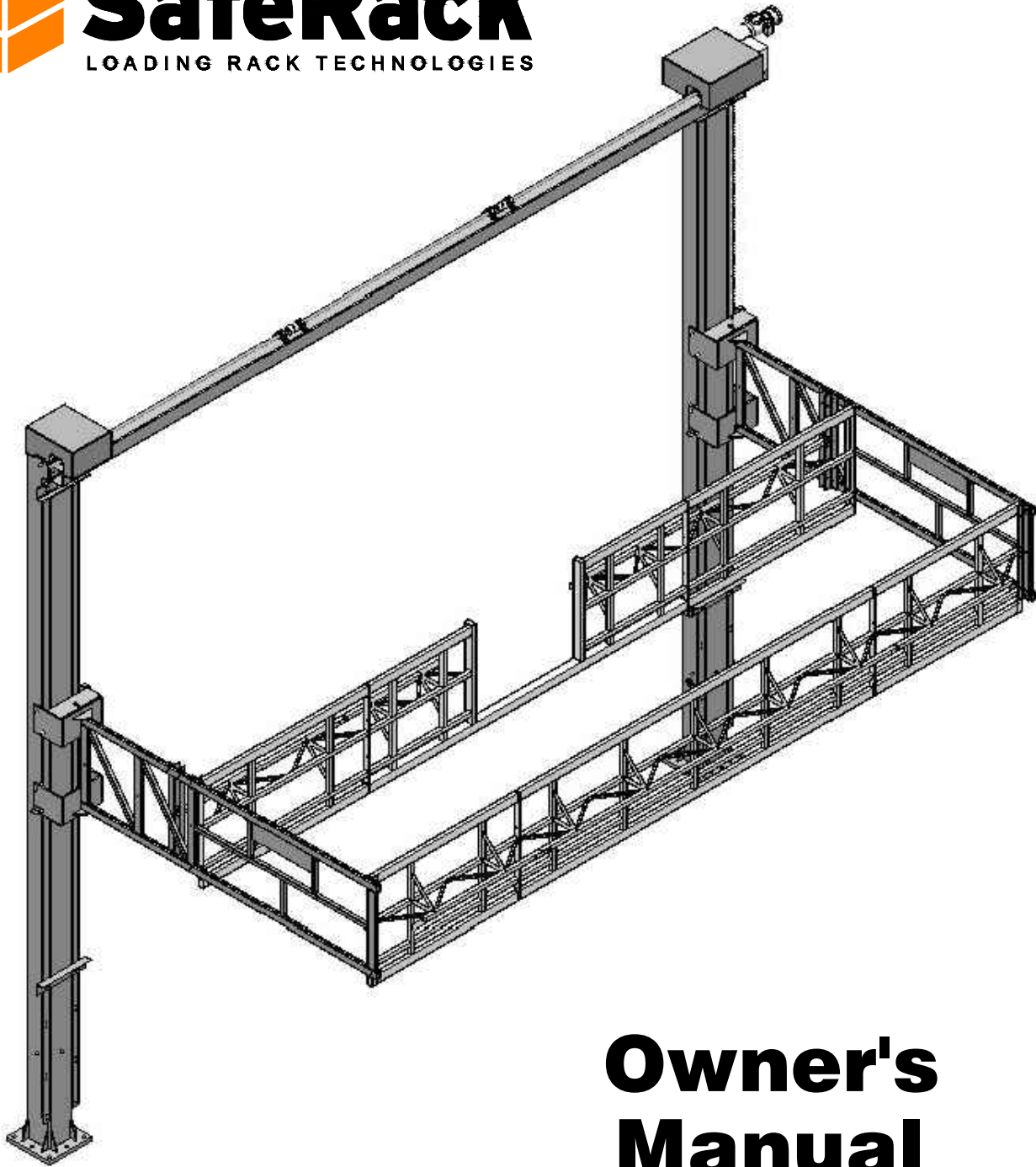




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Owner's Manual

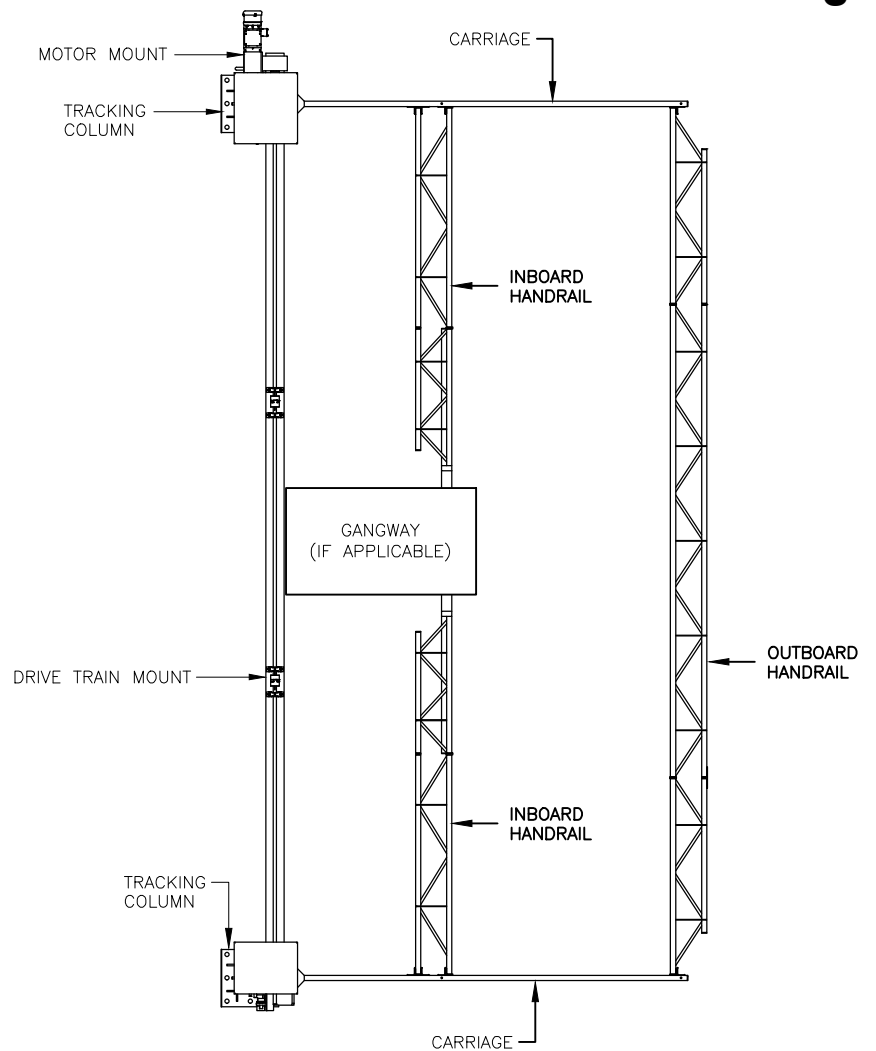
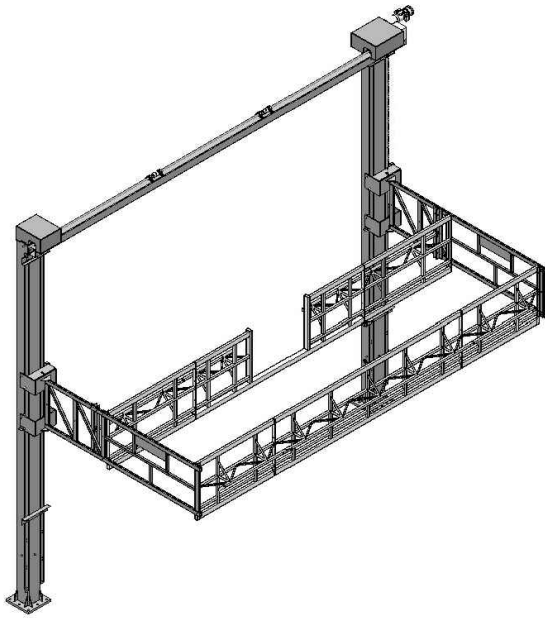
MAXRACK Elevating Cage System

REVISED 1/10/2024

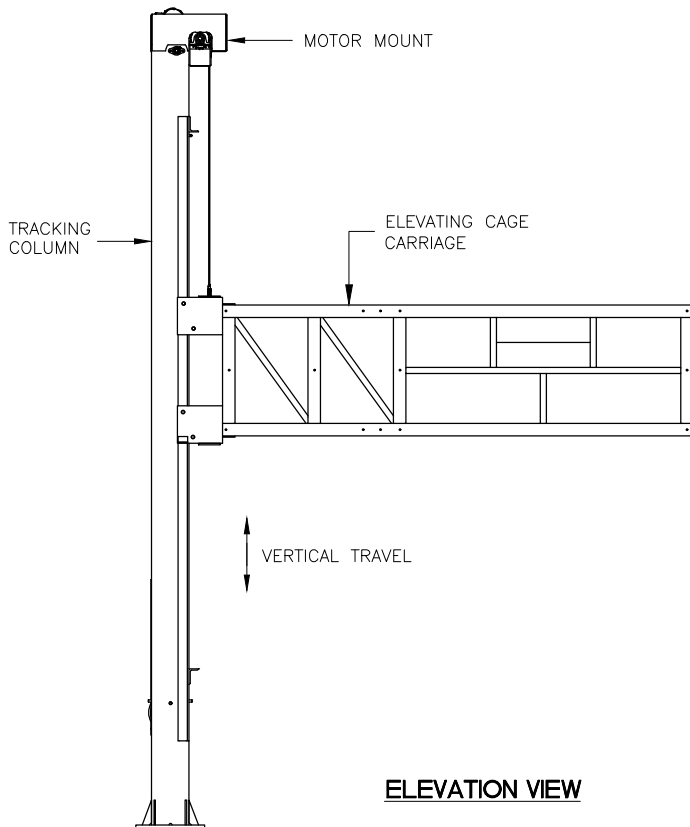
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5	ASSEMBLY INSTRUCTIONS - columns
6	ASSEMBLY INSTRUCTIONS - roller box
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9	ASSEMBLY INSTRUCTIONS - handle & cover
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ADDENDUM 1	CE LABEL LAYOUT





PLAN VIEW:



ELEVATION VIEW

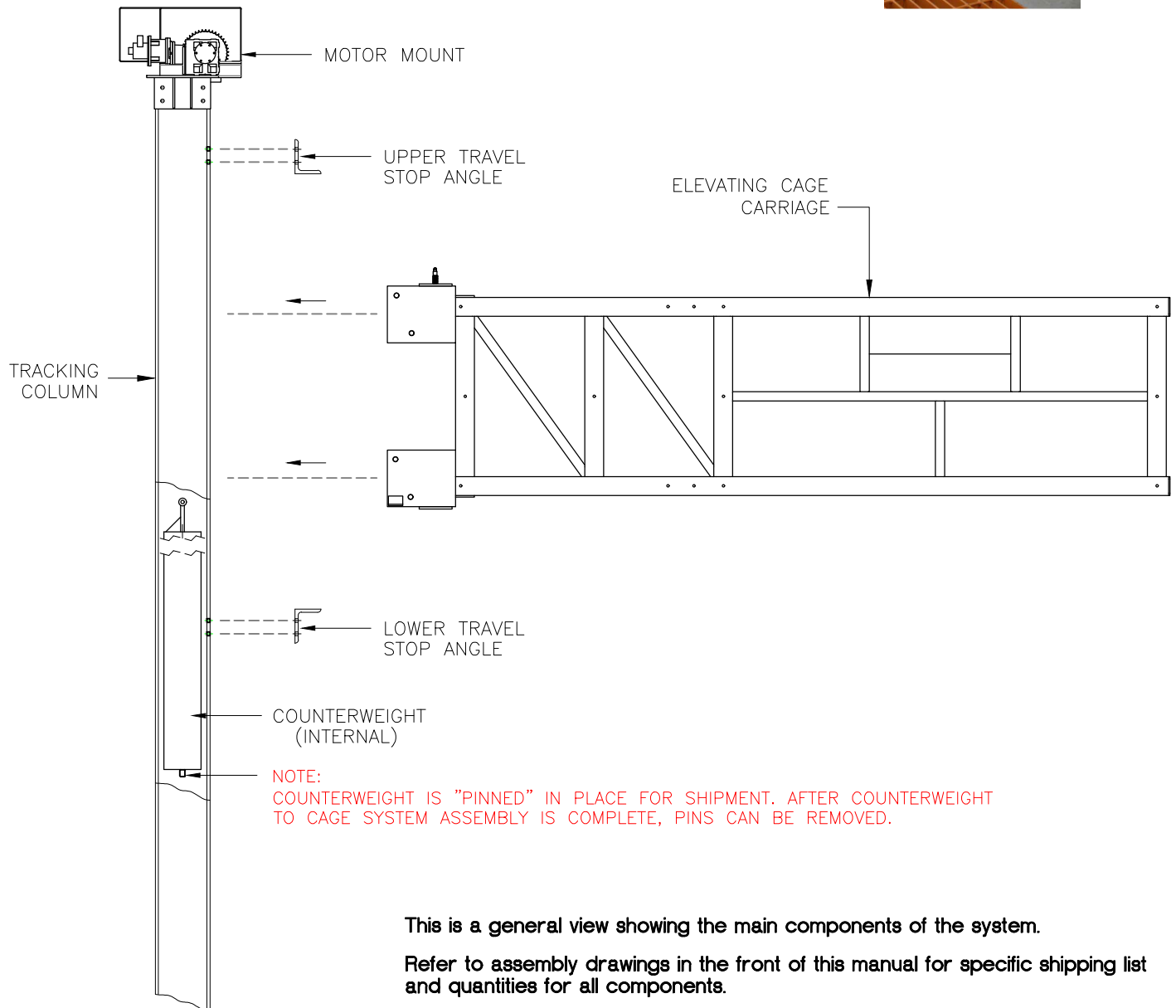
SPECIFICATIONS:

- LOAD CAPACITY – 500 Lb.
- WORKING RANGE – APPROX. 5 FOOT VERTICAL TRAVEL
- TRACKING COLUMNS AND SUPPORT CARRIAGES ARE HOT DIPPED GALVANIZED PER ASTM123
- ELEVATING CAGE CONSTRUCTED OF ALUMINUM PIPE
- AWS WELDING SPEC D1.1; 1.2
- ALL CRITICAL HARDWARE IS STAINLESS STEEL
- SYSTEM DESIGNED TO RAISE AND LOWER UNDER ONE MINUTE

ASSEMBLY INSTRUCTIONS

ALL HARDWARE NEEDED FOR ASSEMBLY IS LOCATED IN A SQUARE HARDWARE BUCKET SHIPPED WITH THE UNIT (OR BOX/PALLET). INSIDE YOU WILL FIND ALL HARDWARE BOXED AND MARKED AS TO ITS PROPER LOCATION. IT IS RECOMMENDED THAT A FORKLIFT, HOIST, CRANE OR OTHER SUITABLE LIFTING DEVICE BE USED FOR PROPER AND SAFE ASSEMBLY.

PLEASE TAKE A MOMENT TO INSPECT YOUR NEW UNIT. PLEASE LOOK FOR SHIPPING DAMAGE OR ANY LOOSE BANDING WHICH MIGHT INDICATE A MISSING PART. PLEASE CHECK PACKING LIST AGAINST YOUR UNIT TO ENSURE ALL PARTS HAVE ARRIVED WITHOUT DAMAGE.



ASSEMBLY INSTRUCTIONS

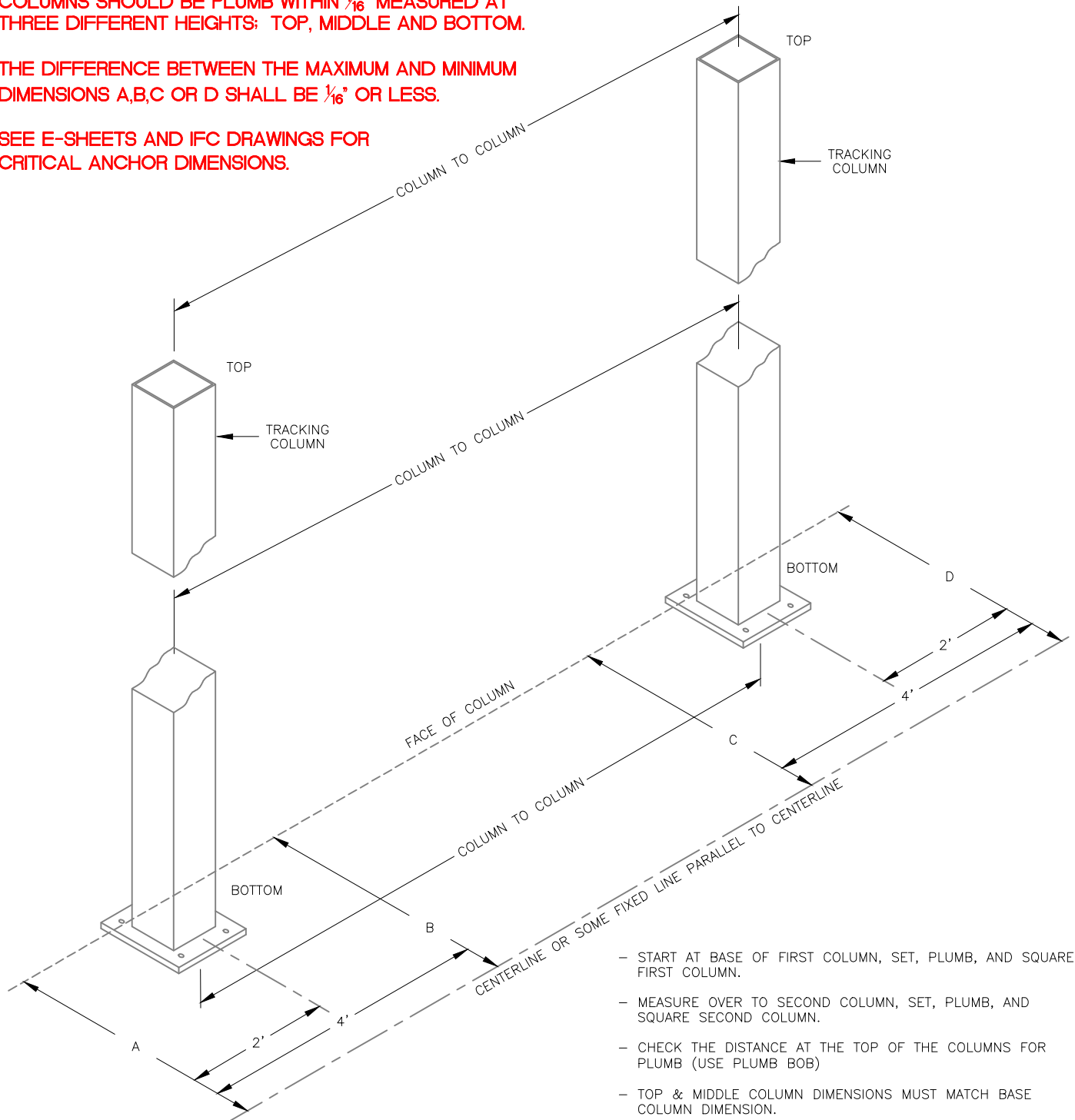
TRACKING COLUMNS FOR ELEVATING CAGE

CENTERLINE OF COLUMN TO CENTERLINE OF COLUMN DIMENSION IS CRITICAL.

COLUMNS SHOULD BE PLUMB WITHIN $\frac{1}{16}"$ MEASURED AT THREE DIFFERENT HEIGHTS: TOP, MIDDLE AND BOTTOM.

THE DIFFERENCE BETWEEN THE MAXIMUM AND MINIMUM DIMENSIONS A,B,C OR D SHALL BE $\frac{1}{16}"$ OR LESS.

SEE E-SHEETS AND IFC DRAWINGS FOR CRITICAL ANCHOR DIMENSIONS.



- START AT BASE OF FIRST COLUMN, SET, PLUMB, AND SQUARE FIRST COLUMN.
- MEASURE OVER TO SECOND COLUMN, SET, PLUMB, AND SQUARE SECOND COLUMN.
- CHECK THE DISTANCE AT THE TOP OF THE COLUMNS FOR PLUMB (USE PLUMB BOB)
- TOP & MIDDLE COLUMN DIMENSIONS MUST MATCH BASE COLUMN DIMENSION.
- FRONT OF COLUMN DIMENSIONS MUST ALSO BE WITHIN $\frac{1}{16}"$.

(MEASURE FROM CENTER OF COLUMN, NOT EDGES, WHEN MEASURING CENTER TO CENTER)

ASSEMBLY INSTRUCTIONS

ROLLER TO ROLLER BOX ASSEMBLY

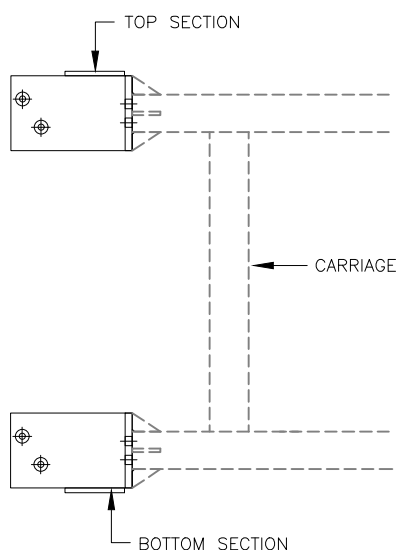


FIGURE 1

BEFORE MOUNTING ROLLER BOXES TO TRACKING COLUMNS, LOAD ROLLERS MUST BE ATTACHED IN THE PROPER ORIENTATION. YOU SHOULD HAVE (4) STRAIGHT ROLLERS AND (4) FLANGED ROLLERS FOR CARRIAGE.

FIRST, POSITION ROLLER BOX/CARRIAGES TO DISTINGUISH TOP AND BOTTOM SECTIONS AS SHOWN IN FIG. 1

THEN, ATTACH BOTH ROLLER TYPES AS SHOWN IN FIGURES 2 AND 3.

BE SURE TO TIGHTEN ALL CONNECTIONS AT EACH ROLLER USING $\frac{7}{16}$ " ALLEN WRENCH.

REPEAT FOR EACH ROLLER BOX.

NOTE:
HOLE ORIENTATION, AS SHOWN IN FIGURE 1, MAY VARY ON SOME UNITS.
BUT, ROLLER ORIENTATION, AS SHOWN IN FIGURES 2 AND 3, IS THE SAME ON ALL UNITS.

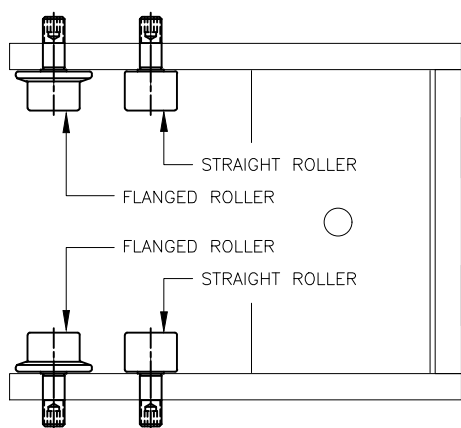


FIGURE 2
TOP SECTION
(PLAN VIEW)

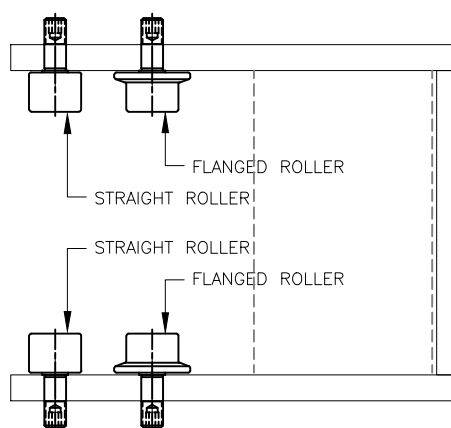


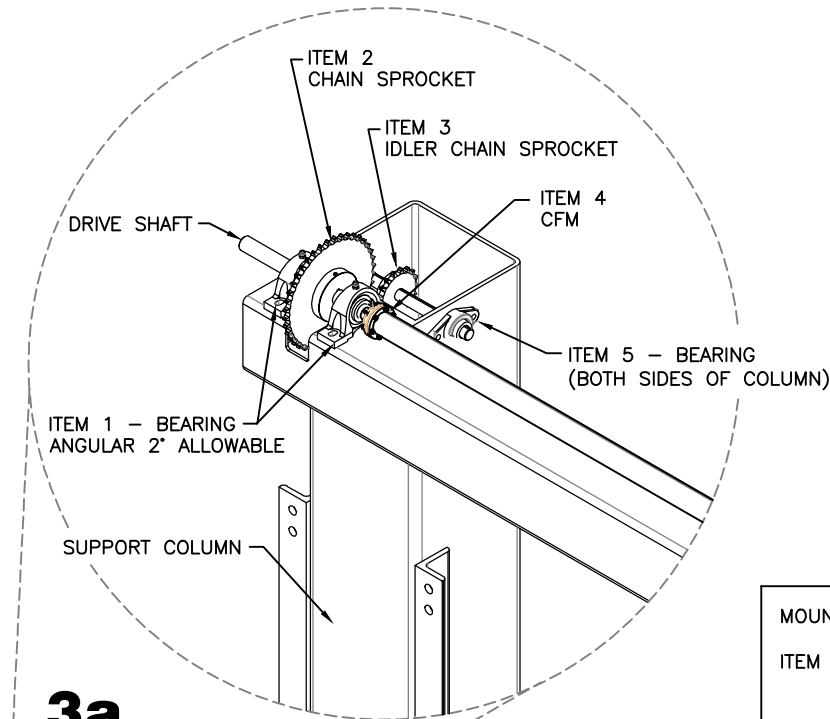
FIGURE 3
BOTTOM SECTION
(PLAN VIEW)

NOTE:

Roller boxes should be pre-assembled and mounted on columns for most units.
If they are not, mount roller boxes to tracking columns. Refer to structural erection drawings in the front of this manual for piece mark/location.

ASSEMBLY INSTRUCTIONS

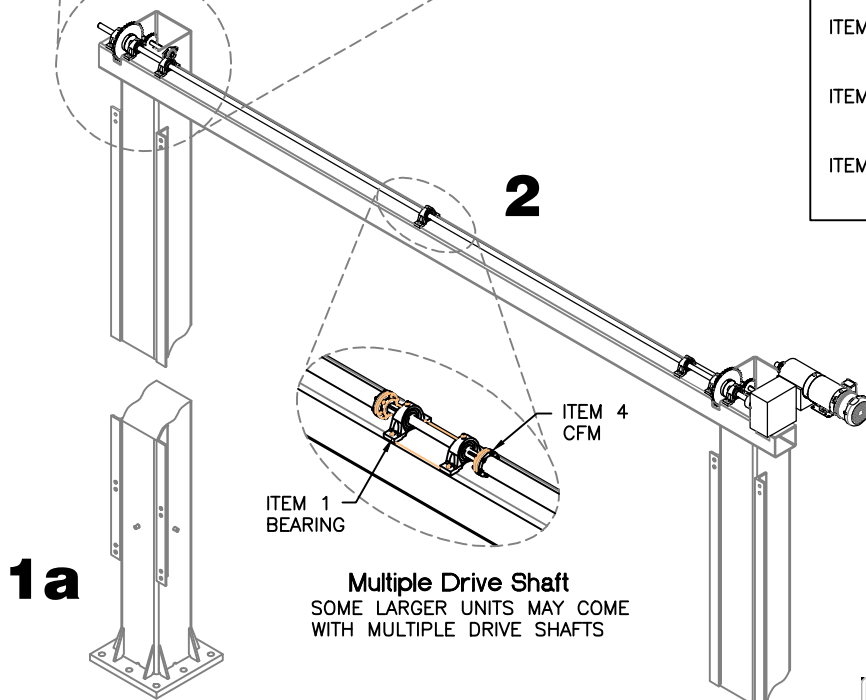
7



MOUNTING/REPLACEMENT PARTS LIST:

- ITEM 1 - BEARING - PILLOW BLOCK MOUNT - 1.25" BORE
PART #55921
- ITEM 2 - CHAIN SPROCKET - 20 TEETH, 1.25" BORE
PART #67744
- ITEM 3 - IDLER CHAIN SPROCKET - 13 TEETH, 1" BORE
PART #65784
- ITEM 4 - COLLAR FLANGE MOUNT (CFM)
PART #107342
- ITEM 5 - BEARING - FLANGE MOUNT - 1" BORE
PART #64526

3a



2

3b



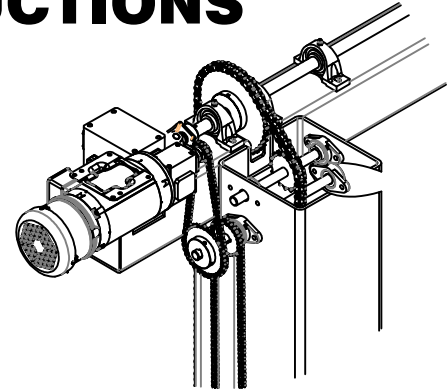
1b

ASSEMBLY INSTRUCTIONS

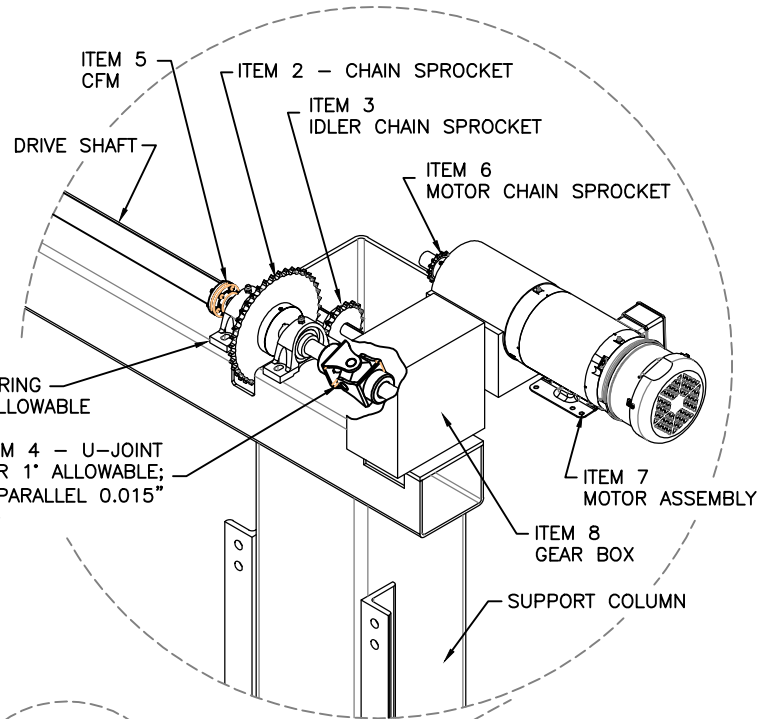
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MOUNTING/REPLACEMENT PARTS LIST:

- ITEM 1 – BEARING – PILLOW BLOCK MOUNT – 1.25" BORE
PART #55921
- ITEM 2 – CHAIN SPROCKET – 20 TEETH, 1.25" BORE
PART #67744
- ITEM 3 – IDLER CHAIN SPROCKET – 13 TEETH, 1" BORE
PART #65784
- ITEM 4 – U-JOINT
PART #104012
- ITEM 5 – COLLAR FLANGE MOUNT (CFM)
PART #107342
- ITEM 6 – MOTOR CHAIN SPROCKET – 12 TEETH, 0.5" BORE
PART #67762
- ITEM 7 – MOTOR ASSEMBLY
PHASE 1 STANDARD / EXPLOSION PROOF
PART #68419 / #68421
PHASE 3 STANDARD / EXPLOSION PROOF
PART #68420 / #68422
PNEUMATIC
PART #68423
- ITEM 8 – GEAR BOX
ELECTRIC PART #68424
PNEUMATIC PART #68442



REAR VIEW



ITEM 1 – BEARING
ANGULAR 2° ALLOWABLE

ITEM 4 – U-JOINT
ANGULAR 1° ALLOWABLE;
PARALLEL 0.015"

3a

2

1a

3b

1b



SET SCREW TORQUE REQUIREMENTS
5/16" SET SCREW = 156 IN/LBS
1/4" SET SCREW = 77 IN/LBS



HAND WHEEL IS NOT TO BE INSTALLED ON THE SYSTEM AT ANY TIME UNLESS IN THE EVENT OF A POWER OUTAGE WHERE THE WHEEL IS BEING USED TO OPERATE THE SYSTEM.



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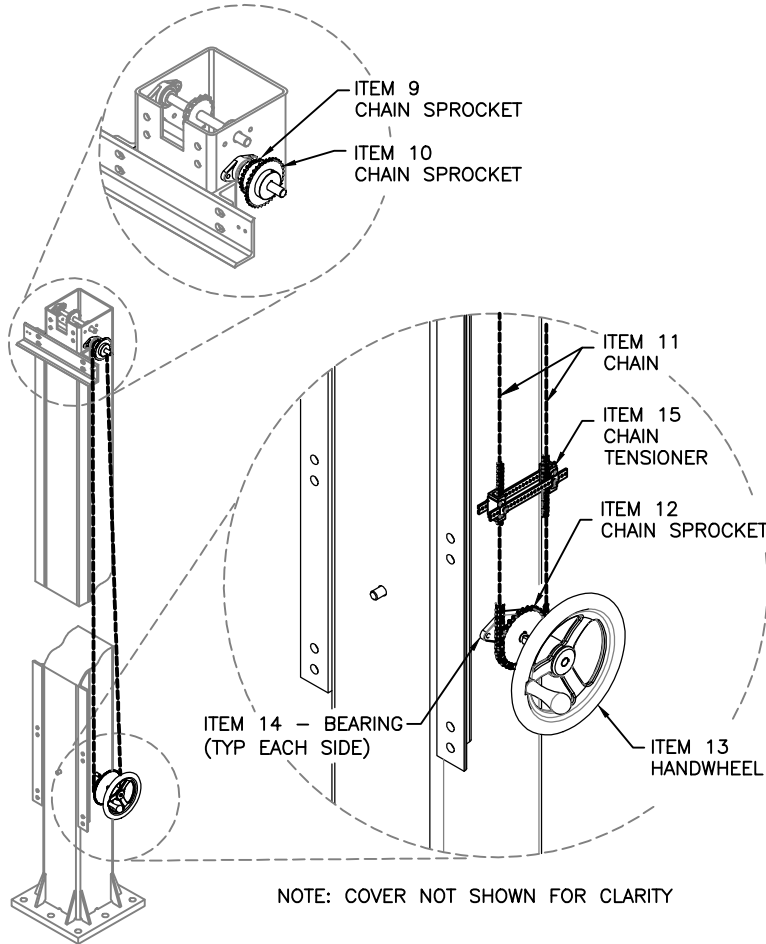
REVISED 1/10/2024

MAXRACK

ASSEMBLY INSTRUCTIONS

9

NOTE: MOTOR NOT SHOWN FOR CLARITY



MOUNTING/REPLACEMENT PARTS LIST:

- ITEM 9 - CHAIN SPROCKET - 24 TEETH, 1" BORE
PART #65786
- ITEM 10 - CHAIN SPROCKET - 35 TEETH, 1" BORE
PART #65732
- ITEM 11 - CHAIN - #40
PART #64536
- ITEM 12 - CHAIN SPROCKET - 30 TEETH, 0.75" BORE
PART #65695
- ITEM 13 - HANDWHEEL - 0.75" BORE
PART #64532
- ITEM 14 - BEARING - FLANGE MOUNT - 0.75" BORE
PART #64527
- ITEM 15 - CHAIN TENSIONER
PART #67951
- ITEM 16 - CHAIN COVER
PART #67666



HAND WHEEL INSTALLATION:

HAND WHEEL IS NOT TO BE INSTALLED ON THE SYSTEM AT ANY TIME UNLESS IN THE EVENT OF A POWER OUTAGE WHERE THE WHEEL IS BEING USED TO OPERATE THE SYSTEM.

PRIOR TO THE INSTALLATION OF THE HAND WHEEL, THE POWER SOURCE FOR THE CAGE SYSTEM MUST BE LOCKED AND TAGGED OUT.

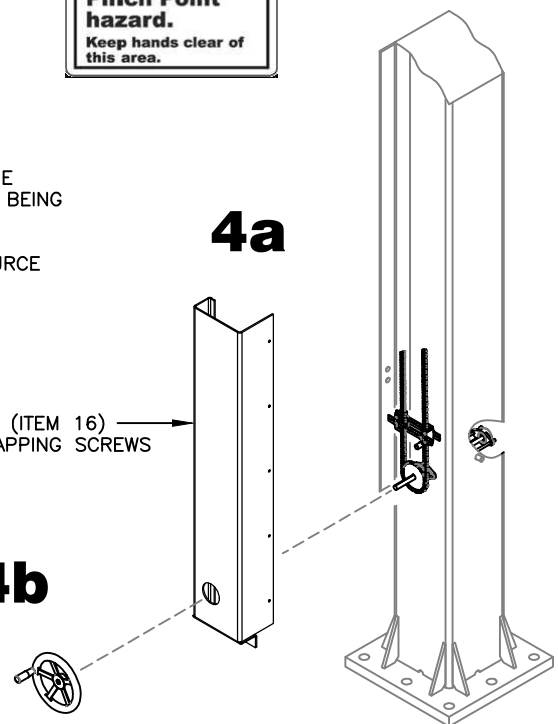
ALL CHAIN AND SHAFT COVERS MUST BE INSTALLED TO PREVENT ACCIDENTAL INJURY TO OPERATORS.



ATTACH COVER (ITEM 16) USING SELF-TAPPING SCREWS

4b

4a



CAUTION - DO NOT RUN WITHOUT CHAIN GUARD IN POSITION

ASSEMBLY INSTRUCTIONS

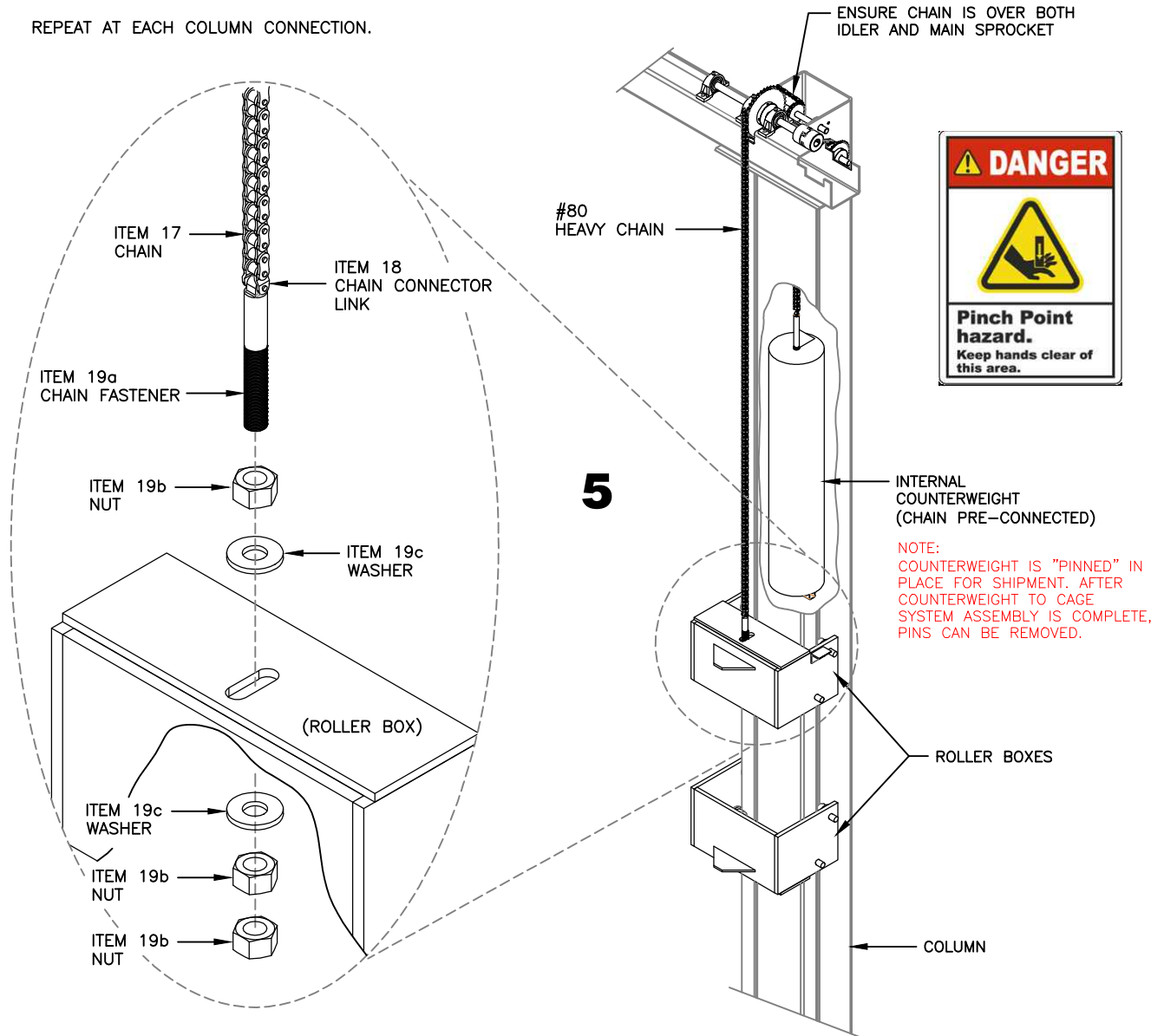
10

CHAIN INSTALLATION:

CONNECT CHAIN BY FEEDING OVER IDLER SPROCKET AND MAIN DRIVE SPROCKET AS SHOWN BELOW.

CONNECT END OF CHAIN TO CHAIN FASTENER EYE THAT CONNECTS TO TOP ROLLER BOX.

REPEAT AT EACH COLUMN CONNECTION.



MOUNTING/REPLACEMENT PARTS LIST:

ITEM 17 - CHAIN - #80
PART #67774

ITEM 18 - CHAIN CONNECTOR LINK - #80
PART #67773

ITEM 19a - CHAIN FASTENER ASSEMBLY
19b - NUT
19c - WASHER
PART #68426



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MAXRACK

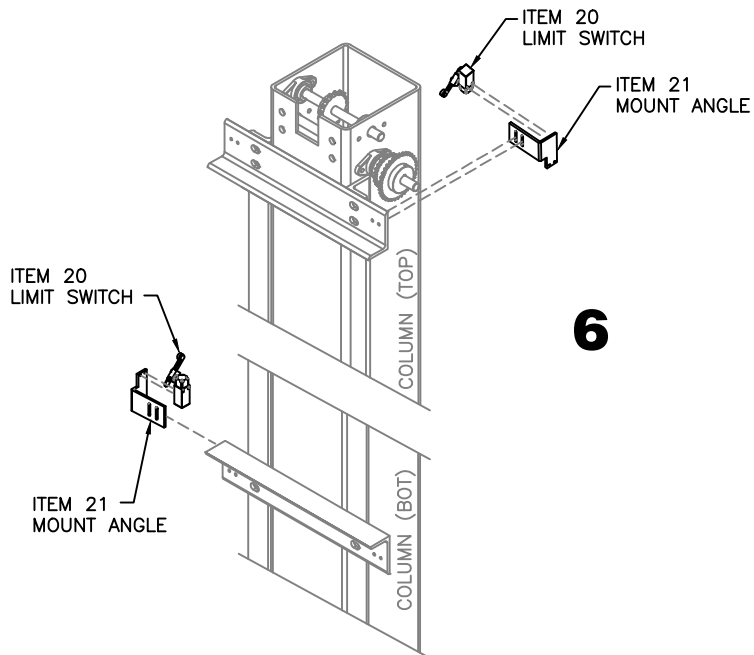
ASSEMBLY INSTRUCTIONS

11

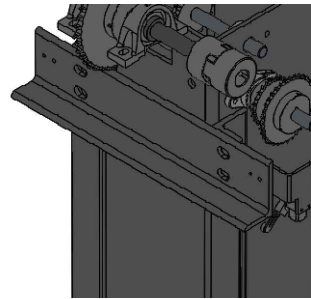
LIMIT SWITCH INSTALLATION:

ATTACH LIMIT SWITCH TO SWITCH MOUNT ANGLE. THEN ATTACH TO COLUMN STOP ANGLE AS SHOWN.

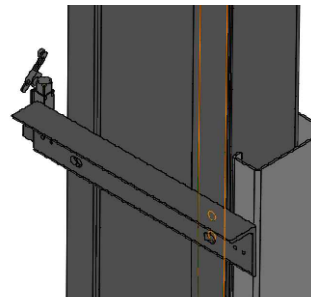
NOTE THAT ANGLE IS REVERSIBLE AND ABLE TO MOUNT TO BOTH TOP AND BOTTOM COLUMN STOP ANGLES AS REQUIRED.



6



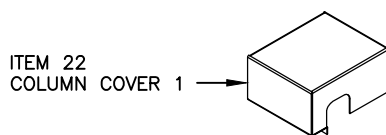
Top Mount Angle Assembly



Bottom Mount Angle Assembly

TOP COVER INSTALLATION:

ATTACH COVERS USING SELF-TAPPING SCREWS.

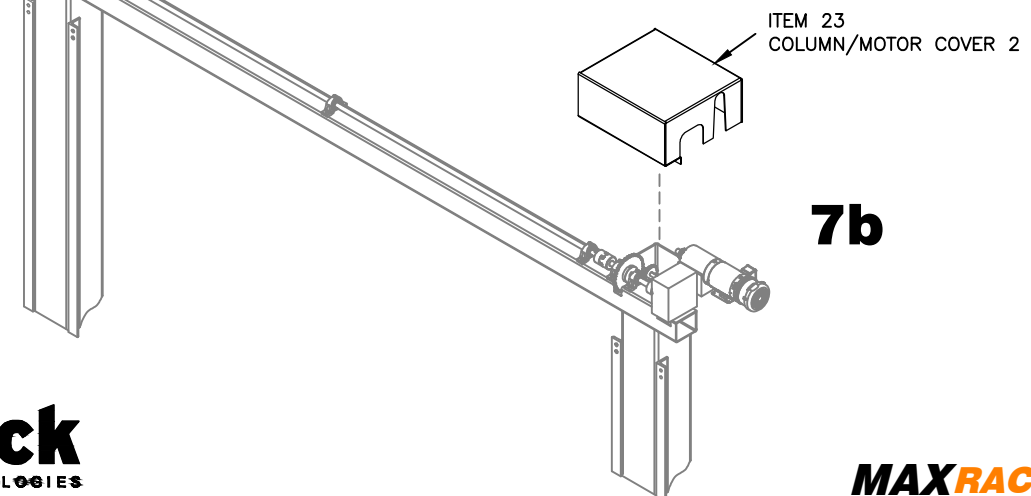


7a



MOUNTING/REPLACEMENT PARTS LIST:

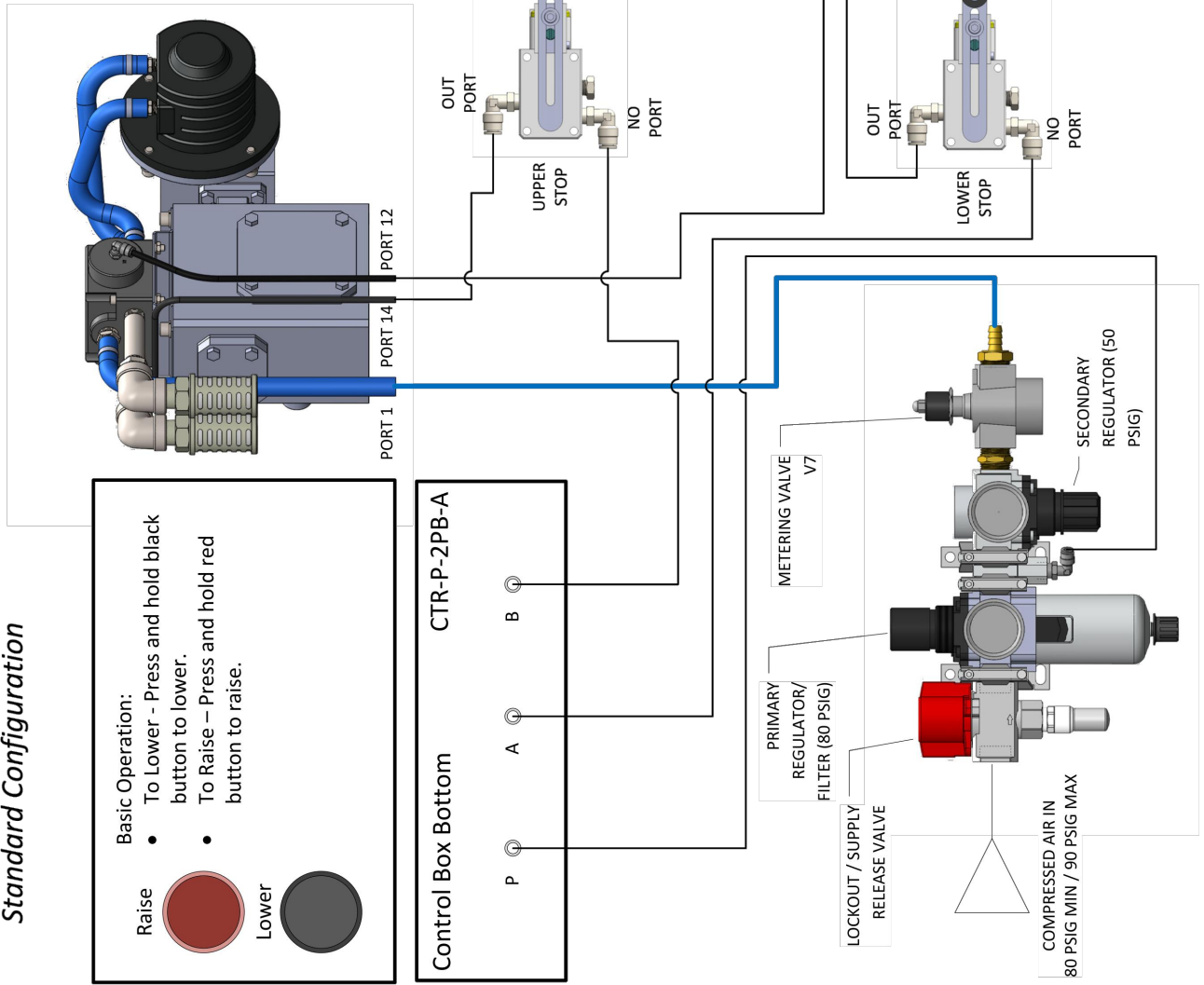
- ITEM 20 - LIMIT SWITCH
STANDARD / EXPLOSION PROOF
PART #46334 / 68522 & 68523
PNEUMATIC - PART #68575
- ITEM 21 - LIMIT SWITCH MOUNT ANGLE
STANDARD / EXPLOSION PROOF
PART #65643 / 67626
- ITEM 22 - COLUMN COVER #1
PART #67638
- ITEM 23 - COLUMN/MOTOR COVER #2
PART #67636



7b

MaxRack Standard Pneumatic Connection Diagram

Standard Configuration



INSTALLATION/ START- UP PROCEDURE

- Recommended Air Supply – ¾" ID up to 100 feet from plant air supply
1" ID 100 to 150 feet from plant air supply
1-1/4" 150 to 300 feet from plant air supply
1. Make all pneumatic connections per Schematic.
 2. Turn air supply valve on Filter/ Regulator Assembly to the Off position.
 3. Turn Metering valve V7 fully clockwise (fully closed).
 4. Connect the Plant Air Supply to Filter/ Regulator Unit.
 5. Turn Plant Air Supply ON.
 6. Make sure all connections are complete.
 7. Turn air supply valve VG located on the Filter/Regulator assembly - ON
 8. Check Primary Air Supply Regulator for set pressure. It should be 80 PSI.
 9. Check Secondary Pressure Regulator. It should be 50 PSI.
 10. Open metering valve V7 to fully open, turn fully counter clockwise.
 11. Now operate system and adjust metering to achieve desired running speed.
 12. Check limit valve adjustments and adjust if necessary.

System is now ready to operate - Start - up is complete.

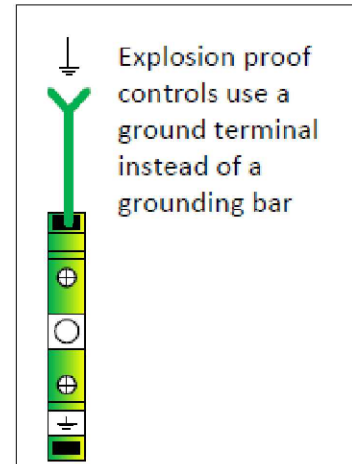
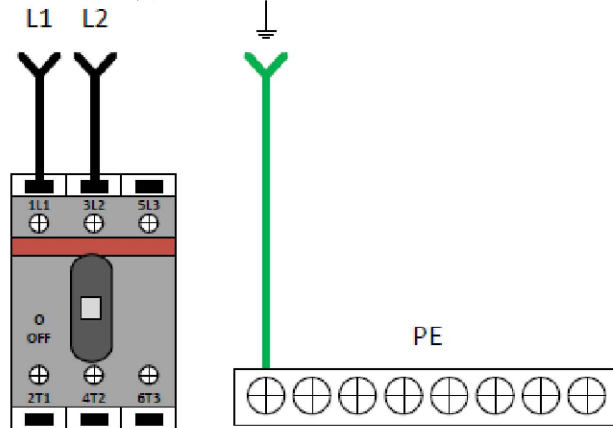
Note: Air Motor should never be operated without a load. Damage to the motor can occur if allowed to run without a load,



CD_EC_MAXRACK-CTR-P-2PB-A_SHOW3DLIMITS_R1

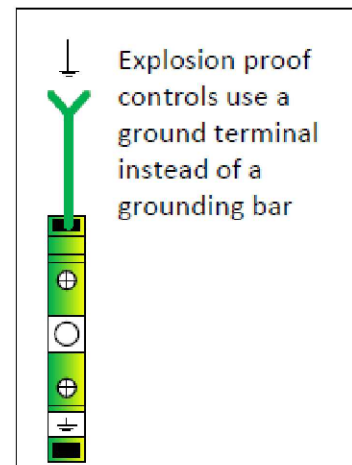
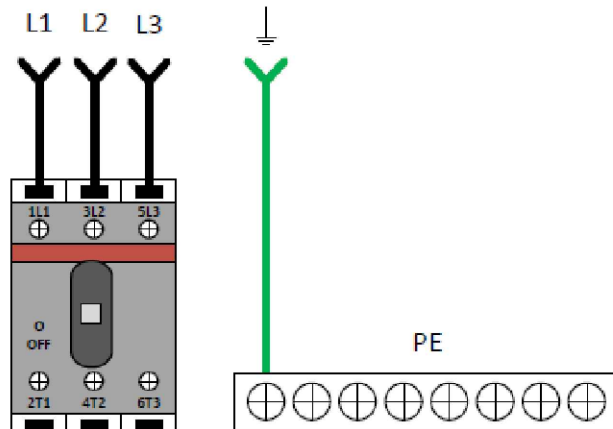
MAIN POWER CONNECTION

240VAC / 1 ϕ /60 Hz

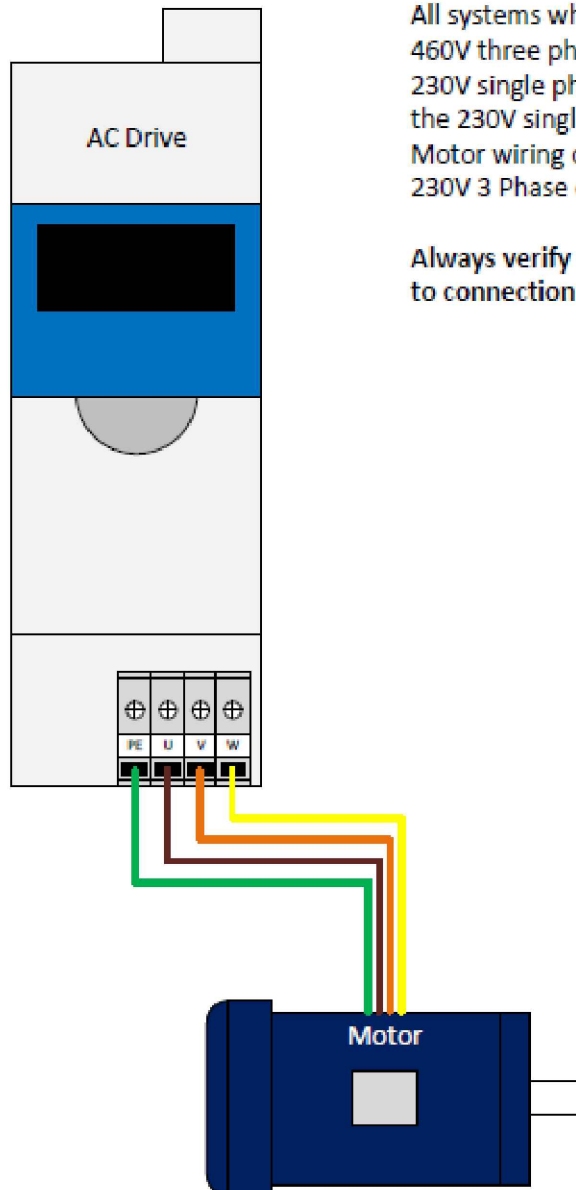


240VAC / 3 ϕ /60 Hz

480VAC / 3 ϕ /60 Hz



MOTOR CONNECTION



IMPORTANT NOTE:

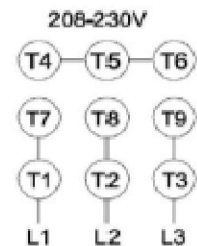
All systems whether 230V single phase, 230V three phase, or 460V three phase utilize a 3 phase motor. In the case of the 230V single phase, the AC Drive creates the 3 phase output from the 230V single phase input necessary to power the motor.

Motor wiring on a 230V single phase system should follow the 230V 3 Phase diagram on the nameplate.

Always verify wiring connections with motor nameplate prior to connection.

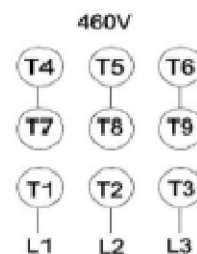
230V Single Phase & 230V Three Phase System - Motor Wiring:

- L1(U) to T1 & T7
- L2(V) to T2 & T8
- L3(W) to T3 & T9
- Tie Together T4 & T5 & T6
- PE to Motor Ground



460V Three Phase System - Motor Wiring:

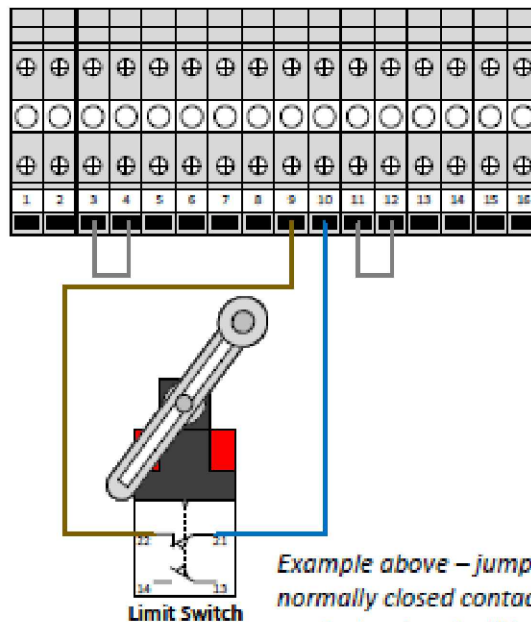
- L1(U) to T1
- L2(V) to T2
- L3(W) to T3
- Tie Together T4 & T7
- Tie Together T5 & T8
- Tie Together T6 & T9
- PE to Motor Ground



LIMIT CONNECTIONS

Raise Limit

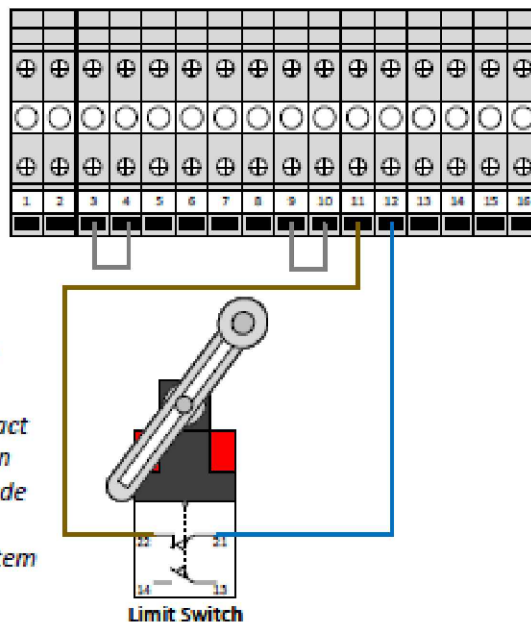
A power signal must flow from terminal 9 to terminal 10 in order for the system to be raised. By removing the jumper between terminal 9 and terminal 10 and replacing it with an external signal (e.g., limit switch or sensor) upward motion can be prevented by an external device



Example above – jumper removed and connection made to normally closed contact on limit switch. When the limit switch is made the signal will be removed and the system will not be able to raise.

Lower Limit

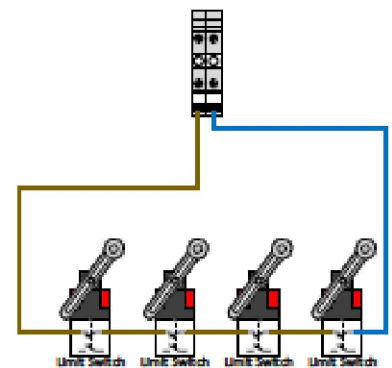
A power signal must flow from terminal 11 to terminal 12 in order for the system to be lowered. By removing the jumper between terminal 11 and terminal 12 and replacing it with an external signal (e.g., limit switch or sensor) downward motion can be prevented by an external device



Example above – jumper removed and connection made to normally closed contact on limit switch. When the limit switch is made the signal will be removed and the system will not be able to lower.

Application Note Multiple Limits:

Because the system looks for a maintained signal multiple limits can be wired in series through normally closed contacts. Making any of these limits will interrupt the signal and prevent motion.

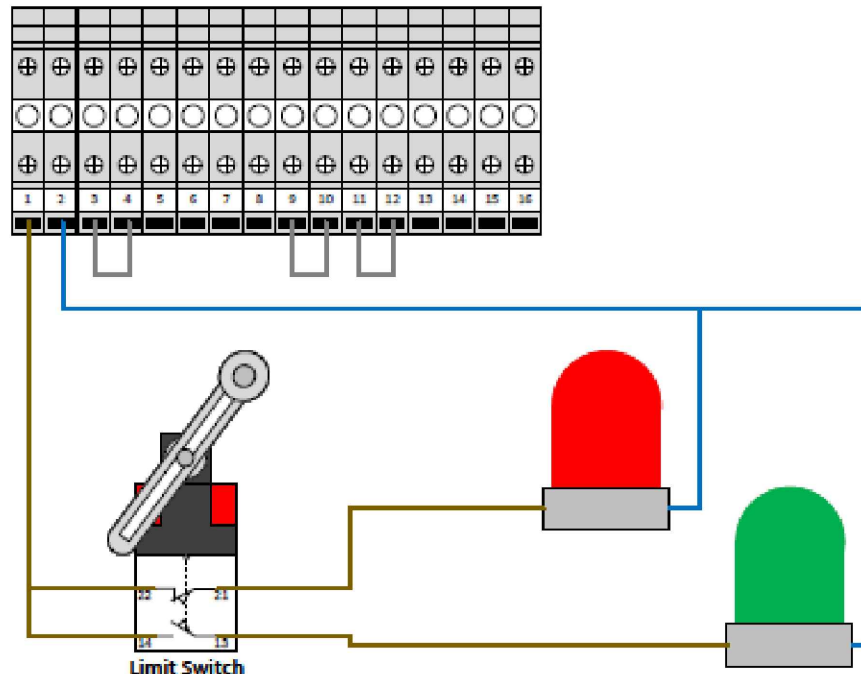


Page 4

OPTION CONNECTIONS

Optional Lights or Accessory Power Connection

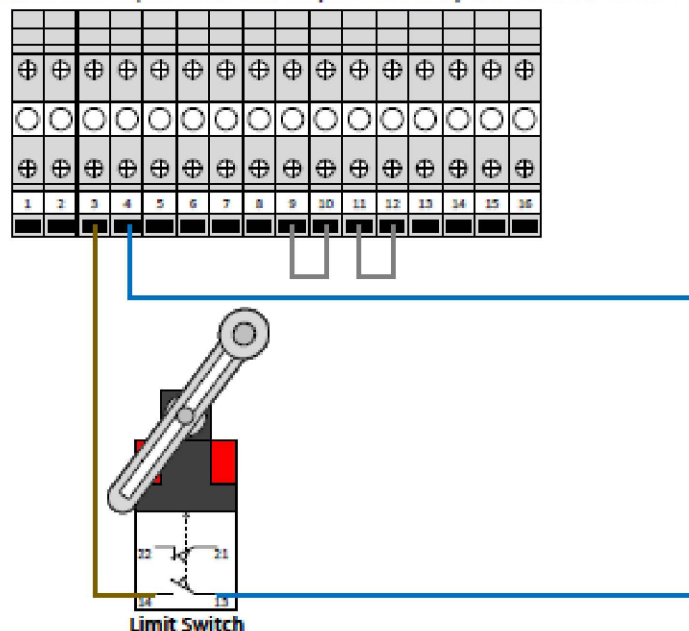
Terminals 1 and 2 are 24VDC Power Connection used to power lights or other accessories when used in the system.



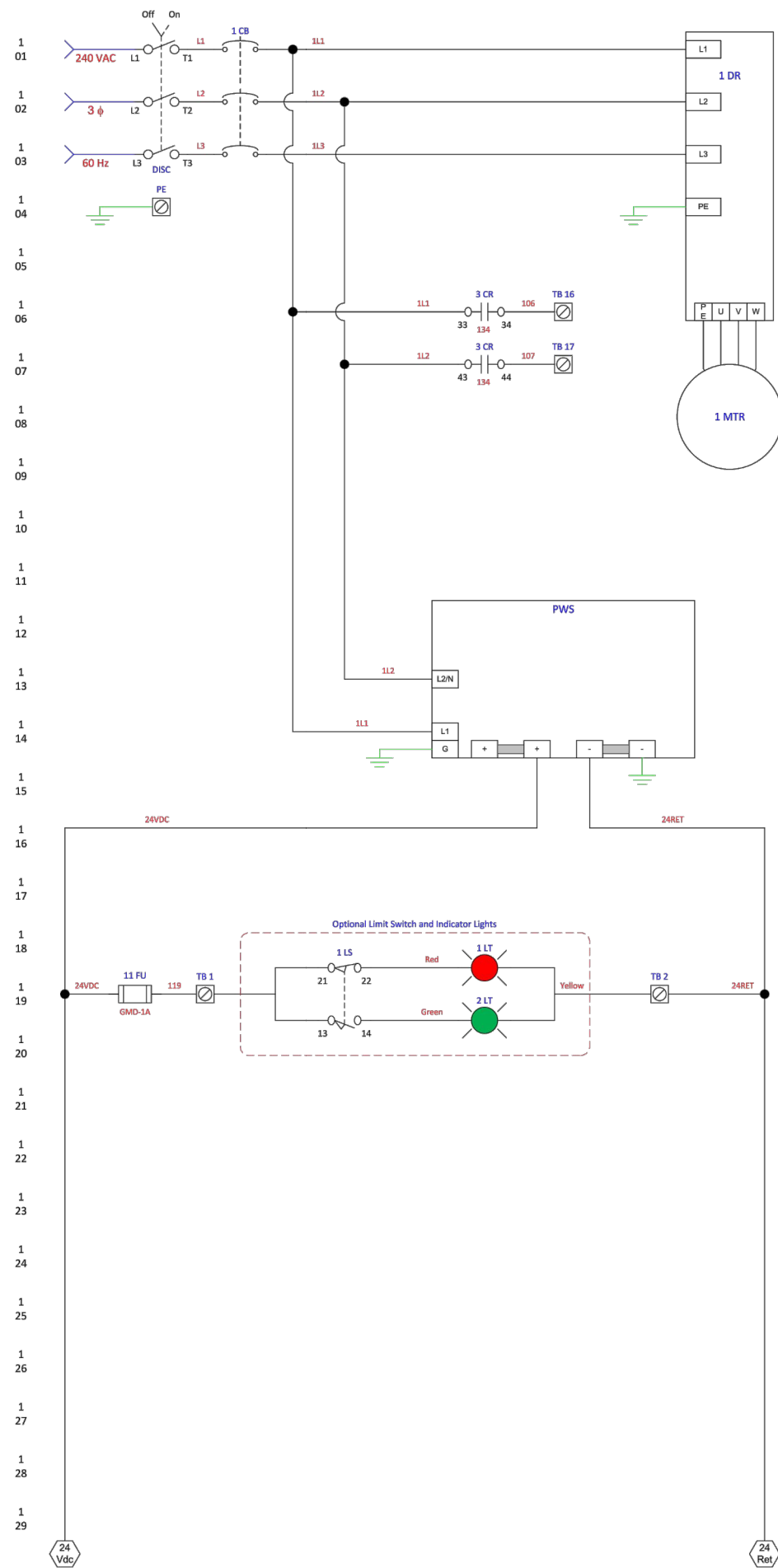
Example above – utilized to power limit switch / light combination

Optional Motion Interlock

A power signal must flow from terminal 3 to terminal 4 in order for the system to operate. By removing the jumper between terminal 3 and terminal 4 and replacing it with an external signal (e.g., limit switch or sensor) motion can be prevented by an external device



Example above – jumper removed and connection to normally open contact on limit switch. The system will not operate unless the limit switch is made.



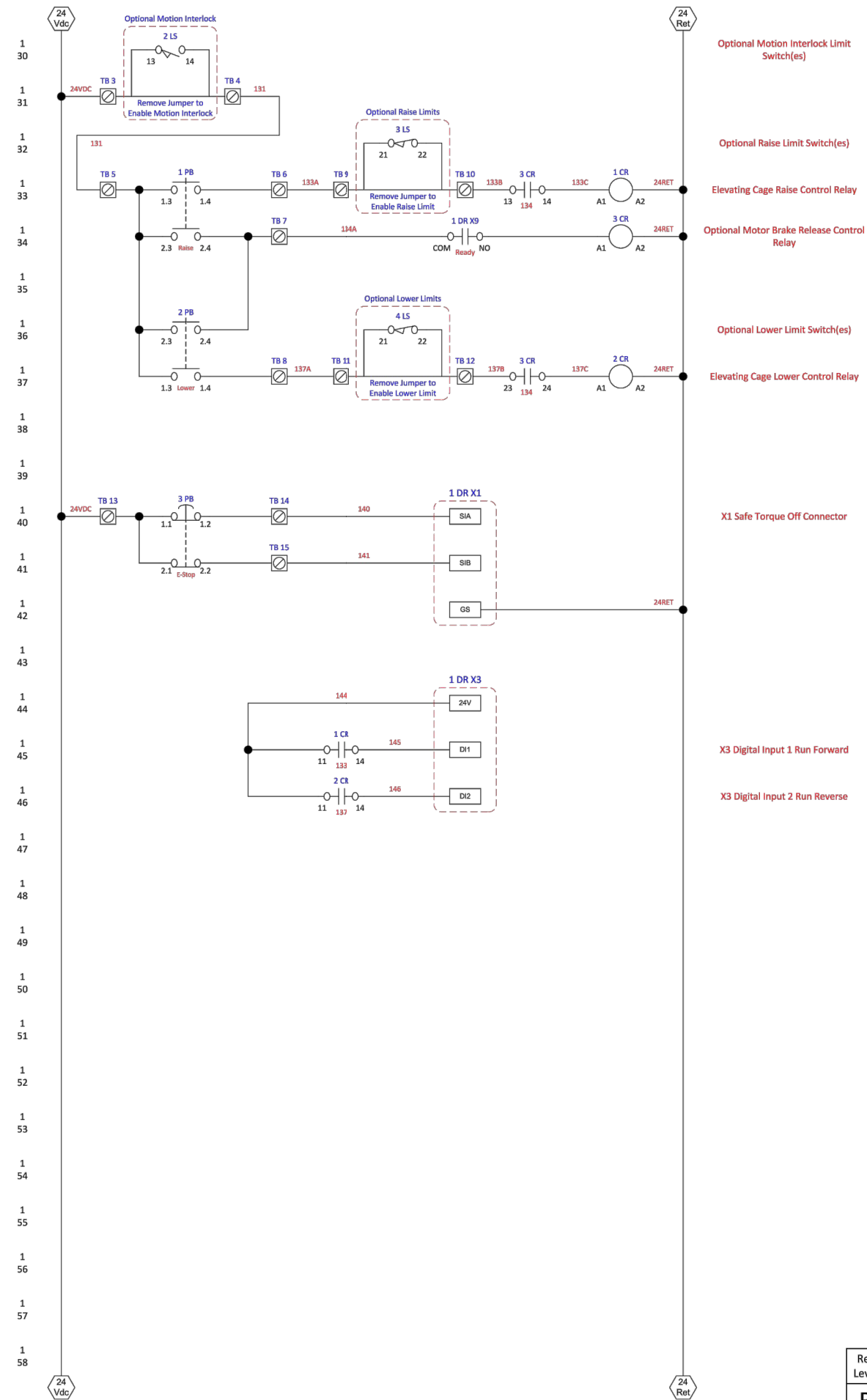
Variable Frequency Drive

Chain Drive Motor

24 VDC/5 Amp Power Supply

**Red Indicator Light
(Not In Home Position)**

**Green Indicator Light
(In Home Position)**



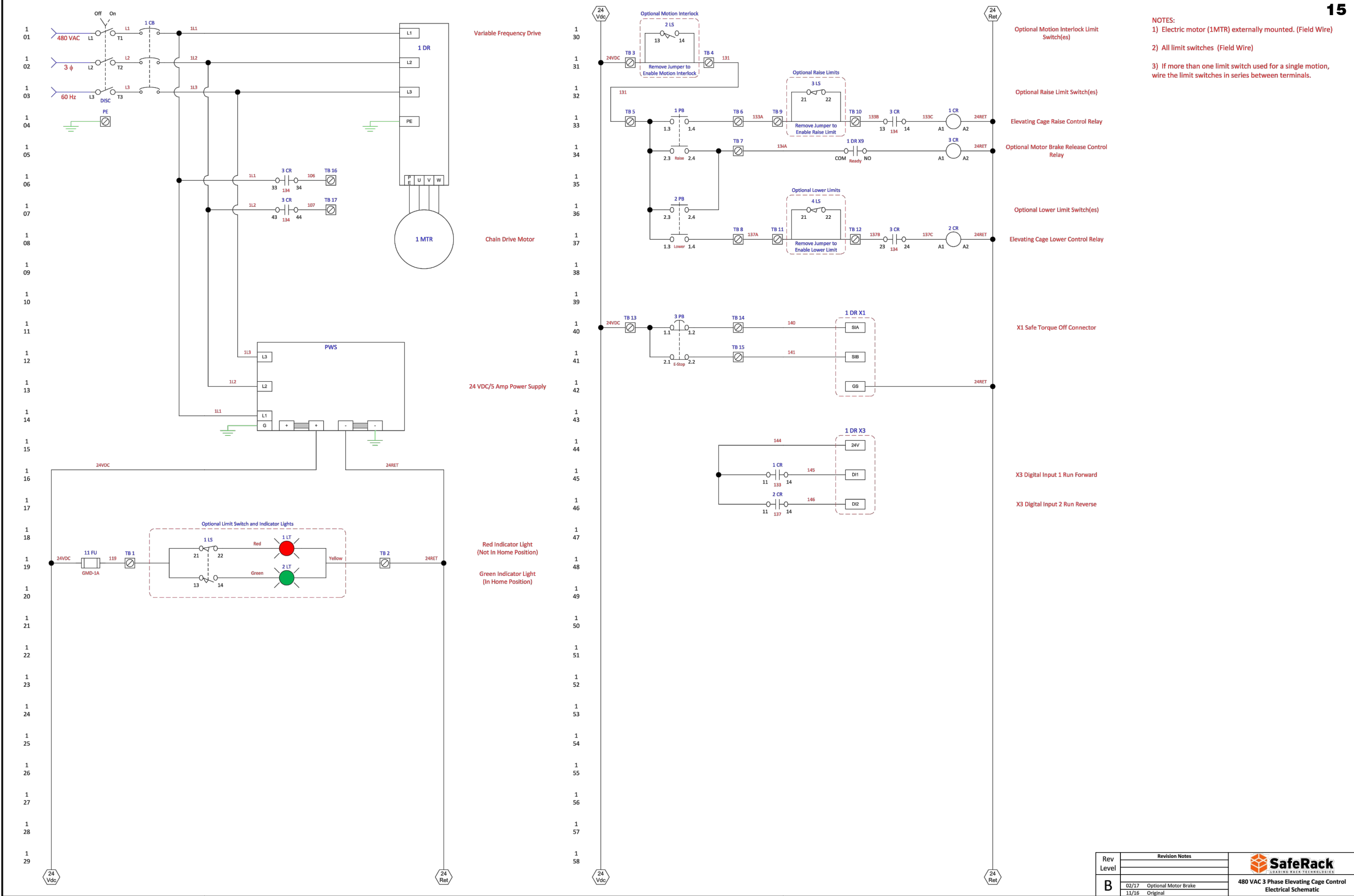
NOTES:

1) Electric motor (1MTR) externally mounted. (Field Wire)

2) All limit switches (Field Wire)

3) If more than one limit switch used for a single motion, wire the limit switches in series between terminals.

Rev Level	Revision Notes	 SafeRack LOADING RACK TECHNOLOGIES
B	02/17 Optional Motor Brake	240 VAC 3 Phase Elevating Cage Control Electrical Schematic
	11/16 Original	



OPERATING INSTRUCTIONS

REFER TO OPERATIONAL HAZARDS PAGE BEFORE OPERATING SYSTEM

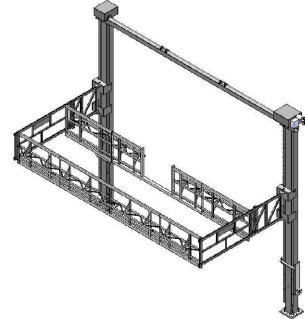
TO LOWER ELEVATING CAGE:

1. CHECK AREA AROUND CAGE TO ENSURE THAT OBJECTS AND EQUIPMENT ARE CLEAR OF PATH OF ELEVATING CAGE AND ENSURE GANGWAY IS IN STORED POSITION.



2. DEPRESS AND HOLD "LOWER" BUTTON TO ACTUATE SYSTEM.

RELEASING THE BUTTON AT ANY TIME WILL STOP SYSTEM.

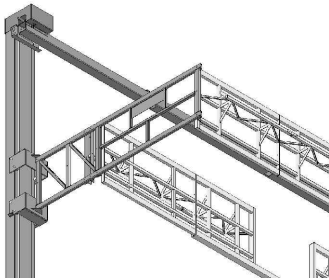


3. ALLOW THE UNIT TO LOWER UNTIL LIMIT SWITCH MAKES CONTACT TO STOP. WATCH CAGE AS IT LOWERS TO ENSURE IT DOES NOT CONFLICT WITH HATCH ON VEHICLE.

DO NOT LEAVE SYSTEM UNATTENDED WHILE IN MOTION. RAISING AND LOWERING WILL TYPICALLY TAKE LESS THAN 1 MINUTE.

TO RAISE AND STORE CAGE:

1. CHECK AREA AROUND UNIT TO ENSURE THAT OBJECTS AND EQUIPMENT ARE CLEAR OF TRACKING PATH OF CAGE AND INSURE GANGWAY IS IN STORED POSITION.



2. DEPRESS AND HOLD "RAISE" BUTTON TO LIFT SYSTEM.

RELEASING THE BUTTON AT ANY TIME WILL STOP SYSTEM.



AS SYSTEM BEGINS TO MOVE, VERIFY THAT UNIT IS TRAVELING LEVEL AND EVENLY UP TRACKING COLUMNS. IF SO, ALLOW UNIT TO RAISE UNTIL IT CLEARS ANY POSSIBLE OBSTRUCTIONS AND LIMIT SWITCH MAKES CONTACT TO STOP.

CAGE IS NOT DESIGNED TO RIDE ON OR HOLD AND/OR STORE ADDITIONAL WEIGHT (i.e. HOSES, TOOLS, TOOLBOXES, ETC.)

WARNING

(OPERATIONAL HAZARDS)

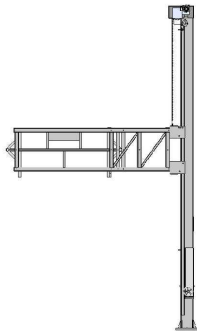
DO NOT USE EQUIPMENT DURING SEVERE WEATHER CONDITIONS, SAFETY FIRST.

CAGE IS NOT DESIGNED TO RIDE ON OR HOLD AND/OR STORE ADDITIONAL WEIGHT
(i.e. HOSES, TOOLS, TOOLBOXES, ETC.)



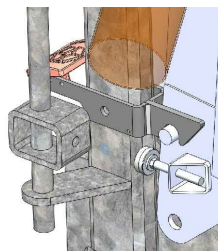
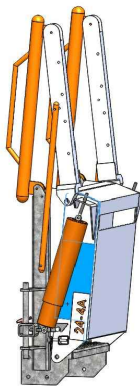
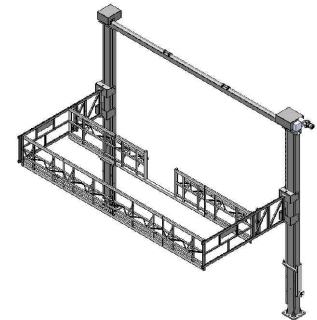
WHEN LOWERING AND/OR RAISING UNIT:

- KEEP HANDS AWAY FROM MOVING PARTS
- DO NOT HOLD ON TO CAGE WHILE IN MOTION.
- DO NOT RIDE CAGE WHILE IN MOTION.
- DO NOT RAISE OR LOWER UNIT WHILE PERSONNEL ARE IN CAGE/VEHICLE WORK AREA.
- KEEP PERSONNEL AND/OR EQUIPMENT CLEAR OF TRACKING AREA WHILE UNIT IS IN MOTION.
- VERIFY CAGE IS IN ITS FULL STORED POSITION BEFORE MOVING VEHICLE.



GANGWAY - IF APPLICABLE

- VERIFY GANGWAY IS IN STORED POSITION BEFORE RAISING AND/OR LOWERING CAGE.
- VERIFY FOOTLOCK IS ENGAGED WHEN GANGWAY IS IN STORED POSITION.



WARNING: This product can expose you to chemicals including cadmium, which is known to the State of California to cause cancer, and/or birth defect or other reproductive harm.

For more information go to www.P65warnings.ca.gov

TROUBLE SHOOTING GUIDE

1) CAGE LOWERS/RAISES ERRATICALLY

- A) CHECK FOR OBSTRUCTIONS
- B) ROLLERS ARE BINDING ON COLUMN FLANGES DUE TO MISALIGNMENT OF SUPPORT COLUMNS.
- C) CHECK COLUMN ALIGNMENT
- D) CHECK FOR CARRIAGE DAMAGE
- E) CHECK FOR DEBRIS IN TRACK/CARRIAGE AREA

2) SYSTEM HAS NO POWER

- A) CHECK BREAKER IN CONTROL BOX

3) SAFETY CAGE LEANING AND/OR SAGGING

- A) BOLTS LOOSE WHERE CONNECTED TO CARRIAGE
TIGHTEN BOLTS, SHIM BOTTOM CARRIAGE CONNECTION TO RAISE CAGE AND PLUMB HORIZONTALLY
- B) CHECK CAGE FOR DAMAGE.
- C) CAGE BENT OR BROKEN

4) HAND WHEEL HARD TO TURN

- A) IDLER SPROCKET MAY BE BURRED OR DAMAGED
(SPROCKET AND ROD WILL NEED TO BE REPLACED)

NOTE:

REFER TO GANGWAY MANUAL FOR ADDITIONAL TROUBLESHOOTING
INFORMATION FOR GANGWAY. (IF APPLICABLE)

SCHEDULED MAINTENANCE

MONTHLY:

- 1) INSPECT CHAINS AND SPROCKETS – USE LIGHT WEIGHT OIL IF NEEDED FOR LUBRICATION.
- 2) INSPECT IDLER SPROCKETS – ADD LITHIUM BASED GREASE EVERY 3 TO 6 MONTHS.
- 3) CHECK ALL BOLTED CONNECTIONS TO ENSURE THAT THEY ARE PROPERLY TIGHTENED.
- 4) INSPECT UNIT FOR DAMAGE THAT MAY HAVE OCCURRED WHILE IN USE, THAT MAY EFFECT OPERATION.
- 5) INSPECT TRACKING CARRIAGE ROLLERS FOR DAMAGE AND/OR WEAR. (ROLLERS ARE SEALED AND SHOULD NOT REQUIRE MAINTENANCE)
- 6) CHECK TRACKING AREA FOR DEBRIS BUILD UP, PRODUCT ACCUMULATION, OR OBSTRUCTIONS.
- 7) CHECK CAGE FOR CRACKED AND/OR BROKEN WELDS.

ANNUALLY:

- 1) PACK BEARINGS VIA GREASE ZERKS WITH LITHIUM BASED GREASE.

QUARTERLY:

- 1) A WATER RINSE MAY BE APPLICABLE IF UNITS ARE GETTING COATED WITH PRODUCT ON A DAILY BASIS OR IN A MEASURABLE TIME FRAME.
- 2) CHECK PLUMB/SQUARE OF ALL VERTICALS TO INSURE SYSTEM IS SETTLING CORRECTLY.
- 3) CHECK ALL CONNECTIONS ON THE HORIZONTAL CAGE AT EACH AND EVERY CONNECTION.
- 4) INSPECT BEARINGS FOR DEBRIS BUILD UP / SEIZURE.