

Hydraulic Tensioning Systems

Technical Document 01/2019



ROPE TENSIONING SYSSYM DESCRIPTION

The hydraulic tensioning system includes a cylinder activated by a hydraulic power unit.

The hydraulic power unit can have an automatic or a manual regulation of the cylinder pressure which as a consequence, determines the tension of the rope.

Concerning chairlifts or long ski lifts, the regulation is automatic and happens electrically through a control software (PLC).

This software controls the electro hydraulic parts (electro valves, transducers) and the electro mechanical components (electrical motor) present inside in the power unit; it controls the load cell present in the cylinder, as well.

Concerning short ski lifts the regulation of the cylinder pressure control is mainly manual (manual pump).

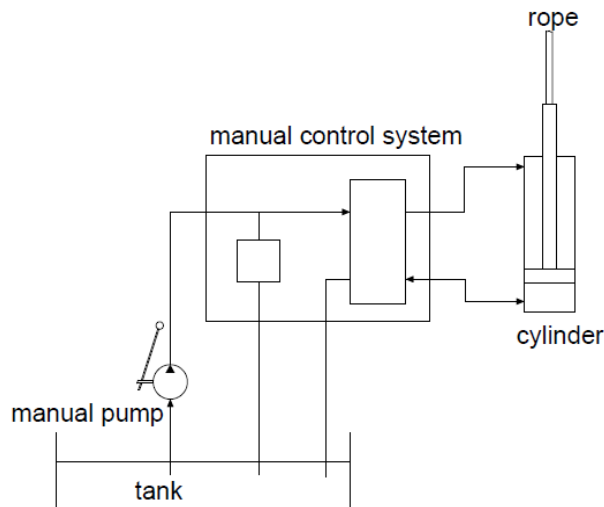
These new automatic and manual systems substitute the counterweight system.

Regarding the components location, the cylinder is mounted on the top of the pillar, one side is fixed on the tensioner trolley, the other side on the supporting structure.

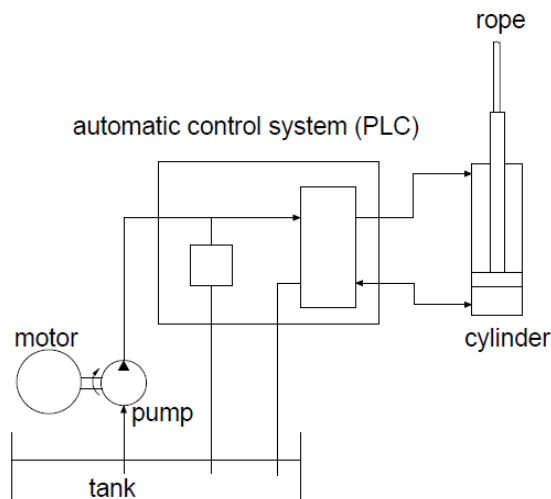
While in the ski lifts the hydraulic power unit is positioned on the main structure (pillar) while for chairlifts it is positioned close to the main structure (see drawing file, pag.4).

Here below a representative scheme of two tensioning systems (manual and automatic).

MANUAL TENSIONING SYSTEM



AUTOMATIC TENSIONING SYSTEM

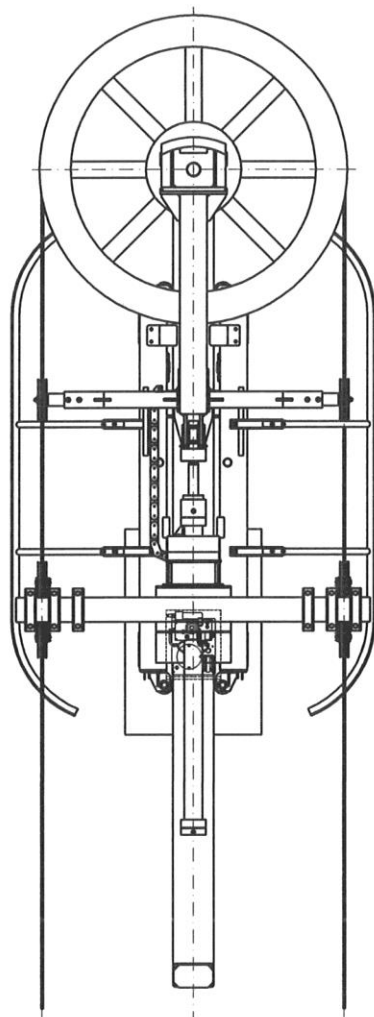


MANUAL TENSIONING SYSTEM



AUTOMATIC TENSIONING SYSTEM





Hydraulic Systems for Brakes Power Units

Technical Doc. Nr.02/2019



Braking System

The hydraulic braking system includes a brake cylinder activated by a hydraulic power unit.

The hydraulic unit has the function of regulating the pressure on the brake cylinder, regulate the deceleration and the arrest of the plant.

The regulation of the braking system operates through a hydraulic system and It is managed by an electronic control software (PLC).

This system, based on pre-set data, determines the deceleration and the prompt arrest of the whole plant.

It is very important to know that the braking force is obtained through the cup springs, which are inside the brake cylinders.

The hydraulic unit is just used to counteract the force released by the cup springs which determine the speed of closing of the brake cylinder.

Types of hydraulic power units for braking systems:

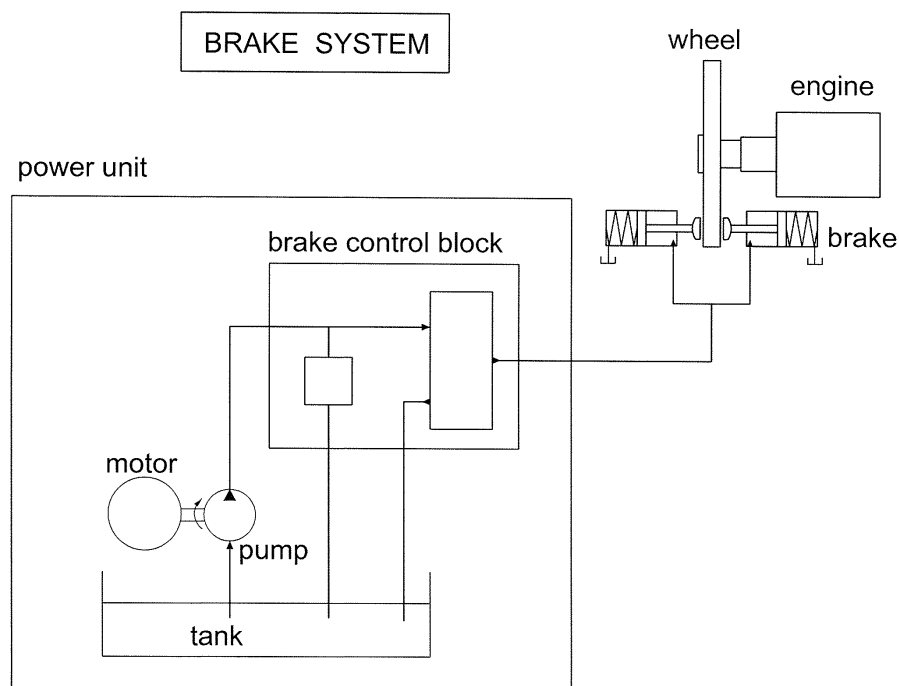
Control units for winch brakes of Chair lifts, Gondola lifts, Cable cars and Funiculars

- Service brakes (on-off / modulated)
- Emergency brakes (on-off / modulated)
- Rescue brakes (on-off / modulated)

Control units for car brakes of Cable car and Funicular

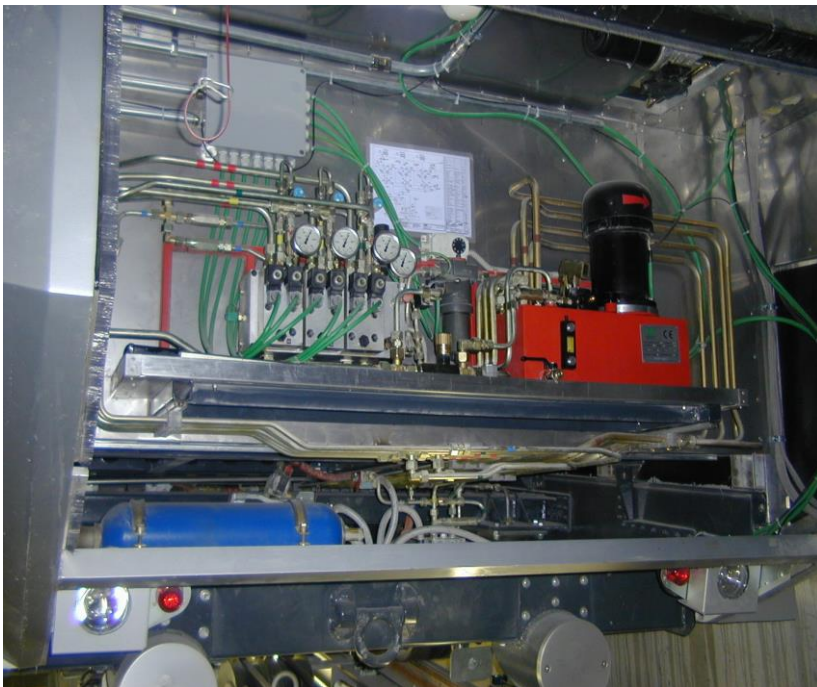
- Emergency brakes (rapid fall)

Here below a representative scheme of the two braking systems .





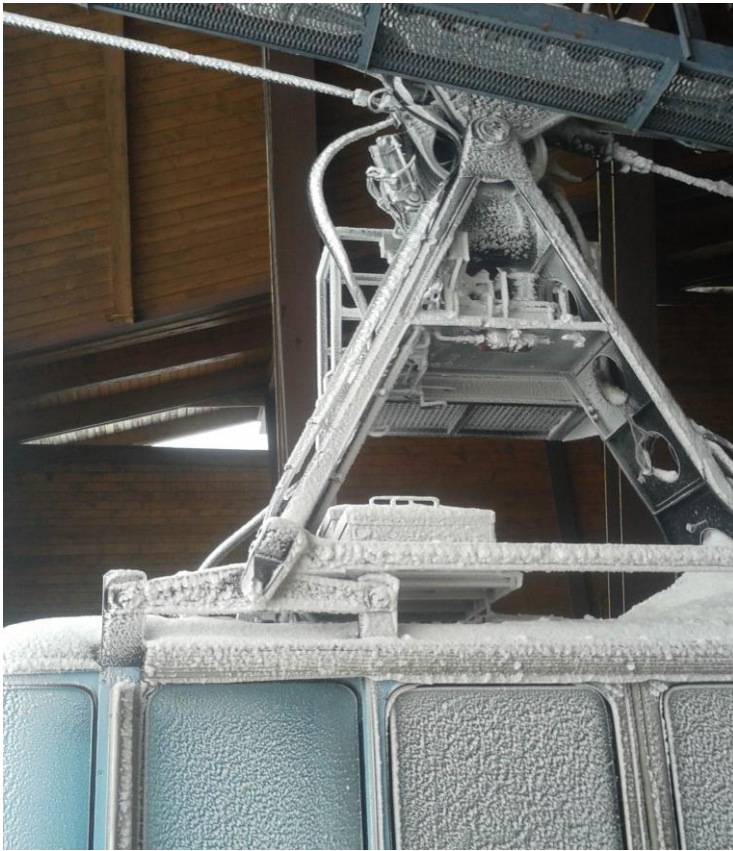
Braking Power Unit for Cable Car- Hong Kong (Ocean Park)



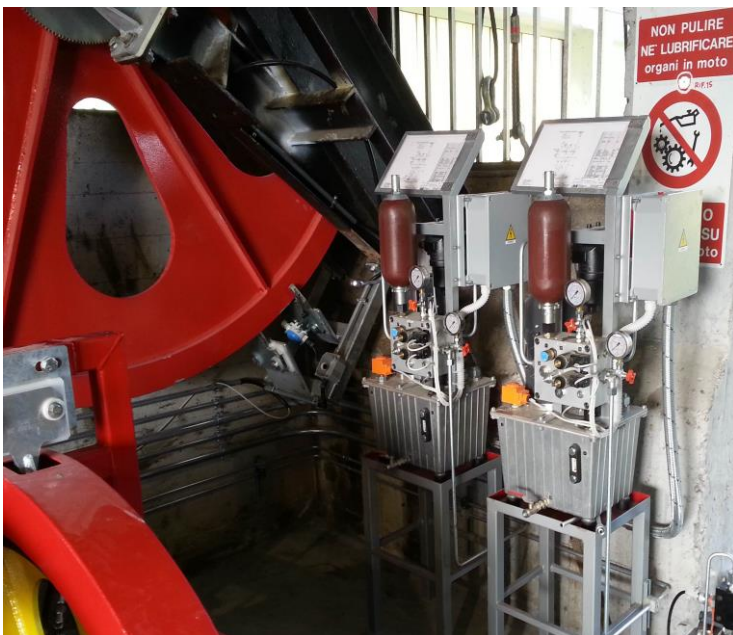
Braking Power Unit for funicular- Santa Cristina, Italy



Braking Power Unit for chair lifts- Sestriere, Italy



Braking Power Unit for Ropeway – Gran Sasso Mountain, Italy



Braking Power Unit for Ropeway- Stresa, Italy



Braking Power Unit for Ropeway – Rio de Janeiro, Brazil

Hydraulic Systems for Reserve, Recovery & Rescue,

Technical Doc. Nr.03/2019



Reserve – Recovery – Rescue Systems

The hydraulic system "Reserve Winch, Recovery, Rescue" is used in the case of an emergency of the main electromechanical control unit of the plant.

RESERVE - used to replace the main group, therefore with equal (same speed) functionality only on funiculars and cable cars.

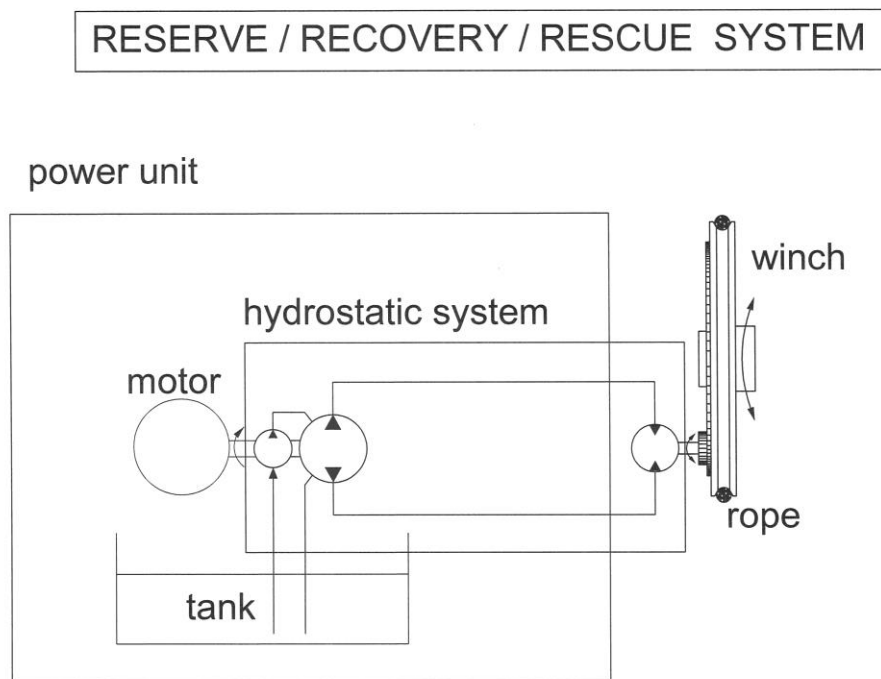
RECOVERY - used as emergency for the main group (reduced speed) on chairlifts, cable cars, funiculars and cable cars.

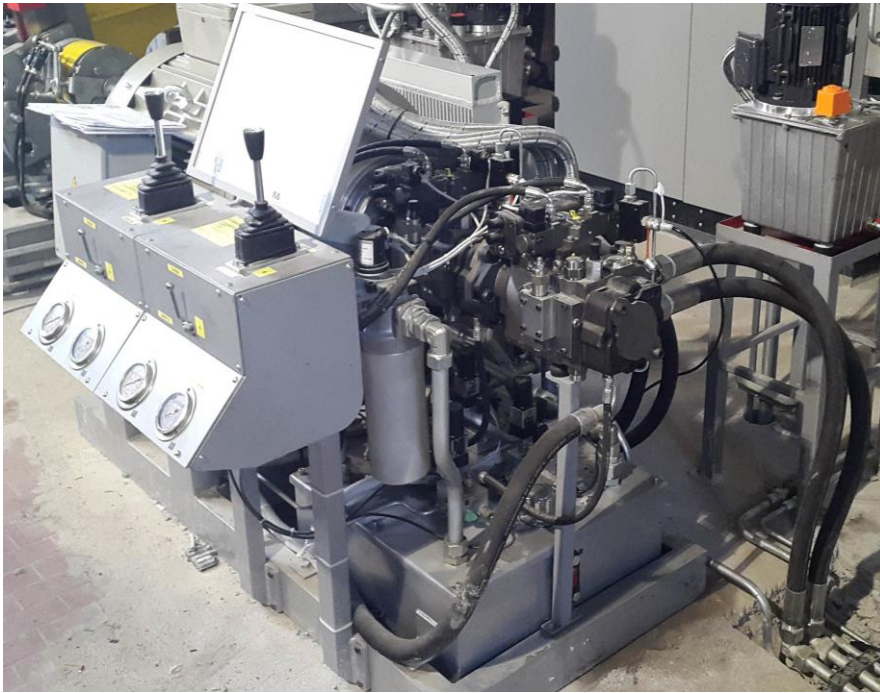
RESCUE used to rescue people on the plant (low speeds) only on cable cars.

The power units uses a thermal or electric motor mechanically connected to a hydrostatic system (pump + hydraulic motor) which directly operate the main winch on which the towing cable of the system is connected (chair lifts - cable cars - cable-railways- funicular).

The system is managed by the same PLC that manages the main system for the RESERVE or RECOVERY system instead for the RESCUE system there is a dedicated independent software then installed only on the cable cars.

Here below a representative scheme "Reserve-Recovery- Rescue systems .





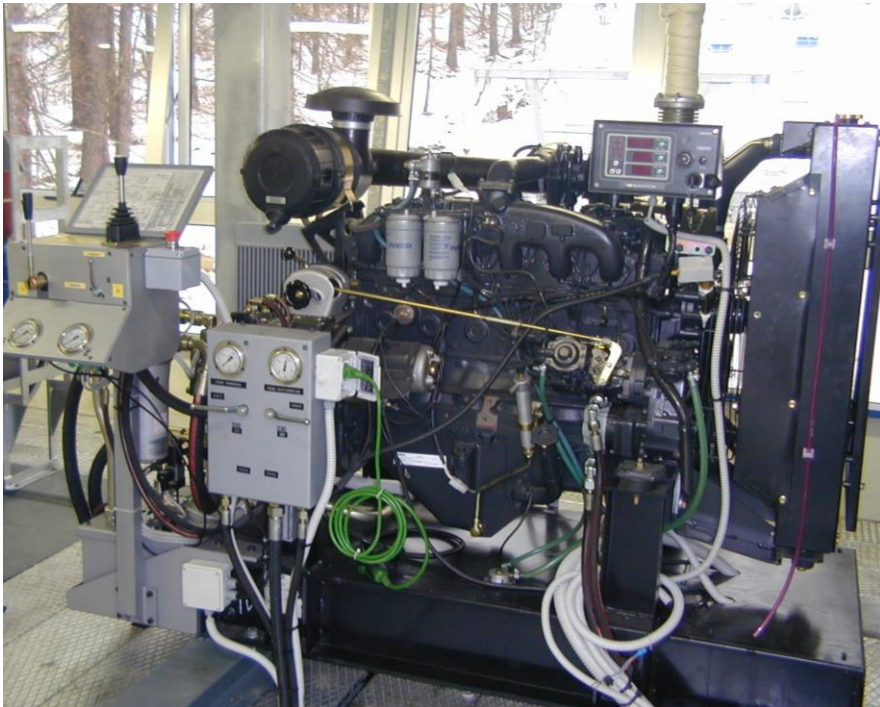
Recovery power Unit for funiculars- Cuneo , Italy



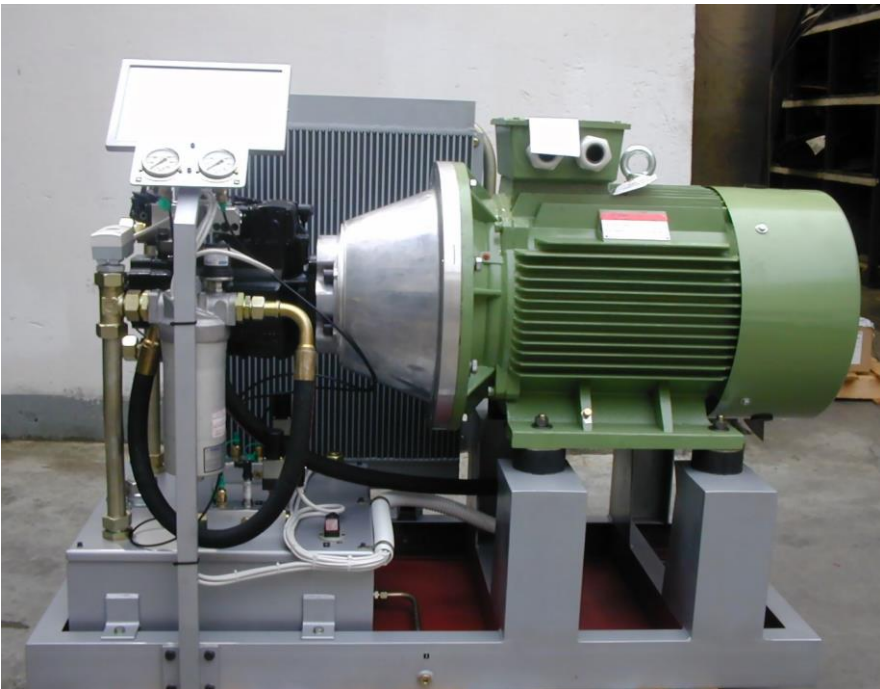
Recovery Power Unit for chair lifts- Sestriere , Italy



Rescue Power Unit for Ropeway- Stresa , Italy



Recovery Power Unit for chair lifts- Cortina , Italy



Rescue Power Unit for ropeways Marmolada, Italy



Recovery/Rescue Power Unit for ropeway - Italy