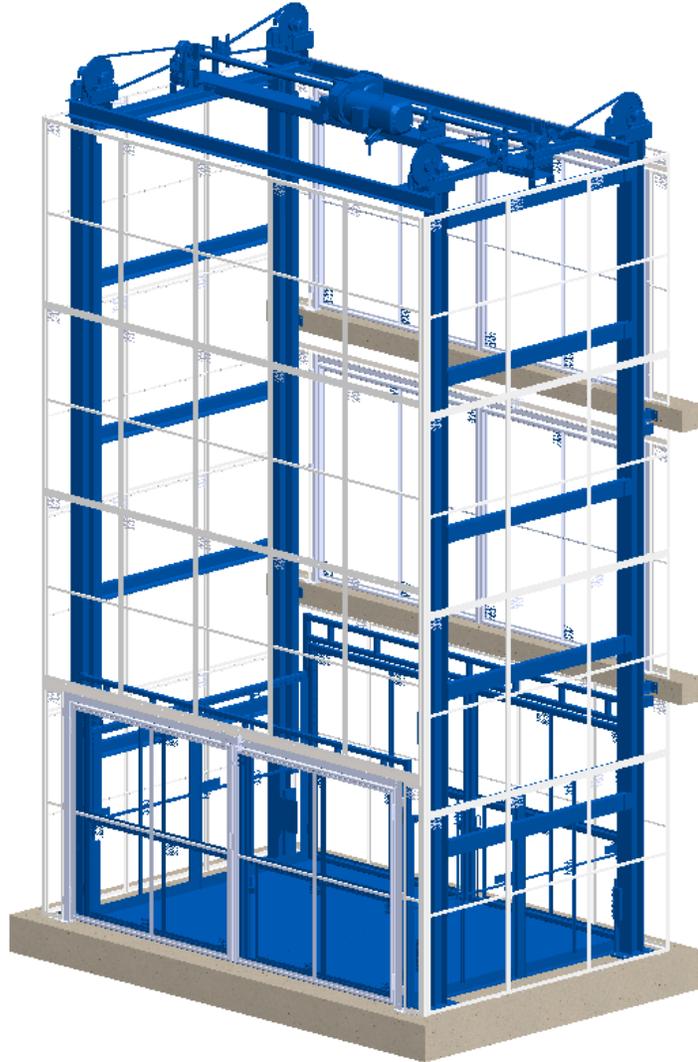


VRC INSTALLATION, OPERATION AND SERVICE MANUAL

Models – FM4



Autoquip

Innovative Lift Solutions

1058 West Industrial Road • Guthrie, OK 73044-1058
888-811-9876 • 405-282-5200 • www.autoquip.com

Item# 830FM4

Version 1.0
April 2021

Contents

| | | |
|------------|---|-----------|
| 1. | Introduction | 1 |
| 1.1 | Contact Information | 1 |
| 1.2 | Code Requirements/Compliance | 1 |
| 1.3 | Important | 1 |
| 1.4 | Identification | 2 |
| 1.5 | Inspection | 2 |
| 1.6 | Modifications | 2 |
| 2. | Responsibility of Owners/Users | 3 |
| 2.1 | Inspection & Maintenance | 3 |
| 2.2 | Removal from Service | 3 |
| 2.3 | Repairs | 3 |
| 2.4 | Operators | 3 |
| 2.5 | Before Operation | 3 |
| 2.6 | During Operation | 3 |
| 2.7 | Modifications or Alterations | 3 |
| 3. | Safety | 4 |
| 3.1 | Safety Signal Words | 4 |
| 3.2 | Safety Features | 7 |
| 3.3 | Safety Labels | 9 |
| 4. | Installation | 13 |
| 4.1 | Pre-installation Activity | 13 |
| 4.2 | Shipment and Initial Inspection | 13 |
| 4.3 | Equipment Layout | 14 |
| 4.4 | Structural Installation | 14 |
| 4.5 | Personnel & Equipment Safeties | 14 |
| 4.6 | Testing | 15 |
| 4.7 | Clean-up & Hand-off | 15 |
| 4.8 | Tools Required | 15 |
| 4.9 | Laying Out Platform Position & Marking Floors for Alignment | 16 |
| 4.10 | Mechanical Installation Details | 18 |
| 4.10.1 | Platform Assembly | 18 |
| 4.10.2 | Spliced Beams (when used) | 20 |
| 4.10.3 | Positioning Wheel Guide Assemblies | 21 |
| 4.11 | Raising the Beams and Wheel Guides | 23 |
| 4.12 | Drive Base Installation and Securing the Masts | 27 |
| 4.13 | Bracing the Beams | 30 |
| 4.14 | Lifting Chain Installation Details | 33 |
| 4.14.1 | Installing Reinforcing Bar (Straddle ONLY) | 36 |
| 4.15 | Electrical Installation Details | 37 |
| 4.16 | Leveling the Platform | 38 |
| 4.17 | Installing Sensing Switches | 40 |
| 4.17.1 | Level Limit Switch Kits | 40 |
| 4.17.2 | Over-Travel Limit Switch Kit | 41 |
| 4.17.3 | Slack Chain Sensing Switch Kit | 42 |
| 4.17.4 | Counterweight Sensing Switch Kit | 44 |
| 4.18 | Test Run (Empty) | 45 |
| 4.19 | Final Adjustments | 46 |
| 4.20 | Gate & Enclosure (Guarding) Installation | 46 |
| 4.21 | Shaft Way Barrier Bar Kit (for shaft way applications) | 47 |
| 4.22 | Back-Stop Kit (when ordered) | 48 |
| 4.23 | Installation Wrap-Up | 49 |
| 5. | Blocking Instructions | 50 |
| 5.1 | Lower the Platform | 50 |
| 5.2 | When the Platform Must be Raised or Secured | 50 |
| 6. | Operation | 52 |
| 6.1 | Moving Up | 52 |
| 6.2 | Moving Down | 53 |
| 6.3 | Emergency Stop | 53 |
| 7. | Maintenance | 54 |
| 7.1 | Planned Maintenance Program | 54 |
| 7.2 | Routine Maintenance | 54 |
| 7.3 | General Maintenance | 55 |
| 7.3.1 | Oil Recommendations | 55 |
| 7.4 | Gear Motor/Drive Maintenance | 55 |
| 7.5 | If a Platform Hangs Up or Jams | 56 |
| 7.6 | Schematics and Field Wiring Details | 56 |
| 8. | Troubleshooting | 57 |
| 9. | Parts Lists | 60 |
| 9.1 | General Assembly | 60 |
| 9.2 | Typical Drive Unit | 61 |
| 10. | Warranty | 62 |

I. INTRODUCTION

WARNING



Please read and understand this manual prior to installation or operation of this lift. Failure to do so could lead to property damage and/or serious personal injury.

NOTICE

The control panel instructions are in the controller manual sent with the order. These are required for installation.

I.1 Contact Information

If you have any questions, contact a local representative, or use the Autoquip contact information below.



Autoquip Corporation
1058 West Industrial Road
Guthrie, OK 73044-1058



aqservices@autoquip.com
sales@autoquip.com



888.811.9876
405.282.5200



[\(FM4 documentation\)](#)



I.2 Code Requirements/Compliance

Vertical Reciprocating Conveyors (VRCs) are ***NOT*** elevators. This conveyor (lift) is designed for the transfer of material only from one level to another. Absolutely NO RIDERS! VRCs have their own national safety code (ANSI/ASME B20.1) and are specifically exempt from the National Elevator Code.

Some states require special components and have specific guidelines regarding how the equipment must be installed, inspected, and tested. The owner is ultimately responsible for understanding these requirements for the specific job location, and Autoquip will incorporate any special requirements into the order as requested and approved by the customer.

Note: Contact Autoquip ([see 1.1 Contact Information](#)) with any questions you may have concerning VRC code requirements.

I.3 Important

Autoquip Corporation has designed and manufactured the VRC to move materials safely and efficiently between multiple floors or levels. It has been built to provide many years of dependable service.

OPERATORS - Please read and understand this manual prior to operation of this VRC. Failure to do so could lead to property damage and/or serious personal injury.

Situations may arise which are not covered in this manual. If you have questions, please contact Autoquip Customer Service ([see 1.1 Contact Information](#)).

NOTE: Unless otherwise stated, mechanical installation does not include unloading, permits, seismic calculations, or extensive acceptance testing. The requirements of each contract should be carefully reviewed for possible conflicts of interpretation.

I.4 Identification

When ordering parts or requesting information or service on this lift, PLEASE REFER TO THE SERIAL NUMBER. This information is on a nameplate attached to the controller. Replacement parts are available from a local representative or Autoquip ([see 1.1 Contact Information](#)).

Please record the following information and refer to it when contacting your representative or Autoquip.

Model Number: _____ Serial Number: _____

Installation Date: ____/____/____

I.5 Inspection

NOTICE

The “Bill of Lading” will state the number of pieces shipped. TWO ITEMS MAY BE BANDED TOGETHER AND COUNT AS ONE PIECE.

Upon receipt of the shipment, check for exposed damage or shortages and make note of it on the trucking company Bill of Lading or the Shipping Papers. Reports of concealed damage to items contained in crates must be reported within 48 hours. DO NOT destroy the crating while opening it to inspect the contents. If damage is suspected or found, report it directly to the carrier. DO NOT contact Autoquip Corporation!! **All shipments are FOB from the Autoquip plant. Any claims for damage must be filed with the carrier. Any parts shipped from Autoquip that are intended to replace damaged or lost items will be invoiced to the ordering party.**

Assuming no damage has occurred to the crate(s), check the components against the packing list. This will provide assurance that every item shipped has been received, report any shortages to Autoquip Corporation within 10 days. (Autoquip is not responsible for parts lost, stolen or damaged during transportation, storage, installation, or during any other circumstances that are beyond corporate control.)

I.6 Modifications

⚠ WARNING

Do not modify lift. Autoquip cannot foresee and is not responsible for injury or damage which results from unauthorized modifications or misuse of lift.

2. RESPONSIBILITY OF OWNERS/USERS

2.1 Inspection & Maintenance

The lift shall be inspected and maintained in accordance with this manual and with other applicable safe operating practices.

2.2 Removal from Service

Any lift not in safe operating condition such as, but not limited to, excessive leakage, missing parts or fasteners, any bent or cracked structural members, cut or frayed electric, hydraulic, or pneumatic lines, damaged or malfunctioning controls or safety devices, etc. shall be removed from service until it is repaired to the original manufacturer's standards.

2.3 Repairs

All repairs must be made by a qualified technician in conformance with Autoquip's instructions. ASME B20.1 defines a qualified person:

Qualified person - *a person who, by possession of a recognized degree or certificate of professional standing or by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve problems relating to the subject matter and work.*

2.4 Operators

Only authorized personnel shall be permitted to operate lift.

Authorized personnel - *a trained or qualified person approved or assigned to perform a specific duty or duties.*

Trained personnel - *personnel who have been trained by a qualified person and have demonstrated the ability to perform a particular function on or around a VRC.*

2.5 Before Operation

Before using lift, operator shall:

- Read and/or had explained, and understood, manufacturer's operating instructions and safety rules.
- Inspect lift for proper operation and condition. Any suspect item must be carefully examined and a determination made by a qualified person as to whether it constitutes a hazard. All items not in conformance with Autoquip's specification must be corrected before operating lift.

2.6 During Operation

Use lift in accordance with this manual.

- Do not overload lift.
- Do not allow any portion of the load to overhang the perimeter of the platform.
- Verify all safety devices are operational and in place.

2.7 Modifications or Alterations

Modifications or alterations to this equipment may be made only with written permission of Autoquip. Unauthorized modification or alteration will void warranty.

3. SAFETY

3.1 Safety Signal Words

Before installing, operating or servicing lift, you must read, understand and follow the instructions and safety warnings in this manual. Your lift may not be equipped with some optional equipment shown in this manual.

The safety information in this manual is denoted by the safety alert symbol: 

The level of risk is indicated by the following signal words.

DANGER

DANGER – Indicates a hazardous situation, which, if not avoided, will result in death or serious injury.

WARNING

WARNING – Indicates a hazardous situation, which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION – Indicates a hazardous situation, which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE – Indicates a situation that could result in damage to the lift or other property.

The following alerts will be identified in this manual.

DANGER



- All maintenance procedures described in this section should only be performed by qualified service personnel.



- Failure to properly adhere to lift blocking procedures is to risk the sudden and uncontrolled descent of the lift during maintenance or inspection. A falling lift can cause severe injury or death.
- Never go under lift platform until load is removed and mechanism is securely blocked in raised position with maintenance devices ([see 5 Blocking Instructions](#)).
- Do not stand beneath the platform while setting the maintenance device into position.



- Check the stability of the supports. If there is any chance of the support tipping or otherwise not providing a safe and stable condition, do not go under the platform!



- Turn off the power and lock out the power at the primary power disconnect switch before service or maintenance per OSHA Lock-Out, Tag-Out procedures.
- Never operate unit when parts are broken or damaged! Do not operate this equipment when non-factory approved or damaged parts are in use! Contact local representative to rectify all such situations or contact Autoquip ([see 1.1 Contact Information](#)).



- DO NOT remove or disconnect the motor, brake, or drive chains unless platform has been blocked with maintenance devices ([see 5 Blocking Instructions](#)).
- DO NOT walk out onto the platform or attempt to physically free the jam until load is removed and mechanism is securely blocked with maintenance devices ([see 5 Blocking Instructions](#)).

⚠ WARNING



- Please read and understand this manual prior to installation or operation of this lift. Failure to do so could lead to property damage and/or serious personal injury.
- Do not modify lift. Autoquip cannot foresee and is not responsible for injury or damage which results from unauthorized modifications or misuse of lift.
- Slack chains require factory help! Do not attempt to repair slack chain conditions alone! Always contact the local representative or Autoquip ([see 1.1 Contact Information](#)).
- Never run the unit with the gates or doors open! Do not operate unit with doors open or with the interlocks “defeated” (bypassed)!
- Shaft way door barrier bars are not intended to be used as a primary means of personnel protection. It is the responsibility of the operator to ensure that all gate/door interlocks have been installed and are functioning properly. Serious injury or death could result if upper level gates/doors can be opened when the lift is not present at that level.
- To protect against death or serious injury, all labels must be on lift and must be legible.
- If any of these labels are missing or cannot be read, contact Autoquip for replacement labels ([see 1.1 Contact Information](#)).
- Improperly or inadequately supported beams could fall and cause serious injury to adjacent personnel or permanent damage to the equipment.
- Do not depend on the platform uprights and wheel blocks to support the beam! Use other means to support and secure the beams in the raised position during installation and prior to final bracing.
- Do not weld on the inside of the guide flanges where the wheel guide runs in the masts! Interfering with the free travel of the wheel guides could cause permanent damage to the lift and prevent safety devices from operating as intended.
- Never operate the lift by “manual-ing” 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.
- When running the unit before ALL limit switches are installed, be prepared to disconnect power on demand. Allowing platform over-travel in either direction can result in severe damage to the equipment and potential injury to standers-by. Temporary power must NOT be used.
- Ensure one “WARNING – Do Not Tamper” label is adjacent to (within 6”-12”) each sensing device (limit switches, door status switches, door interlocks, etc.) in a location that is visible to the operator.
- GUARDS, INTERLOCKS, SAFETY DEVICES and ELECTRICAL CIRCUIT must be restored to correct operation when installing parts or making adjustments or repairs.
- No riders! The VRC is provided for the sole purpose of transporting goods between floor elevations. At no time should it be used to transport personnel.
- Before operating VRC, all personnel interacting with lift must read, understand, and follow instructions and safety warnings in this manual.
- Close all gates when not in use. Never leave the VRC unattended with gates left open.



⚠ CAUTION

- A simple basket strap method may allow rotation of the whole assembly.
- Never use concrete anchor bolts on a cinderblock or brick wall! The wall will not withstand the pull force developed by the lift. Use only recommended anchoring and bracing methods illustrated in this manual. Equipment damage or personal injury could result.
- Do not operate the VRC until the platform is leveled and the guide beams are plumbed and secure.
- All chains must be fully engaged with the teeth of all chain sprockets before operation begins. Chains which jump the sprockets during tensioning can cause permanent damage to the lift.
- Do not operate the VRC until all sensing switches have been confirmed to be installed and adjusted correctly.

NOTICE

- The control panel instructions are in the controller manual sent with the order. These are required for installation.
- The “Bill of Lading” will state the number of pieces shipped. TWO ITEMS MAY BE BANDED TOGETHER AND COUNT AS ONE PIECE.
- In order for the lift to operate:
 - All gates/doors guarding the lift must be closed.
 - Loads cannot hang over the edge or sides of the platform.
 - The load must be within the specified load capacity of the lift.
 - All electrical safeties, sensors, and switches must be in their “normal” condition.
- Per ASME B20.1, operator pushbutton stations must be located such that they cannot be activated while standing on the platform.
- Always find out why the MOR has tripped, and be sure to correct the problem (malfunction, interference, etc.) before making the lift operational again.
- Always find out why the counterweight sensing switch has tripped, and be sure to correct the problem (malfunction, interference, etc.) before making the lift operational again.
- Always find out why the E-Stop button may have been pressed, and be sure to correct the problem (malfunction, interference, etc.) before making the lift operational again.

3.2 Safety Features

There are several active safety features and devices to help protect personnel, property, and the equipment.

Mechanical Locking Safety Cams

Each chain is terminated at the platform in a clevis, which is attached to a tension spring loaded steel safety cam. This safety cam pivots on a high strength steel pin which is chrome plated. The safety cam has serrated teeth cut into one of its faces that are adjacent to the guideway flange.

Should the chain become slack for any reason, the spring tension would cause the serrated teeth of the safety cam to engage the guideway. The teeth bite into the guideway and a wedging effect takes place between the safety cam and the guideway. The result is a positive halt to downward movement.

The only way to release the safety cam is to correct the malfunction that caused the slack chain and exert upward tension on the chain through the chain drive. The cams will support the loaded platform at any point in the vertical travel.

⚠ WARNING

Slack chains require factory help! Do not attempt to repair slack chain conditions alone! Always contact the local representative or Autoquip ([see 1.1 Contact Information](#)).

Slack Chain Sensors

The slack chain sensors are located on the drive base and mast head assembly. The sensors are made up of a mechanical spring tensioner with a nylon roller and an electrical sensing switch. The lifting chains run over the sprockets beside the slack chain sensors, and then to the platform. The drive chains run from the drive base assembly to the mast head assemblies in each corner. The platform holds the chains in constant tension. The sensing switch arm is adjusted to hold the sensing switch contacts closed as the tensioner roller is running against the taut chain. Should a chain become slack or broken, the spring tensioner would rotate and activate the sensing switch arm to open its normally-closed electrical contacts. This would break electrical power to the drive motor and cease movement of the platform. The lift will not operate until each slack chain sensor is restored to its correct operating condition. There is a slack chain sensor for each lifting chain and drive chain.

Platform Over-Travel Limit Switch

A redundant, over-travel limit switch is provided to be field located and installed just above the uppermost level limit switch to stop the motor should the platform not stop at the upper level limit switch location. Breaking of this switch would break the electrical circuits, shut off the motor, and cease movement of the platform. The platform will not move until the over-travel limit device is restored to its correct operating condition.

Counterweight Sensing Switch

These two switches are located on the top of the right side counterweight tubes as a redundant sensing device in the event the slack chain sensors are not performing as designed and the lift motor continues to run in an attempt to lower a jammed platform. If the counterweights attempt to be pulled from their tubes, this switch will activate and will cut off electrical power to the motor.

Power Supply Secondary Circuit Breaker

This circuit breaker is down stream of the power supply and protects the 24 volt DC control circuit from damage should a fault occur which would result in excessive electric current flow. Should the circuit breaker trip it will prevent operation and the interlock circuit will not operate. These circuit breakers are in the control enclosure.

Motor Overload Relays (MOR)

These are current sensing devices that are in line with the three legs of the electric motor primary power circuit (208, 230, or 460 volt). They protect the motor from excessive current draw and overheating if it becomes overloaded or has a short circuit. Should an over-current situation be detected on any leg the MOR will trip and open the path to ground for the contactor coil via an auxiliary contact.

Safety Interlocks/Latches-Gates or Doors (where applicable)

These are electro/mechanical devices that prevent operation of the VRC when the gates or doors are left open on any level. They also prevent the gates or doors from being opened at any level unless the platform is in place at that floor level.

⚠ WARNING

Never run the unit with the gates or doors open! Do not operate unit with doors open or with the interlocks “defeated” (bypassed)!

Shaft Way Door Barrier Bars (where applicable)

Shaft way door barrier bars are designed to provide a secondary means of personnel protection at the upper level landing of a VRC shaft way installation. When the platform is not present at the upper level, the two barrier bars rest in permanent brackets attached to both sides of the door frame on the outside (shaft side) of the upper level door. The barrier bars form rigid barriers at approximately 24” and 48” above floor level. In the unlikely event that the upper level door is able to be opened when the platform is not at the upper landing, the bars provide an additional means of personnel protection against stepping or backing into the shaft way where the platform could be assumed to be present.

When properly installed, the barrier bars are lifted along their tracks by the platform as it approaches the upper landing until it is completely above the load height as the lift stops. As the lift moves to the lower level, it carries the bars back to their stationary brackets attached to the outside of the door.

⚠ WARNING

Shaft way door barrier bars are not intended to be used as a primary means of personnel protection. It is the responsibility of the operator to ensure that all gate/door interlocks have been installed and are functioning properly. Serious injury or death could result if upper level gates/doors can be opened when the lift is not present at that level.

Personnel Guards

Depending on the application, one or more of the following personnel protection features is included in the design of this equipment (different states may vary on the exact design and orientation of these features – IT IS IMPORTANT TO BECOME FAMILIAR WITH THE SPECIFIC CODE REQUIREMENTS OF YOUR STATE):

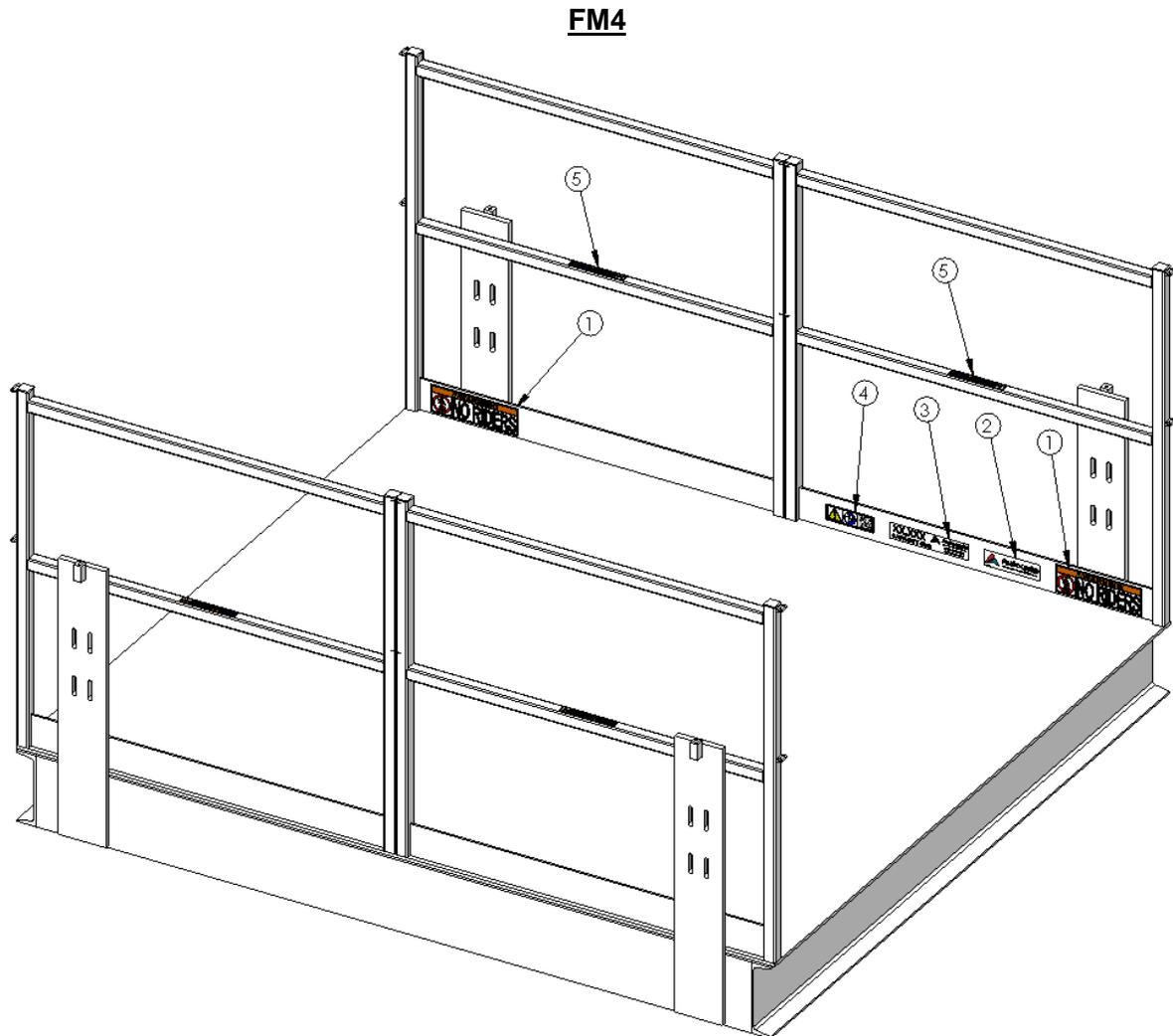
- **GATES & ENCLOSURES:** Required per ASME B20.1 to protect personnel from inadvertent physical contact with a moving lift & moving load at all lift landings.
- **PLATFORM RAILINGS & SNAP CHAINS:** Required per ASME B20.1 to protect personnel whenever personnel walk onto the lift platform when in the raised position. Railings or side guards protect non-operating sides, snap chains protect operating sides.
- **PLATFORM BACK-STOP PANELS:** Additional safety feature required at all upper levels to provide additional fixed guarding 2” (max.) away from & across all unused, operating sides of the lift (typical with non-shaft way, “Z”, & 90-degree load patterns).

3.3 Safety Labels

⚠ WARNING

To protect against death or serious injury, all labels must be on lift and must be legible.

If any of these labels are missing or cannot be read, contact Autoquip for replacement labels ([see 1.1 Contact Information](#)).



FM4 labels (platform)

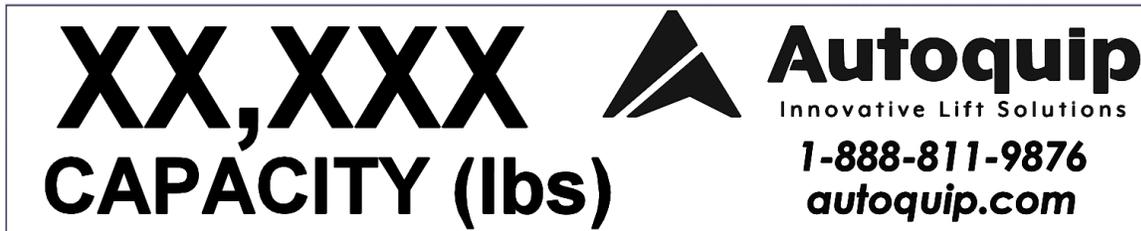
| Item # | Qty. | Description | Part No. |
|--------|--------|--------------------------------------|----------------|
| 1 | 1 / 4 | Warning – No Riders | 36404093 |
| 2 | 1 / 4 | Autoquip Logo Label | 36403220 |
| 3 | 1 / 4 | Capacity | DECAL_CAPACITY |
| 4 | 1 / 2 | Caution – Familiarize Yourself . . . | 36401487 |
| 5 | 1/rail | Warning: Platform Personnel Guarding | 36403720 |



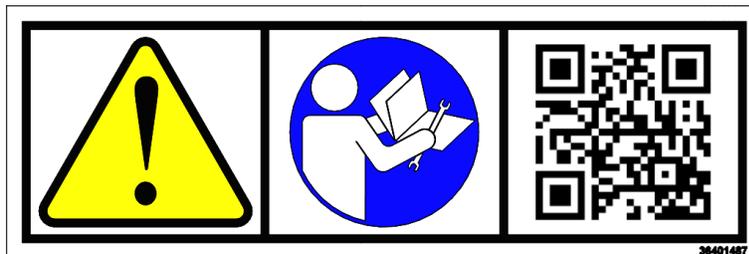
1 – 36404093



2 – 36403220



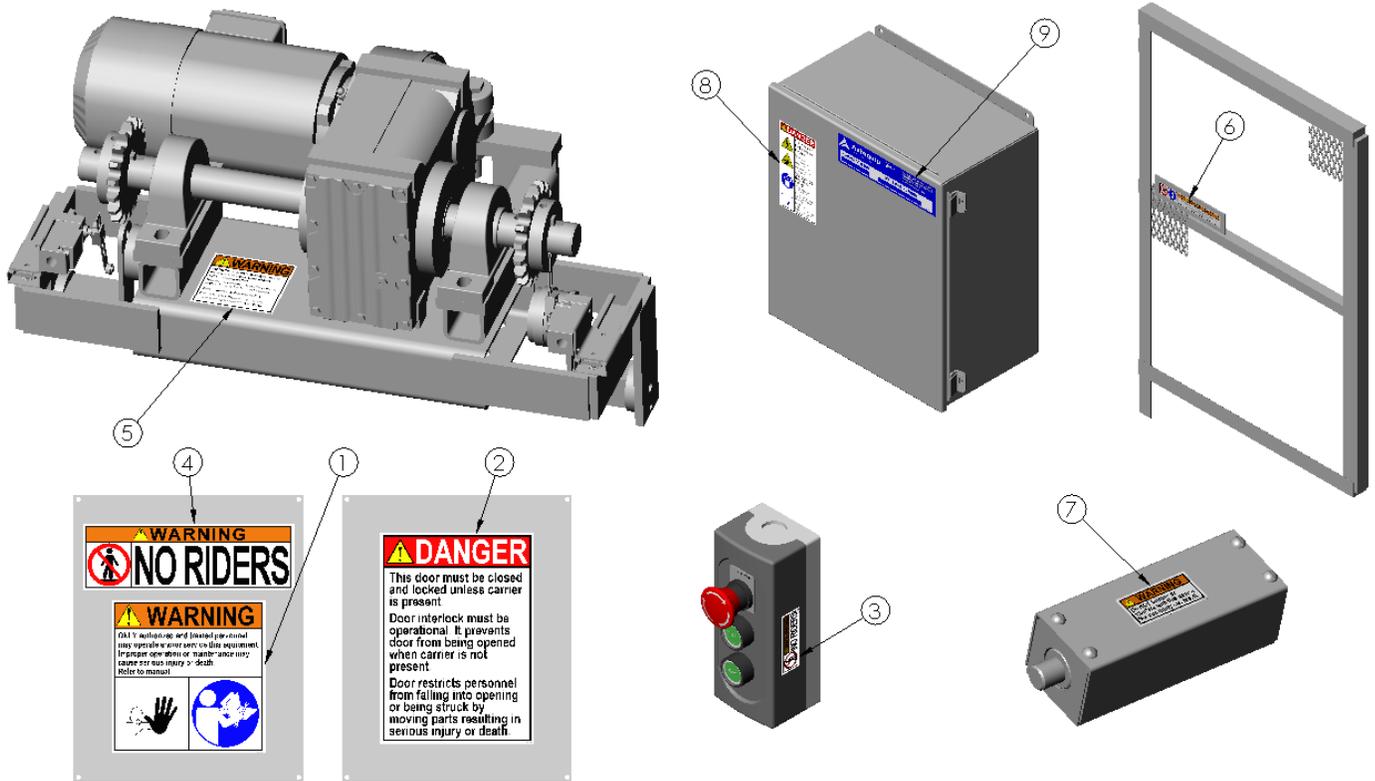
3 – DECAL_CAPACITY



4 – 36401487



5 – 36403720



| FM4 labels (other locations) | | | |
|------------------------------|-----|--|----------|
| Item # | Qty | Description | Part # |
| 1 | 1 | WARNING, ONLY AUTHORIZED AND TRAINED.... | 36405670 |
| 2 | 1 | DANGER, THIS DOOR MUST BE CLOSED.... | 36405680 |
| 3 | 1 | WARNING, NO RIDERS | 36405705 |
| 4 | 1 | WARNING, NO RIDERS | 36404093 |
| 5 | 1 | WARNING,DO NOT DISASSEMBLE MOTOR/GEAR... | 36405110 |
| 6 | 1 | WARNING, DO NOT OPERATE W/O PLATFORM.... | 36403720 |
| 7 | 1 | WARNING, DO NOT TAMPER w/ THIS SAFETY DEVICE | 36405695 |
| 8 | 1 | DANGER, ARC FLASH, SHOCK | 36430303 |
| 9 | 1 | AUTOQUIP SERIAL NUMBER NAME PLATE | 36401570 |

WARNING

ONLY authorized and trained personnel may operate and/or service this equipment. Improper operation or maintenance may cause serious injury or death. Refer to manual.

1 - 36405670

DANGER

This door must be closed and locked unless carrier is present.

Door interlock must be operational. It prevents door from being opened when carrier is not present.

Door restricts personnel from falling into opening or being struck by moving parts resulting in serious injury or death.

2 - 36405680

WARNING

NO RIDERS

3 - 36405705

WARNING

NO RIDERS

4 - 36404093

WARNING

Do NOT operate without personnel guarding. Serious injury or death could occur.

6 - 36403720

WARNING

Do NOT tamper or interfere with this device. Serious injury can result.

7 - 36405695

DANGER

Shock and arc flash explosion hazards.

Follow ALL requirements in NFPA 70E for safe work practices and for Personal Protective Equipment.

Hazardous Voltage.

Will cause severe injury or death.

Turn off and lock out system power before servicing.

DO NOT operate machine with electrical panel doors opened or covers removed.

8 - 36430303

Autoquip
Innovative Lift Solutions

A SUBSIDIARY OF
MINER
CORPORATION

1058 W. INDUSTRIAL AVE.
GUTHRIE, OK 73044-1058
1-888-811-9876
www.autoquip.com

CAPACITY (LBS)

LIFT SERIAL NUMBER

36401570

9 - 36401570

4. INSTALLATION

NOTICE

The control panel instructions are in the controller manual sent with the order. These are required for installation.

Proper installation of Vertical Reciprocating Conveyors (VRCs) is vital to 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.

4.1 Pre-installation Activity

1. Whenever possible, make a pre-installation visit or contact 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.
2. 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.
3. 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.
4. 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: some agencies may require inspection or testing before and/or after lift start-up. Contact Autoquip ([see 1.1 Contact Information](#)) with any questions you may have concerning VRC code requirements.

5. 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.
6. Verify the construction and integrity of building columns, joists, walls, or mezzanines that will be used to help support the VRC mast guide beams.

4.2 Shipment and Initial Inspection

1. 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.
2. Assuming no damage has occurred to the crate, check the components against the packing list. This will help ensure that every item shipped has been received.

3. 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.
4. Read and understand this manual thoroughly prior to starting the installation.

4.3 Equipment Layout

1. Make sure pit and/or lift are properly squared and vertically aligned with upper landings to ensure that the platform will clear the upper landings by the required distance.
2. Be sure to take into consideration any other obstructions (pipes, ductwork, ceiling joists/beams, etc.) that may be located around the lift.
3. Inspect the installation for any overhanging floor landing or other obstruction (pipes, ductwork, ceiling joists/beams, etc.) which could potentially jam a load that is slightly overhanging the platform deck as it raises to the next floor level. Any potential jam point should have some type of slanted or beveled guarding placed beneath the obstruction to push the overhanging load back onto the platform.

4.4 Structural Installation

1. 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.
2. When anchoring guide beams to walls, you must be sure that the walls can support the reaction loads imparted on them.
3. 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. See Installation Section for acceptable limits.
4. Make sure guide beam pairs are plumb, parallel, and straight after you are finished with all welding. See Installation Section for acceptable limits.
5. Do not modify any component of the lift without expressed written consent from the Manufacturer.

4.5 Personnel & Equipment Safeties

1. 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 platform is stopped at that level & that the platform 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 Autoquip whenever there is a question as to whether the gate & enclosure installation meets ASME B20.1.
2. Where the application requires personnel to walk onto the platform in the raised position, the installer must ensure that the platform is adequately provided with railings, guards, and snap chains that are a minimum of 42" high.
3. Travel limit switches must be installed and working properly.

4.6 Testing

1. Test up and down speeds.
2. Test all electrical switches and sensors, gate interlocks, gate status switches, and any other safety features or devices as described in the Installation section of this manual. Also consult any manuals which may have been shipped separately for the gate installation & operation.
3. Some states or municipalities may require testing of the platform free-fall arrest system (locking cams) – consult the local regulatory agency or the manufacturer.

4.7 Clean-up & Hand-off

1. Conduct a final inspection of the lift installation. Correct any deficiencies before clean-up & hand-off.
2. Apply proper signage to all locations of the installation per the guidelines in the Label Identification section and per any instructions shipped separately with the gate interlock kits. Contact Autoquip ([see 1.1 Contact Information](#)) if labels appear to be missing or damaged.
3. Train key personnel on the operation of the system and all safety features and procedures by referencing the corresponding sections in this manual.

4.8 Tools Required

Listed below are some of the tools needed to install the VRC in a professional and prompt manner. Individual site situations and a basic variation in the types of units may dictate the need for additional items.

| | |
|---|------------------------|
| Welding Machine and Equipment | Disk Grinder |
| Cutting Torch with full Tanks | Drill and Drill Bits |
| Fire Extinguisher | Extension Cords |
| Forklift | Sledgehammer |
| Chain Fall | Open or box end wrench |
| Come-A-Long | Drift Punch |
| Cables or Hook Chains with 1,000# Cap. | Carpenter's Square |
| Hack Saw, Reciprocating Saw, or portable band saw | Chalk Line |
| "C" Clamps (12" opening) | Plumb Bobs |
| Socket Set (1/2" drive, sockets to 1-1/8") | 4' Level |
| Pinch Bar | 25' Measuring Tape |
| Hammer Drill & Bits for 1/4", 3/8" and 1/2" anchors | Broom |

The following supplies will also be needed:

- Concrete anchors (24 minimum) sized for the required minimum pullout of the mast foot plates and upper level bracing. Refer to the approval drawing since the size of the anchors can vary for each installation.
- Concrete anchors for accessories, such as enclosures, approach ramps, etc. (Usually 3/8" diameter anchors and at least 12 anchors, minimum.)
- Shim stock for the approach ramp (if a part of this installation)
- Paint (standard colors available in spray can, 1, or 5 gallons)

- Steel angle iron or channel for additional bracing

ALSO - BEFORE YOU BEGIN:

- Beams are too heavy to lift manually and require lifting equipment. Check for availability of overhead attachment of chain fall or of fork truck before you start.
- Before you will be able to complete the installation, the unit must be operated. Power to the motor is required. Arrange for power before starting installation.

NOTE: All illustrations contained in this manual are for reference purposes only. Specific applications and site conditions may require different anchoring and bracing procedures. The ultimate responsibility for the anchoring and bracing rests with the installation crew.

See [9.1 General Assembly](#) for part identification and nomenclature.

4.9 Laying Out Platform Position & Marking Floors for Alignment

The following illustrates how to lay out and mark the reference lines so that the lift will clear the upper landing(s) and any obstructions that may be located around the lift. The General Arrangement (GA) Record Drawings should indicate the necessary clearance needed for the specific application.

1. Layout the position of the lift at the second level landing/opening, marking the edges of the platform.

NOTE: Depending on your load pattern, the platform may not be centered on the opening.

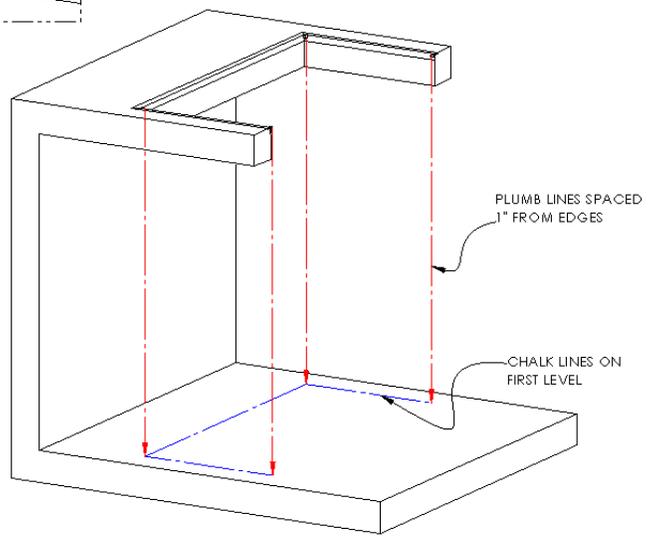
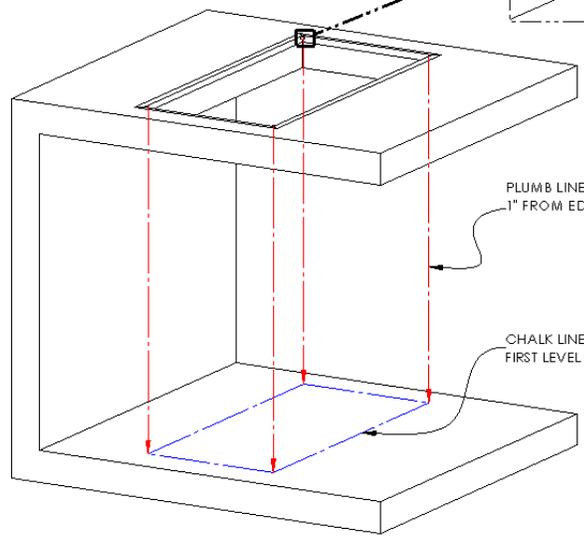
2. Drop a plumb line from each corner of every edge at the second floor **holding the plumb line 1 inch out from the edge of the landing** (this is a standard distance for clearance - deviations may occur).
3. Using a chalk line, snap a line between the plumb lines at the lower level.
4. Check the clearance from the first level all the way up ensuring there is one inch (1 inch) of clearance for the entire travel.

NOTE: To ensure platform clearance between floors, remove any protrusions from the floor, wall, etc., or move the plumb lines out beyond the protrusions.

BLOCK / SPACER
1" FROM EDGES

THRU-FLOOR

3-SIDED



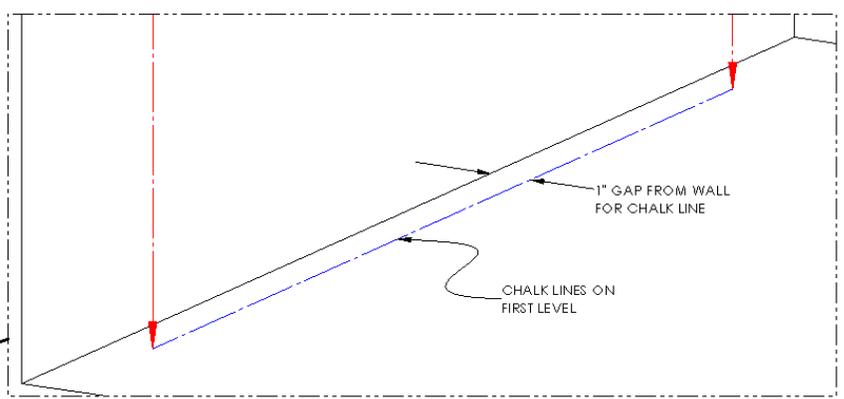
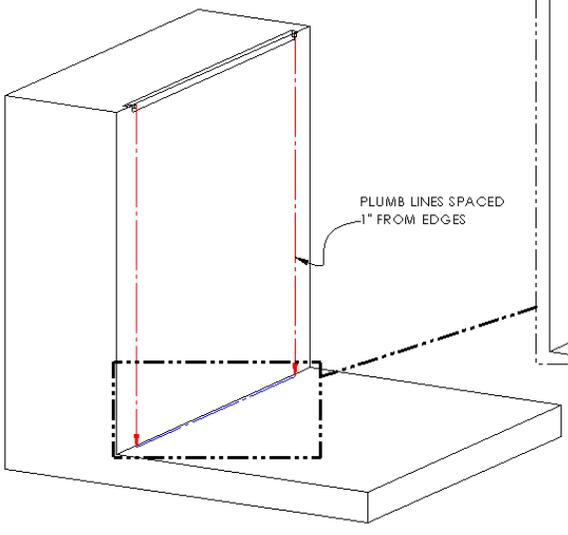
PLUMB LINES SPACED
1" FROM EDGES

PLUMB LINES SPACED
1" FROM EDGES

CHALK LINES ON
FIRST LEVEL

CHALK LINES ON
FIRST LEVEL

EDGE OF MEZZANINE



PLUMB LINES SPACED
1" FROM EDGES

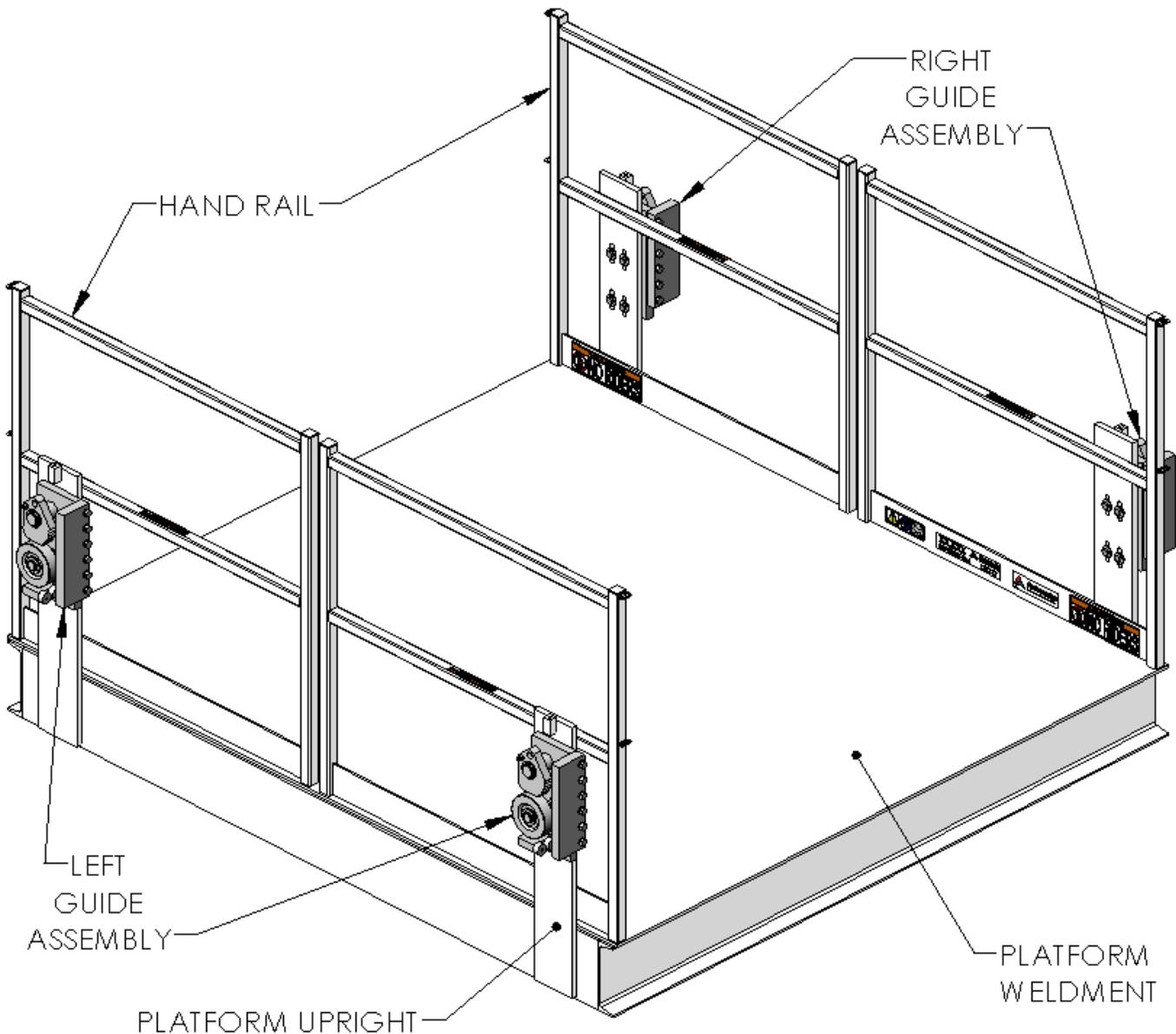
1" GAP FROM WALL
FOR CHALK LINE

CHALK LINES ON
FIRST LEVEL

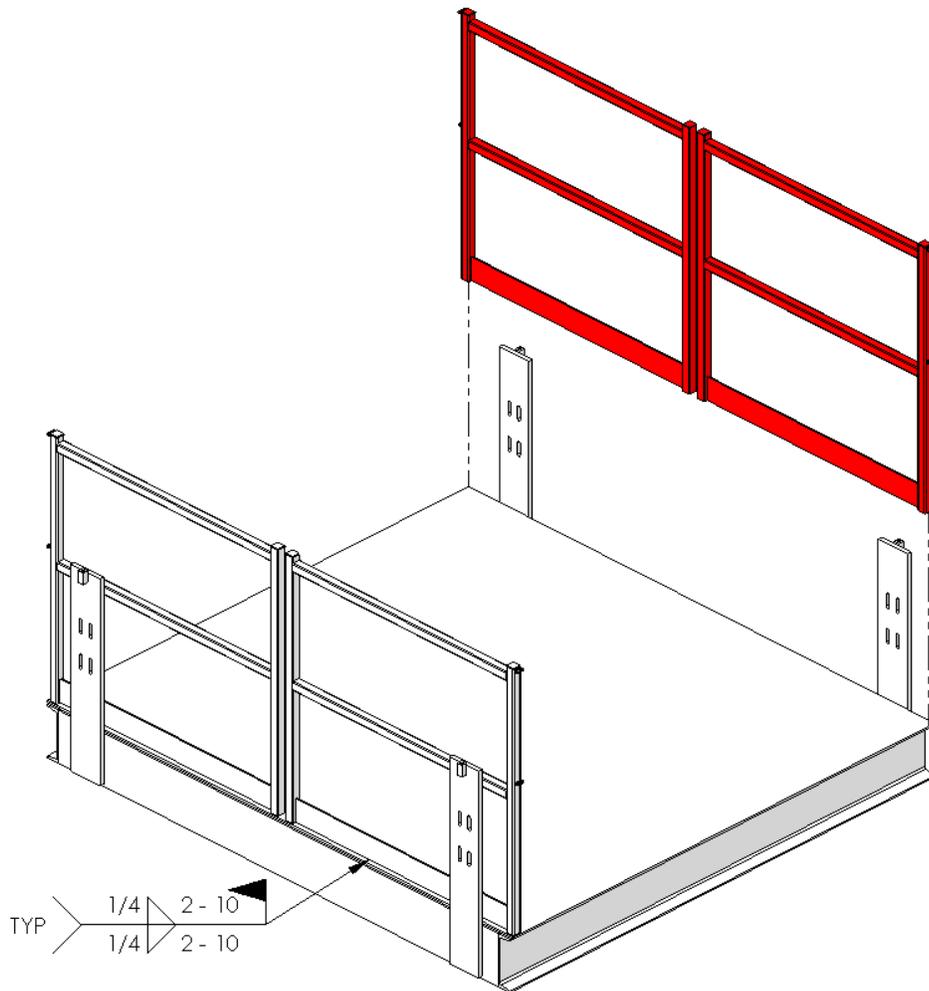
4.10 Mechanical Installation Details

1. Most work can be done with the lift platform fully lowered. Never work under the lift platform unless it is blocked in place ([see 5 Blocking Instructions](#)).
2. Never allow a person to ride on the platform of the lift.
3. Use only the hardware supplied by the Manufacturer to assemble the lift. This hardware is often high grade, some hardware is metric.
4. Use only the platform lifting chains and attachment hardware supplied by the Manufacturer.

4.10.1 Platform Assembly



1. Attach handrails or side guard panels by positioning as shown below and/or the General Arrangement drawing, and welding into place with a minimum $\frac{1}{4}$ inch fillet, 2 inch long on 10 inch centers. Grind welds and touch up the paint where necessary.
2. Follow the instructions included when attaching snap chain(s).



3. ***For Pit Mounted Lifts*** - the pit should be poured $\frac{1}{2}$ - $\frac{3}{4}$ inch deeper than the total thickness of the platform for shim and grout of masts as required.

NOTE: Masts may or may not be in the pit. Verify your pit dimensions before continuing.

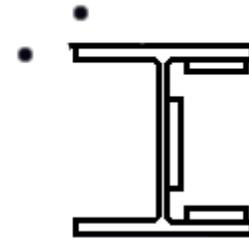
4.10.2 Spliced Beams (when used)

Items needed for field splice:

- AC\DC Arc Welder
- String line (at least 100 feet long)
- Cutting Torch with Full Tanks
- 'C' Clamps - 12 inch (4 minimum)
- Crain, Hoist or Fork Truck to move and position beam
- Straight Edge

1. There are two ways to assemble the splices, depending on your location and job site conditions. The beams can be spliced before you stand the beams vertically, or as you stand them up. In either case the procedure will be the same.
2. The beams will be marked "LF", "LB", "RF", or "RB" on the footplate of each beam. NOTE - the beams will only match one way. Check the guide angle and counterweight tube for orientation.
3. Fit the upper mast to its respective lower mast (plates & beams are marked) in the orientation as shown, taking necessary precautions not to bend or damage transition plates then clamp.
4. Place the string line on the entire beam length to have a straight-line reference. The string should be spaced off the beam about 1 inch as this will allow you to detect the deflection of the beams as they are welded together. The beam should be straightened to $\frac{1}{8}$ inch over any 10 feet, not to exceed $\frac{3}{8}$ inch overall. You will need to put the string on both sides of the beam, to check the straightness. This should also be checked as the beams are welded. The beams should be tack welded at all joints after you are satisfied with the straightness of the beam. (Remember that you cannot straighten the beam very easy after it is welded). The entire operation of the VRC also depends on the straightness of the beam after it is spliced.
5. Weld one side of the splice at a time taking care not to put too much heat to the beam, as this will cause the beam to bow or deflect severely. As the beam is welded check the straight line and make sure the beam is not deflecting too far beyond the tolerance.

STRING LINE HERE



NOTE: If you find the beam bowing beyond the tolerance stop welding that side and move to another side. You may need to let the beam cool as you weld, to help control the deflection of the beam.

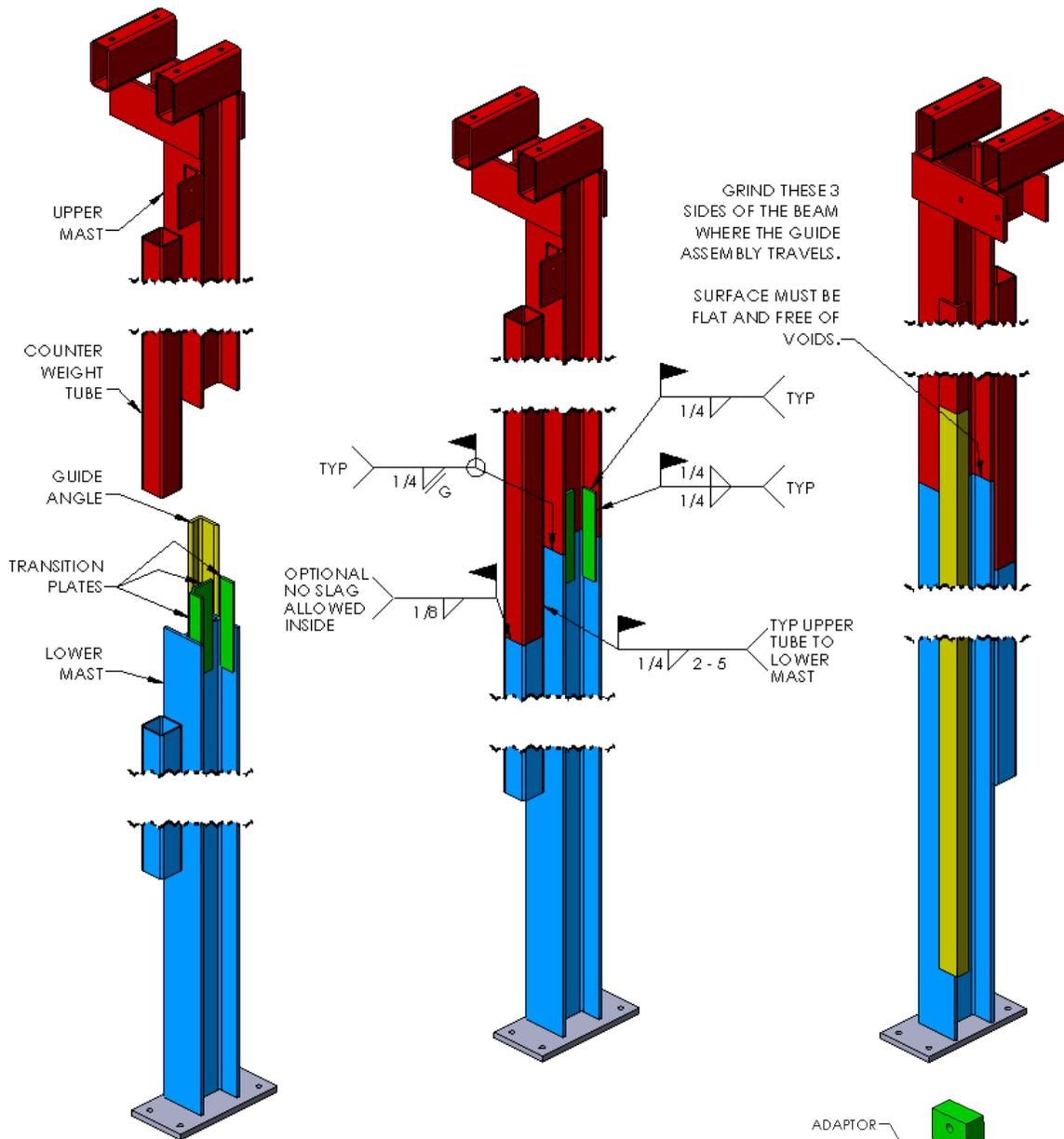
6. After the beams have cooled, verify that both beams are true, straight, and plumb within $\frac{1}{8}$ inch over any 10 foot span and not to exceed $\frac{3}{8}$ inch over the entire length of the beam.

NOTE: This tolerance must not be exceeded or immediate & permanent damage to the hardened wheel guide wheels will occur.

7. Permanently weld the upper & lower mast assemblies together as shown. Weld distortion to the beams must be minimized to hold the required tolerance to beam straightness.

NOTE: Care should be exercised not to distort the masts from welding, and alignment is critical. Grind the guide beam to provide a smooth surface for the guide wheels and rollers.

NOTE: Beams must be plumb and parallel within $\frac{3}{8}$ inch overall before proceeding with permanent bracing. The beams MUST be within this tolerance or the guide wheel assemblies will fail prematurely.



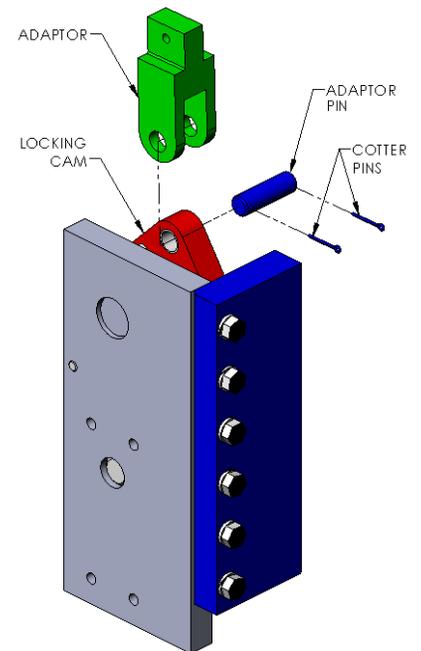
4.10.3 Positioning Wheel Guide Assemblies

Items Needed:

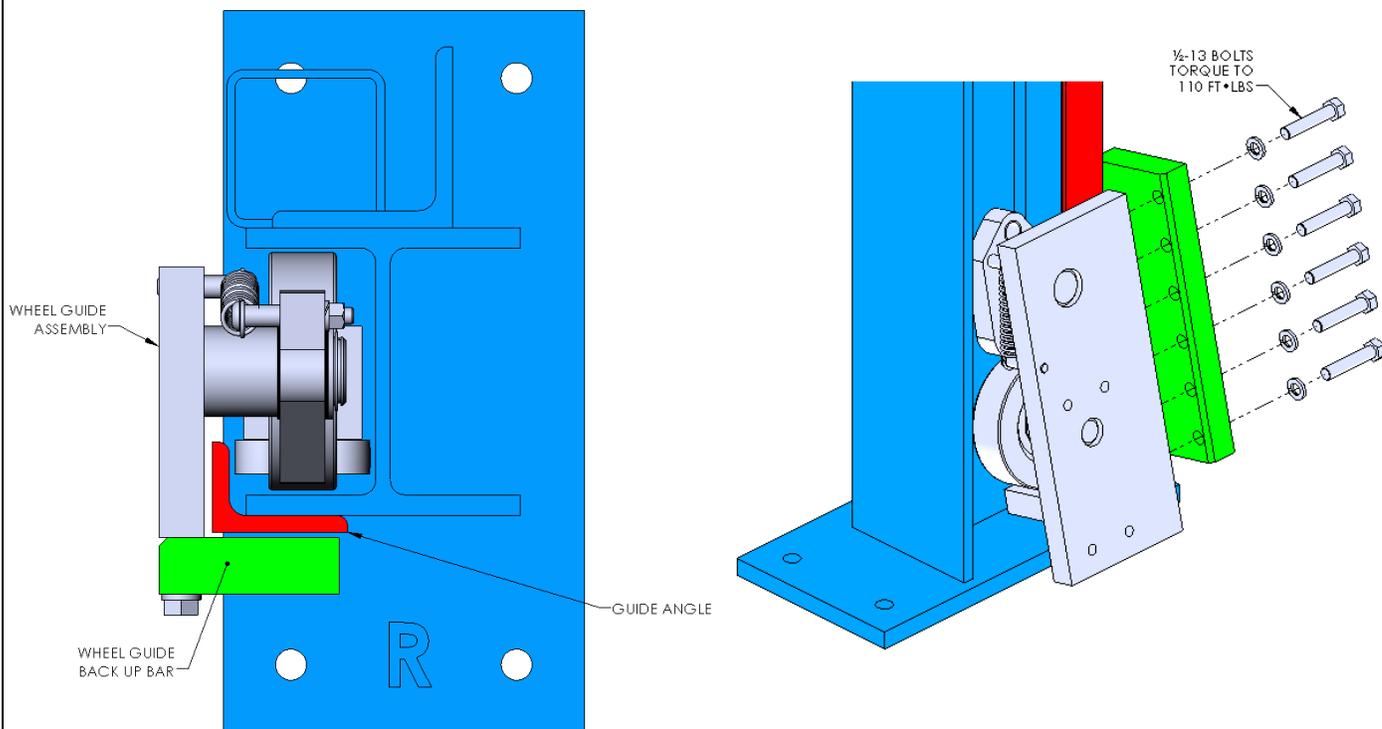
| Qty | Description |
|-----|---|
| 4 | Mast Beams – LF, LB, RF, & RB |
| 4 | Wheel Guides – 2 Left & 2 Right (“L” & “R” on the assembly) |
| 4 | Chain Adaptors |
| 8 | Cotter Pins |
| 4 | Chain Adaptor Pins (with cotter pin holes) |

1. Attach the chain adaptor, pin, and cotter pins to the locking cam.

NOTE: This step must be done first due to the limited access space once the wheel guides are inside the guide beams & behind guide angles.



2. Remove the wheel guide back up bar from the assembly.
3. Place the wheel guide assemblies in the beam as shown by sliding them into the beam running space from below the guide angle near the bottom of the mast beam.



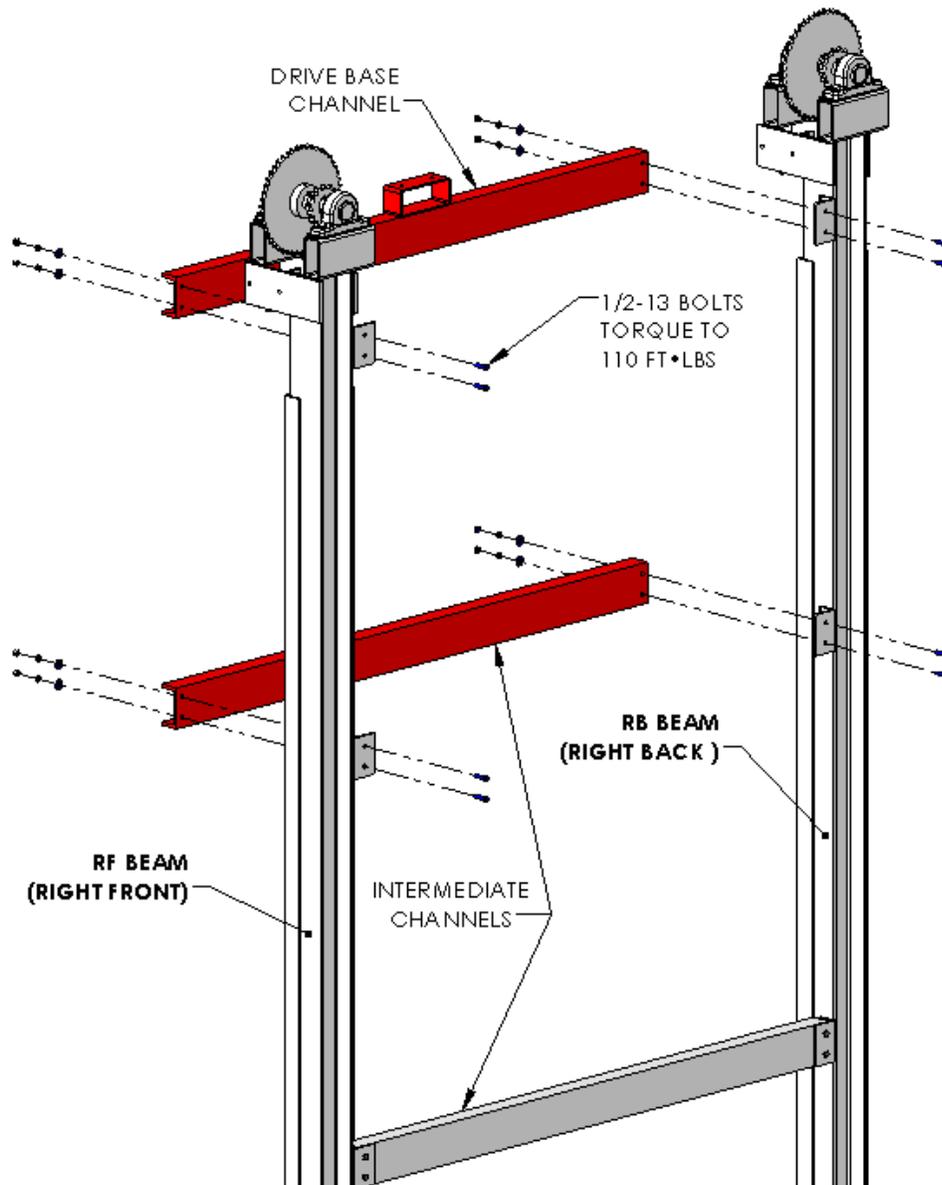
4. Slide the wheel guide up the beam approximately 1-½ feet from the bottom. The wheel guide blocks should then be positioned so they will align with the sets of holes in the platform uprights once the beam is raised into position.

4.11 Assembling the Mast Sides

Items Needed:

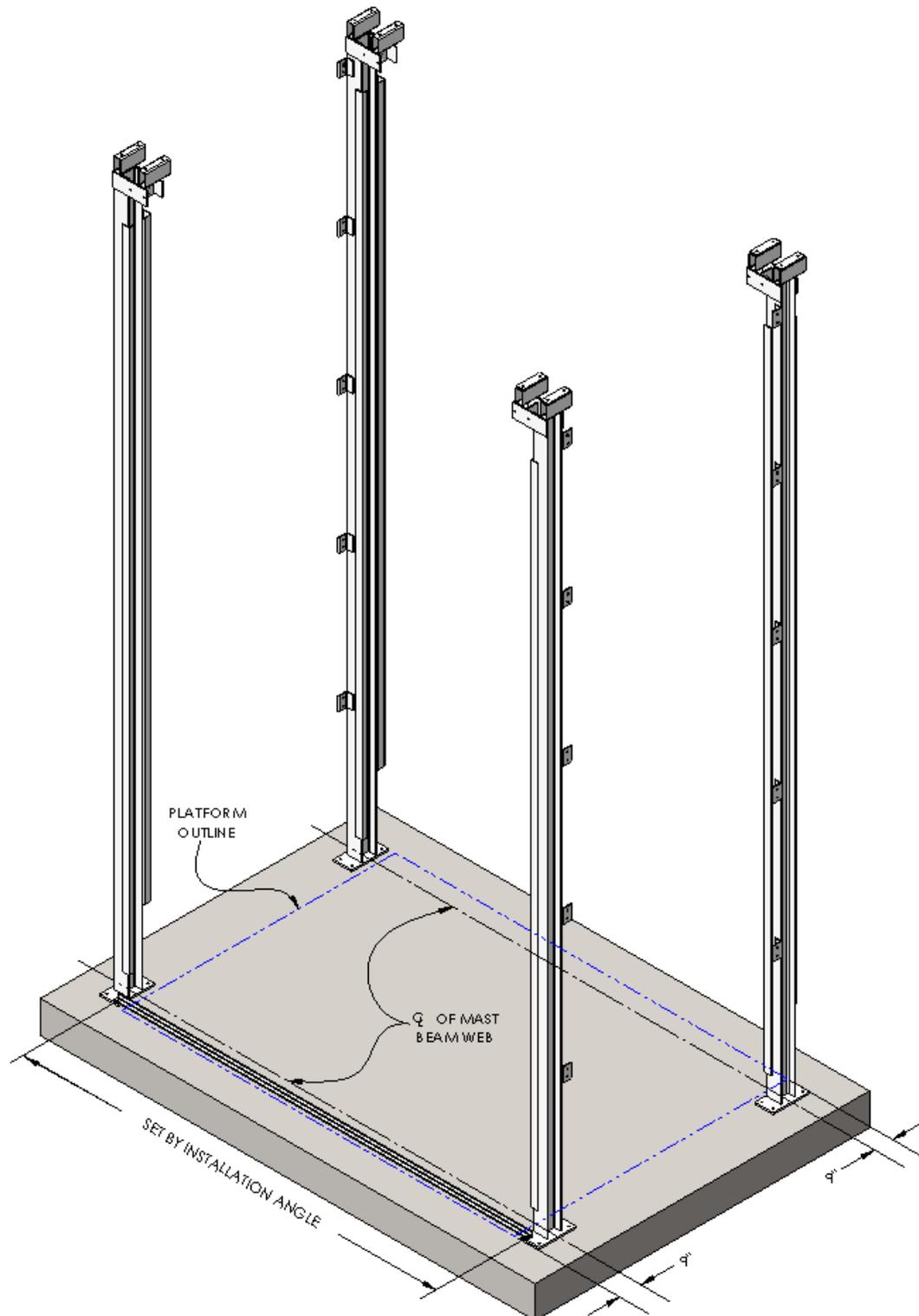
| <u>Qty</u> | <u>Description</u> |
|------------|---|
| 2 | Drive Base Channels |
| - | Intermediate Channels (qty. varies) |
| 2 | Installation Angles (holes drilled in each end) |
| - | Hardware (qty. varies) |

The beams will be marked "LF", "LB", "RF", and "RB" on the footplate of each beam. NOTE - the beams will only match one way. Check the guide angle and counterweight tube for orientation. Assemble the mast sides as shown.

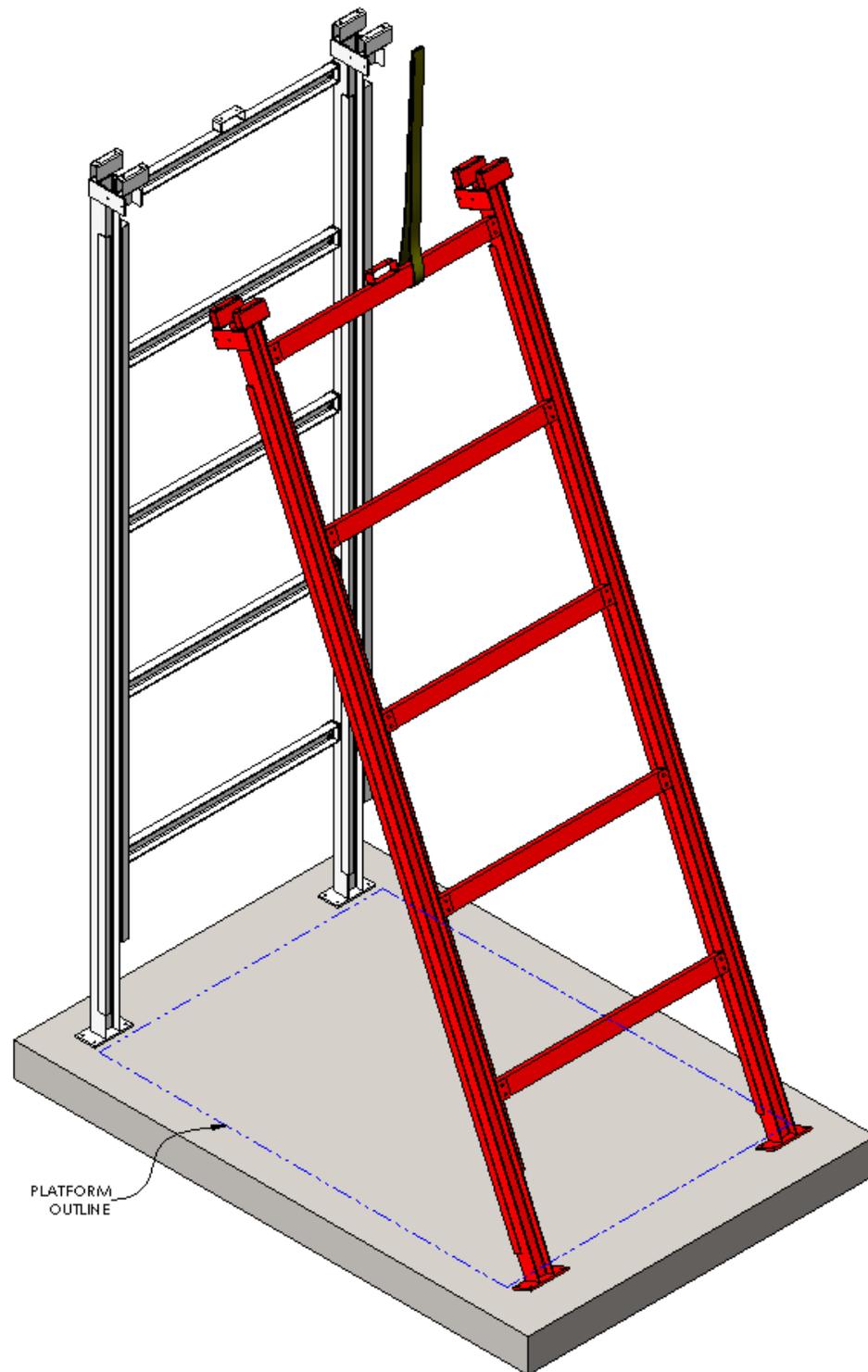


4.12 Raising the Masts and Wheel Guides

1. ***For Through-Floor or Shaft Installations*** – when clearances are tight, you may choose to position the platform after the beams have been assembled and raised into place.
2. The installation angle shipped with your unit can be used to properly space the two sides apart temporarily, prior to setting the platform or securing beams to floor.



3. Raise the beams into position. If using straps, ensure they only wrap the channel itself.



4. If not already done, check the platform alignment with the chalk lines created on the floor earlier.
5. Once platform alignment has been completed and all clearances confirmed with pit walls, floor openings, and/or other site-specific constraints, etc., make sure the platform is level and the masts are plumbed and straight.

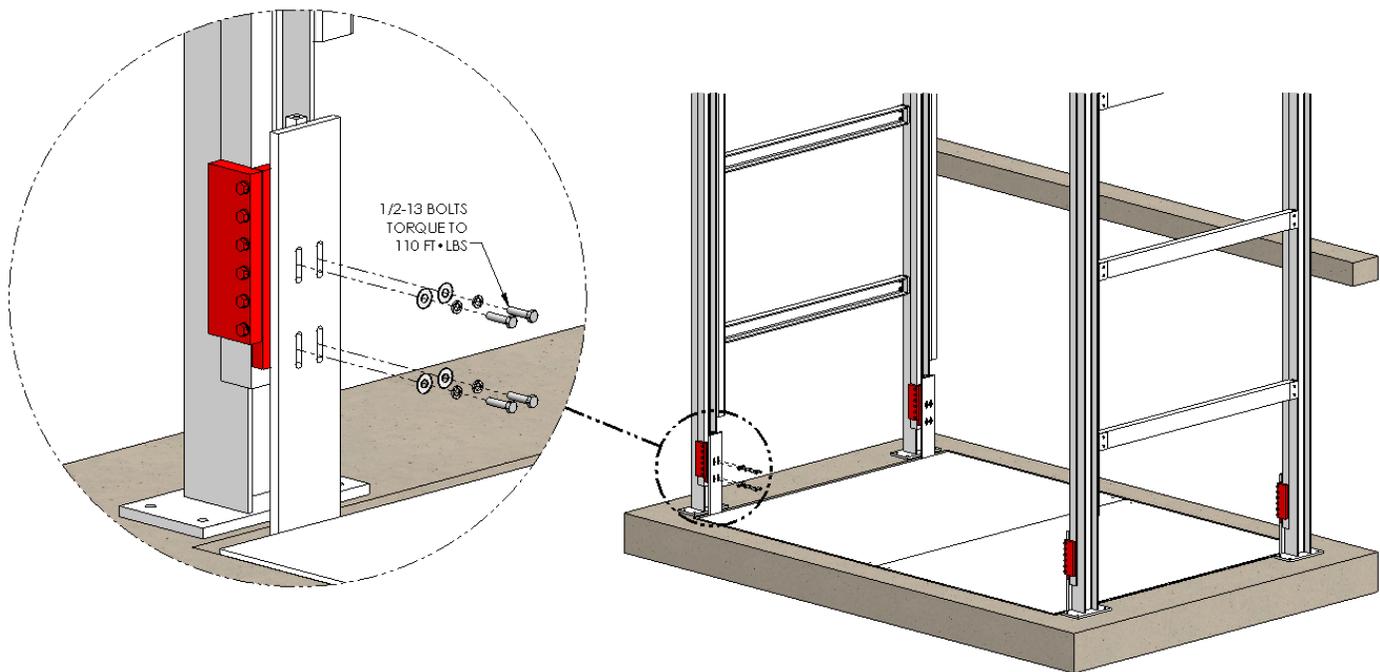
NOTE: Make sure the beam is secure with chain or temporary bracing.

⚠ WARNING

Improperly or inadequately supported beams could fall and cause serious injury to adjacent personnel or permanent damage to the equipment.

Do not depend on the platform uprights and wheel blocks to support the beam! Use other means to support and secure the beams in the raised position during installation and prior to final bracing.

6. The wheel guide assemblies should align with their respective mounting holes on the platform uprights. Bolt the wheel guide assemblies to the uprights using the 1/2-13 grade 8 bolts and washers that have been provided. Torque all these bolts to 110 ft•lbs.



4.13 Securing the Masts and Drive Base Installation

4.13.1 Securing the Masts

Items needed:

| <u>Qty</u> | <u>Description</u> |
|------------|---|
| 2 | Mast cross channels. |
| 8 | 1/2-13 grade 8 bolts, with nuts and washers provided. |

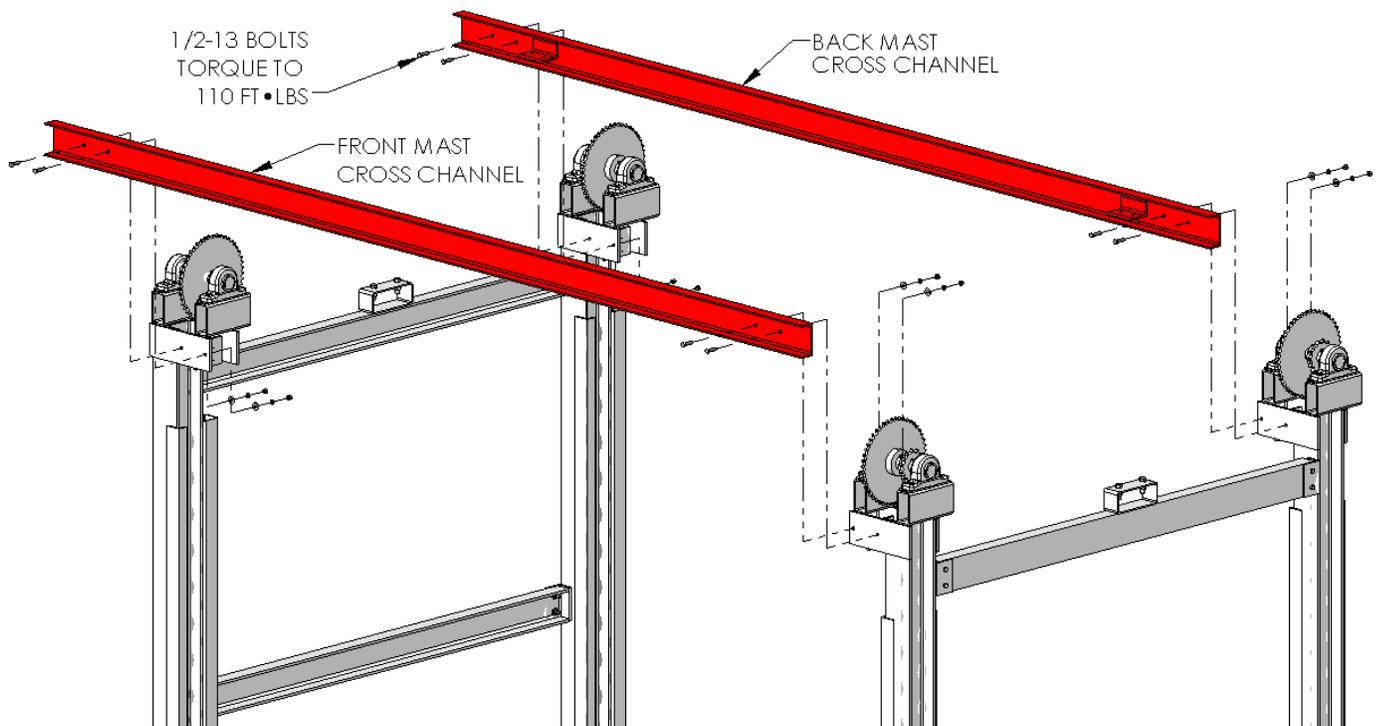
1. Join the Left mast pair assembly to the Right mast pair assembly by installing the front and back mast cross channels. These channels are stamped LB, RB (left back, right back) and LF, RF (left front, right front) for proper orientation. Snug down the bolts to permit later adjustment.

NOTE: Alignment of the main beams is very important! Check the guide angle dimension (from bottom to top) against those shown in the job-specific General Arrangement / Record drawing.

2. Recheck the position of the beams and ensure that the beams are not twisted or turned, and that they are also plumb, parallel, square, and level (beam pairs mounted in pit floors must be checked closely for level because pit floors may not be poured level). To maintain proper positioning of the beams – shim under each mast foot plate as required to fill any gaps between the foot plate and the floor which may have been created during the plumb-square-level process. Torque bolts on the mast cross channels to 110 ft•lbs.

NOTE: Beams must be plumb and parallel within 3/8" over the entire length of beam before proceeding with permanent bracing. The beams MUST be within this tolerance or the guide wheel assemblies will fail prematurely.

3. Remove the two installation angles.
4. Lag the beams to the floor using four (4) bolts for each mast beam plate – sized to withstand the pull-out force specified on the GA drawing. Hand snug these anchor bolts only, do not tighten at this time.



4.13.1 Drive Base Installation

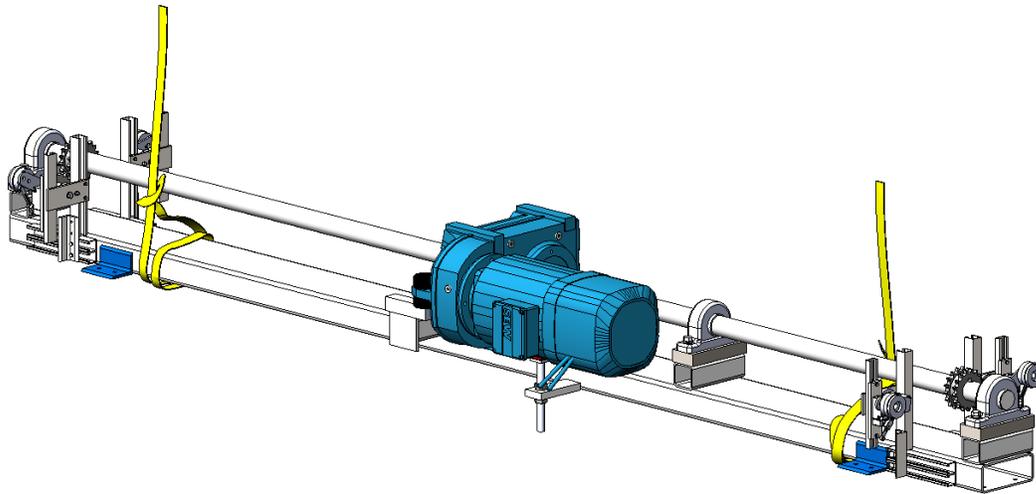
Items needed:

| <u>Qty</u> | <u>Description</u> |
|------------|--|
| 1 | Drive base assembly. |
| 4 | 1/2-13 grade 8 bolts, with nuts, and washers provided. |
| - | |
| 2 | Front-to-Drive-Base channels |
| 2 | Back-to-Drive-Base Channels |
| 16 | 1/2-13 grade 8 bolts, with nuts, and washers provided. |

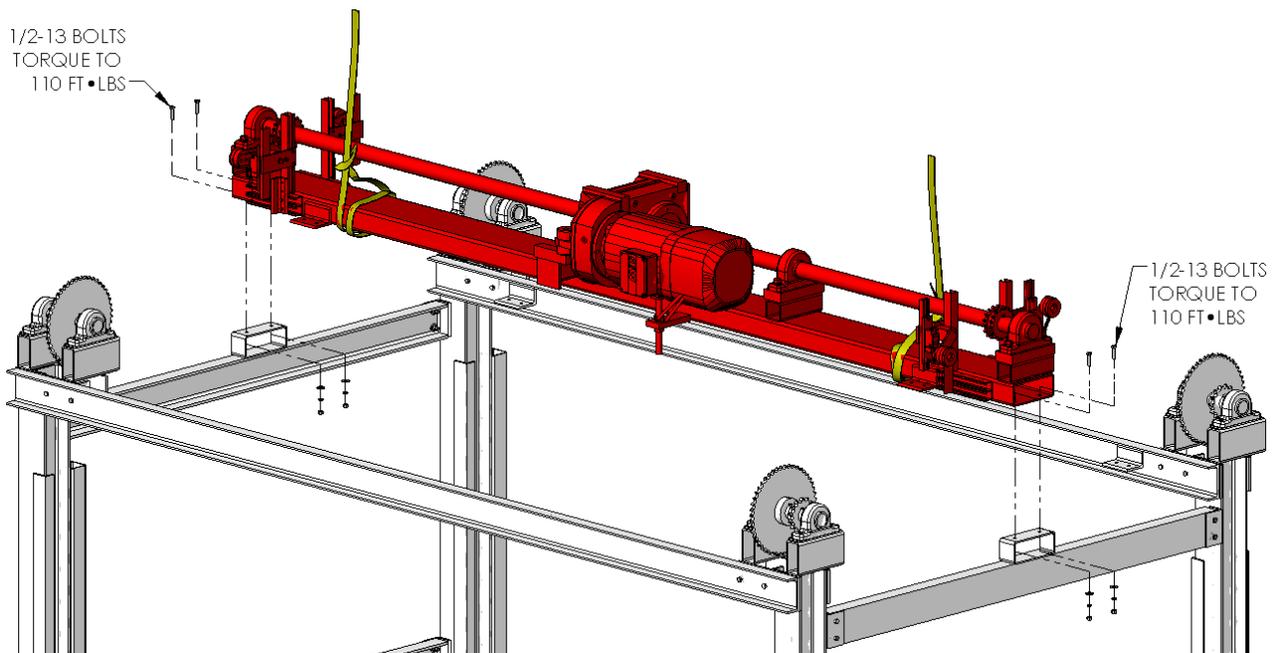
CAUTION

A simple basket strap method may allow rotation of the whole assembly.

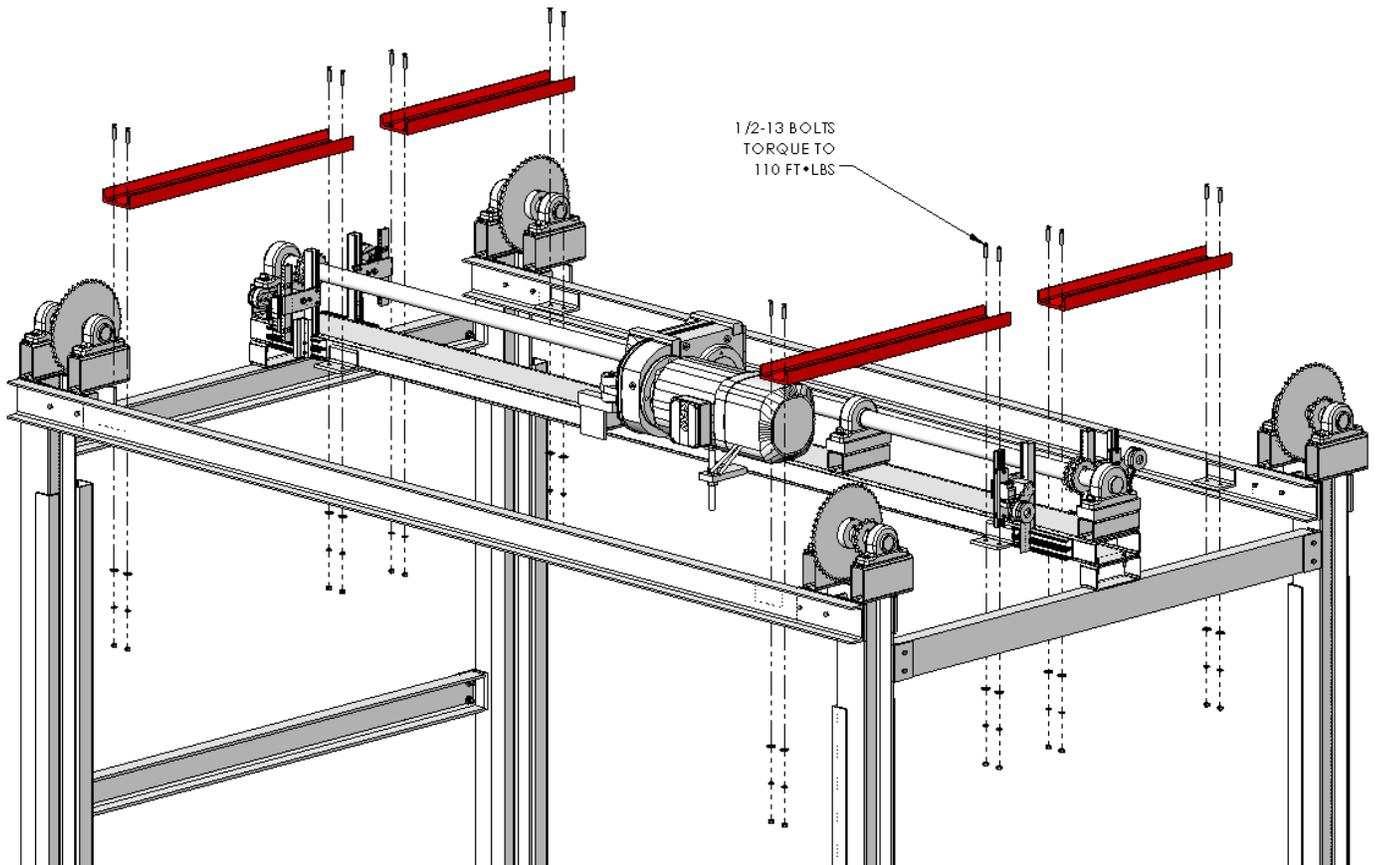
1. Locate straps as shown, just inside the mounting angles. The drive base assembly is not symmetric. Wrap the drive base tube at least twice to prevent rotation of the base and cinch the strap. Lifting straps should be on opposite sides of the shaft as shown.



2. Raise the drive base into position above the mast beams in the orientation shown, and bolt into place using the hardware provided.



3. Bolt the (2) Front-to-Drive-Base channels and (2) Back-to-Drive-Base Channels as shown.



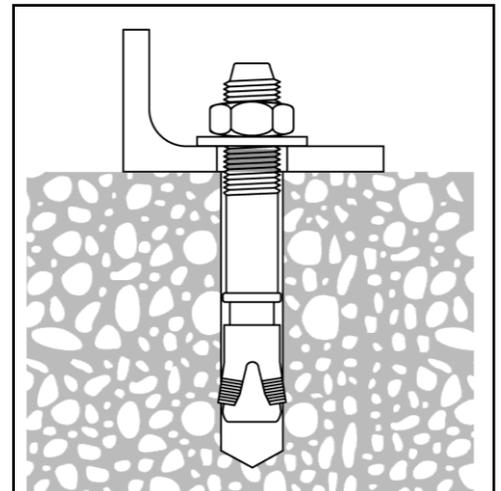
NOTE: Alignment of the main beams is very important! Check the guide angle dimension (from bottom to top) against the GA drawing.

4. Recheck the position of the beams and ensure the beams are not twisted or turned, and that they are also plumb, parallel, square, and level (beam pairs mounted in pit floors must be checked closely for level, pit floors may not be poured level). To maintain proper positioning of the beams – shim under each mast foot plate as required to fill any gaps between the foot plate and the floor which may have been created during the plumb-square-level process. Torque all bolts in this section to 110 ft•lbs.

NOTE: Beams must be plumb and parallel within 3/8” over the entire length of beam before proceeding with permanent bracing. The beams MUST be within this tolerance or the guide wheel assemblies will fail prematurely.

5. Remove the installation angle (if used).
6. Lag the beams to the floor using four (4), 1/2-13 bolts for each mast beam plate – sized to withstand the pull-out force specified on the GA drawing.

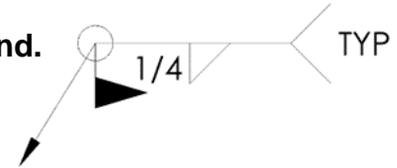
NOTE: Recommended concrete anchor bolts are: HILTI “Kwik-Bolt”, Molly Parabol or similar.



4.14 Bracing the Beams

All illustrations on the GA drawing for bracing preferences are for reference only. Site conditions may require different anchoring and bracing. The installers are ultimately responsible for the proper and safe anchoring and bracing of the equipment. Autoquip Corporation supplies material for bracing on standard applications, but special bracing may be required by the installer on non-standard models. The special materials for anchoring and bracing of the lift and gates are not the responsibility of Autoquip.

NOTE: For all field welding of braces, use ¼ inch fillet – all around.



Items needed:

Qty Description

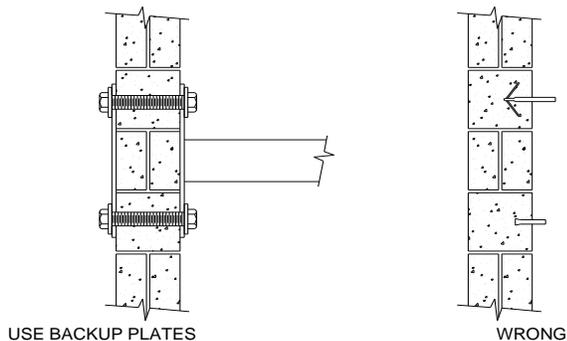
- Horizontal Brace Channels (qty. varies)
- Diagonal Brace Channels (when applicable)
- Side Brace Channels (when applicable)
- Brace Plates – with (4) 9/16" dia. holes each (qty. varies)

1. Attach the horizontal channel brace to the upper floor landings with either lags or by welding (it has been assumed that you will have a solid floor face to attach to for your installation). When attaching the floor to beam brace, use bolts which have been properly sized to withstand the horizontal pull-out force shown on the GA drawing.

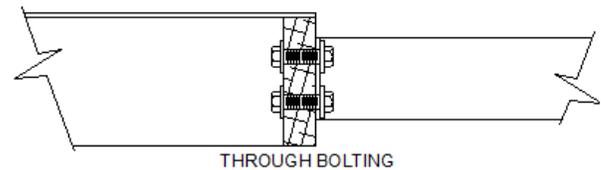
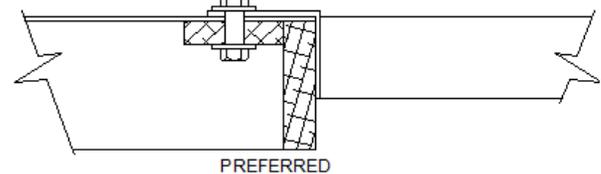
⚠ CAUTION

Never use concrete anchor bolts on a cinderblock or brick wall! The wall will not withstand the pull force developed by the lift. Use only recommended anchoring and bracing methods illustrated in this manual. Equipment damage or personal injury could result.

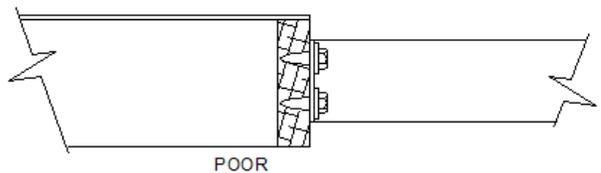
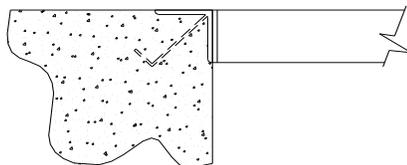
ANCHORING TO BLOCK WALLS



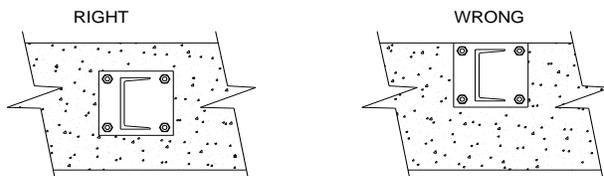
WOODEN FLOORS



WELD TO CURB ANGLE



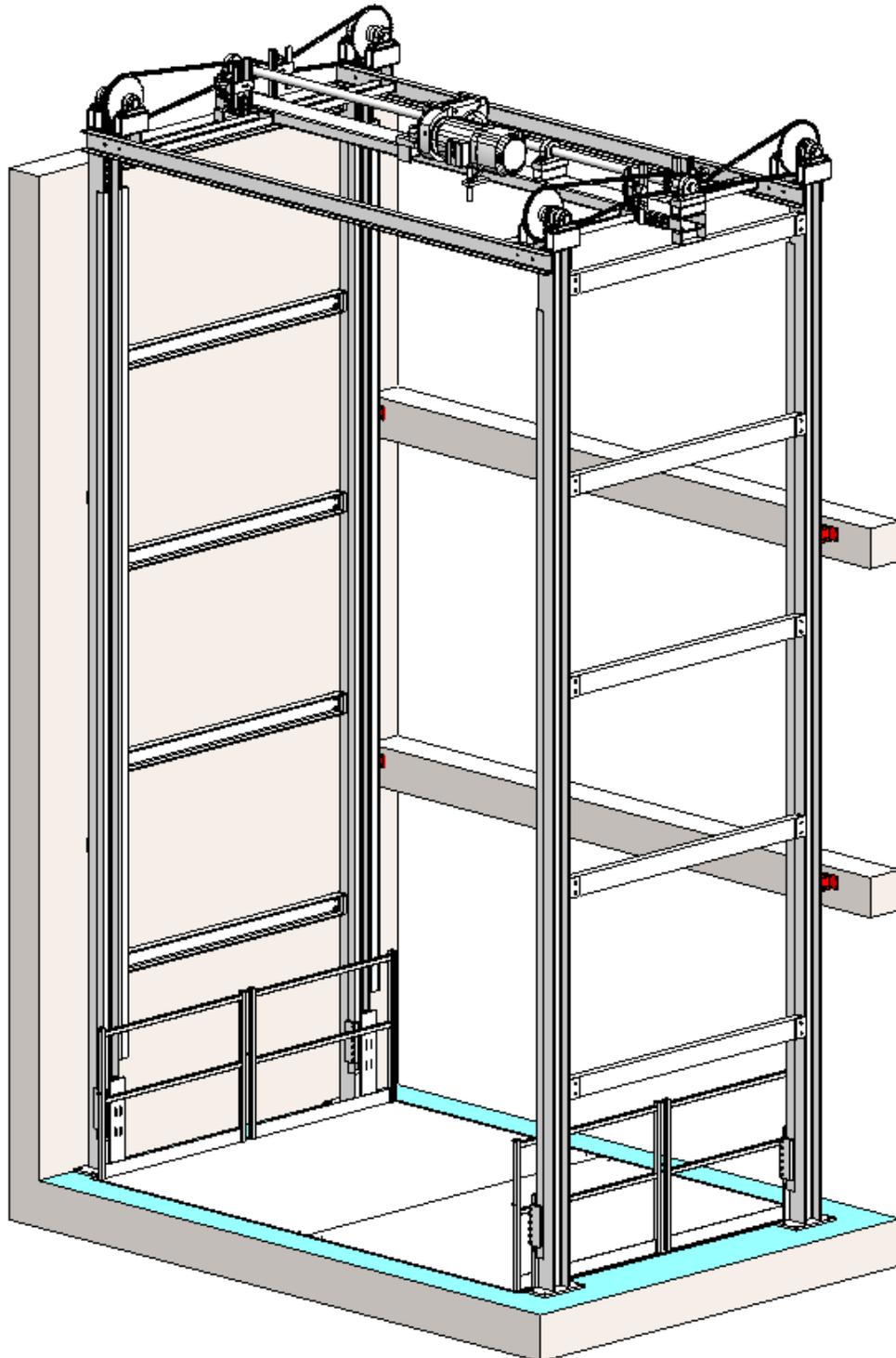
ANCHORING TO FACE OF FLOOR



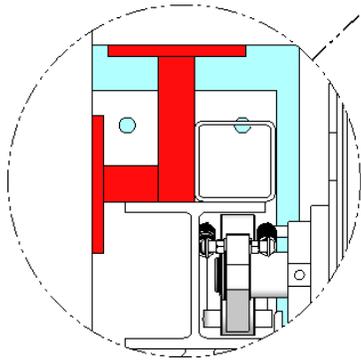
⚠ WARNING

Do not weld on the inside of the guide flanges where the wheel guide runs in the masts! Interfering with the free travel of the wheel guides can cause damage to the lift and prevent safety devices from operating as intended.

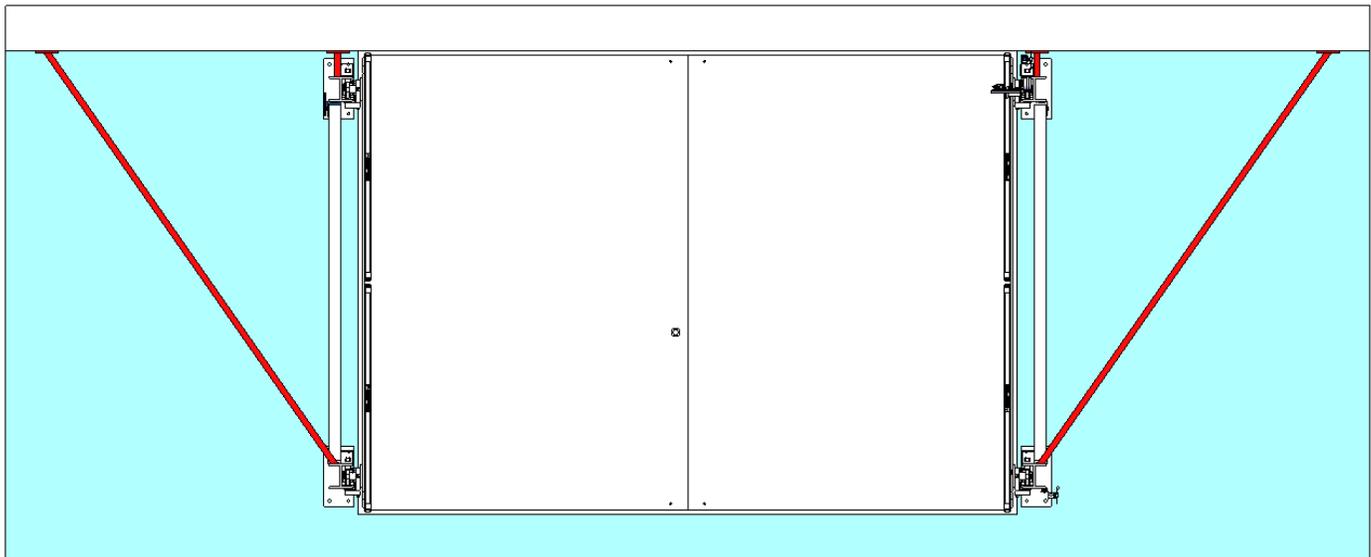
2. Add side bracing as necessary for your specific installation to prevent the beams from flexing or swaying sideways during operation.



TYPICAL BRACING



SECTIONED TOP VIEW FOR BRACING



OPTIONAL SIDE BRACING FOR MEZZANINE

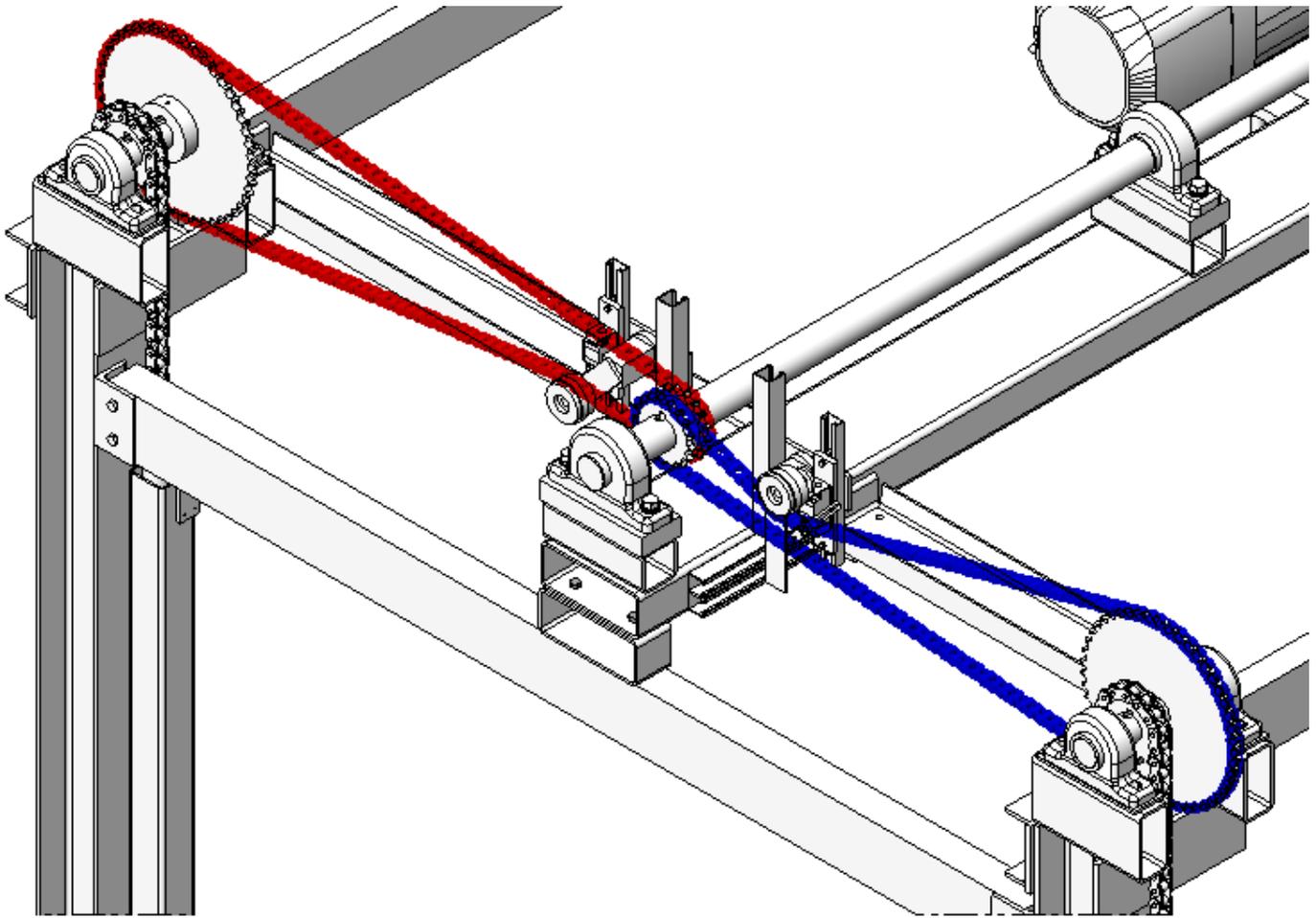
4.15 Lifting & Drive Chain Installation Details

Items needed:

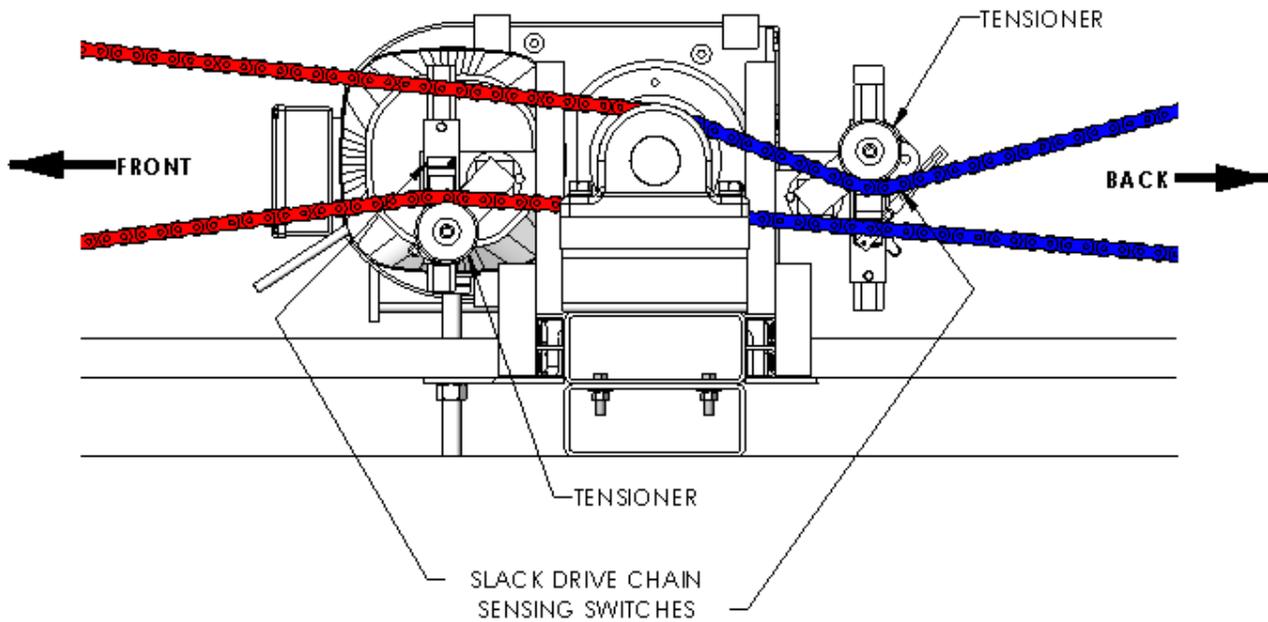
| <u>Qty</u> | <u>Description</u> |
|------------|--------------------------------------|
| 4 | Lifting Chains |
| 4 | Drive Chains (shorter ones) |
| 4 | Counterweights |
| 4 | Lifting Chain Master Link Assemblies |
| 4 | Driving Chain Master Link Assemblies |

1. Familiarize yourself with the drive base layout on top of the lift, ensure that all components are present and oriented as shown.
2. The drive chain will be #80 size. The lifting chain maybe larger.
3. Typically, there are 4 shorter sections (<10 feet) of chain for the drive. Each box will include a master link.
4. Install drive chains between the 17-tooth (approx.) double sprockets on the main drive shaft and the 48-tooth (approx.) sprocket on the top of each mast beam. Each drive chain should engage each drive chain tensioner as shown.
5. The lifting chain will come in 10 foot lengths. Split the boxes into two equal groups so that the 10 foot lengths can be connected to create the lifting chain for each mast. Each box will include a master link. There may also be 4 shorter sections (<10 feet) of chain included. If so, attach one shorter section to each lifting chain.
6. Raise each chain up to the drive base, lower one end of the chain down the mast beam to the platform upright and wheel guides. Lay the other end up and over the sprocket on the top of each mast.
7. Make sure that the platform is level at the lower level before connecting one end of the lifting chain to the wheel guide with the hardware listed & provided as shown
8. With all chains in place, make sure that each of the chains have the equal number of links to the top of sprocket & that they are equally tight by lifting them over each drive sprocket and the free end down into its respective counterweight tubes.
9. Using the hardware provided, attach a counterweight to the end of each chain.
10. Slide each counterweight into its guide tube.
11. Attach the lifting chains to the chain adaptors using a master link.

NOTE: After moving sprockets as needed to align with each other and the attachment point on the platform, apply Loctite to secure the set screw on the sprocket to the shaft.

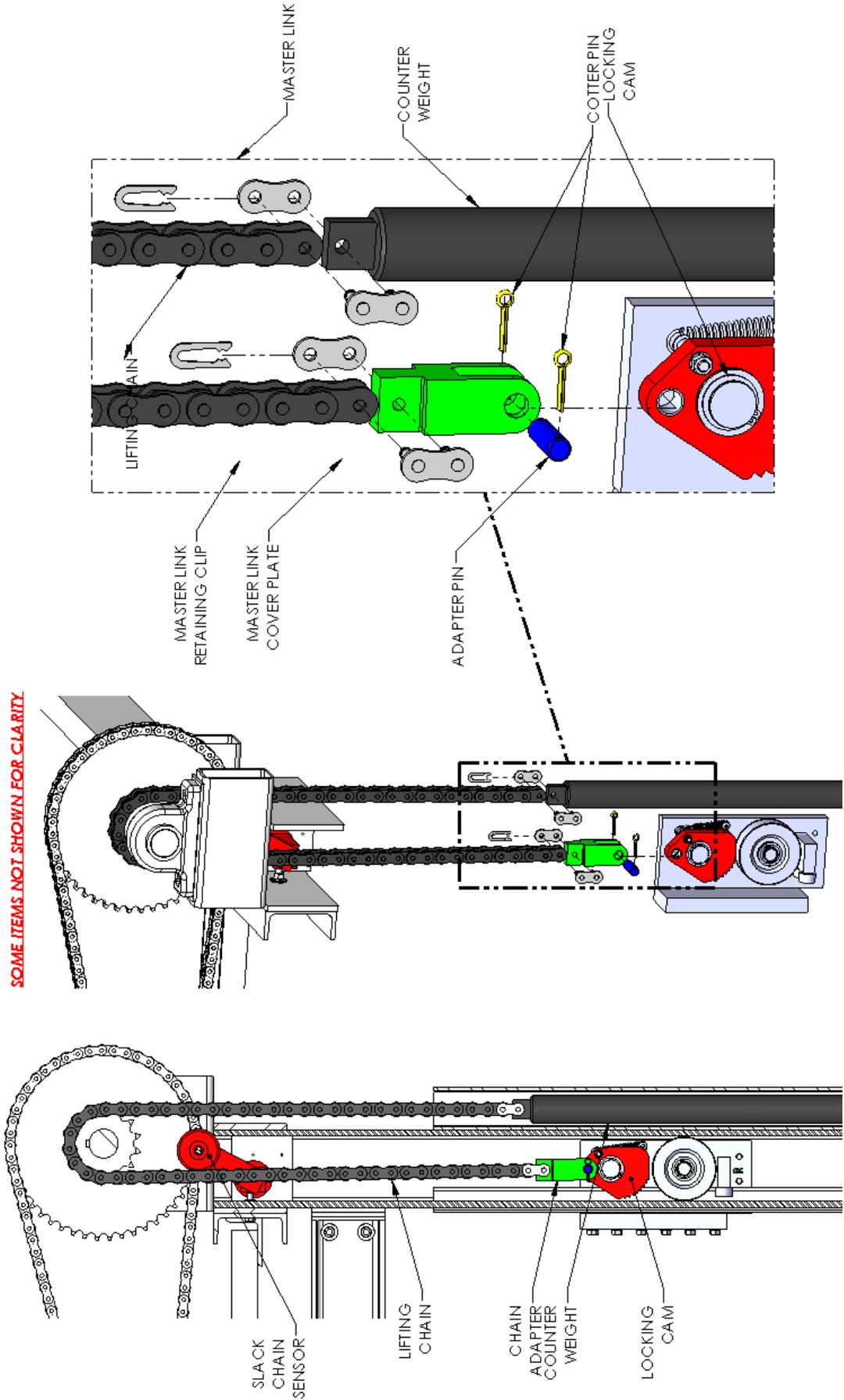


DRIVE CHAIN PATH



NOTE: These chains should be installed as tight as possible when assembled, the roller tensioner assembly is for the sensing part of the operation only, not to take all the slack out of the chain. Also remember to lock tight all sprockets in place as you align them with each other.

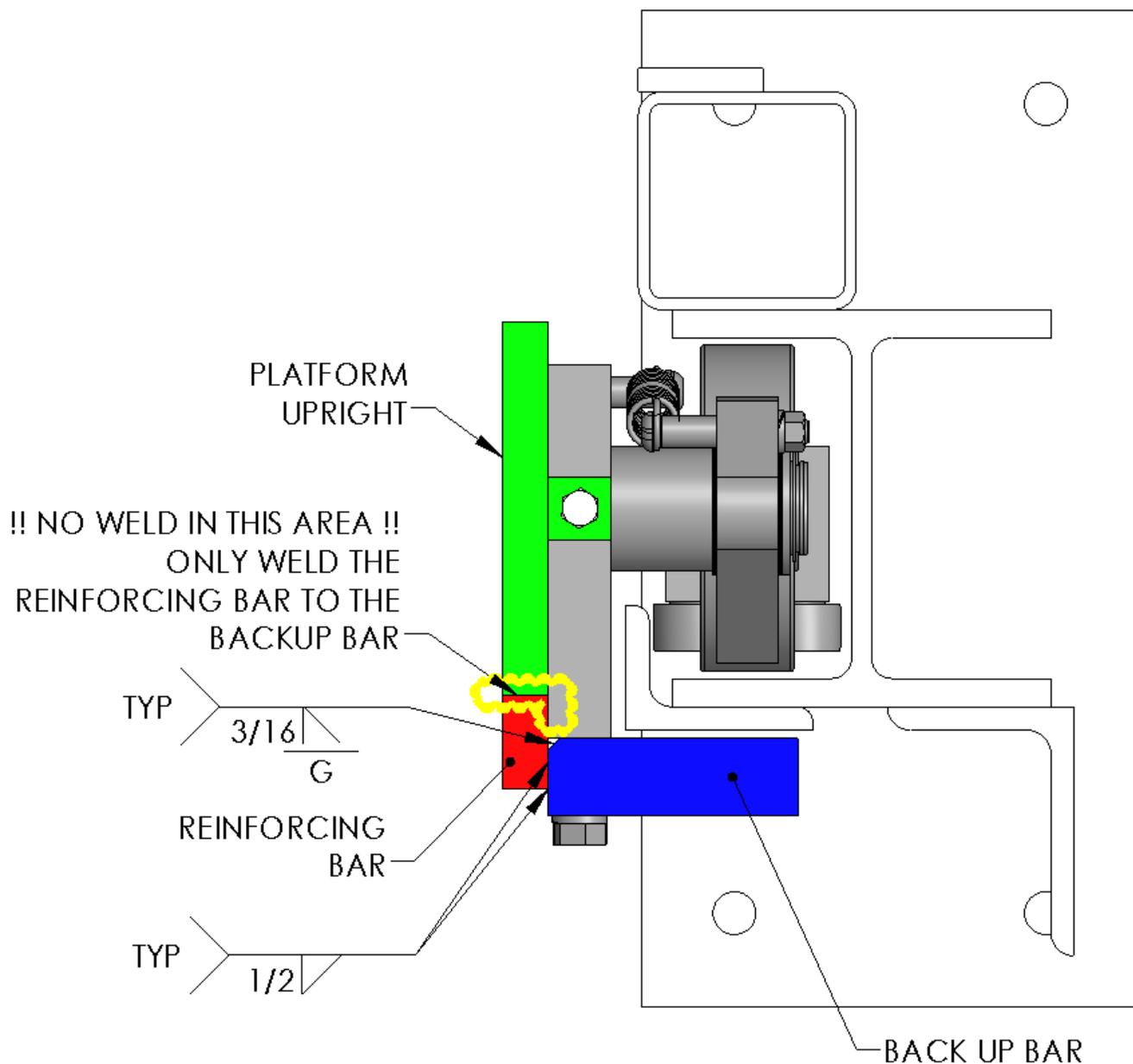
When complete, the lifting chain path should look like that shown.



4.15.1 Installing Reinforcing Bar

1. Locate the ship loose $\frac{3}{4}$ " x $1\frac{1}{2}$ " x $11\frac{1}{4}$ " flat bar and position between the platform upright and wheel guide as shown below
2. Tack weld this bar to the wheel guide as shown.
3. Unbolt the wheel guide back-up bar from the wheel guide to complete the welding on the inside of these parts.
4. Grind this weld as needed to re-bolt weldment to the wheel guide.

NOTE: Do not weld the reinforcing bar to anything but the backup bar.



5. Re-install the backup bar and torque the bolts to 110 ft•lbs.

4.16 Electrical Installation Details

DANGER



All maintenance procedures described in this section should only be performed by qualified service personnel.

WARNING

Never operate the lift by “manual-ing” 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.

CAUTION

Do not operate the VRC until the platform is leveled and the guide beams are plumbed and secure.

NOTICE

The control panel instructions are in the controller manual sent with the order. These are required for installation.

1. Ensure that the supplied voltage matches the motor supplied.
2. For customer-supplied electrical disconnect, see schematic. It should be installed within direct line of sight of the associated lift.
3. All electrical work must meet the requirements of ASME B20.1 as well as all state and local codes.
4. Make sure that only qualified electricians perform all wiring and that they are familiar with the electrical drawings shipped with the equipment.
5. Operator pushbutton stations must not be operable from the platform with the gate(s) or door(s) closed, typically located at least 6 feet away from the platform.
6. Per OSHA requirements, the motor control panel must be mounted in a location that is visible from the lift.
7. Always follow OSHA lock-out, tag-out procedures when the lift being maintained, serviced, or inspected.
8. Bump/jog the motor to check the rotation. See the HMI manual for how to bump/jog the motor without all electrical components installed. If motor is turning wrong direction, reverse any two motor electrical leads.

A job-specific schematic has been shipped separately in a packet of information which includes this installation manual for reference by the electrical contractor or service provider. Refer to this schematic and follow all applicable NEC requirements throughout the electrical installation process.

Autoquip typically provides all the electrical control and signal devices. All required wire, conduit, and main disconnect for field wiring is supplied by others. Unless specifically included in the contract, the mounting and wiring of control and signal devices is the user's responsibility.

MAIN DISCONNECT: This should be a time delay fuse or inverse time circuit breaker type disconnect which is to be located within ten (10) feet of the lift. See schematic for max fuse or circuit breaker size. THIS ITEM IS NOT SUPPLIED BY AUTOQUIP AND IS REQUIRED BY THE NEC (National Electrical Code.)

MAIN CONTROL PANEL: This panel is supplied and shipped loose by Autoquip, then mounted & wired by others. All electrical components will be tied into this panel.

MECHANICAL DRIVE UNIT: Autoquip supplies the power unit shipped loose on a drive base.

PUSH BUTTON STATIONS: Autoquip supplies one (1) P/B station for each level (under normal conditions). Stations are to be mounted by an electrician. The Safety Code (ANSI/ASME B20.1) dictates the position of these units to be, “remotely located so they cannot be activated while standing on the lift platform.”

LEVEL SWITCH: Typically (1) per level, these switches have been shipped loose to be field mounted, wired, and adjusted to sense the status/position of the lift platform.

OVER-TRAVEL SWITCH: This switch has been shipped loose to be field mounted, wired, and adjusted to sense over-travel of the lift platform.

4.17 Leveling the Platform

WARNING

When running the unit before ALL limit switches are installed, be prepared to disconnect power on demand. Allowing platform over-travel in either direction can result in severe damage to the equipment and potential injury to standers-by. Temporary power must NOT be used.

CAUTION

All chains must be fully engaged with the teeth of all chain sprockets before operation begins. Chains which jump the sprockets during tensioning can cause permanent damage to the lift.

NOTICE

The control panel instructions are in the controller manual sent with the order. These are required for installation.

1. Make sure the platform is free and clear.
2. Raise it about 6 inches, check to be sure platform is level and chains are equally tight.
3. Check the chains to ensure they are not off 1-2 links. The chains should have the equal number of links to the top of sprocket. If not, lower the platform taking the weight off the chains before correcting. This can be done in jog mode in the controller which bypasses the lower level limit switch.

NOTE: A loose chain may allow the safety cam lock to engage. This must be manually held back to lower the platform. To release the safety lock, the platform must be raised first.

4.18 Installing Sensing Switches

⚠ DANGER



Never go under lift platform until load is removed and mechanism is securely blocked in raised position with maintenance devices ([see 5 Blocking Instructions](#)).

⚠ WARNING

Ensure one “WARNING – Do Not Tamper” label is adjacent to (within 6-12 inches) each sensing device (limit switches, door status switches, door interlocks, etc.) in a location that is visible to the operator.



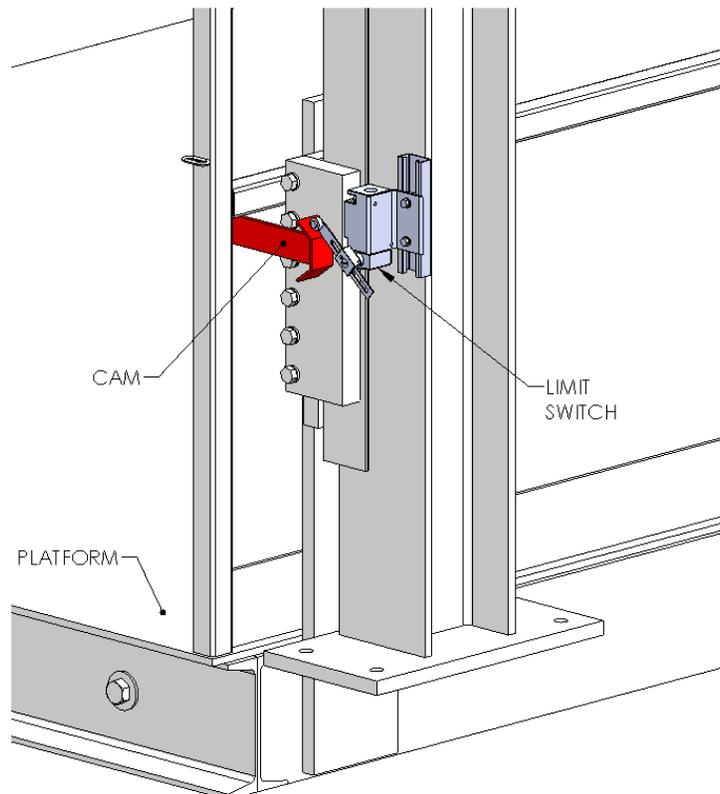
Items needed:

| <u>Qty</u> | <u>Description</u> |
|------------|---------------------------------------|
| - | Level limit switch kits (Qty. varies) |
| 1 | Over-travel proximity switch kit. |
| 2 | Slack chain sensing switch kits. |

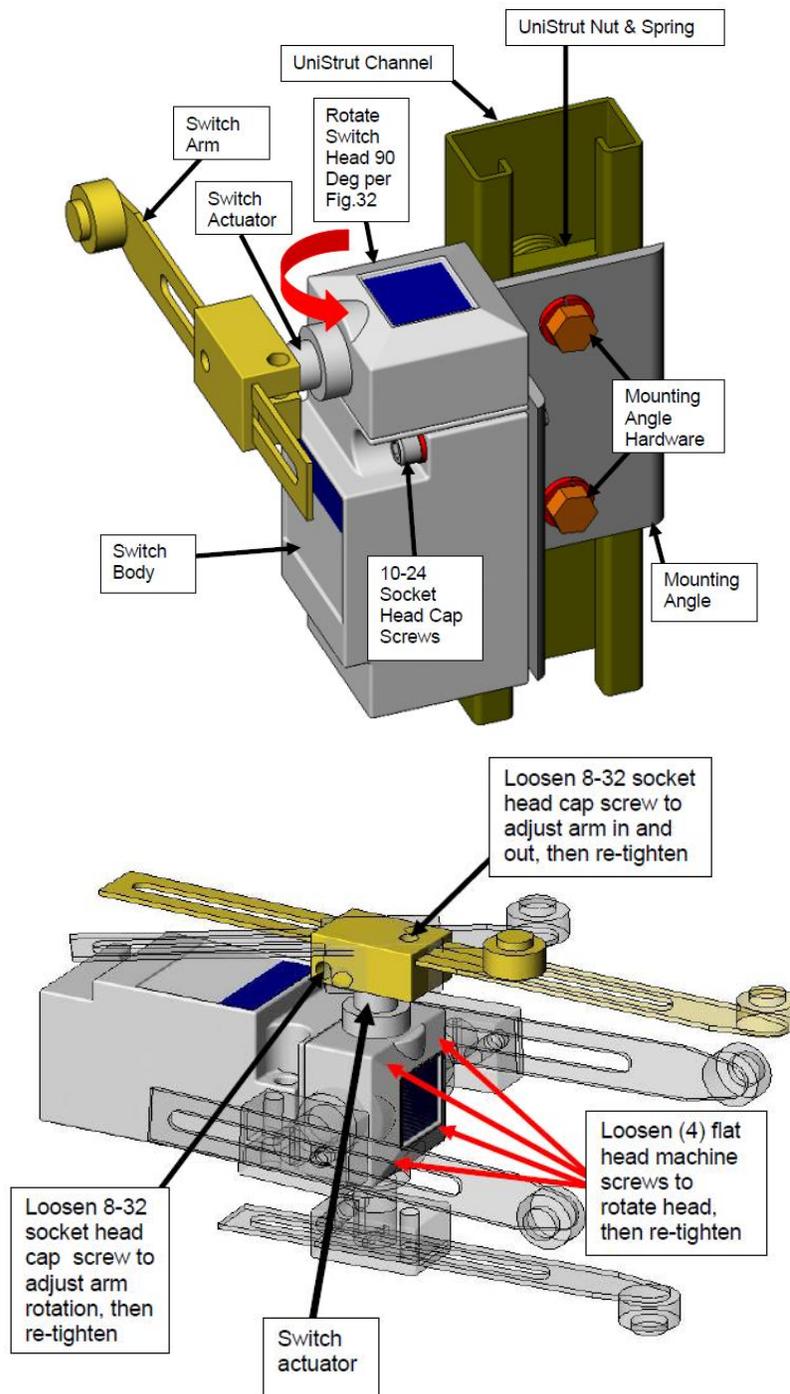
4.18.1 Level Limit Switch Kits

1. Locate and weld the limit switch cam assembly to the platform in a manner that allows the limit switch to strike as shown below.
2. Locate and assemble the adjustable limit switch kits, including the Unistrut mounting channel.
3. Once assembled, orient and weld the Unistrut to the mast to allow the limit switch arm to strike the cam when the platform is at that corresponding level – leaving room for adjustment.
4. For best results in adjusting position of the switch, loosen the mounting bolts that hold the switch to the Unistrut channel just enough so that the switch can be lightly “tapped” into position. It is extremely difficult to loosen the bolts completely and adjust the switch.

NOTE: To change the location direction of the switch, remove the switch head. Change the actuating control knob/mechanism to the desired actuation direction.



STYLE SHOWN IS PIT MOUNTED



4.18.2 Over-Travel Limit Switch Kit

1. Locate and assemble the adjustable limit switch kit as shown above, including the Unistrut mounting channel.
2. Locate and weld the limit switch approximately 6 inches above the top level limit switch kit and adjust position per steps 3 & 4 above.

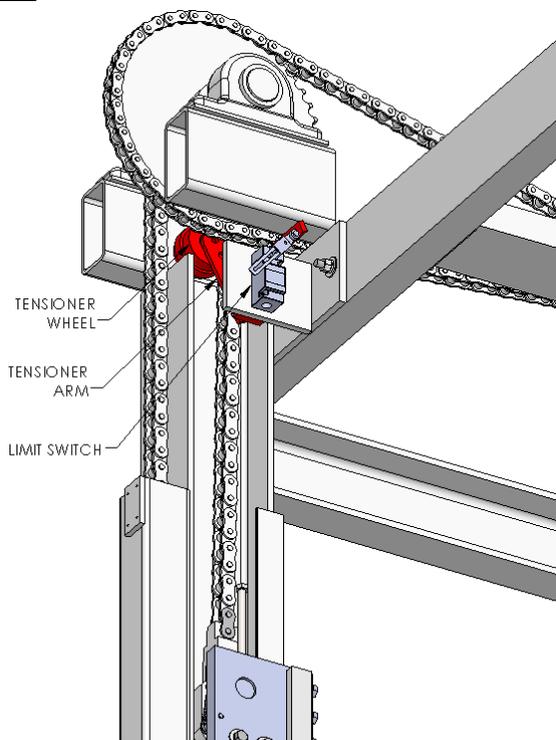
NOTE: You will have to temporarily remove the upper level switch arm to be able to travel past the upper level switch to the over-travel switch. Replace when done.

4.18.3 Lifting Slack Chain Sensing Switch Kit

These kits have been shipped loose to be field mounted, wired, and adjusted per the procedure below. These switches are intended to turn off the motor and stop movement of the platform whenever a slack/broken chain status is sensed.

NOTE: This section may require two sets of hands.

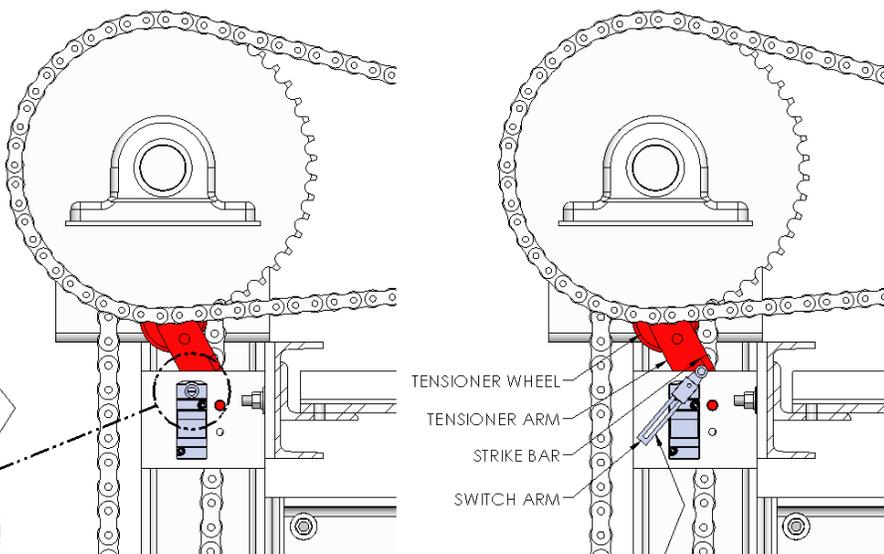
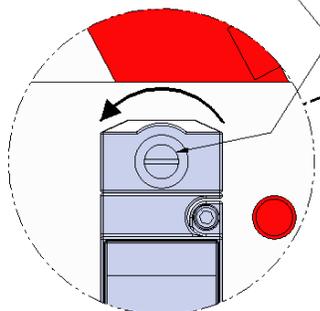
1. To install the lifting slack chain sensing switches, first gain a safe access to the top of the masts. There is a slack chain sensing switch kit provided for each lifting chain, (4) total.
2. With the platform hanging from the chains, each tensioner arm will be pushing towards the sensing switch arm. Each switch is wired to be normally open – held closed.
3. With the sensing switch mounted as shown, minus the arm assembly, use a pair of needle nose pliers to rotate the sensing switch actuator away from the tensioner bar until the electrical contacts close (listen for the “click”).
4. Turn the actuator arm an additional 1/8th of a turn and hold in place.
5. With another hand, push the arm assembly onto the end of the actuator until the end of the actuator is flush with the top of the switch arm – making sure that the roller on the end of the arm is making contact with the tensioner bar as shown.
6. While still holding the actuator in place with the needle nose pliers, tighten the switch arm onto the actuator with the socket head cap screw provided. You can now release the needle nose pliers from around the actuator.



SLACK CHAIN SENSOR

ROTATE SWITCH ACTUATOR AWAY FROM TENSIONER BAR UNTIL YOU HEAR A 'CLICK'.

ROTATE ANOTHER 1/8th TURN AND HOLD.



MOUNT THE SWITCH ARM WHILE HOLDING THE ACTUATOR IN THE SAME POSITION.

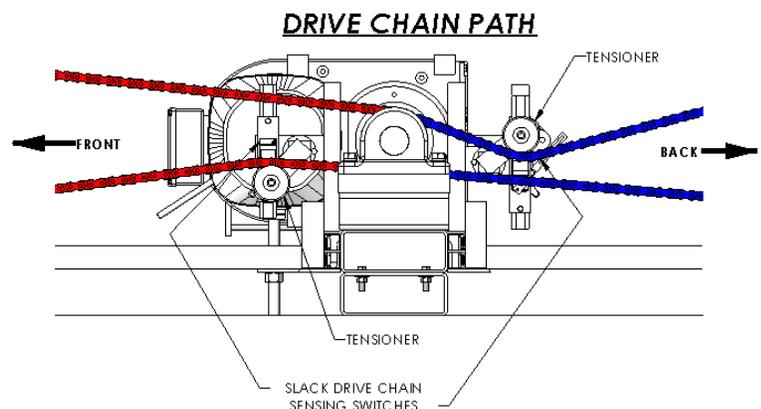
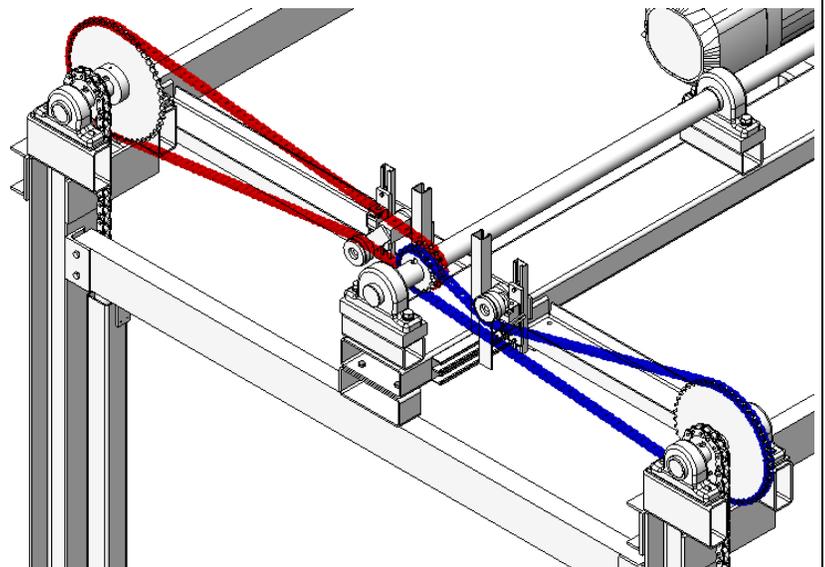
MAKE SURE THE ARM IS TOUCHING THE STRIKE BAR

7. After installing the lifting slack chain sensing switches, you must test them to make sure they are adjusted and set correctly.
8. Stack some empty pallets under the platform, surface must be level.
9. Put the HMI in maintenance mode, jog the lift down until it lands on the pallets and the slack chain sensing switches open and show fault on the HMI. If only one switch faults, jog it down further.
10. Further adjustment on the switches may be required.
11. Re-test until all switches are confirmed open (faulted) when the chains lose tension.

4.18.4 Driving Slack Chain Sensing Switch Kit

These kits have been shipped loose to be field mounted, wired, and adjusted per the procedure below.

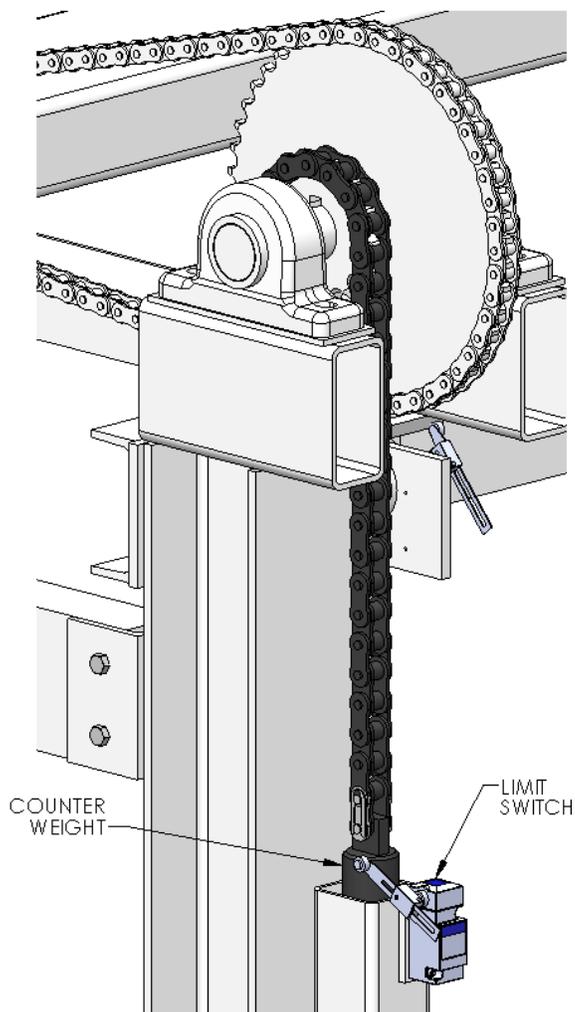
1. To install the drive slack chain sensing switches, first gain a safe access to the drive base at the top of the masts. There is a slack chain sensing switch kit provided for each drive chain, (4) total – (2) mounted above the chain loop, (2) mounted below the chain loop. All switches are to be wired normal open – held closed.
2. Make sure that the tensioner roller is aligned with the installed drive chain. Loosen the bolts holding the tensioner/sensing switch mounting plate to the unistrut channels and slide left or right to gain alignment. Re-tighten bolts when aligned.
3. Pre-load the tensioner arm by loosening the bolts holding the tensioner mounting plate and sliding the plate up or down the unistrut channels until tensioner wheel contacts the chain. Keep pushing tensioner roller into the taut chain until the spring-loaded tensioner arm rotates 15- 20 degrees. Re-tighten bolts when pre-loading the tensioner is complete.
4. Next, loosen the bolts holding the sensing switch mounting plate to its unistrut channels and slide switch assembly away from the tensioner arm to begin adjustment. Once clear of the tensioner arm, reverse motion and push the sensing switch back against the tensioner arm (the two mounted below the drive chain loop will slide up from beneath, the two mounted on top of the drive chain loop will slide down from above) until the switch contacts close (listen for the “click”). Re-tighten bolts now that the Sensing Switch is set.
5. Repeat step 2 on the other drive chain sensing switch assemblies.



4.18.5 Counterweight Sensing Switch Kit

This kit has been shipped loose to be field mounted, wired, and adjusted per the procedure below. This switch is intended to turn off the motor and stop movement of the platform whenever a counterweight attempts to come out of the top of its guide tube when lowering the platform.

1. To install the counterweight sensing switches, first gain a safe access to the top of the masts.
2. Assemble the sensing switch as shown, the switch is to be wired normally closed – held closed.
3. Mount the switch body to the pre-drilled mounting plate using the hardware provided.
4. Mount the switch arm to the switch body, sliding and rotating the switch arm so that it is positioned over the counterweight tube as illustrated.
5. Tighten the switch arm, rotate upwards and confirm that the switch contacts open (listen for “click”) at 10-20 degrees of rotation. Adjust as necessary.
6. Ensure that the counterweight will contact the switch arm as the counterweight is pulled out the top of the square tube.
7. After installing the sensing switch, it should be tested to make sure it is adjusted and set correctly. A qualified electrician should, while referencing the lift’s electrical schematic, test the electrical continuity of the sensing switch inside the lift’s motor control panel to make sure that:
 - a. The contacts in the switch are in the closed condition when in the running position.
 - b. The contacts in the switch are in the open condition when in the activated/rotated position.



4.19 Test Run (Empty)

 **DANGER**



Never go under lift platform until load is removed and mechanism is securely blocked in raised position with maintenance devices. ([see 5 Blocking Instructions](#)).

1. Check that all chains are properly seated in the sprockets.
2. Turn on power and press the UP button to raise the platform 6-12 inches (you must press E-Stop button to stop the lift) and check for:
 - a. Correct rotation/direction of the motor
 - b. Running clearance of the platform in the guides
 - c. Any unexpected noise, vibration, rubbing, interferences, etc.
 - d. Level platform deck surface
3. Re-set the E-Stop and activate the down push button and lower the lift. Is the platform stopping square at the bottom level?
4. Raise the platform 3-6 feet above the floor. Is everything okay? Any unusual noises? Are masts stable or do they need additional bracing?
5. If you are satisfied with the alignment and structural integrity of the unit, run the platform higher, continuing to check the clearance and smoothness of operation.
6. Run the platform to the top floor and check the alignment of the platform. Re-adjust the level limit switch as necessary to achieve alignment with the upper floor. Be sure that at least 1 inch clearance is present between the platform and all building structures, and other site constraints.
7. Adjust the remaining level limit switches to contact the platform limit switch cam.
8. Lower the platform a few feet and raise it back to its full travel, and check platform alignment again.

4.20 Final Adjustments

DANGER



All maintenance procedures described in this section should only be performed by qualified service personnel.

1. Run the system through its paces if you have a complete electrical system.
2. To change the actuation direction of the limit switch, remove the switch head. Change the actuating control knob/mechanism to the desired actuation direction.

WARNING

GUARDS, INTERLOCKS, SAFETY DEVICES and ELECTRICAL CIRCUIT must be restored to correct operation when installing parts, making adjustments or repairs.

4.21 Gate & Enclosure (Guarding) Installation

1. Install the gate and enclosures following the layout on the GA drawing provided with the enclosure package and referring to the Gate & Enclosure Installation Manual that has been sent separately for this particular application.
2. All gates or doors accessing the lift must have electrical contacts and mechanical locks to prevent the lift from operating if a gate is left open. The gate should lock until the platform is at the landing. There are many variables that can affect your installation: the type of gate; the type of door; conditions unique to a specific site. One (1) to Two (2) electrical sensing or signaling devices are supplied with each gate that incorporates the standard interlock design.

NOTE: If the guarding is not purchased from Autoquip it is the responsibility of the Owner to make sure it is in compliance with the requirements set forth in ASME B20.1.

4.24 Installation Wrap-Up

1. After the unit is completely wired, make all necessary adjustments to the interlocks, gate status switches, and upper & lower lift status limit switches to ensure proper operation of the lift and its safeties as required by the schematic.
2. Ensure that all WARNING SIGNS AND DECALS provided with the unit which may have been shipped loose for field installation (gate panel, etc.) are in place ([see 3.3 Safety Labels](#)).
3. Clean the area, paint and touch up as needed.
4. Conduct Operator training before handing off the lift to the customer. Use this manual as reference for this training & familiarization process.

5. BLOCKING INSTRUCTIONS

DANGER



Failure to properly adhere to lift blocking procedures is to risk the sudden and uncontrolled descent of the lift during maintenance or inspection. A falling lift can cause severe injury or death.



Never go under lift platform until load is removed and mechanism is securely blocked in raised position with maintenance devices.

This procedure describes the only factory-approved method of working under a lift. Follow these instructions EVERY time you plan to reach or crawl beneath the lift to perform service or maintenance – no matter how momentary that might be.

5.1 Lower the Platform

The safest way to inspect or maintain a VRC unit is with the load removed and the lift platform in the fully lowered position. When the platform is fully lowered it has no potential to suddenly or unexpectedly shift or drop.

If the platform cannot be lowered by gravity, [see 7.5 If a Platform Hangs Up or Jams](#).

5.2 When the Platform Must be Raised or Secured

1. Remove any load from the unit.
2. Raise the platform to the desired elevation.

If Operational: Enter “Maintenance” mode on the HMI and use the “jog” function until the desired height is reached

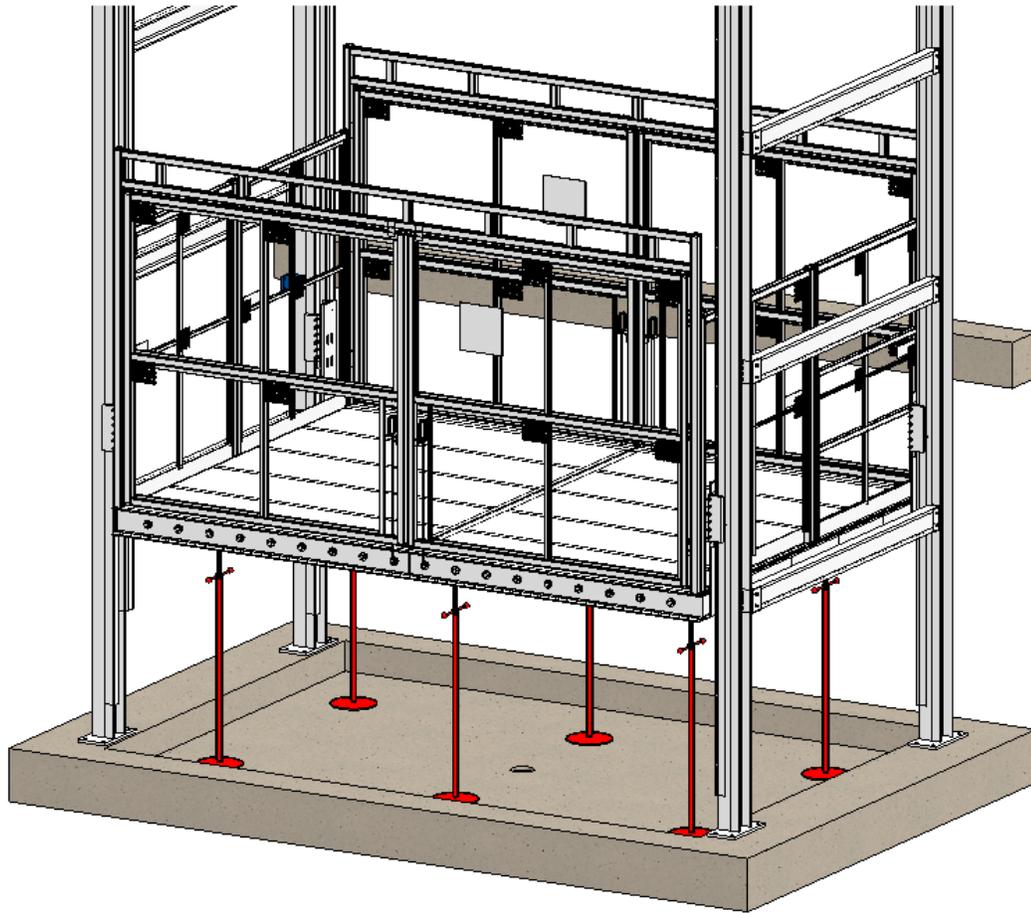
If Not Operational: Use a fork truck or other lifting device to raise the VRC platform, taking care not to damage the platform or lift actuator/drive.

3. Use a series of adequately sized adjustable jack stands (or equivalent) around the underside perimeter of the lift platform to provide a level, stable support.

DANGER

Do not stand beneath the platform while setting the supports into position.

Check the stability of the supports. If there is any chance of the support tipping or otherwise not providing a safe and stable condition, do not go under the platform!



4. Lower the platform onto the supports.

If operational – Enter “Maintenance” mode on the HMI and use the “jog” function until the platform lands onto, and is fully supported by, the maintenance devices.

If NOT operational - Use a fork truck or other lifting device to lower the VRC platform onto the maintenance devices, taking care not to damage the platform or lift actuator/drive. Make sure the platform is level when supported.

5. Re-check to ensure that the supports are fully and properly engaged with the underside of the platform. If not fully engaged the lift could fall unexpectedly, resulting in permanent damage to the device or the lift.
6. Follow OSHA electrical lock-out/tag-out procedures. Disconnect and tag all electrical and/or other power sources to prevent an unplanned or unexpected actuation of the lift.

⚠ DANGER



Turn off the power and lock out the power at the primary power disconnect switch before service or maintenance per OSHA Lock-Out, Tag-Out procedures.

7. Once inspection or work is complete, reverse the performance of the steps above to raise the platform off the maintenance devices and return the devices to their designated storage positions.

6. OPERATION

⚠ DANGER

Never operate unit when parts are broken or damaged! Do not operate this equipment when non-factory approved or damaged parts are in use! Contact local representative to rectify all such situations or contact Autoquip ([see 1.1 Contact Information](#))

⚠ WARNING



No riders! The VRC is provided for the sole purpose of transporting goods between floor elevations. At no time should it be used to transport personnel.

Before operating VRC, all personnel interacting with lift must read, understand, and follow instructions and safety warnings in this manual.

Close all gates when not in use. Never leave the VRC unattended with gates left open.

Never run the unit with the gates or doors open. Do not operate unit with doors open or with the interlocks “defeated” (bypassed).

⚠ CAUTION

Do not operate the VRC until all sensing switches have been confirmed to be installed and adjusted correctly.

NOTICE

In order for the lift to operate:

- All gates/doors guarding the lift must be closed.
- Loads cannot hang over the edge or sides of the platform.
- The load must be within the specified load capacity of the lift.
- All electrical safeties, sensors, and switches must be in their “normal” condition.

Per ASME B20.1, operator pushbutton stations must be located such that they cannot be activated while standing on the platform.



6.1 Moving Up



1. Verify all personnel are clear of VRC.
2. Press and release the “UP” button to raise lift.
3. When the platform reaches the level to which it has been called, the level limit switch will halt travel.
4. For any obstruction in the path, the [MOR](#) should trip and halt travel.

NOTICE

Always find out why the MOR has tripped, and be sure to correct the problem (malfunction, interference, etc.) before making the lift operational again.

6.2 Moving Down



1. Verify all personnel are clear of VRC.
2. Press and release the "DOWN" button to lower lift.
3. When the platform reaches the level to which it has been called, the level limit switch will halt travel.
4. For any obstruction in the path, the slack chain sensing switch should trip and halt travel.

NOTICE

Always find out why the counterweight sensing switch has tripped, and be sure to correct the problem (malfunction, interference, etc.) before making the lift operational again.

6.3 Emergency Stop



1. Press the red emergency stop button to stop all travel of the VRC at any time.
2. The emergency stop button will interrupt all electrical control functions when it is activated. Movement of the platform will cease, regardless of its direction.
3. The emergency stop button is typically reset by one of two methods:
4. Turning clockwise until it pops back out. This is usually indicated by the  symbol.
 - a. Another style just pulls straight back out.
5. After the emergency stop button has been reset, any level button may be pressed to continue travel.

NOTICE

Always find out why the E-Stop button may have been pressed, and be sure to correct the problem (malfunction, interference, etc.) before making the lift operational again.

7. MAINTENANCE

DANGER



All maintenance procedures described in this section should only be performed by qualified service personnel.



Turn off the power and lock out the power at the primary power disconnect switch before service or maintenance per OSHA Lock-Out, Tag-Out procedures.



7.1 Planned Maintenance Program

A local Autoquip representative provides a Planned Maintenance Program (PMP) for this equipment using qualified and experienced personnel. Contact a local representative or Autoquip ([see 1.1 Contact Information](#)).

7.2 Routine Maintenance

Recommended maintenance interval –
Every week or 8 hours of operation.

- Inspect all gates/doors for wear or damage.
- Check that all sprockets and chains are secure.
- While running, listen for unusual noises. Isolate and check for the cause. Repair if required.



Never go under lift platform until load is removed and mechanism is securely blocked in raised position with maintenance devices ([see 5 Blocking Instructions](#)).

- Using a long-handled broom or other implement, remove any debris from under the platform or in the enclosed area.

Recommended maintenance interval –
Every 6 months or 175 hours of operation, whichever comes first.

- Coat drive & lifting chains with oil; inspect for wear, rust, and bent or binding links.
- Make sure the platform is lined up at each floor. Adjust the level limit switch, if required.
- Look for any unusual rub marks on the guides, wall, platform, masts, etc., which might indicate misalignment of the components due to overloading, misuse, or something out of tolerance.
- Inspect guide rollers for wear, binding, or other indication of non-rotation.
- Inspect all gate/door interlocks and status switches for proper operation.
- Inspect all gates/doors for wear or damage.
- Check that all bolts and nuts are secure.

Recommended maintenance interval –

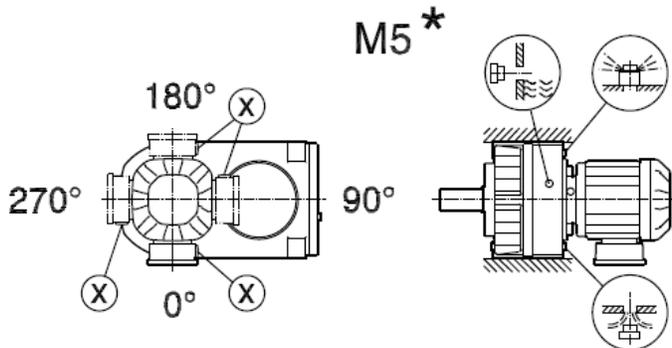
Every 12 months or 350 hours of operation, whichever comes first.

- Inspect all chain sprockets for wear or damage; tighten set screws. Center lifting chains in counterweight tube, and center sprockets on the lifting chains.
- Pillow block bearings on the drive shaft should be greased; tighten all set screws.
- Check the gear oil level in the gear reducer. Oil should be flush with the bottom threads of the oil level plug. The fill and breather holes will be the top hole on one side and the fluid check hole will be a plug about halfway up on the gear reducer.

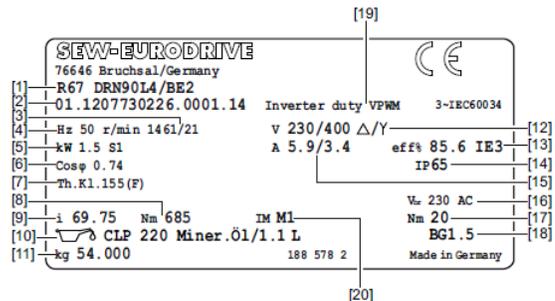
7.3 General Maintenance

7.3.1 Oil Recommendations

The gearmotor nameplate gives the oil type and volume. Use ISO 220 grade EP gear oil for a temperature above 0 °F.



The following figure shows an example of the nameplate of a DRN.. gearmotor.



27021611137296651

| Icon | Meaning |
|------|----------------|
| | Breather valve |
| | Oil level plug |
| | Oil drain plug |

| | |
|------|--|
| [1] | Type designation gearmotor |
| [2] | Serial number |
| [3] | min ⁻¹ Rated speed of the motor / speed of the gear unit output shaft |
| [4] | Hz Nominal frequency |
| [5] | kW Rated power/operating mode |
| [6] | Power factor |
| [7] | Thermal class |
| [8] | Nm Output torque |
| [9] | Gear unit ratio |
| [10] | Oil type and oil fill volume |
| [11] | kg Weight |
| [12] | V Nominal voltage |
| [13] | Efficiency and energy efficiency class |
| [14] | Degree of protection according to IEC 60034-5 |
| [15] | Rated current |
| [16] | V Brake voltage |
| [17] | Nm Nominal braking torque |
| [18] | Brake control |
| [19] | Suitability for inverter operation |
| [20] | Mounting position |

- Oil changes are required at intervals of 10,000 operating hours or every two years, whichever comes first. If a synthetic oil lubricant is used, then this period can be extended to 20,000 operating hours or every four years, whichever comes first. In applications where hostile operating conditions exist, such as high humidity, corrosive environment, or large temperature changes, the lubricant should be changed at more frequent intervals.
- Grease packed bearings should be cleaned and regreased every 10,000 hours or 20,000 hours for synthetic grease. Input (high speed) bearings should not be over-greased. They should be filled with grease not to exceed 1/3 of the bearings free volume. For output bearings and bearings with replaceable grease shields, fill to 2/3 of their free volume.

7.4 Gear Motor/Drive Maintenance



DO NOT remove or disconnect the motor, brake, or drive chains unless platform has been blocked with maintenance devices ([see 5 Blocking Instructions](#)).

Extreme caution must be taken anytime the gearbox, brake motor, or drive chains are disassembled. All holding and braking forces on the lifting chains are removed and these chains are allowed to “free-wheel” under their own weight or any other weight that may be on the chains, including the weight of the platform.

Therefore, any time maintenance to the drive train (gearbox, brake motor, drive chains) is performed, especially when utilizing the lift platform as the work platform, the platform **MUST** be blocked adequately per approved blocking methods ([see 5 Blocking Instructions](#)).

7.5 If a Platform Hangs Up or Jams

⚠ DANGER



All maintenance procedures described in this section should only be performed by qualified service personnel.

Never operate unit when parts are broken or damaged! Do not operate this equipment when non-factory approved or damaged parts are in use! Contact local representative to rectify all such situations or contact Autoquip ([see 1.1 Contact Information](#))



Never go under lift platform until load is removed and mechanism is securely blocked in raised position with maintenance devices ([see 5 Blocking Instructions](#)).



DO NOT walk out onto the platform or attempt to physically free the jam until load is removed and mechanism is securely blocked with maintenance devices ([see 5 Blocking Instructions](#)).

One common issue would be an obstruction somewhere on the platform or guide. The following steps should be followed:

1. Remove load from lift. Inspect all chains, sprockets, and other mechanical components for obstructions or damage.
2. Ensuring the platform is blocked, remove the obstruction and/or replace the damaged part.

If above steps do not correct problem, contact Autoquip ([see 1.1 Contact Information](#)) to provide assistance in discovering the source & acceptable remedy for the platform jam.

Contact an authorized Autoquip dealer or representative to conduct a comprehensive inspection of the lift for structural and component damage before placing it back in service.

7.6 Schematics and Field Wiring Details

PLEASE REFER TO THE JOB SPECIFIC ELECTRICAL SCHEMATIC SUPPLIED WITH ORDER.

8. TROUBLESHOOTING

DANGER



Never go under lift platform until load is removed and mechanism is securely blocked in raised position with maintenance devices ([see 5 Blocking Instructions](#)).



All maintenance procedures described in this section should only be performed by qualified service personnel.



Turn off the power and lock out the power at the primary power disconnect switch before service or maintenance per OSHA Lock-Out, Tag-Out procedures.



The HMI control panel can help diagnose some issues. See the HMI manual for how to show the alarms.

Alarms

Add Alarm

Delete Alarms

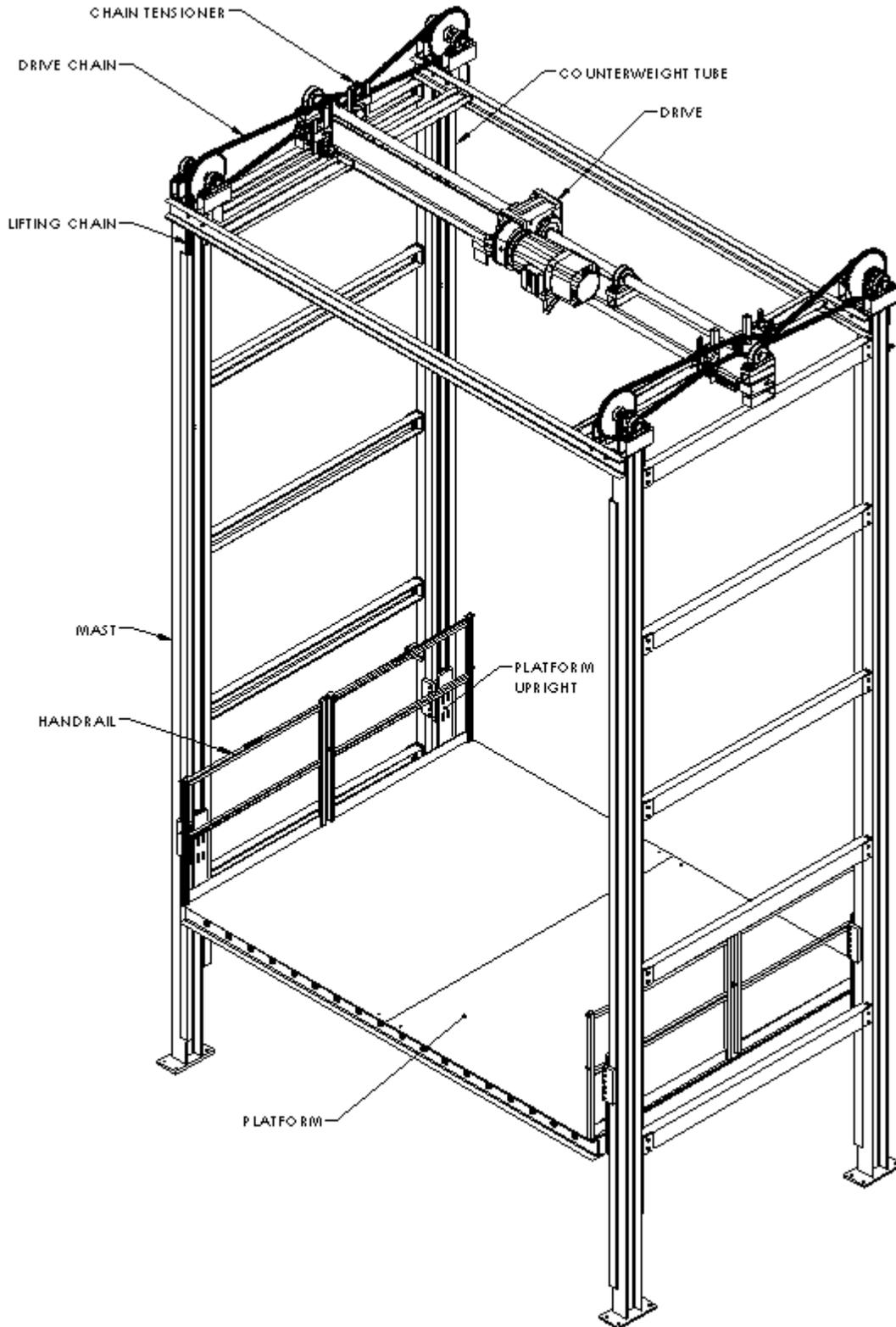
| Trigger | Alarm Type | Message |
|--------------------------------|------------|---|
| ALARM_CS1 | Bit | Carriage gate 1 open(ed). |
| ALARM_CS2 | Bit | Carriage gate 2 open(ed). |
| ALARM_CS3 | Bit | Carriage gate 3 open(ed). |
| ALARM_ENABLE | Bit | The enable switch must be ON and stay ON for the lift to run. |
| ALARM_ESTOP | Bit | Emergency stop activate(d). |
| ALARM_GS_L1 | Bit | Level 1 gate open(ed). |
| ALARM_GS_L2 | Bit | Level 2 gate open(ed). |
| ALARM_LMTSW | Bit | Both level limit switches activated, check for stuck level switches or wiring. |
| ALARM_LS_L1 | Bit | Lift already at level 1. |
| ALARM_LS_L2 | Bit | Lift already at level 2. |
| ALARM_MOVING_TO_1 | Bit | Lift already moving to level 1. |
| ALARM_MOVING_TO_2 | Bit | Lift already moving to level 2. |
| ALARM_OVLD_TRIP | Bit | Motor overload tripped. |
| ALARM_PSW | Bit | Pressure switch tripped without level 2 limit switch. |
| ALARM_REPRESSURIZATION_MAX | Bit | Max repressurization attempts reached. |
| ALARM_REPRESSURIZATION_TIMEOUT | Bit | Repressurization attempt timed out. |
| ALARM_TIMEOUT_DOWN | Bit | Lift did not reach the lower level within the max allowed time, /*N:3 DOWN_TIME_MAX_DINT NOFILL DP:0*/ sec. |
| ALARM_TIMEOUT_UP | Bit | Lift did not reach the upper level within the max allowed time, /*N:3 UP_TIME_MAX_DINT NOFILL DP:0*/ sec. |
| ALARM_TOO_SOON | Bit | Request to move too soon after lift stopped. |
| MAINT_CAR_SILK_1 | Bit | The carriage gate solenoid interlock is nearing end of life, schedule downtime to replace. |
| MAINT_CAR_SILK_2 | Bit | The 2nd carriage gate solenoid interlock is nearing end of life, schedule downtime to replace. |
| MAINT_CAR_SILK_3 | Bit | The 3rd carriage gate solenoid interlock is nearing end of life, schedule downtime to replace. |
| MAINT_SILK_L1 | Bit | The lower level solenoid interlock is nearing end of life, schedule downtime to replace. |
| MAINT_SILK_L2 | Bit | The upper level solenoid interlock is nearing end of life, schedule downtime to replace. |

| Issue | Possible Cause | Solution |
|--|---|--|
| Unit will not raise (motor not running or “humming”). | A slack chain sensing switch is activated due to a slack or broken chain condition, or the sensing switch is malfunctioning or is out of tolerance. | Check and/or re-establish chain tension, or check/repair/adjust sensing switch(es). (See 4.18.3 Slack Chain Sensing Kit). |
| | The main line disconnect switch is open (off). | Check and close (on). |
| | The emergency stop button may be depressed or jammed. | Check all push-button stations. Repair as necessary. |
| | The gate or door is not closed. | Check and close. |
| | The gate status switch or door interlock is malfunctioning or is out of tolerance. | Check and repair or adjust as required. |
| | The main line fuse disconnect fuse is blown. | Check and replace. |
| | The “UP” push button or circuit is malfunctioning. | Check at the other push button station for “UP” function. Check components and circuit. Repair or replace. |
| | The motor overload relay (MOR) has tripped. | Check and reset. If it trips again, check for cause in the motor circuit. |
| | A circuit breaker on the secondary voltage has tripped. | Check and reset CB1 or CB2. |
| Unit will not raise (motor is running or “humming”). | The load may exceed the rating. | Reduce the excess load. |
| | Rotation on the 3-phase motor may be reversed. | Reverse any two motor electrical leads. |
| | 3-Phase motor may be single-phasing (humming). | Check wiring, fuses, etc. |
| | The voltage at the motor terminals may be too low to run the motor with the existing load. | Check before measuring the voltage at the motor terminals (or as near as possible) while the motor is running under load. Reading the source voltage is meaningless. Inadequate or incorrect wiring can starve the motor when the source voltage is ample. Correct as necessary. |
| | The motor brake may be seized if the motor is humming or blowing fuses or overloads. | Remove the motor and check to see if the brake is working correctly (see 5 Blocking Instructions). |
| Unit operates in a “spongy” or jerky fashion. | The chain sprockets may be binding. The chain may be off of a sprocket. The rollers may be binding. The platform may be binding in the guide ways. | Check and repair. |

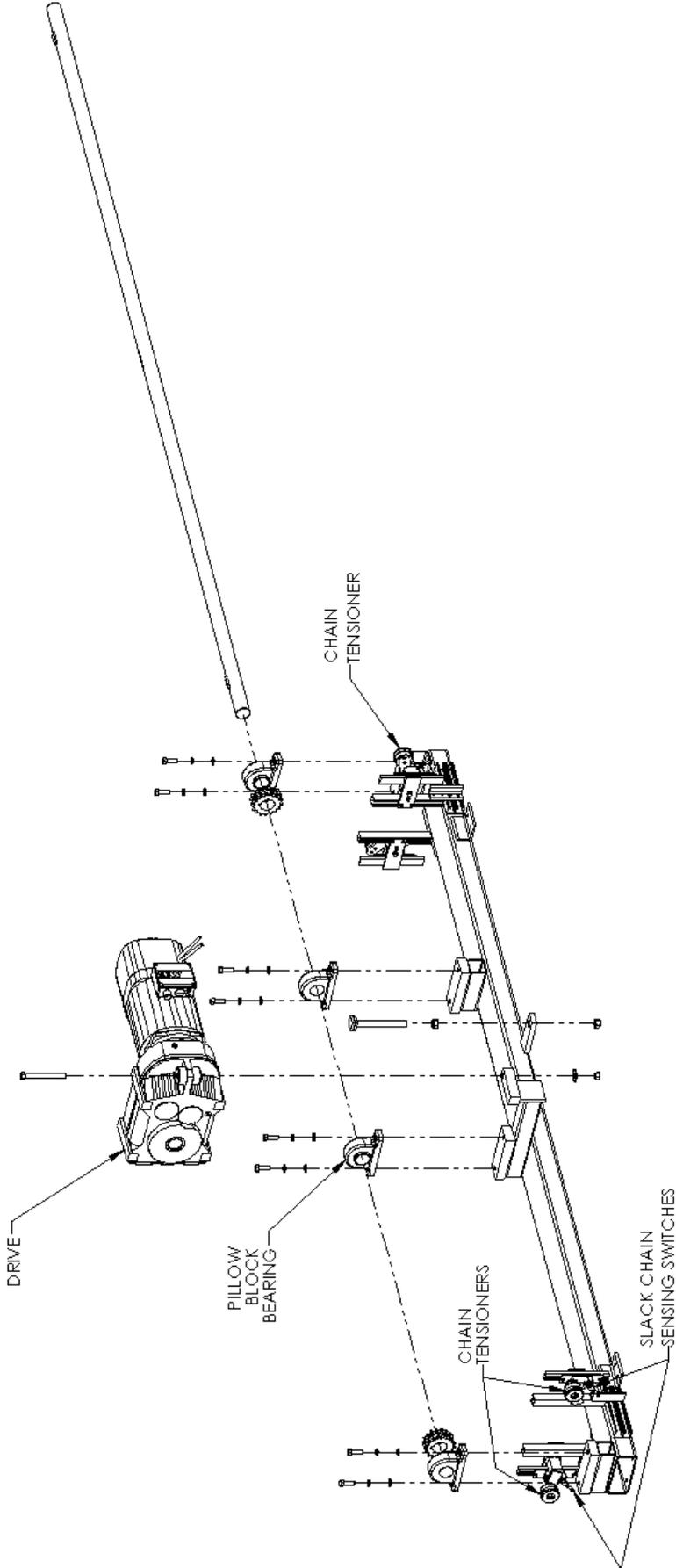
| Issue | Possible Cause | Solution |
|--|---|--|
| Motor labors or heats excessively. | The voltage at the motor terminals may be too low to run the motor with the existing load. | Check before measuring the voltage at the motor terminals (or as near as possible) while the motor is running under load. Reading the source voltage is meaningless. Inadequate or incorrect wiring can starve the motor when the source voltage is ample. Correct as necessary. |
| | The wiring may be incorrect. | Be sure one leg of the motor line is not connected to the ground prong. This can happen particularly on 3-phase units using twist-lock plugs. |
| | The gear reducer may be binding from oil starvation. | This can cause high internal heat. The gear reducer can be irreparably damaged by oil starvation and may have to be replaced! |
| Unit won't lower - Electrical Circuit | A slack chain sensing switch is activated due to a slack or broken chain condition, or the sensing switch is malfunctioning or is out of tolerance. | Check and/or re-establish chain tension, or check/repair/adjust sensing switch(es). (See 4.18.3 Slack Chain Sensing Kit). |
| | The main line disconnect switch is open (off). | Check and close (on). |
| | The emergency stop button may be depressed or jammed. | Check all push-button stations. Repair as necessary. |
| | The gate or door is not closed. | Check and close. |
| | The gate status switch or door interlock is malfunctioning or is out of tolerance. | Check and repair or adjust as required. |
| | The main line fuse disconnect fuse is blown. | Check and replace. |
| | The "DN" push button or circuit is malfunctioning. | Check at the other push button station for "DN" function. Check components and circuit. Repair or replace. |
| | The motor overload relay (MOR) has tripped. | Check and reset. If it trips again, check for cause in the motor circuit. |
| | A circuit breaker on the secondary voltage has tripped. | Check and reset CB1 or CB2. |
| The motor contactor coil has burned out. | Check and replace. | |
| Unit lowers too slowly. | The motor brake may be malfunctioning. | Remove the motor and check to see if the brake is working correctly (see 5 Blocking Instructions). |
| Unit raises, then lowers back slowly. | The motor brake is not locking the motor drive. | The brake needs to be adjusted or replaced. Check for brake material in the brake cover housing. |
| Unit does not raise completely to the upper level. | Upper limit switch is not triggering. | Check the upper limit switch setting to see if the setting is correct. |
| | There is an interference with the platform. | Check and correct (see 5 Blocking Instructions). |

9. PARTS LISTS

9.1 General Assembly



9.2 Typical Drive Unit



10. WARRANTY

The user is solely responsible for using this equipment in a safe manner and observing all of the safety guidelines provided in the Owner's Manual and on the warning labels provided with the lift. If you are unable to locate either the manual or the warning labels, please contact Autoquip ([see 1.1 Contact Information](#)) for replacement downloads or information.

Autoquip expressly warrants that this product will be free from defects in material and workmanship under normal, intended use for a period of One (1) Year for all electrical, mechanical, and hydraulic components, parts or devices. Ninety (90) days labor warranty extended to One (1) year with a Planned Maintenance Contract in place. Autoquip also warrants the structure of the lift against breakage or failure for a period of Five (5) years. The warranty period begins from the date of shipment. When making a claim, immediately send your dealer or Autoquip notice of your claim. All claims must be received by Autoquip within the warranty time period. The maximum liability of Autoquip, under this Limited Warranty, is limited to the replacement of the equipment.

This warranty shall not apply to any Autoquip lift or parts of Autoquip lift that have been damaged or broken in transit/shipping, or due directly or indirectly to misuse, abuse, vehicle impact, negligence, faulty installation, fire, floods, acts of God, accidents, or that have been used in a manner contrary to the manufacturer's limitations or recommendations as stated in the manual, or that have been repaired, altered or modified in any manner outside of Autoquip's manufacturing facility or which have not been expressly authorized by Autoquip.

Autoquip makes no warranty or representation with respect to the compliance of any equipment with state or local safety or product standard codes, and any failure to comply with such codes shall not be considered a defect of material or workmanship under this warranty. Autoquip shall not be liable for any direct or consequential damages resulting from such noncompliance.

Autoquip's obligation under this warranty is limited to the replacement or repair of defective components at its factory or another location at Autoquip's discretion at no cost to the owner. This is owner's sole remedy. Replacement parts (with exception of electrical components) will be warranted for a period of ninety (90) days. Except as stated herein, Autoquip will not be liable for any loss, injury, or damage to persons or property, nor for direct, indirect, or consequential damage of any kind, resulting from failure or defective operation of said equipment. All parts used to replace defective material must be genuine Autoquip parts in order to be covered by this Limited Warranty.



Autoquip
Innovative Lift Solutions