The Crane, Hoist and Monorail Alliance

CMAA CRANE MANUFACTURERS ASSOCIATION OF AMERICA, INC. | HMI HOIST MANUFACTURERS INSTITUTE | MONORAIL Manufacturers Association Workstation Cranes & Patented Track Systems

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Safety Sheet No. 12 : Hoist/Trolley Control - Contactor vs. Variable Frequency Drive (VFD)

Hoist operators are provided many safety and equipment benefits with VFD hoist/trolley controls. Ramp-up (acceleration) and ramp-down (deceleration) times provided by VFD controls reduce the "load bouncing" and "load swinging" effect that can sometimes be created with contactor controls. To obtain the maximum benefits of VFD controls, hoist operators must be aware that a VFD hoist/trolley needs to be operated differently than a hoist with contactors. To receive the maximum benefits of VFD hoist/trolley controls, proper training with hands-on exercises is recommended for fist time VFD hoist/trolley operators.

How do VFD hoist/trolley controls work? VFD controls adjust the speed by changing the frequency applied to the motor. The hoist/trolley operator manages this speed adjustment by one of many optional interfaces (pushbutton, radio control, etc.). This example illustrates the use of a two-step pushbutton (Figure 1).

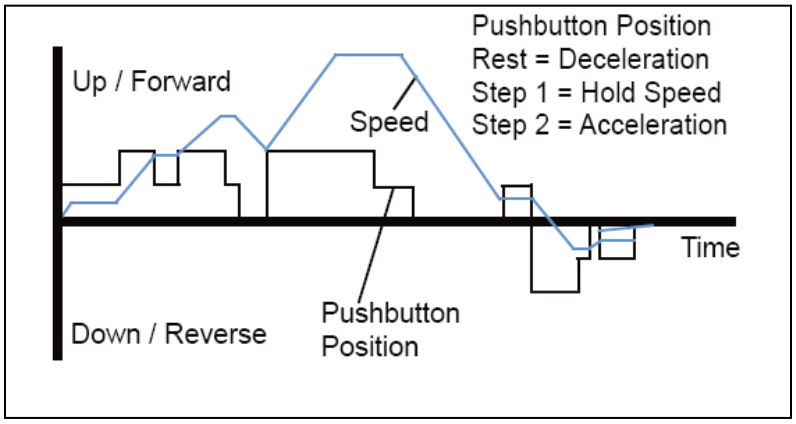

Figure 1

What are the differences between contactor control and VFD control? The biggest difference is the deceleration time. The hoist stops almost instantaneously with contactor controls. Even though the deceleration time with VFD controls is only seconds, it can take a while for operators used to contactor controls to adjust.

What are the benefits?

- Hoist operator controls the speed.
- Ability to select a very slow speed removes the need to "jog" or "inch" a load into place.
- Controlled acceleration/deceleration:
  - Smoother starts and stops
  - Lower motor starting currents (less energy consumption)
  - Reduced gear and motor wear
  - Less structural stress on mechanical components
- Longer equipment up-time and overall life.
- Safer work environment through load control:
  - The operator can match the hoist/trolley speed to the application.
  - The operator can reduce "load bounce" and "load swing" by controlling the speed.

How should first time VFD hoist/trolley control operators prepare? It is your employer's responsibility to provide you with training and to ensure the safe operation of this equipment. Be sure to read the Operator's Manual provided with the equipment. By practicing and becoming familiar with the features of VFD controls, you will obtain the maximum safety benefits.

For additional information and safe lifting practices, please refer to links in the MHI website http://www.mhi.org/osha

Under the Occupational Safety and Health Act, employers are responsible for providing a safe and healthy workplace and workers have rights. OSHA can help answer questions or concerns from employers and workers. OSHA's On-site Consultation Program offers free and confidential advice to small and medium-sized businesses, with priority given to high-hazard worksites. For more information, contact your regional or area OSHA office, call 1-800-321-OSHA (6742), or visit www.osha.gov.

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