

## *VRC Installer Guidelines & Responsibilities*

Proper installation of Vertical Reciprocating Conveyors (VRCs) is vital to the the safety of the operators, the efficiency of the unit, and the ultimate satisfaction of the end user. These guidelines have been prepared by member companies of the Material Handling Industry's VRC Subcommittee to assist the VRC installers in understanding their role and responsibility in providing customers with a safe and reliable VRC.

### I. Pre-Installation Activity

- A. Whenever possible, make a pre-installation visit or call someone at the site. Installers must be familiar with everything relative to proper installation of this equipment. It is the installer's responsibility to check the site for problems and work out solutions with the appropriate people – preferably before installation begins.
- B. Check floor-to-floor dimensions on the general arrangement drawings to make sure that they match on-site conditions. VRC's are designed and built to individual applications and specific customer requirements. It is difficult and expensive to modify the lift after it arrives for installation.
- C. Installation may or may not include unloading, permits, seismic calculations, or extensive acceptance testing. The requirements of each contract should be carefully reviewed for possible conflicts of interpretation.
- D. Each state, county, or municipality may have unique codes governing the installation and acceptance of VRC's. Acquaint yourself with the permitting and/or licensing requirements (and expenses) of the local regulatory agencies. Note also that some agencies may require inspection or testing before and/or after lift start-up.
- E. Make sure there is adequate ingress/egress to the installation site. Verify that the equipment can get through the existing doorways, halls, and shaft openings. Think through how the lift will be unloaded, carted/moved, raised into position, and accessed for installation, operation & maintenance.
- F. Verify the construction and integrity of building columns, joists, walls, or mezzanines that will be used to help support the VRC mast guide beams.

### II. Shipment & Initial Inspection

- A. Upon receipt of the shipment, check for exposed damage or shortages and make note of it on receiving paperwork from the trucking company, any claims for damage must be filed with the carrier. Unless otherwise stated, the VRC Manufacturer is not responsible for parts lost, stolen or damaged during transportation, storage, or installation.
- B. Assuming no damage has occurred to the crate, check the components against the packing list. This will provide assurance that every item shipped has been received.

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- C. Make sure you have a copy of the latest version of the general arrangement and electrical drawings before beginning installation, changes could have been made since original purchase order submittal and order entry.
- D. Read and understand the Installation & Service manual thoroughly prior to starting the installation.

### III. Equipment Layout

- A. Make sure pit and/or lift are properly squared and vertically aligned with upper landings to ensure that the carriage will clear the upper landings by the required distance.
- B. Be sure to take into consideration any other obstructions (pipes, ductwork, ceiling joists/beams, etc.) that may be located around the lift.

### IV. Structural Installation

- A. Follow the bracing recommendations shown on the general arrangement drawings and in the Installation & Service manual. Site conditions may also require customization to standard anchoring and bracing. The installers are ultimately responsible for the proper and safe anchoring and bracing of the equipment and should consult the manufacturer if there is any doubt as to the structural integrity of the installation.
- B. When anchoring guide beams to walls, you must be sure that the walls can support the reaction loads imparted on them.
- C. If spliced masts are provided, be sure to assemble and field install them exactly to the Manufacturer's recommendations. Failure to do so will reduce the safety and performance of the VRC.
- D. Make sure guide beam pairs are plumb, parallel, and straight after you are finished with all welding.
- E. Do not modify any component of the lift without expressed written consent from the Manufacturer.

### V. Mechanical Installation

- A. Most work can be done with the lift carriage fully lowered. Never work under the lift carriage unless it is blocked in place per the Installation and Service manual.
- B. Never allow a person to ride on the carriage of the lift.
- C. Use only the hardware supplied by the Manufacturer to assemble the lift. This hardware is often high grade, some hardware is metric.

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- D. Do not remove or disconnect the motor brake on mechanical drives unless carriage and lifting chains are secured and properly supported.
- E. Check gearbox fluid levels before starting up mechanical drive units. Failure to do so will reduce the effectiveness and safety of the lift.
- F. Use only the carriage lifting cables or chains and attachment hardware supplied by the Manufacturer.

### VI. Hydraulic Installation

- A. Most work can be done with the lift carriage fully lowered. Never work under the lift carriage unless it is blocked in place per the Installation and Service manual.
- B. Never use Teflon tape on threaded connections. Teflon tape does not dissolve and, if introduced into hydraulic system, may contaminate the oil and cause valving to malfunction.
- C. Never adjust a relief valve setting, these are factory set to meet design and code requirements.
- D. Carefully bleed all air out of the hydraulic system before running lift to full travel per Manufacturer's procedure in the Installation and Service manual.
- E. Make sure that the oil level in the reservoir is sufficient for running lift to full travel.
- F. Use only hydraulic fluid recommended by the Manufacturer in the Installation and Service manual.
- G. Make sure all pressure in the system is relieved before cracking open or disassembling any pressurized fitting or hose.

### VII. Electrical Installation

- A. Ensure that the supplied voltage matches the motor supplied.
- B. Make sure the customer-supplied electrical disconnect is installed and adequately fused.
- C. All electrical work must meet the requirements of ASME B20.1 as well as all state and local codes.
- D. Make sure that only qualified electricians perform all wiring and that they are familiar with the electrical drawings shipped with the equipment.
- E. Do not operate the lift until the carriage is leveled and the guide beams are plumbed and secure.

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- F. Never operate the lift by “manualling” the electrical controls (using the contactors located inside the control panel). All safety devices are by-passed in this mode of operation and lift damage or severe personal injury could occur.
- G. Do not operate the lift using the operator pushbuttons prior to having all safety devices and/or gate interlocks wired and in the circuit. Never by-pass any safety device and/or interlock.
- H. Electrician should ensure that motor brake wiring is complete when wiring the motor.
- I. Operator pushbutton stations must not be operable from the carriage with the gate(s) or door(s) closed, or must be located at least 6 feet away from the carriage platform.
- J. Per OSHA requirements, the control panel must be mounted in a location that is visible from the lift.
- K. Always follow OSHA lock-out, tag-out procedures when the lift being maintained, serviced, or inspected.

### VIII. Personnel & Equipment Safeties

- A. ASME B20.1 requires that all VRC installations be completely guarded to prevent injury from inadvertent contact with the lift or its load. ASME also requires that doors or gates at all unloading stations be interlocked so that these doors can only be opened when the lift carriage is stopped at that level & that the carriage is incapable of being operated or moved so long as these doors or gates remain open. It is the responsibility of the installer to ensure that the installation meet these requirements, regardless of who (manufacturer, customer, architect, general contractor, etc.) provides the doors/gates and means of enclosure. Consult the manufacturer whenever there is a question as to whether or not the gate & enclosure installation meets ASME B20.1.
- B. Where the application requires personnel to walk onto the carriage in the raised position, the installer must ensure that the carriage is adequately provided with railings, guards, and snap chains that are a minimum of 42” high.
- C. Travel limit switches, slack chain or cable sensors, and over travel sensors (for mechanical units) must be installed and working properly.
- D. Ensure proper operation and engagement of motor and carriage brake assemblies.

### IX. Testing

- A. Test up and down speeds.

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- B. Test all limiting devices, gate interlocks, gate status switches, sensors, and any other safety features or devices as outlined by the Installation and Service manual.
  - C. Some states or municipalities may require testing of the carriage free-fall arrest system (carriage brakes, slack chain/cable brakes, etc.) – consult the manufacturer.
- X. Clean-up & Hand-off
- A. Ensure that all necessary adjustments to the interlocks, gate status switches, upper & lower lift status limit switches allow proper operation of the lift and its safeties per the manufacturer's requirements.
  - B. Apply proper signage to all locations of the installation per the guidelines in the Installation and Service manual. Consult the manufacturer if labels appear to be missing or damaged.
  - C. Clean up any spilled oil from the area.
  - D. Train key personnel on the operation of the system and all safety features and procedures.