

## Installation and Maintenance THK LM-guides Series GSR



### Unpacking the LM-Guide

The LM-Guide is delivered in a proper packaging that fulfills the needs for a safe transport.

Check packaging for damages before opening. Assure a clean environment for unpacking.

Check whether LM components are complete and without damage. LM blocks are packaged separate from rail. Lubrication nipples are delivered as loose bypack to leave free choice of side.

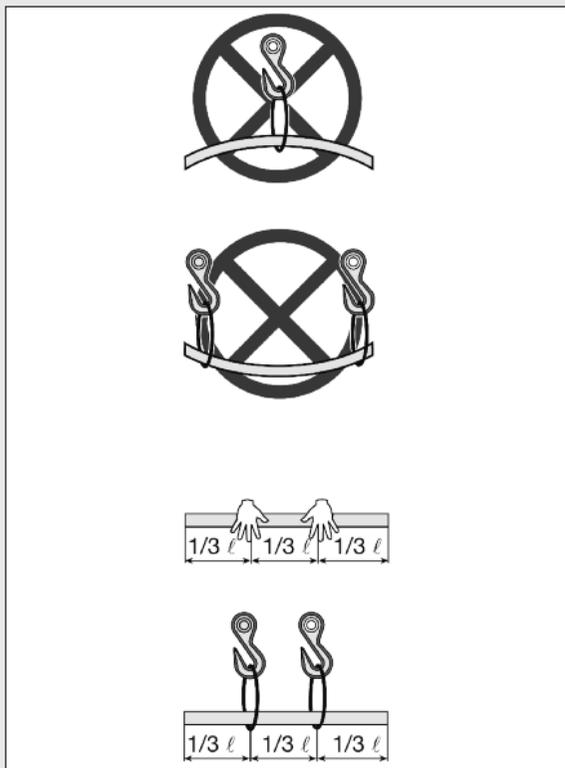
Avoid shocks and impacts to the LM-guide systems.



# Attention!



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## Handling of LM rails!

LM rails have to be lifted in a way that no bending occurs.

For mounting and assembling the following instruction have to be followed thoroughly.

The LM-Guide is manufactured and shipped with supreme care. If you should find out any defects or damages, please contact us in order to prevent malfunction.

Incorrect design, mounting or use may result in malfunction and cause damage to the complete product.

Valid safety rules have to be followed for installing the LM guides to a machine.

## Mounting Instructions

### 1. Preparation of mounting surface

Rectify mounting planes with oil stone, remove ridges, unevenness and dirt (Fig. 1).

**Note:** At time of supply the THK - LM guides are coated with an anti-corrosion oil. Degrease the reference surfaces of rails and blocks with washing oil. Recoil the supporting surfaces and/or datum plane with a low viscosity oil for rust prevention.

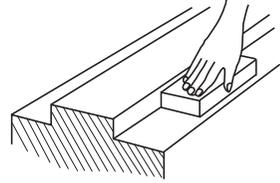


Fig. 1

### 2. Mounting LM rail at master side

One of the following two methods is to be used for mounting and aligning the master rail.

#### a) Mounting rail direct to datum plane shoulder

The following steps have to be repeated for each mounting bolt starting in the centre:

Tighten mounting bolt lightly. Press rail firmly to datum plane with a small C-clamp in the area of this bolt. (s. page 4).

Tighten mounting bolt to specified torque by use of a torque wrench (Fig 2).

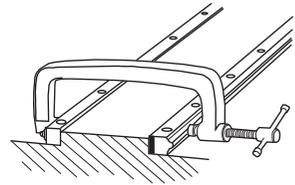


Fig. 2

**Note:** Use clean bolts to mount the THK - LM guide. Property class of bolts has to be 12th9. Before inserting bolts check whether mounting holes and screw holes are properly aligned. Also check whether bolts can be turned by hand. If these two conditions are not met there is high risk of reduced accuracy.

### 3. Mounting rail aligned to remote datum plane using Straight Edge

Place a Straight Edge at the shoulder of the datum plane. Use a dial indicator to adjust distance between rail and datum plane. Start measuring at one end of the rail and tighten mounting bolt provisionally (1/3 of specified torque). Move Straight Edge hole by hole and tighten all bolts (Fig. 3). Now start again at one end and tighten all bolts to the specified torque.

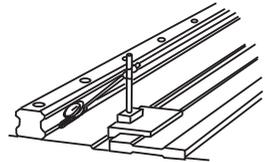


Fig. 3

### 4. Mounting THK - LM blocks

Lay down required LM blocks on the rails in the following manner: Hold blocks slightly tilted, so that the lower row of balls gets in contact first to the rail. Before laying down the upper row of balls, insert a strip of paper between block and rail. Now lay down block. Tear out strip of paper towards the opposite rail. This is to assure proper position of sealing lip (Fig. 4).

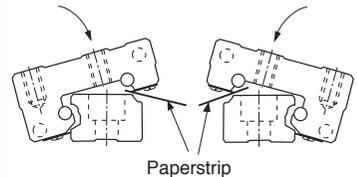


Fig. 4

Now place the table carefully on the LM blocks. Tighten mounting bolts of LM blocks on master rail to specified torque. Tighten mounting bolts of LM blocks on subsidiary rail provisionally to 1/3 of specified torque.

### 5. Aligning subsidiary rail

Slide table over whole length of rail several times to assure proper alignment of LM guide components. Now start tightening bolts of subsidiary rail -starting in the centre- to

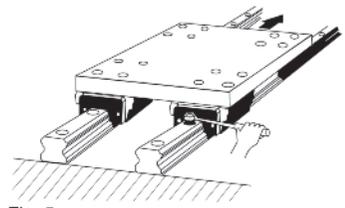


Fig. 5

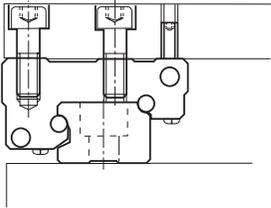
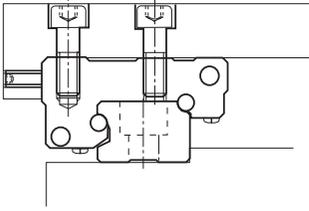
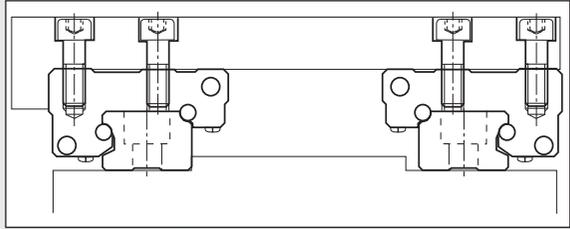


Fig. 7



specified torque (Fig. 5).

Fig.6

**6.** Finally tighten LM blocks on subsidiary rail side to specified torque, which results in making the LM guide system free from play (Fig. 6).

To achieve higher preload for the LM guide system additional set screws for the LM blocks have to be provided (Fig. 7).

**Recommended fastening torques, valid for steel and materials of equal firmness**

Screwsize	Fastening torque (Nm)
M 4	4,2
M 5	9,0
M 6	14,0
M 8	31,0
M 10	69,0

(Property class 12.9) table 1

**Important hint!**

**1. Fastening torque**

The fastening torque THK recommends do not correspond to the maximum value specified for the bolts themselves. Furthermore they correspond to the fastening torque used for rail manufacturing. Therefore best accuracy results for your machine can be expected using the torque recommended by THK.

**2. Screw retention**

Following statements of the screw industry regarding retention elements, the usual screw retention elements like spring locks, spring washers, crown gears, serrated lock washers, safety plates and castle nuts have been proved to be completely ineffective. Therefore fastening THK - linear motion guides with such "retention elements" is NOT permitted under any circumstances (Anyway there is no more space in the rails sink holes to insert additional elements under the bolts).

There are two methods that have proved to be effective through frictional connection:

- Use of sufficient long screws
- Use of adhesives

### 3. Mounting hole caps

To prevent machining chips or other foreign matters from intruding the LM bearing system, the mounting holes have to be closed by caps. These caps are inserted in a way that they flush with the rails surface. Usually C-caps made from plastic are sufficient. For special applications caps from aluminium and brass are available.

### 4. Lubricating arrangement

For lubrication of the THK LM guides the LM blocks are provided with lubrication nipples. These are dedicated for manual lubrication with grease pumps.

If forced lubrication is necessary, dedicated pipe fittings are available on demand.

This is possible for the following guide types:

- GSR20 through 35

Corresponding fitting sets:

swivel type: SV4M6x0,75

angled type: WE4-LLR, WE6-LLR

### 5. Lubrication

#### **IMPORTANT:**

The following lubrication instructions are only basic guidelines. As lubrication is essential, grease type, quantity and intervals have to be adapted for each application!

The THK - linear motion blocks with seals must be filled with high-grade lubricant. For standard applications this is a mineral oil based weakly saponified lithium grease of consistency class 2. After installation and/or before start-up of the machine the THK - LM guide system has to be lubricated via lubrication nipples at the blocks.

Advice: Do not mix different types of grease! Results are unpredictable!

Lubrication intervals according to the conditions of use have to be set up and followed thoroughly. See page 8 for recommended amounts. Under normal operating conditions a lubrication interval of approx. 100 km is sufficient. If a centralised lubricating system is installed, the standard lubrication nipples at the LM blocks have to be replaced with the fittings mentioned under point 4.

Adapters to connect the LM blocks MT6x0,75 threads to SF or LF type fittings are available for the following LM types:

- GSR20 through 35

If the THK LM system is used in other than horizontal orientation, this has to be specified at time of order to arrange appropriate lubrication considerations.

For manual lubrication via grease pump, particularly for wood working machines, we recommend the following special procedure:

1. Regardless of the THK - LM block size supply grease until it exceeds at the front seals.

2. Sled block over a distance of approx. 3 x length of LM block

3. Repeat lubricating like in the first step

In rough environment with high dirt rise, i.e. wood working, the grease content has to be refilled at least once a week with this procedure.

The lifetime of the blocks front seals depends nearly exclusively on the block lubrication. Therefore sufficient lubricant supply is essential. Thereby it has to be considered, that dust of wood or similar matter absorbs the lubricant quickly. The grease filling of the block coats the rail with a thin film, which lubricates the block seals. At insufficient lubrication premature wear appears at the sealing lips. As a result dust and foreign matters can penetrate into the LM block and hinder the balls from recirculating. Besides this premature wear appears in the reversing caps.

#### **Attention !**

At special operating conditions like oscillating movements or intermittent load peaks in combination with short moves (less than length of LM block) tribocorrosion can appear. For special operating conditions like these or other special lubricants and lubrication supplies have to be considered. For non-standard applications consult your THK-partner INDUNORM Bewegungstechnik. We will provide the lubrication solution that fits your needs.

#### **Grease Quantities**

GSR15	1,0 g
GSR20	2,5 g
GSR25	3,0 g
GSR30	4,0 g
GSR35	6,0 g



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