

ASSEMBLY AND SERVICE INSTRUCTIONS
FOR TELESCOPIC STEEL COVERS

IIIIHENNIG®
global excellence in machine protection

ASSEMBLY AND SERVICE INSTRUCTIONS FOR TELESCOPIC STEEL COVERS

DEAR CUSTOMERS,

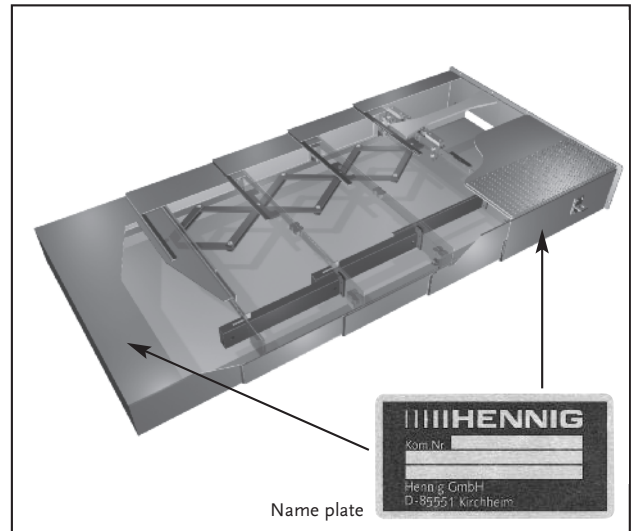
Thank you for choosing Hennig Telescopic steel covers (TSC).

Please read this Assembly and Maintenance instruction to familiarize yourself with this fine product and the required maintenance to guarantee a long service life.

These covers will protect the delicate components of your machine from chips, dust, liquid and fallen objects.

These covers are specially designed to suit each individual machine and might deviate from this description and pictures.

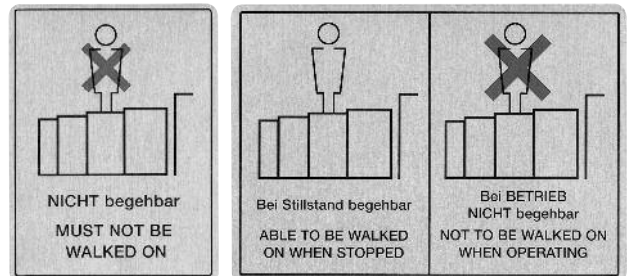
When ordering spare parts or covers please give us the date which is etched on the name plate located outside the largest box, and inside of the smallest box (see picture).



A. HINTS REGARDING DANGER AND PROTECTION

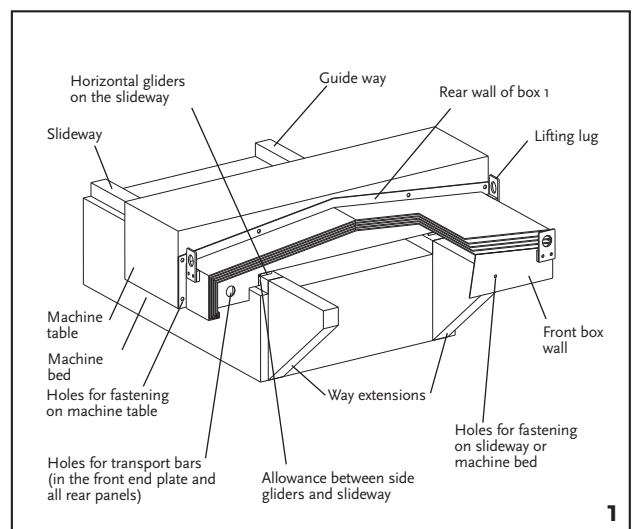
Normally you can not walk on Hennig TSC, unless they are specially designed to be walked on. A label with the necessary instructions is attached (see picture). Ignoring these instructions could damage the intricate guides and supports of the covers and could also cause personal injury.

Hennig Telescopic covers are designed for industrial use and must be properly installed and maintained by trained personnel.

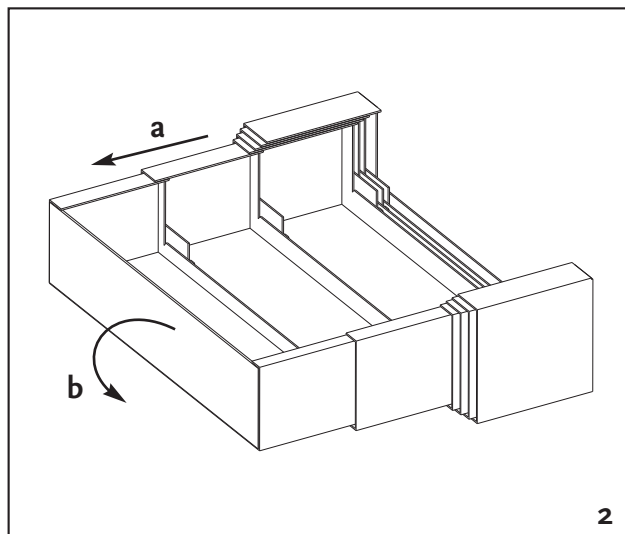


B. ASSEMBLY OF TSC

1. Depending on the design, way extensions might be necessary in order to mount a cover (Fig.1). Make sure that the top and side surfaces of the guide ways are matching seamlessly.
2. Make sure that the way upon which the cover slides is straight, does not sag, and has a smooth surface for brass or plastic guides or a hardened surface for steel rollers.
3. Do not pull the boxes apart, unless the covers is mounted on the ways, to avoid cocking, twisting or bending of the individual boxes when not guiding properly.
4. Make sure that the mounting surfaces are at right angles to the guide way surfaces.



5. Always use the attached lifting lugs on heavy covers when using a crane.
6. Covers with lifting holes thru all rear walls and the front end of the small box must be lifted with lifting rods. Secure the straps or chains to the rod ends.
7. Protect the boxes from damage by the chains or other lifting devices.
8. Carefully lower the cover over the ways and make sure that the side guides don't collide with the top way surfaces.
9. Covers are always mounted in the compressed stage (boxes pushed together). Mount the small box first to the base, next mount sides of large box, to avoid stress within the structure when operating the machine.
10. Predrilled mounting holes might have to be modified to guarantee proper alignment.
11. Secure all mounting bolts with loctite.



I. Horizontal, vertical and cross rail covers in standard construction

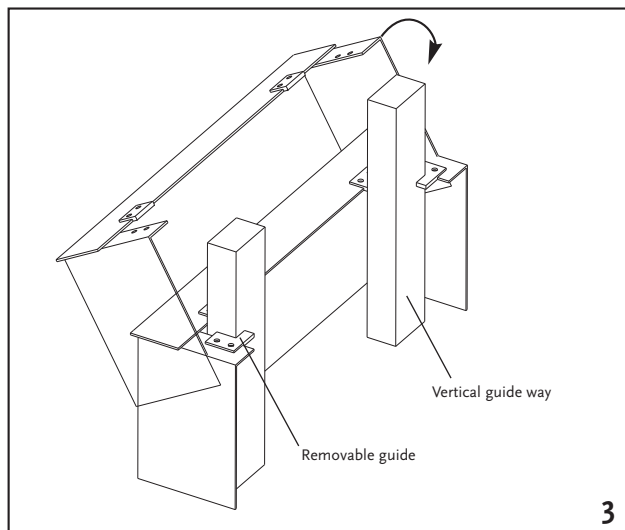
1. Assemble the smallest and largest box with emphases on proper alignment and ensure a square mounting surface to avoid stress on the telescoping boxes.
2. It is important that the largest box should be mounted slightly upward to minimize pressure on the next box.

II. Vertical covers with removable guides

Covers which can not be mounted by sliding the boxes from the ends over the ways are designed with removable guides (Fig. 3).

To assemble such covers, follow Fig. 2 and 3:

1. Lay the cover on its back, pull the two smallest boxes all the way out (Fig. 2a) and twist the smallest box downward to disengage (Fig. 2b).
2. Detach the removable guide
3. Mount the box on the guide way and bolt it to the machine.
4. Attach the guide to cover, tighten and secure
5. Pull out the next largest box (Fig. 2a), tip the box downward (Fig. 2b), and detach the removable guide.
6. Mount the box on the guide way and secure.
7. Repeat step 4.
8. Mount all following boxes as described under steps 5 through 7.
9. Mount the largest box to the machine only after all boxes are assembled.



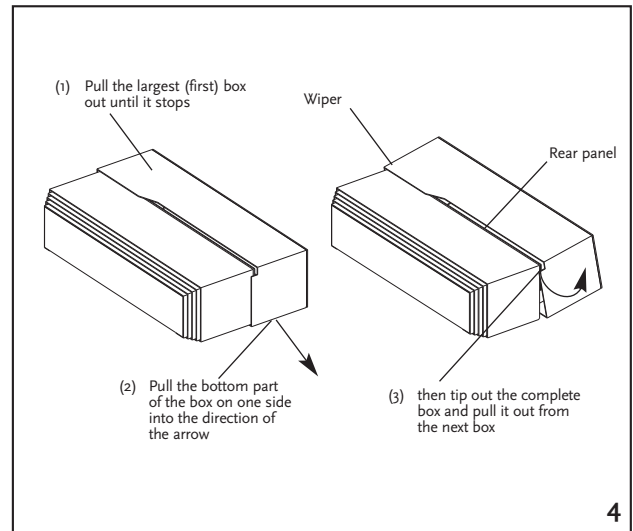
ASSEMBLY AND SERVICE INSTRUCTIONS FOR TELESCOPIC STEEL COVERS

III. Sliding plate covers with guide rails

1. When assembling the guide rail, check for parallelism.
2. Slide the sheets into the slots of the guide rail.
3. Check for misalignment to avoid damage.
4. Mount the front and rear plates of the cover when sheets are compressed.

IV. Steel covers with overtravel protection

The overtravel mechanism and the engagement plates must be properly adjusted so that in all travel positions a long lasting function is guaranteed.



C. DISASSEMBLY AND ASSEMBLY OF STEEL COVERS

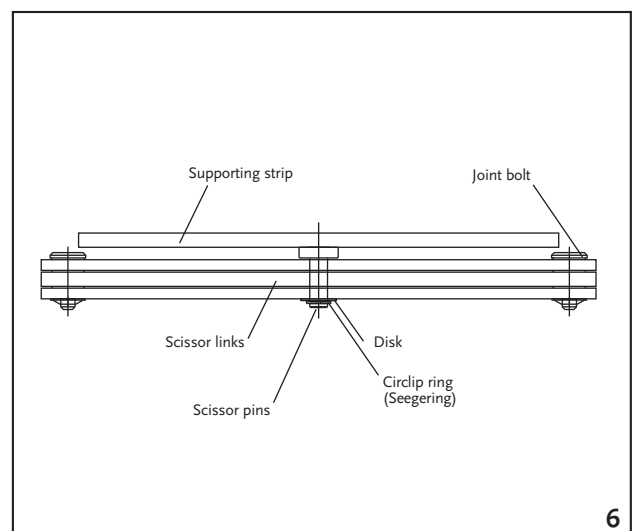
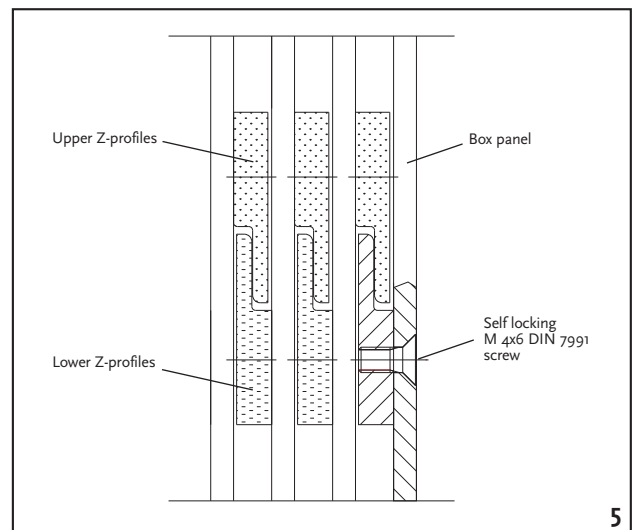
I. Horizontal and cross rail covers

1. Standard covers (Fig. 4)

- 1.1 Loosen the mounting of the largest box.
- 1.2 Push all boxes together.
- 1.3 Pull the largest box out until it stops, hold the following boxes back.
- 1.4 Press lightly against the wiper and tip the pulled out box (largest) upward, using the edge of the wipers as a pivot. Remove the box (Fig. 4).
- 1.5 Pull out the next following box until it stops and follow steps 1.3 and 1.4.
- 1.6 If it is too hard to tip out the boxes, try to pull out slightly the sides of the boxes to disengage the offset of the rear wall. However, be careful not to permanently distort the sides.
- 1.7 When reassembling again, follow the above steps in reverse.

2. Covers with guide-(Z-)profiles (Fig. 5)

- 2.1 Loosen the mounting of the largest box.
- 2.2 Push the steel cover together.
- 2.3 Loosen the M4 Screws from the (Z)-profiles and lift the box upward and forward.
- 2.4 Repeat step 2.3 with the following boxes.
- 2.5 Please follow the above steps in reverse when assembling. Use new, self-locking screws when the guide-(Z)-profiles are assembled.



3. Covers with scissors (Fig. 6)

- 3.1 Loosen the mounting screws of the largest and smallest box.
- 3.2 Push the boxes together.
- 3.3 Remove the cover from the machine and turn it upside down.
- 3.4 Remove the snap rings of the scissor pins and lift up the scissor links.
- 3.5 Reinstall the cover in compressed stage on the guide ways.
- 3.6 Pull out the largest box until it stops, at the same time hold back the remaining boxes.
- 3.7 Press lightly against the wiper and tip the pulled out box upward, using the edge of the wiper as a pivot. Remove the box (Fig. 4).
- 3.8 Pull out the next following box until it stops and follow steps 3.6 and 3.7
- 3.9 If it is hard to tip out the boxes, try to pull out the sides of the boxes to disengage the offset of the rear wall. However, be careful not to permanently distort the sides.
- 3.10 When reassembling again, follow the above steps in reverse. When reassembling the scissors, always use new snap rings.

4. Horizontal covers with screwed on dampeners on the rear walls

- 4.1 Unscrew the mounting of the largest and smallest box.
- 4.2 Push the covers together.
- 4.3 Remove the cover from the machine and turn it upside down.
- 4.4 Unscrew the retainers of the dampeners on the rear wall.
- 4.5 Remove retainers and dampeners.
- 4.6 Pull out the largest box until it stops, press lightly against the wiper and tip the pulled out box upward, using the edge of the wiper as a pivot point. Remove the box (Fig. 4)
- 4.7 Pull out the next following box until it stops and follow steps 4.4 through 4.6.
- 4.8 If it is hard to tip out the boxes, try to pull the sides of the boxes to disengage the offset of the rear wall. However, be careful not to permanently distort the sides.
- 4.9 When reassembling again, follow the above steps in reverse. Make sure, that the retainers are spaced about 1 mm in relation to the next box and secure the screws.

5. Covers with High Speed (HS) modules

Covers with HS modules are complicated and should be disassembled and repaired by Hennig servicemen guaranty safety and proper function. Maintenance work, such as replacing C6-wipers, rollers, guides or dampeners can be done by trained personnel. If necessary, please consult with the Hennig service department to determine if the repair can be done at the customers plant or send to a Hennig service center.

II. Vertical steel covers with removable guides

The disassembly is done directly on the machine as follows:

1. Push the boxes together and unscrew the largest box from the machine.
2. Unscrew the guide from the next largest box and remove the box.
3. Follow the same procedure as outlined under step 2 with all remaining boxes.
4. Unscrew the smallest box and remove.
5. When reassembling, follow the above steps in reverse.

III. Sliding plate covers with guide rails

1. Unscrew the front and rear sheet from the base and slide when sheets are pushed together.
2. Pull the sheets out of the guide rail slots, alternatively the guide rails can also be unscrewed and the whole assembly removed as a unit.
3. When reassembling, follow the above steps in reverse.

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D. START UP

Before shipping, your Hennig TSC has been treated with a corrosion preventive protection and was packed in a plastic foil to protect your cover during shipping and storage. Before installing the cover please lubricate each box with a mineral oil to extend service life.

After installing the cover please test it to make sure it was properly installed: start out with low speed, travel the full stroke and see that no collision occurs with other machine components and that the boxes extend evenly and smooth. Increase the travel speed gradually until it reaches the maximum speed.

At low speed a stick slip affect can occur, due to friction of the wiper lips. This jerky affect is normal and will gradually improve over time. Covers with scissors or HS modules will act similarly at low speed.

If however, the movement of the boxes show a strong pounding, abnormal edging, wearing or sticking, indicating that there could be interference of movement, the cause has to be found and corrected to avoid damage.

E. MAINTENANCE AND SERVICE

I. Visual check and cleaning

TSC require little service. To extend service life it is however recommended to clean the boxes occasionally, depending on the amount of contamination and duty cycles.

On weekly intervals, a visual and functional check should be performed, including checking if the noise level is exceptionally high when the covers move over 40 m/min. If problems show up, they have to be analysed and corrected. Worn components must be replaced regardless of the service life guarantee of the covers. In case that individual components wear out prematurely, the cause must be investigated and the problems eliminated, to prevent more damage.

Please pull the cover apart and clean all contaminates. After cleaning, wipe all boxes with an oil soaked shop towel. This extends the service life of the cover and prevents corrosion. Do not use compressed air for cleaning to avoid dirt to be blown to the inside of the boxes.

With heavy chip contamination please also check, if chips might have penetrated to the inside. If this is the case, the cover must be disassembled and carefully cleaned. Allowing chips to penetrate to the inside will sooner or later damage the cover extensively.

If you need to check the way surfaces, disconnect the largest box and push the boxes together. Before reconnecting spray a coating of oil to the inside of the boxes.

When using aggressive or diluted coolant, the covers with its movable components must be especially maintained in order to reduce or eliminate corrosion. If the covers have not been in operation for some time, they must be disassembled, cleaned and dried also on the inside.

Thereafter the sheet metal must be oiled and any moving joint, greased, assembled and stored in a clean, dry place. When put in operation again, please check that the cover boxes slide smoothly in and out.

In case of damage of the individual boxes of the covers from falling objects (even small damage) the problem must be corrected at once in order to avoid major damage to the cover.

II. Service interval and exchange of wear parts

Frequent preventive maintenance is the basis for a long lasting service.

Therefore on a weekly basis: make a visual and functional check, including high speed covers over 40 m/min a noise and dampener function inspection. Recognized problems must be immediately corrected. Worn components must be replaced regardless of the service guarantee. If parts wear out prematurely, the cause must be investigated and corrected to prevent further damage. Wipers, wiper lips, guide-(Z-)profiles or similar brass guides, dampeners, plastic guides or rollers etc. are considered wear parts and not included in the warranty. These components must be checked at least semi-annually and replaced if needed to guaranty a long lasting function of the cover.

Damage by corrosion also is not covered by our warranty. You must replace the **wipers** or **wiper lips** as soon as you can see, that the wipers don't wipe the following box clean. This can be seen, when contaminations, such as coolant and dust remain, after the wiper wipes the surface.

NOTE: C6 wiper lips, in general, can be replaced without disassembly of the boxes (see section V for a detailed instruction how to replace C6 wiper lips).

With all other TSC, the cover must be disassembled in order to replace the wipers. Worn **guide-(Z-)profiles** made of steel, brass or nitrided steel must be replaced when they are worn down or twisted. Also, worn down **brass strips**, which are used to space out glide components or used as wipers must be replaced.

Dampeners and **bumper stops** are especially affected by the shocks of stopping the boxes at high speed and the chemical reaction causing increasing noise levels and decreasing dampening affects.

Guides and **plastic rollers** must be replaced when they show extensive wear or impregnated chips.

Steel rollers, HS-modules, shock absorbers, scissor systems and overtravel protectors have to be checked after the first year in service and semi-annual thereafter, and replaced if necessary.

Steel rollers must be replaced, when the inner needle bearings are not rotating smoothly anymore or if the outside roller surface is worn extensively.

HS-module must be replaced if they do not move freely or if the chain is dragging. Covers with HS-modules should not be disassembled by untrained personnel and should be handled by Hennig to guarantee safe functions. If proper function of the covers is questioned, please notify a Hennig Service Center.

Shock absorbers should be replaced completely in each box or better yet in all of a cover if the shock absorbing function decreases.

Scissors must be replaced if the components are deformed or worn in the joints. **Scissor systems** must be reworked by trained personnel to guarantee safety. Please consult with a Hennig Service Center, if problems occur.

Damaged **overtravel protectors** must be replaced on both sides including the interlocking plates. New installed overtravel protectors must be adjusted with the interlocking plates to guarantee a proper function long lasting in all conditions.

In regular intervals, check the **mounting frames** or **-angles** for proper sealing. If the calking is damaged by aggressive coolant or chips, it must be scraped off and replaced to avoid coolant penetration to the inside.

Any recognized problem, excessive noise or malfunction of the cover must be immediately corrected in order to prevent more major damage.

The suggested maintenance frequency is based on normal usage of the machine.

In case of heavy duty service, more frequent maintenance must be performed. Damage to the sheet metal box, due to fallen objects, must be immediately corrected. If needed, Hennig can supply replacement boxes for each cover. To determine the right box, please count from the largest box down.

III. C2 / C3 / C5 wiper replacement

1. Disassemble the cover as described in section C.
2. Pull out the worn wiper lip from the steel profile.
3. Clean the steel profile and check for possible damage.
4. Clean the boxes.
5. Insert a new wiper lip by using a special Hennig tool to assist. Be careful that the lip is not stretched excessively.
6. Reassemble the cover as outlined in section C.

IV. eN wiper replacement

1. Disassemble the cover as described in section C.
2. Remove the worn wiper with hammer and chisel. Alternatively the weld spots or rivets can also be drilled or milled out. Be careful not to damage the box.
3. Clean box, remove weld spots, if needed fill the rivet or spot weld holes with weld. Clean, polish and straighten box.
4. Fit new eN wiper. The standard length of eN wipers is 500 mm. Therefore, it might be necessary to fit more than one length to each box. Do not use shorter pieces at the ends but rather in the middle of the box. Chamfer the corner pieces to guarantee a tight fit.
5. Clamp wiper with proper vice grips.

6. Drill and countersink for rivets in proper spacing (the wiper material has rubber free spots for mounting).
7. Rivet eN wiper to the box making sure that the countersunk hole is filled. Short pieces must have at least 3 rivets.
8. All rivets should be made flush with the top of the box.
9. Reassemble as outlined in Section C.

V. C6 Wiper exchange

C6 means: The wiper exchange can be performed without disassembling the TSC directly on the machine.

1. Remove old spring clips with the disassembly tool No. 200.00040. Hold the tool with the handle at an angle upward. Rest the plastic roller of the tool on the sheet metal of the box. Engage the two claws of the tool into the protruding offsets of the spring clip. By pressing down on the handle of the tool, pull out the spring clip carefully. In case, that no tool is available, use a small screwdriver to wedge between the spring clip and wiper casing to carefully pull out the clip. Avoid personal injury.
2. Pull out the complete wiper profile with the worn wiper lip from each box.
3. Pull out the worn wiper lip.
4. Clean wiper profile and check for damage.
5. Clamp down the wiper profile on a work table top. By using a scribe or pin tool, push wiper lip into the dovetail profile. Be careful not to damage or stretch the wiper lip. Avoid personal injury.
6. Clean the wiper profile and the boxes.
7. Carefully insert the wiper profile into the boxes. If needed use a rubber hammer to assure proper seating.
8. Hook wiper profile with new spring clips by hooking the spring clip in the small groove between wiper profile and box and also engaging the slot in the wiper profile and tapping the spring clip in place with a small rubber hammer. NOTE: Do not use old spring clips.
9. Check the spring clips for correct seating.

F. HENNIG SERVICE

Hennig maintains a number of service centers throughout the world and can assist you in the repair and maintenance of all covers as well as replacements of boxes or complete covers. Our service men can assist you in your plant as well as completely remanufacturing your covers in our facilities. Training of your personal is also available. Please ask for our quotation.

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