

Tech Tips - a periodic newsletter

CHECK OVERHEAD CRANE BRAKES

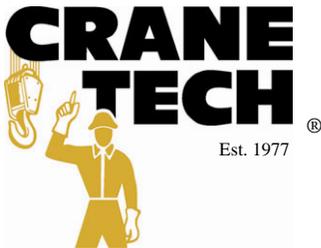
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How and when does an overhead crane operator test the hoist brakes?

Federal regulation OSHA 29CFR1910.179(n)(3)(vii) states:

“The operator shall test the brakes each time a load approaching the rated load is handled. The brakes shall be tested by raising the load a few inches and applying the brakes.”

So how exactly does one apply the brakes on an overhead crane? Overhead crane brakes are applied automatically when hoisting motion stops. This braking action, referred to as holding brakes, requires specific brake torque settings. According to OSHA 29CFR 1910.179:

“Holding brakes for hoist motors shall have not less than the following percentage of the full load hoisting torque at the point where the brake is applied.

125 percent when used with a control braking means other than mechanical.

100 percent when used in conjunction with a mechanical control braking means.

100 percent each if two holding brakes are provided.”

To test the brakes we simply raise the load a few inches and stop hoisting. Holding brakes set automatically, and we're now ready to proceed, right? **Wrong!** At this point we have only tested the holding brakes. What about the control brakes? Control braking exists to prevent the load from accelerating in the lowering direction. If the load is very high and a mechanical load control brake fails when you attempt to stop during load lowering, will the holding brakes still be able to stop the load safely? Probably not. We've seen this occur with very heavy loads where the holding brakes were unable to stop the load resulting in a loss of load control.

Now that we understand how an overhead crane's holding brakes and control brakes combine to provide safe load handling, the process for checking control brakes is simple.

Tech Tip Continued:

After checking to ensure that the holding brakes are functioning properly, hoist the load a little higher, maybe a foot or so more. Allow the holding brakes to stop and hold the load. Next, lower the load about halfway and again stop the load. For a crane equipped with a mechanical load control brake, this procedure tests both the holding brakes and the control brakes. If an overhead crane's brakes are going to fail, they're more likely to fail in the lowering direction.

This procedure should be followed with the first load of the shift, and anytime a substantially heavier load is handled later in the shift.

You can now see why holding brakes, when used in conjunction with control braking means other than mechanical, must be set to 125% of maximum hoist motor torque. Non-mechanical control brakes (eddy current) only control descent speed while the hoist is moving, and are unable to assist with any load holding.

Operators are the first line of defense in accident prevention. Understanding how overhead crane brakes function, and conducting a meaningful test goes a long way toward ensuring a safer and more reliable operation. Other standards that all overhead crane users should be familiar with include the ASME B30.2, ASME B30.11, ASME B30.16, and ASME B30.17. Also, read and be thoroughly familiar with your overhead crane user's manual, and check local and State requirements to make sure you comply with all laws.

Tests are an attempt at a controlled failure. Operators must follow all safe work practices and ensure their body is never in a position to be contacted by the load.

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