



FLOORPOCKET™

REFERENCE MANUAL V1.1

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GETTING STARTED

Congratulations on your purchase of the **Floorpocket** stage lift from Creative Conners, Inc. Elevate your show by lifting scenery and performers with your **Floorpocket**. The **Floorpocket** has been designed to meet the rigorous demands expected from professional stage machinery.

This manual will direct you through:

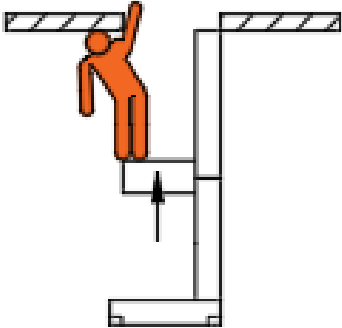
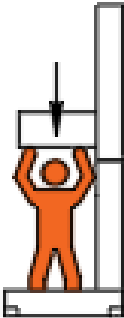
- 1. Unpacking
- 2. Installing & Testing
- 3. Operation Procedures
- 4. Scheduled Maintenance

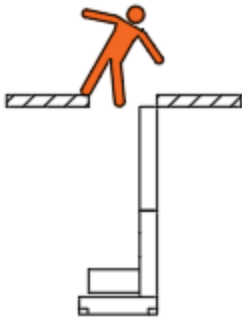
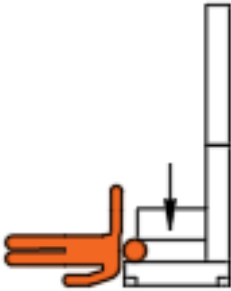
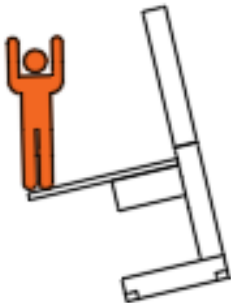
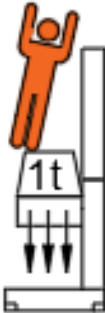

If you need help along the way contact us either on our website (www.creativeconners.com), via email (support@creativeconners.com), or by phone (401.289.2942 x2)

A WORD ABOUT SAFETY

The **Floorpocket** can raise impressive loads effortlessly and swiftly from the trap room to the stage. Such power requires a great deal of respect and attentiveness to ensure that both performers and technicians are kept safe. Automated effects always carry significant risk, but the risk of injury is magnified when lifting scenery and people. Risks are further complicated when raising people and scenery through a hole. As you read this manual, you will see that many safeguards have been designed into both the machinery and controls of the **Floorpocket**, but this engineering rigor is only useful when leveraged by your diligent commitment to safety.

When used in the trap room of a typical production, a stage lift carries several major risks to people, scenery, or props. Some such examples include:

| | |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |
| Crushing Hazard When Lifting | Crushing Hazard When Lowering |

| | |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |
| Falling Hazard | Severing Hazard When Lowering |
|  |  |
| Tip-over Hazard | Overweight Hazard |
|  | |
| Entanglement Hazard | |

If these images and the associated risks fill you with dread, that’s a healthy response. We share that dread and want to make sure you keep yourself and your stage safe. Throughout the manual, we will dive deeper into the safety systems included with the **Floorpocket** and how you can prevent injuries and avoid these hazards. Throughout this manual, watch for the Hazard Images listed above to indicate important notes regarding how you can mitigate these hazards.

The risks inherent in using a stage lift requires not only sound mechanics, but also sophisticated controls that are fully integrated into the machine for safe operation. The **Floorpocket** lift is designed to be used with all of the included safety features: FWD, REV, & ULT limits, machine guarding, and the **Safety Interlock Box** to incorporate safety mat and safe edge design. In addition to the physical safety features, the communication and feedback between the **Stagehand Pro AC**, **Safety Interlock Box**, **Showstopper 3 Base**, and **Spikemark** are paramount in creating a safe operating environment.

Although these safety features are included, they are not intended to be the only risk reduction incorporated into your installation. It is crucial to the safe operation of the **Floorpocket** that you also investigate the risks of their specific installation and take steps to reduce and eliminate those risks. This could include using the incorporated safety edge and safety mats, but may also require additional safety mats or bumpers. Based on the specific conditions, it may also require the creation and installation of a “lift box” to remove additional pinch points. It could also incorporate interlock switches to prevent a trap door from opening or closing if the lift is in an unsafe position.

In the end, although the machine is modular, each installation is unique and requires a critical eye in the planning, installation, and daily operation. Let’s dig into the details and discover how all the individual features of the machine and control system work in unison with the **Stagehand Pro AC** and **Safety Interlock Box** to raise the level of safety both above and below your stage.

WHAT'S INCLUDED

1. **Floorpocket** Base Machine
2. 6' Mast Extension Tower
3. 4 Leveling Feet
4. 4 Removable Heavy Duty Casters - Move the **Floorpocket** around with ease. No need for a pallet jack.
5. Mast Safety Guard
6. Safety Mat
7. Trap Edge Safety Bumper Switches
8. All the hardware you need
 - a. (32) $\frac{5}{8}$ " x 2" hex head bolts
 - b. (6) $\frac{5}{8}$ " x 1- $\frac{1}{4}$ " hex head bolts
 - c. (4) $\frac{3}{8}$ " x 1- $\frac{1}{2}$ " low-head cap screws, washers and Nylock nuts
 - d. (1) $\frac{1}{2}$ " x 5" socket-head cap screw, spacer, washer, and Nylock nut
 - e. $\frac{5}{8}$ " washers and nuts
 - f. 12" ModTruss washer plates
 - g. 6" threaded ModTruss washer plates

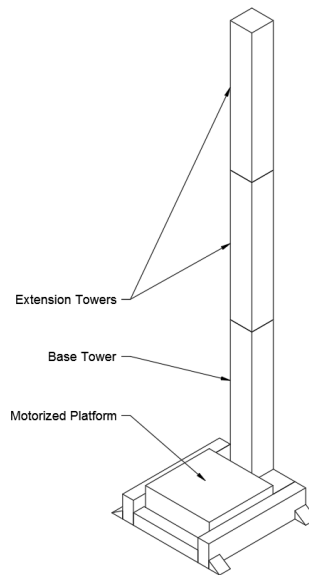
FEATURES

- Modular rack and pinion design allows for the lift to be configured at different heights ranging from 6ft to 18ft tall.
- Designed to fit through most double doorways for easy load-in and strike
- Paired with bumper switches, pressure mat, and a Safety Interlock, the **Floorpocket** is able run safely and reliably.
- Capable of Synchronization - Use multiple lifts together using **Spikemark's** Group Motion to move a larger platform with two or more lifts instead of purchasing a custom lift.
- 1000 lbs of lifting capacity at 14"/sec lifting speed.
- Redundant Brakes.

OVERVIEW

The **Floorpocket** is designed for lifting. It is composed of three primary components:

1. Base Tower
2. Extension Tower(s)
3. Motorized Platform



BASE TOWER

The Base Tower is small enough to be rolled through a standard double-door. It is the foundation of the lift and provides up to 6ft of vertical lift. The Base Tower is made up of the machine frame, leveling feet, guide tracks, and a gear rack that allows the Motorized Platform to climb the tower.

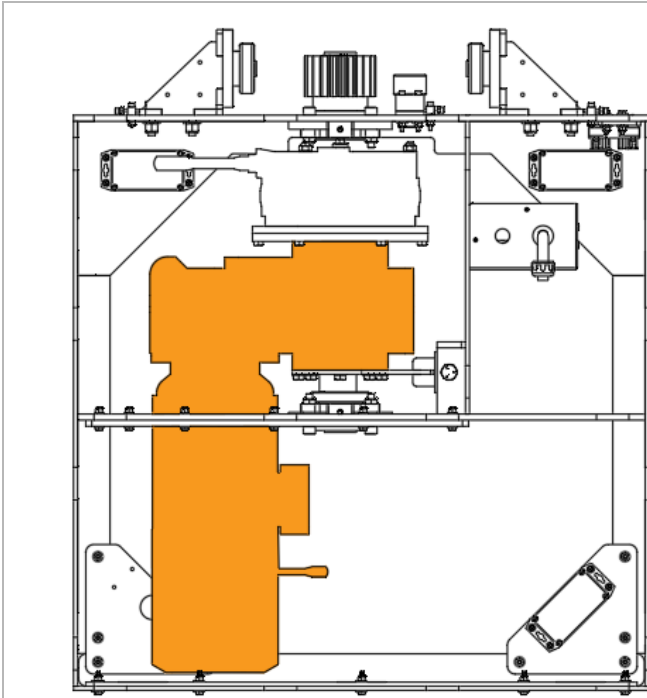
EXTENSION TOWER

The Extension Tower(s) are bolted onto the Base Tower to reach heights up to 18'. Extension Towers are available in 1' or 6' increments. A maximum of two Extension Towers can be added to the Base Tower for a maximum 18' of vertical lift. Both the Base Tower and Extension Tower are fitted with tracks and a gear rack.

MOTORIZED PLATFORM

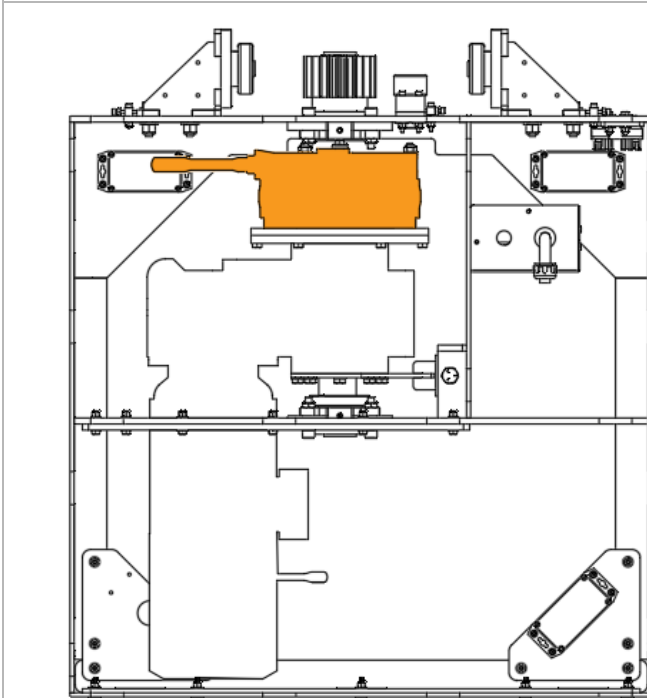
The Motorized Platform climbs up the towers using the tracks and gear rack. The **Floorpocket** is capable of raising and lowering up to 1000 lbs of evenly distributed load at speeds up to 14" per second. Since all the mechanics are enclosed in the platform, the **Floorpocket** can easily be

reconfigured to different heights by changing the arrangement of Extension Towers without affecting the 1000lbs load capacity. Let's dig into what is included inside the Motorized Platform.



Gearmotor, Primary Brake, and Encoder

The Motorized Platform is made up of a 5 HP gear motor that includes the motor-side brake and an integrated incremental encoder. The motor-side brake is the primary brake used to hold the load. The integrated incremental encoder is used for position, overspeed detection, as well as feedback for the Closed Loop Vector control. The **Stagehand Pro AC** uses these signals to automatically engage the brake if a fault is detected. The primary brake is also engaged anytime an E-Stop is pressed.



Load Side Brake

The load side brake is the secondary brake to the motor brake and protects against mechanical failure in the gear motor. The secondary brake is disengaged and engaged by the **Stagehand Pro AC** as well as any E-Stop signal.

While the platform's load capacity is 1000lbs of evenly distributed load, due to the cantilevered nature of the **Floorpocket** any one specific point should not exceed 500lbs. This becomes more apparent at the edge of the lift platform, especially if you decide to build a platform that expands past the original platform's edge. If you have any concerns about how to load your scenery or people onto your **Floorpocket**, give us a shout via email at support@creativeconners.com or by calling 401-289-2942 x2.

Safety Note: A ladder or personnel lift should not be placed on the lifting platform, nor should any bracing be placed under the lifting platform for additional support unless approved by Creative Connors, Inc. The **Floorpocket** is not to be used as an equipment elevator.

INSTALLATION

REQUIRED TOOLS

- Leveling foot square head socket wrench (included)
- 5/32" hex key
- 3/16" hex key
- 3/8" hex key
- 3/8" open end wrench
- 9/16" socket wrench
- 9/16" open end wrench
- 3/4" socket wrench
- 3/4" open end wrench
- 15/16 socket wrench
- 15/16" open end wrench

UNPACKING THE FLOORPOCKET

The **Floorpocket** ships from the factory on a custom pallet. A pallet jack is helpful and is what we use in the shop to move the palletized machine around. Once the **Floorpocket** is roughly in its desired location, the following steps are required to begin operation.

1. Remove any accessories from the **Floorpocket** platform.
2. Remove the plywood guards on the front, sides and rear of the Floorpocket. The guards are attached with carriage bolts and wing nuts.
3. If the Mast Extension is on the same pallet:
 - a. Attach a lifting line to the top of the Mast Extension
 - b. Remove the banding holding the mast extension to the base frame.
 - c. Remove the mast extension from the base frame, setting aside the plywood guards behind and beneath the mast extension

4. If the Mast Extension is shipped on a separate pallet:
 - a. Remove the banding holding the mast extension to the pallet
 - b. Move the Mast Extension to the lift location - it may be helpful to attach a lift line to move the Mast Extension around.
 - c. Follow the steps to install the Mast Extension below

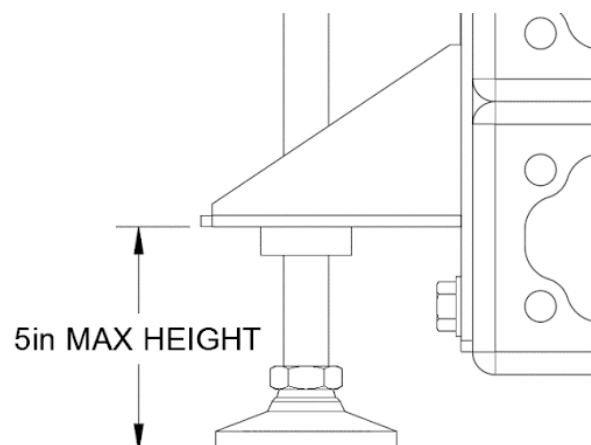
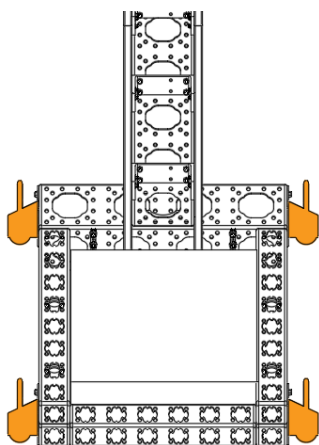
NOTE: Removing the mast extension requires careful consideration – not only of the pick points, but also the lifting method and the safety of any person in the vicinity of the lift. Mast extensions may weigh over 350lb. Safe rigging practices are an essential part of this process. This process should only be completed by a qualified rigger.

PLACING THE FLOORPOCKET

The **Floorpocket** base configuration includes (4) removable casters for moving the unit without a pallet-jack, but the casters should not be used while operating the lift. To install the casters, use the included 5/8" GR8 Hex Head Bolts with the included threaded ModTruss Washer Plates. Each Caster will use (2) threaded ModTruss Washer Plates, (4) Grade 8 5/8" Hex Head Bolts, and (4) Grade 8 5/8" Washers.

In addition to having (4) casters, (4) removable and adjustable feet are included with your **Floorpocket**. Both the casters and feet are bolted through the base frame, see the details below. To install the leveling feet, use the included Grade 8 5/8" Hex Head Bolts with the included threaded ModTruss Washer Plates. Each Caster will use (2) ModTruss Washer Plates, (4) Grade 8 5/8" Hex Head Bolts, and (4) Grade 8 5/8" Washers.

Once the **Floorpocket** is moved into place, level the machine by adjusting the leveling feet with the included 1" square head socket wrench. The bottom of the adjustable foot bracket can be no higher than 5" from the floor. It is the responsibility of the installer to determine the structural integrity of the venue floor. Depending on the installation circumstances, it may be necessary to modify the structure to accommodate the **Floorpocket**.

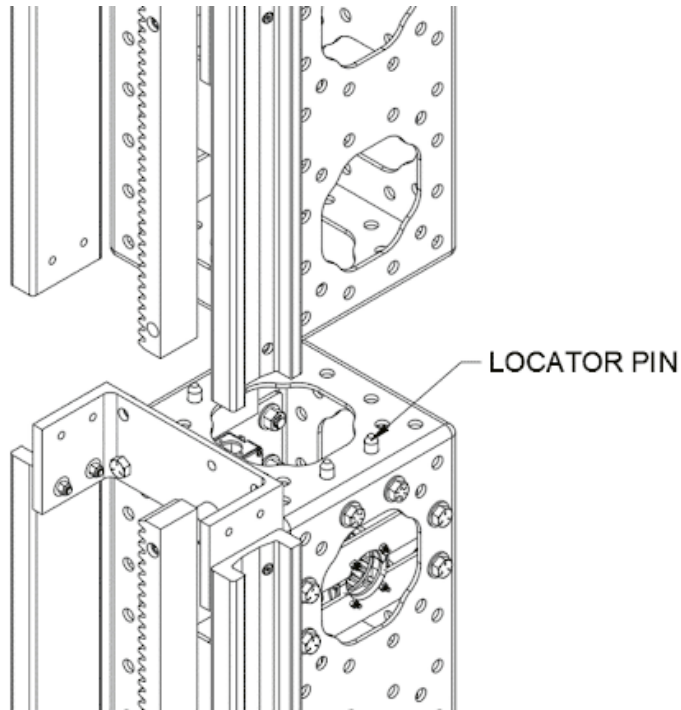


EXTENDING THE FLOORPOCKET

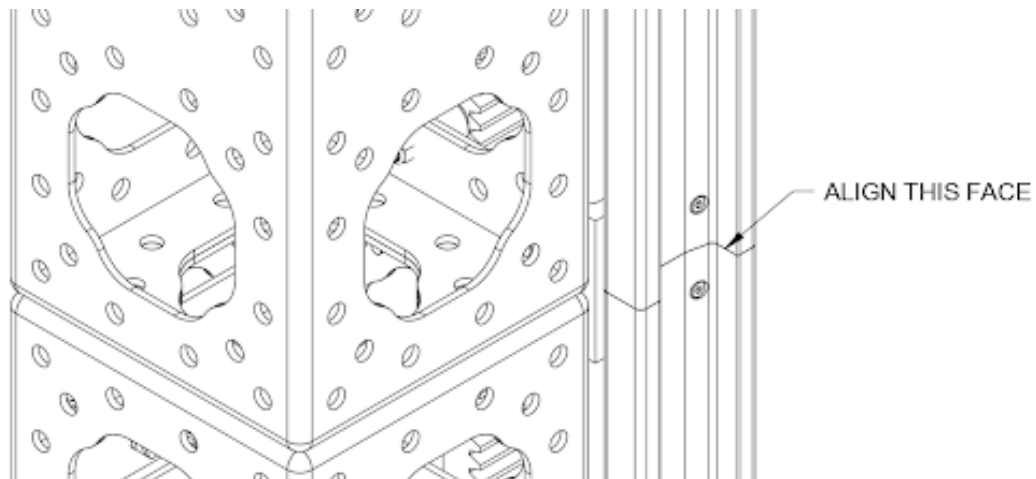
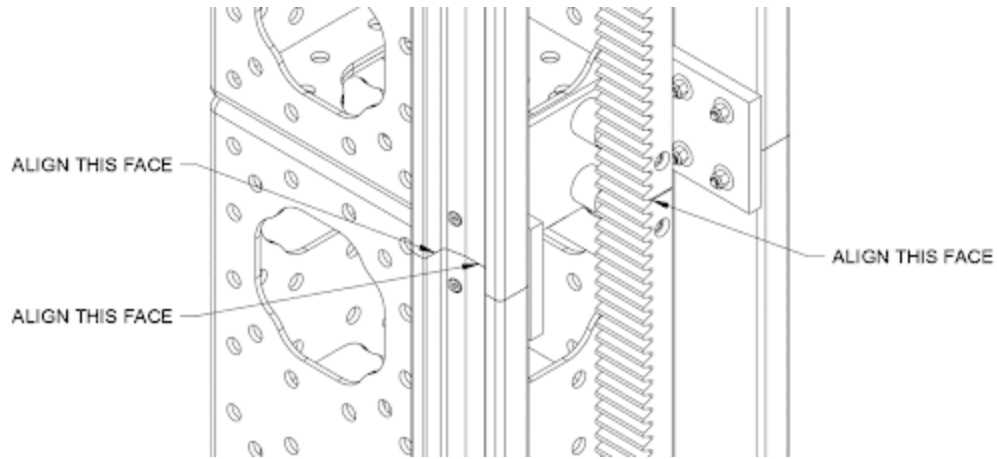
Extension Towers can be bolted onto the Base Tower to extend the overall height from 6' up to 18'. Follow the steps below to extend the **Floorpocket** mast.

NOTE: Attaching a mast extension requires a coordinated effort with at least (3) individuals, and involves raising and suspending the mast extension over the heads of several of those individuals. Mast extensions may weigh over 350lb. Safe rigging practices are an essential part of this process. This process should be completed by a qualified rigger.

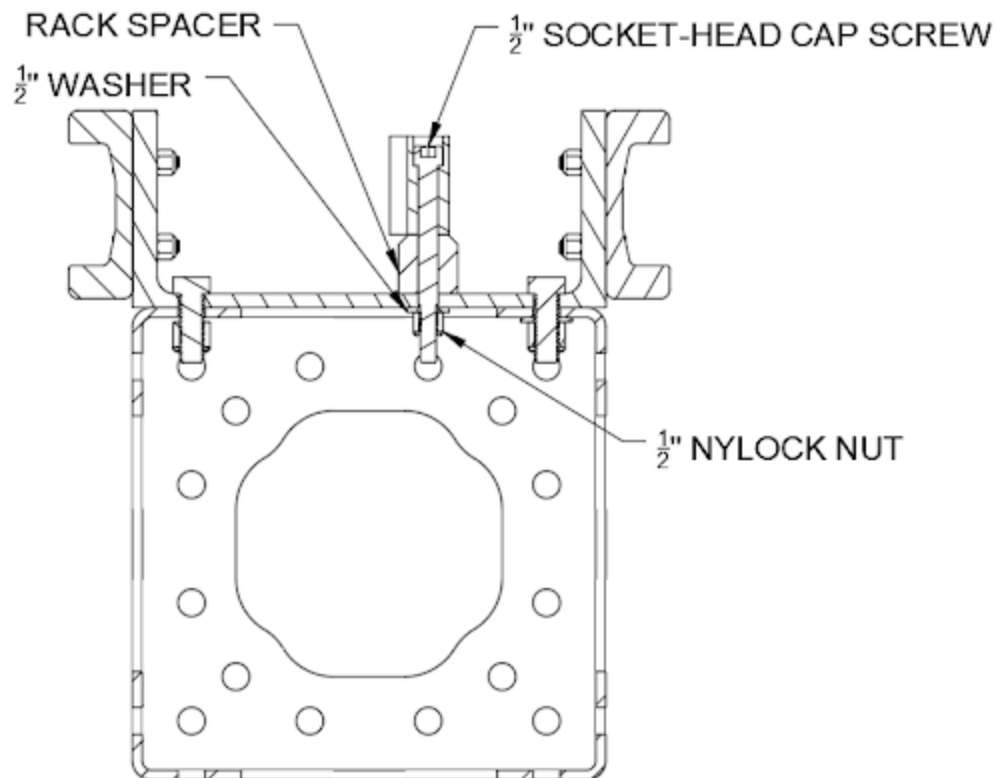
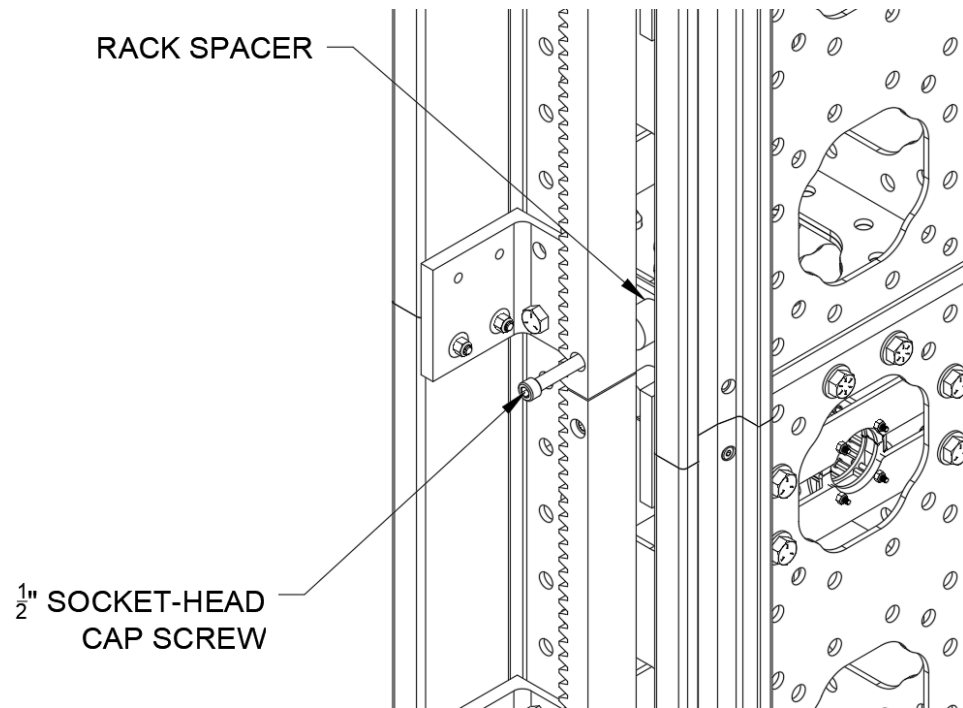
1. Clear the area around the **Floorpocket** and lifting machinery, and confirm overhead clearance.
2. Lift the mast extension into position above the **Floorpocket** base frame mast.
3. Lower the mast extension onto the base frame mast, using the (4) locator pins as guides.



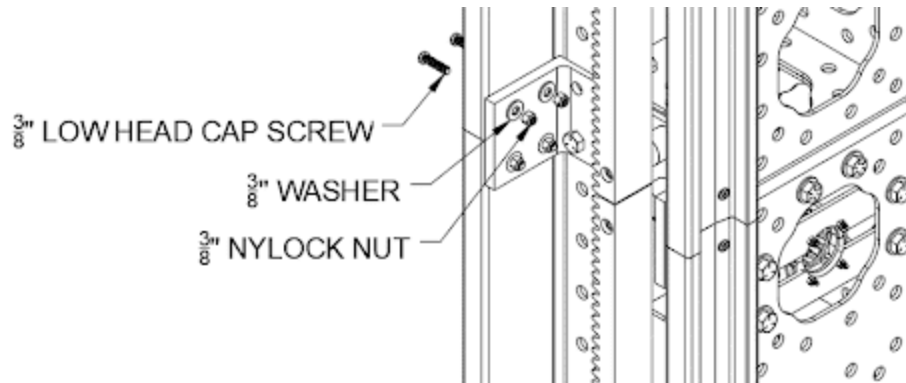
4. Confirm the toothed face of the gear rack and the inner faces of the guide rails are flush at the seam.



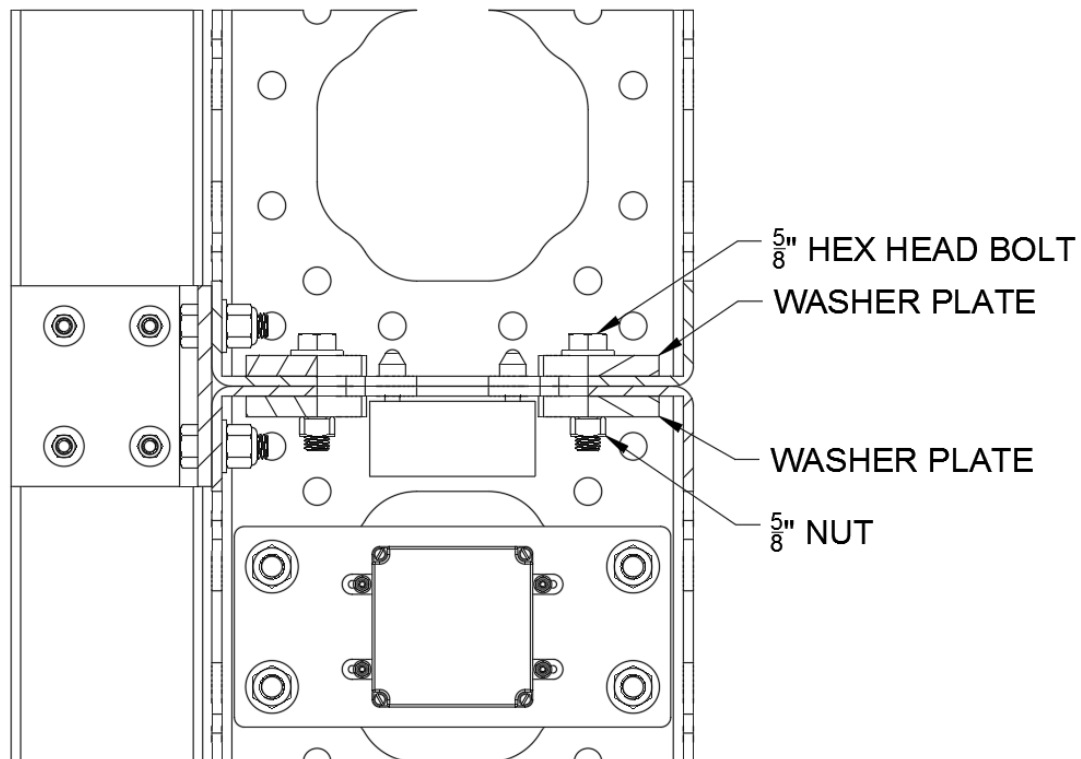
5. Connect the gear rack to the top mast bracket with the included 1/2" Socket-head cap screw, rack spacer, washer, and Nylock nut. With 3/8" hex key and 3/4" socket.



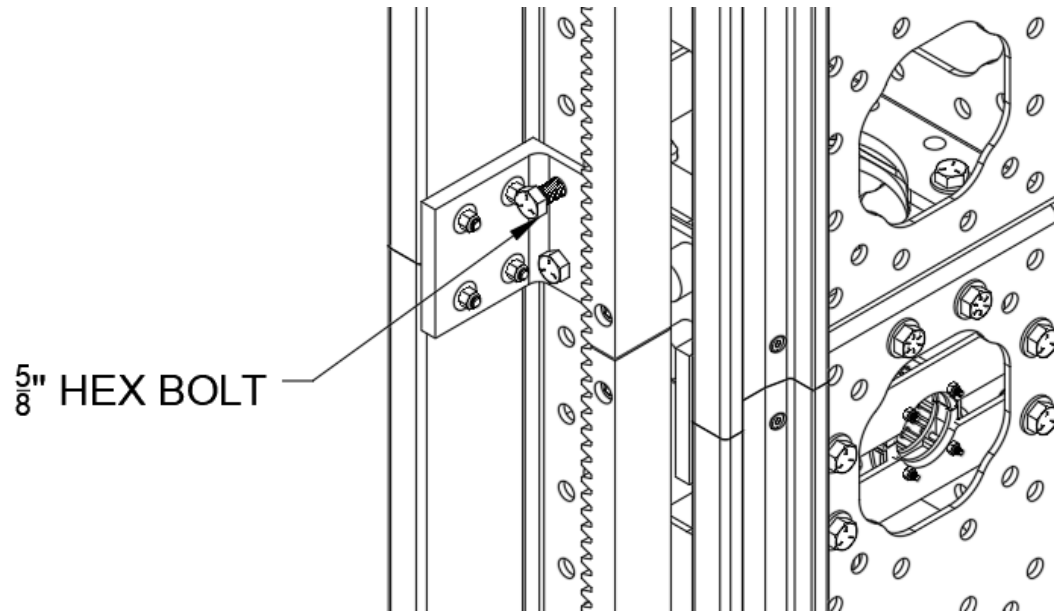
6. Connect the guide rails to the top mast tower bracket using the (4) included 3/8" low-head cap screws, washers and Nylock nuts.



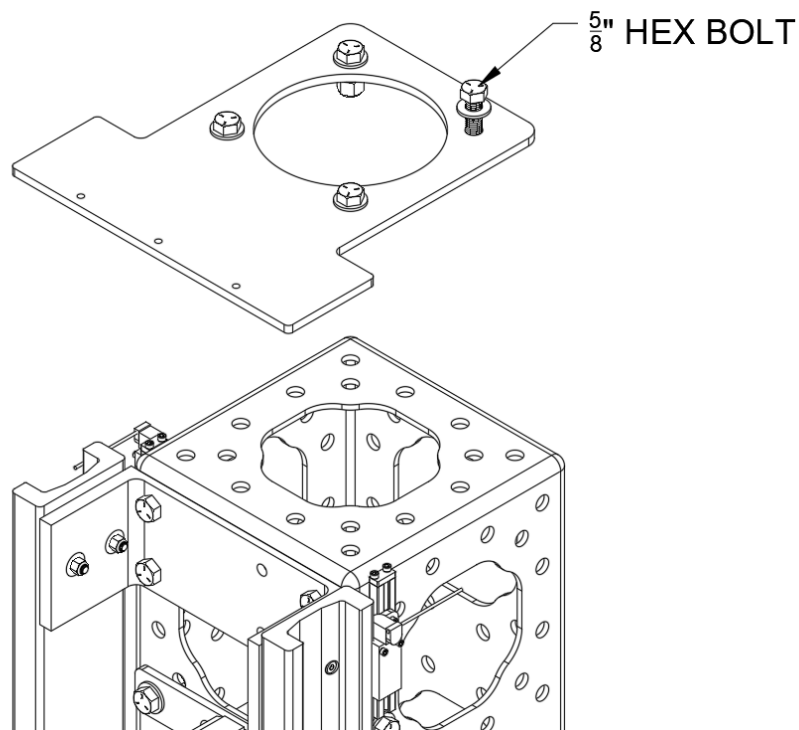
7. Use the included sets of 5/8" x 2" hex head cap screws, washers and nuts, along with the 12" ModTruss washer plates to attach the mast extension ModTruss to the base frame.



8. Connect the top mast bracket to the top of the upper mast section and secure it using the included (4) Grade 8 5/8" x 1-1/4" hex-head bolts, washers and nuts.



9. Attach mast cap with included 5/8" x 1-1/4" hex head bolts, washers and nylock nuts.



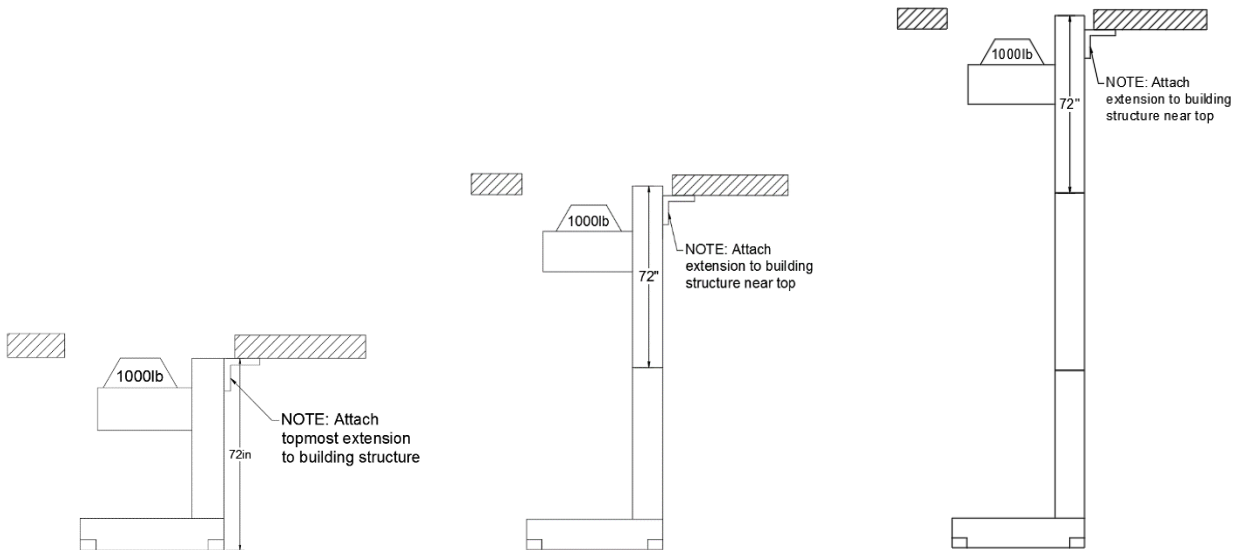
10. Confirm the surfaces from step 4 are still flush, and all connections are tightened to the following torques:

- 3/8" hardware – 23 ft-lb
- 1/2" hardware – 57 ft-lb
- 5/8" hardware – 112 ft-lb

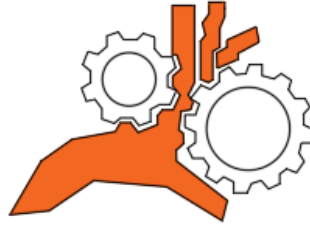
To prevent Tip-over Hazards, the **Floorpocket** is required to be connected at the top of the mast, no matter the configuration. The top connection must be able to withstand a constant load of 600 lbs in all directions.



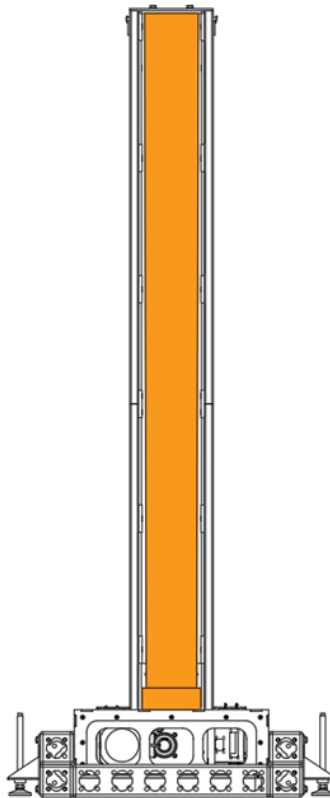
Any additional platforming must not overhang the lifting platform unless consulted through Creative Conners, Inc. with approved engineering review, and all additional platforms should be attached to the lifting platform through the four mounting holes provided.



To prevent Entanglement Hazards, install the included and attached Mast Tower Machine Guard.



This guard must be installed to prevent any entanglement of props, costumes, or humans in the drive rack. This guard also has the added benefit of keeping the grease from the drive rack away from those priceless costumes. The **Floorpocket** comes with the Mast Tower Machine Guard preinstalled to the platform. Simply raise the retracting guard to the top of the mast and secure the guard to the top of the mast. Slide the mounting bracket between the top plate and the top guide rail bracket. Attach with ¼"-20 x 1" Button Head Cap Screw into the threaded holes. The graphic below shows where the guard should cover the Mast Tower.



INSTALLING A LARGER PLATFORM

Use the load table below when determining the load capacity for a larger platform. If you have any questions regarding the capacity of the lift with a larger platform, give us a call or drop us a line at Phone: 401-289-2942 x2 or Email: support@creativeconnors.com.

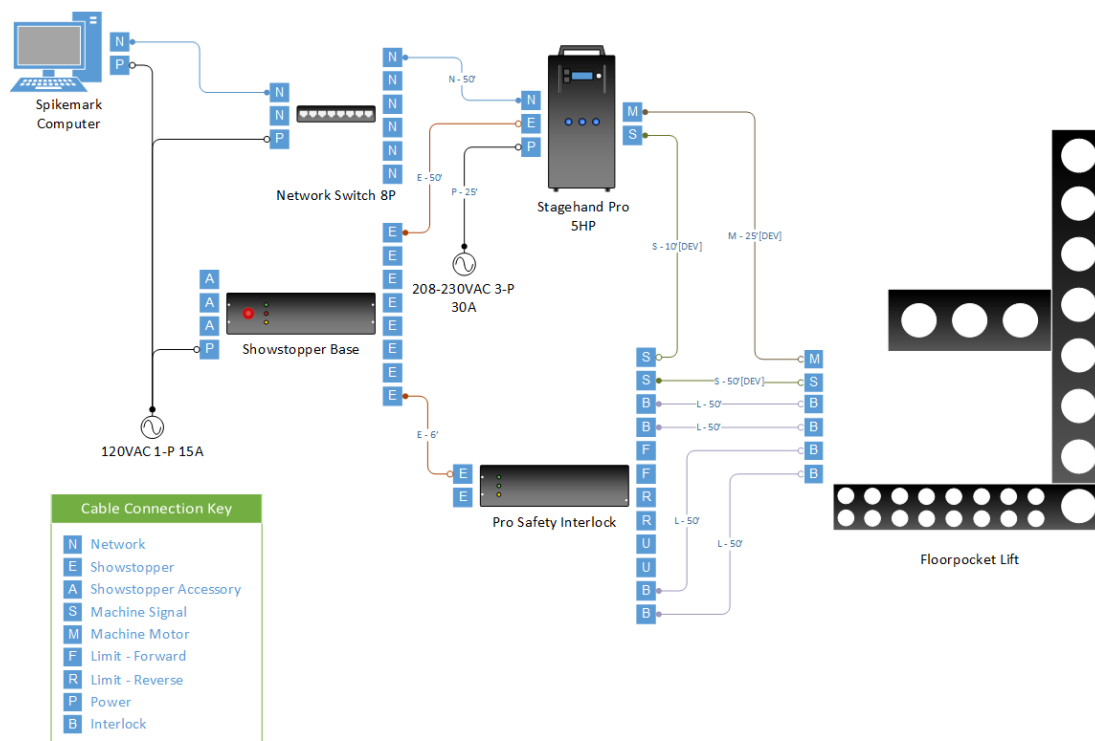
| | | Allowable Distributed Live Load on End User Supplied Deck (psf) | | | | | |
|-------------------------------------------------|----|-----------------------------------------------------------------|----|----|----|----|----|
| | | Deck Width (in) | | | | | |
| | | 36 | 42 | 48 | 54 | 60 | 66 |
| Deck Depth (in) | 36 | 100 | 85 | 70 | 60 | 55 | 50 |
| | 42 | 85 | 70 | 60 | 50 | 45 | 40 |
| | 48 | 70 | 60 | 50 | 45 | 35 | 35 |
| | 54 | 60 | 50 | 40 | 35 | 30 | 25 |
| | 60 | 45 | 40 | 30 | 25 | 25 | 20 |
| | 66 | 35 | 30 | 25 | 20 | | |
| | 72 | 25 | 20 | | | | |
| | 78 | 20 | | | | | |
| | 84 | | | | | | |
| | 90 | | | | | | |
| | 96 | | | | | | |
| *Excludes End User Supplied Deck weighing 10psf | | | | | | | |

| | | Allowable Point Load on End User Supplied Deck (lbs) (load may be placed anywhere on the deck) | | | | | |
|-------------------------------------------------|----|------------------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|
| | | Deck Width (in) | | | | | |
| | | 36 | 42 | 48 | 54 | 60 | 66 |
| Deck Depth (in) | 36 | 625 | 525 | 450 | 400 | 350 | 325 |
| | 42 | 525 | 500 | 450 | 400 | 350 | 325 |
| | 48 | 450 | 425 | 425 | 400 | 350 | 325 |
| | 54 | 375 | 350 | 350 | 350 | 350 | 325 |
| | 60 | 325 | 300 | 300 | 300 | 275 | 250 |
| | 66 | 275 | 250 | 250 | 250 | 225 | 225 |
| | 72 | 250 | 200 | 200 | 200 | 200 | 175 |
| | 78 | 200 | 175 | 175 | 150 | 150 | 125 |
| | 84 | 175 | 150 | 150 | 125 | 125 | 100 |
| | 90 | 150 | 125 | 125 | 100 | | |
| | 96 | 125 | 100 | | | | |
| *Excludes End User Supplied Deck weighing 10psf | | | | | | | |

MAKING THE CONNECTIONS

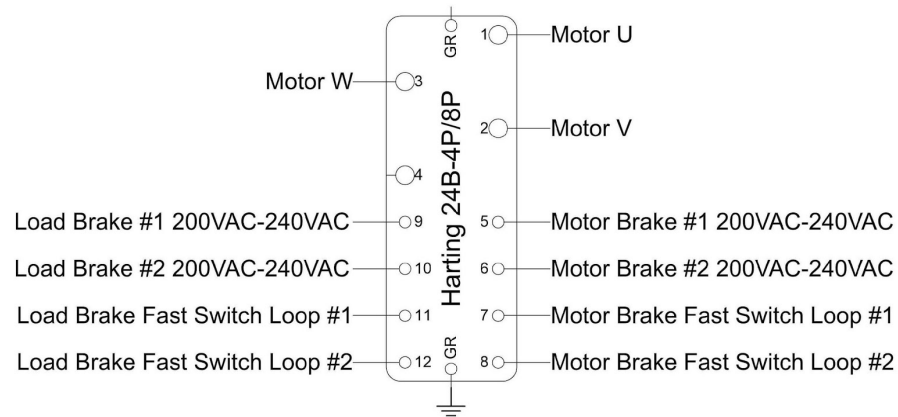
The **Floorpocket** lift requires a **Stagehand Pro AC** and a **Safety Interlock Box** for operation. The **Stagehand Pro AC** has several key safety features not found in other Stagehand controllers that are critical for safe operation.

- Closed Loop vector mode for full-torque at zero-speed control
- Overspeed detection
- Safety Relay
- Ultimate Limit inputs
- Dual brake control



MOTOR & BRAKES

Connect the Pro Motor Cable manufactured by Creative Conners, Inc to carry power for the motor and brake from the **Stagehand Pro AC** to your **Floorpocket** Junction Box. We use a Harting IRC latching hood style connector for the Pro Motor Cable to ensure that your machine stays connected during operation.

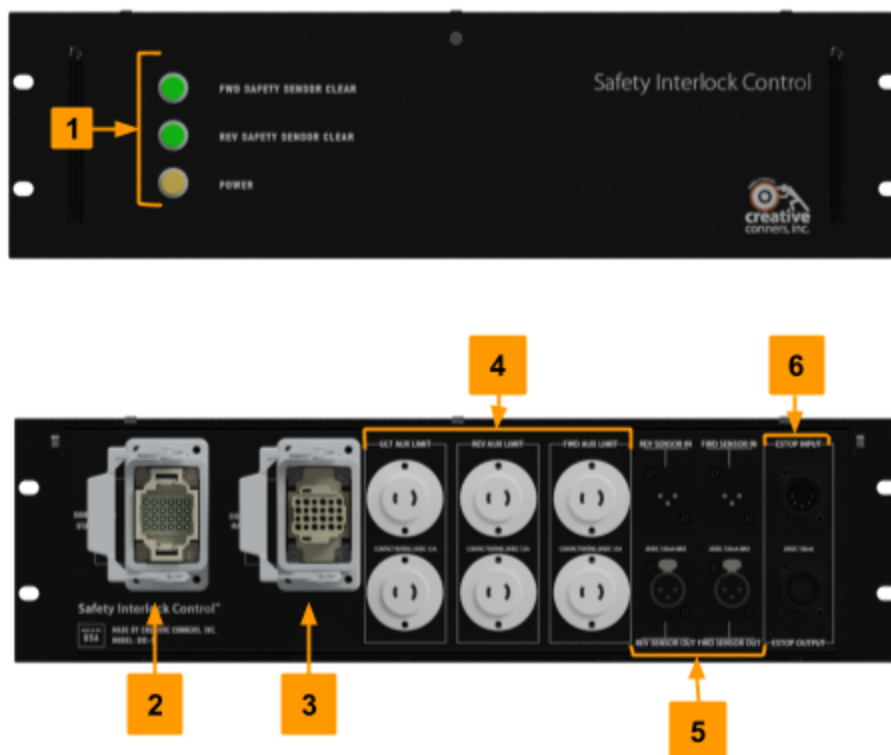


Motor & Brakes Connector

SAFETY INTERLOCK

You may be thinking, “wait, don’t we have all the safety we need already?”. Unfortunately a stage lift requires many safety features to keep everyone safe. These additional systems include bumper switches, safety mats and auxiliary limits, which are incorporated through the Safety Interlock Box.

The Safety Interlock Box sits between the **Stagehand Pro AC** and the **Floorpocket**, reading signals from the safety sensors and interrupting motion if any safety sensor is activated.

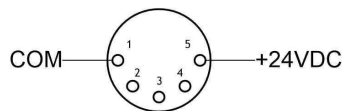


1. Three indicator lights to show the status of the **Safety Interlock**
2. Signal input from the **Stagehand Pro AC**
3. Signal output to the **Floorpocket**
4. Aux Limit connections, two each:
 - a. Ultimate, Forward, Reverse
5. Forward and Reverse sensors (one input and output for each direction)
6. Emergency Stop input and through

EMERGENCY STOP CONNECTION

The **Safety Interlock Pro** requires a +24VDC Emergency Stop signal from a **Showstopper 3 Base** or **Hub** in order to allow motion. This +24VDC powers an internal safety relay, and you can daisy chain through to the Stagehand motion controller. The 5-pin XLR cable is not a DMX signal, but rather it was chosen as a convenient cable that is prevalent in many venues so you should always be able to find a spare cable when needed.

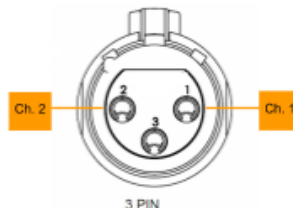
Below is the pin-out for the Emergency Stop input - polarity is important:



SAFETY SENSORS CONNECTIONS

The **Safety Interlock Pro** adds additional support for 4 wire safety circuits (e.g. bumper switches, pressure mats). A 4 wire safety circuit, when used in conjunction with a safety relay, allows monitoring for the following four conditions:

1. Disconnected – The safety relay sends out test pulses through the sensor and expects the signal to return. If that signal does not return the safety relay will go into a faulted state and disallow any further motion.
2. Shorted – If a wire has been crushed by equipment or cut the safety relay will go into a faulted state.
3. Cross Circuit – If the signals get crossed and the test pulse comes back on the opposite channel the safety relay will go into a faulted state.
4. Good – If none of the above conditions occur the safety relay will not prohibit any movement.

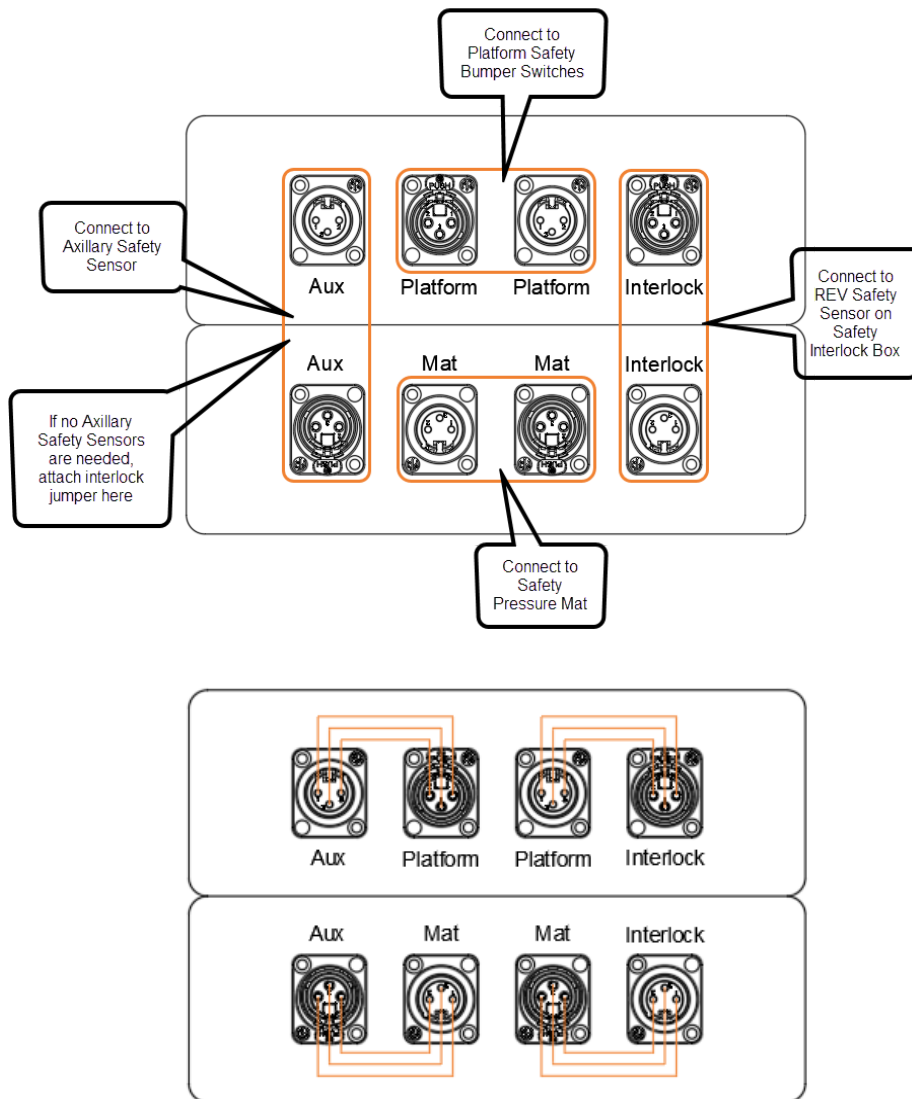


There are 4 sets of safety sensors that are designed to be connected with the **Floorpocket** and the **Safety Interlock Box**.

1. Safety Pressure Mat (REV Safety Sensor)
2. Platform Safety Bumper Switches (REV Safety Sensor)
3. Trap Edge Safety Bumper Switches (FWD Safety Sensor)
4. Auxiliary Safety Sensors (optional)

INTERLOCK AGGREGATOR BOX

The Interlock Aggregator Box is located inside the ModTruss frame of the **Floorpocket**. The Interlock Aggregator Box distributes the signal for the REV Safety Sensor of the **Safety Interlock Box**. Below are graphics that show how you should connect into the Interlock Aggregator Box and how the Interlock Aggregator Box is wired:

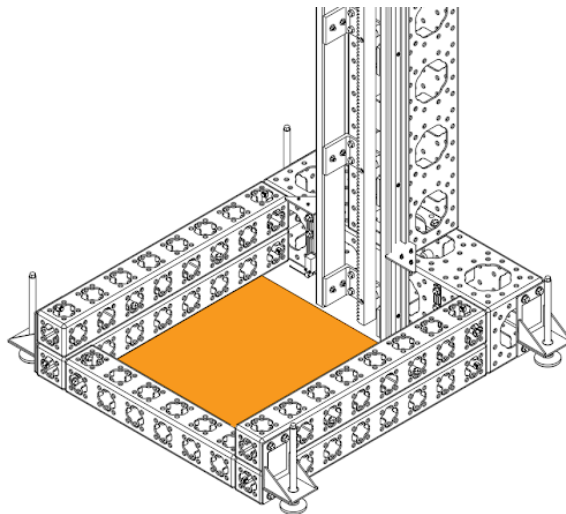


SAFETY MAT

To prevent a Crush Hazard when the lift is lowering, we include a Safety Mat to stop the machine from running if there is pressure applied to the Safety Mat.

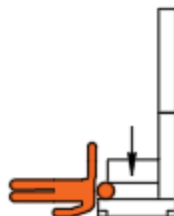


Install the Safety Mat by placing the Safety Mat under the platform and plugging both 3-pin XLR connectors into the Interlock Aggregator Box located inside the ModTruss Bottom Frame.

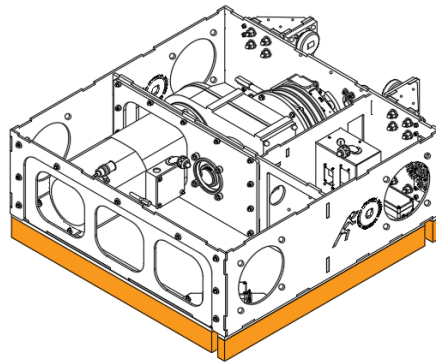


PLATFORM SAFETY BUMPER SWITCHES

To prevent a Severing Hazard while the lift is lowering, we include Safety Bumpers already attached to the platform.

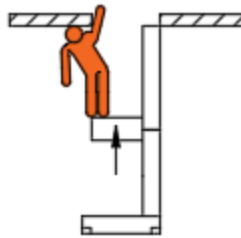


Simply verify that all 4 Safety Bumper Switches attached to the platform are connected together and wired to the Interlock Aggregator Box located inside the ModTruss Bottom Frame.

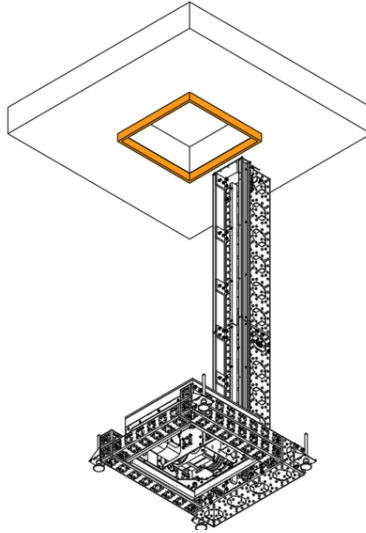


TRAP EDGE SAFETY BUMPER SWITCHES

To prevent a Crushing Hazard while the lift is rising, we included Safety Bumper Switches for you to install around the opening of your stage.



To install your Trap Edge Safety Bumper Switches, slide the rubber bumper out of the aluminum mounting bracket. Use the holes in the mounting bracket to fasten the mounting bracket to the bottom side of the stage. Attach the mounting brackets around the perimeter of your stage opening, using the fasteners that attach best to your building structure. Then slide the rubber bumper back into the mounting bracket. Lastly, connect the 3-pin XLR connectors together in series and connect into the FWD Safety Sensor Connectors of your **Safety Interlock Box**.

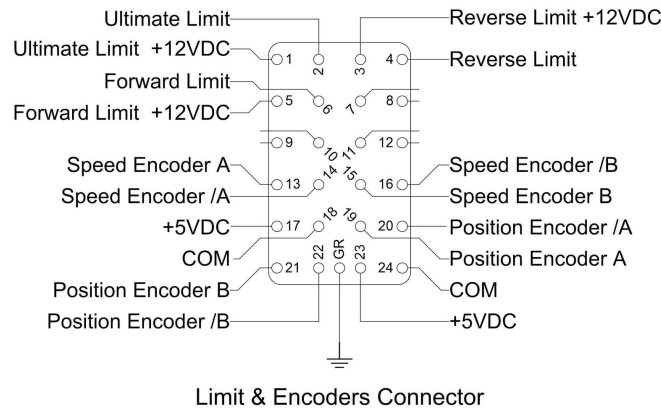


AUXILIARY SAFETY SENSOR

The Auxiliary Safety Sensor is an additional available way to integrate a REV Safety Sensor. You may wonder why you would need an additional REV Safety Sensor. In some situations, you may need a larger platform than the stock 3ft x 3ft platform. If you do need a larger platform, please consult us here at Creative Conners, Inc. to make sure the new platform fits within the engineered specifications. With a larger platform, you will need to add an additional set of Safety Bumper Switches to the larger platform to prevent a Severing Hazard while the lift is lowering. If you are not using the Auxiliary Safety Sensor, make sure the included Interlock Jumper Cable is inserted into the Interlock Aggregator Box.

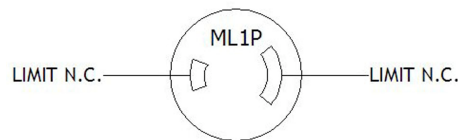
SIGNAL CONNECTIONS

Two sets of encoder signals (one for speed monitoring and one for positioning) and three sets of limit switch signals (forward, reverse, and ultimate) are combined in one cable with a bulkhead connector (ILME CDDF-24). Encoders are powered at 5vdc for broadest compatibility.



All limit switch signals require Normally Closed (N.C.) switches. The **Stagehand Pro AC** sources 12vdc on a pin of each limit circuit and expects to see that 12vdc signal returned on the other pin when the limit is not activated. If the limit is either activated or disconnected, or a wiring fault occurs, the 12vdc return signal is interrupted and the **Stagehand Pro AC** will enter a limit fault condition and disallow motion.

The limit switch inputs are used to protect against the motor traveling too far in either direction and causing damage or injury. When running in a cue, this is one of the safety features that guards against overtravel due to encoder failure. When jogging manually, this keeps you from accidentally traveling too far. Limit switches use NEMA ML1 connectors.



The signal cable for the **Floorpocket** must be run through the **Safety Interlock Box** from the **Stagehand Pro AC** to operate. This means that you will need two signal cables. One to connect the **Stagehand Pro AC** to the **Safety Interlock Box** and a second to connect from the **Safety Interlock Box** to the **Floorpocket**.

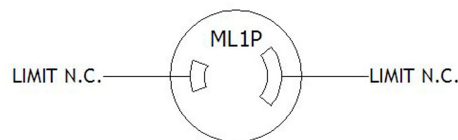
LIMITS

On the **Floorpocket** we include a redundant set of end-of-travel limits. Like many of our machines, the **Floorpocket** come with FWD, REV, FWD ULT, and REV ULT Limits pre-installed on the machine. Below shows the location of each limit. Each limit needs to be plugged into the Limit J-Box.

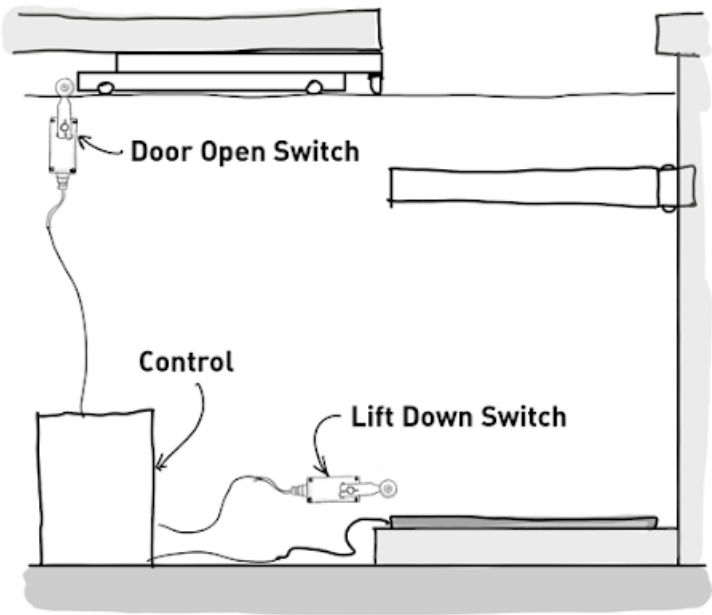


INTERLOCK AUXILIARY LIMIT SWITCHES

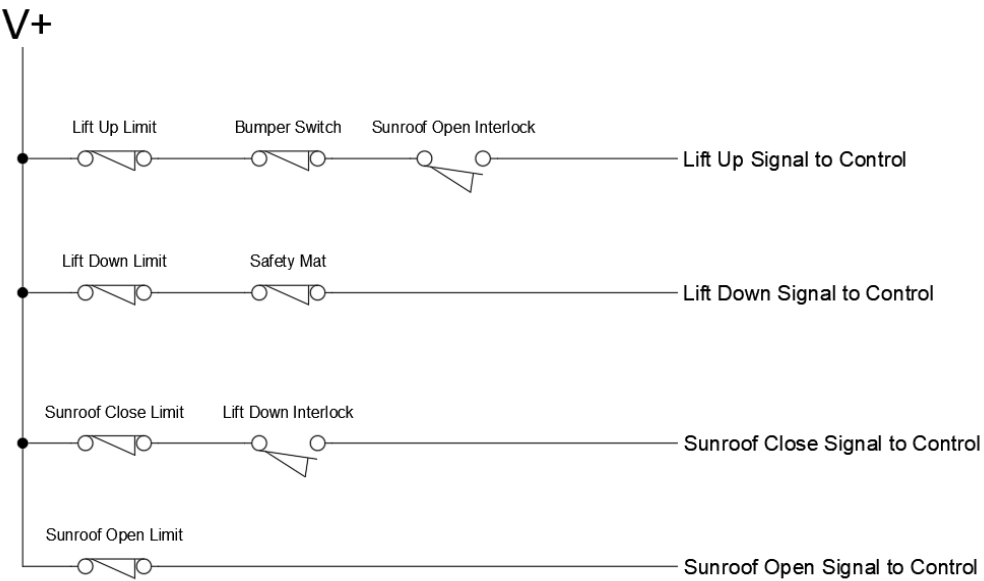
Auxiliary Limits – These limits are wired in series with their corresponding standard limits. Thus, if a Forward Auxiliary limit is activated, the **Stagehand Pro AC** will read the limit as a Forward Limit. Similarly, if a Reverse Auxiliary limit is activated the **Stagehand Pro AC** will read the limit as a Reverse Limit. Auxiliary limits use NEMA ML1 connectors.



The Auxiliary Limits were originally conceived to be used with a **Floorpocket** and trapdoor (sunroof) application. This way, if you placed a Normally Open limit switch that is connected to the FWD Aux Limit input of the **Stagehand Pro AC** in the open position of your trapdoor (sunroof), this would prevent the lift from moving forward (or up) until the trapdoor (sunroof) is open. Similarly, you can do this with the REV Aux Limit to prevent the trap door from closing while the lift is in its raised position by placing a Normally Open limit switch where the limit is struck when the lift reaches its lowest position and is clear of the trapdoor (sunroof). If you are not using a trapdoor (sunroof) with your **Floorpocket**, you do not need Auxiliary Limits for your system. If you are not using a trapdoor (sunroof) with your **Floorpocket**, simply insert the included auxiliary limit jumpers to clear the limits. The graphic below shows how the limits could be placed for this system.



The graphic below shows the logic of how the interlock system controls the ability for motion to take place.



PREPPING THE MACHINE FOR OPERATION

Testing Brake Functionality

The **Floorpocket**, like all of Creative Conners, Inc.'s hoisting equipment, has a redundant set of brakes as a safeguard against a brake failure. There is one brake located on the motor side of the machine and the other brake is located on the load side of the machine.

Motor Brake

The motor brake is a small, fast-acting brake that holds the motor shaft in place when the machine is stopped. The motor brake uses the mechanical advantage of the speed reducer (aka gearbox) to increase its holding ability. The **Stagehand Pro AC** expects that the motor brake will be fully released within 60ms of receiving power.

Under normal operation, the motor brake is only engaged once the motor has come to a controlled, complete stop. The motor brake needs power to release. If power is removed, the motor brake will engage by spring force. This is a "fail-safe" brake, it fails to a safe condition by engaging when power is lost. Not all machines explicitly require a motor brake, but we recommend using motor brakes in all applications. All of Creative Conners, Inc.'s machines are built with a motor brake.

Load Brake

In lifting applications, a second brake is required to provide redundant protection in case of equipment failure. Often, this second brake is placed directly on the output side of the speed reducer. If either the speed reducer or the motor brake fails, a brake on the load side of the machine will be able to stop a falling load. The **Stagehand Pro AC** expects that the load brake will be fully released within 500ms of receiving power.

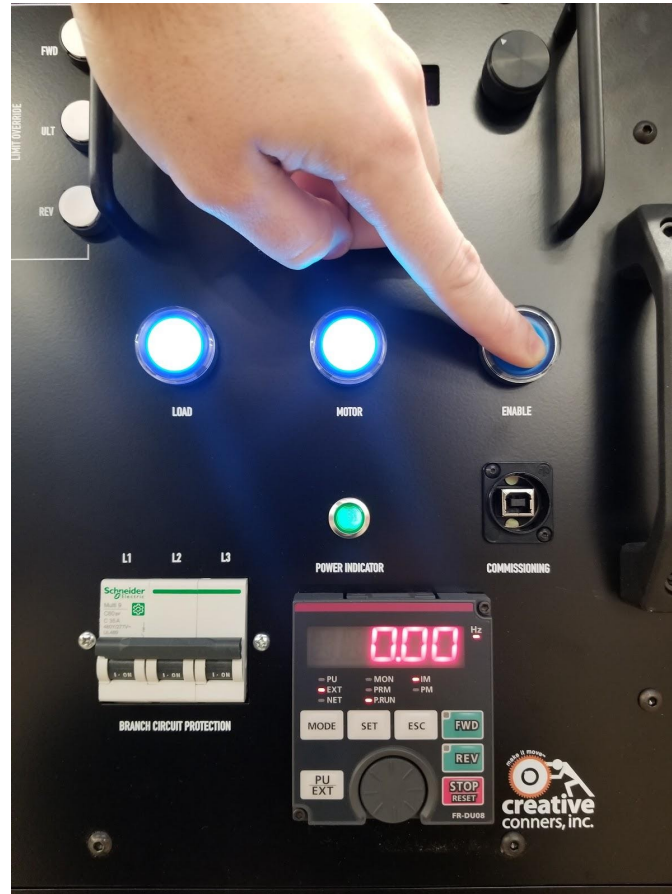
If a brake is used on the output side (aka load side) of a speed reducer, then it must be much larger than the motor side brake since it isn't able to use the mechanical advantage of the speed reducer to increase its holding power. Load brakes are not required on all machines. The additional expense is often not incurred for machines that are moving scenery laterally. For instance, our **Pushstick** deck winch does not have a load brake, but our **Spotline** hoist does use a load brake.

Brake Testing

Having two brakes is a good thing, but you might ask how do you know if a brake fails when the other brake is still operating correctly? We had this thought too. This is why we now include a brake test feature on our **Stagehand Pro AC**. Before operating the machine and during your nightly pre-show check, you should perform a brake test to ensure that both brakes are operating correctly.

- Clear the area around the lift. If a brake were to have failed, the lift platform could fall during this test.

- Press the Brake Test Enable Button



- While holding the Brake Test Enable Button, press the Load Brake Button. This will manually release the Load Brake. The Motor Brake should still be engaged and will hold the load. If the suspended scenery slips down, release the Load Brake button immediately. Since the Motor Brake did not hold the load as expected, that brake has failed.

**DO NOT OPERATE THE MACHINE UNTIL THE MOTOR BRAKE IS REPAIRED OR REPLACED.
FAILURE TO REMOVE THE MACHINE FROM SERVICE COULD RESULT IN DAMAGE, INJURY, OR DEATH.**



- Provided the Motor Brake passed the functional test, release the Load Brake button.
- While holding the Brake Test Enable Button, press the Motor Brake Button. This will manually release the Motor Brake. The Load Brake should still be engaged and will hold the load. If the suspended scenery slips down, release the Motor Brake button immediately. Since the Load Brake did not hold the load as expected, that brake has failed.

**DO NOT OPERATE THE MACHINE UNTIL THE LOAD BRAKE IS REPAIRED OR REPLACED.
FAILURE TO REMOVE THE MACHINE FROM SERVICE COULD RESULT IN DAMAGE, INJURY, OR DEATH.**



- Release the Motor Brake Button

Pro Tip: If you press all three buttons at once, both brakes will engage

Testing The Motor

To confirm that your motor is properly connected to the **Stagehand Pro AC** you should test these conditions:

1. E-Stop – Release the E-Stop button on your **Showstopper**. You should hear a “click” from inside the Stagehand, this is the E-Stop contactor closing. The OLED display should show that the E-Stop is released by changing the status display; “Not Connected” indicates that the **Stagehand Pro AC** is not communicating with a computer running **Spikemark**.
2. Brake release – Press the FWD jog button. You should hear a distinct “click” from your redundant brake quickly followed by the motor brake. This is the sound of the brake releasing. Release the FWD jog button. You should hear a click of the brakes engaging.
3. Motor Motion – Press the FWD jog button and slowly turn the knob clockwise. The lift should begin moving upwards. Turn the knob counterclockwise to slow the lift to a stop, then release the jog button. Repeat with the REV jog button and verify that the lift moves downwards.
4. Encoder – When jogging the motor the OLED will display the encoder counts. While jogging the motor, verify the counts are increasing while running in the forward direction and decreasing while running in the reverse direction.
5. Limit Switches – Manually activate the forward ultimate limit and the forward limit then activate the reverse ultimate limit and reverse limit. The OLED display on the **Stagehand Pro AC** should indicate when the corresponding limit is detected.

Setting the Limits

Each limit is attached to its own track to adjust the position at which the limit is triggered. To adjust your limits, loosen the socket head cap screw attaching the limit to the track with a 5/32” hex key, slide the limit up or down its track, and resecure the socket head cap screw. The FWD and REV limits are there to prevent your **Floorpocket** from getting damaged. The FWD ULT and REV ULT limits are set behind their initial limits for redundancy to prevent your **Floorpocket** from getting damaged if your FWD or REV limit does not trigger the stop in motion. If you are installing an extension tower onto your **Floorpocket**, you will need to attach the FWD and FWD ULT limit tracks to the ModTruss tower with the included 5/8” Grade 8 hex head bolts, washers, and nuts.

VFD Settings

The parameter settings on the Mitsubishi Variable Frequency Drive (VFD) are tailored to make the unit work effectively with each machine. The **Floorpocket** uses a different set of VFD parameters than all of the other Creative Conners, Inc. stock products. Below is a list of the parameters that are changed from the factory defaults, and what they do. Viewing and changing the parameters is a straightforward process. On the VFD keypad press the MODE button until a 'P' is displayed. Use the wheel to scroll to the desired parameter number and press the SET button. The display will change and display a number value. Use the wheel to adjust the value and press SET. To make no change, simply press the SET button. When all settings are confirmed/adjusted, press the mode button 3 times until the display shows 0.00. A more detailed explanation of this process can be found at <http://cci.fyi/vfd>.

We have designed a few variants of the **Stagehand Pro** and they each need slightly different parameters to run your **Floorpocket** efficiently and effectively. To know what **Stagehand Pro** and VFD you have, look at the VFD keypad on the face plate and notice where that keypad is located on the **Stagehand** itself. If the keypad is square and is located on the bottom right of the faceplate, it is a **Stagehand Pro 3** with an A800. If the keypad is square on the bottom left of the faceplate it is a **Stagehand Pro 2** with an A800. If it is rectangular and is located on the bottom left of the faceplate, it is a **Stagehand Pro 2** with an A700.

| YOU MUST SET PARAMETER 77 = 2 PRIOR TO BEGINNING THE MANUAL RESTORE PROCESS | | | | | |
|-----------------------------------------------------------------------------|------------------------------|----------------------------------------------------------|-----------------|----------------------|----------------------|
| Pr. No. | Name | Description | Stagehand Pro 3 | Stagehand Pro 2 A800 | Stagehand Pro 2 A700 |
| 1 | Maximum frequency | Set the upper limit of the output frequency. | 80 | 80 | 80 |
| 2 | Minimum frequency | Set the lower limit of the output frequency. | 0 | 0 | 0 |
| 3 | Base frequency | Set the frequency at the rated motor torque. (50Hz/60Hz) | 60 | 60 | 60 |
| 7 | Acceleration time | Standard time to accelerate a movement. | 0 | 0 | 0 |
| 8 | Deceleration time | Standard time to decelerate a movement. | 0 | 0 | 0 |
| 9 | Electronic thermal O/L relay | Current rating from the motor nameplate. | 17.5 | 17.5 | 17.5 |
| 10 | DC injection brake | Set the frequency at which the brakes | 3 | 3 | 3 |

| | | | | | |
|-----|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|
| | operation frequency | will release. | | | |
| 13 | Starting frequency | Motor won't start until the speed signal is at least this value. | 0.5 | 0.5 | 0.5 |
| 18 | High speed maximum frequency | Allows for VFD output at 120Hz or higher. | 80 | 80 | 80 |
| 30 | Regenerative function selection | External brake resistor, L1/L2/L3 power source. | 1 | 1 | 1 |
| 70 | Special regenerative brake duty | Duty cycle of the braking resistor. | 10 | 10 | 10 |
| 71 | Applied motor | Other manufacturers' standard motor. | 3 | 3 | 3 |
| 72 | PWM frequency selection | Carrier Frequency. Reduces output noise. | 15 | 15 | 15 |
| 73 | Analog input selection | +/-10vdc with reversing enabled. | 1 | 14 | 14 |
| 77 | Parameter write selection | Allow parameter writes regardless of operation status. | 2 | 2 | 2 |
| 79 | Operation mode selection | External control at power ON, changeable to PU mode with PU/EXT button | 0 | 0 | 0 |
| 80 | Motor capacity | Kilowatt rating of motor.(1hp=0.75kw, 5hp=3.7kw, 10hp=7kw) | 4 | 4 | 4 |
| 81 | Number of motor poles | governs the base rpm of the motor | 4 | 4 | 4 |
| 83 | Rated motor voltage | Set the voltage rating from the motor nameplate. | 230 | 230 | 230 |
| 84 | Rated motor frequency | Set the frequency rating from the motor nameplate. | 60 | 60 | 60 |
| 96 | Auto tuning setting/status | Offline auto-tuning status. 0 = not set; 1 = auto-tuning initiated, 2 = auto-tuning in progress, 3 = auto-tuning completed. See Stagehand Pro manual for instructions | 0 | 0 | 0 |
| 117 | PU communication station number | Specifies the inverter station number. | 1 | 1 | 1 |
| 118 | PU communication speed | 4800bps | 48 | 48 | 48 |

| | | | | | |
|-----|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------|------|------|
| 119 | PU communication stop bit length / data length | Data length: 8 bits, stop bit: 1 bit | 0 | 0 | 0 |
| 120 | PU communication parity check | No parity check. | 0 | 0 | 0 |
| 125 | Terminal 2 frequency setting gain frequency | Terminal 2 input gain (maximum) frequency. | 60 | 60 | 60 |
| 180 | RL terminal function selection | general input (used to sense load brake relay status) | 9999 | 9999 | 9999 |
| 181 | RM terminal function selection | general input (used to sense motor brake relay status) | 9999 | 9999 | 9999 |
| 182 | RH terminal function selection | SQ signal, sequence run for PLC mode. Must be shorted to run, open to program | 50 | 50 | 50 |
| 183 | RT terminal function selection | general input (used to sense load brake test button) | 9999 | 9999 | 9999 |
| 184 | AU terminal function selection | general input (used to sense motor brake test button) | 9999 | 9999 | 9999 |
| 190 | RUN terminal function selection | Alarm signal, normally on shuts off if there's a fault | 199 | 199 | 199 |
| 191 | SU terminal function selection | general output (used by PLC to indicate a brake relay failure) | 9999 | 9999 | 9999 |
| 192 | IPF terminal function selection | general output (used by PLC for motor brake) | 9999 | 9999 | 9999 |
| 193 | OL terminal function selection | general output (used by PLC for load brake) | 9999 | 9999 | 9999 |
| 194 | FU terminal function selection | General output | 9999 | 9999 | 9999 |
| 252 | Override bias | Percentage of analog signal to use for speed signal ***adjust this to overspeed motor | 100 | 100 | 100 |
| 285 | Overspeed detection frequency (speed deviation excess detection frequency) | Hz difference between commanded speed and actual that will trip an overspeed fault | 20 | 20 | 20 |

| | | | | | |
|------------|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------|------|------|
| 331 | RS-485 communication station number | RS-485 Communication | 1 | 1 | 1 |
| 332 | RS-485 communication speed | RS-485 Communication | 48 | 48 | 48 |
| 333 | RS-485 communication stop bit length / data length | RS-485 Communication | 0 | 0 | 0 |
| 334 | RS-485 communication parity check selection | RS-485 Communication | 0 | 0 | 0 |
| 338 | Communication operation command source | RS-485 Communication | 0 | 0 | 0 |
| 339 | Communication speed command source | RS-485 Communication | 0 | 0 | 0 |
| 340 | Communication startup mode selection | RS-485 Communication | 0 | 0 | 0 |
| 359 | Encoder rotation direction | CCW encoder rotation is forward | 1 | 1 | 1 |
| 368 | Feedback gain | Response of the feedback will become slow when the acceleration/deceleration time is long. In such case, increase the setting value | 1 | 1 | 1 |
| 369 | Number of encoder pulses | PPR for Vector Control (Floorpocket preJan '19 = 2500) All other machines = 1024 | 1024 | 1024 | 1024 |
| 374 | Overspeed detection level | Inverter shuts down if motor speed is greater than indicated value. (Hz) | 9999 | 9999 | 75 |
| 376 | Encoder signal loss detection enable/disable selection | Inverter shuts down if encoder stops working or encoder signal is lost. | 1 | 1 | 1 |

| | | | | | |
|------------|---------------------------------------------|------------------------------------------------------------------------------------------------------------|------|------|------|
| 414 | PLC function operation selection | enable PLC to run brake switching logic, must be turned off to manually auto-tune motor. A800='2' A700='1' | 2 | 2 | 1 |
| 549 | Protocol selection | MODBUS RTU protocol | 1 | 1 | 1 |
| 550 | NET mode operation command source selection | The RS-485 terminals are the command source when in the NET operation mode | 1 | 1 | 1 |
| 551 | PU mode operation command source selection | The RS-485 terminals are the command source when in the PU operation mode. | 9999 | 9999 | 9999 |
| 800 | Control method selection | 0=Vector control, speed control, 10=Sensorless Vector control, 20=Volts/Frequency control | 0 | 0 | 0 |
| 802 | Pre-excitation selection | servo lock | 1 | 1 | 1 |
| 818 | Easy gain tuning response level setting | 1-15 range that governs aggression of easy gain-tuning | 2 | 2 | 2 |
| 819 | Easy gain tuning selection | OFF | 0 | 0 | 0 |
| 820 | Speed control P gain 1 | pgain level, higher for tighter speed control but more oscillation | 20 | 20 | 20 |
| 850 | Brake operation selection | zero speed control | 1 | 1 | 1 |
| 853 | Speed deviation time | seconds that an overspeed can occur before faulting | 1 | 1 | 1 |
| 903 | Terminal 2 frequency setting gain frequency | C4 - Enter the value on the Stagehand cabinet or refer to the Stagehand manual for details | TBD | TBD | TBD |

Pre-2019 Floorpocket

If you happen to be working with a **Floorpocket** that was manufactured before January 2019, you will need to change a few parameters for your **Floorpocket** to function properly. This version the **Floorpocket** are the **Floorpockets** that we currently have in our rental stock. This version of the **Floorpocket** has a slightly different motor and encoder. Change the following parameters using this table below following the process described above.

| No. | Name | Description | Initial value | Setting value |
|-----|---------------------------------------------|-----------------------------------------------------------------------------------|---------------|---------------|
| 3 | Base frequency | Set the frequency at the rated motor torque. (50Hz/60Hz) | 60 | 50 |
| 84 | Rated motor frequency | Set the frequency rating from the motor nameplate. | 60 | 50 |
| 125 | Terminal 2 frequency setting gain frequency | Terminal 2 input gain (maximum) frequency. | 60 | 50 |
| 369 | Number of encoder pulses | PPR for Vector Control (Floorpocket pre-Jan '19 = 2500) All other machines = 1024 | 1024 | 2500 |

INSPECTIONS

The following is a checklist to inspect the **Floorpocket** prior to operation. It is necessary to perform the checklists detailed below to ensure all components of the **Floorpocket** are operating correctly. If any component fails the test, do not use the **Floorpocket** and consult Creative Conners, Inc.

LOAD IN INSPECTION

Mechanical

- ☐ Confirm all structural/mechanical connections are secured to the proper torque settings.
- ☐ Confirm the base frame is level.
- ☐ Confirm gear rack and linear rail alignment.
- ☐ Confirm the platform is level.
- ☐ Confirm the platform is rigid and stable.
- ☐ Inspect gear rack and pinion for excessive wear.
- ☐ Lubricate gear rack and pinion.
 - ☐ Recommendation: Microlube GB 0, Mobilux EP 111
- ☐ Confirm rack safety guard is installed.
- ☐ Confirm safety guards above and below guide rollers are installed.

Electrical

- ☐ Confirm the **Floorpocket** can jog in both directions.
- ☐ Confirm the **Stagehand Pro AC** is receiving encoder signals.
 - ☐ Position value should increase while lift moves FWD/upward.
 - ☐ Position value should decrease while lift moves REV/downward.
- ☐ Confirm the **Stagehand Pro AC** displays proper limit information when limit switches or safety bumpers are engaged.
 - ☐ FWD Limit
 - ☐ FWD limit at top of travel
 - ☐ Halo safety edge
 - ☐ Ultimate FWD Limit
 - ☐ ULT FWD limit at top of travel
 - ☐ REV Limit
 - ☐ REV limit at bottom of travel
 - ☐ Platform bumper edge
 - ☐ Safety mat
 - ☐ Ultimate REV Limit
 - ☐ ULT REV limit at bottom of travel
- ☐ Confirm brake operation with brake test sequence.

PRESHOW INSPECTION

- ☐ Run brake test sequence.
- ☐ Connect the **Stagehand Pro AC** to **Spikemark**.
 - ☐ Confirm current position
- ☐ Confirm safety mat and safe edge is connected and functioning.
- ☐ Check Limit Placement/Operation.
 - ☐ FWD Limit
 - ☐ Physical switch at the top of travel
 - ☐ Halo safety edge
- ☐ ULT FWD Limit
 - ☐ Physical switch at the top of travel
- ☐ REV Limit
 - ☐ Physical switch at the bottom of travel
 - ☐ Platform bumper edge
 - ☐ Safety mat
- ☐ Ultimate REV Limit
 - ☐ ULT REV limit at the bottom of travel
- ☐ Confirm smooth operation over the entire range of motion.
- ☐ Run a test cue in **Spikemark**, confirming that all safety interlocks are functioning correctly and target position is achieved.

TROUBLESHOOTING

Though the combination of the **Floorpocket**, **Stagehand Pro AC**, **Showstopper 3**, and **Spikemark** strives to make automation easy, there are certainly times when things don't work. This part of the guide will give you some earned advice about what culprits to look for when motors refuse to move.

| Problem | Checkpoint |
|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| When running forward (UP), the encoder position decreases. When running reverse (DOWN), the encoder position increases | <p>The encoder and motor have electrically inverse polarity. You need to either change the motor wiring or the encoder wiring.</p> <p>Rewire the encoder to match the motor polarity:</p> <ul style="list-style-type: none"> • Swap signal A with signal B. • Swap signal /A with signal /B. <p>You may need to rewire both the Position and Speed encoder signals.</p> |
| Motor runs roughly or makes strange noises when jogging manually. | <ul style="list-style-type: none"> • Run the auto-tuning procedure outlined in the Restoring VFD Parameters found on http://cci.fyi/restore • Test both brakes for functionality |
| The FWD LIMIT, REV LIMIT and ULT LIMIT fault messages are displayed on the status screen and the motor won't move. | <ul style="list-style-type: none"> • Make sure the Signal cable is plugged into the Stagehand Pro AC, Safety Interlock Box and Floorpocket. • Check limit switch connections at the limit junction box. • Check the placement of your limit switches. If both are physically activated, adjust the placement to clear one or both switches. |
| I'm trying to jog the motor, but the status display shows "SET IP" | <p>The motion controller is in IP Address setting mode, which happens when the knob is pressed (either intentionally or just bumped in passing). Turn the knob until the cursor is blinking over the word CANCEL and then press the knob. The motion controller will now be in normal mode and can jog the motor again.</p> |
| Floorpocket manually jogs smoothly but has jerky motion in a cue | <ul style="list-style-type: none"> • Use the Brake Test Buttons on the Stagehand Pro AC to ensure that both brakes are disengaging. • Confirm all VFD parameters are set |

| | |
|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>correctly.</p> <ul style="list-style-type: none"> ● Run the auto tune process outlined in the Stagehand Pro AC manual. ● Adjust the PID tuning parameters in Spikemark (see Spikemark manual). ● Call Creative Conners, Inc. |
| Stagehand Pro AC displays “Brake Fault” | <ul style="list-style-type: none"> ● Ensure that the motor and brake cable is connected at the Stagehand and the Floorpocket ● Ensure that the signal cable is connected to the Stagehand Pro AC, Safety Interlock Box and Floorpocket. ● Ensure that the control cable connector is plugged in. ● Call Creative Conners, Inc. with the fault code displayed on the Mitsubishi keypad. |
| When trying to move, the Stagehand Pro AC displays “Drive Fault” | <ul style="list-style-type: none"> ● Ensure that the motor and brake cable is connected at the Stagehand and the Floorpocket ● Ensure that the signal cable is connected to the Stagehand Pro, Safety Interlock Box and Floorpocket. ● Ensure that the control cable connector is plugged in. ● Call Creative Conners, Inc. with the fault code displayed on the Mitsubishi keypad. |

Common Mitsubishi A800 VFD Fault Codes

| Error Code | Name | Description |
|------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| E.ECT | Encoder Signal Loss | <ul style="list-style-type: none"> The Speed Encoder is disconnected, make sure it's wired up and plugged in. |
| E.OSD | Speed Deviation Error | <ul style="list-style-type: none"> Caused by a mismatch between encoder feedback and command motor speed. Make sure the Speed Encoder is properly wired and plugged in. Can also be caused by a brake failure or loose brake connection. |
| E.OS | Overspeed Occurrence | <ul style="list-style-type: none"> The motor was running faster than the maximum value programmed for the drive. This usually means the motor was in free fall. Remove the load from the motor and begin testing in a controlled environment to determine if the machine is healthy. Can also be caused by a brake failure or loose brake connection. |
| E.THM | Overload Trip | <ul style="list-style-type: none"> Primary causes are either too much load or a failure of the brake(s) to release. Confirm the lifting platform is not overloaded or binding, then check brake functionality. |
| E.OV2 | Over Voltage Error | <ul style="list-style-type: none"> The primary cause is when the platform is moving down. The load applied to the motor turns the motor into a generator sending electricity back to the Stagehand. The Stagehand has a built in Brake Resistor to prevent this. However, under high duty cycle at full load and full speed, this fault may occur. Fixes are decreasing load, speed, or duty cycle while running the machine. |

TECHNICAL SUPPORT

If you get stuck, we're here to help. The best way to get in touch with a tech expert is via email - even during normal business hours - because most days we are spread around the shop and may not be near the phone. There's someone in the office from 8:30a-5pm EST Monday - Friday and will return an email or phone call quickly. After hours (honestly when most tech support issues arise) we have a crack team monitoring email and voicemail who will respond quickly to help get you moving.

- Online: www.creativeconners.com
- Email: support@creativeconners.com
- Phone: 401-289-2942 x2

SPECIFICATIONS

Electrical Specifications

| Description | Value |
|-------------------|----------------------|
| Input Voltage | 230VAC, 60hz 3-phase |
| Max Input Current | 15.1 amps |

Physical Specifications

| Description | Value |
|--------------------------------|------------------------------------------------|
| Lifting Capacity | 1,000lbs Evenly Distributed, 500lbs Point Load |
| Max Lifting Speed | 14in/sec |
| Base Weight | 1250lbs |
| 6' Mast Tower Extension Weight | 350lbs |
| Max Travel | Mast height minus 8" |

Drawings

