TECHNICAL CRANE REPORT
NORTH AMERICAN INDUSTRIES, INC.

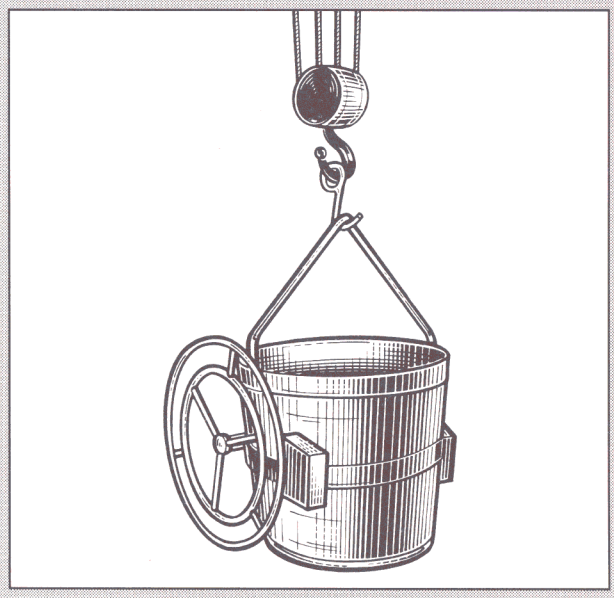
Hot Metal Cranes What is Required?

Cranes carrying hot metal have many additional safety considerations, and code mandated requirements.

If your crane is carrying hot metal, it may be subject to additional requirements beyond those laid out in CMAA (Crane Manufacturers Association of America), OSHA, and NEC (National Electrical Code) specifications. The Foundryman's Code outlines additional provisions for hot metal hoists and trolleys. A customer, in conjunction with their safety committee, insurance company, and local regulators, must decide if a Foundryman's hot metal hoist is required.

A Hot Metal Hoist and Trolley include:

- ❑ **8:1 safety factor** on the hoist wire rope; 5:1 safety factor is standard. This allows for some "loss of strength" due to the heat. This often requires a special hoist drum to accommodate larger diameter wire rope, or down rating the capacity of a standard hoist (a 15 Ton hoist rated at 10 Tons).
- ❑ A **power circuit upper limit switch,** which cuts all power to the hoist when the hook is in the fully raised position. All hoists have an upper limit switch, but most hoists have only a control circuit upper limit switch, which triggers a control relay which in turn stops the upward travel of the hoist. A power circuit limit switch physically opens a disconnect switch, which actually breaks the circuit. When handling hot metal, it is critical to stop the hook block before it hits the hoist body. Such a collision could cause the hot metal to splash out of the ladle. A standard control circuit limit switch could (in theory) fail to work if the relays become defective, but a power circuit limit switch is nearly foolproof.
- ❑ When the hook is in its lowest position (at the floor), there must be **3 wraps of wire rope** still on the drum (2 wraps is the standard).
- ❑ Trolleys must be fitted with **drop lugs,** to hold the trolley on the cross girder in case of axle failure. Standard cranes require only the end trucks to have drop lugs.
- ❑ A **warning device** (either a bell, horn, siren, or flashing light) is required to be activated whenever the crane is in motion.



Carrying hot metal poses many additional safety concerns. The Foundryman's code addresses these issues and assures a safe crane.

- ❑ All " suspension bolts" (bolts that hold the hoist to the trolley) that are in tension require an **external locking device,** such as cotter pins, rather than lock washers or double nuts.

Other Recommended (but not required) Features:

A number of options are available to help improve safety and performance of cranes that carry hot metal.

- ❑ **Independent traveling push button** that allows the crane operator to stand a safe distance from the load.
- ❑ **Small pendant** allowing one-handed operation. Often the crane operator will want to use one hand to steady the load.
- ❑ **Soft start** on bridge and trolley, so that the load does not swing on start-up. The gentle acceleration of a soft start prevents the load from penduluming.
- ❑ **Soft stop** on bridge and trolley, so that the load does not swing when stopping. Either a mechanical "gentle stop" brake or an inverter controlled brake will stop a crane without load swing. Avoid electric brakes which stop the crane too quickly and cause the load to swing.

Also: See North American Industries Technical Report on Cranes For High Temperature Environments.