

# Riggingcall #4

A look at things (impartially, of course) from a rigging point of view.

## Double-brake hoists

**When should you consider using hoists with two brakes and why? Often it is an attempt to avoid the time and effort in using secondary suspensions ('safeties'). One could argue the likelihood of hoist failures is small, as far as we know. Well maintained hoists, used correctly with a sensible load share are unlikely to fail. However, the consequences of failure may be catastrophic, particularly when people are beneath; safeguards need to be proportionate. Regulation 8 (1) (c) of the Approved Code of Practice for LOLER and guidance notes 234 and 235 may apply, although this technically relates to people working under loads, rather than when loads are suspended over people.**

There are several ways to stop a load falling, typically secondary suspensions or (where the load needs to be able to move as part of the show) using load arrest devices. The provision of secondary suspensions also requires assessment to ensure that should a hoist fail, the load will not alter its position significantly or create dynamic loads that may themselves create additional, possibly greater risks. *Technical Standards for Places of Entertainment* states secondary suspensions are not normally necessary in permanent

installations because conditions and usage are more controlled.

An independently anchored, almost taut secondary suspension will stop a load falling; a 'motor bypass' cuts the hoist out of the load path. Accidents have often involved chain-to-hook connections; these would not have been prevented using a 'motor bypass'. Using shortening clutches on hoist chain creates extra risks and the main manufacturers are not keen on this practice.

There is nothing in law that requires the use of a 'second' brake in the UK. Although BS7906:1 suggests use of a second brake, this is not legislation. A second brake may increase safety under certain conditions, but only protects against primary brake failure. Perhaps because it is offered by manufacturers, it seems to be highly regarded as a preferable specification: certainly, providing a second brake is a commercial opportunity few manufacturers pass up. They are responding partly to German Regulation BGV C1 *Staging and production facilities for the entertainment industry (1998)*. Although the Regulation does not specify double brakes, where hoists are permanently installed overhead in entertainment venues it calls up DIN 56925 (scenery hoists: safety and testing) and in

Germany, VBG C1 hoist systems must be used. Bear in mind there are many other conditions a system must meet to comply with VBG C1: the position of the load limiting device in the load path is also specified.

VBG C1 'does not preclude other at least equally safe solutions which may have been set out by other EU states' although it seems a sensible set of requirements. As in BS7906:1, VPLT (Germany's equivalent of PLASA) code of practice SR2.0 (though not a standard) for the 'provision and use of electric chain hoists in the event industry' contains requirements where hoists lift and/or suspend a load over people.

So what can we expect a second brake to do? It acts on the same shaft as the primary brake and guards against brake wear, incorrect adjustment, possible contamination or other brake lining problems on the primary brake. However, one well known manufacturer believes fitting a 'safety' hook may prevent more accidents than a second brake; two brakes won't prevent loads slipping out of hooks - a cause of many accidents.

In summary, double brakes may be of benefit when dynamic loads cannot be safeguarded in another way or when using secondary suspensions are not practicable. The onus is

BS7906:1	To <u>move</u> loads over people(dynamic load)		To <u>suspend</u> loads over people (static load)	
	Category A	Category B	Category A	Category B
Hoist type				
Brake type	Double brake essential	May be single	-	May be single
Brake position	Brake acts directly on load	Brake may act via clutch	-	Brake may act via clutch
Limits	Top, bottom and ultimate limits essential	Top and bottom limits	-	May not be provided
Mechanical stops	End of travel stops essential	End of travel stops desirable	-	May not be provided
Emergency stop	Essential	Essential	-	May not be provided
Secondary suspension	Not necessary	Load arrestor device essential	Not necessary	Static secondary suspension essential
Controller	Desirable	May not be provided	-	May not be provided

Category A hoists are intended for entertainment industry use for lifting and suspending loads over people, and meeting the requirements of BS7905:1 and DIN 56925. Category B hoists are not intended for such use.



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VLPT 2.0	Basic 'industrial' hoist	Hoist used with secondary suspension	De-rated, double brake hoist	De-rated, double brake hoist with overload, extra limits and group shutdown
Type of use	Hoists used when people are present under the load being moved			
Mechanical handling for load in/out	No	No	No	Yes
Hoist lifts and <u>suspends</u> load for show	No	Yes	Yes	Yes
Hoist <u>moves</u> load as part of performance	No	No	No	Yes
VPLT hoist classification	D8	D8 + secondary	'D8 plus'	C1 (DIN 56925)

firmly on the user in the particular application - something over which the manufacturer has no control.

There are other engineering solutions to the 'brake' issue. ASM chain hoists, distributed in the UK by Hall Stage, have no brake in the traditional sense. This hoist holds the load via very high gear ratios and a mechanical lock, the load being held initially by electrically induced stasis in the motor. There are therefore no brake linings to wear and no adjustment of spring pressure required.

The Work at Height Regulations came into force on 6 April, as expected. PLASA has done a much better job of writing broad guidance than can be done here and I thoroughly recommend the guidance note to you. There is also a short HSE guidance leaflet (indg401) available from the HSE website which gives useful information. In the next few months, I am sure we will see 'sector specific' guidance we can use in addition to our own. As with LOLER, if you were doing it right before, you'll probably comply; there is little that changes existing good practice.

However, read the information; you may discover you weren't using best practice to start with! I would draw your attention particularly to 'fragile surfaces' (and what those may be in the entertainment industry), specifications of 'suitable' platforms and the non-standard use of scaffolding. Rescue planning and formal training requirements may come as a surprise!

*Next time: Rescue plans . . .*

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