Lubrication and Maintenance

# Lubrication

Rexroth Roller Rail Systems are delivered filled with an anti-corrosion agent.

Immediately after mounting the runner blocks (before start-up), make sure the system has sufficient initial lubrication (basic lubrication).

Depending on the runner block type, the following lubricant types are possible:
- Both grease and oil
- Oil only

## Grease lubrication using grease guns or progressive feeder systems

**Recommended grease types**
We recommend using **Dynalub 510** with the following properties:
- High performance lithium soap grease, consistency class NLGI 2, to DIN 51818 (KP2K-20 to DIN 51825)
- Good water resistance
- Corrosion protection
- Temperature range: –20 to +80°C

Under conventional environmental conditions this ground-fiber, homogeneous grease is ideally suited for the lubrication of linear elements:
- At loads of up to 50% C
- For 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.de/brl.
Please also read the notes on page 154 of this catalog!

Part numbers for Dynalub 510:
- R3416 037 00 (cartridge 400 g)
- R3416 035 00 (hobbock 25 kg)

**Initial lubrication of the runner blocks (basic lubrication)**

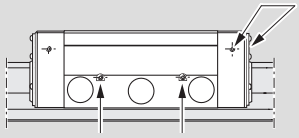
**Stroke ≥ 2 · runner block length $B_1$ (normal stroke)**
- For initial lubrication, mount one lube fitting per runner block, at either of the two end caps!
-

Initial lubrication is applied in three partial quantities as specified in table 1:
1. Grease the 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 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. Check whether a film of lubricant is visible on the guide rail.

| Size | Initial lubrication (normal stroke) Partial quantity cm³ |
|---|---|
| 25 | 0.8 (3x) |
| 35 | 0.9 (3x) |
| 45 | 1.0 (3x) |
| 55 | 1.4 (3x) |
| 65 | 2.7 (3x) |
| 55/85 | 1.8 (3x) |
| 65/100 | 3.2 (3x) |
| 100 | 15.0 (3x) |
| 125 | as shown in Fig. 1 |

Table 1

**Initial lubrication for size 125**
At one of the end face or side lube ports **on either** of the two end caps:
25 cm³ (3x)



**and** on the runner block body at all four side lube ports:
7.5 cm³ (3x) per port

Fig. 1

**Stroke < 2 · runner block length $B_1$ (short stroke)**
- Install and lubricate two lube fittings per runner block, one on each of the two end caps!

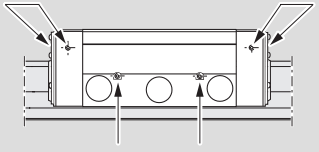
Initial lubrication is applied to each fitting in three partial quantities as specified in table 2:
1. Grease each fitting on the runner block with the first partial quantity as per Table 2, pressing it in slowly with the help of a grease gun.
2. to 4. Repeat the procedure as for initial lubrication (normal stroke).

| Size | Initial lubrication (short stroke) Partial quantity per port | |
|---|---|---|
| | 1st end cm³ | 2nd end cm³ |
| 25 | 0.8 (3x) | 0.8 (3x) |
| 35 | 0.9 (3x) | 0.9 (3x) |
| 45 | 1.0 (3x) | 1.0 (3x) |
| 55 | 1.4 (3x) | 1.4 (3x) |
| 65 | 2.7 (3x) | 2.7 (3x) |
| 55/85 | 1.8 (3x) | 1.8 (3x) |
| 65/100 | 3.2 (3x) | 3.2 (3x) |
| 100 | 15.0 (3x) | 15.0 (3x) |
| 125 | Lube ports 1st end, 2nd end **and** sides as shown in Fig. 2 | |

Table 2

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

25 cm³ (3x) 25 cm³ (3x)



**and** on the runner block body at all four side lube ports:
7.5 cm³ (3x) per port

Fig. 2

Lubrication and Maintenance

# Lubrication

## Grease lubrication using grease guns or progressive feeder systems (continued)

### Relubrication of runner blocks

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

- When the travel distance shown as the relubrication interval in Fig. 5 has been reached, apply the relubrication quantity as specified in Table 3.

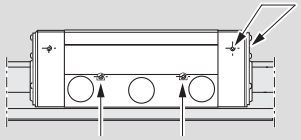
Please also read the notes on relubrication on page 154 of this catalog!

| Size | Relubrication (normal stroke) |
|---|---|
| | $cm^3$ |
| **25** | 0.8 |
| **35** | 0.9 |
| **45** | 1.0 |
| **55** | 1.4 |
| **65** | 2.7 |
| **55/85** | 1.8 |
| **65/100** | 3.2 |
| **100** | 15.0 |
| **125** | as shown in Fig. 3 |

Table 3

**Relubrication for size 125**

At one of the end face or side lube ports **on either** of the two end caps: 55 $cm^3$



**or** on the runner block body at all four side lube ports: 15 $cm^3$ per port

Fig. 3

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

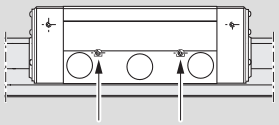
- When the travel distance shown as the relubrication interval in Fig. 5 has been reached, apply the relubrication quantity as specified in Table 4.
- At each lubrication cycle the runner block should be traversed through a lubricating stroke of 3 · runner block length $B_1$. In any case, the lubricating stroke must be at least the length of the runner block. If the largest possible lubricating stroke is smaller than the runner block length $B_1$, lubricant must be applied to the guide rail. Please consult us for details.

Please also read the notes on relubrication on page 154 of this catalog!

| Size | Relubrication (short stroke) per port | |
|---|---|---|
| | 1st end $cm^3$ | 2nd end $cm^3$ |
| **25** | 0.8 | 0.8 |
| **35** | 0.9 | 0.9 |
| **45** | 1.0 | 1.0 |
| **55** | 1.4 | 1.4 |
| **65** | 2.7 | 2.7 |
| **55/85** | 1.8 | 1.8 |
| **65/100** | 3.2 | 3.2 |
| **100** | 15.0 | 15.0 |
| **125** | Side ports as shown in Fig. 4 | |

Table 4

**Relubrication for size 125**



On the runner block body at all four side lube ports: 15 $cm^3$ per port

Fig. 4

Lubrication and Maintenance

# Lubrication

## Grease lubrication using grease guns or progressive feeder systems (continued)

**Load-dependent relubrication intervals for grease lubrication using grease guns or progressive feeder systems (“dry axes”)**

**Sizes 25 to 125**

**The following conditions apply:**
- Grease lubricant Dynalub 510
- or alternatively Castrol Longtime PD 2
- Maximum speed: $v_{max}$ = 2 m/s
- No exposure to metalworking fluids
- Standard seals
- Ambient temperature: T = 20 – 30°C

**Key to graph**

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

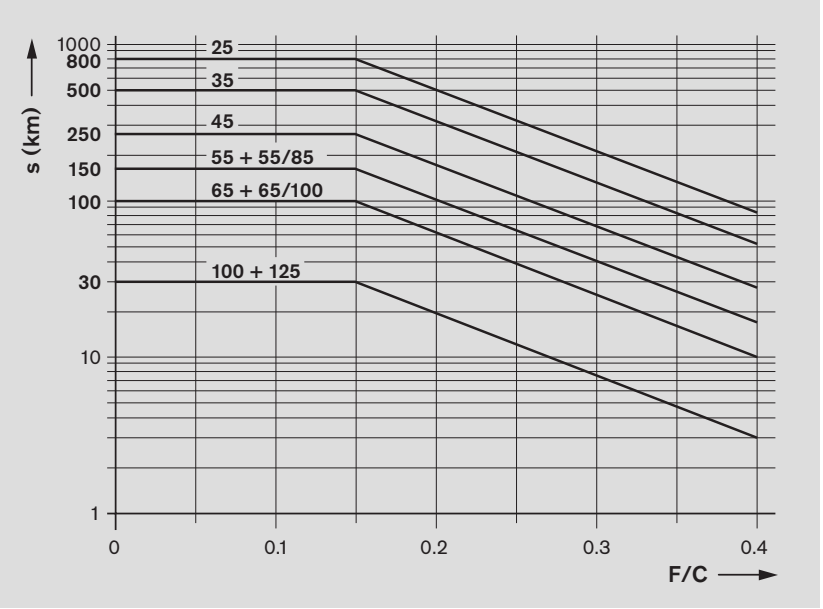



Fig. 5

**Notes**
The load ratio F/C is the quotient of the equivalent dynamic load on the bearing F (making allowance for a preload of 8% C or 13% C) divided by the dynamic load capacity C (see “General Technical Data and Calculations”).

**For relubrication intervals in applications involving exposure to metalworking fluids, please consult us.**

⚠ **If other lubricants are used, this may lead to a reduction in the relubrication intervals, the achievable travel in short-stroke applications, and the load capacities. Possible chemical interactions between the plastic materials, lubricants and preservative oils must also be taken into account.**

⚠ **Do not use greases containing solid particles (e.g., graphite or $MoS_2$)!**

⚠ **When using progressive feeder systems, do not go below the minimum dosing quantity for relubrication as given in Table 9.**

⚠ **If the system is to be exposed to metalworking fluids, always apply 2 to 5 lubricant pulses at the beginning or when the system has been at a standstill for a longer period. If possible, apply lubricant while the system is in motion. Carry out cleaning and lubricating strokes (see “Maintenance”).**

⚠ **If the application conditions involve dirt, vibrations, impacts, etc. we recommend shortening the relubrication intervals accordingly. 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 environment, increased exposure to fluids or aggressive media, extreme temperatures), please consult us. These situations must be investigated on a case by case basis and may require the use of a special lubricant. Be sure to have all the information concerning your application at hand when contacting us.

⚠ **Switching from grease to oil lubrication while the system is in service is not possible as the lubrication ducts are already filled with grease, and oil will not be able to pass through them.**

Lubrication and Maintenance

# Lubrication

## Liquid grease lubrication via single-line piston distributor systems

**Liquid grease lubrication**
We recommend using **Dynalub 520** with the following properties:
- High performance lithium soap grease, consistency class NLGI 00, to DIN 51818 (GP00K-20 to DIN 51826)
- Good water resistance
- Corrosion protection
- Temperature range: –20 to +80°C

Under conventional environmental conditions this ground-fiber, homogeneous grease is ideally suited for the lubrication of linear elements:
- In single-line centralized lubrication systems
- At loads of up to 50% C
- For short-stroke applications > 1 mm
- For the permissible speed range of Roller Rail Systems
- For miniature versions

The product and safety data sheets can be found on our website at www.boschrexroth.de/brl.
Please also read the notes on page 158 of this catalog!

Part numbers for Dynalub 520:
- R3416 043 00 (cartridge 400 g)
- R3416 042 00 (bucket 5 kg)

**Initial lubrication of the 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 9.

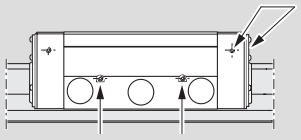
**Stroke ≥ 2 · runner block length $B_1$ (normal stroke)**
- For initial lubrication, mount one lube fitting per runner block, at either of the two end caps!

Initial lubrication is applied in three partial quantities as specified in table 5:
1. Grease the runner block with the first partial quantity as per Table 5, pressing it in slowly with the help of a grease gun.
2. Slide the 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. Check whether a film of lubricant is visible on the guide rail.

| Size | Initial lubrication (normal stroke) Partial quantity cm³ |
|---|---|
| 25 | 0.8 (3x) |
| 35 | 0.9 (3x) |
| 45 | 1.0 (3x) |
| 55 | 1.4 (3x) |
| 65 | 2.7 (3x) |
| 55/85 | 1.8 (3x) |
| 65/100 | 3.2 (3x) |
| 100 | 15.0 (3x) |
| 125 | as shown in Fig. 6 |

Table 5

**Initial lubrication for size 125**
At one of the end face or side lube ports **on either** of the two end caps:
25 cm³ (3x)



**and** on the runner block body at all four side lube ports:
7.5 cm³ (3x) per port

Fig. 6

**Stroke < 2 · runner block length $B_1$ (short stroke)**
- Install and lubricate two lube fittings per runner block, one on each of the two end caps!

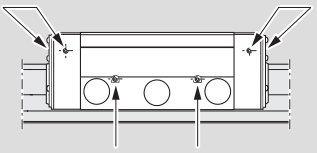
Initial lubrication is applied to each fitting in three partial quantities as specified in table 6:
1. Grease each fitting on the runner block with the first partial quantity as per Table 6, pressing it in slowly with the help of a grease gun.
2. to 4. Repeat the procedure as for initial lubrication (normal stroke).

| Size | Initial lubrication (short stroke) Partial quantity per port | |
|---|---|---|
| | 1st end cm³ | 2nd end cm³ |
| 25 | 0.8 (3x) | 0.8 (3x) |
| 35 | 0.9 (3x) | 0.9 (3x) |
| 45 | 1.0 (3x) | 1.0 (3x) |
| 55 | 1.4 (3x) | 1.4 (3x) |
| 65 | 2.7 (3x) | 2.7 (3x) |
| 55/85 | 1.8 (3x) | 1.8 (3x) |
| 65/100 | 3.2 (3x) | 3.2 (3x) |
| 100 | 15.0 (3x) | 15.0 (3x) |
| 125 | Lube ports 1st end, 2nd end **and** sides as shown in Fig. 7 | |

Table 6

**Initial lubrication for size 25**
At two lube ports, **one on each** of the two end caps:

25 cm³ (3x) 25 cm³ (3x)



**and** on the runner block body at all four side lube ports:
7.5 cm³ (3x) per port

Fig. 7

Lubrication and Maintenance

# Lubrication

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

### Relubrication of runner blocks

**Stroke ≥ 2 · 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 (in Fig. 10) has been reached.

**Notes**

The required pulse count is the quotient (as a whole number) of the minimum relubrication quantity according to Table 7 and the smallest permissible piston dis-tributor size (i.e. the minimum pulse quantity) according to Table 9. 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. 10) by the calculated pulse count (see design example on page 163).

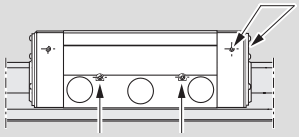
| Size | Relubrication (normal stroke) cm³ |
|---|---|
| 25 | 0.8 |
| 35 | 0.9 |
| 45 | 1.0 |
| 55 | 1.4 |
| 65 | 2.7 |
| 55/85 | 1.8 |
| 65/100 | 3.2 |
| 100 | 15.0 |
| 125 | as shown in Fig. 8 |

Table 7

Please also read the notes on relubrication on page 158 of this catalog!

**Relubrication for size 125**

At one of the end face or side lube ports **on either** of the two end caps: 55 cm³



**or** on the runner block body at all four side lube ports: 15 cm³ per port

Fig. 8

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

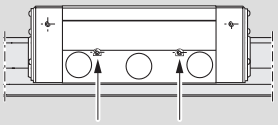
- Apply the minimum quantity according to Table 8 per lube port until the relubrication interval as specified (in Fig. 10) has been reached. Calculate the required pulse count and lubricant cycle time in the same way as for relubrication (normal stroke).
- At each lubrication cycle the runner block should be traversed through a lubricating stroke of 3 · runner block length $B_1$. In any case, the lubricating stroke must be at least the length of the runner block. If the largest possible lubricating stroke is smaller than the runner block length $B_1$, lubricant must be applied to the guide rail. Please consult us for details.

Please also read the notes on relubrication on page 158 of this catalog!

| Size | Relubrication (short stroke) per port | |
|---|---|---|
| | 1st end cm³ | 2nd end cm³ |
| 25 | 0.8 | 0.8 |
| 35 | 0.9 | 0.9 |
| 45 | 1.0 | 1.0 |
| 55 | 1.4 | 1.4 |
| 65 | 2.7 | 2.7 |
| 55/85 | 1.8 | 1.8 |
| 65/100 | 3.2 | 3.2 |
| 100 | 15.0 | 15.0 |
| 125 | Side ports as shown in Fig. 9 | |

Table 8

**Relubrication for size 125**



On the runner block body at all four side lube ports: 15 cm³ per port

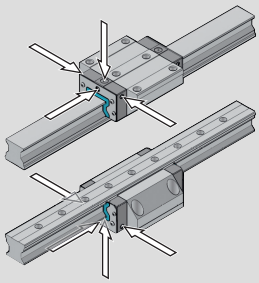
Fig. 9

Lubrication and Maintenance

# Lubrication

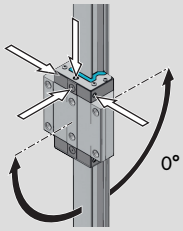
## Liquid grease lubrication via single-line piston distributor systems (continued)

**Mounting orientation I – normal stroke**
**Horizontal**
1 lube fitting at **either** of the two end caps



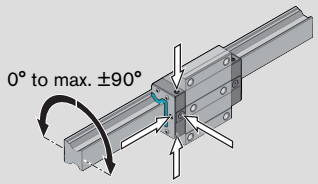
**Horizontal, top-down**
Same port

**Mounting orientation II – normal stroke**
**Vertical to slanting horizontal**
1 lube port at top end cap



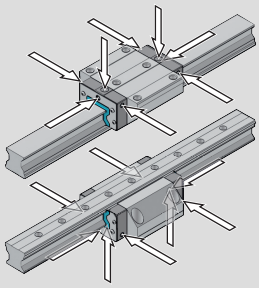

**Vertical to slanting, top-down**
Same port

**Mounting orientation III – normal stroke**
**Wall mounting**
1 lube fitting at **either** of the two end caps



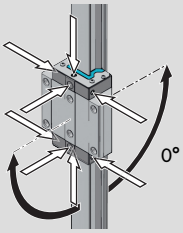

For runner block R1859 620 31,
2 lube ports, **one on each** end cap, **either** at the end face **or** on the mounting face

**Mounting orientation IV – short stroke**
**Horizontal**
2 lube ports, **one on each** of the two end caps



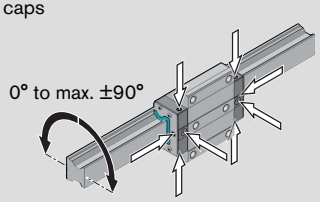
**Horizontal, top-down**
Same port

**Mounting orientation V – short stroke**
**Vertical to slanting horizontal**
2 lube ports, **one on each** of the two end caps (top and bottom)




**Vertical to slanting, top-down**
Same port

**Mounting orientation VI – short stroke**
**Wall mounting**
2 lube ports, **one on each** of the two end caps




**Not possible**
with runner block R1859 620 31

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

| Runner blocks | | Smallest permissible piston distributor size (⇔ minimum pulse quantity) per lube port ($cm^3$) for liquid grease, NLGI class 00 Size | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Part numbers** | **Mounting orientations** | **25** | **35** | **45** | **55** | **65** | **55/85** | **65/100** | **100** | **125** |
| **R18.. ... 10 or ... 60 or** | **Horizontal I, IV** | 0.06 | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0.2 | 0.3 | 0.3 |
| **R18.. ... 13 or ... 63 or** | **Vertical II, V** | 0.06 | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0.2 | 0.3 | 0.3 |
| **R18.. ... 16 or ... 66** | **Wall mounting III, VI** | 0.06 | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0.2 | 0.3 (2x)[2)] | 0.3 (2x)[2)3)] |
| **R18.. ... 18 or ... 68** | **Wall mounting III, VI[2)]** | – | 0.06 | 0.06 | 0.06 | – | – | – | – | – |
| **R1859 620 31** | **Wall mounting III** | – | – | – | – | 0.1 | – | – | – | – |

Table 9

1) Applies under the following conditions:
   - Dynalub 520 (or alternatively Castrol Longtime PD 00) and piston distributors from Vogel
   - Lube ducts must be filled
   - Ambient temperature T = 20 – 30 °C
2) Sizes 100 and 125: Either two pulses in short succession or two metering valves each delivering one pulse simultaneously
3) Size 125: 0.3 $cm^3$ per port when all four ports in the runner block body are used

Lubrication and Maintenance

# Lubrication

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

**Load-dependent relubrication intervals for liquid grease lubrication via single-line piston distributor systems ("dry axes")**

**Sizes 25 to 125**

**The following conditions apply:**
- Liquid grease Dynalub 520
  or alternatively
  Castrol Longtime PD 00
- Maximum speed:
  $v_{max}$ = 2 m/s
- No exposure to metalworking fluids
- Standard seals
- Ambient temperature:
  T = 20 – 30°C

**Key to graph**

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

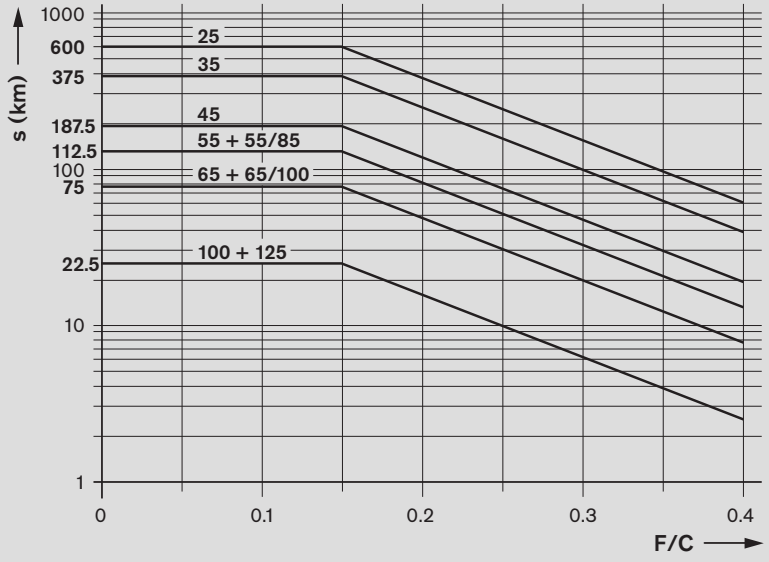



Fig. 10

**For relubrication intervals in applications involving exposure to metalworking fluids, please consult us.**
Without taking distance traveled into account
Assume 3 to 4 pulses per hour as a guide value for relubrication.

**Notes**
The load ratio F/C is the quotient of the equivalent dynamic load on the bearing F (making allowance for a preload of 8% C or 13% C) divided by the dynamic load capacity C (see "General Technical Data and Calculations").

⚠ **If other lubricants are used, this may lead to a reduction in the relubrication intervals, the achievable travel in short-stroke applications, and the load capacities. Possible chemical interactions between the plastic materials, lubricants and preservative oils must also be taken into account. In addition, the suitability of the lubricant for use in single-line centralized lubrication systems must be ensured.**

⚠ **Do not use greases containing solid particles (e.g., graphite or $MoS_2$)!**

⚠ **If the system is to be exposed to metalworking fluids, always apply 2 to 5 lubricant pulses at the beginning or when the system has been at a standstill for a longer period. If possible, apply lubricant while the system is in motion. Carry out cleaning and lubricating cycles (see "Maintenance").**

⚠ **If the application conditions involve dirt, vibrations, impacts, etc. we recommend shortening the relubrication intervals accordingly. 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 environment, increased exposure to fluids or aggressive media, extreme temperatures), please consult us. These situations must be investigated on a case by case basis and may require the use of a special lubricant. Be sure to have all the information concerning your application at hand when contacting us.

⚠ **Switching from grease to oil lubrication while the system is in service is not possible as the lubrication ducts are already filled with grease, and oil will not be able to pass through them.**

We recommend using piston distributors from Vogel. These should be installed as close as possible to the lube ports of the runner bocks.
Long lines and small line diameters should be avoided, and the lines should be laid on an upward slant.

A selection of possible lube fittings is given in the section "General Accessories – Runner Blocks" (for more information, you should also consult the manufacturer of your lubrication system).

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

Lubrication and Maintenance

# Lubrication

## Oil lubrication via single-line piston distributor systems

**Oil lubricant**
We recommend using **Shell Tonna S 220** with the following properties:
- Special demulsifying oil CLP or CGLP to 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

Please also read the notes on page 162 of this catalog!

**Initial lubrication of the 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.

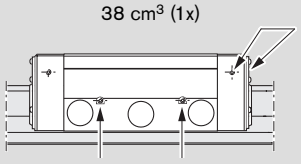
**Stroke ≥ 2 · runner block length $B_1$ (normal stroke)**
- For initial lubrication, mount one lube fitting per runner block, at either of the two end caps!

Initial lubrication is applied in two partial quantities as specified in table 10:
1. Apply the first of the oil quantities as specified in table 10 to the runner block.
2. Slide the 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. Check whether a film of lubricant is visible on the guide rail.

| Size | Initial lubrication (normal stroke) Partial quantity cm³ |
|---|---|
| 25 | 1.2 (2x) |
| 35 | 1.3 (2x) |
| 45 | 1.5 (2x) |
| 55 | 2.0 (2x) |
| 65 | 4.0 (2x) |
| 55/85 | 2.7 (2x) |
| 65/100 | 4.8 (2x) |
| 100 | 11.0 (2x) |
| 125 | as shown in Fig. 11 |

Table 10

**Initial lubrication for size 125**
At one of the end face or side lube ports on **either** of the two end caps:
38 cm³ (1x)



**and** on the runner block body at all four side lube ports:
9 cm³ (1x) per port

Fig. 11

**Stroke < 2 · runner block length $B_1$ (short stroke)**
- Install and lubricate two lube fittings per runner block, one on each of the two end caps!

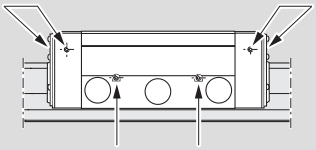
Initial lubrication is applied in two partial quantities per lube fitting as specified in table 11:
1. Apply the first of the oil quantities as specified in table 11 to each of the lube fittings on the runner block.
2. to 4. Repeat the procedure as for initial lubrication (normal stroke).

| Size | Initial lubrication (short stroke) Partial quantity per port | |
|---|---|---|
| | 1st end cm³ | 2nd end cm³ |
| 25 | 1.2 (2x) | 1.2 (2x) |
| 35 | 1.3 (2x) | 1.3 (2x) |
| 45 | 1.5 (2x) | 1.5 (2x) |
| 55 | 2.0 (2x) | 2.0 (2x) |
| 65 | 4.0 (2x) | 4.0 (2x) |
| 55/85 | 2.7 (2x) | 2.7 (2x) |
| 65/100 | 4.8 (2x) | 4.8 (2x) |
| 100 | 11.0 (2x) | 11.0 (2x) |
| 125 | Lube ports 1st end, 2nd end **and** sides as shown in Fig. 12 | |

Table 11

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

38 cm³ (1x) 38 cm³ (1x)



**and** on the runner block body at all four side lube ports:
9 cm³ (1x) per port

Fig. 12

Lubrication and Maintenance

# Lubrication

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

### Relubrication of runner blocks

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

- Apply the minimum quantity according to Table 12 to the lube port until the relubrication interval as specified (in Fig. 15) has been reached.

**Notes**

The required pulse count is the quotient (as a whole number) of the minimum relubrication quantity according to Table 12 and the smallest permissible piston distributor size (i.e. the minimum pulse quantity) according to Table 14. The smallest permissible piston distributor size also depends on the mounting orientation.

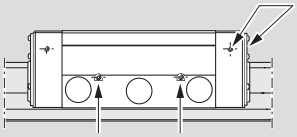
The lubricant cycle time can then be obtained by dividing the relubrication interval (according to Fig. 15) by the calculated pulse count.

| Size | Relubrication (normal stroke) cm³ |
|---|---|
| **25** | 1.2 |
| **35** | 1.3 |
| **45** | 1.5 |
| **55** | 2.0 |
| **65** | 4.0 |
| **55/85** | 2.7 |
| **65/100** | 4.8 |
| **100** | 11.0 |
| **125** | as shown in Fig. 13 |

Table 12

Please also read the notes on relubrication on page 162 of this catalog!

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



**or** on the runner block body
at all four side lube ports:
9 cm³ per port

Fig. 13

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

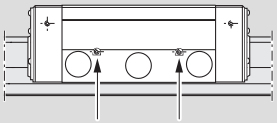
- Apply the minimum quantity according to Table 13 per lube port until the relubrication interval as specified (in Fig. 15) has been reached. Calculate the required pulse count and lubricant cycle time in the same way as for relubrication (normal stroke).
- At each lubrication cycle the runner block should be traversed through a lubricating stroke of 3 · runner block length $B_1$. In any case, the lubricating stroke must be at least the length of the runner block. If the largest possible lubricating stroke is smaller than the runner block length $B_1$, lubricant must be applied to the guide rail. Please consult us for details.

Please also read the notes on relubrication on page 162 of this catalog!

| Size | Relubrication (short stroke) per port | |
|---|---|---|
| | 1st end cm³ | 2nd end cm³ |
| **25** | 1.2 | 1.2 |
| **35** | 1.3 | 1.3 |
| **45** | 1.5 | 1.5 |
| **55** | 2.0 | 2.0 |
| **65** | 4.0 | 4.0 |
| **55/85** | 2.7 | 2.7 |
| **65/100** | 4.8 | 4.8 |
| **100** | 11.0 | 11.0 |
| **125** | Side ports as shown in Fig. 14 | |

Table 13

**Relubrication for size 125**



On the runner block body
at all four side lube ports:
9 cm³ per port

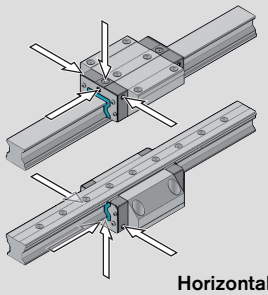
Fig. 14

Lubrication and Maintenance

# Lubrication

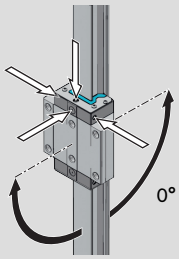
## Oil lubrication via single-line piston distributor systems (continued)

**Mounting orientation I – normal stroke**
**Horizontal**
1 lube fitting at **either** of the two end caps



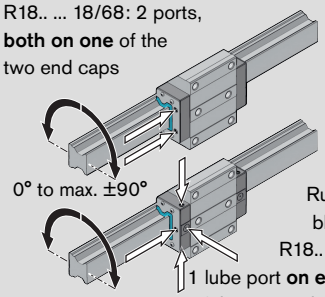
**Horizontal, top-down**
Same port

**Mounting orientation II – normal stroke**
**Vertical to slanting horizontal**
1 lube port at top end cap



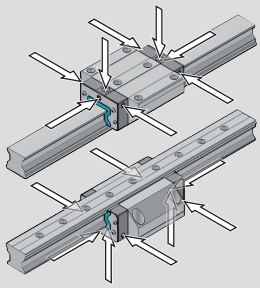

**Vertical to slanting, top-down**
Same port

**Mounting orientation III – normal stroke**
**Wall mounting**
R18.. ... 18/68: 2 ports, **both on one** of the two end caps



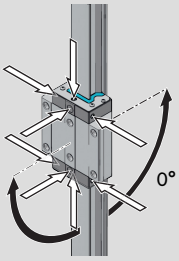

Runner blocks R18.. ... 1.: 1 lube port **on either** of the two end caps;
R1859 620 31: 2 ports, **one on each** end cap, **either** at the end face **or** on the mounting face

**Mounting orientation IV – short stroke**
**Horizontal**
2 lube ports, **one on each** of the two end caps



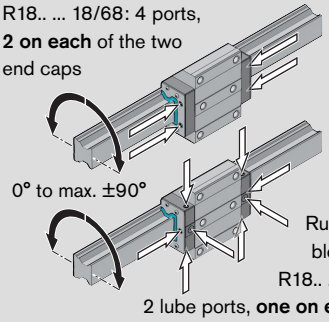
**Top-down**
Same port

**Mounting orientation V – short stroke**
**Vertical to slanting horizontal**
2 lube ports, **one on each** of the two end caps (top and bottom)




**Vertical to slanting, top-down**
Same port

**Mounting orientation VI – short stroke**
**Wall mounting**
R18.. ... 18/68: 4 ports, **2 on each** of the two end caps




Runner blocks R18.. ... 1.: 2 lube ports, **one on each** of the two end caps
**Not possible** with runner block R1859 620 31

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

| Runner blocks | | Smallest permissible piston distributor size (⇔ minimum pulse quantity) per lube port (cm³) at oil viscosity 220 mm²/s | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Size | | | | | | | | |
| Part numbers | Mounting orientations | 25 | 35 | 45 | 55 | 65 | 55/85 | 65/100 | 100 | 125 |
| R18.. ... 10 or ... 60 or | Horizontal I, IV | 0.06 | 0.10 | 0.10 | 0.16 | 0.2 | 0.6 | 0.6 | 1.5 | 1.5 |
| R18.. ... 13 or ... 63 or | Vertical II, V | 0.06 | 0.10 | 0.10 | 0.16 | 0.2 | 0.6 | 0.6 | 1.5 | 1.5 |
| R18.. ... 16 or ... 66 | Wall mounting III, VI[2)] | 0.10 | 0.20 | 0.40 | 0.40 | 0.6 | 1.0 | 1.5 | 1.5 (3x)[3)] | 1.5 (3x)[3)4)] |
| R18.. ... 17 or ... 67 | Horizontal I, IV | – | 0.06 | 0.06 | 0.10 | – | – | – | – | – |
| | Vertical II, V | – | 0.06 | 0.06 | 0.10 | – | – | – | – | – |
| | Wall mounting III, VI[2)] | – | 0.06 | 0.10 | 0.16 | – | – | – | – | – |
| R18.. ... 18 or ... 68 | Wall mounting III, VI[2)] | – | 0.06 | 0.06 | 0.10 | – | – | – | – | – |
| R1859 620 31 | Wall mounting III | – | – | – | – | 0.1 | – | – | – | – |

Table 14

1) Applies under the following conditions: Lube oil Shell Tonna S 220 using piston distributors from Vogel
2) Please note the varying **suitability of the runner bocks for the mounting orientations wall mounting III, VI**:
   **+++ runner blocks R18.. ... 18 or ... 68**
   **++ runner blocks R18.. ... 17 or ... 67**
   **+ runner blocks R18.. ... 10/13/16 or ... 60/63/66**
3) Sizes 100 and 125: Either three pulses in short succession or three metering valves delivering one pulse simultaneously
4) Size 125: 1.5 cm³ per port when all four ports in the runner block body are used

Lubrication and Maintenance

# Lubrication

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

**Load-dependent relubrication intervals for oil lubrication via single-line piston distributor systems (“dry axes”)**

**Sizes 25 to 125**

**The following conditions apply:**
- Shell Tonna S 220
- Maximum speed: $v_{max}$ = 2 m/s
- No exposure to metalworking fluids
- Standard seals
- Ambient temperature: T = 20 – 30°C

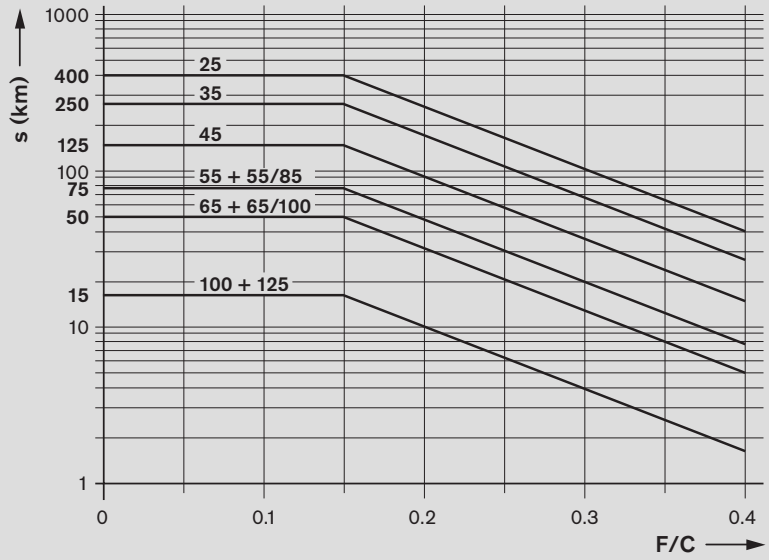



Fig. 15

**Key to graph**

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

**Notes**
The load ratio F/C is the quotient of the equivalent dynamic load on the bearing F (making allowance for a preload of 8% C or 13% C) divided by the dynamic load capacity C (see “General Technical Data and Calculations”).

⚠ **If other lubricants are used, this may lead to a reduction in the relubrication intervals, the achievable travel in short-stroke applications, and the load capacities. Possible chemical interactions between the plastic materials, lubricants and preservative oils must also be taken into account. In addition, the suitability of the lubricant for use in single-line centralized lubrication systems must be ensured.**

⚠ **Do not use greases containing solid particles (e.g., graphite or $MoS_2$)!**

**For relubrication intervals in applications involving exposure to metalworking fluids, please consult us.**
Without taking distance traveled into account
Assume 3 to 4 pulses per hour as a guide value for relubrication.

⚠ **If the system is to be exposed to metalworking fluids, always apply 2 to 5 lubricant pulses at the beginning or when the system has been at a standstill for a longer period. If possible, apply lubricant while the system is in motion. Carry out cleaning and lubricating cycles (see “Maintenance”).**

⚠ **If the application conditions involve dirt, vibrations, impacts, etc. we recommend shortening the relubrication intervals accordingly.**

If your application involves more demanding environmental requirements (such as clean room, vacuum, food industry environment, increased exposure to fluids or aggressive media, extreme temperatures), please consult us. These situations must be investigated on a case by case basis and may require the use of a special lubricant. Be sure to have all the information concerning your application at hand when contacting us.

⚠ **Switching from grease to oil lubrication while the system is in service is not possible as the lubrication ducts are already filled with grease, and oil will not be able to pass through them.**

We recommend using piston distributors from Vogel. These should be installed as close as possible to the lube ports of the runner bocks. Long lines and small line diameters should be avoided, and the lines should be laid on an upward slant.

A selection of possible lube fittings is given in the section “General Accessories – Runner Blocks” (for more information, you should also consult the manufacturer of your lubrication system).

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

Lubrication and Maintenance

# Lubrication

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

### X-axis

| Component or parameter | Given data |
|---|---|
| **Runner block** | Size 45; 4 blocks; C = 92,300 N; part numbers: R1851 423 10 (catalog page 38) |
| **Guide rail** | Size 45; 2 rails; L = 1,500 mm; part numbers: R1805 463 61 (catalog page 64) |
| **Equivalent dynamic load on bearing** | F = 20,768 N (per runner block) taking into account the preload (in this case 8% C) |
| **Stroke** | 500 mm |
| **Average 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 runner block) | Information sources |
|---|---|---|
| 1. Normal or short stroke? | Normal stroke:<br>Stroke ≥ 2 · runner block length $B_1$<br>500 mm ≥ 2 · 101.5 mm ?<br>500 mm ≥ 203 mm<br>i.e. normal stroke | – Normal stroke formula from catalog page 155, $B_1$ from catalog page 39 |
| 2. Initial lubrication quantity | Initial lubrication quantity: 1.0 $cm^3$ (3x) | – Initial lubrication quantity from Table 5 |
| 3. Relubrication quantity | Relubrication quantity: 1.0 $cm^3$ | – Relubrication quantity from Table 7 |
| 4. Mounting orientation | Mounting orientation I – normal stroke (horizontal) | – Mounting orientation from catalog page 157 |
| 5. Piston distributor size | Permissible piston distributor size:<br>0.1 $cm^3$ | – Piston distributor size from Table 9<br>For size 45, mounting orientation I |
| 6. Pulse count | Pulse count $= \frac{1.0\ cm^3}{0.1\ cm^3} = 10$ | – Pulse count = $= \frac{\text{relubrication quantity}}{\text{perm. piston distributor size}}$ |
| 7. Load ratio | Load ratio $= \frac{20{,}768\ N}{92{,}300\ N} = 0.225$ | – Load ratio $= \frac{F}{C}$<br>F and C from given data |
| 8. Relubrication interval | Relubrication interval: 90 km | – Relubrication interval from Table 10:<br>– Curve size 45 at load ratio 0.22 |
| 9. Lubrication cycle | Lubrication cycle $= \frac{90\ km}{10} = 9\ km$ | – Lube cycle = $\frac{\text{relubrication interval}}{\text{pulse count}}$ |
| **Interim result (X-axis)** | For the X-axis, a minimum quantity of 0.1 $cm^3$ Dynalub 520 must be supplied to each runner block every 9 km. | |

Lubrication and Maintenance

# Lubrication

## Y-axis

| Component or parameter | Given data |
|---|---|
| **Runner block** | Size 35; 4 blocks; C = 56,300 N; part numbers: R1851 323 10 (catalog page 38) |
| **Guide rail** | Size 35; 2 rails; L = 1,000 mm; part numbers: R1805 333 61 |
| **Equivalent dynamic load on bearing** | F = 8,445 N (per runner block) taking into account the preload (in this case 8% C) |
| **Stroke** | 50 mm |
| **Average 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 runner block) | Information sources |
|---|---|---|
| 1. Normal or short stroke? | Normal stroke:<br>Stroke ≥ 2 · runner block length $B_1$<br>50 mm ≥ 2 · 79.6 mm ?<br>50 mm < 159.6 mm<br>i.e. short stroke | – Normal stroke formula from catalog page 155, $B_1$ from catalog page 39 |
| 2. Initial lubrication quantity | 2 lube ports, initial lubrication quantity per lube port: 0.9 $cm^3$ (3x) | – Initial lubrication quantity from Table 5 |
| 3. Relubrication quantity | 2 lube ports, relubrication quantity per port: 0.9 $cm^3$ | – Relubrication quantity from Table 7 |
| 4. Mounting orientation | Mounting orientation V – short stroke (vertical) | – Mounting orientation from catalog page 157 |
| 5. Piston distributor size | Permissible piston distributor size: 0.1 $cm^3$ | – Piston distributor size from Table 9 for size 35, mounting orientation V |
| 6. Pulse count | Pulse count = $\frac{0.9\ cm^3}{0.1\ cm^3} = 9$ | – Formula as for X-axis |
| 7. Load ratio | Load ratio = $\frac{8{,}445\ N}{56{,}300\ N} = 0.15$ | – Formula as for X-axis, F and C from given data |
| 8. Relubrication interval | Relubrication interval: 375 km | – Relubrication interval from Fig. 10:<br>– Curve size 35 at load ratio 0.15 |
| 9. Lubrication cycle | Lubrication cycle = $\frac{375\ km}{9} = 42\ km$ | – Formula as for X-axis |
| **Interim result (Y-axis)** | For the Y-axis, a minimum quantity of 0.1 $cm^3$ Dynalub 520 must be supplied to each runner block every 42 km. | |
| **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 (9 km) determines the overall cycle of the system, i.e. the Y-axis will also be lubricated every 9 km.<br>**The number of ports and the minimum lubricant quantities determined for each axis remain the same.** | |

Lubrication and Maintenance

# Lubrication

## Lubrication from above

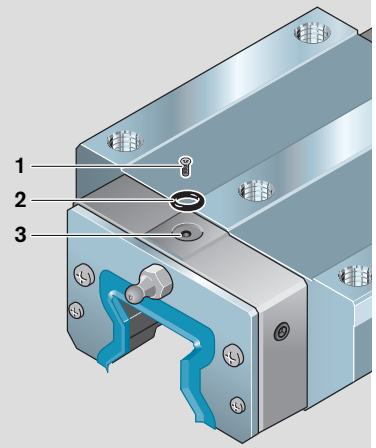
**Standard runner blocks with open lube ports for lubrication from above**

The following new standard runner blocks have lube ports opened at the top:
**R18.. ... 16** or **... 66**
**R18.. ... 17** or **... 67**

In the new standard runner blocks for lubrication from above the top lube holes have already been opened, but they are closed with screws for shipment.
In the high runner blocks S.H, slimline ... high, the vertical clearance between the end caps and an attachment mounting surface with integrated lube adapters has been designed for ease of maintenance (see Fig. B).

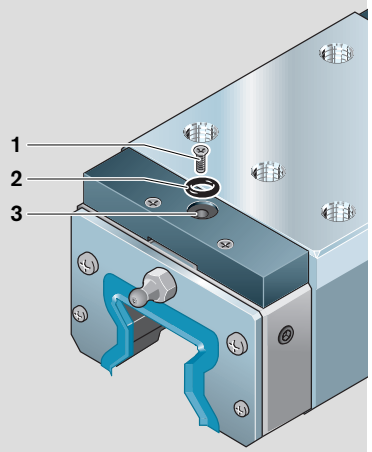
Remove screw (1) from the lube hole (3).
Insert O-ring (2) in the recess (O-ring is supplied with the runner block).

**A**




**Runner block FNS**
**R1851 ... 17 or ... 67**
**flanged, normal, standard height**
**(example)**

**B**




**Runner block SNH**
**R1821 ... 17 or ... 67**
**slimline, normal, high**
**(example)**

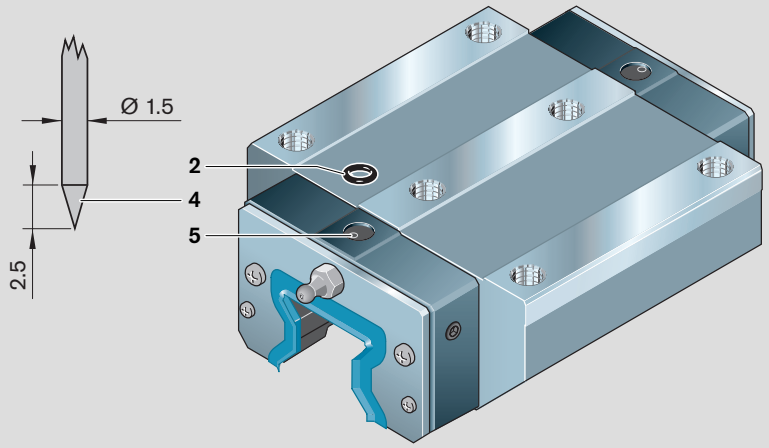
**Subsequent opening of a lube hole at the top for standard runner blocks F.S and S.H and for heavy duty runner blocks**

If a lube hole is to be opened up at the top of standard or heavy duty 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!**

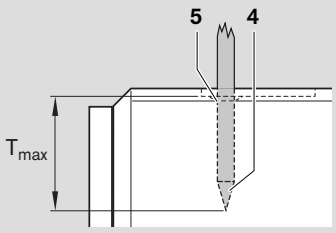
- Heat up a pointed metal punch (4) with diameter of 1.5 mm.
- Carefully punch through the recess (5) to open the lube hole.
- Do not exceed the permissible depth $T_{max}$ as specified in the table!
- Insert O-ring (2) in the recess (O-ring is **not** supplied with the runner block).

For subsequent lubrication from above of high runner blocks S.H, use a lube adapter (not included in supply scope; please consult us).




**Runner block FNS**
**R185. ... 10 or ... 60**
**flanged, normal, standard height**
**(example)**

| Size | Lube hole at top: Maximum permissible depth for punching open $T_{max}$ (mm) |
|---|---|
| 25 | 4 |
| 35 | 5 |
| 45 | 5 |
| 55 | 5 |
| 65 | 5 |
| 100 | 5 |



Lubrication and Maintenance

# Maintenance

## Cleaning cycle

Dirt can settle and encrust on 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 run two cleaning cycles over the entire installed rail length, followed by at least two lubrication cycles over the entire installed rail length.

## Checking accessories

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