



FEDERATION EUROPEENNE DE LA MANUTENTION
Section IX
SERIES LIFTING EQUIPMENT

FEM
9.761

**Lifting force limiters for controlling the loading
of motorized series hoist mechanisms**

01.1995 (E)

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Directives, Standards and Draft Standards referred to:
Directive 89/392/EEC, EN 292-1, EN 292-2, prEN 954

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1 Scope of application

The present rule defines the technical requirements with respect to lifting force limiters used for the loading control of electrically, pneumatically or hydraulically motorized series hoist mechanisms.

2 Safety targets

The lifting force limiter is intended to prevent the lifting of impermissibly high loads in order to avoid hazard to persons, animals and objects as a result of overloading.

The lifting force limiter should not reduce the rated capacity of the hoist. It should be designed in such a way that the static and dynamic tests called for by Directive 89/392/EEC, Annex I, Item 4.1.2.3 can be carried out. The warning device specified in Annex I, Item 4.1.2.4 of the Directive can be omitted in compliance with Item 1 of the Preliminary Remarks of this Annex. In series hoist mechanisms, there is generally no hazard associated with the triggering of the lifting force limiter.

3 Definitions

Lifting force limiters act automatically by limiting the force flow (direct lifting force limitation) or by switching off and stopping the lifting drive (indirect lifting force limitation). Lifting force limiters are safety devices within the meaning of the standard EN 292-2.

The **lifting force** is the force required to lift and accelerate the load. The maximum permissible load is defined by the rated capacity of the series hoist mechanism.

The **triggering limit** of the lifting force limiter is the load which causes the lifting force limiter to respond without any additional acceleration forces (static load).

4 Causes of overloading of series hoist mechanisms

The risk of overloading series hoist mechanisms can be due to one or several of the following reasons:

- unknown weight of load
- incorrect weight given for load
- immovable load
- obstruction of the load or the load handling device by snagging
- interaction of two series hoist mechanisms with unequal load distribution caused by the load centre of gravity being off-centre
- side pulling of the load
- swinging of the load
- snatching of the load at high lifting speed
- load falling into the hoist medium by tilting
- load vibration in the hoist medium induced by inching
- cumulative effect of several individually permissible loadings

Not all overloads can be prevented by lifting force limiters and thus additional measures might be necessary and would have to be specified in the Operating Instructions as to how overload situations must be avoided.