LGB linear guide

Construction

LGB linear guide systems are designed for compact space application. The carriages are in narrow structures. Railway, narrow carriage and lubrication cover are its basic construction.

Railway

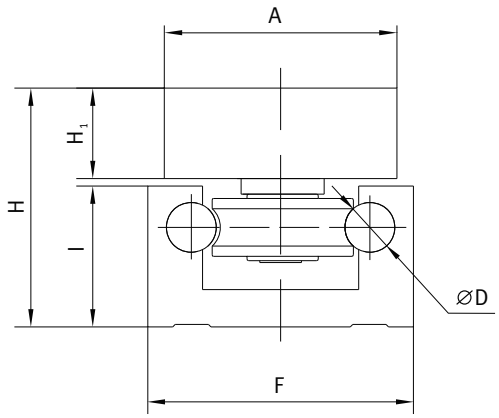
Anodized aluminum alloy body with two Chrome-plated steel shafts

Carriage

Anodized aluminum alloy plate
3 pieces double row balls bearings(Rollers)
Eccentric bolt used for adjust the clearane/preload
Optional lubrication covers with oil soaked felt wipers

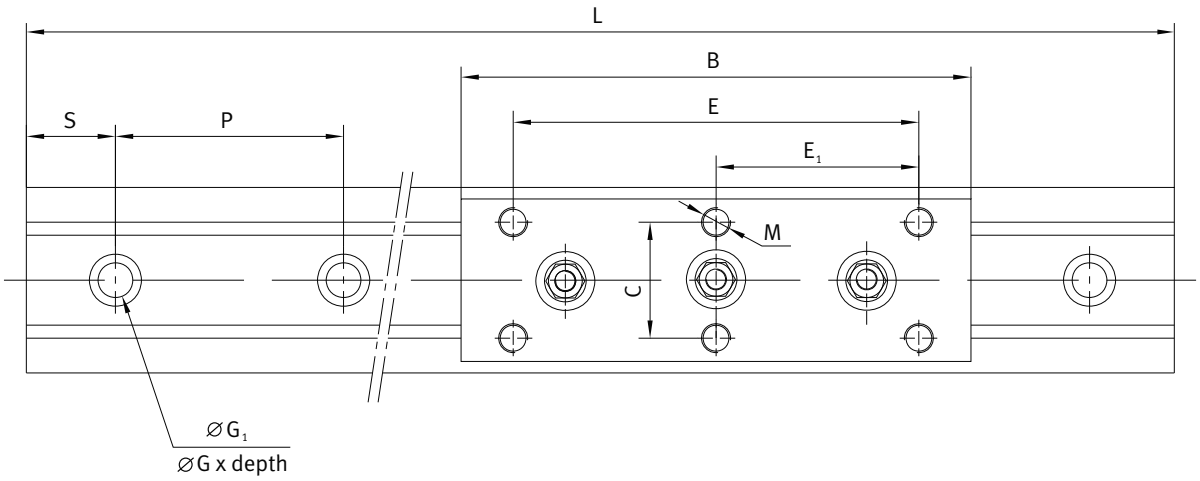
Feature

1.High speed, Low friction and Low noise
2.Preload is adjustable
3.Narrow body for compact application
4.Optional Lubrication covers



Type	Assembly Dimensions		Carriage Dimensions					
	H	F	A	B*	C	E	E_1	
SB-LGB15	28.8	32	28	88	20	70	—	
SB-LGB20	35.5	47	47	108	38	50	—	
SB-LGB25	43	65	64	150	47	130	65	

* This size does not include plastic cover's thickness. All size plastic cover's thickness is 2.5mm. So covered carriages' length must add 5.0mm to size B.



			Railway Dimensions						
	H_1	M	D	Gxdepth	G_1	I	S	P	Lmax
	10.9	4xM5	6	7.5x2.5	4.5	17	30	60	3000
	11.5	4xM6	8	9.5x5	5.5	21.75	30	60	3000
	14.7	6xM8	10	11x4	6.5	26.5	30	60	3000

Setting clearance - free

None clearance is necessary for system's rigidity and stability. LGB series carriage has two concentric bolts on both sides and one eccentric bolt in the center along the railway. This eccentric bolt is used for setting clearance-free.

1. Tighten concentric bolts.

2. Tighten the eccentric bolt to near the critical point, but not reach the critical point. (This is for rotate the eccentric bolts).

3. Rotate the eccentric bolts with internal hexagonal wrench in the end of the eccentric bolt to adjust the clearance. Adjust the clearance to zero.

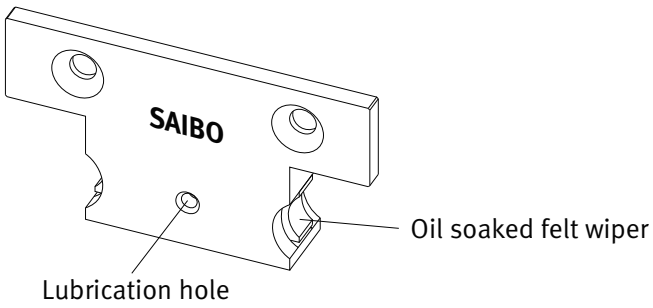
4. Slide the carriage by hand and adjust to the extent where there causes a slight slipping resistance.

5. Keep eccentric bolt's position and tighten the nut.

Setting Pre-load

It is same as Setting clearance-free. First adjust clearance to zero, continue rotating eccentric bolt will get pre-load. Appropriate pre-load should be decided according to application. Over pre-load will decrease system's life. Please be careful.

Lubrication

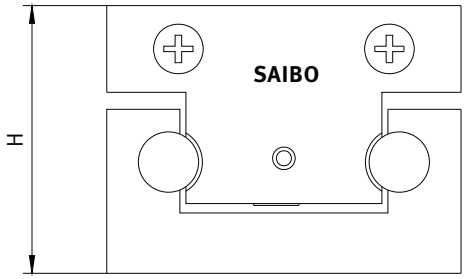


Plastic lubrication cover contains oil soaked felt wipers which can be re-lubricated via lubrication hole. This lubrication cover is optional, not included in standard carriage.

Working parameter

Max speed:	10m/s
Max acceleration:	50m/s^2
Working temperature:	−20°C ~ +80°C

Accuracy

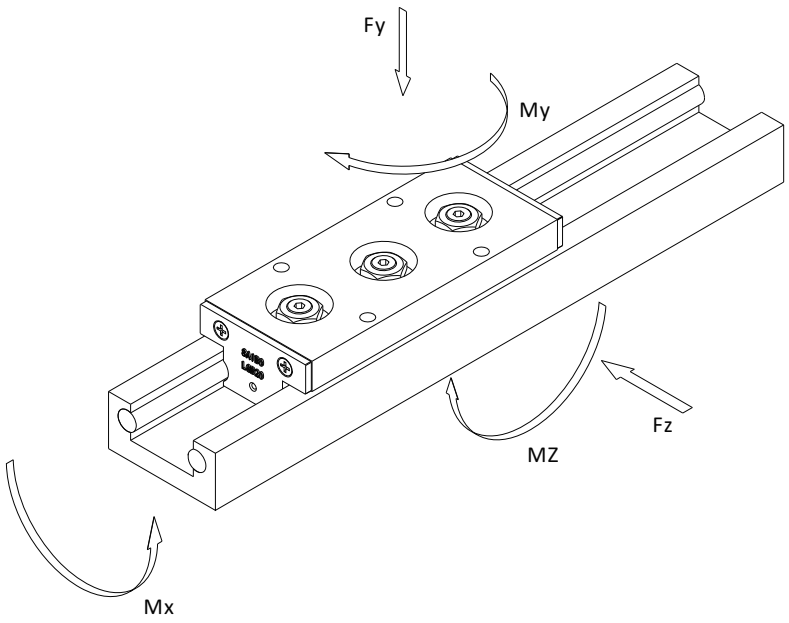


Tolerance H： 0.20mm

Note: Higher accuracies are available upon request.

Load / life calculation

Due to the hardness of the railway's shaft and fatigue analysis of railway and roller, the railway's life does not determine the system life. It is determined by roller's life. System's life varies by actual combination of load, working status and environment conditions etc. So loading factor should be calculated firstly. Then system's life could be calculated via using below formula.



LF - Loading factor

(LF should be less than 1.0 for any combination of load)

$$LF = \frac{Fy}{Fymax} + \frac{Fz}{Fzmax} + \frac{Mx}{Mxmax} + \frac{My}{Mymax} + \frac{Mz}{Mzmax}$$

Fy - Actual load in Y direction. (N)

Fz - Actual load in Z direction. (N)

Mx - Actual moment in X direction. (N·m)

My - Actual moment in Y direction. (N·m)

Mz - Actual moment in Z direction. (N·m)

Below parameters can be taken from the table of Load capacity.

Fy max - Max load capacity in Y direction. (N)

Fz max - Max load capacity in Z direction. (N)

Mx max - Max moment capacity in X direction. (N·m)

My max - Max moment capacity in Y direction. (N·m)

Mz max - Max moment capacity in Z direction. (N·m)

Load capacity

Railway type	Max Load capacity(N)		Max moment capacity(N.m)		
	Fymax	Fzmax	Mxmax	Mymax	Mzmax
SB-LGB15	330	1000	1.8	12	5.5
SB-LGB20	520	1200	6.6	45	15
SB-LGB25	1200	4000	19	120	50

Life calculation

SAIBO designed LGB series load capacity according to basic life of 100km for each type. So after customers designed system's actual load, system's life could be calculated via below formula.

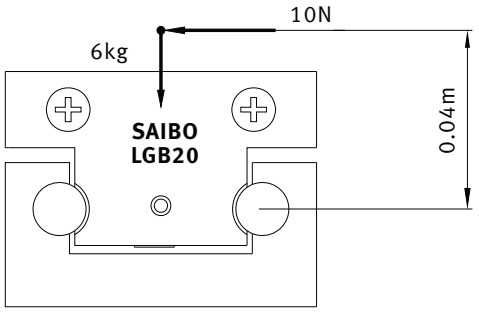
$$\text{Life(km)} = \frac{100}{(0.03+0.97LF*f)^3}$$

f- Reduction coefficient of the application and environment.

None vibration or shock, Low speed (＜1m/s), Low frequency shift direction, clean environment.	1-1.5
Light vibration or shock, medium speed (1-2.5m/s) medium frequency shift direction, some dirtiness	1.5-2
Heavy vibration or shock, high speed (＞2.5m/s) high frequency shift direction, heavy dirty	2-3.5

Calculation example

Here select SB-LGB20 as calculation example. This system loaded as blow picture. Working condition is clean and there is no vibration or shock.



The load factor LF is calculated use formula

$$LF = \frac{Fy}{Fymax} + \frac{Fz}{Fzmax} + \frac{Mx}{Mxmax} + \frac{My}{Mymax} + \frac{Mz}{Mzmax}$$

Fy = 6 kg x 9.8 (gravity) = 58.8 N

Fz = 10 N

Mx = 10 x 0.04 = 0.40 N·m

My = 0

Mz = 0

Take parameters Fy max, Fz max, Mx max, My max, Mz max from table and then fill in the formula

$$LF = \frac{58.8}{520} + \frac{10}{1200} + \frac{0.40}{6.60} + \frac{0}{Mymax} + \frac{0}{Mzmax} = 0.182$$

According to the description of working condition of light shock, take f=1.1

$$\text{Life(km)} = \frac{100}{(0.03+0.97LF*f)^3}$$

$$= \frac{100}{(0.03+0.97*0.182*1.1)^3}$$

$$= 8849\text{km}$$