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TECHNICAL INFORMATION

MOBILE FRICTION WINCHES

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The initial roping-up as well as the later rope changing operations still belong to the relatively risky works in a shaft. In order to realize this difficult task on multi-rope hoisting systems quickly and safely in deep shafts, corresponding auxiliary devices have to be used. The need for more simple handling, economic realization, and safe procedures when dealing with high loads can only be met by using continuously improved machines and adequate auxiliary devices.

The principle of the friction winch is based on the transmission of forces from the drums to the rope by friction (see sketch). The value of the traction force S_1 depends on the number of rope windings on the drums, the friction value between rope and drum lining, as well as the retaining force S_2 . The required retaining force is reduced by means of hydraulically operated pressure roller chains assuring that the ropes of the last two windings (on S_2 side) are properly pushed into the rope grooves. Thus the ropes can easily be moved from the supply reelers as they are operated almost load free (S_2).



The design of the friction winch does not only allow the lowering of ropes, but also the pulling of the ropes out of the shaft. A friction winch is able to simultaneously install different numbers of ropes, in principle up to 10 ropes. It can ideally handle hoisting and balance ropes as well as guide ropes.

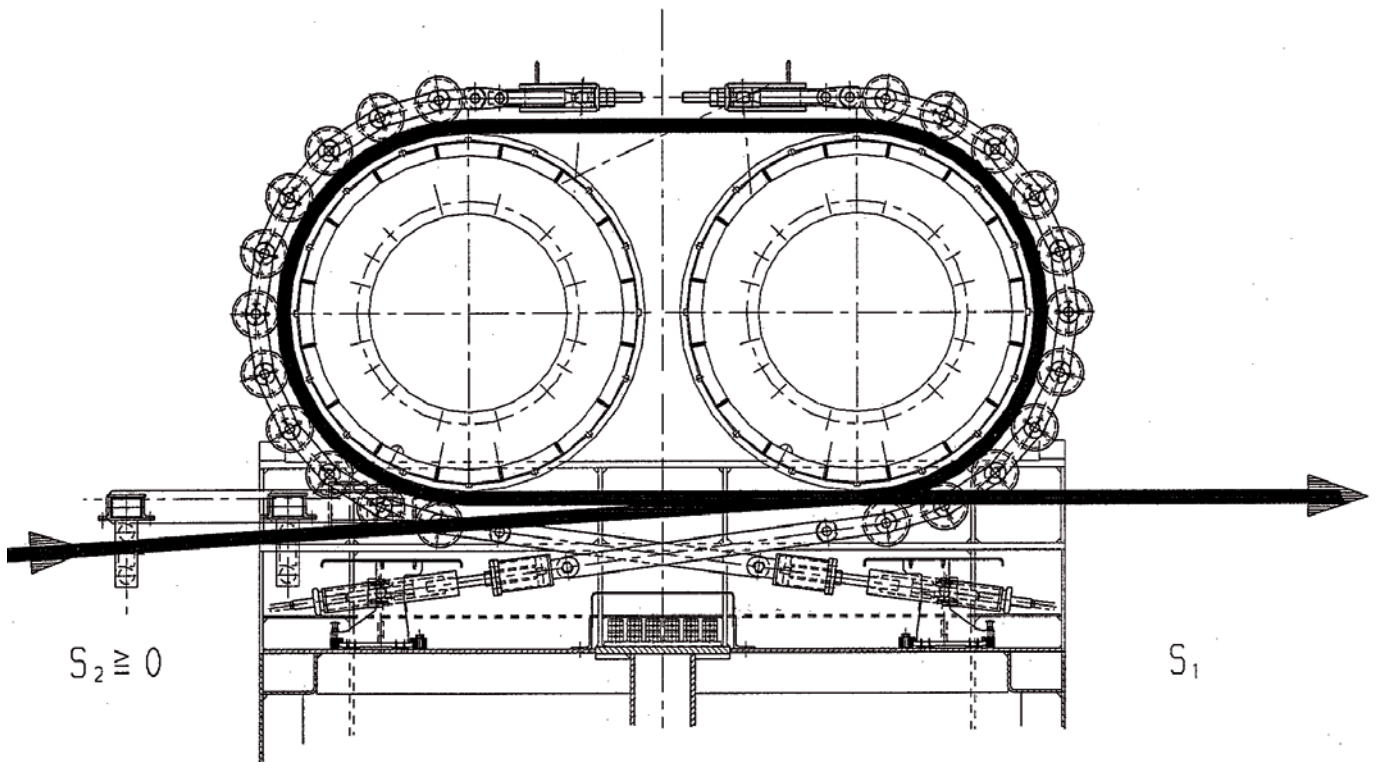
A friction winch is typically designed as a mobile unit adapted to any specific road requirements and can, therefore, be used flexibly and quickly at different shafts. The travelling gear is usually attached to the frame structure and can be lowered by its integrated hydraulics so that the friction winch can be set and anchored onto the foundations quickly.

The two friction drums of the winch are driven by an electric motor and two planetary gears, which are synchronized on their high-speed side by a sufficiently dimensioned cardan shaft.

All operations and functions are controlled and monitored from the control stand. Friction winches may easily be adapted to different rope diameters due to exchangeable drum friction-linings. Special winches with drums in an inclined position, with respective linings, allow the careful installation and handling not only of round ropes but also flat ropes.

ADVANTAGES OF MOBILE FRICTION WINCHES

- Safe roping-up and rope-changing operations
- Designed for lifting and lowering the ropes
- Efficient and careful rope handling
- Flexible in operational use



TECHNICAL DATA (SELECTED REFERENCES)

	Palabora Mining Company, South Africa	Impala Platinum Limited, South Africa	Oyu Tolgoi LLC., Mongolia
Winch traction force	100 – 1,500 kN	100 – 1,800 kN	100 – 1,830 kN
Operating speed	0 – 0.2 m/s	0 – 0.2 m/s	0 – 0.2 m/s
Number of ropes	1 – 6	1 – 6	1 – 6
Diameter friction drums	1,400 mm	1,600 mm	1,600 mm
Motor power	315 kW	500 kW	500 kW
Road travelling speed	25 km/h	10 km/h	10 km/h
Total weight	95 t	150 t	160 t