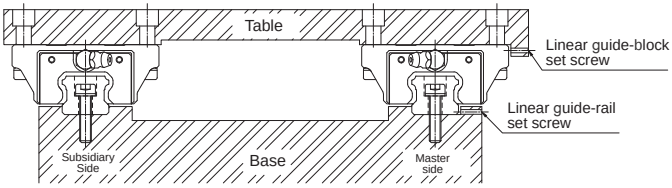
Mounting the linear guide

Mounting procedures

- Sample installation of the linear guide on a vibration-and-impact susceptible machine that requires rigidity and high accuracy.



Mounting the linear guide rail

(A) Prior to assembly, always remove all burrs, dents and dust that are likely to form on the mounting surface of the machine on which linear guide is to be installed. (Fig. 1)

CAUTION : The linear guide is delivered with an anticorrosive oil applied. You have to remove the oil from the reference surface using a wash oil or a clean soft cloth. If the anticorrosive oil is removed, the surface is likely to rust. The application of a low-viscosity spindle oil or the like is therefore recommended.

(B) Gently place a linear guide rail on the base, and temporarily tighten the bolts so that the rail lightly contacts the mounting surface. Hold the line marked side of the linear guide rail against the base-side reference surface (Fig 2)

CAUTION : Use clean bolts to fasten the linear guide. When inserting bolts into the linear guide rail mounting holes, make sure the threads of the bolt and nut are properly aligned. (Fig 3)

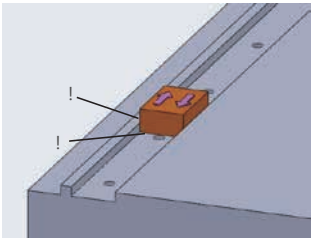


Fig 1. Checking the mounting surface.

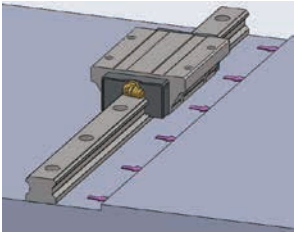


Fig 2. Holding an linear guide rail against the reference surface

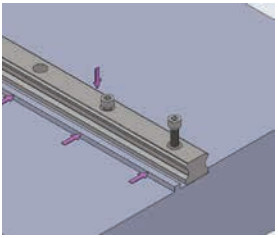


Fig 3.Checking bolt play

Installation of linear guide

Tightening torque for Allen bolt

Unit : N-cm

ModelNo.	Tightening torque	
	Iron	Aluminum
M3	186	98.0
M4	392	206
M5	882	441
M6	1370	686
M8	3040	1470
M10	6760	3330
M12	11800	5880
M14	15700	7840
M16	19600	9800

(C) Tighten the linear guide rail set screws in sequence, until they lightly contact the rail-mounting side surface.(Fig. 4)

(D) Using a torque wrench, tightening the mounting bolts to the specific torque (fig. 5).

CAUTION : The sequence for tightening the linear guiderail mounting bolts should start from the center to the end. Following this sequence to maintain accuracy.

(E) Following the same procedures for the remaining linear guide rails, complete linear guide rail installation.

(F) Drive caps into the bolt holes on the linear guide rails so that they are flush with the rail top surface.

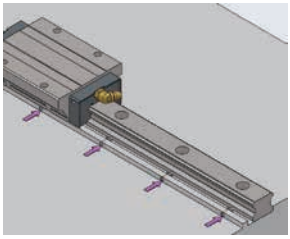


Fig. 4 Tightening set screws

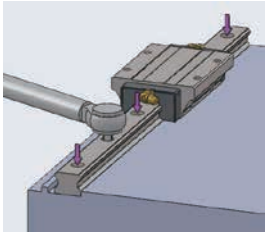


Fig. 5 Full tightening of mounting bolts

Mounting the linear guide block

(A) Gently place a table on the linear guide blocks and temporarily tighten the mounting bolts.
(B) Using set screws, hold the master-rail linear guide block against the table reference-side surface, and position the table.
(C) Fully tighten the mounting bolts on both the master and subsidiary sides. This completes linear guide block installation.

Caution: To ensure uniform fastening of the table, tighten the mounting bolts diagonally, as shown in (Fig.6) in accordance with the numbers.

(D) Using a torque wrench, tightening the mounting bolts to the specified torque.(fig 5)

Caution: The sequence for tightening the linear guide rail mounting bolts should start from the center to the end. Following this sequence to maintain.

The method specified above minimizes the time required to ensure the straightness of the linear guide-rail. Moreover, there is no need to use the fastening knock pins, thereby greatly reducing the required assembly man-hours.

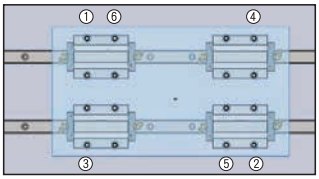


Fig. 6

• Sample installation of the linear guide without set screws on the master linear guide rail.

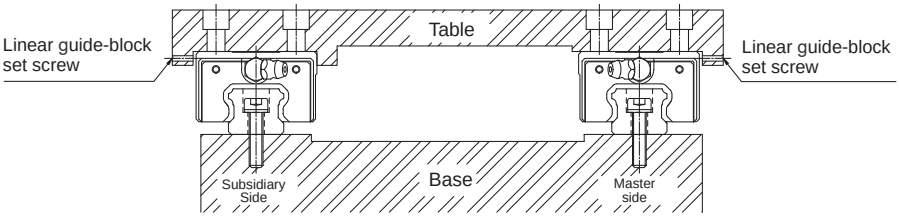


Fig. 7 Mounting the linear guide without set screws on the master linear guide rail

Installation of linear guide

Mounting the master linear guide rail.

After temporarily tightening the mounting bolts, use a small device or the like to firmly press the rail to the side, against the reference section. Fully tighten the mounting bolts.

Repeat this for each mounting bolt in sequence. (Fig. 8) Mounting the subsidiary linear guide rail.

To ensure parallelism of the subsidiary linear guide rail with the master linear guide rail properly mounted, the following methods are recommended.

Use a straight edge

Position a straight edge between the two rails then confirm parallelism with a dial gauge. Using the straight edge as a reference to confirm subsidiary rail straightness from one end to the other, tightening the mounting bolts in sequence as you go. (Fig. 9)

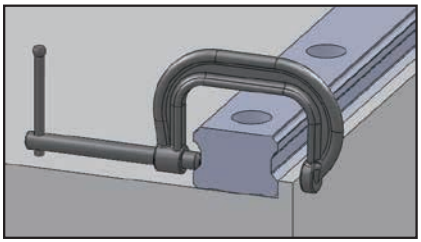


Fig. 8 Mounting the master linear guide rail

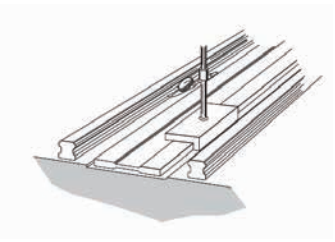


Fig. 9 Use a straight edge

Move the table

Fasten two linear guide blocks on the master side to the table (or a temporary measurement table). Temporary fasten the subsidiary linear guide rail and block to the base and table. From the dial-gauge stand, with a dial gauge contact the subsidiary rail linear guide block side, move the table from the rail end and check the parallelism between the block and the subsidiary linear guide rail, fastening the bolts on sequences as you go. (Fig. 10)

Compare to the master linear guide rail

Make sure the master linear guide rail is properly installed. Temporarily fasten the subsidiary linear guide rail in place. Place a table on the linear guide blocks mounted on the master rail and on the temporarily fastened subsidiary linear guide rail. fully tighten the mounting bolts on the two linear guide blocks on the subsidiary rail. With the remaining linear guide block on the subsidiary rail temporarily fastened, correct the position of the subsidiary linear guide rail, fully tichtening its mounting bolts in sequence as you go. (Fig. 11)

Method using a jig

Using a jig as shown in (Fig. 1) confirm parallelism between the master-rail-side reference surface and that of the subsidiary rail at each mounting hole, and fully tighten the mounting bolt there.

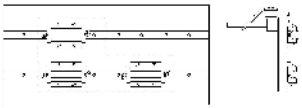


Fig.10 Move the table

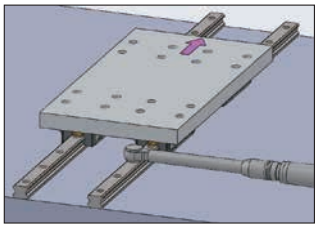


Fig.11 Compare to the master linear guide rail

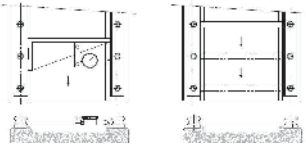


Fig. 12

- Sample Installation of the linear guide without a reference section for the master linear guide rail.

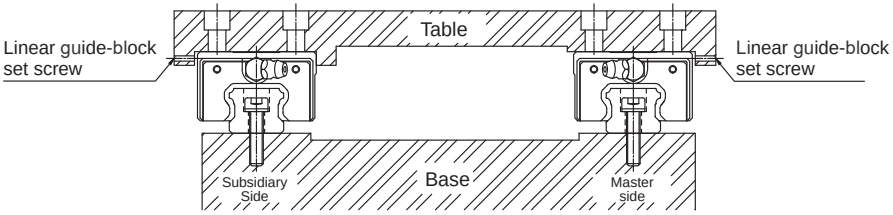


Fig.13 Installation of the linear guide without a reference section for the master linear guide rail

Mounting the master linear guide rail

Use a temporary reference surface from end to end to acquire linear guide rail straightness. For this method, however, two linear guide block must be fastened together, positioned on the top of each other while attached to a measurement plate, as shown in (fig. 14).

Use a Straight Edge

After temporarily tightening the mounting bolts, use a dial gauge to check the straightness of the linear guide-rail-side reference surface from end to end, fully tightening the mounting bolts insequence as you go, as shown in (fig. 15).

To mount the subsidiary linear guide rail, follow the procedures specified in the second paragraph on the previous page.

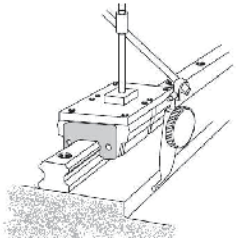


Fig. 14 Use a temporary reference surface

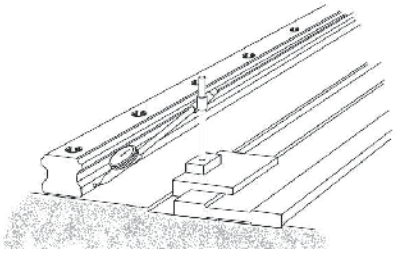


Fig. 15 Use a straight edge

Lubrication

Lubrication is essential to linear motion system. Without lubrication, the friction of rolling parts increases and might be the main factor of service life shortening.

A lubricant :

(1) Reduces friction on moving parts, thereby to prevent wearing due to raise in temperature.
(2) Forms an oil film on rolling surfaces, thus decreasing stress that develops on the surfaces and safeguarding the system against rolling fatigue.
(3) Covers metal surfaces with an oil film, thereby preventing rust.

To tap the full function of a linear motion system, lubrication is essential to meet the system service conditions.

• Even the linear motion system is sealed, it cannot completely prevent the leakage of lubricants no matter how negligible the amount of leakage is at any given time. It is therefore necessary to replenish the lubricant periodically according to the operating conditions.

Classification of Lubricants

Primarily grease and sliding surface oil are used as lubricants for linear motion systems.

In general a lubricant must :

(1) Form a strong oil film.
(2) Reduce wear as much as possible.
(3) Have high wear resistance.
(4) Have high thermal stability.
(5) Be non-corrosive.
(6) Be highly rust-preventive.
(7) Be free from dust and some moisture.
(8) Be free from significant fluctuations in consistency against repeated agitation of grease.

Fig. 16 Lubricants in general use

Lubricant	Classification	Item
Grease	Shell Gadus S2 V220 2	Shell Gadus S2 V220 2
Oil	Sliding surface oil or turbine oil ISOVG 32~68	Super Multi 32 to 68 (Idemitsu Kosan) Vactra No.2S (Mobile Oil) DT Oil (Mobile Oil) Tonner Oil (Showa Shell Sekiyu) or equivalent

• Feeding should be performed every 50 km of travel under normal usage conditions to prevent incomplete lubrication by exhausted lubrication.

Fig. 17 Amounts of lubricating grease

Size	*1e keer* Hoeveelheid in cm^3 / ml		*Onderhoud* Hoeveelheid in cm^3 / ml	
	normaal	***zwaar***	***normaal***	***zwaar***
15	0,9	-	0,3	-
20	1,5	2,1	0,5	0,7
25	2,4	3,0	0,8	1,0
30	3,9	5,1	1,3	1,7
35	5,7	7,2	1,9	2,4
45	11,4	13,8	3,8	4,6
55	18,9	23,1	6,3	7,7
65	30,0	40,5	10,0	13,5

Note: *For special purposes such as high temperatures, food industry etc., you must always use a special grease. Please let us know, we are happy to help you find the right grease.*

Precautions of linear guide

Handling

(1) Tilting the linear guideway may cause the block falling out from the rail by their own weight.
(2) Hitting or dropping the linear guideway may cause its function to be damaged, even if the product looks intact.
(3) Do not disassemble the block, this may cause contamination to enter into the carriage or decrease the installation accuracy.

Lubrication

(1) Please remove the preservative oil.
(2) Please do not mix different kinds of lubricants.
(3) Lubrication can be varied, please consult Almotion before use.

Usage

(1) The temperature of the place where linear guideways are used should not exceed 70°C. A higher temperature may damage the plastic end cap, do not exceed 100°c in friction.
(2) For applications under special conditions such as constant vibrations, high contamination or exceeding our suggested temperature limits etc., please contact Almotion.

Storage

When storing the linear guideway, enclose it in a package and store it in a horizontal orientation while avoiding high temperature, low temperature and high humidity.

Note: Never remove the preservation oil when the linear guide is stored!