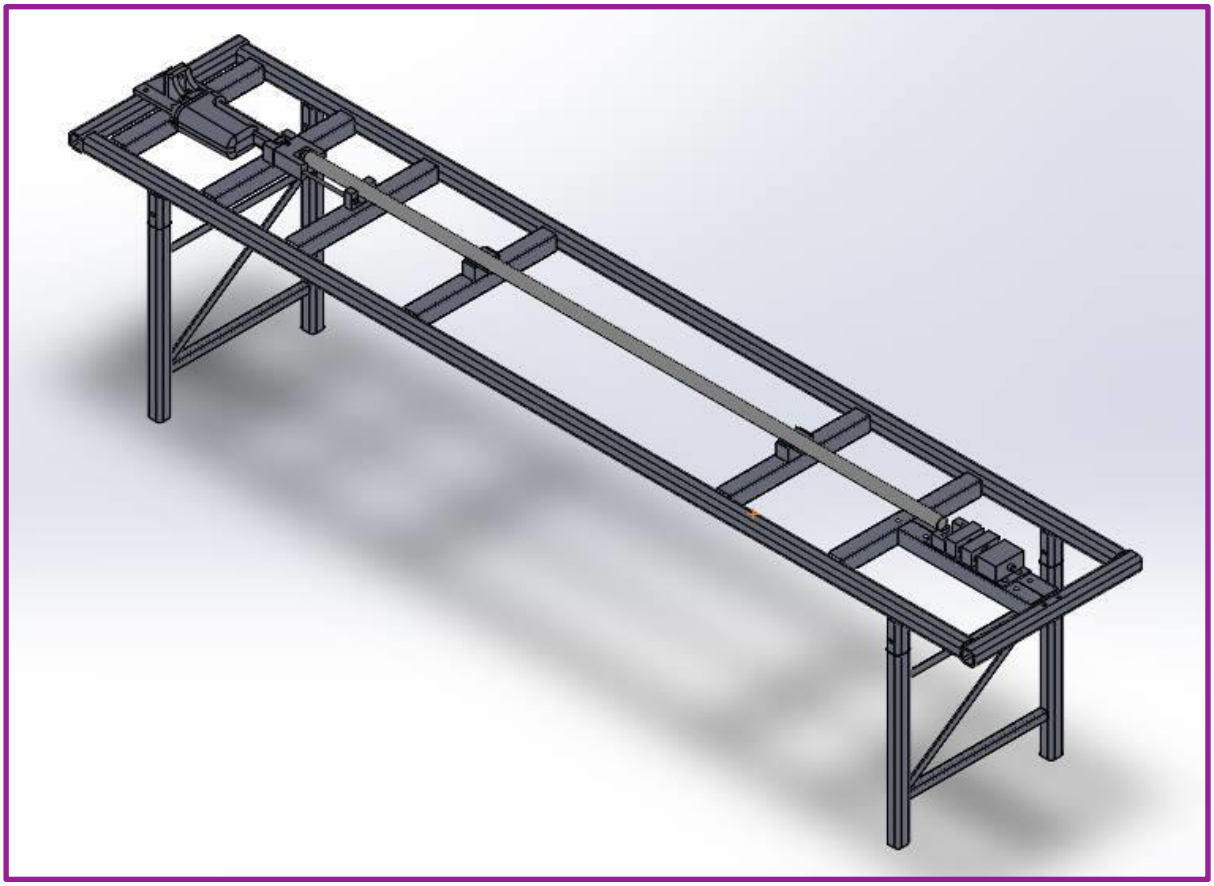
HealthCraft SuperPole Assembly Press

USER MANUAL



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Glossary

Actuator	A mechanism that supplies and transmits a measured amount of energy for the operation of another mechanism or system.
Automated	Refers to the mechanical process which eliminates the manual labour involved in assembling the SuperPole
DC	Direct Current providing constant voltage
Duty Cycle	The cycle of operation of a machine that operates intermittently, rather than continuously
PPE	Personal Protective Equipment
Threaded Bushing	A metal fastener element with a coiled interior that is inserted into the SuperPole
Threaded Insert	A metal bar with a coiled exterior that is inserted into the threaded bushing
Toggle Clamps	A push-action clamp used for securing the SuperPole in place
SuperPole	A grab bar that is installed between the floor and ceiling to provide support for those with mobility issues
VDC	Volts DC
V-blocks	Precision metalworking jigs, typically used to hold round metal rods or pipes.

Introduction

The objective of this manual is to explain to HealthCraft employees how to operate the SuperPole Assembly Press. The HealthCraft SuperPole Assembly Press is designed to accurately press a threaded bushing into the bottom of a pole using an electric linear actuator. The SuperPole Assembly Press ensures that the production of HealthCraft's trademarked SuperPole is precise and consistent.

The Product Description will provide a part-by-part description of the SuperPole Assembly Press. The Operator Guide will teach HealthCraft employees how to operate the SuperPole Assembly Press. The Safety Guide will present information that is necessary for the safe operation. The Reference Guide will provide a troubleshooting table, maintenance information, and a guide for ordering new parts and materials as they need replacing.

This manual will help untrained HealthCraft employees to operate the SuperPole Assembly Press, and act as a reference guide for future queries and troubleshooting.

For more information about **What is SuperPole Assembly Press**, see pg. 3
For more information about **History of the SuperPole**, see pg. 3
For more information about **How to Use this Manual,** see pg. 4
For more information about **Document Conventions**, see pg. 5

What is SuperPole Assembly Press?

The SuperPole Assembly Press is an automated assembly table designed to accurately press a threaded bushing into the bottom of a pole. It is powered by an electric linear actuator. The press is used to assemble HealthCraft's trademarked SuperPole, a commercial grab bar which assists people in their day-to-day lives.

The SuperPole Assembly Press consists of two main components: the principal mechanical table and the support table. The user interacts with the assembly press by placing the SuperPole in position and flipping a switch to activate the electric linear actuator, which will press the threaded bushing into the bottom of the SuperPole.

History of the SuperPole

The SuperPole Assembly Press is designed to provide employees of HealthCraft with an accurate way to insert a threaded bushing into the bottom of a pole. The SuperPole Assembly Press should allow HealthCraft employees to assemble up to 80 SuperPoles during a single day of work.

In the past, the bushing was manually placed on the ground on top of a metal plate that was covered with a piece of cardboard. A HealthCraft employee then drove a pole into the threaded bushing by hand, using sheer force, pressing the bushing into the bottom of the pole. This method relied on the presence, experience, and skills of an employee.

The process described above was very labour-intensive and increased manufacturing defects. The employee would have to rely on their hand-eye coordination and experience to gauge how much force was required to ensure alignment between the threaded bushing and the pole. As this method relied greatly on human skill, achieving a consistent standard of quality was difficult.

Manufacturing SuperPoles manually yielded a five percent rate of manufacturing defects. Most commonly, repeated off center blows while pressing the threaded bushing into the bottom of the pole caused deformities in the cross section of the pole. This type of deformity compromised the structural integrity of the SuperPole and led to issues during installation or during use by the end user. The process was also unsustainable as one HealthCraft employee was responsible for assembling all SuperPoles by hand.

Consistent quality and repeatability are of paramount importance to HealthCraft due to the critical nature of the product in the customer's hands. The automation of the previously manual process decreases manufacturing defects, decreases human error, and increases production. The SuperPole Assembly Press allows for a more consistent assembly of a threaded bushing into the bottom of the SuperPole.

How to Use this Manual

This manual contains four primary sections: the Product Description, the Operator Guide, the Safety Guide, and the Reference Guide. The Product Description section provides a visual parts breakdown and product description of the SuperPole Assembly Press. The Safety Guide section provides detailed safety tips, considerations, and precautions for HealthCraft employees while using the product. The Operator Guide provide training to employees with limited technical knowledge on how to operate the SuperPole Assembly Press. It explains how to place a pole and threaded bushing into the correct positions and activate the linear actuator to press the bushing into the bottom of the pole. The Reference Guide section provides information to skilled employees on how to perform daily maintenance routines, and a guide to replace parts as needed.

Section	Description
Product Description	Visual parts breakdown Explains the parts' functions and how they interact.
Safety Guide	Personal protective equipment Provides helpful Safety tips Provides information about First Aid
Operator Guide	Getting Started Explains how to operate the Assembly Press
Reference Guide	Maintenance routines Troubleshooting Information on ordering replacement parts

Document Conventions

You will see the following document conventions used in this manual to highlight notes, cautions, and warnings. Please carefully read all directions containing cautions and warnings before proceeding with operation of the HealthCraft SuperPole Assembly Press.

Name	Symbol	Purpose
Note		To provide additional information relevant to a step or procedure.
Tip		To provide a shortcut or alternative method to complete a step or procedure.
Caution		To provide information related to a step or procedure that may cause injury to HealthCraft employees or the product.

Warning		To provide information related to a step or procedure that may cause death or critical injury to HealthCraft employees.
Results Statement		To confirm that the procedure has been successfully completed.
Correct Action		To indicate best safety practices.
Incorrect Action		To indicate the practices you need to avoid.

Product Description

This section provides background information on HealthCraft, and contains a visual breakdown of the major components of SuperPole Assembly Press. The Product Description section intends to help users develop an understanding of how the individual parts of the SuperPole Assembly Press work together.

In this section, users will find information about the history of HealthCraft and the design information on the SuperPole Assembly Press.

For more information **About HealthCraft**, see pg. 6
For more information about **SuperPole Assembly Press**, see pg. 7

About HealthCraft

HealthCraft is an Ottawa-based company that designs and manufactures innovative support products that help people continue to live independently. HealthCraft was founded in 1993. HealthCraft's mission is to solve mobility issues and to help empower people.

SuperPole Assembly Press

The SuperPole Assembly Press consists of two main components: (1) the principal mechanical table, and (2) the support table. The principal mechanical table houses the electric linear actuator and user controls. The support table is designed to hold the SuperPole firmly and accurately in place.

The Principal Mechanical Table

The principal mechanical table is designed to house all the mechanical components required to assemble a SuperPole. It is constructed from 1 ¼ in. square steel tubing that has been welded together to form its frame. The principal mechanical table features an electric linear actuator, the user controls, safety mechanisms, and alignment pins used to attach to the support table during assembly (*See Figure 1*).

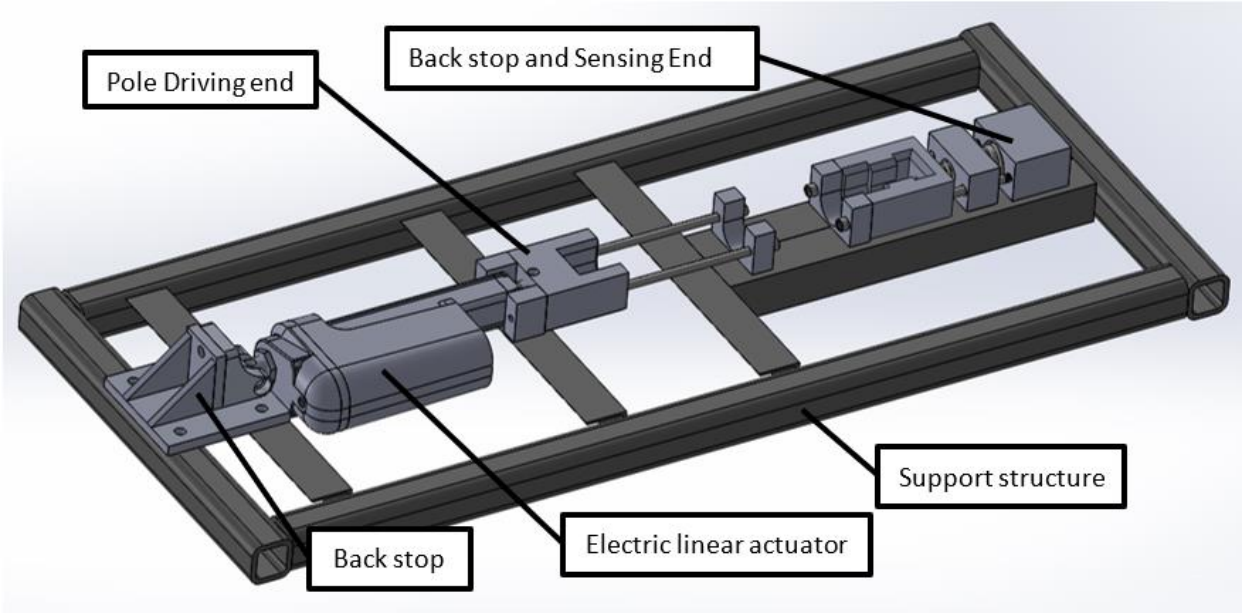

Figure 1: The Principle Mechanical Table

The table below provides a description of the main components of the Principal Mechanical Table.

Component	Description
Pole Driving End	The pole driving end supports and aligns the SuperPole and transfers force from the electric linear actuator to the SuperPole.
Back Stop and Sensing End	The back stop and sensing end align the threaded insert and resist the force of the electric linear actuator as a pole and a threaded bushing are pressed together. The back stop and sensing end will also detect if the force from the linear actuator is below a minimum value of 200 lbs.
Back Stop	The back stop resists the applied force of the electric linear actuator.
Electric Linear Actuator	The electric linear actuator has a pressing force of 2000 lbs. and runs on 12 VDC. It operates at a speed of 0.25 inches/sec and has a duty cycle of 20%.
Support Structure	The frame of the table, made of 1 ¼ in. square steel tubing.

The Support Table

The SuperPole support table is designed to hold a SuperPole firmly and accurately in place during assembly. It is constructed from 1 ¼ in. square steel tubing that has been welded together to form its frame. The support table features toggle clamps and V-blocks to firmly hold a SuperPole in place while the pressing operation is being carried out (*See Figure 2*).

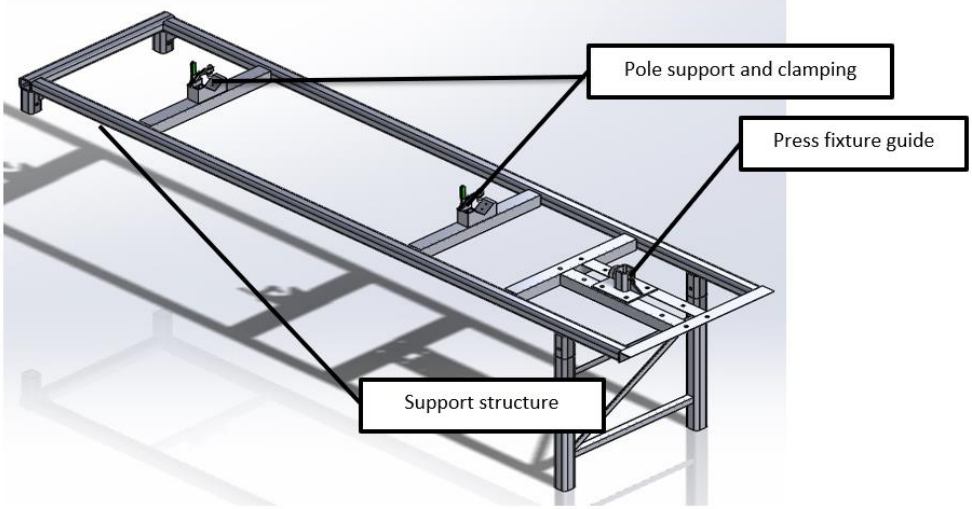

Figure 2: The Support Structure

The table below provides a description of the main components of the Support Table.

Component	Description
Pole Support and Clamping	The pole V-blocks are designed to accurately place the SuperPole on the support table. The toggle clamps ensure that the SuperPole is held down and does not move during the pressing operation.
Press Fixture Guide	The press fixture is a raised boss that fits into the open end of the SuperPole and resists any lateral pole movement. This ensures that the toggle clamps do not become overloaded during operation.
Support Structure	The frame of the table, made of 1 ¼ in. square steel tubing.

Operator Guide

The operator guide section explains how to operate the SuperPole Assembly Press. It will describe what you, as the operator, need to do before starting operation of the press, the step-by-step processes of operating the press, and the tasks required to conclude the operation.

For more information about **Getting Started**, see pg.10
For more information about **Using the Press**, see pg. 11
For more information about **Concluding the Operation**, see pg. 14

Getting Started

Before operating the SuperPole Assembly Press, you must ensure you have the proper safety equipment, that your materials are assembled, and that the threaded bushing and insert are attached to the SuperPole.

Having the Proper Safety Equipment

See *Safety Guide*.

Assembling Your Materials

To operate the SuperPole Assembly Press ensure you have:

- SuperPole
- Threaded bushing
- Threaded insert

Attaching the Threaded Bushing and Insert to the SuperPole

In order to operate the press, you will need to place the threaded bushing (with attached threaded insert) inside the rim of the SuperPole.

To Attach the Bushing and Insert to the SuperPole:

1. Twist the threaded insert into the threaded bushing until you feel resistance.

Figure 3: The threaded bushing (left) and threaded insert (right)

Do not force the threaded bushing into the SuperPole.

2. Place the outer edge of the threaded bushing (with attached threaded insert) inside the rim of the SuperPole.

Using the Press

Once you are ready to operate the unit, you must carry out a series of tasks to insert the threaded bushing into the end of a SuperPole - securing the SuperPole to the table, turning on the press, and operating the press.

Securing the SuperPole to the Table

You must properly secure the SuperPole to the Support Table before turning on the press.

To Secure the SuperPole to the Support Table:

1. Take one SuperPole and position it horizontally at hip height.

2. Place it on the two V-blocks on the table.

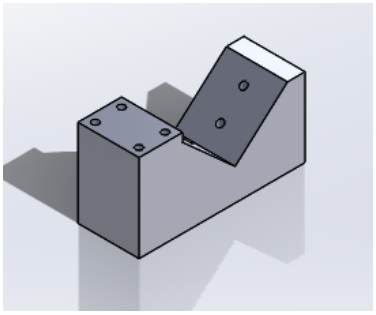

Figure 4: V-block

3. Place the end of the SuperPole without the threaded bushing against the .

Ensure the threaded insert is lined up properly with the circular stopper on the back stop and sensing end.

4. Secure the SuperPole with the aid of the two toggle clamps beside the V-blocks.

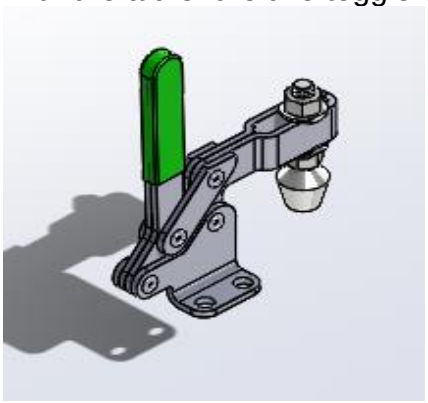

Figure 5: The Toggle Clamps

5. Lower the safety cover over the SuperPole.

The SuperPole is flat on the V-blocks, secured to the table with the toggle clamps *(See Figure 6)*

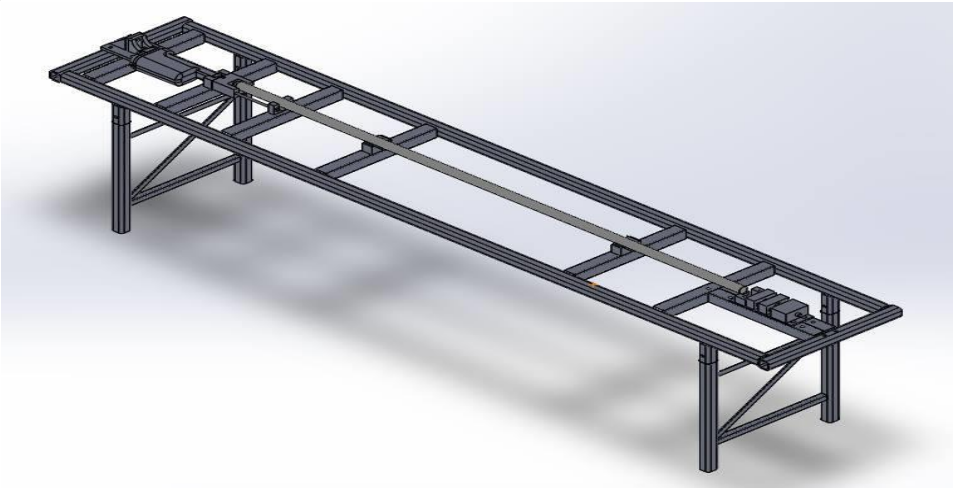

Figure 6: SuperPole secured to the press

Turning on the Press

You must turn on the press before you operate it.

To Turn on the Press:

1. Plug the power source of the SuperPole Assembly Press into an electrical outlet.
2. Flip the on/off switch from Off to **On**.

Figure 7: The On/Off switch

Operating the Press

Once the press is turned on, you are ready to operate it and press the threaded bushing into the SuperPole.

You must wear PPE when operating the press. Refer to the PPE section.

To Operate the Press:

1. Toggle the operating switch so that the pole driving end begins pushing the SuperPole toward the back stop and sensing end.

Figure 8: The Operating switch

2. Hold the operating switch until the pressure of the back stop has fully pressed the threaded bushing the required depth into the SuperPole.

3. Toggle the operating switch in the other direction to reverse the SuperPole with threaded bushing (and attached threaded insert) to its original position.

The threaded bushing is now inserted properly in the SuperPole.

Concluding the Operation

Once the SuperPole has been assembled, you must turn off the press and allow for downtime.

Turning Off the Press

After operating the SuperPole Assembly Press, you must turn it off.

To turn off the Press:

1. Flip the on/off switch from On to **Off**.

2. Open the safety cover.

3. Release the fully-assembled SuperPole, with the installed threaded insert, from the press. *(See Figure 9)*

The SuperPole is now fully assembled.

Figure 9: Fully-assembled SuperPole with threaded bushing/insert

Allowing for Downtime

The SuperPole Assembly Press has a duty cycle of 20 percent, meaning that for every 20 minutes it is in operation, it must have 80 minutes to cool down before being operated again.

Safety Guide

The SuperPole Assembly Press is safe to use; however, the press has multiple electrical components that can be potentially hazardous. This safety guide describes and explains the safe way of using the SuperPole Assembly Press. The first part of the guide provides the list of suggested work attire. You must familiarize yourself with this section before beginning your training. The second part of the guide outlines the basic operational safety tips. Refer to this section both during and after your training. The third part of the guide provides instructions on First Aid treatment of the most common workplace injuries. Refer to this section if you've sustained a workplace injury. In case of a serious injury, always call 911. All HealthCraft employees must follow the rules outlined in this guide, review them often, and use common sense in carrying out the assigned duties.

For more information about workplace health and safety, please visit the Ontario workplace health and safety website.

For more information about **Personal Protective Equipment**, see pg. 16
For more information about **Operational Safety Tips**, see pg. 18
For more information about **First Aid**, see pg. 20

Personal Protective Equipment

Before you begin using the SuperPole Assembly Press, make sure that you are wearing appropriate personal protective equipment (PPE). This section lists the required PPE as well their accompanying rules. Wearing PPE is mandatory, and every operator must comply with the rules and requirements listed below.

Basic PPE Requirements

The following are the basic uniform requirements for working with the SuperPole Assembly Press:

- Protective Safety Footwear
- Eye Protection
- Hand Protection
- Long pants and shirts with sleeves extending over the shoulders

Rules for PPE

The following are the rules and regulation for operator's usage of personal protective equipment:

Eye Protection

The operator **must** always wear safety glasses while operating the SuperPole Assembly Press. Below you can find the list of recommended eye protection equipment:

- Safety glasses
- Safety goggles

Do not wear regular glasses/sunglasses while operating the assembly press.


Not complying with the eye protection recommendations can lead to a serious injury

Clothing

The operator **must** always wear appropriate clothing and shoes while operating the SuperPole Assembly Press. Below you can find the list of recommended work clothing:

- Work boots
- Long-sleeve shirt

Do not wear sleeveless shirts, tank tops, loose hair, jewellery, or highly flammable and static producing materials.


Not complying with the clothing recommendations can lead to a serious injury.

Gloves

The operator **must** always wear appropriate hand protection while operating the SuperPole Assembly Press. Below you can find the list of recommended gloves:

- Pigskin leather gloves
- Cotton gloves
- Goatskin leather gloves

Do not wear thin latex gloves while operating the SuperPole Assembly Press.

 Not complying with the hand protection recommendations can lead to a serious injury.

Operational Safety Tips

Operators must always exercise caution while using the SuperPole Assembly Press. This section outlines the best practices and common mistakes when operating the SuperPole Assembly Press. Always refer to your supervisor if you have any further safety-related questions about operating the assembly press.

Avoiding Common Mistakes

In this section, you will find what **NOT** to do while operating the SuperPole Assembly Press:

Do not operate the SuperPole Assembly Press if you have not been sufficiently trained.

Do not operate the SuperPole Assembly Press on the uneven surface.

Do not open the safety cover until the pole has been completely inserted into the bushing.

Do not place your hand on the electric linear actuator during the operation.

Do not continue the operation if the safety alert has been triggered (orange light).

Do not continue the operation if the diameter of the bushing does not match the diameter of the SuperPole Assembly Press

- Using a bushing of the wrong diameter increases the possibility of the bushing becoming a projectile.

Following the Best Practices

In this section, you will find what to do while operating the SuperPole Assembly Press:

Always wear protective clothing while operating the SuperPole Assembly Press.

Always inspect the SuperPole Assembly Press for compromised wiring and/or debris at the beginning of each interval of operation

Always ask your supervisor for clarification if you are unsure about procedures.

Always make sure that the SuperPole Assembly Press is well-maintained.

Always close the safety cover using the push button before beginning the operation.

Always be cautious of the power cord connection.

When using the power cord, make sure that you:

- Use the correct power cord
- Do not touch the power cord with a wet hand
- Ensure that the connecting portion of the power cord is clean (with no dust) before using. Use a soft, dry cloth to clean the power plug if necessary
- Avoid using a loose, unsound outlet
- Insert the power plug into a power outlet firmly

First Aid

The SuperPole Assembly Press is both safe and easy to use; however, the press has multiple electrical components that can be potentially hazardous. You must be ready to treat a workplace injury, should one occur. This section describes the most common workplace injuries and provides instructions on how to treat them.

In case of a serious injury, always call **911**.

First Aid Instruction

The most common workplace injuries are: flesh wounds, flesh burns, and eye injuries. In case of an injury, please follow the provided instructions below.

Wounds

If you sustain lacerations, cuts, abrasions, or punctures, follow these instructions:

1. Rinse out the wound using soap and water.
2. Cover the wound with a sanitary bandage or cloth.

   If there are no sanitary bandages, use a clean piece of clothing.

3. Press directly on the wound.
4. Keep pressure on the wound until bleeding stops.

Burns

If you sustain a burn, follow these instructions:

1. Rinse the burned area in cold water for 10-15 minutes. Do not scrub.
2. Cover the burnt area with a sterile gauze or a clean cloth.

Eye Injury

If you sustain an eye injury, follow these instructions:

Do not rub your eyes.

1. Pull the upper lid down and blink repeatedly.
2. If particle is still there, rinse with eyewash.
3. If rinsing doesn't help, close eye, bandage it lightly.

Reference Guide

The following sections provides additional information about what to do to keep the Assembly Press functioning and clean. It also provides tips about how to fix problems that may occur while operating the SuperPole assembly press and how to fix any issues that arise.

For more information about **Maintenance**, see pg. 22
For more information about **Troubleshooting**, see pg. 23
For more information about **Replacing Parts**, see pg. 24

Maintenance

This section describes the maintenance routines for the SuperPole Assembly Press. It describes how often you will have to inspect the assembly press. It also provides information on what to do if issues arise due to insufficient maintenance.

How to Maintain the SuperPole Assembly Press

Keep debris off the SuperPole Assembly Press.

There is no cooling fan for the electric linear actuator.

Remove any dust that is on the actuator daily to ensure there is nothing insulating the system and prevents it from overheating.

Allow the actuator to rest for four times longer than it has been running.

The actuator will overheat if it has been running for too long and not been turned off.

How often do you have to inspect the SuperPole Assembly Press?

Inspect the safety mechanism for malfunctions daily, and before using the assembly press. If an issue arises, do not use the assembly press, call a technician to service the press.

Troubleshooting

This section describes problems that may occur during the operation of the assembly press and possible reasons for these problems. It also provides information and tips on how to fix these issues.

Why is the electric linear actuator not responding?

If the electric linear actuator is not responding, ensure that the system is plugged in.

If the electric linear actuator is plugged in and it continues to be unresponsive, it is the electrical system. Call a technician to fix this issue. Do not attempt to fix the electrical system yourself.

Why has the SuperPole Assembly Press stopped working?

Consult the table below for an outline of reasons why the SuperPole Assembly Press has stopped working as well as ways to fix the issue.

Reason	Solution
The assembly press will stop if the force required to press it together exceeds 1000 lbs. per square inch and the motor cannot go forward.	Replace the pole and threaded bushing.
The assembly press will stop if the parts are not aligned properly.	Ensure that the threaded insert is lined up with the circular stopper on the back stop.
The assembly press will stop if the pole is cracked.	Replace the pole with a new pole and start the process again.
The assembly press will stop if the threaded bushing is too large to insert into the pole.	Ensure the bushing is the proper size and restart the process.
The assembly press will stop if the pole has not been cut properly.	Ensure the inside of the pole has an even edge around the opening so the bushing can be inserted without friction.
The assembly press will stop if the operating switch has been interrupted.	Ensure the switch operating is held down while operating the press.

What should you do if the actuator overheats?

If the electric linear actuator overheats it cannot be fixed and a replacement must be purchased. Replacement actuators may be purchased at Princess Auto for $450.

What if the safety cover is closed, but nothing happens?

If the safety cover is closed but nothing happens, the operating switch could be defective. Call and consult a technician to change the switch.

The operating switch could also be defective. Ensure the switch is not mishandled during operation or damaged. Handle the switch with care and do not force it in either direction.

There could also be an electrical issue between the switches and the motors. Call a technician to resolve any electrical issues.

Replacing Parts

This section describes where to buy replacement parts. It also includes the average retail price for each part.

Where can you find replacement parts?

The electric linear actuator can be found at Princess Auto and retails for $450. The actuator is easily worn out. See Maintenance for information on keeping the actuator running.

The V-blocks should last up to 20 years.

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