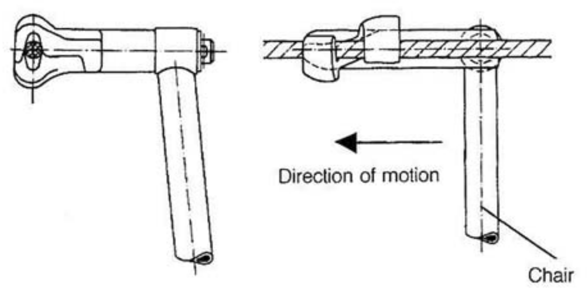
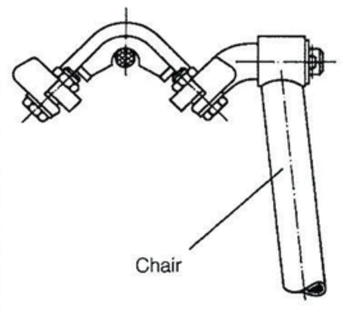
Rope clamp of APOD 1



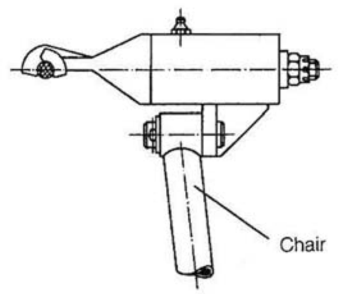
Chairs:	detachable
Speed:	max. 1.5 m/s
Curves:	vertical
Gradient:	max. 45°

Support element with 4 rollers of APOD 2



Chairs:	detachable
Speed:	max. 5.0 m/s
Curves:	horizontal and vertical
Gradient:	max. 18°

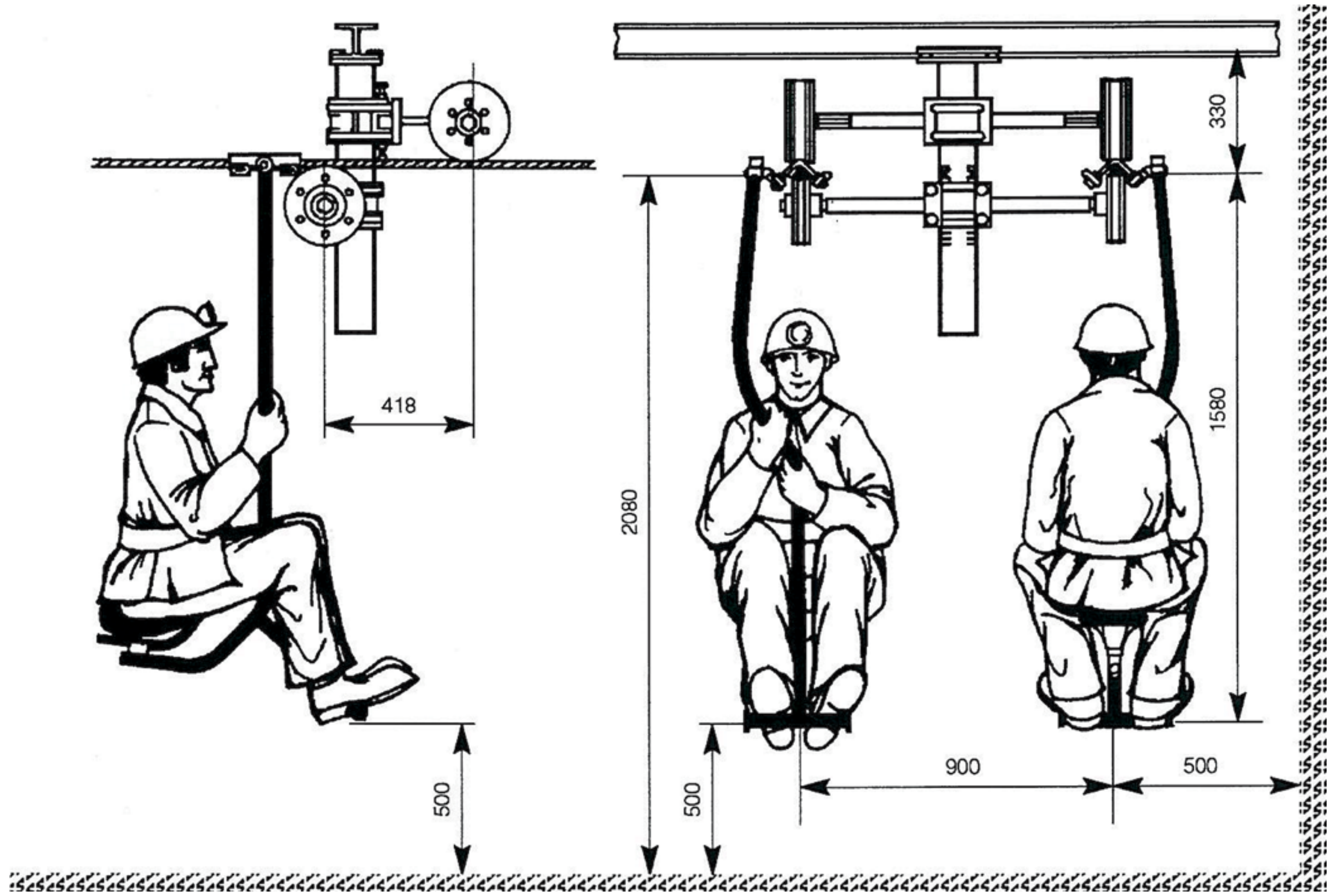
Rope clamp of APOD 3



Chairs:	permanently attached, driving round
Speed:	max. 1.5 m/s
Curves:	vertical
Gradient:	max. 45°

In horizontal curves (Fig. 6), special curve stations have to be applied. The detachable chairs are then taken off the rope and guided on tubes which are bent in accordance with the curve radius. This section is similar to an - normally straight - intermediate embarking/ disembarking station that is possible with all SCHARF chairlifts.

In addition to normal manriding, the Scharf chairlift system also permits the transportation of injured personnel (Fig. 7). For this purpose the special support element can be hooked onto the rope after the SCHARF-chairlift has been stopped by the emergency trip wire. An accompanying person can monitor the safe transport from the next chair.



Technical data of chairlift Type II

Drive power:	20 - 132 kW
Pulling force:	15 - 32 kN
Speed:	max. 5.0 m/s
Transport capacity:	400 - 900 pers/ h
System length:	over 3,000 m
Gradient:	0-18 deg.
Horizontal curves:	0-120 deg.
Minimum radius:	4,0 m

Technical data of chairlift Type I

Drive power:	22 - 132 kW
Pulling force:	15 - 32 kN
Speed:	1.5 m/s
Transport capacity:	400 - 900 pers/ h
System length:	up to 3,000 m
Gradient:	0-45 deg.
Horizontal curves:	0 - 120 deg.
Minimum radius:	4,0 m

Technical data of chairlift Type III

Drive power:	20 - 132 kW
Pulling force:	15 - 32 kN
Speed:	1.5 m/s
Transport capacity:	400 - 900 pers/ h
System length:	up to 3,000 m
Gradient:	0-45 deg.

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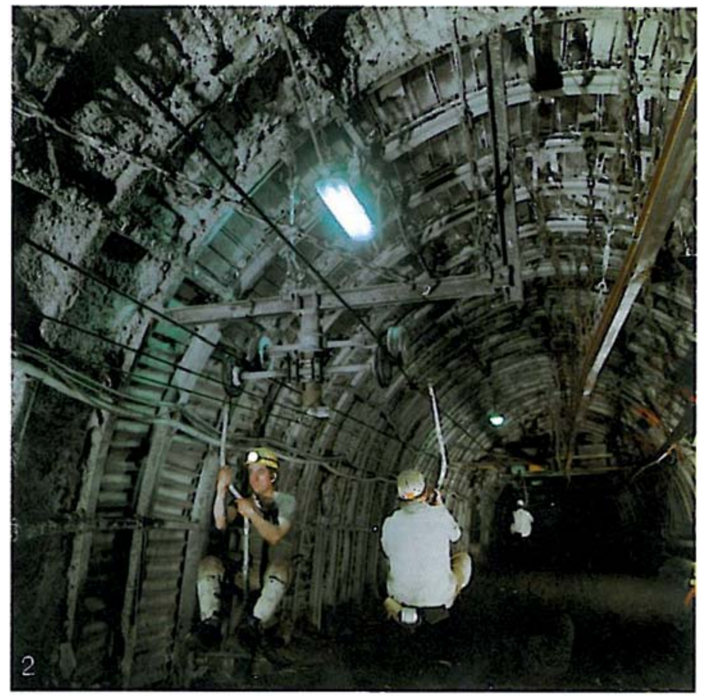
SCHARF

CHAIRLIFT


1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3


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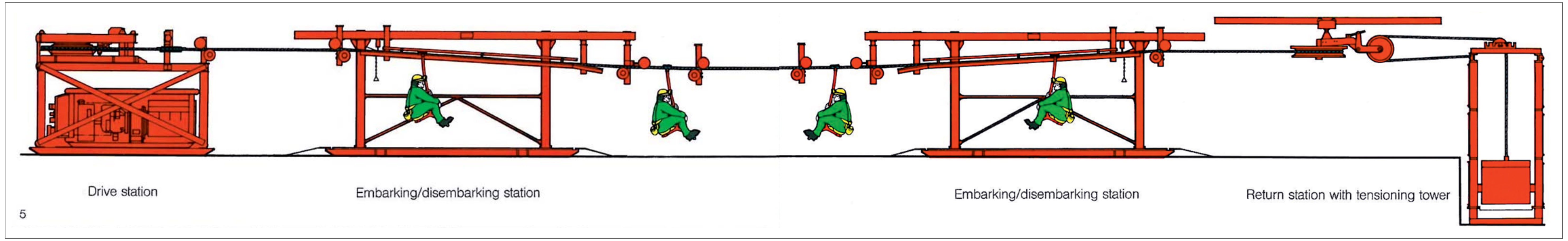

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6 7

Chairlifts - The Economic Personnel Mover

Reliable logistic systems for men and material as well as for rock and waste transport are very important for all underground mining operations.

Chairlifts offer an economic solution for the transport of personnel in mines with long travelling distances. As a continuous transport system chairlifts are permanently available. Chairlifts are also fast, safe and easy to use and operate. They are typically automated, thus need no operator and very little maintenance.

Like all SMT SCHARF logistic and transport systems SMT SCHARF-chairlifts are layed out in close co-operation with the customer. Systems have been built with a length of up to 3,000 m. The typical transport capacity of chairlifts is between 400 to 900 pers/h parallel in Both directions. Unlike their counterparts above ground they can be equipped with intermediate embarking/ disembarking stations for more transport flexibility and direct access to different mine levels. Chairlifts can also be designed to negotiate curves of up to 120 degrees with a minimum of 4.0 m radius.

Three basic designs can be distinguished:

- systems with fixed chairs, with the possibility to negotiate curves (APOD I)
- systems with detachable chairs that are held on the rope by positive friction (APOD II)
- systems with fixed chairs only for straight declines (APOD III)

The fixed chair systems can be used in very steep declines up to a gradient of 45 degrees with a travelling speed of 1.5 m to ensure save embarking/ disembarking of the chairs. The system with removable chairs allows higher speeds of 3.0 to 5.0 m/s in declines between 0 and 18 degrees. The different carrier design of the chairlifts can be taken from the x-sections (Fig. 9-11).

All three designs basically consist of the same components:

- Drive station
- Embarking / Disembarking Station
- Intermediate Support Rollers
- Embarking / Disembarking Station
- Return Station with Tensioning Tower

This principal arrangement of a chairlift can be seen in Fig. 5.

The drive station (Fig. 1) is always placed at the uphill end of the chairlift. A horizontal drivewheel is powered by an electric or electro-hydraulic drive. The diameter of the drive and the return wheels correspond to the respective system track gauge, typically from 900 mm to 1,835 mm. Replaceable polyurethane linings in the wheels ensure low wear on the rope.

Electronically controlled overspeed devices apply the fail-safe spring loaded brakes, should the speed be increased by more than 10 D/o. The brakes *are* also immideately applied in case the trip wire is pulled (that is arranged all along the chairlift) or when one of the rope dislodged trip mechanisms becomes activated.
The return station and tensioning tower with internal tensioning weight are installed at the down-hill end.

The return station is installed on support rails to adjust the tensioning distance of the counterweight. The weight ensures the necessary rope tension in the system and serves to compensate for various loads.

In case of the friction chairlift system (Fig. 5) the chairs are taken from the depository and are manually placed on the embarking rail. The chair is then released for travel by pulling a trigger (Fig. 4). Then it accelerates down a steel tube running on small rollers. At the end of the tube the chair will have achieved the same speed as the moving rope and sits on the rope held by positive friction.

The chair can only be released after the previous chair has travelled over a safety distance of 3 to 4 times the travelling speed. Operation of the start trigger also causes the system to be automatically switched off after 1,5 turns to avoid operation of the system when there is no demand for travelling. Alarm hooters are installed in intervals along the chairlift to warn personnel when the chairlift is going to start.

For deceleration, the system works vice versa i.e. an inclined tube picks up the chair carrier for deceleration down to a near standstill. The chair then can be lifted off the tube manually.

Fig. 2 and 3 show a friction type chairlift (APOD II) operating in a decline and the arrangement of intermedia-te linestands. The cover and Fig. 8 show the operation of a chairlift with fixed chairs (APOD I). Typically all intermediate line stands are suspended from the hanging wall. Footwall based systems are also available.