

Maintaining your gearbox could be more complicated than you think!



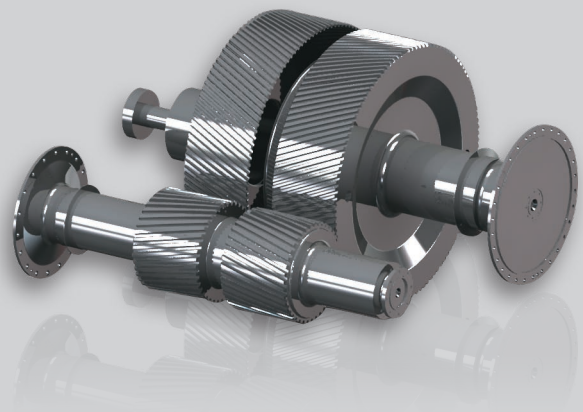
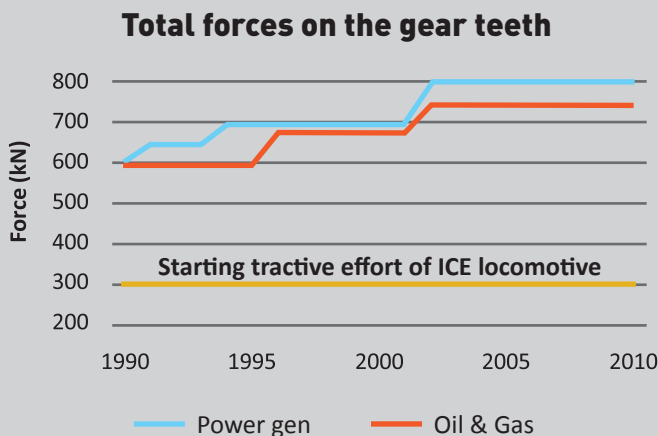
ENERGY CAPITAL

Here are a few facts that you might not know before...

Do you know how much force are applied on the gear teeth?

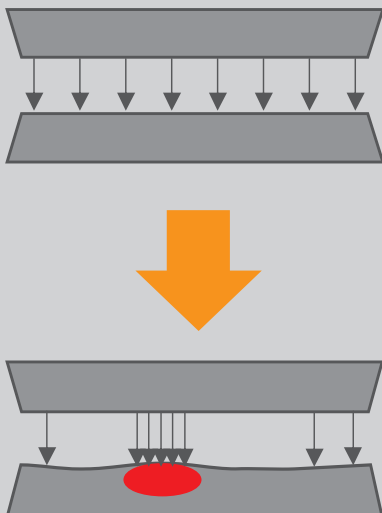
The largest capacity Flender-Graffenstaden gearbox is capable of withstanding close to 800kN of force on its teeth.

To picture this, the ICE German high-speed train needs 300 kN to start moving. This train is 210 meters long and it weighs over 400 tons.



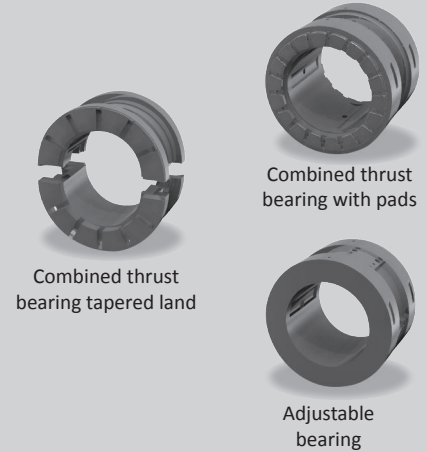
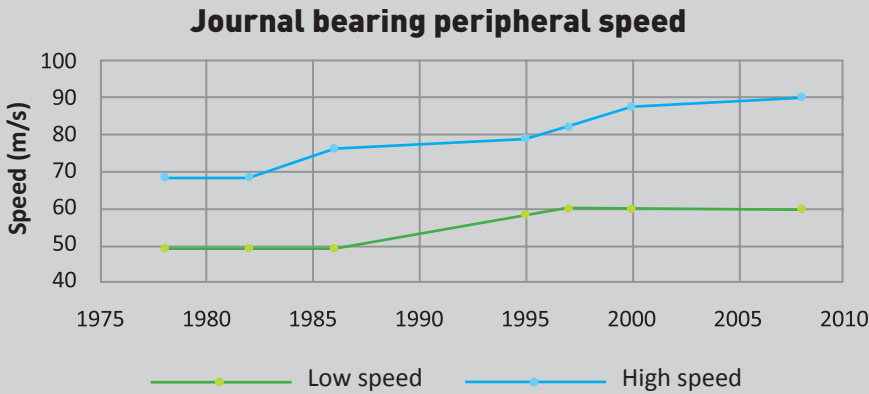
Did you ever think a strand of hair is thin?

Due to the forces applied on the gear teeth, the precision of our tooth profiling can be as small as 5-6 microns. As a comparison, the average thickness of a strand of hair is only about 70 microns. Teeth are hardened then profiled with an optimized correction to anticipate the gears deformation. It allows to have the most accurate tooth contact to guarantee a homogenous dissipation of the load. Deformation of a few microns can easily occur due to a wrong maintenance; resulting in the concentration of all the pressure on a localised area.



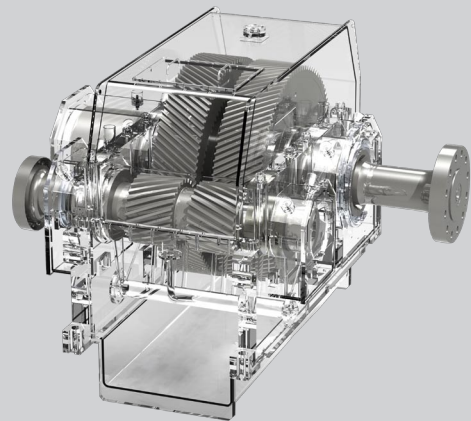
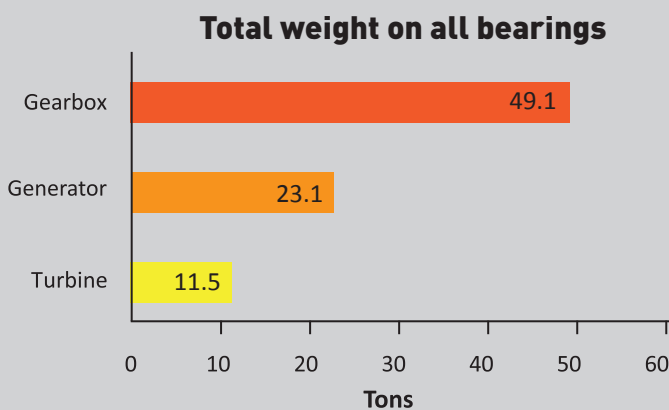
How fast can the bullet train go?

The maximum speed of the Japanese bullet train, the Shinkansen, is 320 km/h. Some of our gearboxes has recorded a bearing peripheral speed of 90 m/s which is in theory faster than the bullet train. By increasing the shaft size to transmit a higher power, we automatically increased the peripheral speed. High peripheral speeds can cause design issues because of oil flow turbulences. Flender-Graffenstaden constantly improved our gearboxes performance by utilising different bearings technologies and designs.



Do you know the difference between the bearings of the gearbox, the generator and the turbine?

The forces observed on the gearbox bearings are more than just the weight and the rotation of the rotor. Gearbox bearings are designed to experience radial loads in contrast to generator and turbine bearings, which are designed to support the respective rotor weights. The gearbox is subjected to considerable forces generated by the torque and the meshing. To picture this, the graph shows the forces converted in tons to represent the weight supported by the different bearings on a Frame 6 gas turbine.



Why contact us?

Energy Capital is the official representative of Flender- Graffenstaden in South-East Asia. We are the most qualified and efficient partner to help you to do an accurate maintenance. Do not hesitate to contact us if you have any enquiries!

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