Direct lubrication

The medium lubricator as a liquid including solid parts gets through the air gap because of its high density FROM the valve nozzle TO the targeted area, the GAUGE EXACTNESS SIDEWALL (of the WHEEL tire's flanges, or in the end by being wiped off the RAIL).

So if this THEORETICALLY is a good possibility of transferring, then it should be considered, if it is possible to create an option where lubricator is sprayed DIRECTLY to the gauge exactness sidewall or inside micrometre sidewall. Then the lubricator is applied DIRECTLY where it is PRIMARILY needed, WITHOUT ANY DETOURS.

Even this new developed (electro) hydraulic system, while MAINTAINING the “spraying of the gauge exactness sidewall or inside micrometre sidewall of the WHEEL TIRE’S FLANGE” in connection with wipe off process of the gauge exactness sidewall of the rail or secondary rail, such spraying of the only as transfer element used “wheel tire's flange”, is still NOT the optimal solution.

A further disadvantage is that the lubricator which is applied to the wheel tire's flanges is transported to the outside due to speeds centrifugal forces because of the wheel's circumference. This fact must be taken into consideration from the beginning. As soon as the lubricator is in the targeted area – rail fixed on solid ground – then it has the tendency to flow downwards due to earth's gravity.

Following drawing shows this case on the example of a grooved rail.

![Grooved Rail Diagram](image)

However, DIRECT spraying of the rail's sidewalls is COMPLICATED. The main risk is spraying the running surfaces, which affects the coefficient of static friction in a negative way. The valve nozzles must be placed very low. Here the main reasons for their damages are:

- stones which lie in the grooves
- whirled up stones when running over the flanges
- coarsenesses caused by worn out railway switches....

The gauge exactness and rail cross-section must be taken into consideration when spraying the rail's sidewalls. Gauge exactness tolerance is relatively large on wheels and rails (e.g. Deutsche Bahn AG: gauge exactness tolerance = 30 mm). This fact reduces the accuracy of the sprayed lubricator!

Tram 11 mm and DB 14 mm under the rail's upper edge measured vertical to the track.
The following shows measure points for track alignment, track width and permitted gauge widening, using the tram as an example.

Following animation shows the DIRECT lubrication of the RAILS gauge exactness sidewall, alternatively the secondary RAIL sidewall.

Both holders with the valve nozzles are mounted on the bogie (or the railway body) facing the wheel tire. Valvenozzles spray lubricator to different directions.

In practice, this variation is ONLY realizable on wheels and rails, when handled with GREAT care and considering relatively large track gauge TOLERANCES.

Because of large track gauge tolerances it could be that the sprayed lubricator:
- NOT ALONE hits the aimed surface
- BUT ALSO hits the rail head RUNNING SURFACE, which is not intended

Depending on the application sensible COMBINATIONS can be created by:
- conventional spraying of the wheels
  (= indirect lubrication of the gauge exactness sidewalls and the secondary rail sidewall)
  AND
- spraying of the rails
  (= DIRECT lubrication of the rails gauge exactness sidewall and the rails running surface)