



SUSPENDED SCAFFOLDING SECTION

SSFI TECHNICAL BULLETIN

Rigging for Stall Load of a Hoist

Federal OSHA standards often require that a suspended platform be rigged such that the resisting overturning moment be either 1.5 times the stall load of the hoist or 4 times rated load **whichever is greater**. This language first surfaced in the mid 1990's and still appears in many regulations that adopted the text.

- Problem # 1: The user doesn't know what the stall load of a hoist is. It is neither on the nameplate nor in any published material that is provided with the hoist. To determine the stall load, the user would have to apply sufficient load to the platform until it won't lift and determine the load applied to the hoist. Multiply that load times 1.5 and see if it exceeds 4 times the rated load of the hoist.
- Problem # 2: Stall load varies significantly with power supply, so it changes day to day and job to job. If voltage is reduced, as happens with brownouts and long power cords, then the stall load is reduced. If air pressure is increased, then stall load increases. Stall load also varies with the amount of wire rope on a drum. Temperature has an effect on stall load as well, since gear oil viscosity changes. And worn parts will affect stall load.
- Problem # 3: Nobody defines how to test for stall load. If one travels full speed and is stopped by an obstruction, for example, if a moving platform hits a balcony, the peak stall will be greater than just trying to lift a load off the ground.
- Problem # 4: The manufacturers themselves don't know the stall load, but have a good idea of its range. Scaffold hoist manufacturers are required to limit the stall to less than 3 X rated load. Generally it is far less than 3 X, sometimes 1.8 to 2 X rated load. For a 1000 lb. rated load hoist, a test load of 3000 lbs. is prepared. The hoist shall not lift it. If it doesn't lift the load, the test is passed... Manufacturers then don't start removing load until it lifts to record a "stall load".

The mess that was created – theoretically if any hoist were capable of stalling at 2.66 to 2.99 X rated load (it must be less than 3) then the rigging would need a safety factor of greater than 4. At most a 4.49 to 1 safety would be required. 4:1 has been the standard requirement for decades. We know of no rigging ever pulled off the roof by a scaffold hoist when a safety factor of 4 was used against overturning. In Europe a safety factor of only 3 is required for the same hoists and they can travel faster!

After explaining the chaos created by using stall load in regulations, OSHA instructed their field staff to determine if the qualified person has determined the stall load of the hoist (extremely unlikely) OR whether the scaffold is counterbalanced by at least 4 times the rated load of the hoist. The key word is OR.

Hopefully with additional rulemaking we will see any reference to stall load vanish, except for the requirement that a hoist shall not lift more than 3 x rated load This is happening now. In March 2005, the State of Washington took this path. WAC 296-874-300 enacted a suspended scaffold requirement that simply says that **you must make sure that the stall load of any scaffold hoist is not more than 3 times its rated load.**

This Technical Bulletin was prepared by members of the SSFI Suspended Scaffolding Section.

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