Lubrication Notes

– The service life of the roller rail systems crucially depends on the lubrication. For this purpose, the documentation, especially the chapter on lubrication, must be read and understood completely.

– The operator is responsible for the selection and adequate supply of an appropriate lubricant to the roller rail system. These instructions do not exempt the operator from the individual examination of the conformity and suitability of the lubricant for its application.

– For recommended lubricants, see the chapter “Notes on Dynalub”.

– Rexroth roller rail systems are delivered filled with an anti-corrosion agent (sufficient for mounting and start-up).

– Immediately after mounting the roller runner blocks (before start-up), make sure the system has sufficient initial lubrication (basic lubrication). All roller runner blocks are designed for both grease lubrication and for oil lubrication.

⚠ To safeguard the supply of lubricant the lube ports from the “Accessories” section are to be used.
On the usage of different lube ports attention is to be paid to ensuring they are identical to Rexroth lube ports (M6 x 8).

⚠ If using a progressive lubrication system, with grease lubrication, please pay attention to the minimum dosing amount for relubrication stated in table 5.

⚠ We recommend carrying out initial lubrication separately using a grease gun before connecting to the central lubrication system.
If using a central lubrication system, you must make sure that all the pipes and elements are filled with lubricant and do not contain any air pockets until they are connected to the consumer (roller runner block).
The number of pulses results from the partial amounts and the piston distributor size.

- **With fluid grease lubrication according to table 5**
- **With oil lubrication according to table 8**

⚠ The seals on the roller runner block must be oiled or greased with the respective lubricant before installation.

⚠ If you use different lubricants from the ones stated, you may find that relubrication intervals are shorter and that performance decreases with short stroke and load ratio; in addition, chemical interactions can take place between the plastics, lubricants and the preservative agents. In addition, pumpability in single-line central lubrication systems must be guaranteed.

⚠ Pumping or storage tanks for the lubricant must be fitted with a stirrer to guarantee the flow of lubricant (to avoid funneling in the tank).

⚠ You must not use lubricants containing solid lubricating components (like graphite and MoS_2 for example)!

⚠ In the case of relubrication, it is not possible to change from grease to oil lubrication.

⚠ When applying metalworking fluids at the start or after a relatively long standstill, carry out two to five lubrication pulses in succession. When the system is in operation, 3 to 4 pulses per hour are recommended, irrespective of the distance traveled. If possible, carry out lubrication in one lubricating stroke. Carry out cleaning cycles (see “Maintenance”). The user alone is responsible for selecting suitable metalworking fluids. An unfavorable selection of metalworking fluids may lead to damage to the roller rail system. We recommend getting in touch with the manufacturer of the metalworking fluids. Bosch Rexroth accepts no liability. Lubricant and metalworking fluids must be coordinated.

⚠ In the case of environmental influences such as contamination, vibration, jolting, etc., we recommend shortening the relubrication intervals appropriately. Even under normal operating conditions, the system must be relubricated at the latest after 2 years due to aging of the grease.

– If your application involves more demanding environmental requirements (such as clean room, vacuum, food industry applications, increased exposure to fluids or aggressive media, extreme temperatures), please consult us. Each application must be considered on its own merits in order to choose the most appropriate lubricant. Be sure to have all the information concerning your application at hand when contacting us. Pay attention to the chapter “Maintenance”.

– Rexroth recommends piston distributors manufactured by SKF. These should be installed as close as possible to the lube ports of the roller runner blocks. Long lines and small line diameters should be avoided, and the lines should be laid on an upward slant. Install the lines at a gradient.

– Refer to the chapter entitled “Roller runner block accessories” for a selection of possible lube ports (in this connection, contact the manufacturer of your lubrication system too).

– If other consumers are connected to the single-line centralized lubrication system, the weakest link in the chain will determine the lubrication cycle time.

Note on load ratio

The load ratio F/C is the quotient of the equivalent dynamic load on the bearing F (making allowance for the preload C) divided by the dynamic load capacity C (see “General Technical Data and Calculations”).

Notes on Dynalub

⚠ Pay attention to the assignment of the roller rail system.

Under conventional environmental conditions this ground-fiber, homogeneous grease is ideally suited for the lubrication of linear elements:

- With loads up to 50% C
- With short-stroke applications > 1 mm
- For the permissible speed range of roller rail systems

The product and safety data sheets can be found on our website at: www.boschrexroth.com.

Dynalub 510

Lubricating grease

Properties:

- Lithium-based, high-performance grease of NLGI grade 2 according to DIN 51818 (KP2K-20 according to DIN 51825)
- Good water resistance
- Corrosion protection
- Temperature range: –20 to +80 °C

Material numbers for Dynalub 510:

- R3416 037 00 (cartridge 400 g)
- R3416 035 00 (hobbock 25 kg)

Alternative greases:

- Castrol Longtime PD2 or Elkalub GLS 135/N2

Dynalub 520

Liquid grease

Properties:

- Lithium-based, high-performance grease of NLGI grade 00 according to DIN 51818 (GP00K-20 according to DIN 51826)
- Good water resistance
- Corrosion protection
- Temperature range: –20 to +80 °C

Material numbers for Dynalub 520:

- R3416 043 00 (cartridge 400 g)
- R3416 042 00 (bucket 5 kg)

Alternative greases:

- Castrol Longtime PD00 or Elkalub GLS 135/N00

Notes on lubricant oil

We recommend **Shell Tonna S3 M 220** or similar products with the following properties:

- Special demulsifying oil CLP or CGLP as per DIN 51517-3 for machine bed tracks and tool guides
- A blend of highly refined mineral oils and additives
- Can be used even when mixed with significant quantities of metalworking fluids

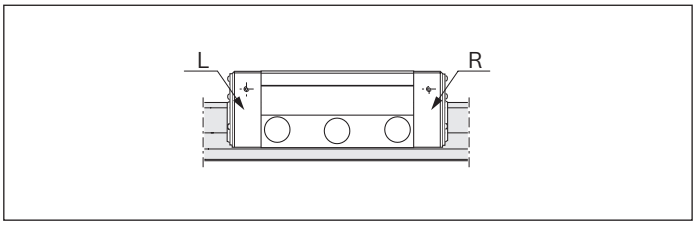
Lubrication of the RSHP

Lubrication using a grease gun or a progressive feeder system

⚠ Take note of “Lubrication Notes” section.

Lubricating grease
We recommend using **Dynalub 510**. For further information, see “Lubrication Notes” section.

Lube port end cap
L = left
R = right



Initial lubrication of the roller runner blocks (basic lubrication)

Stroke ≥ 2 · roller runner block length B_1 (normal stroke)

- For initial lubrication, mount one lube fitting per roller runner block, at either of the two end caps!

Initial lubrication is applied in three partial quantities as specified in Table 1:

1. Grease the roller runner block with the first partial quantity as per Table 1, pressing it in slowly with the help of a grease gun.
2. Slide the roller runner block back and forth over at least three times the block length for three full cycles.
3. Repeat steps 1. and 2. twice more.
4. Make sure there is a visible film of lubricant on the roller guide rail.

Stroke < 2 · roller runner block length B_1 (short stroke)

- Install and lubricate two lube fittings per roller runner block, one on each of the two end caps!

Initial lubrication is applied to each fitting in three partial quantities as specified in Table 1:

1. Grease each fitting on the roller runner block with the first partial quantity as per Table 1, pressing it in slowly with the help of a grease gun.
2. Slide the roller runner block back and forth over at least three times the block length for three full cycles.
3. Repeat steps 1. and 2. twice more.
4. Make sure there is a visible film of lubricant on the roller guide rail.

Size	Initial lubrication quantity		
	Normal stroke Partial quantity (cm^3)	Short stroke Partial quantity per port (cm^3)	
		L	R
25*)			
30*)			
35	0,9 (3x)	0,9 (3x)	0,9 (3x)
45	1,0 (3x)	1,0 (3x)	1,0 (3x)
55	2,5 (3x)	2,5 (3x)	2,5 (3x)
65	2,7 (3x)	2,7 (3x)	2,7 (3x)

Table 1

***)** Values in preparation

Relubrication of roller runner blocks

Stroke ≥ 2 · roller runner block length B_1 (normal stroke)

- When the travel distance shown as the relubrication interval in Fig. 1 has been reached, apply the relubrication quantity as specified in Table 2.

Stroke < 2 · roller runner block length B_1 (short stroke)

- When the travel distance shown as the relubrication interval in Fig. 1 has been reached, apply the relubrication quantity as specified in Table 2.
- During each lubrication cycle the roller runner block should be traversed through a lubricating stroke of 3 · roller runner block length B_1. In any case, the lubricating stroke must be at least the length B_1 of the roller runner block.

Size	Relubrication quantity		
	Normal stroke (cm^3)	Short stroke per port (cm^3)	
		L	R
25*)			
30*)			
35	0.9	0.9	0.9
45	1.0	1.0	1.0
55	2,5	2,5	2,5
65	2,7	2,7	2,7

Table 2 ***)** Values in preparation

Lubrication cycle time calculations

f_{KSS} = 1 (no exposure to metalworking fluids)

f_{KSS} = 5 (exposure to metalworking fluids)

$$S_T = s \cdot \frac{1}{f_{KSS}}$$

Load-dependent relubrication intervals

The following conditions apply:

- Maximum speed: v_{max} = 4 m/s
- No exposure to metalworking fluids
- Standard seals
- Ambient temperature: T = 10 – 40 °C

Key to graphs

s = relubrication interval expressed as travel (km)
C = dynamic load capacity (N)
F = equivalent dynamic load (N)
S_T = lubrication cycle for the application
f_{KSS} = metalworking fluids correction factor

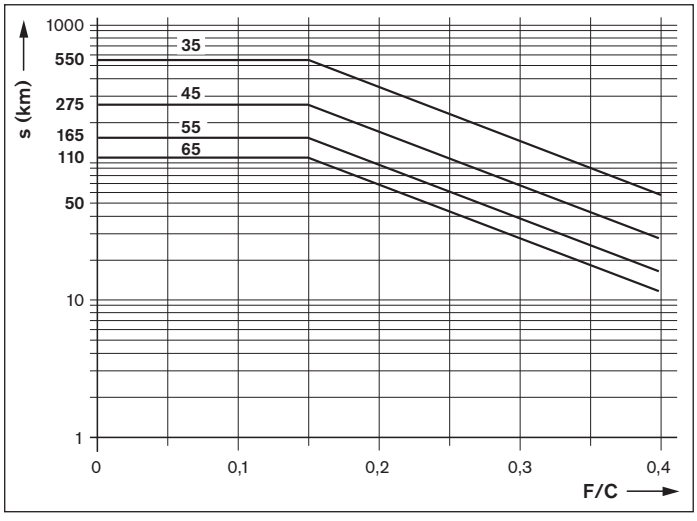


Fig. 1: Relubrication interval

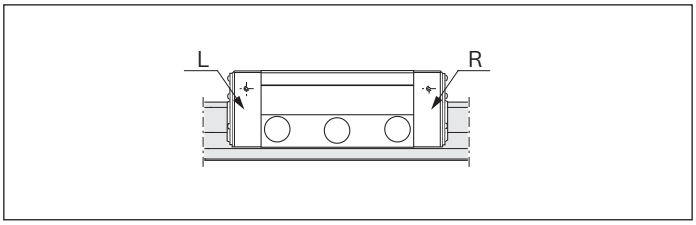
Lubrication of the RSHP

Liquid grease lubrication (NLGI 00, with centralized lubrication system via piston distributor)

⚠ Take note of “Lubrication Notes” section.

Liquid grease
We recommend using **Dynalub 520**. For further information, see “Lubrication Notes” section.

Lube port end cap
L = left, R = right



Initial lubrication of the roller runner blocks (basic lubrication)

We recommend applying initial lubrication with a manual grease gun before connecting the equipment to the centralized lubrication system. If initial lubrication is nevertheless carried out via the centralized lubrication system, it is essential that all lines and piston distributors should be filled. The pulse count can then be calculated from the partial quantities according to Table 3 and the piston distributor size according to Table 5.

Stroke ≥ 2 · roller runner block length B_1 (normal stroke)

- For initial lubrication, mount one lube fitting per roller runner block, at either of the two end caps!

Initial lubrication is applied in three partial quantities as specified in Table 3:

1. Grease the roller runner block with the first partial quantity as per Table 3, pressing it in slowly with the help of a grease gun.
2. Slide the roller runner block back and forth over at least three times the block length for three full cycles.
3. Repeat steps 1. and 2. twice more.
4. Make sure there is a visible film of lubricant on the roller guide rail.

Stroke < 2 · roller runner block length B_1 (short stroke)

- Install and lubricate two lube fittings per roller runner block, one on each of the two end caps!

Initial lubrication is applied to each fitting in three partial quantities as specified in Table 3:

1. Grease each fitting on the roller runner block with the first partial quantity as per Table 3, pressing it in slowly with the help of a grease gun.
2. Slide the roller runner block back and forth over at least three times the block length for three full cycles.
3. Repeat steps 1. and 2. twice more.
4. Make sure there is a visible film of lubricant on the roller guide rail.

Size	Initial lubrication quantity		
	Normal stroke Partial quantity (cm^3)	Short stroke Partial quantity per port (cm^3)	
		L	R
25*)			
30*)			
35	0.9 (3x)	0.9 (3x)	0.9 (3x)
45	1.0 (3x)	1.0 (3x)	1.0 (3x)
55	2,5 (3x)	2,5 (3x)	2,5 (3x)
65	2,7 (3X)	2,7 (3X)	2,7 (3X)

Table 3

***)** Values in preparation

Relubrication of roller runner blocks

Stroke ≥ 2 · roller runner block length B_1 (normal stroke)

- Apply the minimum quantity according to Table 4 to the lube port until the relubrication interval as specified (in Fig. 2) has been reached.

Stroke < 2 · roller runner block length B_1 (short stroke)

- Apply the minimum quantity according to Table 4 per lube port until the relubrication interval as specified (in Fig. 2) has been reached. Calculate the required pulse count and lubricant cycle time in the same way as for relubrication (normal stroke).
- During each lubrication cycle the roller runner block should be traversed through a lubricating stroke of 3 · roller runner block length B_1. In any case, the lubricating stroke must be at least the length B_1 of the roller runner block.

Size	Relubrication quantity		
	Normal stroke (cm^3)	Short stroke per port (cm^3)	
		L	R
25*)			
30*)			
35	0.9	0.9	0.9
45	1.0	1.0	1.0
55	2,5	2,5	2,5
65	2,7	2,7	2,7

Table 4

***)** Values in preparation

Notes: The required pulse count is the quotient (as a whole number) of the minimum relubrication quantity according to Table 4 and the selected piston distributor size according to Table 5. The smallest permissible piston distributor size is independent of the mounting orientation. The lubricant cycle time as per Formula 1 can then be obtained by dividing the relubrication interval (according to Fig. 2) by the calculated pulse count (see design calculation example).

Lubrication cycle time calculations

f_{KSS} = 1 (no exposure to metalworking fluids)

f_{KSS} = 5 (exposure to metalworking fluids)

$$n_i = V_{Grease} / K_v$$

$$S_T = s \cdot \frac{1}{f_{KSS}} \cdot \frac{1}{n_i}$$

Formula 1

Load-dependent relubrication intervals

The following conditions apply:

- Maximum speed: v_{max} = 4 m/s
- No exposure to metalworking fluids
- Standard seals
- Ambient temperature: T = 10 – 40 °C

Key to graphs

n_i	= number of pulses	(-)
V_{Grease}	= relubrication quantity according to Table 4	(cm^3)
K_v	= piston distributor size according to Table 5	(cm3)
s_T	= lubrication cycle	(km)
s	= relubrication interval according to Fig. 2	(km)
C	= dynamic load capacity	(N)
F	= equivalent dynamic load	(N)
S_T	= lubrication cycle for the application	
f_{KSS}	= metalworking fluids correction factor	

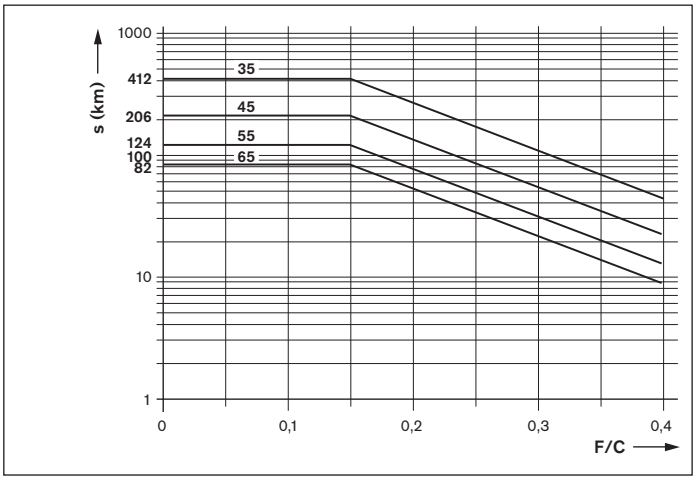


Fig. 2: Relubrication interval

Part number Roller runner blocks	Smallest permissible piston distributor size (≙ minimum pulse quantity) per port (cm^3)						
	Size	25	30	35	45	55	65
R18 .. ... 2X		–	–	0,1	0,1	0,1	0,2

Table 5

Liquid grease lubrication (NLGI 00, with centralized lubrication system via piston distributor) (continued)

Calculation example:

Given data:

Roller runner block	1851 323 2X
Dynamic load capacity C	61,000 N
Equivalent dynamic load on bearing F	18,300 N
Stroke	500 mm
Average linear speed v_m	1.0 m/s
Temperature T	20 – 30 °C
Mounting orientation	horizontal
Lubrication	Single-line centralized lubrication system for all axes with liquid grease Dynalub 520
Exposure to contaminants	No exposure to fluids, chips, dust

Calculation of relubrication quantity:

Normal or short-stroke	Normal stroke	Stroke ≥ 2 • roller runner block length B_1 500 mm ≥ 2 x 79.6 mm 500 mm ≥ 159.2 mm i.e. normal stroke is applicable
Initial lubrication quantity	0.90 cm^3 (3x)	According to Table 3
Relubrication quantity	V_{Grease} = 0.90 cm^3	According to Table 4
Permissible piston distributor size	K_v = 0.1 cm^3	According to Table 5
Number of pulses	$n_i = V_{Grease} / KV$ = 0.90 cm^3 / 0.1 = 9	According to Formula 1
Load ratio	F/C = 18,300 N/61,000 N = 0.30	
Relubrication interval	s = 100 km	According to Fig. 2
Lubrication cycle	$s_T = s / n_i$ = 100 km / 9 = 11.11 km	According to Formula 1
Exposure to contaminants	$s_T = s \cdot \frac{1}{1} \cdot \frac{1}{9}$	No exposure to media: Chips, dust...

Result:

Every 11.10 km a minimum quantity of 0.1 cm^3 Dynalub 520 must be supplied to the roller runner block.

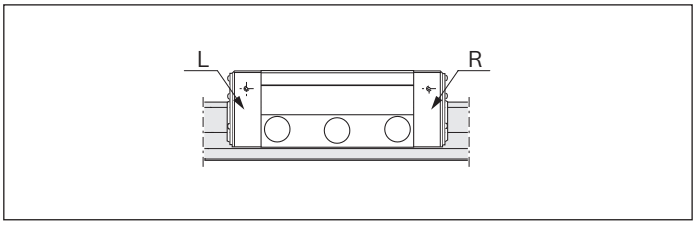
Lubrication of the RSHP

Oil lubrication via single-line piston distributor systems

⚠ Take note of “Lubrication Notes” section.

Oil lubricant
We recommend using **Shell Tonna S3 M 220**. For further information, see “Lubrication Notes” section.

Lube port end cap
L = left
R = right



Initial lubrication of the roller runner blocks (basic lubrication)

We recommend applying initial lubrication with a manual grease gun before connecting the equipment to the centralized lubrication system. If initial lubrication is nevertheless carried out via the centralized lubrication system, it is essential that all lines and piston distributors should be filled.

Stroke ≥ 2 · roller runner block length B_1 (normal stroke)

- For initial lubrication, mount one lube fitting per roller runner block, at either of the two end caps!

Initial lubrication is applied in two partial quantities as specified in Table 6:

1. Oil the roller runner block with the first partial quantity as per Table 6.
2. Slide the roller runner block back and forth over at least three times the block length for three full cycles.
3. Repeat steps 1. and 2.
4. Make sure there is a visible film of lubricant on the roller guide rail.

Stroke < 2 · roller runner block length B_1 (short stroke)

- Install and lubricate two lube fittings per roller runner block, one on each of the two end caps!

Initial lubrication is applied in two partial quantities per lube fitting as specified in Table 6:

1. Oil the roller runner block per port with the first partial quantity as per Table 6.
2. Slide the roller runner block back and forth over at least three times the block length for three full cycles.
3. Repeat steps 1. and 2.
4. Make sure there is a visible film of lubricant on the roller guide rail.

Size	Initial lubrication quantity		
	Normal stroke Partial quantity (cm^3)	Short stroke Partial quantity per port (cm^3)	
		L	R
25*)			
30*)			
35	1,3 (2x)	1,3 (2x)	1,3 (2x)
45	1,5 (2x)	1,5 (2x)	1,5 (2x)
55	2,0 (2x)	2,0 (2x)	2,0 (2x)
65	4,0 (2x)	4,0 (2x)	4,0 (2x)

Table 6

***)** Values in preparation

Relubrication of roller runner blocks

Stroke ≥ 2 · roller runner block length B_1 (normal stroke)

- Apply the minimum quantity according to Table 7 to the lube port until the relubrication interval as specified has been reached.

Stroke < 2 · roller runner block length B_1 (short stroke)

- Install and lubricate two lube fittings per roller runner block, one on each of the two end caps.
- Apply the minimum quantity according to Table 7 to the lube port until the relubrication interval as specified has been reached. Calculate the actual quantity applied as described in Relubrication (normal stroke), and if necessary adjust the piston distributor size and/or cycle time.
- During the lubrication cycle the roller runner block should be traversed through a lubricating stroke of 3 · roller runner block length B_1. In any case, the lubricating stroke must be at least the length B_1 of the roller runner block.

Size	Relubrication quantity V_{min}		
	Normal stroke (cm^3)	Short stroke per port (cm^3)	
		L	R
25*)			
30*)			
35	1.3	1.3	1.3
45	1.5	1.5	1.5
55	2.0	2.0	2.0
65	4.0	4.0	4.0

Table 7 ***)** Values in preparation

Notes: The actual amount applied in the relubrication interval is calculated taking into account the average speed, the piston distributor selected and the cycle time according to Formula 2. The quantity calculated must be greater than or equal to the relubrication quantity according to Table 7. Should this amount be lower, either the cycle time must be reduced and/or a larger piston distributor selected. The calculation process according to Formula 2 is then to be repeated.

Calculation of relubrication quantity

f_{KSS} = 1 (no exposure to metalworking fluids)

f_{KSS} = 5 (exposure to metalworking fluids)

$$V_{Oil} = \text{round}\ \frac{16.67 \cdot S_{AP} \cdot K_v}{v_m \cdot t_T} \geq V_{min} \text{ according to Table 7}$$

Calculation of the relubrication interval for the application

Load-dependent relubrication intervals

The following conditions apply:

- Maximum speed: v_{max} = 4 m/s
- No exposure to metalworking fluids
- Standard seals
- Ambient temperature: T = 10 – 40 °C

$$S_{AP} = s \cdot \frac{1}{f_{KSS}}$$

Formula 2

Key to graphs

V_{Oil}	= relubrication quantity applied in the relubrication interval	(cm^3)
V_{min}	= relubrication quantity	(cm^3)
s	= relubrication interval according to Fig. 3	(km)
K_v	= piston distributor size according to Table 8	(cm^3)
V_m	= average linear speed (including waiting times)	(m/s)
t_T	= cycle time for the centralized lubrication system	(min)
C	= dynamic load capacity	(N)
F	= equivalent dynamic load	(N)
S_{AP}	= relubrication interval for the application	
f_{KSS}	= metalworking fluids correction factor	

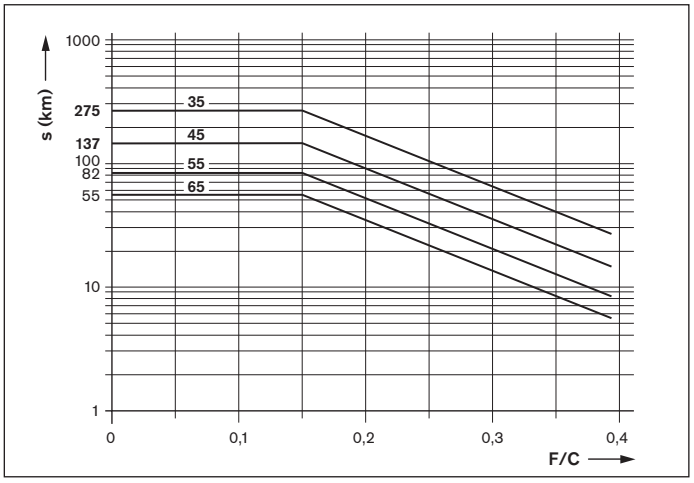
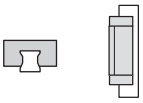
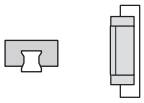


Fig. 3: Relubrication interval

Lubrication of the RSHP

Oil lubrication via single-line piston distributor systems (continued)

Roller runner block size	**35**			**45**		
Mounting orientation						
Cycle time (min)	**Permissible piston distributor size (cm^3)**					
Up to 30	0.06	0.06	0.10	0.10	0.10	0.16
30 to 60	0.10	0.10	0.20	0.16	0.16	0.40
60 to 90	0.16	0.16	0.40	0.20	0.20	0.40
90 to 120	0.20	0.20	0.40	0.40	0.40	0.40
> 120	0.40	0.40	0.40	0.40	0.40	0.40

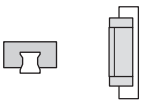
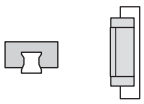
Roller runner block size	**55**			**65**		
Mounting orientation						
Cycle time (min)	**Permissible piston distributor size (cm^3)**					
Up to 30	0.16	0.16	0.20	0.20	0.20	0.40
30 to 60	0.20	0.20	0.40	0.40	0.40	0.60
60 to 90	0.40	0.40	0.60	0.60	0.60	1.00
90 to 120	0.60	0.60	0.60	1.00	1.00	1.00
> 120	0.60	0.60	0.60	1.00	1.00	1.00

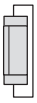
Table 8

On the usage of lube ports that are not offered by Rexroth for usage on the RSHP, an extension is imperative for all mounting orientations.

Mounting orientations:

 horizontal

 horizontal, top-down

 vertical

 wall attachment

Calculation example:

Given data:

Roller runner block	1851 323 2X
Dynamic load capacity C	61,000 N
Equivalent dynamic load on bearing F	18,300 N
Stroke	500 mm
Average linear speed v_m	1.0 m/s
Temperature T	20 – 30 °C
Mounting orientation	Horizontal
Lubrication	Single-line centralized lubrication system for all axes with oil Shell Tonna S3 M 220
Cycle time for the centralized lubrication system t_T	20 min
Exposure to contaminants	Exposure to metalworking fluids

Calculation of relubrication quantity:

Normal or short-stroke	Normal stroke	Stroke ≥ 2 • roller runner block length B_1 500 mm ≥ 2 x 79.6 mm 500 mm ≥ 159.2 mm i.e. normal stroke is applicable
Initial lubrication quantity	1.30 cm^3 (2x)	According to Table 6
Relubrication quantity	V_{Oil} = 1.30 cm^3	According to Table 7
Piston distributor size	K_v = 0.06 cm^3	According to Table 8
Load ratio	F/C = 18,300 N/61,000 N = 0.30	
Relubrication interval on exposure to metalworking fluids	$S_{AP} = 60\ km \cdot \frac{1}{f_{KSS}} = 60\ km \cdot \frac{1}{5} = 12\ km$	According to Fig. 3
Relubrication quantity applied in the relubrication interval:	$V_{Oil} = round\ \frac{16.67 \cdot S_{AP} \cdot K_v}{v_m \cdot t_T}$ $V_{Oil} = round\ \frac{16.67 \cdot 12 \cdot 0.06}{1.0 \cdot 20} = 0.6\ cm^3$	According to Formula 2

Result:

The lubrication design with a piston distributor of 0.06 cm^3 is **inadequate**, as the necessary relubrication quantity according to Table 7 of 1.30 cm^3 is not applied during the relubrication interval. The calculation is to be repeated with a larger piston distributor.

New piston distributor size selected	K_v = 0.16 cm^3	
New calculated relubrication quantity applied in the relubrication interval	$V_{Oil} = round\ \frac{16.67 \cdot S_{AP} \cdot K_v}{v_m \cdot t_T}$ $V_{Oil} = round\ \frac{16.67 \cdot 12 \cdot 0.16}{1.0 \cdot 20} = 1.6\ cm^3$	According to Formula 2

Result:

The lubrication design with a piston distributor of 0.16 cm^3 is **adequate**, as the necessary relubrication quantity according to Table 7 of 1.30 cm^3 is exceeded during the relubrication interval.

Lubrication of the Heavy Duty Roller Rail System

Lubrication using a grease gun or a progressive feeder system

⚠ Take note of “Lubrication Notes” section.

Lubricating grease
We recommend using **Dynalub 510**. For further information, see “Lubrication Notes” section.

Initial lubrication of the roller runner blocks (basic lubrication)

Stroke ≥ 2 · roller runner block length B_1 (normal stroke)

- For initial lubrication, mount one lube fitting per roller runner block, at either of the two end caps!

Initial lubrication is applied in three partial quantities as specified in Table 10:

1. Grease the roller runner block with the first partial quantity as per Table 10, pressing it in slowly with the help of a grease gun.
2. Slide the roller runner block back and forth over at least three times the block length (size 125 at least 300 mm) for three full cycles.
3. Repeat steps 1. and 2. twice more.
4. Make sure there is a visible film of lubricant on the roller guide rail.

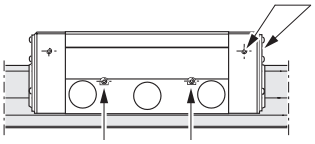
Stroke < 2 · roller runner block length B_1 (short stroke)

- Install and lubricate two lube fittings per roller runner block, one on each of the two end caps!

Initial lubrication is applied to each fitting in three partial quantities as specified in Table 10:

1. Grease each fitting on the roller runner block with the first partial quantity as per Table 10, pressing it in slowly with the help of a grease gun.
2. to 4. Repeat the procedure as for initial lubrication (normal stroke).

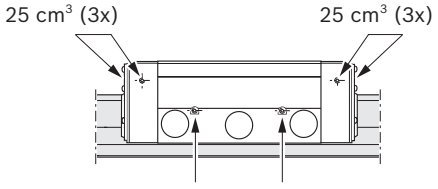
Initial lubrication for size 125 (normal stroke)
At one of the end face or side lube ports
on **either** of the two end caps: 25 cm^3 (3x)



and on the roller runner block body at all four side lube ports: 7.5 cm^3 each (3x)

Fig. 10

Initial lubrication for size 125 (short stroke)
At two lube ports, **one on each** of the two end caps:



and on the roller runner block body at all four side lube ports: 7.5 cm^3 each (3x)

Fig. 11

Size	Initial lubrication		
	Normal stroke Partial quantity (cm^3)	Short stroke Partial quantity per port (cm^3)	
		left	right
55/85	1.8 (3x)	1.8 (3x)	1.8 (3x)
65/100 65 FXS	3.2 (3x)	3.2 (3x)	3.2 (3x)
100	15.0 (3x)	15.0 (3x)	15.0 (3x)
125	as shown in Fig. 10	Ports left, right **and** side as shown in Fig. 11	

Table 10

Relubrication of roller runner blocks

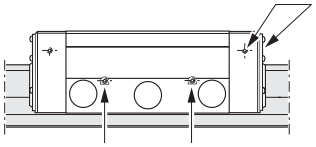
Stroke ≥ 2 · roller runner block length B_1 (normal stroke)

- When the travel distance shown as the relubrication interval in Fig. 14 has been reached, apply the relubrication quantity as specified in Table 11.

Stroke < 2 · roller runner block length B_1 (short stroke)

- When the travel distance shown as the relubrication interval in Fig. 14 has been reached, apply the relubrication quantity as specified in Table 11 per lube port.
- During each lubrication cycle the roller runner block should be traversed through a lubricating stroke of 3 · roller runner block length B_1. In any case, the lubricating stroke must be at least the length B_1 of the roller runner block.

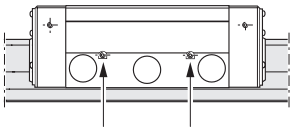
Relubrication for size 125 (normal stroke)
At one of the end face or side lube ports
on **either** of the two end caps: 55 cm^3



or on the roller runner block body at all four
side lube ports: 15 cm^3 each

Fig. 12

Relubrication for size 125 (short stroke)



On the roller runner block body at all four
side lube ports: 15 cm^3 each

Fig. 13

Size	Relubrication		
	Normal stroke Partial quantity (cm^3)	Short stroke Partial quantity per port (cm^3)	
		left	right
55/85	1.8	1.8	1.8
65/100 65 FXS	3.2	3.2	3.2
100	15.0	15.0	15.0
125	As shown in Fig. 12	Side ports as shown in Fig. 13	

Table 11

Load-dependent relubrication intervals ("dry axes")

The following conditions apply:

- Maximum speed: v_{max} = 2 m/s
- No exposure to metalworking fluids
- Standard seals
- Ambient temperature: T = 10 – 40 °C

Key to graphs

s = relubrication interval expressed as travel (km)
C = dynamic load capacity (N)
F = equivalent dynamic load (N)

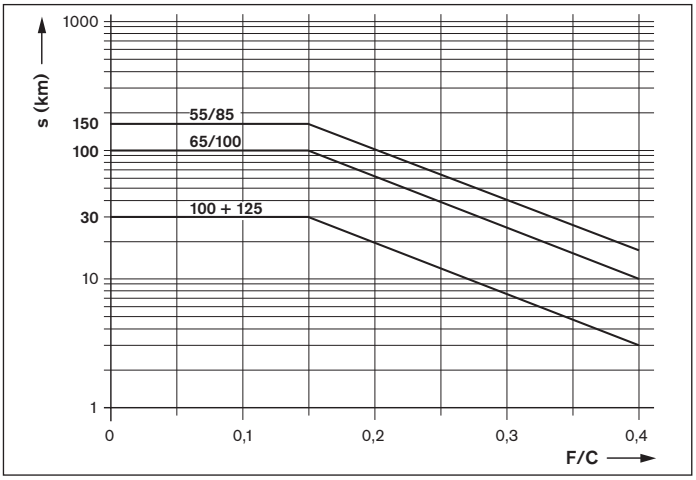


Fig. 14

Lubrication of the Heavy Duty Roller Rail System

Liquid grease lubrication via single-line piston distributor systems

⚠ Take note of “Lubrication Notes” section.

Liquid grease

We recommend using **Dynalub 520**. For further information, see “Lubrication Notes” section.

Initial lubrication of the roller runner blocks (basic lubrication)

We recommend applying initial lubrication with a manual grease gun before connecting the equipment to the centralized lubrication system. If initial lubrication is nevertheless carried out via the centralized lubrication system, it is essential that all lines and piston distributors should be filled. The pulse count can then be calculated from the partial quantities and the piston distributor size according to Table 14.

Stroke ≥ 2 · roller runner block length B_1 (normal stroke)

- For initial lubrication, mount one lube fitting per roller runner block, at either of the two end caps!

Initial lubrication is applied in three partial quantities as specified in Table 12:

1. Grease the roller runner block with the first partial quantity as per Table 12, pressing it in slowly with the help of a grease gun.
2. Slide the roller runner block back and forth over at least three times the block length (size 125 at least 300 mm) for three full cycles.
3. Repeat steps 1. and 2. twice more.
4. Make sure there is a visible film of lubricant on the roller guide rail.

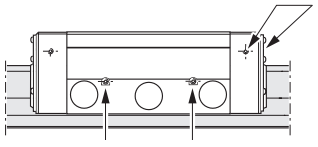
Stroke < 2 · roller runner block length B_1 (short stroke)

- Install and lubricate two lube fittings per roller runner block, one on each of the two end caps!

Initial lubrication is applied to each fitting in three partial quantities as specified in Table 12:

1. Grease each fitting on the roller runner block with the first partial quantity as per Table 12, pressing it in slowly with the help of a grease gun.
2. to 4. Repeat the procedure as for initial lubrication (normal stroke).

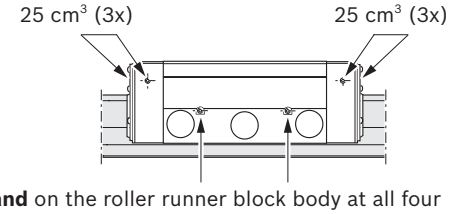
Initial lubrication for size 125 (normal stroke)
At one of the end face or side lube ports
on **either** of the two end caps: 25 cm^3 (3x)



and on the roller runner block body at all four side lube ports: 7.5 cm^3 each (3x)

Fig. 15

Initial lubrication for size 125 (short stroke)
At two lube ports, one on each of the
two end caps:



and on the roller runner block body at all four side lube ports: 7.5 cm^3 each (3x)

Fig. 16

Size	Initial lubrication		
	Normal stroke Partial quantity (cm^3)	Short stroke Partial quantity per port (cm^3)	
		left	right
55/85	1.8 (3x)	1.8 (3x)	1.8 (3x)
65/100 65 FXS	3.2 (3x)	3.2 (3x)	3.2 (3x)
100	15.0 (3x)	15.0 (3x)	15.0 (3x)
125	As shown in Fig. 15	Ports left, right **and** side as shown in Fig. 16	

Table 12

Relubrication of roller runner blocks

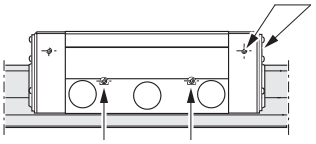
Stroke ≥ 2 · roller runner block length B_1 (normal stroke)

- Apply the minimum quantity according to Table 13 to the lube port until the relubrication interval as specified (in Fig. 19) has been reached.

Stroke < 2 · roller runner block length B_1 (short stroke)

- Apply the minimum quantity according to Table 13 per lube port until the relubrication interval as specified (in Fig. 19) has been reached.
  Calculate the required pulse count and lubricant cycle time in the same way as for relubrication (normal stroke).
- During each lubrication cycle the roller runner block should be traversed through a lubricating stroke of 3 · roller runner block length B_1. In any case, the lubricating stroke must be at least the length B_1 of the roller runner block.

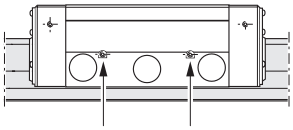
Relubrication for size 125 (normal stroke)
At one of the end face or side lube ports on **either** of the two end caps: 55 cm³



or on the roller runner block body at all four side lube ports: 15 cm³ each

Fig. 17

Relubrication for size 125 (short stroke)



On the roller runner block body at all four side lube ports: 15 cm³ each

Fig. 18

Size	Relubrication		
	Normal stroke (cm³)	Short stroke per port (cm³)	
		left	right
55/85	1.8	1.8	1.8
65/100 **65 FXS**	3.2	3.2	3.2
100	15.0	15.0	15.0
125	As shown in Fig. 17	Side ports as shown in Fig. 18	

Table 13

Notes
The required pulse count is the quotient (as a whole number) of the minimum relubrication quantity according to Table 13 and the smallest permissible piston distributor size (≙ the minimum pulse quantity) according to Table 14. The smallest permissible piston distributor size also depends on the mounting orientation.
The lubricant cycle time can then be obtained by dividing the relubrication interval (according to Fig. 19) by the calculated pulse count (see design calculation example).

Load-dependent relubrication intervals ("dry axes")

The following conditions apply:

- Maximum speed: v_{max} = 2 m/s
- No exposure to metalworking fluids
- Standard seals
- Ambient temperature: T = 10 – 40 °C

Key to graphs

s	= relubrication interval expressed as travel	(km)
C	= dynamic load capacity	(N)
F	= equivalent dynamic load	(N)

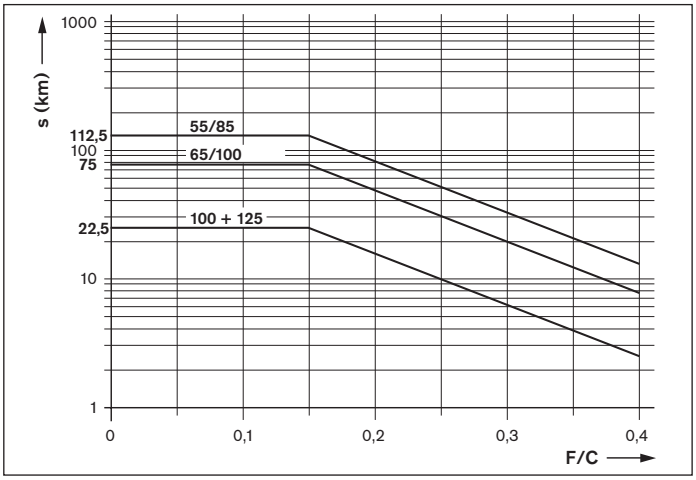


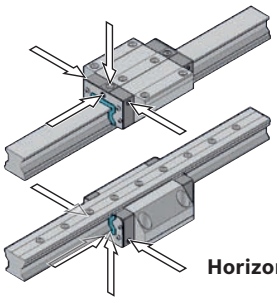
Fig. 19

Lubrication of the Heavy Duty Roller Rail System

Liquid grease lubrication via single-line piston distributor systems (continued)

Mounting orientation I – normal stroke

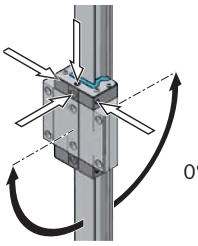
Horizontal
1 lube port at **either** of the two end caps



Horizontal, top-down
Same port

Mounting orientation II – normal stroke

Vertical to inclined horizontal
1 lube port at top end cap

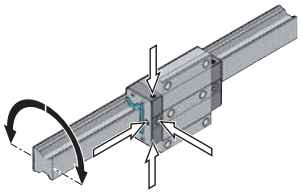


0° to max. ±90°

Vertical to inclined, top-down
Same port

Mounting orientation III – normal stroke

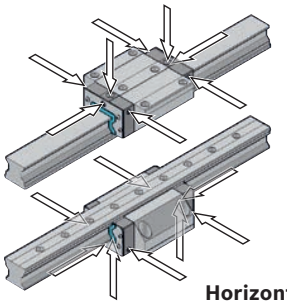
Wall mounting
1 lube port at **either** of the two end caps



0° to max. ±90°

Mounting orientation IV – short stroke

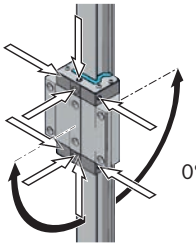
Horizontal
2 lube ports, **one on each** of the two end caps



Horizontal, top-down
Same port

Mounting orientation V – short stroke

Vertical to inclined horizontal
2 lube ports, **one on each** of the two end caps (top and bottom)

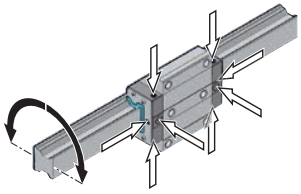


0° to max. ±90°

Vertical to, top-down
Same port

Mounting orientation VI – short stroke

Wall mounting
2 lube ports, **one on each** of the two end caps



0° to max. ±90°

Smallest permissible piston distributor sizes for liquid grease lubrication through single-line centralized systems[1)]

Roller runner blocks		Smallest permissible piston distributor size (≙ minimum pulse quantity) per lube port (cm^3) for liquid grease, NLGI class 00			
		Size			
		55/85	65/100/65 FXS	100	125
Part numbers	**Mounting orientations**				
R18.. ... 10 or ... 60	**Horizontal I, IV**	0.1	0.2	0.3	1.5
	Vertical II, V	0.1	0.2	0.3	1.5
	Wall mounting III, VI	0.1	0.2	0.3 (2x)[2)]	0.3 (2x)[2)3)]

Table 14

1) The following conditions apply: Liquid grease Dynalub 520 (or Castrol Longtime PD 00, or Elkalub GLS 135/N00) and piston distributors from SKF
2) Sizes 100 and 125: Either two pulses in short succession or two metering valves delivering one pulse simultaneously
3) Size 125: 0.3 cm^3 per port when all four ports in the roller runner block body are used

Lubrication of the Heavy Duty Roller Rail System

Oil lubrication via single-line piston distributor systems

⚠ Take note of “Lubrication Notes” section.

Oil lubricant

We recommend using **Shell Tonna S3 M 220**. For further information, see “Lubrication Notes” section.

Initial lubrication of the roller runner blocks (basic lubrication)

We recommend applying initial lubrication with a manual grease gun before connecting the equipment to the centralized lubrication system.

Stroke ≥ 2 · roller runner block length B_1 (normal stroke)

- For initial lubrication, mount one lube fitting per roller runner block, at either of the two end caps!

Initial lubrication is applied in two partial quantities as specified in Table 15:

1. Apply the first of the oil quantities as specified in Table 15 to the roller runner block.
2. Slide the roller runner block back and forth over at least three times the block length (size 125 at least 300 mm) for three full cycles.
3. Repeat steps 1. and 2.
4. Make sure there is a visible film of lubricant on the roller guide rail.

Stroke < 2 · roller runner block length B_1 (short stroke)

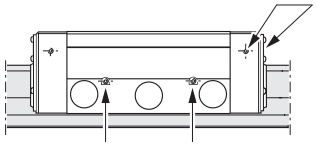
- Install and lubricate two lube fittings per roller runner block, one on each of the two end caps!

Initial lubrication is applied in two partial quantities per lube fitting as specified in Table 15:

1. Apply the first of the oil quantities as specified in Table 15 to the roller runner block.
2. to 4. Repeat the procedure as for initial lubrication (normal stroke).

If initial lubrication is nevertheless carried out via the centralized lubrication system, it is essential that all lines and piston distributors should be filled. The pulse count can then be calculated from the partial quantities and the piston distributor size according to Table 17.

Initial lubrication for size 125
At one of the end face or side lube ports on **either** of the two end caps: 38 cm^3 (1x)

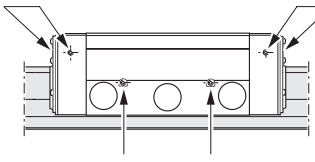


and on the roller runner block body at all four side lube ports: 9 cm^3 each (1x)

Fig. 20

Initial lubrication for size 125
At two lube ports, **one on each** of the two end caps:

38 cm^3 (1x) 38 cm^3 (1x)



and on the roller runner block body at all four side lube ports: 9 cm^3 each (1x)

Fig. 21

Size	Initial lubrication		
	Normal stroke Partial quantity (cm^3)	Short stroke Partial quantity per port (cm^3)	
		left	right
55/85	2.7 (2x)	2.7 (2x)	2.7 (2x)
65/100 65 FXS	4.8 (2x)	4.8 (2x)	4.8 (2x)
100	11.0 (2x)	11.0 (2x)	11.0 (2x)
125	As shown in Fig. 20	Ports left, right **and** side as shown in Fig. 21	

Table 15

Relubrication of roller runner blocks

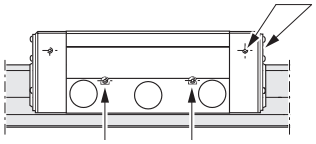
Stroke ≥ 2 · roller runner block length B_1 (normal stroke)

- Apply the minimum quantity according to Table 16 to the lube port until the relubrication interval as specified (in Fig. 24) has been reached.

Stroke < 2 · roller runner block length B_1 (short stroke)

- Apply the minimum quantity according to Table 16 to the lube port until the relubrication interval as specified (in Fig. 24) has been reached.
  Calculate the required pulse count and lubricant cycle time in the same way as for relubrication (normal stroke).
- During each lubrication cycle the roller runner block should be traversed through a lubricating stroke of 3 · roller runner block length B_1. In any case, the lubricating stroke must be at least the length B_1 of the roller runner block.

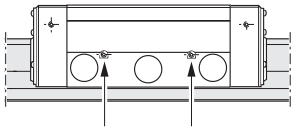
Relubrication for size 125
At one of the lube ports on **either** of the two end caps: 38 cm³



or on the roller runner block body at all four side lube ports: 9 cm³ each

Fig. 22

Relubrication for size 125



On the roller runner block body at all four side lube ports: 9 cm³ each

Fig. 23

Notes

The required pulse count is the quotient (as a whole number) of the minimum relubrication quantity according to Table 16 and the smallest permissible piston distributor size (≙ minimum pulse quantity) according to Table 17. The smallest permissible piston distributor size also depends on the mounting orientation.
The lubricant cycle time can then be obtained by dividing the relubrication interval (according to Fig. 24) by the calculated pulse count.

Size	Relubrication		
	Normal stroke (cm³)	Short stroke per port (cm³)	
		left	right
55/85	2.7	2.7	2.7
65/100 **65 FXS**	4.8	4.8	4.8
100	11.0	11.0	11.0
125	As shown in Fig. 22	Side ports as shown in Fig. 23	

Table 16

Load-dependent relubrication intervals ("dry axes")

The following conditions apply:

- Maximum speed: v_{max} = 2 m/s
- No exposure to metalworking fluids
- Standard seals
- Ambient temperature: T = 20 – 30 °C

Key to graphs

s = relubrication interval expressed as travel (km)
C = dynamic load capacity (N)
F = equivalent dynamic load (N)

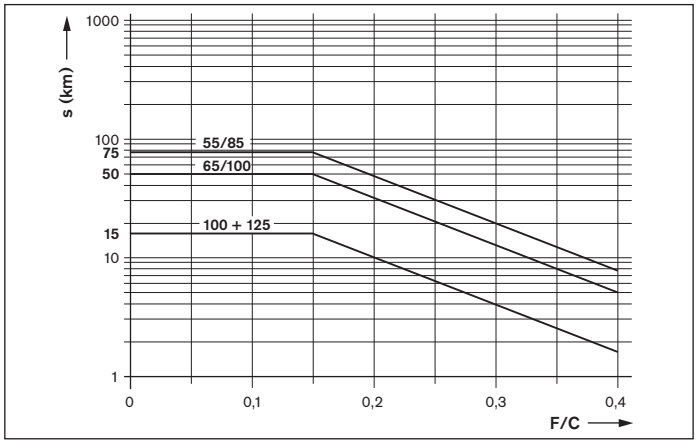


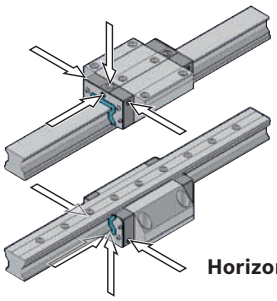
Fig. 24

Lubrication of the Heavy Duty Roller Rail System

Oil lubrication via single-line piston distributor systems (continued)

Mounting orientation I – normal stroke

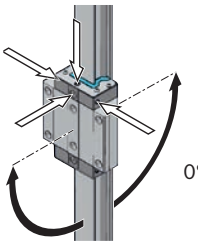
Horizontal
1 lube port at **either** of the two end caps



Horizontal, top-down
Same port

Mounting orientation II – normal stroke

Vertical to inclined horizontal
1 lube port at top end cap

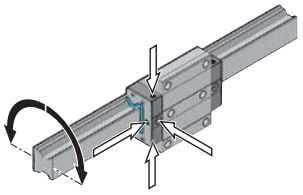


0° to max. ±90°

Vertical to inclined, top-down
Same port

Mounting orientation III – normal stroke

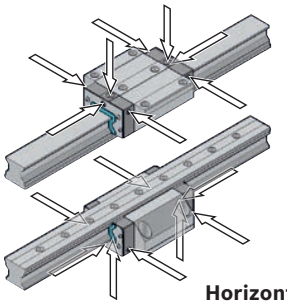
Wall mounting
1 lube port at **either** of the two end caps



0° to max. ±90°

Mounting orientation IV – short stroke

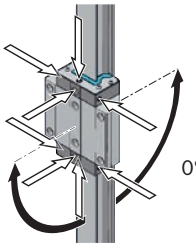
Horizontal
2 lube ports, **one on each** of the two end caps



Horizontal, top-down
Same port

Mounting orientation V – short stroke

Vertical to inclined horizontal
2 lube ports, **one on each** of the two end caps (top and bottom)

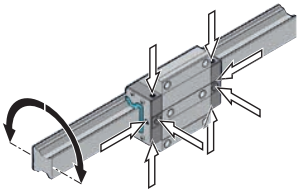


0° to max. ±90°

Vertical to inclined, top-down
Same port

Mounting orientation VI – short stroke

Wall mounting
2 lube ports, **one on each** of the two end caps



0° to max. ±90°

Smallest permissible piston distributor sizes for oil lubrication via single-line centralized systems[1)]

Roller runner blocks		Smallest permissible piston distributor size (≙ minimum pulse quantity) per lube port (cm^3) for oil viscosity 220 mm^2/s			
		Size			
Part numbers	**Mounting orientations**	**55/85**	**65/100/65 FXS**	**100**	**125**
R18.. ... 10 or ... 60	**Horizontal I, IV**	0.6	0.6	1.5	1.5
	Vertical II, V	0.6	0.6	1.5	1.5
	Wall mounting III, VI	1.0	1.5	1.5 (3x)[2)]	1.5 (3x)[2)3)]

Table 17

1) The following conditions apply: Lube oil Shell Tonna S3 M 220 using piston distributors from SKF
2) Sizes 100 and 125: Either three pulses in short succession or three metering valves delivering one pulse simultaneously
3) Size 125: 1.5 cm^3 per port when all four ports in the roller runner block body are used

Design example for lubrication of a typical 2-axis application with centralized lubrication
X-axis

Component or parameter	Given data
Roller runner block	Size 100; 4 blocks; C = 461,000 N; part number: R1861 223 10
Roller guide rail	Size 100; 2 rails; L = 1,500 mm; part number: R1835 263 61
Equivalent dynamic load on bearing	F = 115,250 N (per roller runner block) taking into account the preload (in this case 8% C)
Stroke	800 mm
Average linear speed	v_m = 1 m/s
Temperature	20 to 30 °C
Mounting orientation	Horizontal
Lubrication	Single-line centralized lubrication system for all axes with liquid grease Dynalub 520
Exposure to contaminants	No exposure to fluids, chips, dust

Design variables	Design input (per roller runner block)	Information sources
Normal or short-stroke	Normal stroke: Stroke ≥ 2 · roller runner block length B_1 800 mm ≥ 2 · 204 mm? 800 mm ≥ 408 mm! i.e. normal stroke applicable!	Normal stroke formula from catalog, B_1 from catalog
Initial lubrication quantity	Initial lubrication quantity: 15.0 cm^3 (3x)	Initial lubrication quantity from table
Relubrication quantity	Relubrication quantity: 15.0 cm^3	Relubrication quantity from table
Mounting orientation	Mounting orientation I – normal stroke (horizontal)	Mounting orientation from catalog
Piston distributor size	Permissible piston distributor size: 0.3 cm^3	Piston distributor size from table for size 100, mounting orientation I
Pulse count	Pulse count = $\frac{15.0\ cm^3}{0.3\ cm^3}$ = 50	Pulse count = $\frac{\text{Relubrication quantity}}{\text{Perm. piston distributor size}}$
Load ratio	Load ratio = $\frac{115{,}250\ N}{461{,}000\ N}$ = 0.25	Load ratio = $\frac{F}{C}$ F and C from given data in catalog
Relubrication interval	Relubrication interval: 10 km	Relubrication interval from figure Curve size 100 at load ratio 0.25
Lubrication cycle	Lubrication cycle = $\frac{10\ km}{50}$ = 0.2 km	Lubrication cycle = $\frac{\text{Relubrication interval}}{\text{Pulse count}}$

Interim result (X-axis)

Every 0.2 km a minimum quantity of 0.3 cm^3 Dynalub 520 must be supplied to the roller runner block on the X-axis.

Lubrication of the Heavy Duty Roller Rail System

Design example for lubrication of a typical 2-axis application with centralized lubrication (continued)
Y-axis

Component or parameter	Given data
Roller runner block	Size 65/100; 4 blocks; C = 265,500 N; part number: R1851 323 10
Roller guide rail	Size 65/100; 2 rails; L = 1,500 mm; part number: R1875 663 61
Equivalent dynamic load on bearing	F = 66,375 N (per roller runner block) taking into account the preload
Stroke	300 mm
Average linear speed	v_m = 1 m/s
Temperature	20 to 30 °C
Mounting orientation	Vertical
Lubrication	Single-line centralized lubrication system for all axes with liquid grease Dynalub 520
Exposure to contaminants	No exposure to fluids, chips, dust

Design variables	Design input (per roller runner block)	Information sources
Normal or short-stroke	Normal stroke: Stroke ≥ 2 · roller runner block length B_1 300 mm ≥ 2 · 194 mm? 300 mm < 388 mm! i.e. short stroke applicable!	Normal stroke formula from catalog, B_1 from catalog
Initial lubrication quantity	2 lube ports, initial lubrication quantity per lube port: 3.2 cm^3 (3x)	Initial lubrication quantity from table
Relubrication quantity	2 lube ports, relubrication quantity per port: 3.2 cm^3	Relubrication quantity from table
Mounting orientation	Mounting orientation V – short stroke (vertical)	Mounting orientation from catalog
Piston distributor size	Permissible piston distributor size: 0.2 cm^3	Piston distributor size from table for size 65/100, mounting orientation V
Pulse count	Pulse count = $\frac{3.2\ cm^3}{0.2\ cm^3}$ = 16	Pulse count = $\frac{\text{Relubrication quantity}}{\text{Perm. piston distributor size}}$
Load ratio	Load ratio = $\frac{66{,}375\ N}{265{,}500\ N}$ = 0.25	Load ratio = $\frac{F}{C}$ F and C from given data in catalog
Relubrication interval	Relubrication interval: 30 km	Relubrication interval from figure Curve size 65/100 at load ratio 0.25
Lubrication cycle	Lubrication cycle = $\frac{30\ km}{16}$ = 1.875 km	Lubrication cycle = $\frac{\text{Relubrication interval}}{\text{Pulse count}}$

Interim result (Y-axis)

Every 1.875 km a minimum quantity of 0.2 cm^3 Dynalub 520 must be supplied to the roller runner block on the Y-axis.

End result (two-axis lubrication)

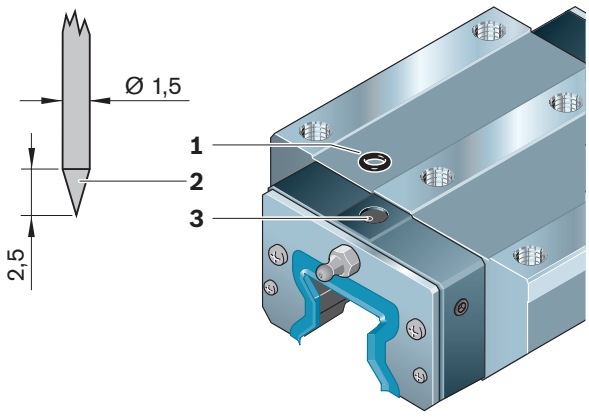
Since both the axes in this example are supplied by a single-line centralized lubrication system, the X-axis with its smaller lube cycle (0.2 km) determines the overall cycle of the system, i.e. the Y-axis will also be lubricated every 0.2 km.
The number of ports and the minimum lubricant quantities determined for each axis remain the same.

Subsequent opening of a lube hole at the top for heavy duty roller runner blocks sizes 100 and 65 FXS

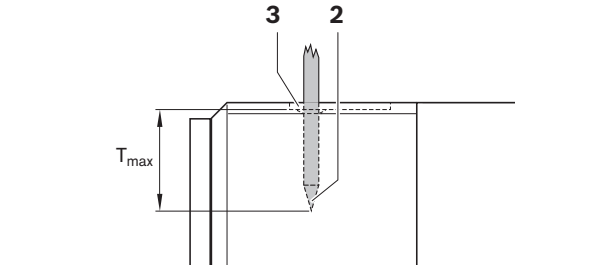
If a lube hole is to be opened up at the top of heavy duty roller runner blocks, the following points should be noted:

⚠ In the O-ring recess there is a further pre-formed small recess (5). Do not use a drill to open this. Risk of contamination!

- Heat up a pointed metal punch (4) with diameter of 1.5 mm.
- Carefully punch through the recess (5) to open the lube hole.
  Do not exceed the permissible depth T_{max} as specified in the table!
- Insert O-ring (2) in the recess (O-ring is not supplied with the roller runner block).



Roller runner block FNS R186. ... 10 or ... 60 flanged, normal, standard height (example)



Size	Lube hole at top: Maximum permitted depth for punching open T_{max} (mm)
65 FXS, 100	5

Maintenance

Cleaning cycle

Dirt can settle and encrust on roller guide rails, especially when these are not enclosed.
To ensure that seals and cover strips retain their functionality, this dirt must be removed at regular intervals.
It is advisable to run the machine through at least one full cleaning cycle over the entire installed rail length every 8 hours.
Depending on the amount of soiling and on the coolant used, more frequent cleaning may be required.

Before shutting down the machine, always apply 3 lubrication pulses or lubrication strokes. The lubrication pulses should be applied during the movement of the axis over the largest possible travel (cleaning cycle).

Maintenance of accessories

All accessories used for scraping or wiping the roller guide rails must be checked at regular intervals.
In environments with heavy contamination, it is advisable to replace all the parts directly exposed to such contamination.
We recommend checking the accessories at least once a year.