

## Installation instructions for the HESTAL-*LiftMaster* 770 (version from April 2006)

Intended for vehicle manufacturers and trained technical staff. Do NOT allow non-specialists to carry out any installation work!

If there are any uncertainties or questions concerning the installation, please feel free to give us a call, and we will be glad to help.

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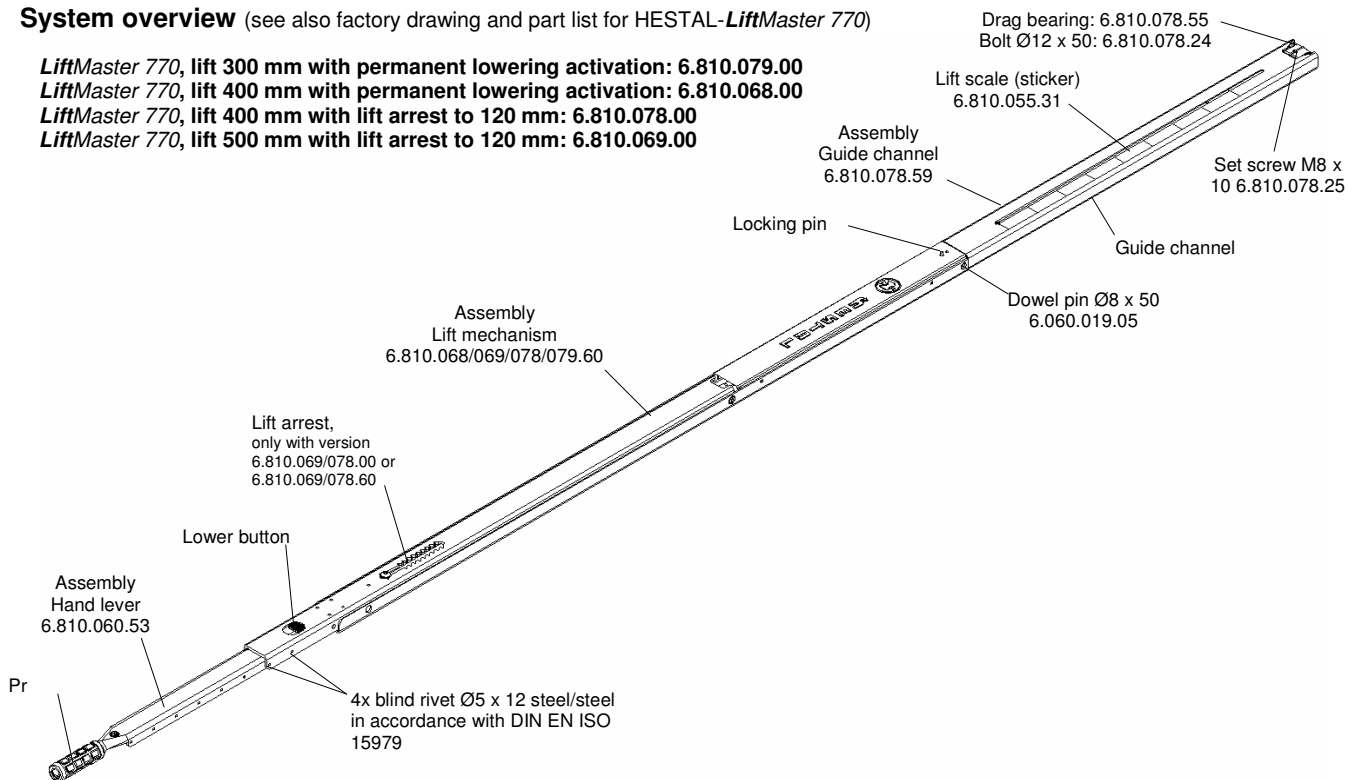
### System overview (see also factory drawing and part list for HESTAL-*LiftMaster* 770)

**LiftMaster 770, lift 300 mm with permanent lowering activation: 6.810.079.00**

**LiftMaster 770, lift 400 mm with permanent lowering activation: 6.810.068.00**

**LiftMaster 770, lift 400 mm with lift arrest to 120 mm: 6.810.078.00**

**LiftMaster 770, lift 500 mm with lift arrest to 120 mm: 6.810.069.00**



### General (intended use)

The HESTAL-*Liftmaster* 770 is a mechanical device for lifting and lowering the roof of commercial vehicles to make the full volume of the cargo area usable and to facilitate the loading or unloading process.

The HESTAL-*Liftmaster* 770 is available with lift arrest (6.810.069/078.00) for drive mode with different roof positions, or with permanent lowering activation (6.810.068.00) for smaller bodies with a light roof.

### Technical description

The HESTAL-*LiftMaster* 770 is used to variably lift the roof of a commercial vehicle up to 300, 400 or 500 mm on each corner via a knee-lever mechanism. Drive is executed through hand power via a swing-out hand lever in multiple single strokes with up to 50 mm of roof lift per single stroke.

In this process the raised roof is secured in each lift position by a blocking element. In addition, in the version with lift arrest (6.810.069/078.00) drive mode is permitted with a vehicle roof that has been raised up to 120 mm. **However maximum permissible total vehicle height of 4 m how should not be exceeded in this process. (see StVZO §32 Section 2)**

The roof is lowered via a lowering button, and the lowering speed can be metered with the activation force. Depending on the version the lowering activation can be either temporarily (6.810.069/078.00) executed, or permanently executed (6.810.068.00/079.00). In drive mode the completely lowered roof rests flush on the guide channel of the HESTAL-*LiftMaster* 770 thus the knee-lever mechanism is offloaded. In addition the hand lever is secured against unintentional swing-out by a spring element.

## General information

**Factory drawing and part list (6.810.068/069/078/079.00) are not part of these installation instructions and must be present for installation! Please request the latest version of these documents per post or email (CAD data).**

Because lifting or lowering is executed separately on each corner the total construction of the vehicle roof must be designed by the body manufacturer so that the possibility of jamming or collision is excluded.

The HESTAL-*LiftMaster* 770 has a standard length of 2750 or 2950 mm, which if necessary can be adapted to any body height by shortening the hand lever assembly in 50 mm increments to a minimum length of 2450 or 2650 mm.

This product is designed for a variable lift to max. 400 or 500 mm, and roof weight to a max. of 1000 kg.

Roof weight is the sum of the weight of the roof construction, all of the tarp(s), and all center stanchions.  
(Total of the weights of all components that will be lifted).

A HESTAL-*LiftMaster* 770 (width 60 mm, depth 30 mm) is riveted into the corner pillars of the vehicle body (Fig. 1).

Prior to lifting the vehicle roof the doors of the rear portal should always be open.

 **If there are changes to the HESTAL-*LiftMaster* 770 or deviations from the operating instructions any type of liability claim is rendered null and void!**

## Regulations for installation and operation

The following regulations and directives must be complied with:

- Liability Insurance Association (BG) regulation "General Regulations" (BGV A1)
- BG regulation "Vehicles" (BGV D 29)
- BG principles "The testing of vehicles by drivers" (BGG 915)
- BG principles "The testing of vehicles by drivers" (BGG 916)
- BG rules "Vehicle repair and maintenance" (BGR 157)
- StVZO (German Road Traffic Act)
- Body guidelines established by the vehicle manufacturer
- Operating instructions for the HESTAL-*LiftMaster* 770
- If goods are to be sealed in bond, the vehicle must be equipped in accordance with Customs and Excise guidelines.

## General regulations

The HESTAL-*LiftMaster* 770 is laterally riveted into the corner stanchions by the body manufacturer below the side tarps; guide channel and U-profile should not be considered in the strength consideration. For replacement of wear parts depending on the stanchion design, in the area of the pin connections (dowel pin Ø8 x 50) mounting bores Ø12 must be drilled into the corner stanchions (pay attention to mounting and possible dismantling! See factory drawing for position).

We recommend installing the HESTAL-*LiftMaster* 770 only on bodies with clamped-down side tarps!

The HESTAL-*LiftMaster* 770 is designed for a lift load (corner load) of max. 250 kg, when used in all four corner stanchions for a roof load of maximum 1000 kg (take possible snow load into account). A combination with higher corner loads or roof loads is only permitted with our express approval.


Supplemental loads such as snow, ice, etc. must be removed prior to operation due the danger of slipping.

The lowered roof should be secured form-fit through appropriate technical measures (centering cams).

All middle stanchions must be equipped with telescopes that permit a lift of 400 or 500 mm, as well as with a pull-out brake or fall brake (e.g. HESTAL-*VarioMaster* 900 or 901 with telescope).

 **The lift of 300, 400, or 500 mm should not be mechanically restricted through additional technical measures!**

Cargo height should not exceed the clear interior height of the cargo area, if this is not the case the roof cannot be completely lowered!

 **Drive mode with raised roof is only permissible with version 6.810.069/078.00 or 6.810.069/078.60 (lift mechanism assembly), and only with a maximum lift of 120 mm, with temporary lowering activation and bracing via the arrest saddle!**

## Attachment of mechanical components (see also factory drawing and part list for HESTAL-*LiftMaster* 770)

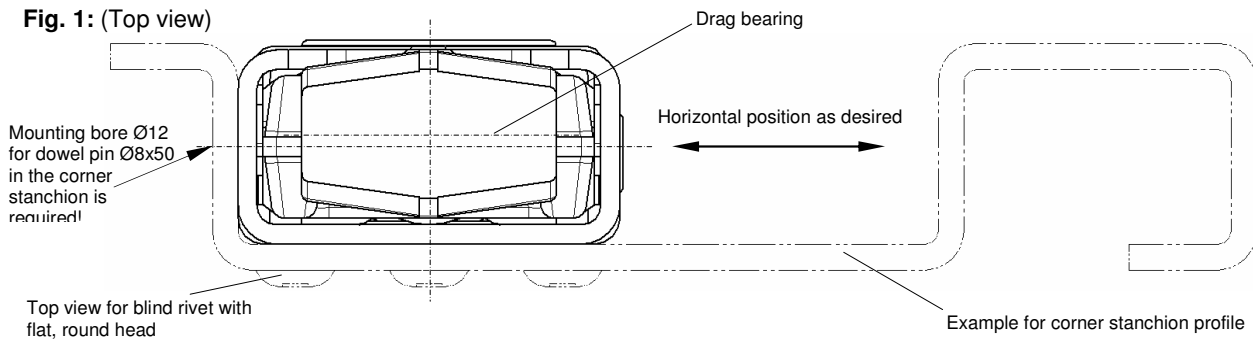
The mechanical components of the HESTAL-*LiftMaster* 770 are the guide channel, lift mechanism, hand lever, and drag bearing assemblies (see system overview) and they are riveted vertically in the lateral corner stanchion profile supplied by the vehicle body manufacturer (see Fig. 1). The horizontal position in the corner stanchion can be selected by the body manufacturer as desired.

The total factory length of the mechanism can be adapted to the standard body height as needed by shortening the hand lever (saw cut, etc.) in increments of 50 mm (max. 300 mm) to a minimum length of 2450 or 2650 mm (lift 500 mm). The

hand lever assembly is mounted on the lower end of the lift mechanism assembly via the existing hole pattern via four blind rivets Ø5x12 St/St DIN EN ISO 15979 (not included in the scope of delivery)

The upper ends of the guide channel and the corner stanchion form the support plane for the lowered vehicle roof (see Fig. 1, 3, and 4). It is not necessary to cut out the corner stanchion profile in the drag bearing area!

**Fig. 1:** (Top view)



For rivet mounting 12 blind rivets are required (not included in the scope of delivery). Depending on the desired position in the corner stanchion profile an appropriate bore pattern must be executed in the corner stanchions. The dimensions of the hole pattern are shown on the factory drawing of the HESTAL-*LiftMaster 770*. Please request the latest version!

To fasten the HESTAL-*LiftMaster 770* in the corner stanchion profile of the body manufacturer, we recommend the blind rivet versions specified in the table. When selecting the blind rivet the material strength of the corner stanchion profile (clamping length) and the desired head form are the crucial factors; if projection of the rivet head into the cargo area is not desired, then the listed blind rivets with countersunk head can be used (countersunk bore required in the corner stanchion).

Type designation	Clamp length	Mat. strength, corner stanchion	Minimum strengths		Order no. Hesterberg
			Shear (N)	Tensile force (N)	
Blind rivet Ø6.5 x 16.3 steel/steel with <b>flat round head</b> Ø13.1 x 2.6	6 mm	<b>3 mm</b>	12500	9000	6.800.040.23
Blind rivet Ø6.5 x 18.3 steel/steel with <b>flat round head</b> Ø13.1 x 2.6	7 – 8 mm	<b>4 - 5 mm</b>	15000	9000	6.800.040.24
Blind rivet Ø6.4 x 13.5 steel/steel with (90°) <b>Countersunk head</b> Ø10 x 2	6 – 7 mm	<b>3 - 4 mm</b>	10300	5490	On request
Blind rivet Ø6.4 x 15.5 steel/steel with (90°) <b>Countersunk head</b> Ø10 x 2	8 – 9 mm	<b>5 - 6 mm</b>	10300	5490	On request

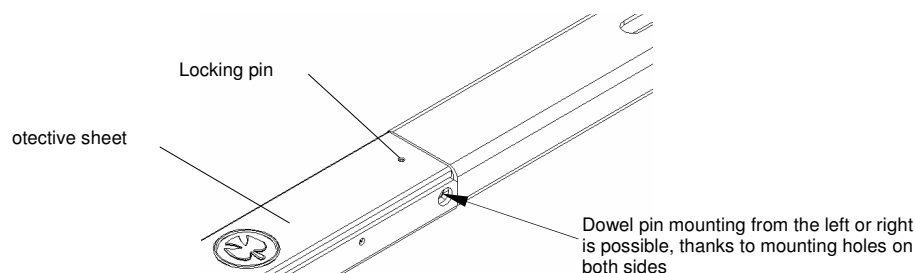
For processing the blind rivets specified in the table, special processing devices are required that you can purchase directly from the blind rivet manufacturers! Please request the appropriate information and data sheets for the blind rivets and processing devices!

**⚠ Only the rivets specified in these installation instructions should be used! If a different blind rivet execution is intended it must be tested by the body manufacturer for usability relative to bore diameter, stress, and function of the HESTAL-*LiftMaster 770* (shape of the snap head)!**

**⚠ After riveting on the lift mechanism and guide channel assemblies these must be connected with the Ø8 x 50 DIN EN 28752 dowel pin included in the scope of delivery (provide mounting holes in the corner stanchion, see Fig. 1, Fig. 2).**

**The dowel pin must be driven in far enough that it there is no overlap of the mounting holes!**

**Illustration 2:**



For the last work step, i.e. after concluding all mounting tasks, the lock pin (see Fig. 2) can be removed. To do this pull the lock pin horizontally out of the mechanism using pliers or a similar tool. To facilitate this work step the release lever should be open! The HESTAL-*LiftMaster 770* is now ready for operation!

**Only remove the locking pin after conclusion of all mounting work (including attachment of the drag bearing) and before the first activation/lifting of the roof!**

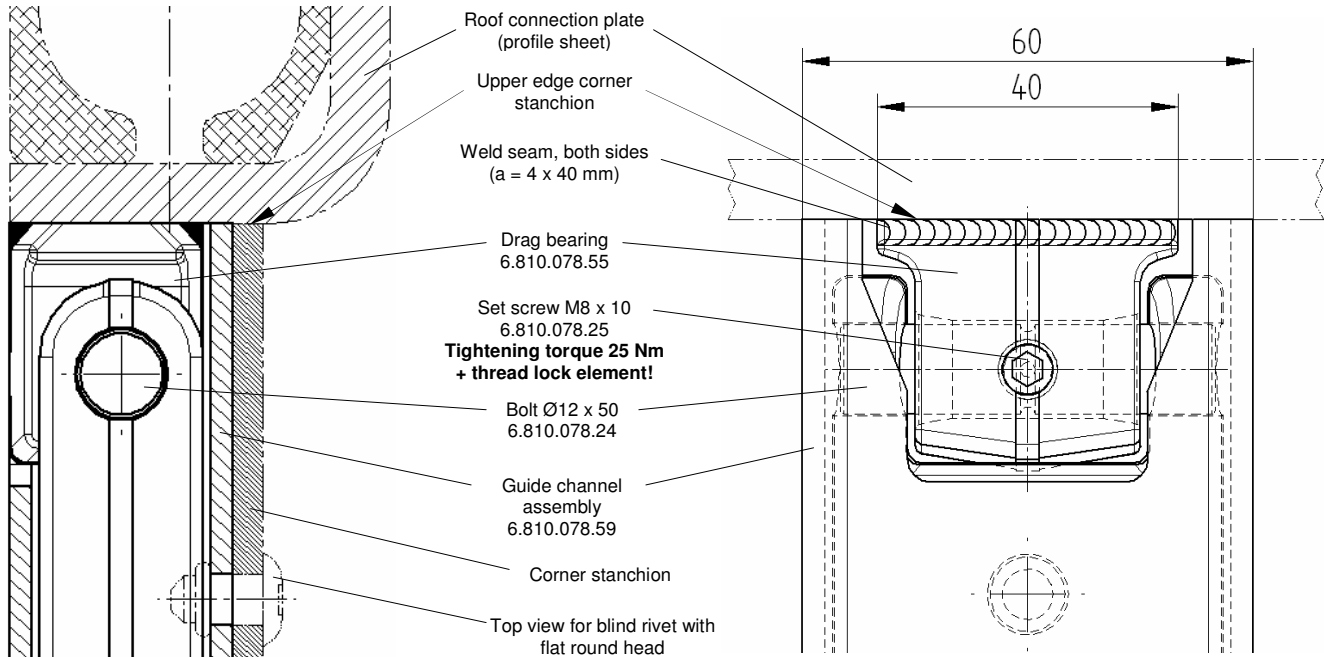
### Attachment of the drag bearing



The drag bearing must be welded under the roof connecting plate (profile sheet metal) ( $a = 4 \text{ mm}$ ) and positioned so that the centers of the drag bearing and the guide channel assembly are flush, (see Fig. 4).  
**The roof connection plate (profile sheet) must be selected by the body manufacturer depending on the roof design. The tightening torque for the set screw M8 x 10 is 25 Nm! In addition we recommend using high-strength thread locking elements (e.g.: Weicon AN 306-30)!**

**Fig. 3:** (Side view, transverse side of vehicle)


**Fig. 4:** (Front view, long side of vehicle)



### Function check

**Lifting:** Grasp the handle on the hand lever (see system overview) and pull the lever out of the securing against the spring pressure. As soon as the hand lever is completely swung out of the securing mechanism you can start lifting the roof.

Pull the hand lever towards you, the vehicle roof will lift. A single stroke lifts the roof a max of 50 mm, however the stroke can be interrupted at anytime! Then swing back the hand lever and again pull it toward you. This process can be repeated until the desired roof position, or the maximum roof lift of approximately 400 to 500 mm is reached (see the lift the display).

 After reaching the maximum roof lift the mechanism is protected against overload by a free-wheel mechanism, i.e. additional hand lever swing movements do not lift the vehicle roof any further.

**After the lift process is concluded the hand lever must be swung back and locked into the secured end position!**

**Lowering:** Press the lowering button (see page 1) the vehicle roof will lower. The lowering speed can be metered with the lowering button, i.e. the further the lowering button is pressed in, the faster the roof will be lowered. The lowering process can be interrupted at any time by releasing the lowering button.



**If the lift mechanism is equipped with permanent lowering (6.810.068.60), after the lowering button is engaged the lowering process can only be stopped by opening the hand lever!**

### Important instructions

Trouble-free function of the HESTAL-*LiftMaster 770* is ensured if the operating instructions are complied with.

For reasons of operational safety, road safety, as well as operational health and safety, you must not combine any components other than the HESTAL components shown here.



The operating manual included in the scope of delivery must be transferred to the vehicle owner!

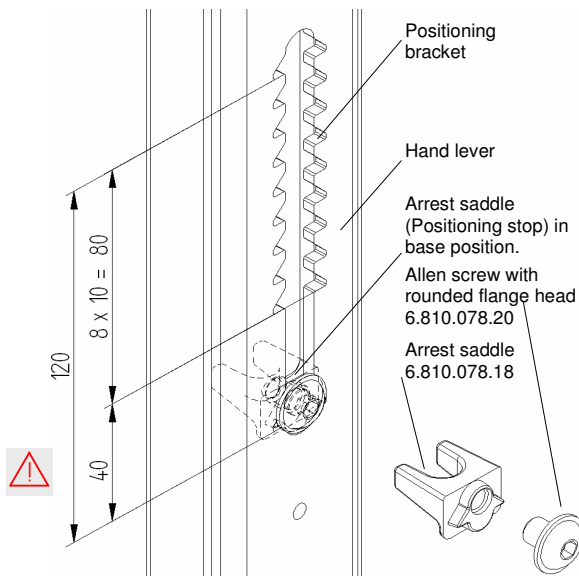
Paint should only be applied when the hand lever is closed and the vehicle roof is lowered! DO NOT PAINT INSIDE!

The lift scale included in the scope of delivery (sticker) should be attached to the right of the lift display on the guide channel after final painting!

**If installed properly the HESTAL-LiftMaster 770 satisfies the BG regulation "Vehicles" (BGV D29).**

**Adjusting the lift arrest** (only the lift mechanism assembly - 6.810.078.60 or *LiftMaster 770* - 6.810.078.00)

Use the lift arrest to pre-select the lowered position of the vehicle and thus enlarge the clear interior height of the cargo area by 40mm to a max 120mm (10mm grid). A wrench (SW5) is required for the adjustment. Adjustment of the arrest saddle (positioning stop) should be executed as described below:



1. Open the hand lever and lift the vehicle roof by a min of 150 mm.
2. Loosen the Allen screw with rounded flange head with the opened hand lever via socket wrench (SW 5) and unscrew it 4 - 5 mm.
3. Pull the arrest saddle out of the positioning bracket to the inside (screw flange is again resting on the surface).
4. Slide the arrest saddle into the desired position within the bracket and from inside press it into the positioning bracket of the hand lever.
5. Hand tighten the Allen screw with rounded flange head.
6. Swing back the hand lever and close until it engages.
7. Press the lower button and lower the vehicle roof to the stop on the arrest saddle.
8. Tighten the Allen screw with rounded flange head with a socket wrench

**ATTENTION! Do not exceed the maximum permissible total vehicle height of 4 m. (see StVZO §32 Section 2)**

**Replacement of the lift mechanism assembly** (6.810.068.60 with perm. lowering activation or 6.810.069/078.60 with lift arrest)

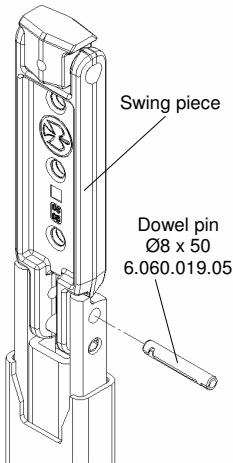
If the vehicle roof can no longer be raised, or if the vehicle roof does not stay in the lifted position, the lift mechanism subassembly is defective. This wear part must always be completely replaced!

Proceed as follows for this:

1. Secure the lift mechanism against falling (attach it to the corner stanchion) with at least two screw clamps.
2. Remove Ø8 x 50 dowel pin when the vehicle roof is completely lowered (see system overview and Fig. 2).
3. Bore out and remove the blind rivets of the lift mechanism (6) from the cargo area side.
4. Loosen the screw clamp - Attention: The lift mechanism assembly can fall - and remove the lift mechanism.
5. Mount new lift mechanism assembly as described under "Attachment of mechanical components (starting on page 2).

The hand lever assembly (see system overview) can still be used on the new lift mechanism assembly!

## Particularities (settings in case of need)



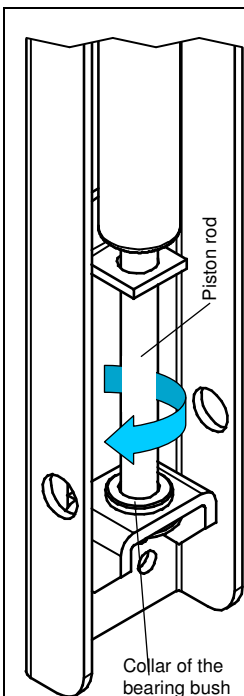
The rear corner stanchions are always equipped by the vehicle manufacturer with a permanently mounted crossbeam. This crossbeam must remain in its initial position when the roof is lifted, to provide the necessary stability to the entire rear portal. (This is also where the counter-holder of the rotating bar latches are mounted).

The end of the roof forms another crossbeam and is also raised when the roof is raised. The HESTAL-*LiftMaster* 770 is designed for this body concept.

If a permanently mounted crossbeam is not provided by the body manufacturer then the corner stanchions must be configured so that they are appropriately stable, so that it is not possible to swing the corner stanchions up to the roof. In addition the body manufacturer must ensure that trouble-free function of the HESTAL-*LiftMaster* 770 is ensured.

As an aid we also offer the possibility of blocking the swing movement of the swing piece by driving in an additional Ø8 x 50 DIN EN ISO 8752 dowel pin (6.060.019.05, not included in the scope of delivery), as shown. However we expressly state that this measure can cause an increase in the friction forces in the mechanism.

## Readjusting the lowering speed



The factory screw-in depth of the piston rod takes a minimum play between the strike pin and the lowering lever into account. With light vehicle roofs this play can result in overly slow or varying lowering speeds (particularly in combination with permanent lowering).

To readjust the lowering speed this play can be reduced if needed by screwing the piston rod (clockwise) into the bearing bush. This measure reduces the distance between strike pin and lowering lever and enlarges the valve opening when the lowering lever is in pressed status. This produces an increase in the lowering speed.

For readjustment the hand lever must be opened and held in this position. The overlying collar of the bearing bush is then held in place via a pipe wrench while the piston rod is screwed in clockwise via a second pipe wrench. Any damage that may occur to the piston rod does not pose a problem because the hydraulic element is not moved in this area. The thread pitch is 1 mm (1 revolution = 1 mm readjustment).

If needed a reduction of the lowering speed can be achieved by unscrewing the piston rod out of the bearing bush (counter clockwise).

**However readjustment should not exceed a max. of 1 mm (max. revolution; mark the piston rod beforehand)! A residual play must remain between the strike pin and the lowering lever! This play must be verified after the adjustment by closing the hand lever and lightly activating the lowering button.**

**A lack of play between strike pin and lowering lever results in failure of the lift mechanism!**

**Checklist for final checking by the body manufacturer**

**Assembly**

- Original factory drawing and parts list available
- Exclusively genuine HESTAL parts have been used
- Desired version with lift arrest or permanent lowering activation installed
- Lift mechanism, drag bearing, and all pin and bolt connections are mounted as specified in the drawing
- Drag bearing positioned according to the specifications (see page 4)
- M8 x 10 dowel pin mounted with tightening torque 25 Nm and high-strength thread locking elements
- Regulations and directives followed
- HESTAL-*LiftMaster 770* mounted laterally on the vehicle and below the side tarps
- Mounting bores Ø12 present for pin connection (dowel pin Ø8 x 50) in all corner stanchion profiles.
- Corner load max 250 kg (measurement or mathematical confirmation)
- Vehicle body with clamped-down side tarps
- Center stanchions with telescoping device and pull-out brake or fall brake (gas spring or rubber cord)
- No mechanical lift restriction due to supplemental technical measures
- Layout and execution of riveted joints as specified and correct
- Final painting in closed and lowered status executed (no paint applied within the mechanism)

**Function**

- Full lift possible (corner, side, compl. roof)
- Lowering (with interruption) possible (corner, side, compl. roof)
- Hand lever engages properly and completely in the locking spring
- Function check executed with no objections (no jamming, etc.) (see page 5)

**Information**

- Operating instructions 6.800.174.48 have been added to the vehicles documentation
- The vehicle's owner or user has received instructions on how to operate the system
- The vehicle's owner or user has been informed about maintenance and inspection work

Vehicle description / model: .....

Chassis no.: .....

Date of initial registration: .....

**This checklist is to be used for the final inspection of the installation and operation of our product prior to its initial use.**

.....  
Examiner's signature

.....  
Place and date of final testing