

SKF®

Acceptable Oil/grease Leakage on a Paper machine

Presented by

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Lubrication for Paper Machines

**Acceptable Oil/grease leakage
on a paper machine**

Questionnaire

How much lubricant on the product is acceptable ?

None at all!

How much lubricant is acceptable dropping on the machine floor?

None at all!

Do we accept leakages anyway if they are not harmful to our product?

Yes, much too often!

What are the reasons for leakages?

Old piping, cold start-ups, wrong adjustments, over-filled grease bearings

Can we do anything about it?

Oh yes, we can!



1

Oil Leakages

Main Reasons for Oil Leakages – Cold start-ups

Time is money!

After an outage, paper machines must be operational as fast as possible. There is no time to follow “un-necessary” warm-up procedures of the lubrication system.

But the flow meters on the lubrication system indicate “low flow”.
The machine cannot go operational.

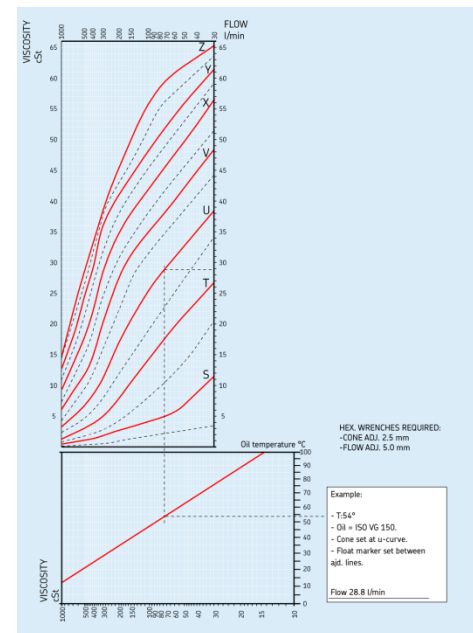
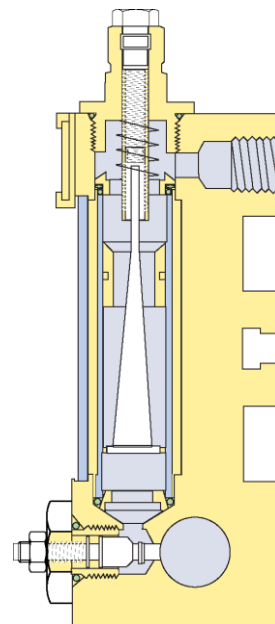
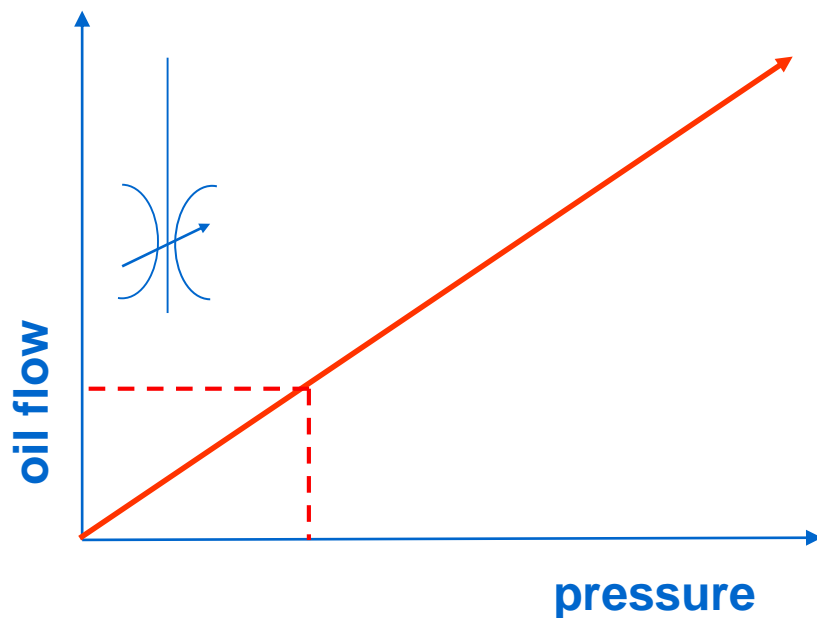
What do you do?

1. Adjust the flows on each meter and start the machine. ✗
2. Be patient and let the lubrication system warm-up as recommended. ✓

Why?

Main Reasons for Oil Leakages – Cold start-ups

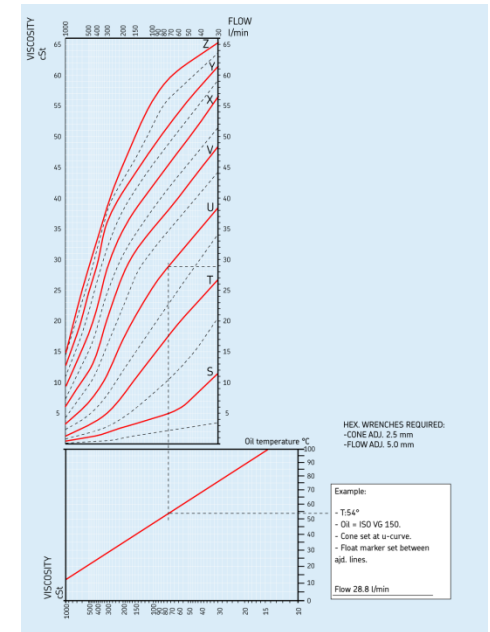
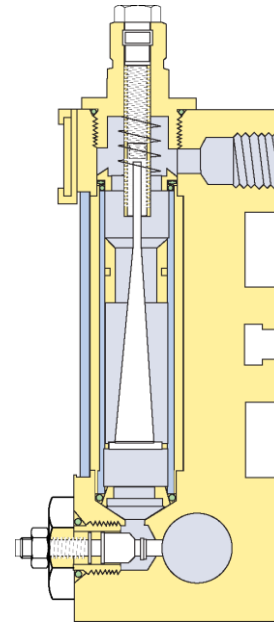
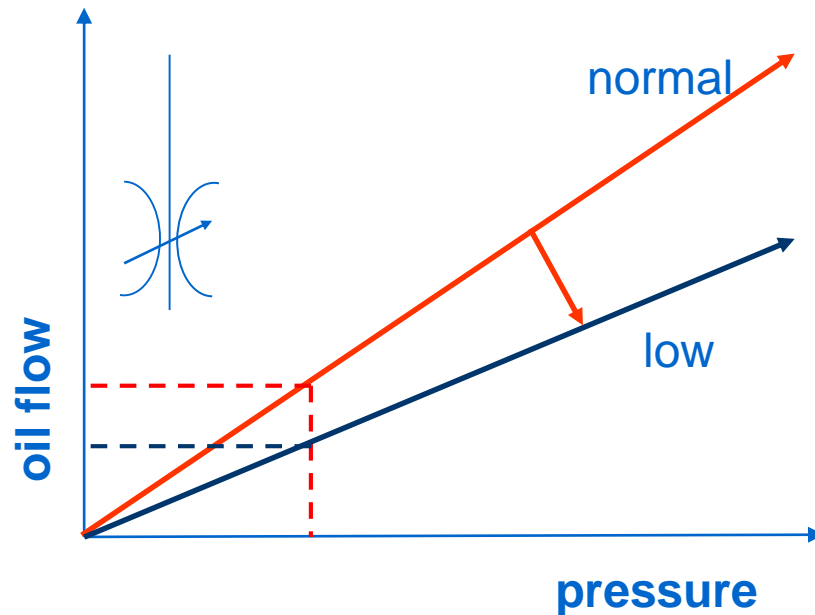
The majority of flow meters used in a paper mills oil circulating lubrication system are pressure and temperature dependent.



The oil flow is adjusted with constant system pressure and constant viscosity (oil temperature). This oil temperature is the working temperature during normal operation of the paper machine. Every change of temperature or pressure results in a different flow.

Main Reasons for Oil Leakages – Cold start-ups

During start-up, the oil is cold. The system pressure is kept constant. What happens?

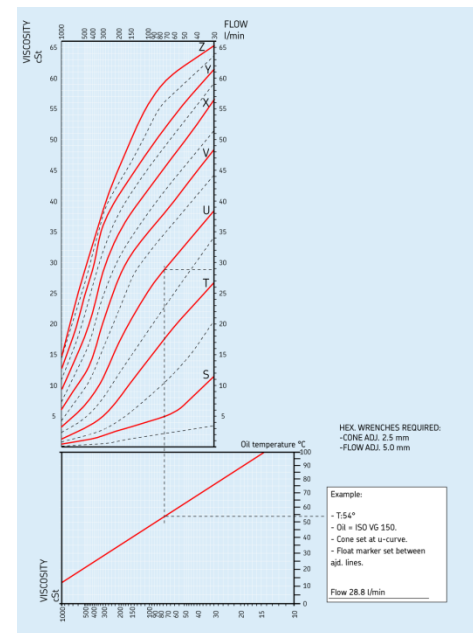
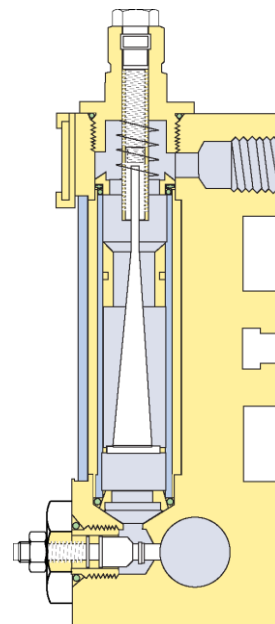
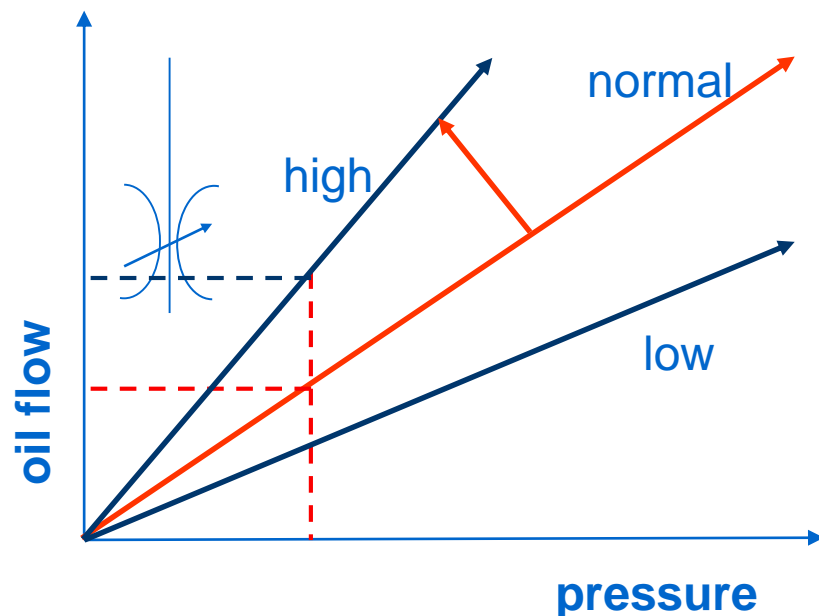


The oil flow is too low, indicated by the float being down. If we “adjust” at this moment, the float comes up indicating a higher flow. The drain in the bearing house cannot handle this much low. The bearing is leaking.

Main Reasons for Oil Leakages – Cold start-ups

Now, during operation, the oil heats up. The system pressure is still constant.

What is the result?



The oil flow increases above the originally adjusted flow.

The float goes up. Possibly the drain cannot handle the higher flow. The bearing is leaking.

We “re-adjust” the flow meter to its normal value and the same procedure will happen again at the next cold start-up.

Main Reasons for Oil Leakages – Conclusion

1. Double-check your individual oil flows!

They are usually recommended by the bearing manufacturer.

2. Consider the drain bores of your bearing houses!

Even if you go by the recommended oil flows, drains may be too small.

In this case, contact the bearing manufacturer for advise.

3. Set up your flow meters at operating oil temperature and operating pressure.

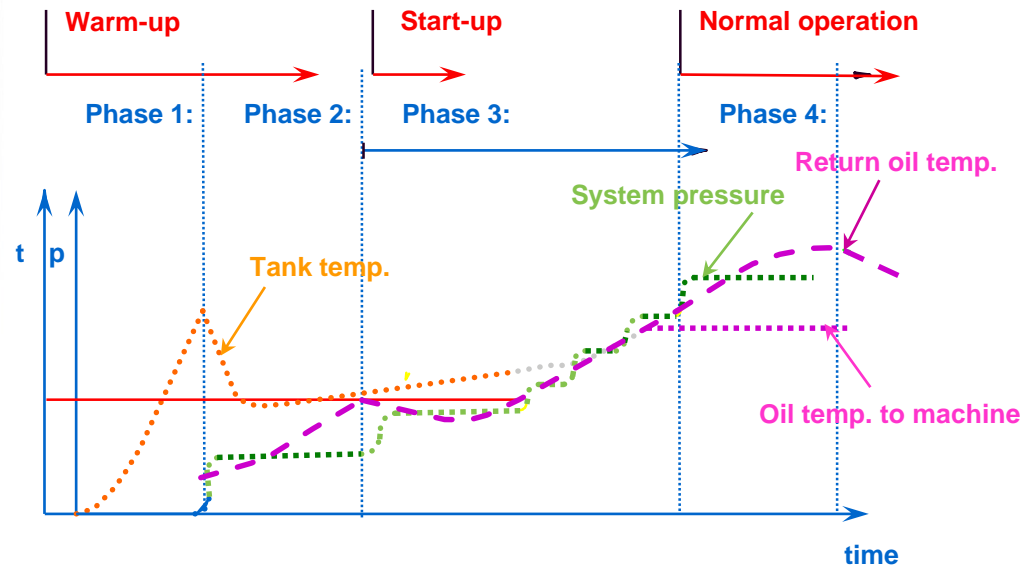
Never ever change the adjustment unless you change the system pressure, the operating oil temperature or the oil viscosity class.

4. Let your machine warm up as recommended!

What else can be done?

There is a wide range of system solutions, flow meters and software features for cold start-up.

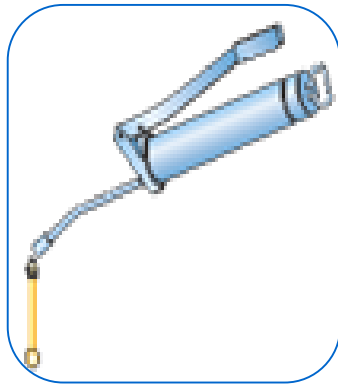
Modern oil circulating lubrication systems offer frequency controlled pumps and start-up procedures to guarantee a safe and smooth operation without leakages.



2

Grease Leakages

What is the purpose of grease lubrication?



Lubrication

+



Corrosion
protection

+



Protection from
foreign particles

The task of a centralized grease lubrication system is to provide
the correct amount of lubricant
to each lubrication point
at the correct time.

What is Grease?

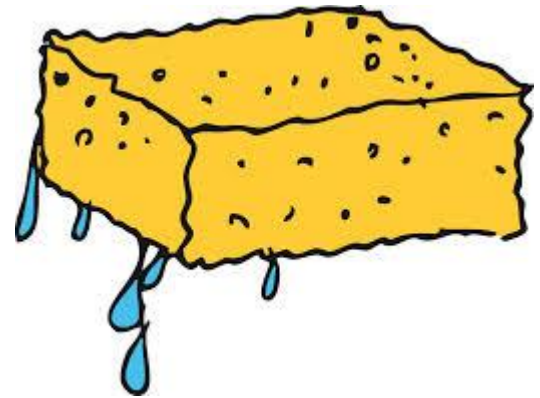
Grease is made out of 2 components:

Oil + thickener (soap)

The thickener acts like a sponge which holds the oil.
The bleeding oil then lubricates the bearing.

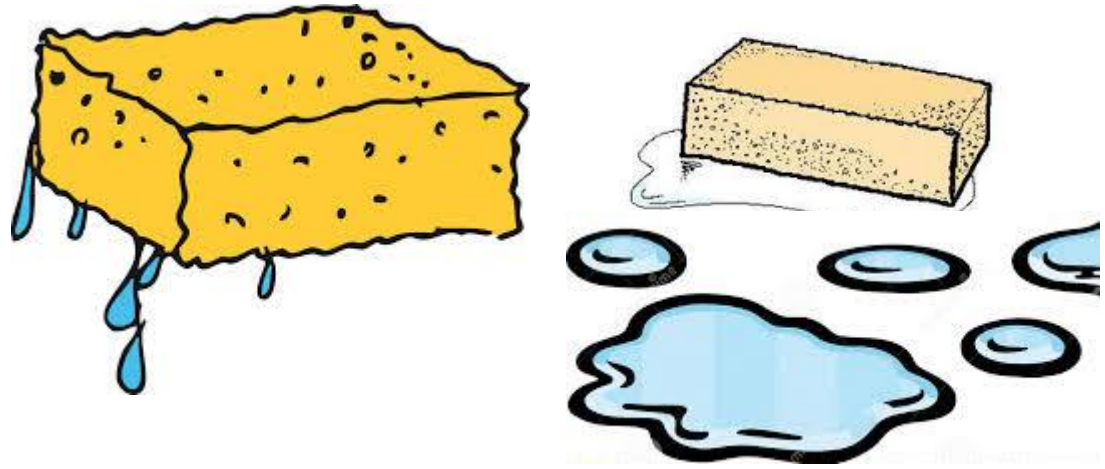
So, bleeding is important! It is influenced by

- Temperature
- Operating time
- Grease consistency
- Pressure (e.g. by centrifugal forces)
- Oil viscosity
- Thickener type
- Grease manufacturing process



Main Grease Properties

- Other than oil in an oil circulating lubrication system, grease is only used once! It is called “lost lubrication”.
- Grease bleeds!
Only the oil contained in the grease lubricates the bearing.
- Grease becomes hard!
Under pressure and temperature and over time, oil bleeds more and more and leaves the thickener behind.
- With the wrong approach, grease causes blockages in metering devices, pipes and bearings.



How to prevent grease from solidifying?

- Grease must keep in motion!
Dead ends must be avoided!
- Grease should not be under pressure for a long time.
- Grease is not grease!
It must fit the application. Especially for felt roll bearings it must be extremely heat resistant.
- If used in an automatic lubrication system, grease must be released for the use with such systems.

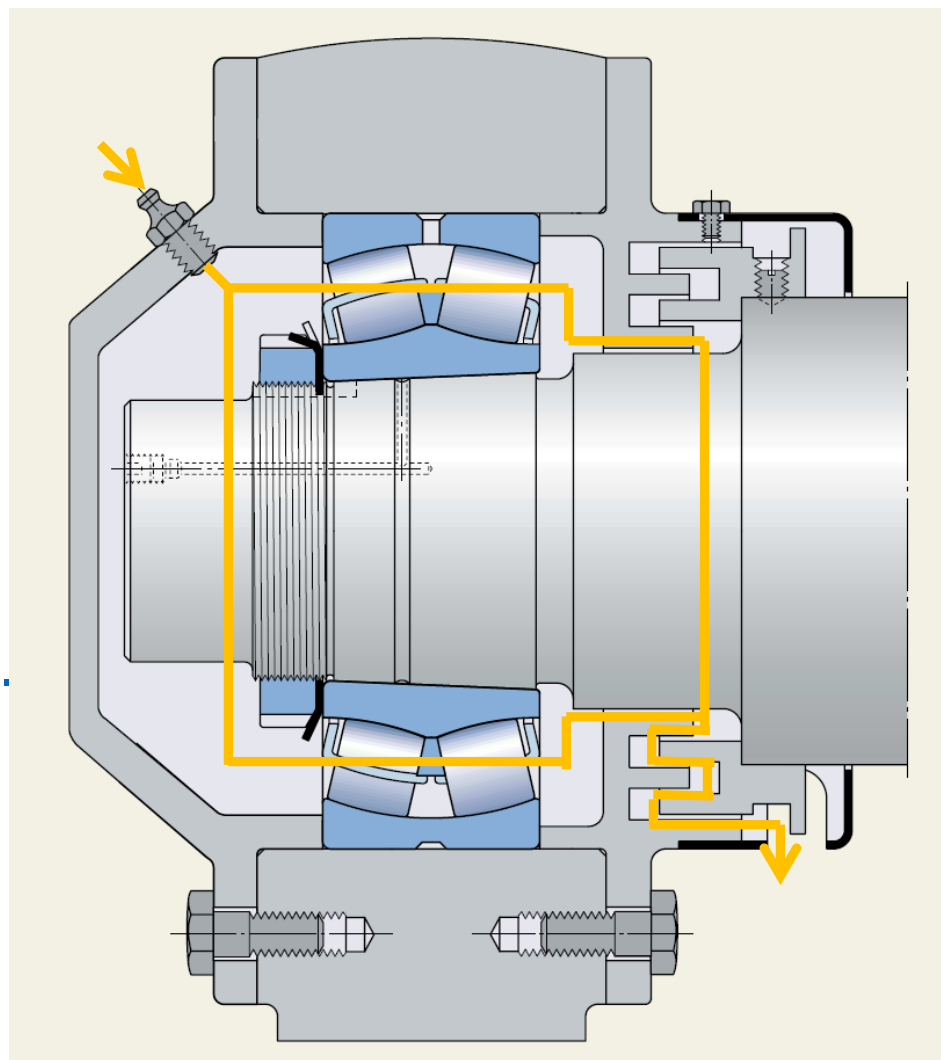


Felt Roll Lubrication

A typical grease lubricated felt roll bearing may look like this:

Fresh grease is fed from one side and leaves the bearing on the opposite side.

This way, the used grease always leaves the bearing first.



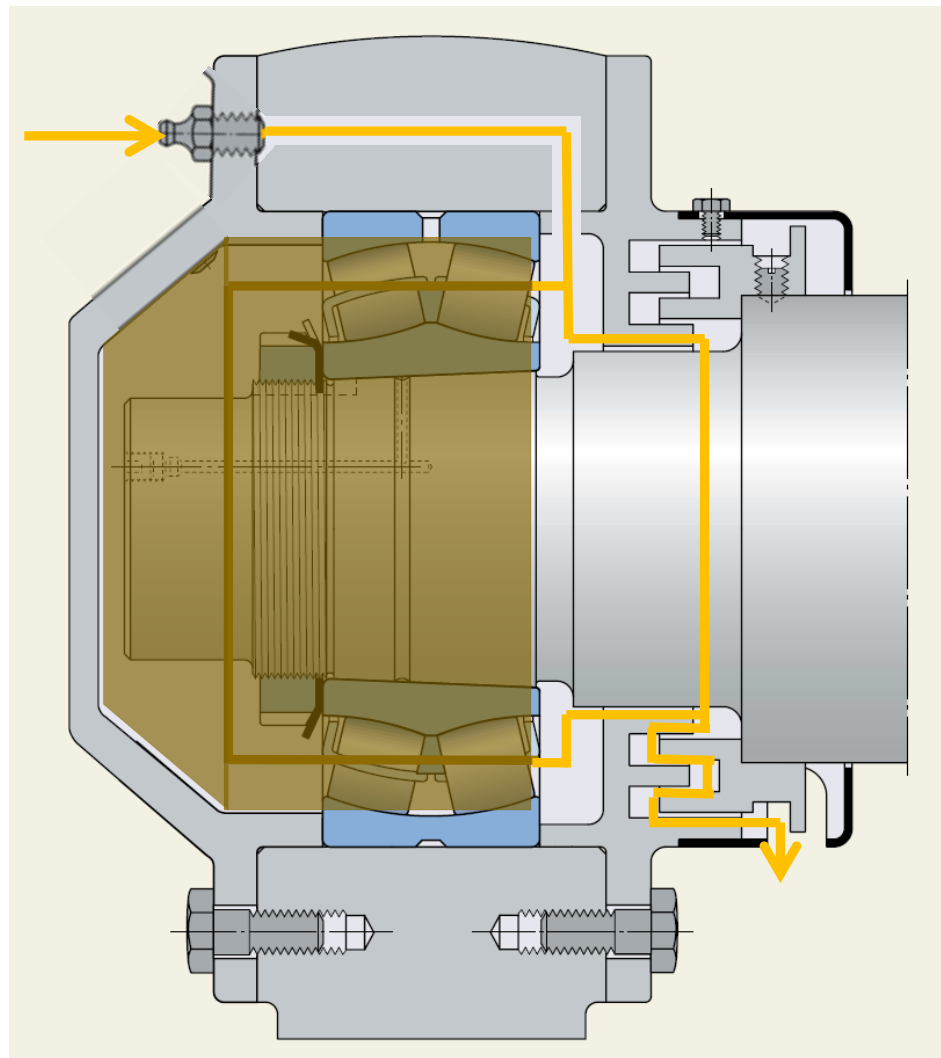
Felt Roll Lubrication

Feeding from the wrong side:

If grease is fed from the wrong side, it accumulates behind the bearing and inside the bearing.

Fresh grease will not even reach the bearing any more but leaves the bearing house right away.

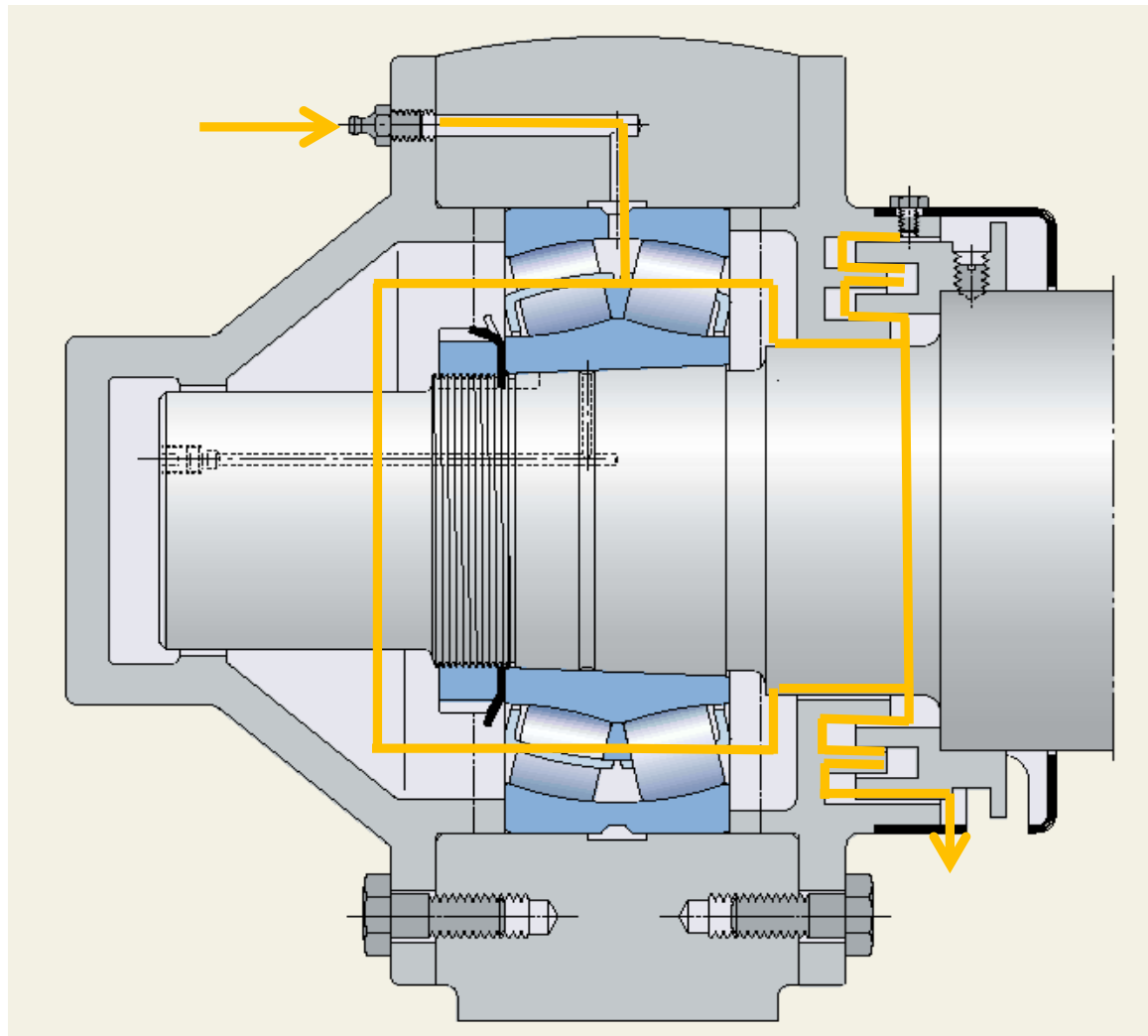
This is not only useless, but damages the bearing and over-heats it.



Felt Roll Lubrication

Optimum solution:

Feed W33 bearings
Right through the
groove to apply the
grease to the right
spot. However, even in
this case, the bearing
house needs to be
cleaned and the old
grease removed from
time to time.



How to avoid Grease Leakages

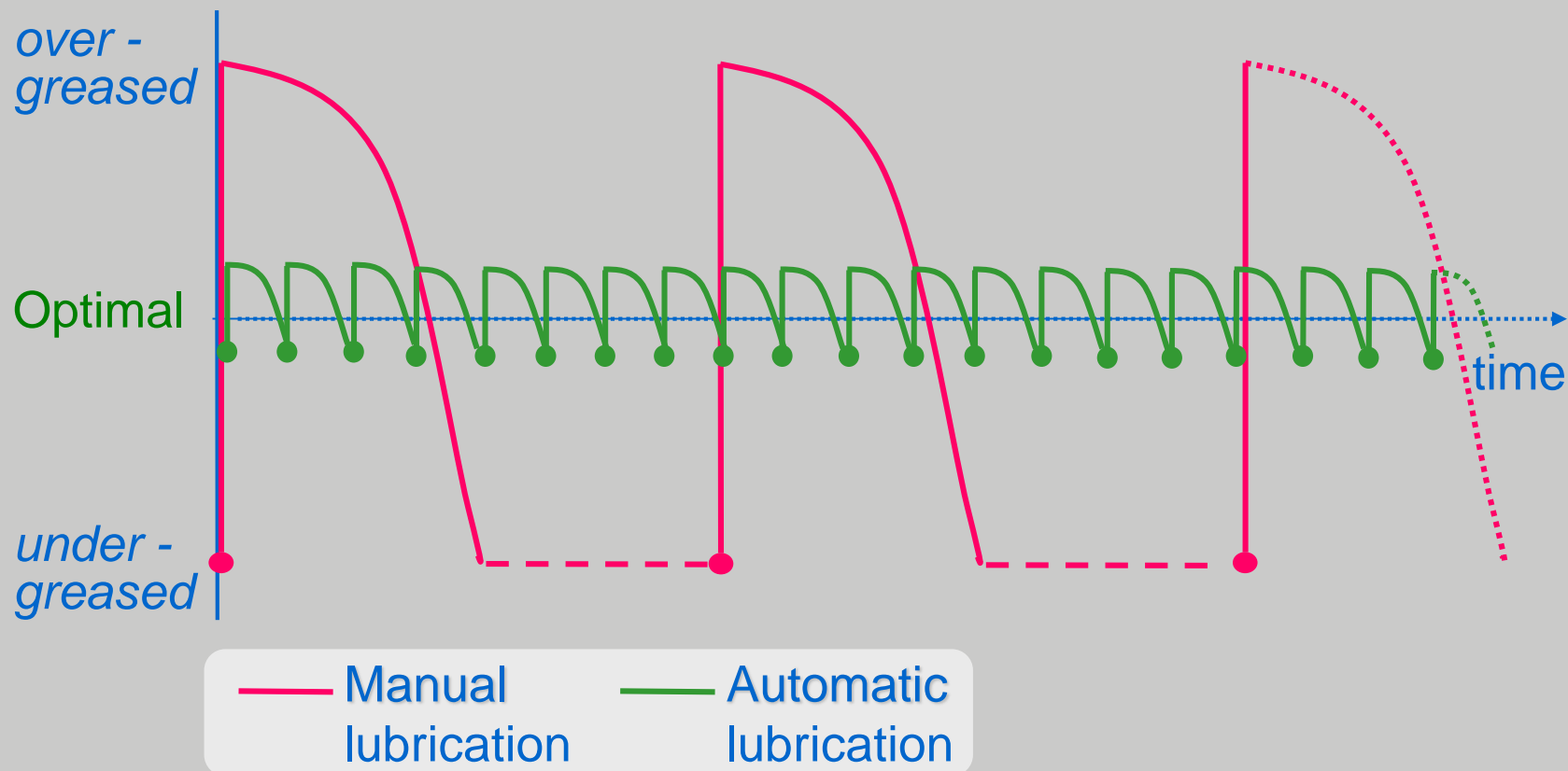
Grease does not really evaporate.

When it leaves the bearing, it forms a visible collar, which protects the bearing from water ingress and foreign particles.

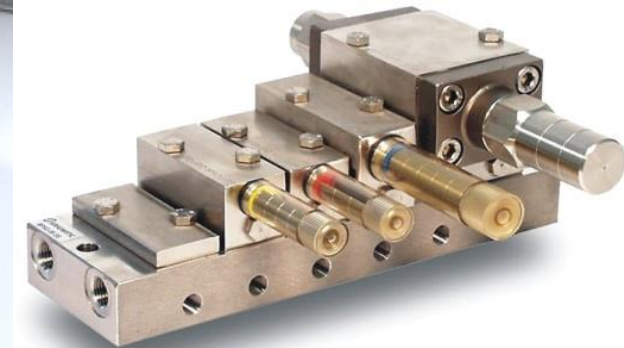
From time to time, this old grease must be manually removed. Doing this, we automatically check the proper function of a lubrication system. At the same time, the used grease is prevented from falling down and contaminating the product.

Automatic grease lubrication systems feed little but frequently. This way, the bearing does not get overfilled resulting in a longer bearing life.

Automatic vs. manual lubrication



Automatic Grease Lubrication System





SKF

Hvala za vašo pozornost

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