

VOLVO

E-MOBILITY LUBRICATION CHALLENGES FOR CONSTRUCTION EQUIPMENT

Dr Henrik Strand | Lube Expo | 2024

Volvo Construction Equipment is part of the Volvo Group

The Volvo Group is headquartered in Gothenburg, Sweden, employs more than 100,000 people and serves customers in almost 190 markets. In 2023, net sales amounted to SEK 553 billion (EUR 48 billion). Volvo shares are listed on Nasdaq Stockholm.

Volvo Group in short

Trucks, buses, construction equipment, power solutions for marine and industrial applications, financing and services.

Founded in 1927 | Headquartered in Gothenburg

100,000 employees | 190 markets

10 business areas | 12 brands

Sharing resources and technology

Safer, cleaner and more productive



The world is changing and so are we

We are living in a new era defined by increased urbanization, further digitalization and climate change.

To meet these challenges our long-term ambition is to become:

100%
safe

100%
fossil-free

100%
more productive

A plan validated by science

Our plan to reach net-zero value chain greenhouse gas emissions by 2040 is backed up by science.

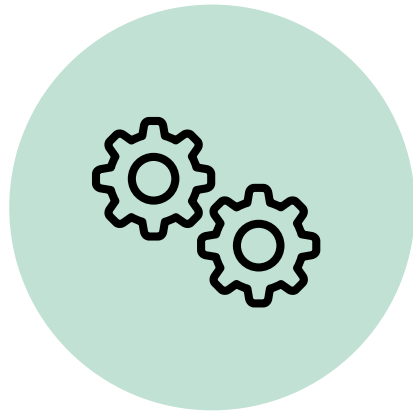
The Science Based Targets initiative enables us to set emission reduction targets in line with leading climate science.

These targets are in line with what the latest climate science deems necessary **to meet the goals of the Paris Agreement** – to limit global warming to well below 2°C above pre-industrial levels and pursue efforts to limit warming to 1.5°C.



Accelerating the transformation through partnerships

Partnerships and collaborations is key to accelerate the transformation through knowledge sharing, infrastructure, and supply chain development.



Industrial partnerships

To rapidly commercialize fossil-free solutions for each and every customer, we need to form strong partnerships with like-minded experts.



Societal partnerships

We are capable of leading the sustainable evolution for the benefit of all, through powerful collaborations that influence far beyond our industry.



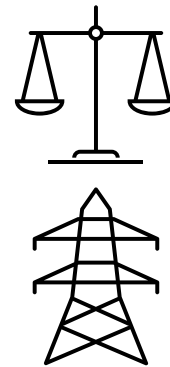
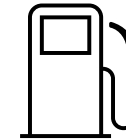
Academic partnerships

Challenging students to bring new perspectives while inspiring ourselves to think in radical new ways.

How to reach Science Based Targets?



- Increased amount of electrification and better efficiency are key points
- Range & operating time issue with capacity/weight/space in batteries
 - Alternative fuels (H2, e-DME, Methanol...)
 - Lighter Powertrain (engine+transmission+axles)
- Customers willing and able to buy our electrified products
 - Legislation
 - Total Cost of Ownership
 - Societal pressure
 - Electric infrastructure



Wishlist for Construction Equipment e-Drivelines

- Safe
- Reliable and durable at low cost
- More efficient than today
- Brake and retarder functionality
- Powershift
- Low weight
- Small space claim
- Long lubricant life / fill for life
- Common oil for hydraulics, lubrication, clutch-activation and MDS cooling



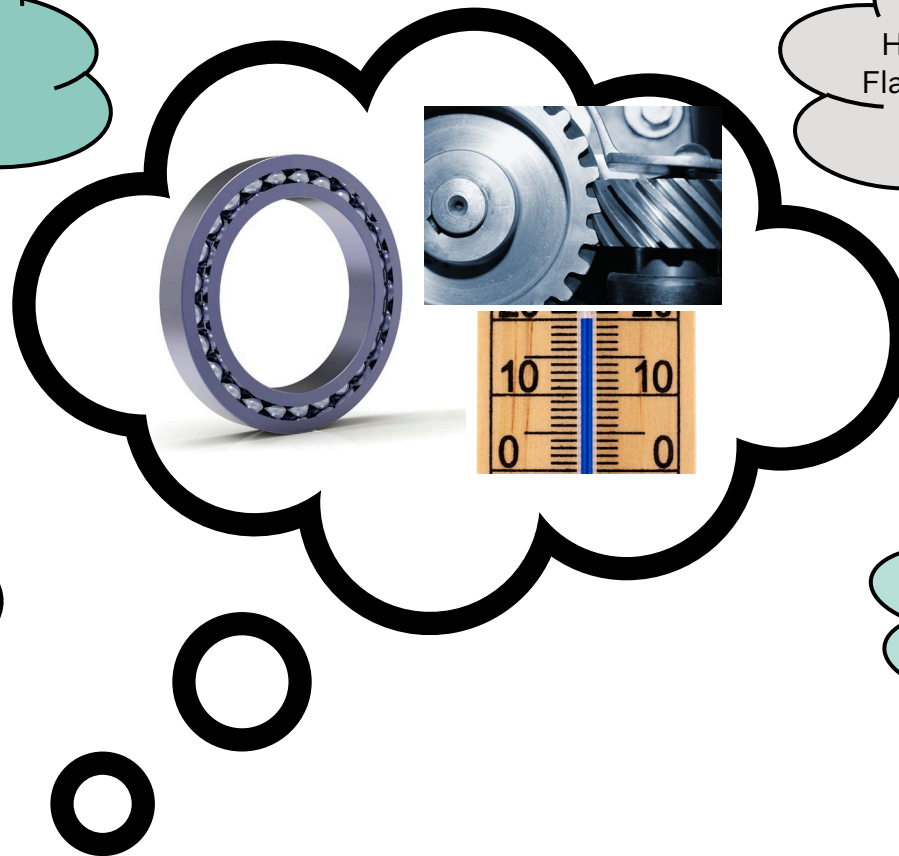
A40G
39ton payload
69ton total weight loaded
57km/h top speed
2525Nm engine torque

One oil to rule them all?

Not possible from what we know today, maybe tomorrow with your help?

High heat conductivity and thermal capacity for cooling
EM motor cooling – Cu corrosion resistance
High temperature resistance AO

Available on all markets that we sell to
Bio-based or circular base fluid stock
Non-toxic before and after use



Wet clutch and brake friction stability (FM)
High film formation capability in gears and bearings
Flat viscosity over temperature range -40°C - +200°C
Gear scuffing protection (EP/AW) - FZG
Bearing surface protection (EP/AW) - FE8

Low surface adhesion where you don't want it
Fine filtration capability without loss of additives
Low internal shear when not building film
Shear stable over time

VOLVO

BUILDING THE WORLD WE WANT TO LIVE IN