

Fire Engineering®

Construction Concerns: Bridge Cranes

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For www.fireengineering.com

Photos by author.

Bridge cranes are commonly found in many manufacturing and equipment repair facilities. Photo 1 shows a small (10-ton capacity) bridge crane that serves 300 feet of service and manufacturing bays in a heavy vehicle assembly plant.

Common features of bridge cranes are the following:

- Each end of the bridge is carried on a wheeled carriage supported on railroad rails that are bolted or welded to beams (photo 2). In the photo, the railroad rails are attached to the top flange of the beam with J-bolts.
- Each bridge carriage has one or more reversible electric drive motors (photo 3) to move the bridge along the rails.
- The hoist moves on an electrically-powered trolley along the bottom flange of the bridge; it is also electrically powered. Photo 3 shows the bridge crane hoist at the end of the bridge.
- Electric power is carried to the bridge crane by way of exposed copper buss bars (as seen in photo 2 and at left in photo 1). Most of these cranes used three-phase electric power at 480 volts or higher and require three buss bars for electrical power and a fourth—often colored green—as an equipment ground.
- Electric power is transferred from the buss bars to the bridge crane by way of spring-loaded arms with contact shoes for each buss bar (photos 4, 5).
- Buss bars are connected to the power source at one end only. An electrical disconnect switch may be located on a column or wall supporting the track, or it may be located in a motor control center.

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(1)



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(2)



(3)

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(4)

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(5)

Small bridge cranes are often operated from the floor with pendant control boxes. More modern cranes like the one in the photo may use wireless remote control boxes that are carried by the operator on the shop floor. Very large bridge cranes, like those used in foundries and steel rolling mills, will carry the operator in an enclosed cab at the power end of the bridge.

Although the electrical buss bars are exposed and uninsulated, they are usually far out of reach of anyone working in the factory. Those in the photos are about 30 feet above the floor.

Some bridge cranes are designed so that when the crane is shut down, relays in the electrical system shut down the power to the buss bars. Other buss bars may remain energized unless manually disconnected at a switch or motor control center.

Although the spacing of the buss bars for the contact shoes reduces the possibility of a short circuit or ground fault from a discharging fire sprinkler head, they are not far enough apart to prevent electric shock conducted by a solid hose or master stream device.

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Notes on our preincident plan for a facility with one or more bridge cranes should include the location of the cranes, the location of the power source, whether the buss bars are deenergized when the crane is not in use, and any other information on the crane and its use that may affect firefighting operations.



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