

Hy-Brid Lifts™
by Custom Equipment



OPERATION AND SAFETY MANUAL

Hy-Brid Lifts
Model
HB-P830CE
Series 2

Push-Around
Aerial Work Platform

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Original instructions are written in English

Foreword

The purpose of this Operations and Safety Manual is to provide users with the instructions and operating procedures essential to properly and safely operate the Custom Equipment Hy-Brid Lift for its intended purpose, to position personnel and their necessary tools and materials.


DANGER
THE OPERATION AND SAFETY MANUAL MUST BE READ AND UNDERSTOOD PRIOR TO OPERATING THE MACHINE.

THE USER/OPERATOR SHOULD NOT ACCEPT OPERATING RESPONSIBILITY UNTIL THE MANUAL HAS BEEN READ AND UNDERSTOOD AS WELL AS HAVING OPERATED THE LIFT UNDER SUPERVISION OF AN EXPERIENCED AND QUALIFIED OPERATOR.

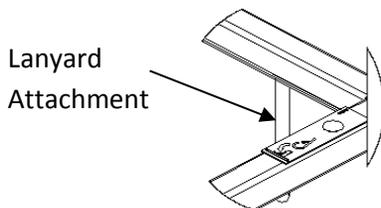
BECAUSE THE MANUFACTURER HAS NO DIRECT CONTROL OVER MACHINE APPLICATION AND OPERATION, PROPER SAFETY PRACTICES ARE THE RESPONSIBILITY OF THE USER AND ALL OPERATING PERSONNEL.


WARNING
ANY MODIFICATION ON THIS MACHINE WITHOUT THE EXPRESS WRITTEN CONSENT OF THE MANUFACTURER IS PROHIBITED.

Fall Protection Notice

The guardrail system around the perimeter of the platform is the **fall protection system** for push-around elevating work platforms per the EN 280:2001 Standard. It is **prohibited** to use an Aerial Work Platform manufactured by Custom Equipment, Inc. with any portion, or all, of the guardrails **removed**.

Lanyard anchorage points on this type of equipment are not required to conform to the applicable standard. However, if anchorage points for lanyard attachments are required by site authorities, or other regulations, the anchorage points on all equipment manufactured by Custom Equipment, Inc. are recommended to be used for **work positioning restraints** of personnel only. Lanyard lengths are to be determined by operator/owner to restrict the operator to the confines within the guardrail system.




WARNING
USE OF FALL ARREST SYSTEMS ATTACHED TO ANCHORAGE POINTS ON EQUIPMENT MAY CAUSE MACHINE TO TIP, RESULTING IN SERIOUS INJURY OR DEATH.

If there is a question on application and/or operation, contact:

Custom Equipment, Inc.
2647 Hwy 175
Richfield, WI 53076
USA
Phone: 262-644-1300
Fax: 262-644-1320
www.hybridlifts.com

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Revision Table

Revision A (12/17/12): Initial Release

Revision B (3/8/13): Revised Upper Control Appearance

Product Description

Purpose

Custom Equipment's Hy-Brid Scissor Lift is an aerial work platform designed to be safe and reliable. The purpose of the machine is to elevate personnel, along with their necessary tools and materials. The machine is intended for indoor use (no wind load). Manufacturer approval is required for any use other than the intended use.

EC Declaration of Conformity

We hereby declare that the above mentioned machine has been assessed, tested and approved in accordance with the requirements of the Machinery Directive 2006/42/EEC using the document EC Community Legislation on Machinery and taking guidance from EN280:2001 + A2:2009.

An EC type-examination was tested internally by the manufacturer, in accordance with EN280:2001+A2:2009 and 2006/42/EEC Annex VIII, as listed in Article 12 and Annex IV, item 17 of directive 2006/42/EEC, which excludes devices with a platform height of less than three meters.

Model Numbers: HB-P830CE, Series 2

Machine Type: Mobile Elevating Work Platform

Applicable Harmonised Standard: EN280:2001+A2:2009

Manufacturer:

Custom Equipment, Inc.

2647 Hwy 175

Richfield, WI 53076

USA

Phone: 262-644-1300/Fax: 262-644-1320

www.hybridlifts.com

Machine Specifications

(Subject to change)

	HB-P830CE	
Working Height (maximum)	14 ft.	4.27m
Platform Height (maximum)	8 ft.	2.44 m
Stowed Height	67.71 in.	1.72 m
Ground Clearance	2 in.	0.05 m
Overall Width	30 in	0.76 m
Overall Length	43 in.	1.09 m
Platform	25 in. x 38.25 in.	0.65 m x 0.97 m
Guard Rail Height	43.83 in.	1.1 m
Toe Board Height	6 in.	0.15 m
Platform Entrance	25.76 in.	0.65 m
Step Height	12.58 in.	0.32 m
Wheel Base	35.07 in.	0.89 m
Wheel Track	25.5 in.	0.65 m
Turning Radius (Inside)	Zero	Zero
Tire Size (Solid, Non-Marking)-Front	8 in.	20.3 cm
Tire Size (Solid, Non-Marking)-Rear	8 in.	20.3 cm
Lift Capacity (Evenly Distributed):	500 lbs./1 Person	226.8 kg/1 Person
Horizontal/Manual Force	45 lb.	200 N
Machine Weight (Unloaded) (Approx.)	690 lb.	313 kg
Minimum Wheel Load-Contact Pressure	21.56 psi	148.67 kPa = 1.52 kg/cm ²
Maximum Wheel Load-Contact Pressure	37.18 psi	256.4 kPa = 2.61 kg/cm ²
Minimum Machine Loading-Floor Pressure	77 PSF	3.69 kPa = 5.42 kg/cm ²
Maximum Machine Loading-Floor Pressure	133 PSF	6.36 kPa = 9.34 kg/cm ²
ENVIRONMENTAL LIMITATIONS		
Wind	No Windy Conditions/Indoor Use Only	
Rated Slope	Level Surface	
Temperature	-4° F-104° F	-20° C-40° C
Vibration	8.2 ft/s ² max	2.5 m/s ² max
Sound	86 dB Normal Use	86 dB Normal Use
Lift/Lower Speed	10/10 sec	10/10 sec
Hydraulic Pressure (max)	1300 psi	8963 kPa
Hydraulic Fluid Capacity	3 quarts	2.84 L
Power System-Voltage	12V DC	12V DC
Battery-Deep Cycle Marine	12V, Group 27	12V, Group 27

Safety

Safety Symbols

Warnings and instructions that have a direct impact on safety are identified with the following signals:

 DANGER FAILURE TO FOLLOW THIS WARNING WILL CAUSE DEATH OR PERSONAL INJURY.	"DANGER" indicates an imminently hazardous situation, which, if not avoided, <i>will</i> result in death or serious injury.
 WARNING FAILURE TO FOLLOW THIS WARNING MAY CAUSE DEATH OR PERSONAL INJURY.	"WARNING" indicates a potentially hazardous situation, which, if not avoided, <i>could</i> result in death or serious injury
 CAUTION FAILURE TO FOLLOW THIS WARNING MAY CAUSE INJURY OR DAMAGE EQUIPMENT	"CAUTION" indicates a potentially hazardous situation which, if not avoided, <i>could</i> result in minor or moderate injury or damage to equipment

General Rules and Precautions

Custom Equipment, Inc. designed the Hy-Brid Lift push-around scissor lift to be safe and reliable. It is intended for elevating personnel, along with their necessary tools and materials to overhead work locations. Vibration does not create significant hazards on this machine.

An operator of any type of work platform is subject to certain hazards that cannot be protected by mechanical means. It is therefore essential that operators be competent, careful, physically and mentally fit, and thoroughly trained in safe operation of this machine. Although Custom Equipment, Inc. conforms to specified EN: 280 requirements, it is the responsibility of the owner to instruct operators with the safety requirements made not only by Custom Equipment, Inc., but by the various safety boards in your area, as well as additional requirements set forth by EN: 280 If you come across a situation that you think might be unsafe, stop the platform and request further information from qualified sources before proceeding.

 WARNING NEVER REACH BETWEEN SCISSORS LINKS OR PROP UP PLATFORM

 CAUTION WHEELS EXTENDING BEYOND THE SIDES OF THE BASE MAY OCCUR IN TIGHT TURNING SITUATIONS
--

Safety Features & Emergency Controls

Safety Features

- Puncture-proof Wheels.
- Guardrails - 1.1 m height with 15 cm kick plates.
- Non-slip Deck.
- Entrance Gate.
- Automatic Brake when Elevated.
- Free Descent Protection. A pressure compensated flow control valve is installed in the hydraulic circuit to prevent the platform from descending in case of a ruptured hydraulic hose. The platform is hydraulically locked with a check valve and has controlled descent when valve activates.
- Decals. Danger, Caution, and Warning decals are displayed at various locations on this unit.
- Key Switch Security. A key switch is required to prevent unauthorized use.

Safety Indicators & Interlocks

Load Sensing

An audible alarm sounds, a light flashes, and movement is inhibited when the load exceeds the rated load and elevating is attempted from the stowed position. Elevating will begin, and then stop. Remove the load and return to the stowed position before continuing operation.

Armguard

When lowering the platform, the platform will stop when the ends of the scissors are 50mm apart for 3 seconds. Release the enable button. Look around all sides of the scissors to check for persons at risk. Then continue lowering the platform. If elevating platform less than 50mm, the lift will not descend due to the armguard feature. Elevate the platform higher before lowering, or use the manual override in case of emergency.

Pausing more than 20 seconds before re-activating the descent signal will cause the system to time out. The system will again stop for 3 seconds and wait for the signal to be re-activated before continuing.

Descent/Motion Alarm

An audible alarm sounds when the machine is lowering.

Safety Controls

Descent--Manual Override

For manually lowering the scissors, a manual down valve on the cylinder is provided. To lower the scissors, pull the cable located near the front of the machine.

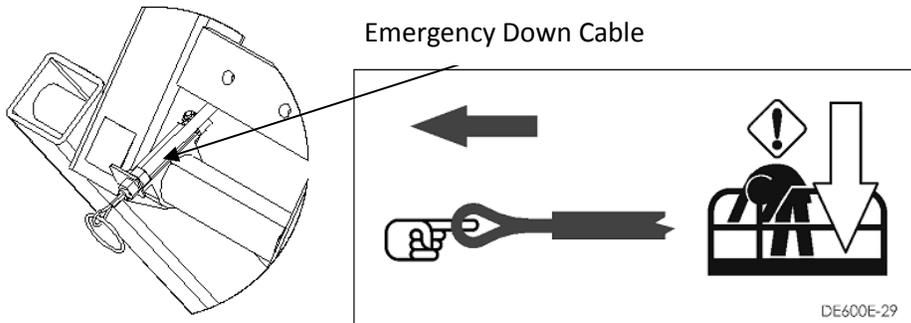


Figure 1: Emergency Lowering Valve



WARNING

IF PLATFORM SHOULD FAIL TO LOWER, DO NOT ATTEMPT TO CLIMB DOWN THE BEAM ASSEMBLY. SERIOUS INJURY MAY RESULT. HAVE AN EXPERIENCED OPERATOR USE THE EMERGENCY LOWERING PROCEDURE TO SAFELY LOWER THE PLATFORM.

Emergency Stop

This lift is equipped with two emergency stop switches, one at the platform control and one at the base control, that when activated, will render the unit inoperable until reset. To reset, pull the button out.



WARNING

PUSHING THE EMERGENCY STOP BUTTON WILL STOP MOVEMENT IMMEDIATELY. THIS MAY CAUSE UNEXPECTED PLATFORM MOVEMENT AS THE MACHINE COMES TO A SUDDEN STOP. BRACE YOURSELF AND SECURE OBJECTS ON THE PLATFORM DURING OPERATION OF THE MACHINE.

Maintenance Lock

The maintenance chock must be placed into position whenever the machine is being serviced in a partially raised position. Serious injury and/or death could result if maintenance lock is not used properly.

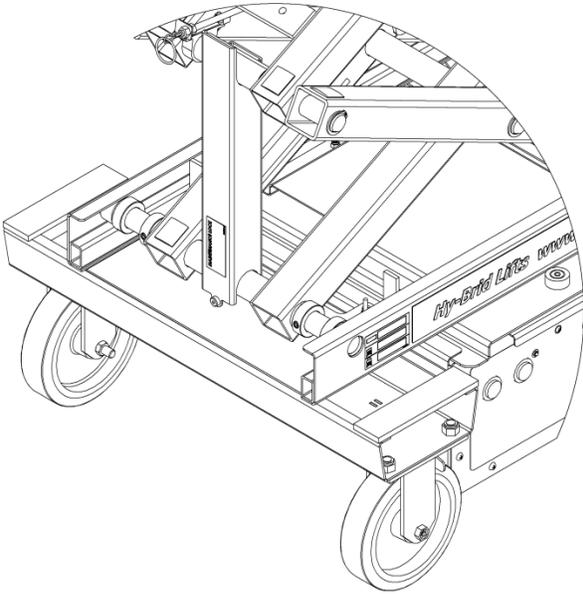


Figure 2: Maintenance Lock Use

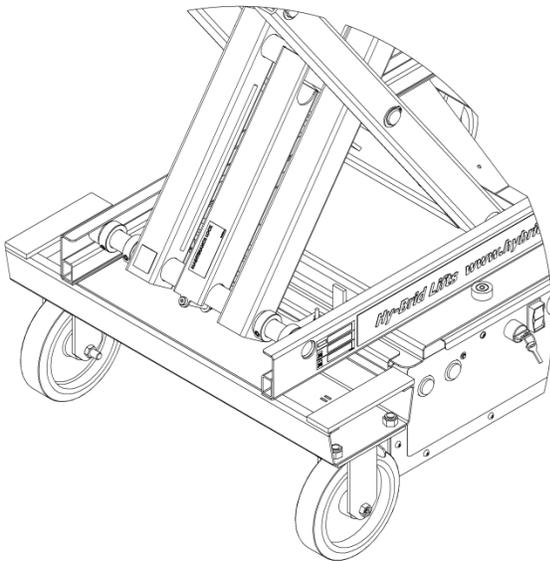
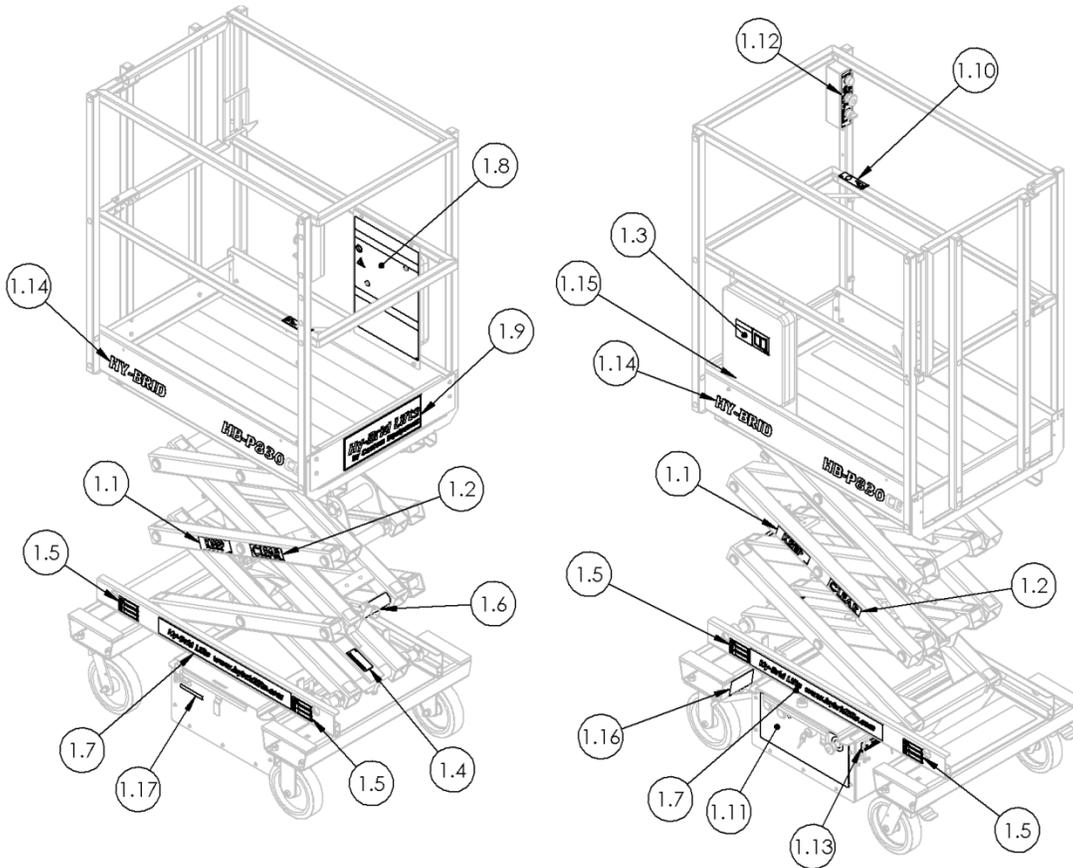


Figure 3: Maintenance Lock Storage

Safety and Control Decal Locations



ITEM #	PART #	DECAL MEANING OR DESIGNATION	QTY.
1.1	DE600-16C	KEEP CLEAR DECAL (KEEP)	2
1.2	DE600-16D	KEEP CLEAR DECAL (CLEAR)	2
1.3	DE600E-10	IMPROPER USE HAZARD FAILURE TO READ, UNDERSTAND AND OBEY THE ENCLOSED SAFETY MAY RESULT IN DEATH OR SERIOUS INJURY.	1
1.4	DE600E-14	MAINTENANCE LOCK PIN DECAL--DANGER DO NOT ENTER THE SPACE BENEATH THE WORK PLATFORM OR SCISSORS STRUCTURE DURING MAINTENANCE UNLESS MAINTENANCE LOCK IS IN PLACE.	1
1.5	DE600E-24E	MAXIMUM WHEEL LOAD	4
1.6	DE600E-29	FOR EMERGENCY LOWERING, PULL CABLE	1
1.7	DE652	HY-BRID LIFTS DECAL	2
1.8	DE654	UPPER DECAL-DANGERS & WARNINGS	1
1.9	DE601	HY-BRID LOGO	1
1.10	DE613	LANYARD ATTACHMENT POINT	1
1.11	DE656	LOWER CONTROLS & WARNINGS	1
1.12	DE662	UPPER CONTROLS	1
1.13	DE629	CHARGER CORD INPUT	1
1.14	DE603-3 & DE603E	MODEL NUMBER	2
1.15	NO PT#	SMALL SERIAL NUMBER REFERENCE	1
1.16	NO PT#	SERIAL NUMBER	1
1.17	DE636	MASTER POWER SWITCH	1

Safety Guidelines

Only qualified operators may operate this unit.

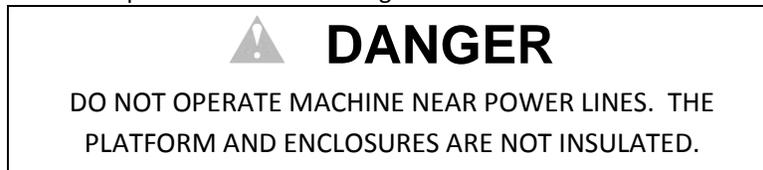
- All operators must read and understand the Operation and Safety Manual. They must understand all decals and warning labels on unit.
- Do not work on platform if your physical condition is such that you feel dizzy or unsteady in any way.
- Do not neglect/misuse machine. Report any misuse of equipment to proper personnel.
- Prevent unauthorized use; when unit is not in use, remove key.
- It is recommended all personnel on unit wear approved personal protective equipment (PPE), i.e. head gear.

Use machine only for purposes for which it was intended.

- Lift should never be used as a crane.
- Do not exceed the load capabilities of the platform.
- Distribute load evenly over platform floor area.
- Never use unit as electrical grounds for arc welding.
- Do not override any hydraulic, mechanical, or electrical safety devices.
-

Check job site for unsafe working conditions.

- Watch out for others. Keep others clear of operating platform. Never allow others to pass under a raised platform or position the platform over someone.
- Avoid contact with fixed (buildings, etc.) or moving (vehicles, cranes, etc.) objects. Check work area for overhead obstructions or possible hazards.
- Follow any applicable national traffic regulations.
- Use indoors only. Lift is not designed for windy conditions or electrical storms.
- Unit must be on hard level surface before elevating. Do not operate on incline or uneven surface.
- You must maintain a clearance between any part of the machine, or its load, and any electrical line or apparatus. Follow local power line clearance regulations.



Equipment is only as safe as the operator.

- Do not use ladders or scaffolding on the platform to obtain greater height.
- Do not enter or exit platform while machine is in motion.
- Never mount or dismount a raised platform.
- Make sure entry gate is secured before operating machine from the platform.
- Never belt or tie off to an adjacent structure.
- Secure tools and materials.
- Personnel must maintain a firm footing on the platform floor and work only within the platform area.

Before operation, ensure that the machine is properly serviced.

- Do not use machine if it is not working properly.
- Make sure platform rails and pins are secured.
- Operator shall use the maintenance lock when performing all types of maintenance procedures.
- Do not smoke while charging the battery.

Transport, Handling, and Storage

Preliminary Unpacking Instructions and Dealer Inspection

Maintenance locks must be engaged prior to inspecting or servicing the unit when the platform is extended. Inspect machine for any possible damage during shipment; perform a pre-delivery inspection. See checklist on the Maintenance Manual. Reset emergency stop switches, if necessary.

Storage

After periods of storage, exposure to extremes of ambient conditions-heat, cold, moisture, dust etc., inspect the machine. Refer to the Pre-Delivery/ Frequent Inspection Checklist in the Maintenance Manual.

Preparation for Transport

Lower the work platform to the down position. Turn key switch to off position. For safety and controlled handling, it is not recommended to move the unit on a slope greater than 5°. Check entire machine for loose or unsecured items. Remove any loose items from machine. Apply manual brake lock on rear wheels.

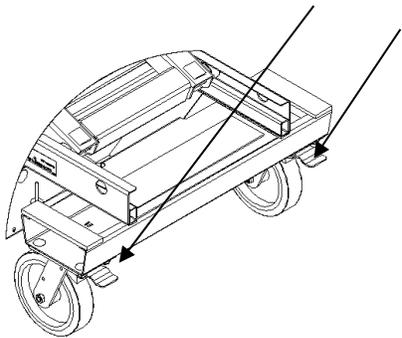


Figure 4: Rear Brakes

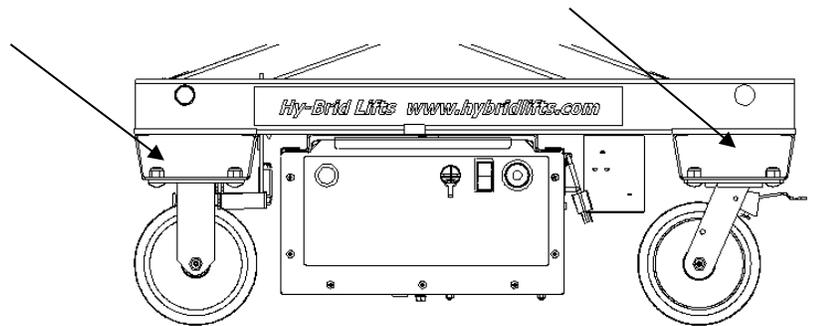


Figure 5: Fork Location

A forklift may be used from the side, through the pockets as shown.

Tie down points are provided in the front and rear of the machine for securing the machine on a trailer or truck bed for transport between places of use. They may also be used as lift points.

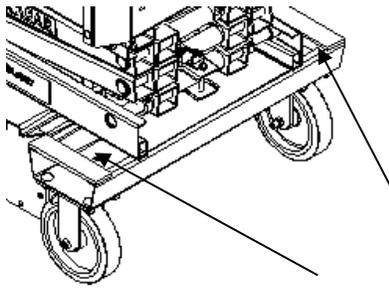


Figure 6: Tie Down Point

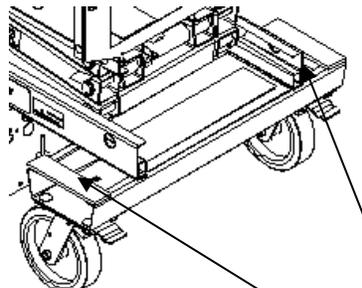


Figure 7: Tie Down Point

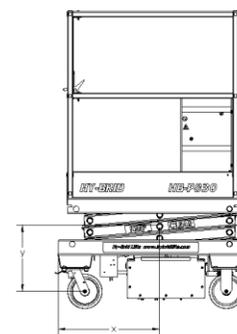


Figure 8: Center of Mass

Center of Mass

HB-P830CE: $x=37.6$ cm; $y=48.2$ cm

Operation

Pre-start Inspection

Before use each day or at the beginning of each shift, the machine shall be given a visual inspection and functional test. Repairs (if any) must be made prior to operating the machine, as it is critical to ensure safe operation of the machine. A checklist for pre-start inspection can be found in the Daily Maintenance section of this manual.

Controls

Upper & Lower Controls Locations

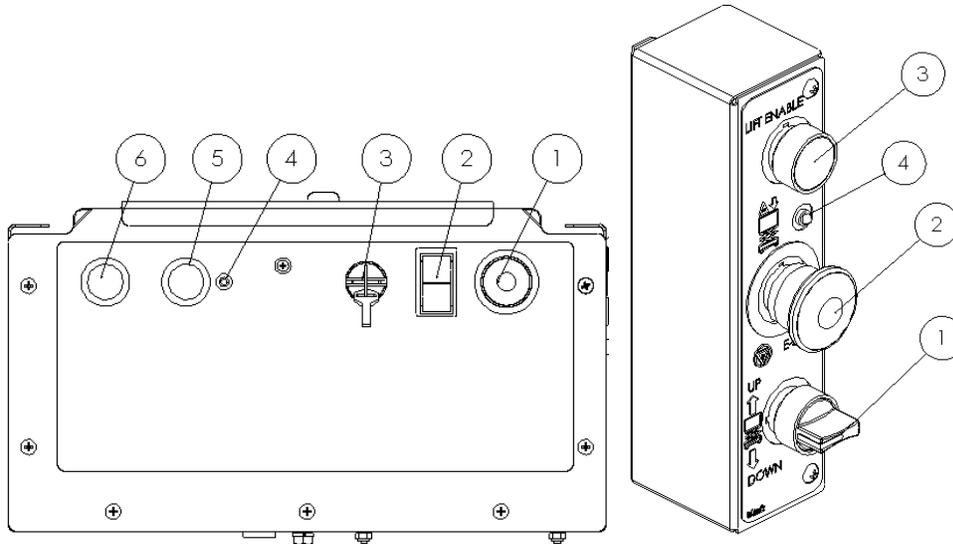


Figure 9: Base and Platform Controls

Base Controls	
Item	Control/Indicator
1	Emergency Stop (Operation described in the Safety Controls section of this manual)
2	Up/Down Rocker Switch (Operation described as follows)
3	Key Switch (Operation described as follows)
4	Overload LED (Flashes when unit is overloaded)
5	Beeper Alarm (Alarm sounds for overload)
6	Beeper Alarm (Alarm sounds for descent, motion)

Platform Controls	
Item	Control/Indicator
1	Up/Down Rotary Switch (Operation described as follows)
2	Emergency Stop (Operation described in the Safety Controls section of this manual)
3	Lift Enable Button (Operation described as follows)
4	Overload LED (Flashes when unit is overloaded)

Startup/Shut Down

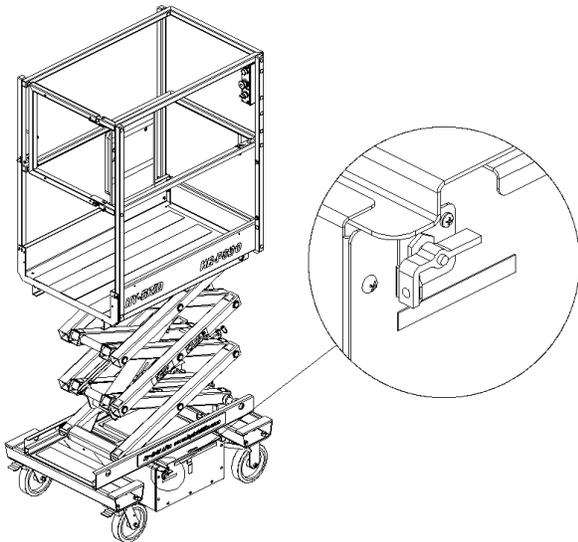


Figure 10: Master Power Switch

 **DANGER**

THE OPERATOR MUST BE AWARE OF THE ENVIRONMENT. DO NOT RAISE THE PLATFORM IF THE MACHINE IS NOT ON A FIRM, LEVEL SURFACE.

- Check that the work area is safe.
- It is not recommended to maneuver the unit on a slope greater than 5°.
- Check that master power switch is in "ON" position.
- Ensure that the key in the lower control panel is in the "ON" position for the chassis or platform control.
- Machine must be on a hard, level, surface before operation. Check that bubble level is centered.
- Engage the manual brakes on the rear casters before elevating the platform.

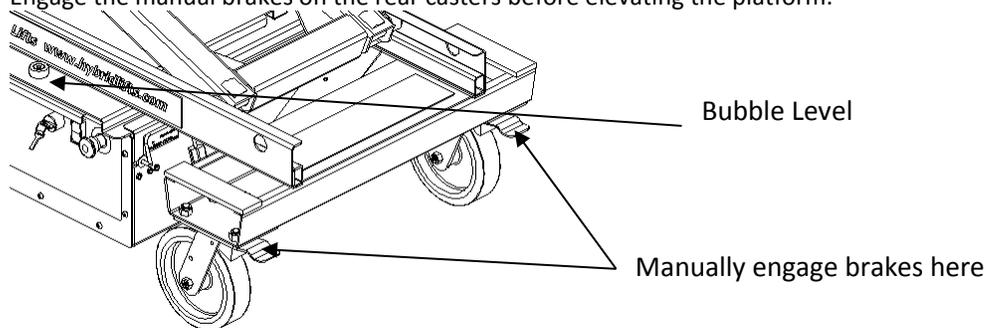


Figure 11: Rear Brakes

- Enter the work platform in the stowed position using the constant three point contact method.
- Follow all general rules and precautions stated in this manual
- When finished with the machine, place the platform in the stowed position.
- Carefully exit the platform using the constant three point contact method. NEVER JUMP OFF PLATFORM.
- Park the machine on a level surface.
- Remove key from lower control panel to prevent unauthorized use.

Elevating and Lowering

Using Upper Platform Controls

Make sure the platform controls are selected with the selector switch at the base controls. To raise or lower the platform, press the Elevate/Lower Enable Button. While holding down the Enable Button, rotate and hold the Elevate/Lower switch until the platform is in the desired position.

When lowering the platform, the platform will stop when the ends of the scissors are 50mm apart for 3 seconds. Release the joystick enable. Look around all sides of the scissors to check for persons at risk. Then continue lowering the platform. (See the Safety Features section of this manual).

Using Lower Base Controls

Make sure the base controls are selected with the selector switch at the base controls. Press the Enable Button at the same time as the Elevate/Lower Switch to raise or lower the platform. Pressing the top of the switch raises the platform, pressing the bottom lowers the platform.

Daily Maintenance



CAUTION

FAILURE TO PERFORM INSPECTIONS AND PREVENTITIVE MAINTENANCE AT RECOMMENDED INTERVALS MAY RESULT IN THE UNIT BEING OPERATED WITH A DEFECT THAT MAY RESULT IN INJURY OR DEATH OF THE OPERATOR.

Regular inspection and conscientious maintenance is important to efficient economical operation of this machine. It will help to assure that equipment will perform satisfactorily with a minimum of service and repair. Make checks at the stated intervals or more frequently if required by local operating conditions. A Pre-Start Inspection Checklist is included in this manual. In addition, Pre-Delivery/Frequent and Monthly Checklists are included in a separate Maintenance Manual. Also refer to the Maintenance Manual for replacement part information.

Charging the Battery

This unit is equipped with a deep cycle 12-volt battery. The care and maintenance of your battery has much to do with how well this unit functions. Battery wiring and water level should be checked monthly. **Do not overfill.** When the cells are too full, fluid will seep out when charging.

Note: The surrounding temperature greatly affects the power reserve within a battery.

Example: A battery that is 100% charged at 80° F (27°C) drops to 65% at 32°F (0°C) At 0°F (-18°C), this battery will drop to 40% efficiency.



WARNING

LEAD-ACID BATTERIES GENERATE EXPLOSIVE GASES. KEEP SPARKS AND FLAME AWAY FROM BATTERIES. DO NOT SMOKE WHILE CHARGING.

Do not operate unit while charging. Shortened battery life will result.

- Park the machine on a level surface.
- Plug charger into AC outlet until charged.
- For best battery life, leave charger plugged in until machine will be used again. The charger will maintain the battery charge.

The charger will not begin the charging cycle on severely discharged batteries.

 WARNING DO NOT OPERATE UNIT WHILE CHARGING.	 CAUTION NEVER ADD ACID TO BATTERY!
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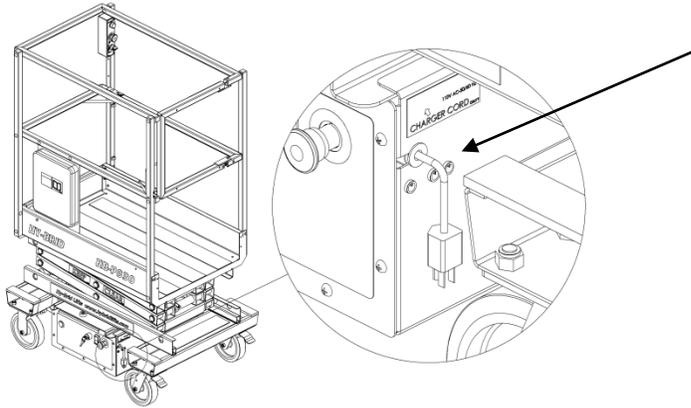
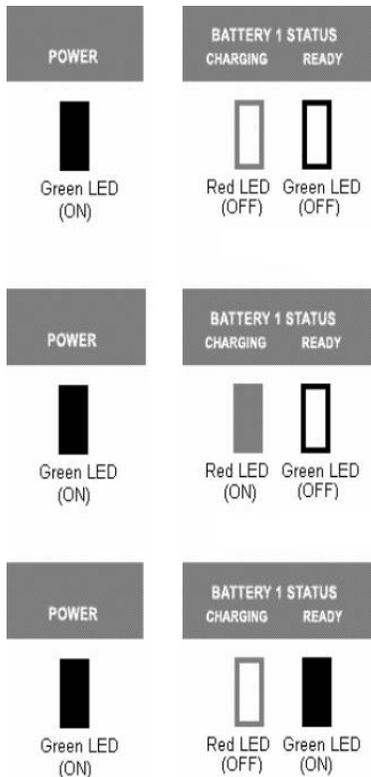


Figure 12: Battery Charger LED Display



This display indicates that power is on but there is no connection to a battery. The charger must see approximately 5 volts on a battery in order to deliver d/c current.

This display indicates that power is on and that the output is delivering d/c current to the batteries.

This display indicates that power is on and that the output is finished charging and is in a float maintenance mode.

Prestart Inspection



WARNING

THIS CHECKLIST MUST BE USED AT THE BEGINNING OF EACH SHIFT OR AFTER EVERY SIX TO EIGHT HOURS OF USE. FAILURE TO DO SO COULD AFFECT THE SAFETY OF THE OPERATOR.

MODEL HB-P830CE SERIAL NUMBER _____

1. Keep inspection records up-to-date.
 2. Record and report all discrepancies to your supervisor.
 3. A dirty machine cannot be properly inspected.
- Y-Yes/Acceptable N-No/Unacceptable R-Repaired

Description	Y	N	R
<i>Visual Inspections</i>			
Check that there are no damaged, dented, or bent structural members.			
There are no loose or missing parts.			
Check that warning and instructional labels are legible and secure. Ensure that load capacity is clearly marked.			
Check the platform rails and safety gate for damage.			
Platform and base controls are not missing, damaged, or disconnected.			
Electrical cables and wires are not torn, frayed, or disconnected.			
Hydraulic hoses are not torn or loose, and there are no leaks. Check that hoses and the cables have no worn areas or chafing.			
Check the hydraulic fluid level with the platform fully lowered.			
Check the tires for damage.			
Check that all snap rings are secure in grooves on pivot pins.			
<i>Functional Tests</i>			
Gate closes automatically and latches.			
Platform Controls: Check all switches and push buttons for proper operation. Emergency Stop (Stops all movement) Up/Down Controls (Elevates, Lowers, Enable button must be pressed)			
Base Controls: Check all switches and push buttons for proper operation. Emergency Stop (Stops all movement) Key Switch (Selects Platform Control, Ground Control, or Off) Up/Down Rocker Switch (Elevates, Lowers) Alarm (Not damaged, sounds for descent, overload) LED (Flashes when overloaded)			
Wheels: Front and rear wheels rotate freely.			
Brakes engage and hold when platform elevated.			
When overloaded, platform stops elevating when at a height between 81cm and 94 cm from the ground.			

DATE _____ INSPECTED BY _____