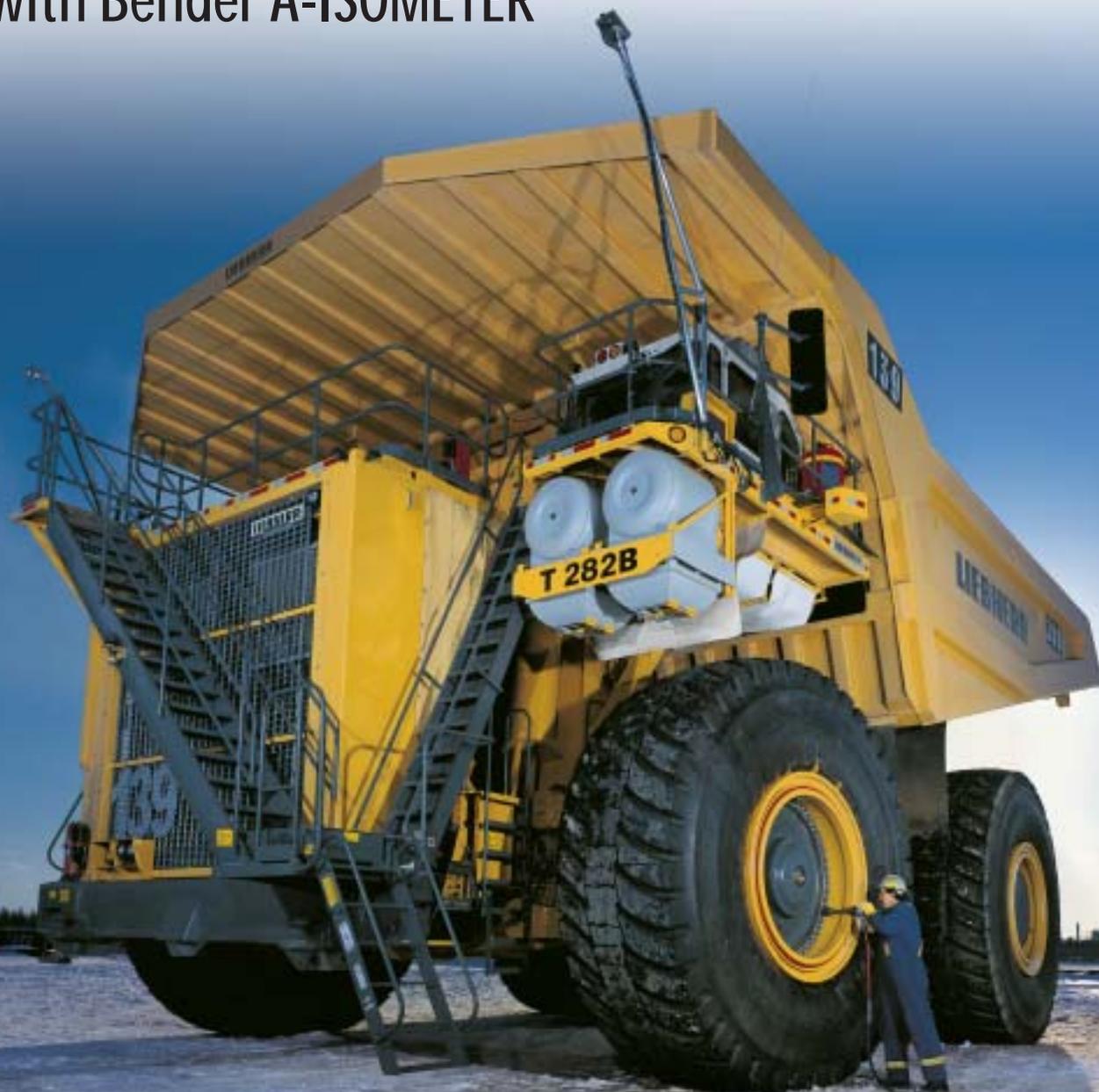


LIEBHERR

Liebherr, a group of companies based in Bulle, Switzerland, is one of the largest construction equipment manufacturers worldwide and is recognised as a supplier of technically sophisticated products and services. Liebherr has been one of Bender's key customers for many years. The unearthed systems in cranes in particular are monitored by A-ISOMETER[®]. Even the large mining truck T 282 B, one of the largest two-axle commercial vehicles worldwide, runs on Bender technology. ▶▶

A giant on wheels

– with Bender A-ISOMETER[®]



"The T 282 B offers two concrete advantages over the conventional hydraulic power units for mining trucks: shorter transport cycles and lower costs per transported ton."



►► Due to the shortage of energy, open pit mines for various raw materials have become increasingly more important over the last few years. As this involves moving large volumes of earth, the industry needed to develop commercial vehicles with increasingly larger transport capacities. Liebherr has also been active in the large mining truck market sector since 1995. As the large mines are requiring increasingly larger payload capacities and faster unloading, the Liebherr flagship, the large mining truck T 282 B, was developed – one of the largest two-axle commercial vehicles available.

One look at the frame makes it clear: the Liebherr truck is no ordinary mining truck – no drive shafts, but instead several electrical transmissions.

From diesel to power

Conventionally, large mining trucks are driven similarly to normal-sized commercial vehicles: with standard diesel motors and mechanical drives. Liebherr does this differently. A generator is driven by a large-volume diesel motor that is run with constant rotational speed similar to that of a ship's diesel. The created electrical energy sets the vehicle in motion using electric motors. This so-called diesel-electric concept illustrates a preferred state-of-the-art drive solution for mining trucks of this size.

Robust and reliable

- The diesel-electric drive offers a number of advantages such as:
- > fewer mechanical parts subject to wear
 - > improved capacity utilisation of the braking system
 - > fuel-saving due to brake energy recovery
 - > increased vehicle speed
 - > lower maintenance costs.



Foto: Liebherr



Combined, these characteristics offer two concrete advantages over the conventional hydraulic power units for mining trucks: shorter transport cycles and lower costs per transported ton.

Safeguarding the drive

Amongst others, mining trucks are used in quarries, coal, ore and copper mines as well as other large open pit mines and are also employed for removing oil sand. Insulation faults can occur during such robust operation due to the exceptionally strong mechanical wear.

The created generator voltage is approx. 2,000 volts. Voltages as high as this rule out the application of common insulation monitoring devices. Bender developed the A-ISOMETER® version IRDH275BU-6 in conjunction with a coupling device especially for the medium-voltage range. These devices, in particular the AGH575S-6 coupling device, can guarantee an

T 282 B wheel suspension



! INFO

Technical data for T 282 B

Payload/max.: 363 t / 592 t

Diesel generator set: 20-cylinder / 2610 kW

Max. travel speed 64 km/h / 40 mph

Liebherr AC drive system

Drive motors each approx. 1 MW

Length/width/height 14.22 m / 8.99 m / 7.84 m

Empty vehicle weight: 10.5 t

insulation monitoring in systems with up to 3.6 kV with directly connected drive system converters.

Both units are mounted completely in a water-cooled control cabinet located directly next to the driver's cab. Insulation faults are displayed immediately on the driver's dashboard.

The portable insulation fault location system EDS3065 from Bender helps detecting the faulty location. Due to the high voltage, earth leakages can only be searched for when in switched off mode.

Bender safety solutions help guarantee the high vehicle availability and reliability that is prioritised as part of the development of the mining truck while reducing operating costs at the same time. ■



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