

Crane Safety

From the Bushman AvonTec Engineering Department



Crane safety requires careful attention to detail.

This picture serves as a reminder of why no one should ever stand under a hanging load! We can prevent accidents like the one pictured above by performing frequent and periodic inspections on cranes and below-the-hook lifting equipment. Frequent and periodic inspections are defined in ASME B30.20 Below-the-Hook Lifting Devices, while crane inspections are defined by other industry standards. Lifting beams come in many different configurations, but inspections are very similar. The Frequent Inspection starts with a global review of the beam, looking for obvious material deformation, bent hooks, missing retaining pins, keeper bars, safety signs and manufacturer's labels. Then inspect the hooks or attachment points of the load to the beam:

Are the pins that connect the J-hooks or other lifting points to the beam in good condition? If there is more than a 2-5% obvious indentation, consult the manufacturer about replacements. Are the hooks bent? If so, they need to be replaced.

For beams with adjustable lifting points or bails, we carefully inspect the mechanism that holds the assembly position.

Is there sufficient wear or degradation that would allow the assembly to slip out of position inadvertently during a pick?

Are the pins or clips that hold the position in good condition? Are the shackles/links/hooks/slings in good condition?

Are the pins or other retaining devices in place to prevent the load from being released?

Are they sized properly if they have been substituted from the original design?

The next step is to inspect the beam visually for obvious weld cracks or other signs of deformation. Cracks in structural members would warrant the beam being tagged out of service until repairs can be made. Cracks in spacers or other non-load bearing members need to be evaluated to determine if they would be detrimental to the operation of the beam. The bail or bail pin between the crane and the beam should be inspected for obvious wear and excessive indentations. If the beam is made of channel, I-beam or other structural members, checking the straightness of the beam can determine if the beam has been subjected to excessive forces or loads. A simple piece of string pulled taught along the edge of the structural member will quickly determine the difference in the camber and sweep of the lifter. Anything in excess of 3° out of alignment should be investigated.

During Periodic Inspections, the same inspections as above are performed and recorded for trending data. In addition, the following items are inspected:

Dye-penetrant checks should be performed at the critical loading areas on all hooks or other members that connect the load to the beam. After removing paint, oil, and other debris, this non-destructive test should indicate no cracks in the base metal.

Dye-penetrant checks should be performed at all structural welds in the bail assembly and the beam. After removing paint, oil, and other debris, this non-destructive test should indicate no cracks in the welds (or in the base metal of the pin.)

The mill duty equipment found in industry is usually designed for severe duty cycles and minimal maintenance. The inspection criteria and maintenance procedures mentioned are what we at Bushman Equipment have found to be useful in maximizing the longevity of lifting equipment. This is not intended to usurp the original manufacturer's recommendations or other regulatory authority. While required by ASME standards, inspection of all lifting equipment is also a prudent maintenance procedure because it improves the overall productivity and safety of the manufacturing line. Maintaining a regular inspection and maintenance program on lifters will help ensure a long useful life of the lifter and a better return on your investment.

For more information, refer to ASME B30.20 standards.