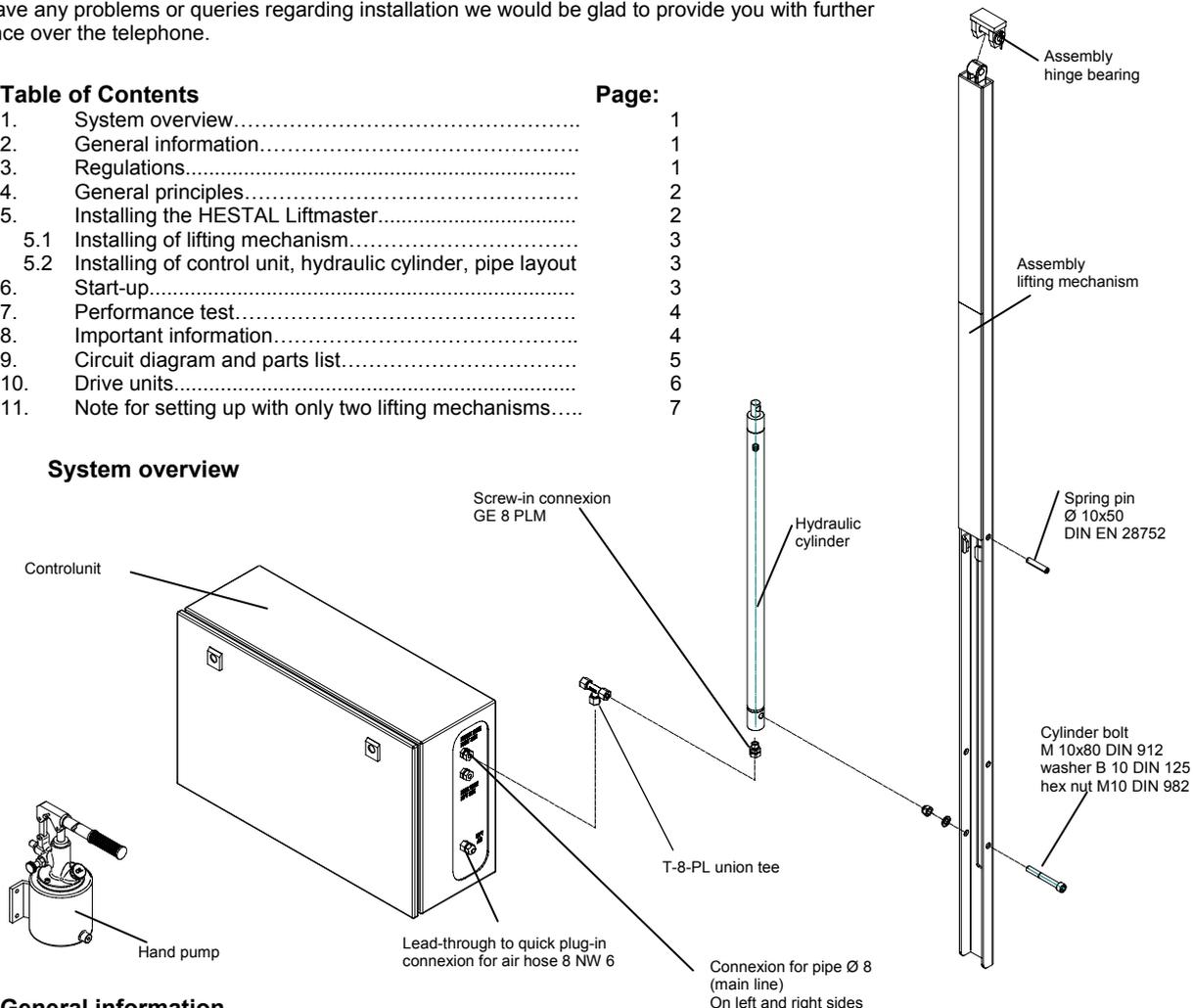


## Installation manual for HESTAL 855 Liftmaster

For use by vehicle construction plants and trained specialised staff.  
Installation work NOT to be performed by inexperienced personnel!  
If you have any problems or queries regarding installation we would be glad to provide you with further assistance over the telephone.

Table of Contents	Page:
1. System overview.....	1
2. General information.....	1
3. Regulations.....	1
4. General principles.....	2
5. Installing the HESTAL Liftmaster.....	2
5.1 Installing of lifting mechanism.....	3
5.2 Installing of control unit, hydraulic cylinder, pipe layout	3
6. Start-up.....	3
7. Performance test.....	4
8. Important information.....	4
9. Circuit diagram and parts list.....	5
10. Drive units.....	6
11. Note for setting up with only two lifting mechanisms.....	7

### 1. System overview



### 2. General information

The HESTAL 855 Liftmaster is designed for raising a roof up to 580mm. One lifting mechanism (width 60mm & depth 30mm) is welded into each of the corner frame profiles of the vehicle superstructure. The working unit is fitted at a suitable point underneath the vehicle frame. Any modifications to the HESTAL 855 Liftmaster or failure to adhere to the installation manual render all liability claims null and void!

### 3. Regulations

In addition to this installation manual, the following regulations and guidelines must be observed:

- BG (Employer's Insurance) "General Regulations" (BGV A1)
- BG "Winching, Lifting and Traction Equipment" regulations (BGV D8)
- BG "Vehicles" regulations (BGV D29)
- VDI [Association of German Engineers] Guideline 2700 "Securing Loads on Road Vehicles"
- Vehicle manufacturer's construction guidelines
- StVZO [Road Traffic Licensing Regulations]
- Hydraulic oils DIN 51524
- Pipe connexions DIN 2353
- Seamless precision steel pipes DIN 2391
- Pipe fitting manufacturer's general instructions and assembly instructions
- Hoses reinforced with wire mesh DIN 20022
- Requirements for fitting hoses DIN 20066
- Hose fittings DIN 20078-9
- Safety regulations for hydraulic hoses (ZH 1/74)

#### 4. General principles

The HESTAL 855 Liftmaster is designed for a total maximum roof weight of 1,000kg. Additional loads such as snow, ice etc. must be removed prior to operation, in case they slide off! (Maximum lifting force 2,000kg)

**The lowered roof must be positively locked, using appropriate technical measures (e.g. lugs).**

The superstructure manufacturer has integrated the HESTAL 855 Liftmaster's lifting mechanism in the corner supports. The lifting mechanism and its profile must not be included when strength is evaluated.

The centre supports must be fitted with telescopes, allowing the roof to be raised by 580mm. (e.g. HESTAL 700.7 centre support with 600 telescope).

On no account must the ultrahigh pressure hydraulic hoses also be painted.

In addition, all connexions must be secured with a suitable thread locking substance! (to be chosen by the superstructure manufacturer)

Only genuine HESTAL parts must be used for maintaining or repairing the HESTAL 855 Liftmaster.



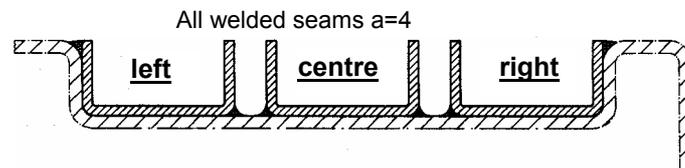
**Driving with the roof raised (even only slightly) is not permitted!**

#### 5. Installing the HESTAL 855 Liftmaster

##### 5.1. Mounting the lifting mechanism

The lifting mechanism can be welded into the corner frame profiles of the vehicle superstructure, either on the left, on the right or in the centre.

Figure 1:

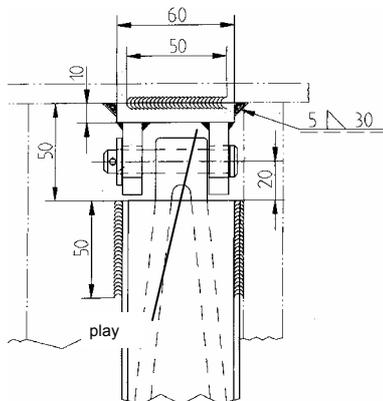


Corner pillar profile chosen by superstructure manufacturer

After the lifting mechanism has been aligned, the following seams must be welded:

On both sides, beginning at the upper end of the U-profile, each 50mm in length, with a weld seam thickness of a=4mm. Underneath that, 10 welded seams, each 40mm in length (with 150mm between them) and a weld seam thickness of a=4mm. (U-profile length: 1950mm). Distance from the upper end to the lower edge of the roof connecting plate: 50mm).

Figure 2: Fitting the hinge bearing to the roof connecting plate



In order to prevent crevice corrosion, cover any unwelded parts with sealant.

Weld executed according to DIN EN ISO 13920-BF, DIN EN 25817-C; DIN EN ISO 9692-2 and DIN EN 29692. The choice of materials and dimensions for the corner supports, as well as the choice of a suitable welding material must be determined by the superstructure manufacturer, with regard to the loads permitted and expected in this case.

Example: If the corner support is made of Item 52-3, we recommend a NiFe wire for welding and, as a welding electrode, ENIFEBG11 in accordance with DIN 8573 or ENIFE-C in accordance with the AWS standard.

The hinge bearing should be welded under the roof connecting plate, as shown in Figure 2 and positioned so that there is some play between (moulded) hinge bearing and outside of the vehicle.

(taking the length of the side of the vehicle into account)

In this way, Figure 2 shows the mounting of the left front, or right corner pillar.

The roof connecting plate sits on the corner pillar and must be chosen by the superstructure manufacturer, depending on the roof design.

## 5.2 Fitting the drive unit and the hydraulic cylinders and line installation

**The line installation for the HESTAL 855 Liftmaster and the assembly of the working unit and the hydraulic cylinders must be completed by the vehicle manufacturer, with those tasks being carried out by personnel suitably specialised (in hydraulics).**

The **drive unit** (with baseplate-mounted control unit and pump unit or, alternatively, hand pump) is fitted, with as much protection as possible, in a suitable place and in a stipulated installation area under the vehicle frame. For this purpose, you should use four bolts with M8 thread, in accordance with DIN 931, 933, 912 or 6912 (bolt length to be chosen by the vehicle manufacturer), B8 washers in accordance with DIN 125 and self-locking M8 hex nuts in accordance with DIN 982 or 985 (parts not supplied). In addition, the bolted joints must be painted with a suitable thread locking substance. (The thread locking substance, suitable for the expected stress, must be chosen by the superstructure manufacturer).

### **Pneumatic- connexion (10 bar maximum permitted operating pressure):**

a) cabins, b) articulated lorry trailers and vehicles with pneumatic shock absorption

- a) If not already present, an auxiliary user connexion point must be installed to serve as a four-circuit safety valve. The HESTAL 855 Liftmaster is connected here to Connexion Point 23, as an auxiliary user unit.
- b) An over current or reverse current valve must be fitted to the pressure tank for brake system or air shock absorption, to which the HESTAL 855 Liftmaster is connected.

For this you can use a pressurised air hose, of the type generally used in vehicle construction, and preferably of polyurethane, with an external diameter of 8mm/NW 6. The air pressure hose is led into the steel housing through the hole provided and pushed as far as it will go, into the air shut-off valve (quick plug-in connexion). Attention: the end of the hose must be cut at a right angle.

The hydraulic cylinders must be provided with the GE-8-PLM screw-in connexion and each must then be mounted in the U-profile of the lifting mechanism with an M10x80 DIN 912 cylinder bolt (8.8 strength category), a B10 DIN 125 washer and a M10 DIN 982 hex nut (49Nm tightening torque); in addition, each piston rod is connected to the thrust plates by a spring pin (mounting holes may have to be made in the corner supports). The cylinder-stroke should be in an upward direction and the cylinders must be fitted so that the bleeder screw is accessible. In addition, the bolted joints must be painted with a suitable thread locking substance. (The thread locking substance, suitable for the expected stress, must be chosen by the superstructure manufacturer).

### **Connecting the hydraulic line to the control unit and the pump unit on baseplate**

Lay both main connecting lines on the left and right sides of the drive unit as far as the centre of the vehicle, and from there connect the T-8-PL union tee to the hydraulic cylinders on the appropriate side. In the vehicle frame, 8x1 35.4 NBK DIN 1630/2391 lines made of galvanised steel pipe are used for this purpose.

### **Connecting the hydraulic line to the hand pump: a hand pump is needed for each side of the vehicle**

Lay the connecting main line as far as the centre of the vehicle and from there connect the T-8-PL union tee to the hydraulic cylinders on the appropriate side. In the vehicle frame, 8x1 35.4 NBK DIN 1630/2391 lines made of galvanised steel pipe are used for this purpose.

A flexible ultrahigh pressure hydraulic hose, in accordance with DIN 20022, 250 bar nominal pressure with 8 L hose connexion, connects the main steel pipe line to the hydraulic cylinders, in the corner supports.

Care must be taken to ensure that the steel pipe line is laid and fastened inside the vehicle frame in such a way that it cannot rub against edges or lead-throughs or become damaged in any other way.

**The pneumatic and hydraulic lines should be concealed when they are laid inside the corner supports and the vehicle frame.**

**Pipes must be adjusted stress-free before assembly**

**Pipe systems must be fastened with suitable pipe clamps at specific intervals.**

**With Ø 8 mm pipe, the distance between the clamps must be 900mm.**

**Hydraulic hoses, which are laid in the actual working area and are exposed to traffic, must be shrouded.**



**If there are no manufacturer's stipulations, the hydraulic hoses must be replaced (because of age) after a maximum period of six years!**

## 6. Start-up

Fill oil tank up to the mark with HLP 10 hydraulic oil which complies with DIN 51524.

Open the bleeder screws on the hydraulic cylinders. (Allen key SW 4 )

If necessary, bleed pipes in advance. Start pumping process pneumatically or manually (see Operating Instructions). Depending on the length of the pipes, it may be necessary to fill the oil tank again up to four times, until the pipes and the hydraulic cylinders are completely full. After the system has been bled completely, fully tighten all pipe connexions and the hydraulic cylinder bleeder screws again.

## 7. Performance test

**Performance test on control unit and pump unit on baseplate** (see also Operating Instructions)

Preselect roof side      Switching the ball valve for the right or left side of the roof determines which side is to be raised.



**Attention:**      **The centre supports must be fitted with telescopes and be located in the fastening points located on the vehicle frame!**

Raise roof      The pump is switched on by opening the air shut-off valve (switch is parallel to pipe).  
The vehicle roof is now raised. This procedure may be interrupted at any point you choose, by switching the pump off again.  
**When both roof sides have to be raised, the ball valve of the raised roof side must be closed before.**

**On completion of the raising procedure, the pump must be switched off by means of the air shut-off valve!**

Lower roof      The vehicle roof is lowered by opening the handwheel. This procedure may be interrupted at any point you choose, by closing the handwheel.  
Only the side with opened pipe can be lowered ( select ball valve )  
**When the lowering process is complete, the handwheel must be closed again!**

**Performance test on hand pump** (see also Operating Instructions)



**Attention:**      **The centre supports must be fitted with telescopes and be located in the fastening points located on the vehicle frame!**

Raise roof      Insert pump lever in hand pump mount and start pumping process.  
The vehicle roof is now raised. This procedure may be interrupted at any point you choose.

Lower roof      The vehicle roof is lowered by opening the handwheel. This procedure may be interrupted at any point you choose, by closing the handwheel.  
**When the lowering process is complete, the handwheel must be closed again!**



**Then the system must be checked once more for a tight seal.**

## 8. Important Information

**Adhering to the installation and operating manuals will ensure the HESTAL 855 Liftmaster functions perfectly.**

**During the (lowering) operation, there must be no one in the loading area or on the load itself!**

**It is permitted to operate the HESTAL 855 Liftmaster only with extendible centre supports.**  
(e.g. HESTAL 700.7 centre support with 600 telescope).

**The lowered roof must be positively locked, using appropriate technical measures (e.g. lugs).**

**Driving with the roof raised (even only slightly) is not permitted.**

**For reasons of operational, road and work safety, only combinations of the HESTAL parts illustrated here are permitted.**

**When properly installed, the Liftmaster conforms to the stipulations of Appendix 1  
“Basic Safety and Health Requirements in the Design and Construction of Machines” of the EU Machine Guideline  
(89/392/EEC), and the “Vehicles” accident prevention regulations (BGV D29).**

**The Operating Instructions provided must be attached to the vehicle documents and kept in the vehicle itself!**

Vehicle-side

9. Circuit diagram and parts list

Figure 4: Circuit diagram

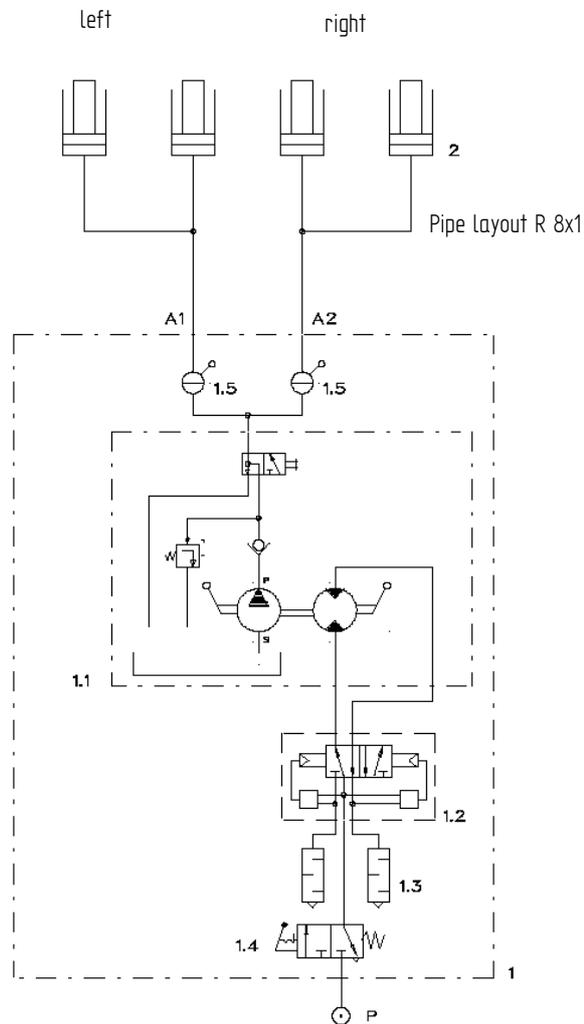
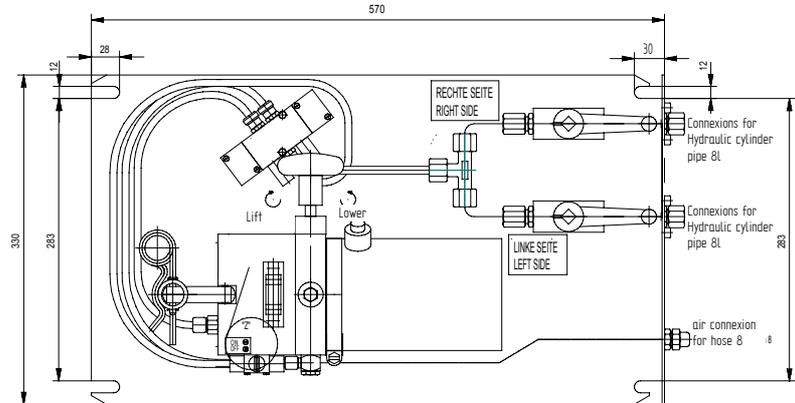


Figure 5: Parts list

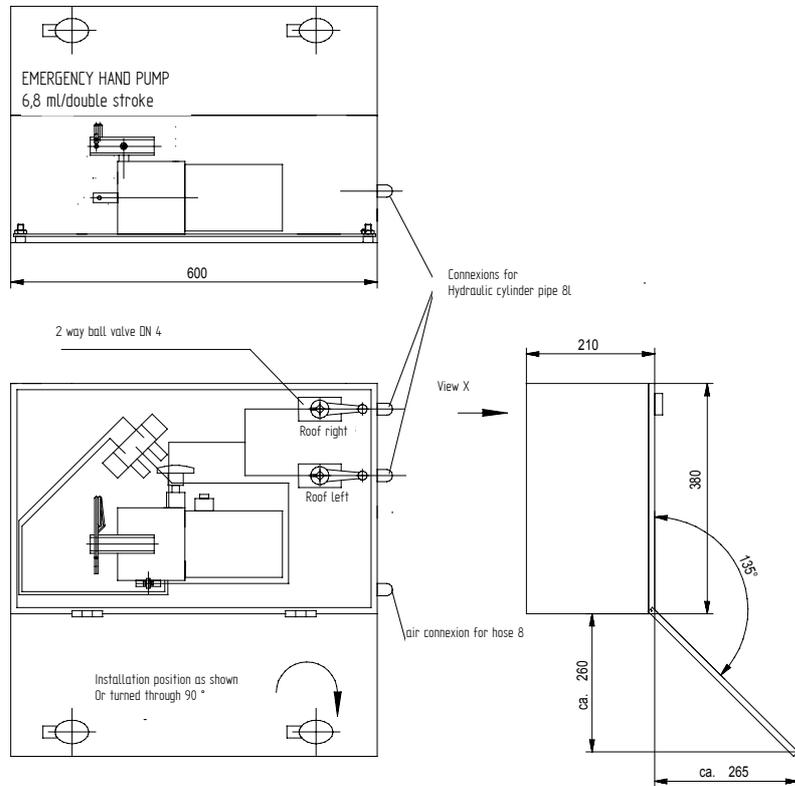
Parts list			
Item	Designation/dimensions	Hestal No.	ID No.
1	Control unit	6.810.064.10	299-40339
	Pump unit on baseplate	6.810.064.25	299-40340
	consisting of:		
1.1	Compressed air hydraulic pump	6.810.064.09	252-40004
	manually operated, pressure valve		
	Drain valve and 1 litre tank		
	Model LPH 100 / 12 / 6-250-1		
1.2	Oscillating valve Model 900.525N - G1/8	6.810.008.21	904-10020
1.3	Sound absorbers	6.810.008.07	884-10044
1.4	3/2 way stop valve Model HE-3-QS-8	6.810.064.06	904-10011
1.5	2/2 way ball valve DN 4 PN 500 St M 16x1,5	6.810.064.05	909-10082
	possible cylinder models:		
2	Pressure cylinder ED16-580 QB11	6.810.064.20	114-10032
2	Pressure cylinder ED16-400 QB11	6.810.064.30	114-10006
2	Pressure cylinder ED16-1000 QB11	6.810.064.35	114-40024

10. Drive units

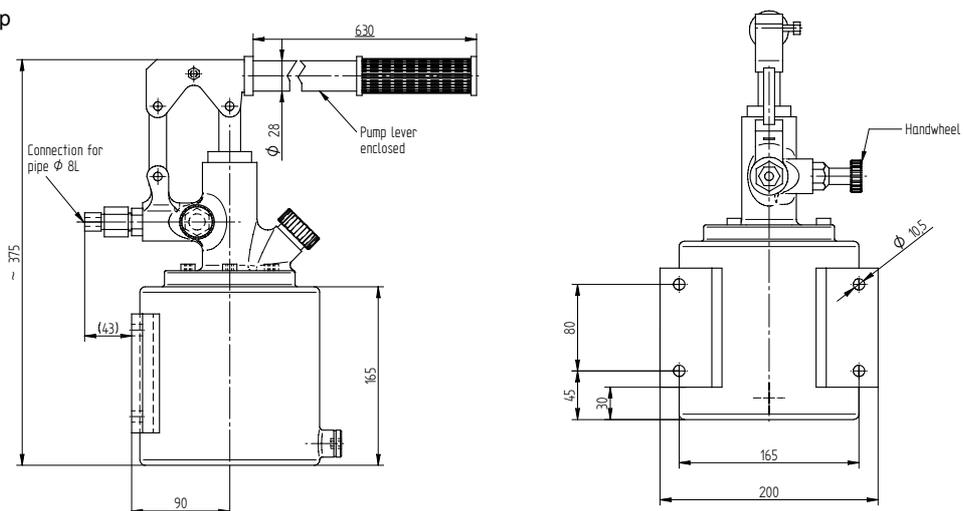
a) Pump unit on baseplate



b) Control unit



c) Hand pump



**11. Note for setting up with only two lifting mechanisms...**

If it is intended to raise the vehicle roof on one side only, the vehicle manufacturer must provide suitable roof hinge bearings on the side of the vehicle not to be raised. (See Fig. 7)

Also, the unused main line-out on the control unit must be filled with a blind plug (see circuit diagram, Fig. 4)

For practical reasons, the control unit must be attached to the side of the vehicle to be raised.

Figure 7:

