

**FPU® SYSTEMS OPERATION MANUAL
(INCLUDING REPAIR PARTS)
EXPEDITIONARY CONTAINERIZED AUTHORIZED STOCKAGE LIST (ECASL)
BOH FPU Field Pack-up Units**

European Patent Number EP 1224127

CHAPTER 2

OPERATOR INSTRUCTIONS

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OPERATOR INSTRUCTIONS

FPU® SYSTEMS OPERATION MANUAL (INCLUDING REPAIR PARTS) EXPEDITIONARY CONTAINERIZED AUTHORIZED STOCKAGE LIST (ECASL) BOH FPU Field Pack-up Units

PREPARATION FOR MOVEMENT

INITIAL SETUP:

ECASL Packed out

Maintenance Level

Operator/Crew

Personnel Required

Two (plus one supervisor)

PREPARATION FOR MOVEMENT

WARNING

The ECASL System was designed and tested to interface, load directly on to and lock on to the HEMTT-LHS or PLS. Use of any other vehicle that is not designed with the same function and features as the HEMTT-LHS or PLS may cause damage to the ECASL System, injury or death.

This work package provides step-by-step instructions for the download, set-up and moving of the ECASL systems.

WARNING



If a container is dropped during transit movement of any kind, extreme care should be taken when opening the doors to preclude material from falling on and injuring personnel.

Site Requirements

WARNING



Container must be operated on level ground. To maintain control, consider the ground surface conditions for adequate traction, such as mud, snow, ice, sand.

If the container is transported on the HEMTT-LHS truck or PLS trailer, the selected site must have a minimum of 50 ft. x 30 ft. of flat level, open space to provide setup space for the container. Care should be taken to ensure that no overhead obstructions interfere with the offload of the container from the HEMTT-LHS or PLS.

CAUTION

Flood plain conditions should be considered since the containers have vent holes for the ventilation system that are not designed to withstand flooding. If in doubt, consult the operations supervisor or commander.

PREPARING FPU FOR USE

The FPU is designed for a ground-based operation, never attempt to access the containers when the containers are on any transporting equipment or not downloaded and established in an operational site. Once downloaded from the HEMTT-LHS or PLS truck or trailer, the FPU is ready for immediate use in most circumstances.

OPERATION OF ROOF ACCESS SYSTEM

The Roof Access System consists of seven retractable steps on the end of the FPU-20-3 with handles recessed in the roof for three-point control while climbing.

WARNING



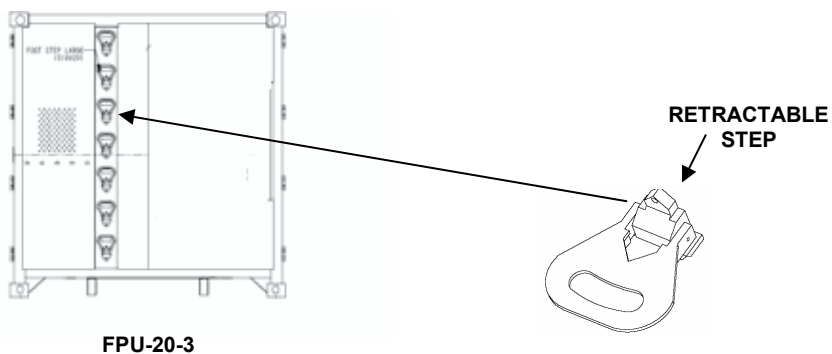
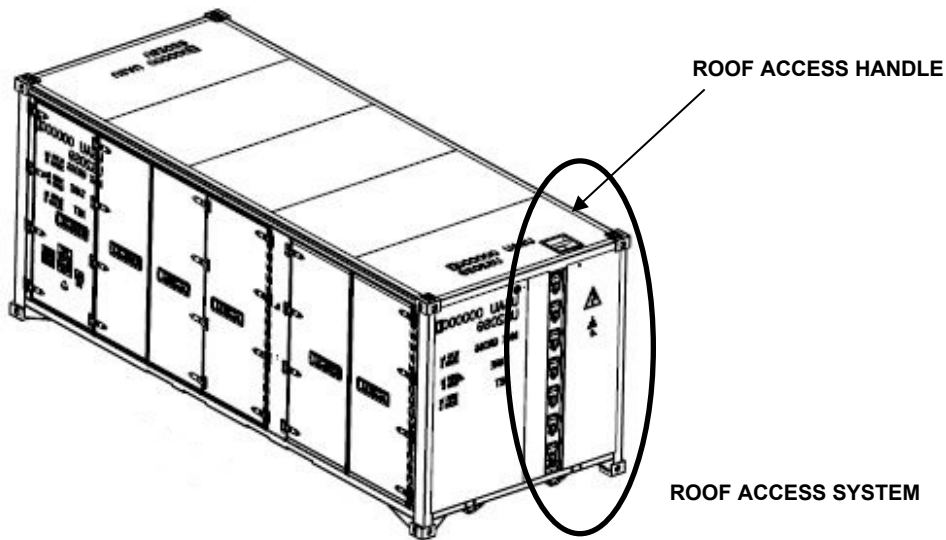
Fall hazards exist when climbing onto, returning from or working from the top of the container. Always maintain three points of contact to the ladder and FPU container when climbing onto the FPU container. Never move, step, or walk backwards when working on top of the system. All movement should be in the forward direction. A fall can occur if the worker loses concentration and steps backwards off of the edge. Stand erect only if necessary and only away from the edge. Working from a kneeling position helps reduce the threat of a fall.

The FPU-20-3 container is marked with the following ISO marking. Its meaning is provided below:

WARNING



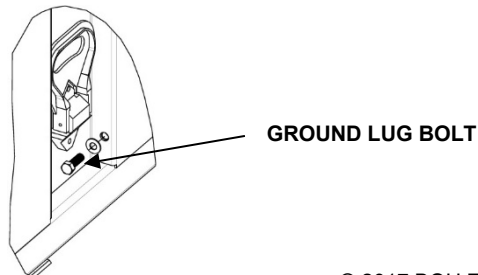
Overhead power lines and obstructions can cause serious injury or damage to property. Forklift operators, truck drivers and ground guides should always clear overhead when loading, unloading or accessing the roof of the containers.



WARNING



Overhead power lines and obstructions can cause serious injury or damage to property. Forklift operators, truck drivers and ground guides should always clear overhead when loading, unloading or accessing the roof of the containers. When the container is in position, establish a ground connection located at the folding steps.



WARNING



Fall hazards exist when climbing onto, returning from or working from the top of the container. Always maintain three points of contact to the ladder and FPU container when climbing onto the FPU container. Never move, step, or walk backwards when working on top of the system. All movement should be in the forward direction. A fall can occur if you lose concentration and step backwards off of the edge. Stand erect only if necessary and only away from the edge. Working from a kneeling position helps reduce the threat of a fall.

INSTALLING/REMOVING REAR ROLLER ASSEMBLY

Detachable dual 7-inch rollers are mounted only on the rear end (8-ft side) of the FPU-20-3 container. The roller assemblies are attached to the underside of the lower end rail with two ¾-inch attaching pins and secured by four lynch-pins. When attached to the FPU-20-3, the rear rollers enable the container to be loaded on the HEMTT-LHS, PLS and PLS trailer. When detached and stored within the FPU-20-3, they permit the container to be stacked or transported via standard ISO container transportation methods and devices.

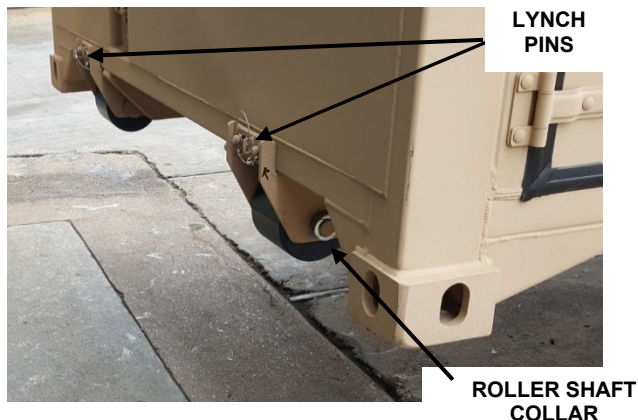
WARNING



The rear rollers are to be used only during the action of loading/unloading on the HEMTT-LHS, PLS and PLS trailer. Any other use, such as rolling the container between different locations especially with turns involved, may result in damage to the rollers or may present a dangerous situation that could result in serious injury or even death. The rollers must also be removed once unloaded on the ground as they may become damaged in this position over an extended period of time.

ROLLER INSTALLATION/REMOVAL

After all container connection actions have been successfully completed, the roller assemblies can be installed. This installation will require two people.



REAR ROLLERS ATTACHED FPU-20-3
LADDER END



REAR ROLLERS (SIDE VIEW) TUCKED INWARD
BENEATH CONTAINER

Installation

1. Using the HEMTT-LHS or PLS, lift the FPU-20-3 container approximately 12-inches off the ground at the FPU roller end to allow access to the rear frame assembly of the container. Leave roller attached for transport and unloading.

WARNING



Do not allow the system to swing if using overhead lift. Always ensure an appropriate sling is used in the lift. Always use properly sized forklift, crane-lifting device. Always use appropriate blocking/bracing in conjunction with proper MHE when working under the container. Failure to comply with these safety measures could cause damage to equipment, serious injury or death.

2. It is preferred the rollers be oriented so the roller wheel is tucked inward beneath the container (see picture above).

NOTE

While it may be possible that either roller orientation (wheels tucked beneath vs. extending out from the container end) will allow the roller brackets to be secured to the underside of the container frame and due to some slight variations in container handling equipment found in the field, it is preferred the rollers be oriented with wheels tucked in.

3. Position roller assembly so that the roller shaft collar faces the nearest side of the container as shown above.
4. Person number one fits the roller saddle to the underside of the container frame and aligns the two pinning holes.
5. Second person inserts the two pins through the aligned holes to attach roller assembly to container frame.
6. Secure the two pins in place using the four lynchpins attached to the exterior side of the roller assembly.
7. Repeat process for the other roller.

Removal

1. While loaded on the HEMTT-LHS or PLS, remove the 4 lynchpins from the exterior side of the roller assemblies.
2. Remove the two pins holding the roller assembly to the container frame.
3. Remove roller assembly from container frame.
4. Lower the FPU-20-3 to the ground with the HEMTT-LHS or PLS.

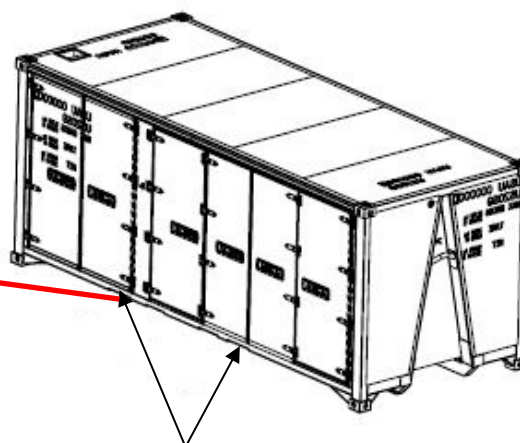
WARNING



Ensure all internal material is secured through the use of drawer locking mechanisms, cargo strap/netting, pallet lock rods, module locking devices (WP 0006 00 - 0010 00). Failure to comply could cause serious injury or death.

MOVING THE FPU USING Material Handling Equipment (MHE) (FORKLIFT)

The FPU-20-3 has two sets of forklift pockets located on their outer and inner loading rails. 1 set of inside forklift pockets are used to move it when empty and one set of outside forklift pockets are used to move it when loaded. The top portion of the forklift pockets are still visible from the outer rail and can be used to help the forklift operator guide the forklift tines through the inner loading rail forklift pockets as shown below.



OUTSIDE FORKLIFT POCKETS
FOR LOADED CONDITION

LOADING THE FPU USING A HEMTT-LHS or PLS



Loading and unloading via the HEMTT-LHS and PLS must be accomplished as indicated in HEMTT-LHS and PLS technical manuals. Loading and unloading onto and off of a M1076 Palletized Load-handling System Trailer (PLST) must be accomplished as indicated in the PLS trailer technical manual (TM9-2320-364-10) (see exception noted below).

NOTE

Orient the roller assembly with the roller wheel tucked inward beneath the container (see page 0005 00-18 and #2 NOTE on page 0005 00-19). In this orientation, the roller wheel will not be required to rest against the trailer back stop and slight adjustments of the container position may be required to align the container din locks within the respective trailer lock window.

WARNING

The ECASL System was designed and tested to interface, load directly on to and lock on to the HEMTT-LHS or PLS. Use of any other vehicle that is not designed with the same function and features as the HEMTT-LHS or PLS may cause damage to the ECASL System, injury or death.

CAUTION

Do not exceed 26,000 lbs. Maximum Gross Weight (MGW) for loading FPU systems aboard HEMTT-LHS or 37,000 lbs aboard a PLS transport.

CAUTION

Caution must be exercised when transporting the FPU on the PLS trailer on cross-country terrain which can produce excessive vibration and shock. When conditions simulate the 6-inch washboard effect, damage may result to the FPU container and the material stored within if excessive speed for this condition is allowed to happen. Operators should always adjust driving speed to local conditions ensuring a safe operation based on local conditions. If a 6-inch washboard effect is encountered, it may be necessary to reduce speed to as low as 3 miles per hour to avoid damage to the FPU and its contents.

SECURING FPU TO THE PLS TRAILER**CAUTION**

When transporting the FPU on cross-country terrain which produce excessive vibration and shock. When conditions produce 6-inch washboard effect, damage may result to the FPU container and material stored within if excessive speed is allowed. Operators should adjust driving speed to local conditions. If a 6-inch washboard condition is encountered, operators should reduce speed to as low as 3 mile per hour to avoid damage to the FPU and its contents.

Refer to the PLS trailer technical manual to determine when the PLS trailer is to be used. After loading the FPU on to the trailer, slight adjustments of the container position may be required to align the pinning holes with mating holes in trailer frame. See page 0005 00-5 for rear roller installation/removal instructions and #2 NOTE.

END OF WORK PACKAGE

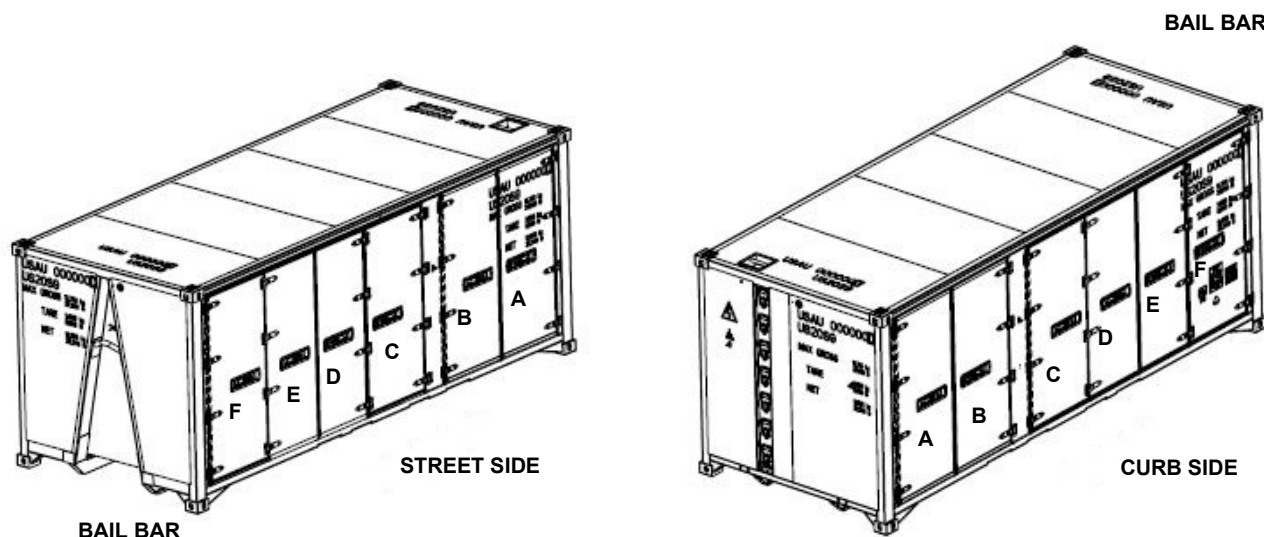
OPERATOR INSTRUCTIONS

FPU® SYSTEMS OPERATION MANUAL (INCLUDING REPAIR PARTS) EXPEDITIONARY CONTAINERIZED AUTHORIZED STOCKAGE LIST (ECASL) BOH FPU Field Pack-up Units

OPERATION OF FPU CONTAINERS

OPERATION OF FPU CONTAINERS

This work package provides procedures associated with safe and efficient operation of the FPU and FPU components. Familiarity with these procedures will allow military units to derive maximum benefit from FPU modularity and the options for FPU configuration.



OPERATION OF FPU DOORS

Opening the Doors

All of the following Warnings, Cautions and procedural steps apply to the FPU-20-3 when opening, closing and securing the doors.

NOTE

Doors A and B on the 8-ft side of the container should be opened simultaneously. When opening the 12-ft side of the container, open the left and right center doors D and E simultaneously, then open both left and right doors C and F.

WARNING

Use care when opening door while containers are on an incline. To maintain control, consider the ground surface conditions for adequate traction, such as mud, snow, ice, sand and seek assistance from fellow soldiers to prevent strain or injury.

CAUTION

When closing the FPU 20-3 center doors, always allow the right hand door to lead slightly to mate the door seal edges and prevent damage to the seals.

CAUTION

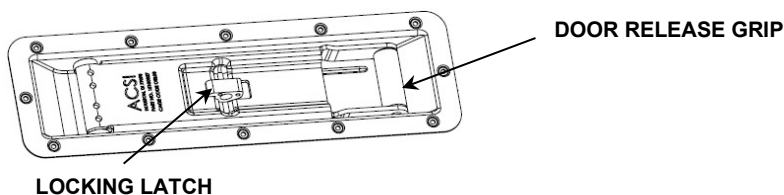
The FPU containers will exceed the width requirement if a heavy security padlock is used to secure the exterior doors. Padlocks not exceeding one-inch shank length will allow the width requirements to be met. Padlocks may be taped to the exterior doors to ensure further measures will stay within the ISO envelope.

FPU 20-3 Container Doors

1. Using your right palm for left-hand doors and left palm for right hand doors, depress locking latch while using your free hand to prevent handle from springing outwards.

WARNING

The container door release grip has limited room allocated for hand space. This creates a pinch point at the handles when closing the door. Place the door handles in the closed position after opening the doors so they will fold against each other.

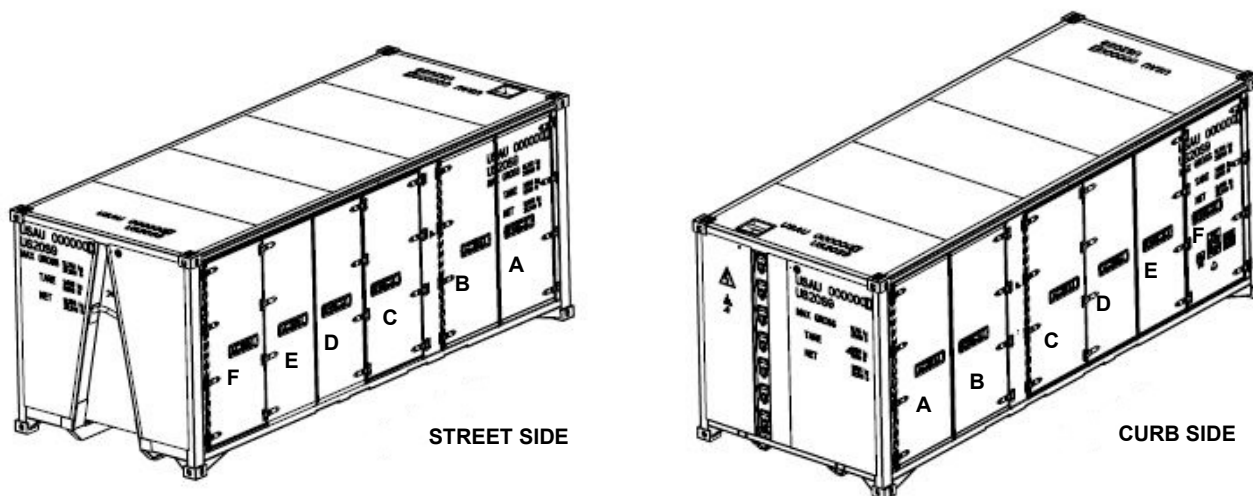


2. Rotate both handles to their fully open position.
3. Pull both handles simultaneously. Because containers are constructed with tubular steel and are subject to flexing when containers are sitting on an un-level surface, doors may be difficult to open. In this event, you may require the assistance of other personnel to open the doors.

CAUTION

After doors are open, door handles must be re-latched in their closed position to prevent equipment damage to handles as doors are folded back in the open position.

Door Sequences



WARNING



To prevent injury to personnel, after opening each door, install door restraints to prevent accidental closing due to wind conditions or when the container is resting on an un-level surface. Assistance may be required for this operation.

FPU-20-3 Container Doors

The FPU-20-3 container doors are retained by fabric straps with shackles to welded rings on the end and interior of the door. Secure the doors using door restraint straps.

WARNING



The container door release grip has limited room allocated for hand space. This creates a pinch point at the handles when closing the door. Place the door handles in the closed position after opening the doors so they will fold against each other.

NOTE

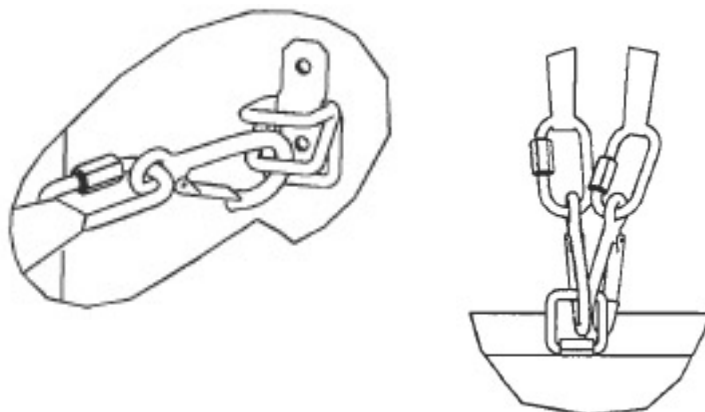
Unlatch all four doors prior to attempting to open doors. Unlatching all door handles will assist in unseating doors.

1. Rotate handles to their full open position.

CAUTION

When doors are open, door handles must be latched in closed position to prevent equipment damage to handles as doors are folded back in the open position.

2. With assistance, grasp both the center door handles and pull bi-fold doors simultaneously. Because containers are constructed with tubular steel and are subject to flexing when containers are sitting on an un-level surface, doors may be difficult to open. In this event you may require the assistance of other personnel to open the doors. While pulling on center doors simultaneously, have additional personnel pull handles on doors.
3. Fold the doors and retract away from the container. Attach the restraining straps.
4. Attach each midsection door strap to the dual D ring between the bi-fold doors, see page 0006 00-5.



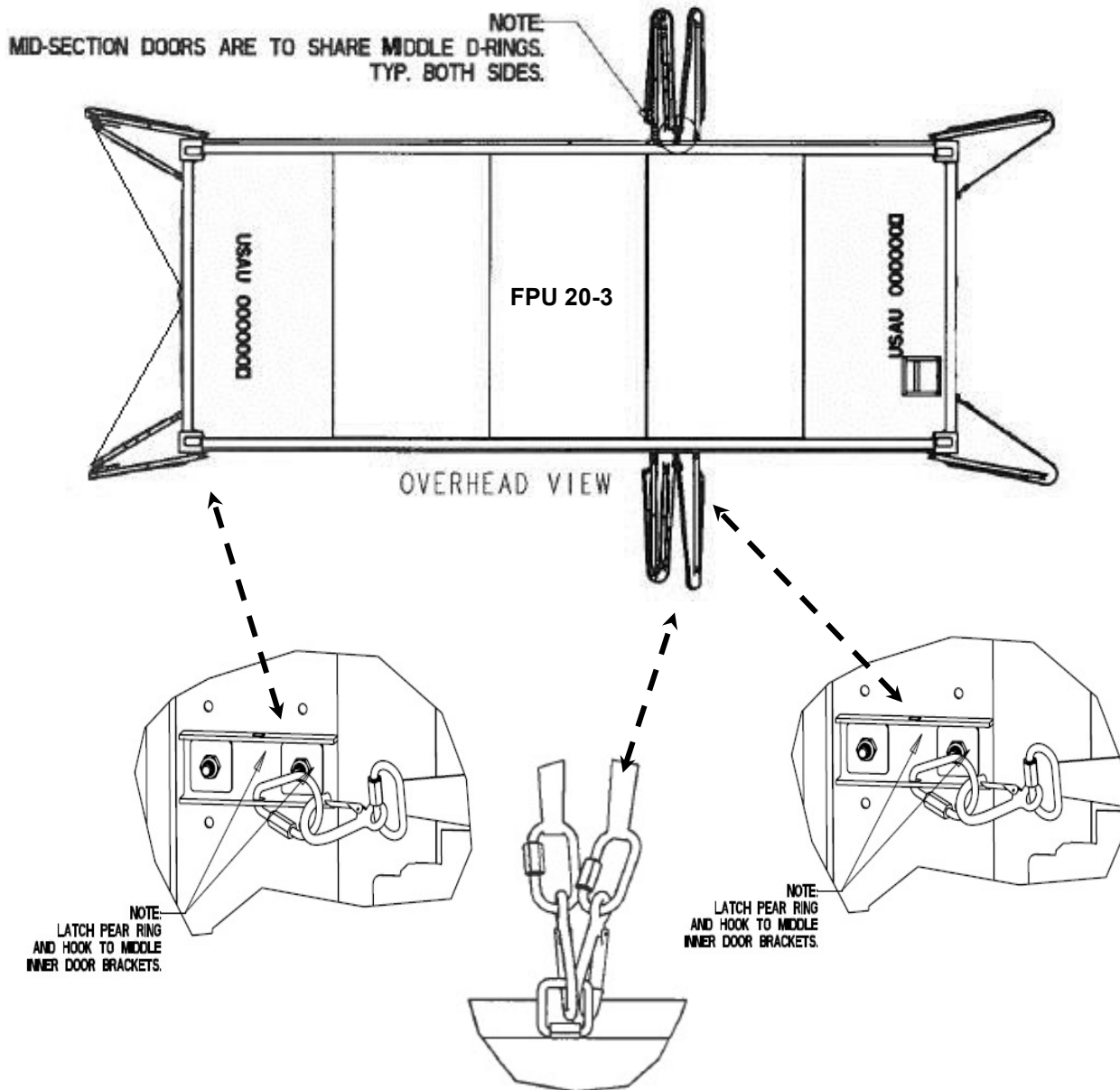
FPU 20-3 Bi-Fold Dual Strap D rings

Door Strap Arrangement FPU 20-3

WARNING



To prevent injury to personnel, after opening each door, install door restraints to prevent accidental closing due to wind or container resting on an un-level surface. Assistance may be required for this operation.



Closing the Doors

FPU door seals consist of a double lip design in which the inner lip forms a tight seal against a fixed surface around the door opening while the outer seal overlaps the door facing to provide a double sealing protection against the environment. Overlapping doors require one door (left side) to have double seal lips while the adjacent door (right side) has a single seal lip (no outer seal lip). During the closing process, as the overlapping doors begin to mate, be sure that the door with no outer seal lip (right side) is ahead of the double seal lip door (left side).

WARNING



To prevent injury to personnel, caution should be exercised when releasing more than one door at a time from door restraints during the closing procedure. All straps should be clipped to their door bracket links before closing the door.



NOTE

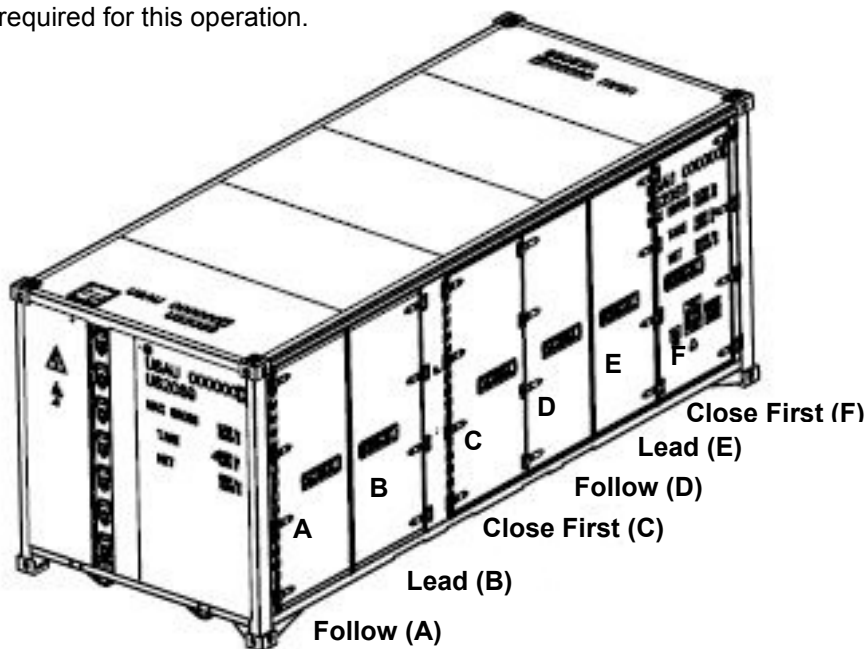
Do not remove the pear shaped links from the door brackets.

CAUTION

Prior to beginning the door closing procedure, ensure that the container threshold is completely free of debris (dirt, sand, gravel, etc.). This will provide for proper sealing of the doors and prevent leaks.

Closing the FPU-20-3 Doors

Assistance may be required for this operation.



1. Close and latch both outer doors C and F first, then close both doors D and E simultaneously aligning the single seal lip of the right door E to be slightly ahead of the double seal lip left door D. Also close both doors A and B simultaneously aligning the single seal lip of the right door B to be slightly ahead of the double seal lip left door A.

CAUTION

During the closing process, as the overlapping doors begin to mate be sure that the door with no outer seal lip (right side) is ahead of the double seal lip door (left side).

2. Push firmly until the door cams engage the door cam keepers inside the container.
3. Rotate door handles to the full closed position. Ensure the locking latch has fully engaged the handle.

CAUTION

The FPU containers will exceed the width requirement if a heavy security padlock is used to secure the exterior doors. Padlocks not exceeding one-inch shank length will allow the width requirements to be met. Padlocks may be taped to the exterior doors to ensure further measures will stay within the ISO envelope.

LOADING/ UNLOADING FPU MODULES (rear section of the FPU-20-3 ONLY)

The FPU Module System consists of a storage/shipping module and a removable cradle. FPU modules are designed to be easily inserted/removed from the rear section of the FPU-20-3 when module cradles have been installed. Modules consist of four tapered feet and a female receiver located on the bottom that allows them to be mounted directly to the removable cradle. Modules are retained in place using twist lock on the removable cradle. Modules are locked on to the removable cradle by pushing in on the module-locking arm. Floor plate adapters provide four module storage positions.

Removing FPU Modules

1. Be sure modules 3-G bar is pinned in place.



2. Pull the red module-locking arm handle fully out to its open position.



- Adjust forklift tines to fit forklift pockets on the FPU module.



- With the assistance of a ground guide, insert tines into module.

NOTE

Be sure to enter the forklift pockets with tines above the red handle and allow approximately 18-inches between the forklift-bridge and module to prevent damage to the forklift or container.

- Lift module directly upward maintaining a level position to a height just above the module receptacles on the removable cradle.
- Using ground guide, slowly back out paying close attention to the guide and the upper clearance between the top of the module and container door cam keeper that protrudes downward from the top of the container frame. The module may have to be raised or lowered during this process if the tilt is too far forward or backwards.



7. Continue backing out until completely clear of the container.
8. Transport to desired drop area and slowly lower until the module is resting fully on the ground.
9. Slowly back away until completely clear of the module.

Inserting FPU Modules

1. Be sure the 3-G bar is pinned in place.
2. Be sure red handle on the module-locking arm located on the removable cradle is pulled fully out to its open position.
3. Adjust forklift tines to fit forklift pockets on the FPU module.
4. With the assistance of a ground guide, insert tines into module. Stop with about 12-inches between the FPU module and the forklift bridge. This will allow for the clearance needed between the forklift bridge and the container frame when loading the module to prevent the bridge from making contact with the container frame.
5. Using ground guide, lift module and position feet directly above the receptacles located on the removable cradle at the desired module storage position.
6. Lower the module until it settles into its position (shifting the tines left/right as necessary to align properly).
7. Push the module-locking arm in completely.
8. Slowly back away from the module until the tines have completely cleared.
9. Verify that the red handle on the module-locking arm is pushed completely to its closed and locked position.



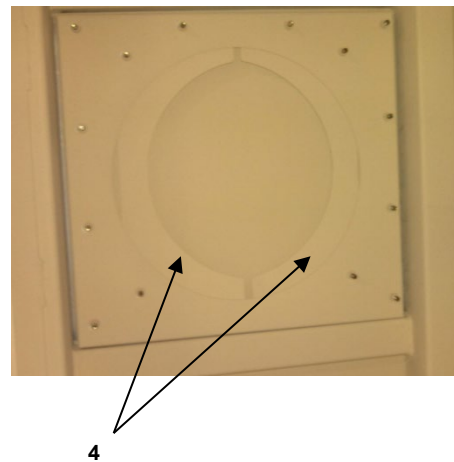
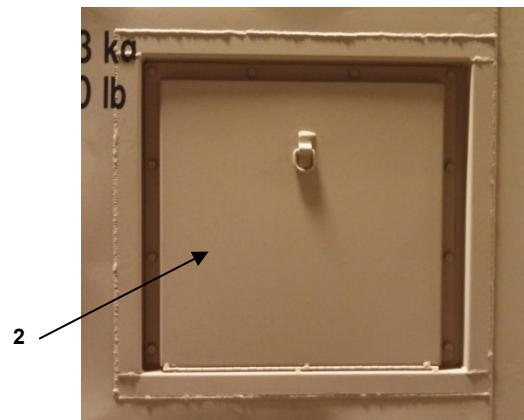
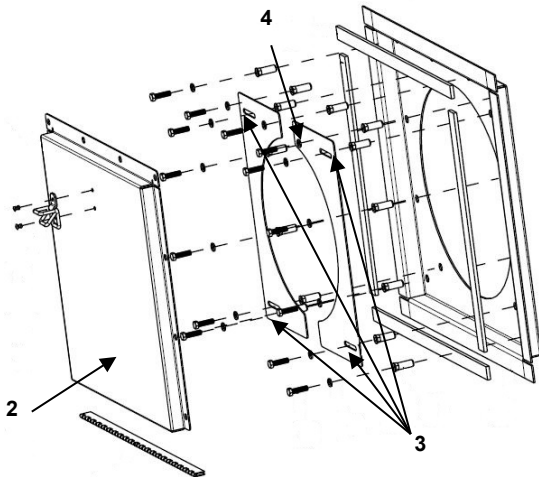
OPTIONAL ENVIRONMENTAL CONTROL UNIT (ECU)

The FPU 20-3 container can be outfitted with the optional Environmental Control Unit (ECU) for items which require a climate-controlled environment.

Securing the Hose Attachment

The ECU enables the securing of separate HVAC hose attachments (1).

1. Unscrew all ten bolts from the ECU cover (2) using a ½" wrench and open the cover.
2. Loosen the four bolts (3) from the hose lock plate (4) and insert the hose.
3. Slide the hose lock plate around the hose attachment and tighten all four bolts securing the hose attachment in place.



END OF WORK PACKAGE

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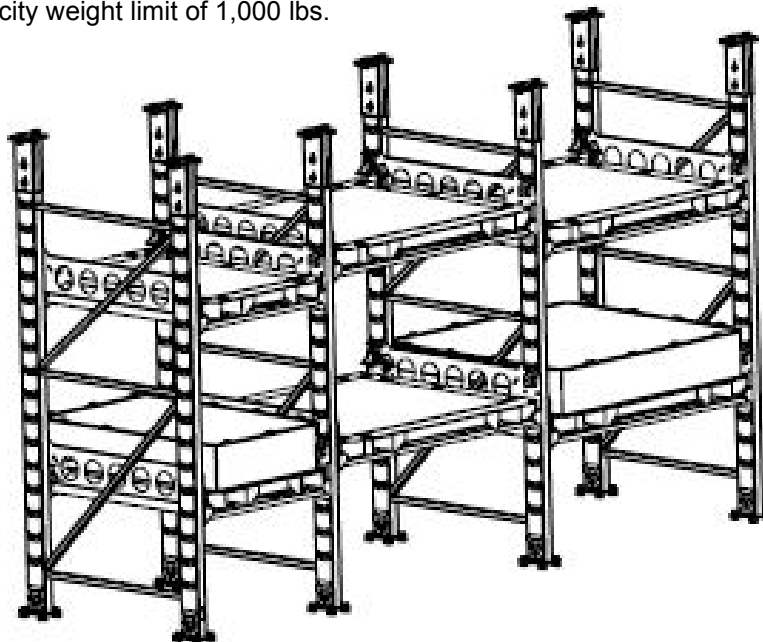
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OPERATION OF BULK STORAGE AIDS

OPERATING FPU PALLETS (BULK STORAGE AIDS)

Each pallet position in the pallet rack system consists of a pallet and left and right load centering adjustable pallet mounting ledges. Ledge assemblies are attached to the vertical rack frame at two locations by ten ¼ -inch carriage bolts and nuts. When pallet is inserted on pallet ledges, they are secured by rear cam locks and held in front by two adjustable lock rods that seat the pallet into position when tightened. All pallets are provided with nets or ratchet straps to secure material. Pallets are rated with a maximum capacity weight limit of 1,000 lbs.



CAUTION

Do not exceed maximum weight limit of 1,000 lbs. per pallet. Exceeding load limits may damage pallets and pallet ledges.

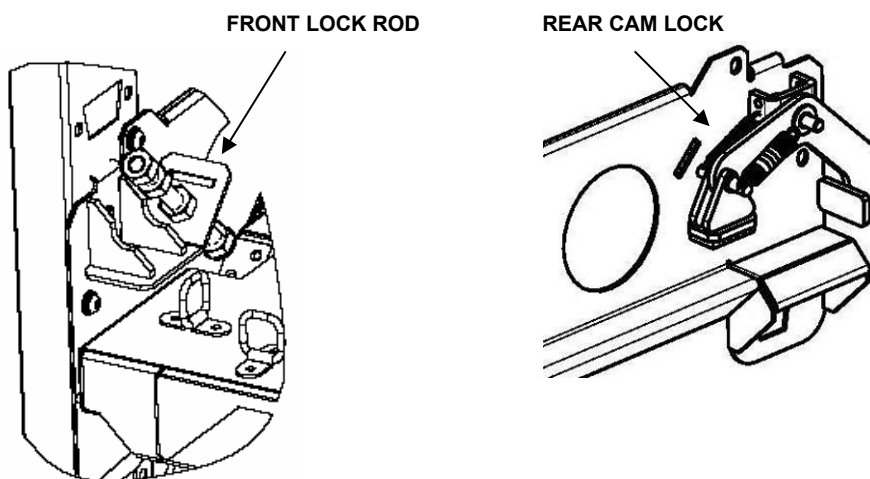
WARNING



Never work underneath loaded pallets. Failure to comply could cause serious injury or death.

CAUTION

Ensure the lock rods have been completely retracted prior to removing or inserting the pallets.

**Inserting Pallets**

The following process will require a forklift operator and a ground guide.

1. Adjust forklift tines to match fork pockets of pallet to be installed.
2. Pick up pallet with forklift.

NOTE

Pallets are designed with a forklift tine stop to ensure proper distance is maintained between the forklift bridge and the FPU container. It also assists in inserting the pallet to the rear locked position.

3. Using the ground guide, align pallet to the pallet ledge opening.

CAUTION

Ensure the lock rods have been completely retracted prior to removing or inserting the pallets.

4. Once approximately 12-inches into the pallet ledge, lower the pallet and allow it to slide along the pallet ledge into the lock position.
5. Retract forklift.
6. Tighten the lock rods evenly to 120 lb.-in. (105 psi) using 7/8-inch deep well socket and 1/2-inch drive flex head wrench to secure the front of the pallets. Continue alternating from one lock rod to the other until the pallet is properly seated under the locking cam located at the rear of the pallet.

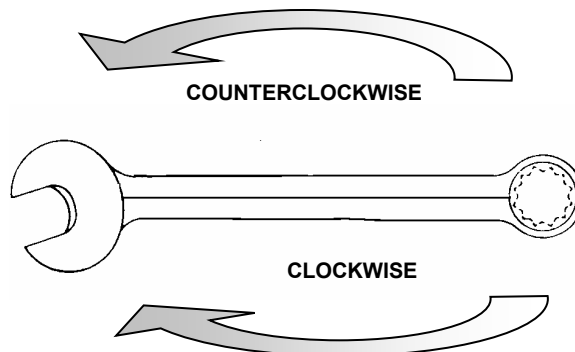
NOTE

Alternate tightening sequence left to right to ensure proper alignment of pallet on pallet ledges.

7. Tighten Jam nut using 7/8-inch combination wrench to hold lock rod in the closed position.

Removing Pallets

1. Loosen jam nuts using 7/8-inch combination wrench.



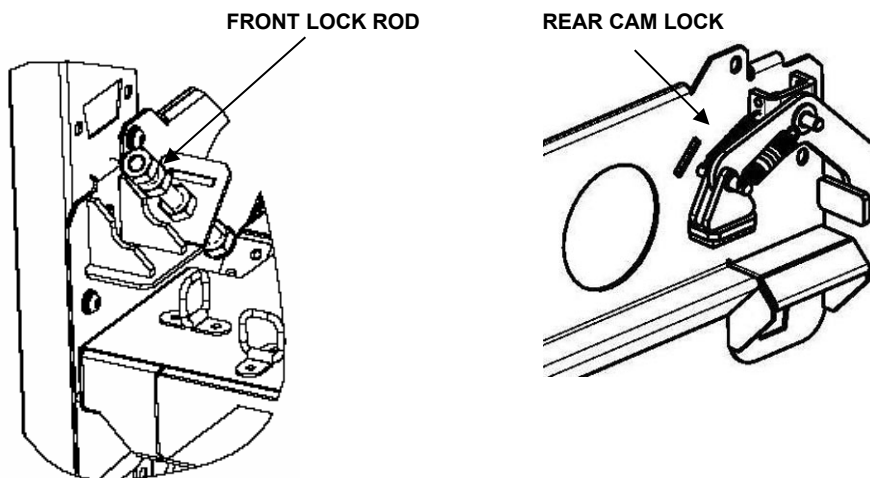
NOTE

All hardware, bolts, jam nuts, and screws are loosened with a counter clockwise rotation. All hardware, bolts, jam nuts, and screws are tightened with a clockwise rotation.

WARNING



Never work underneath loaded pallets. Failure to comply could cause serious injury or death.



2. Completely retract lock rods using 7/8-inch deep well socket and a 1/2-inch drive flex head wrench. Turn lock rods counterclockwise fully until retracted. The rod will bottom out when fully retracted.
3. Adjust forklift tines to match fork pockets of pallet to be removed.
4. Using the ground guide's direction, insert tines into pallet until contact with pallet stops is made.
5. One 2-inch ratchet strap connected to the forklift is required to overcome the rear cam lock tension.
6. Using the 2-inch ratchet strap provided, attach one hook to a left front pallet D-ring.
7. Feed strap through the forklift bridge to opposite side and attach to a right front pallet D-ring.

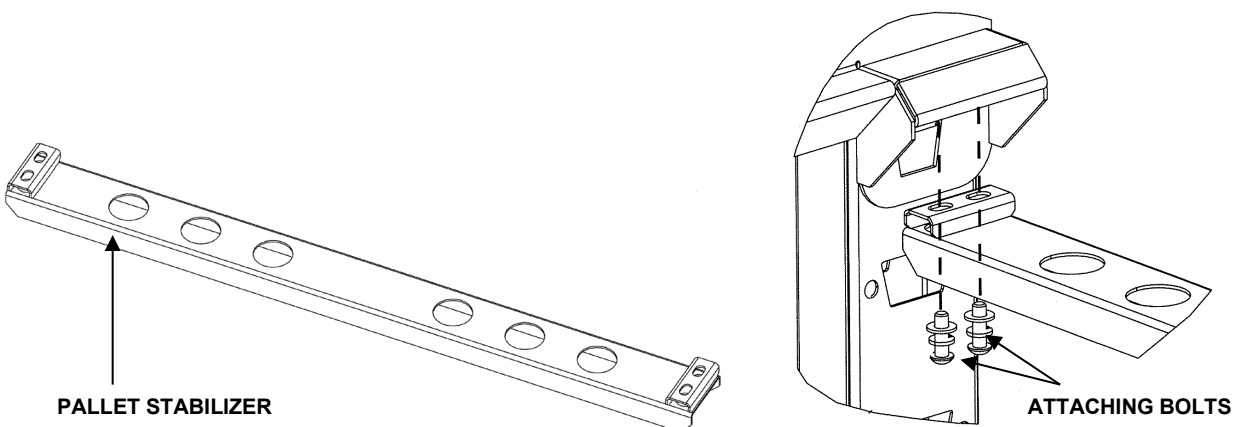
8. Tighten ratchet strap to remove any slack.
9. Raise the forks approximately 1-inch.
10. Back out slowly approximately 12-inches to allow pallet to clear rear cam lock.
11. Tilt forks back to obtain approximately 1-inch of clearance between the pallet and pallet ledge.
12. Continue backing out until clear. Once clear of container, position pallet to desired location and lower to the ground.
13. Disconnect ratchet straps from pallet D-rings and remove from the Forklift Bridge.

Adjusting Pallet Position

1. Remove the pallet to be relocated and any pallets located above prior to beginning the following steps (Refer to inserting/removing pallet procedures).
2. Remove front and rear pallet ledge stabilizer by turning attaching bolts counterclockwise on each side of the stabilizer using 3/16-inch hex driver socket and 3/8-inch ratchet with an extension.

NOTE

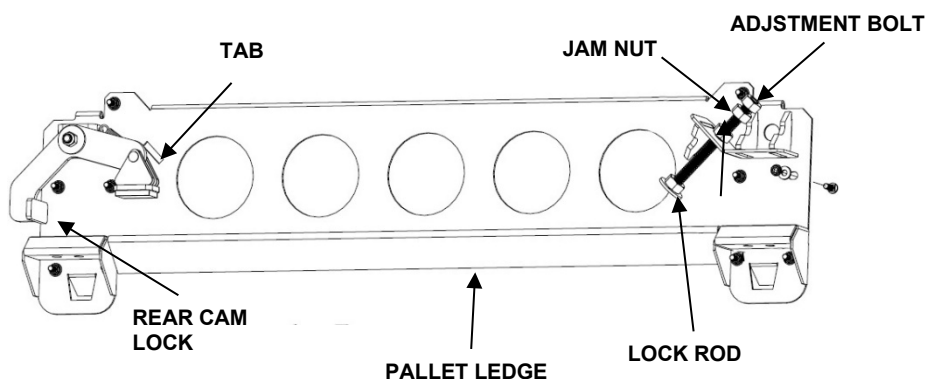
The operator must crawl into the container to remove the rear Allen bolts.



3. Loosen, but do not remove, the ten carriage bolt nuts using 7/16-inch socket and ratchet with extension from the two pallet ledges on the vertical rack frame.

CAUTION

If a bolt is lost or damaged beyond use, obtain a replacement. Do not install with less than the proper number of bolts or damage to equipment may occur.



4. Pallet ledges are retained on the vertical rack frame by ten ¼-inch carriage bolts and four bayonet tabs protruding into the windows of the vertical rack frame. This requires the ledge to be loosened from the vertical rack frame. While one person securely holds the pallet ledge, the second person applies an upward force by tapping the underside of the ledge at the attached point with a 2 X 4 soft wooden block or similar material.
5. Place the pallet ledges in their desired positions by inserting the bayonet tabs into the vertical rack frame windows while aligning the ten carriage bolts into their appropriate slots. Ensure that pallet ledges are at the same height in the vertical rack frame. Ensure all bayonet tabs have engaged the vertical rack frame windows before tapping into place. Tap down on the ledge with a 2 X 4 soft wooden block or similar material. Ensure the carriage bolts drop completely down in the slots.

NOTE

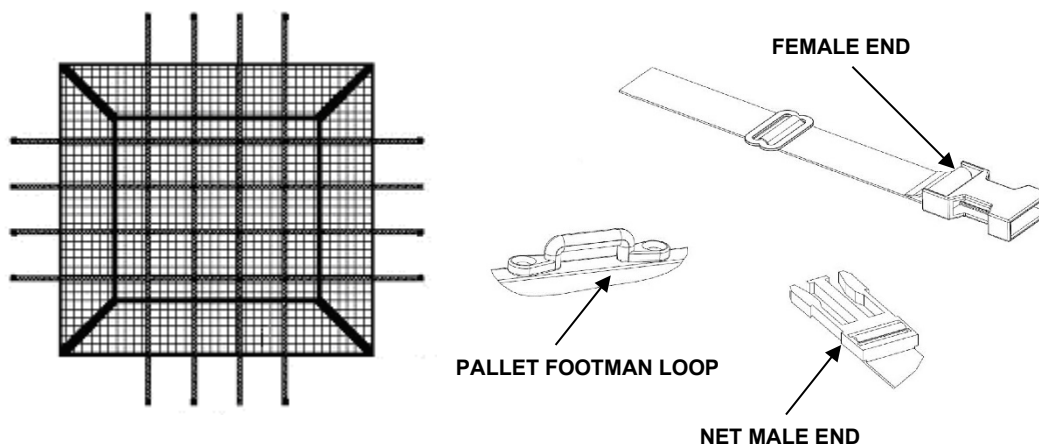
Pallets may be adjusted in 4-inch increments

6. Tighten all ¼-inch carriage bolts using a 7/16" socket wrench, ratchet and extension.
7. Reinstall rear pallet ledge stabilizer, four button head bolts using 3/16-inch hex driver socket and 3/8-inch ratchet with extension from the two positions of each pallet ledge. There are four bolts located at each vertical rack frame.
8. Reinstall front pallet ledge stabilizer, four button head bolts using 3/16-inch hex driver socket and 3/8-inch ratchet with extension from the two positions of each pallet ledge. There are four bolts located at each vertical rack frame.
9. Reinstall pallet (see Inserting Pallets page 0007 00-2).

SECURING FPU CARGO USING NETS (HAZMAT Pallets Only)

FPU Cargo netting is attached to HAZMAT pallets and the tops of 2-inch parts drawers and is then tightened around the stowed material by means of adjustable straps with parachute clips.

1. Place material to be secured in the HAZMAT pallet.
2. Arrange net to ensure male and female parachute clips are aligned.
3. Attach the male ends of the parachute clips located on nets to the female clips located on the pallet.
4. Pull loose ends of the straps to remove slack.
5. To remove, detach parachute clips.



SECURING FPU CARGO USING FLOOR NETS (When configured with bulk storage aids)

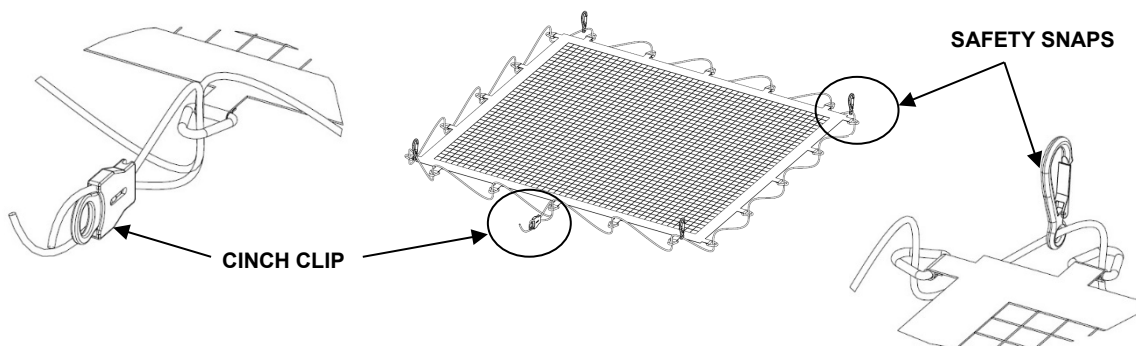
WARNING



Some HAZMATs may react negatively with other HAZMATs. The MSDS for each type of hazardous material to be shipped must be referenced prior to shipment. All recommended safety procedures must be followed. Be sure to use the appropriate absorbent material inside the containers to absorb spills. All HAZMATs must be double wrapped prior to shipment in lined HAZMAT storage pallets. Failure to do so may result in damage to pallets, FPU cargo, and hardware and/or injury to personnel.

FPU floor cargo nets are designed to secure cargo directly to the floor of the FPU-20-3 containers configured with bulk storage aids. These floor nets consist of a net with four safety snaps positioned to fit into the recessed rings located at the bottom of the vertical rack frames and an adjustable cinch rope that runs along the outer edge of the net.

1. Remove pallets directly above the position that the cargo is to be secured.
2. Insert load to be stored and secured.
3. Align net and attach the two safety snaps to the two rear rings of the vertical rack frame.
4. Feed the net over and around the load.
5. Attach the remaining two safety snaps to the two front rings of the vertical rack frame.
6. Pull cinch rope tightly to secure load in place.

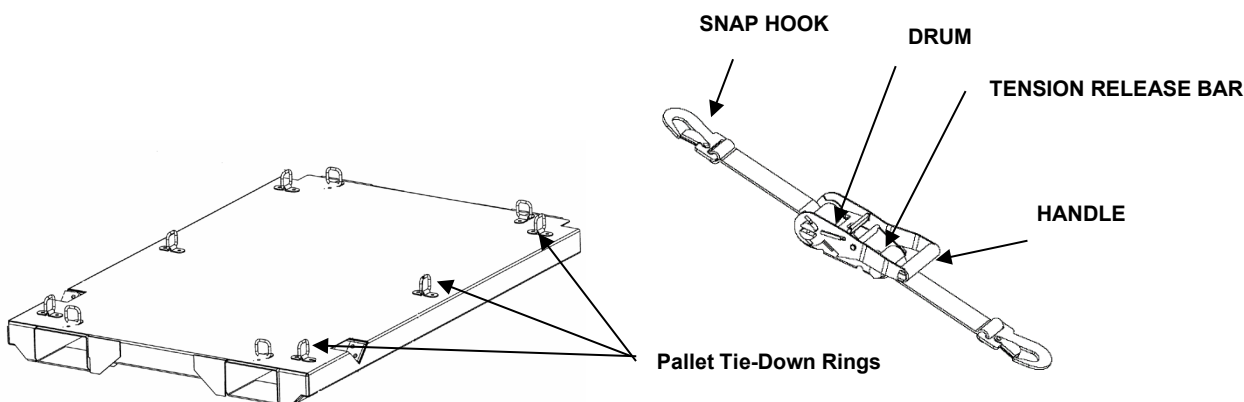


SECURING FPU CARGO USING RATCHET STRAPS

FPU pallets are designed with a series of D-rings around their edges. D-rings have a load limitation of 1,000 lb. per pallet. Pallets (except HAZMAT Pallets) are provided with four 2-inch ratchet straps that utilize a tension ratchet and snap hook ends to secure. These straps hook directly on to the D-rings. Proper position of these straps depends on size and shape of the material stored on the pallet.

Ratchet Strap

1. Extend the ratchet strap and fasten one snap hook end to one of the tie-down rings on the edge of the pallet and extend the strap over the material to be secured until you can connect the other snap hook end to another tie-down ring on the opposite side of the pallet.
2. Grasp the loose end of the blue strap and take-up the slack in the drum and strap until the strap has firm contact with the material.
3. Use the ratchet handle to tighten and add tension to secure the material.
4. To remove the straps, grasp the tension release bar and pull toward the handle.

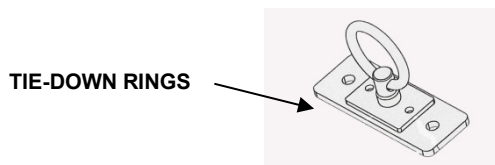


CAUTION

2" blue ratchet straps have a 2,000lb break strength and 667lb WLL (Working Load Limit) unless specified otherwise on the strap. Keep in mind the strap load limits when determining the quantity and configuration of straps required for properly securing material. Exceeding the strap load limits may result in damage to equipment and possible injury to personnel. *****Update Oct. 2018: New dark blue (with red/black stripe) ratchet strap used with a WLL of 2,000 lbs (noted on strap tag)**

FLOOR TIE-DOWN RINGS

Floor Tie-Down Rings are used to secure large material to the floor of the container in place of the pallet rack stanchions with ratchet straps and have a load limitation of 5,000 lb.



END OF WORK PACKAGE

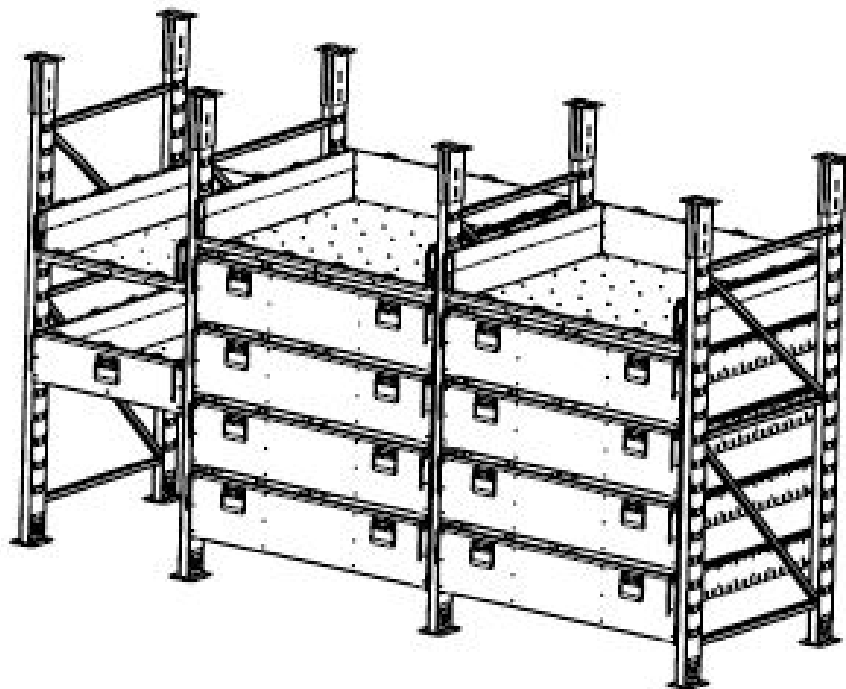
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OPERATOR INSTRUCTIONS

FPU® SYSTEMS OPERATION MANUAL (INCLUDING REPAIR PARTS) EXPEDITIONARY CONTAINERIZED AUTHORIZED STOCKAGE LIST (ECASL) BOH FPU Field Pack-up Units

OPERATION OF PARTS STORAGE AIDS

OPERATING ADJUSTABLE DRAWERS (PARTS STORAGE AIDS)



NOTE

All of the following Warnings, Cautions and procedural steps apply to the FPU-20-3 when removing, installing, adjusting and securing the drawers

Adjustable drawer slide ledges have been installed in the FPU-20-3 parts container. These slide ledge assemblies are attached to the vertical rack frame at two locations by four ¼ inch carriage bolts at each point of attachment. Drawers are mounted to these ledges by four bolts on each ledge.

All drawers are full extension and are operationally secured by locking rod handles to prevent opening during transport or accidental closing during use. Drawers consist of fixed longitudinal dividers and moveable transversal dividers that allow adjustment on two-inch centers. Drawers are rated with a maximum load weight limit of 150 lbs. per drawer.

CAUTION

Do not exceed maximum weight limit of 150lbs per drawer. Exceeding load limits may damage slide and drawer systems.

Opening and Closing Drawers (FPU parts only)

WARNING



Use care when opening drawers while containers are on an incline. Physical injury may occur. The container should be placed on as level a terrain as possible and periodically be checked for shift in its position from its level state.

Do not use bottom drawers or pallets as step substitutes when trying to access material located in upper drawers and on pallets. It is recommended that an optional 4-step stairway with handrail be used to access upper drawer and pallet material.



CAUTION

Never allow material to exceed the height of the drawer sides. Material exceeding drawer height will interfere with travel of that drawer and the drawer above.

Opening

Rotate the two locking mechanism handles upward toward the center of the drawer and hold in the open position. Pull out until the locking handles can be released to lock the drawer in the open position.

NOTE

Drawers will lock in both the closed and fully extended position by rotating the handle.

Closing

Rotate the two locking mechanism handles upward toward the center of the drawer and hold in the open position. Push the drawer in until the locking handles can be released to lock the drawer in the closed position.

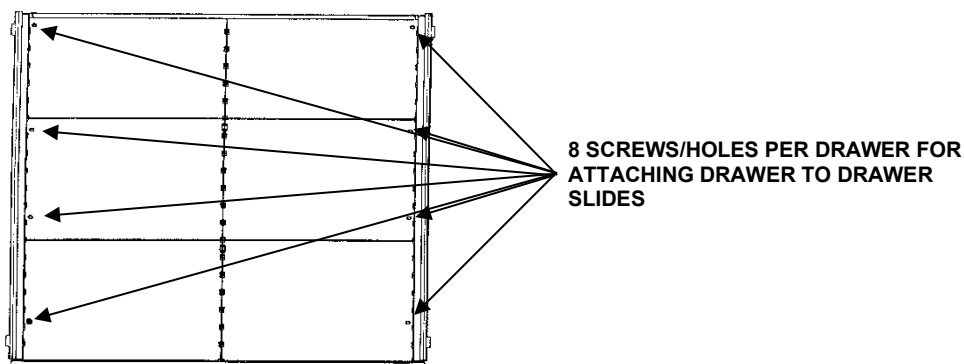


Moving/Adjusting Drawer Dividers

Drawers consist of fixed longitudinal dividers and moveable transversal dividers that allow adjustment on 2-inch centers from front to rear. To move a divider, grasp each side of the divider at the top and pull upward until free. Select the desired position and insert divider into slots on drawer. Be sure divider is inserted into slots directly across from each other. Twelve-inch drawers consist of multiple slots for maximum retention of divider. Ensure divider is engaged in all the slots at the chosen location and is seated completely to the drawer bottom surface.

Repositioning Drawers (front section of the FPU-20-3 Parts Storage Aids only)

1. Fully extend and lock the drawer in open position.
2. Remove all stored material from drawer.
3. Remove eight 1/4-inch screws located in the bottom of the drawer at either side.

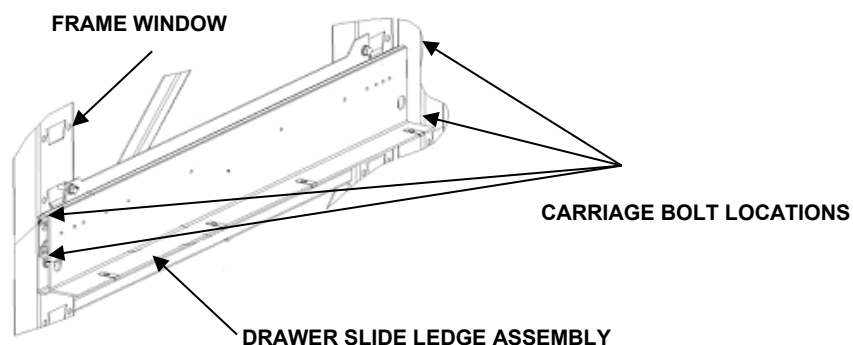


4. Lift drawer from slide ledges.

CAUTION

If a bolt is lost or damaged beyond use, obtain a replacement. Do not install with less than the proper number of bolts, or equipment damage may occur.

5. Loosen, but do not remove, the four front and rear 1/4-inch nuts on the carriage bolts using a 7/16-inch socket with ratchet and extension.



6. Slide ledges are retained on the vertical rack frame by two bayonet tabs; protruding into the windows of the vertical rack frame. This requires the ledge to be loosened from the vertical rack frame. While one person securely holds the slide ledge, the second person applies an upward force by tapping the underside of the ledge at the attached point with a 2 X 4 soft wooden block or similar material.

7. Place the drawer slides ledges in their desired positions by inserting the bayonet tabs into the vertical rack frame windows. Then align the four carriage bolts into their appropriate slots.
8. Tap down on the ledge a 2 X 4 soft wooden block or similar material.
9. Ensure the carriage bolts drop completely down in the slots.

NOTE

Drawers may be adjusted in 4-inch increments.

10. Tighten drawer slide ledge to rack frame by tightening the four $\frac{1}{4}$ -inch carriage bolts and nuts using a $\frac{7}{16}$ -inch socket with ratchet and extension.
11. Reposition the drawer on to the slide ledge careful to align mounting holes.
12. Install all eight bolts and lightly hand-tighten.
13. After hand tightening the eight $\frac{1}{4}$ -inch mounting screws, push drawer completely closed and pull back to its fully-extended position to allow the drawer to seat into its proper location on the drawer slide ledge.

CAUTION

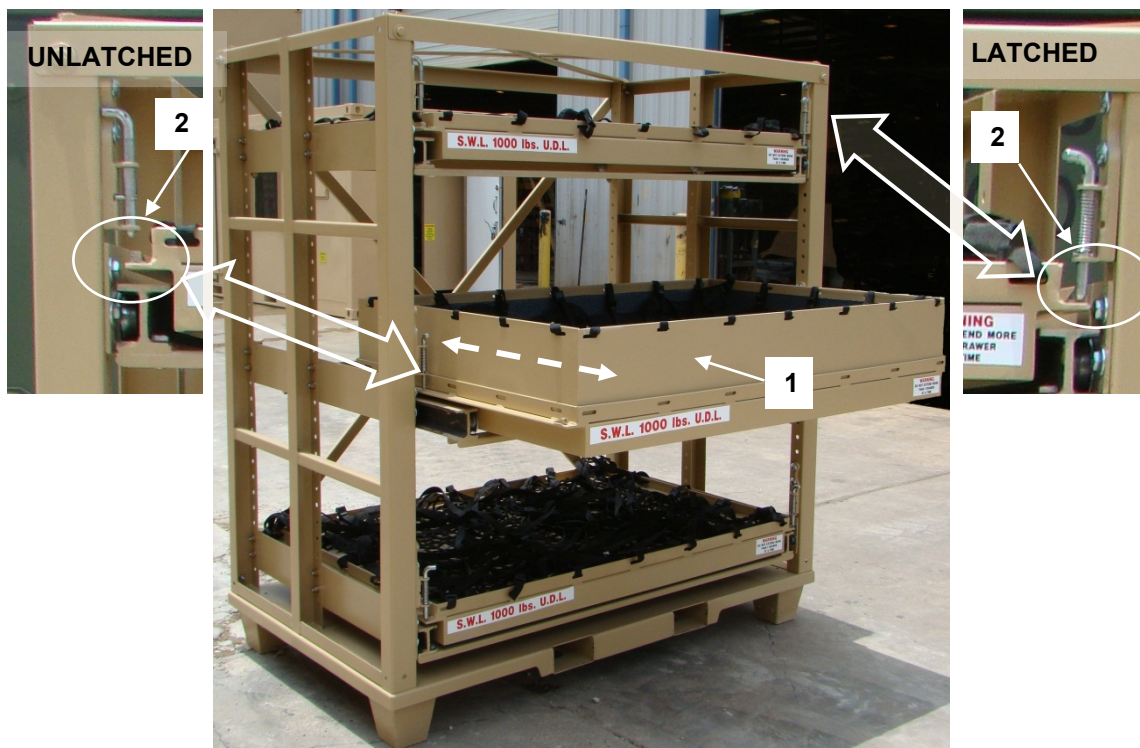
Be careful not to over tighten when securing the eight $\frac{1}{4}$ -inch mounting screws.

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

FPU® SYSTEMS OPERATION MANUAL (INCLUDING REPAIR PARTS) EXPEDITIONARY CONTAINERIZED AUTHORIZED STOCKAGE LIST (ECASL) BOH FPU Field Pack-up Units

OPERATION OF BULK STORAGE MODULE



Note: ECASL #1 consists of Bulk Modules #3 which includes 3 bins (example above includes only one center bin)

The FPU BULK MODULE system is designed to store and ship bulk materials. Trays and battery storage bins come in 75% extension slides and have maximum capacities of 1,000 lbs. Cargo nets are provided to retain material during transportation.

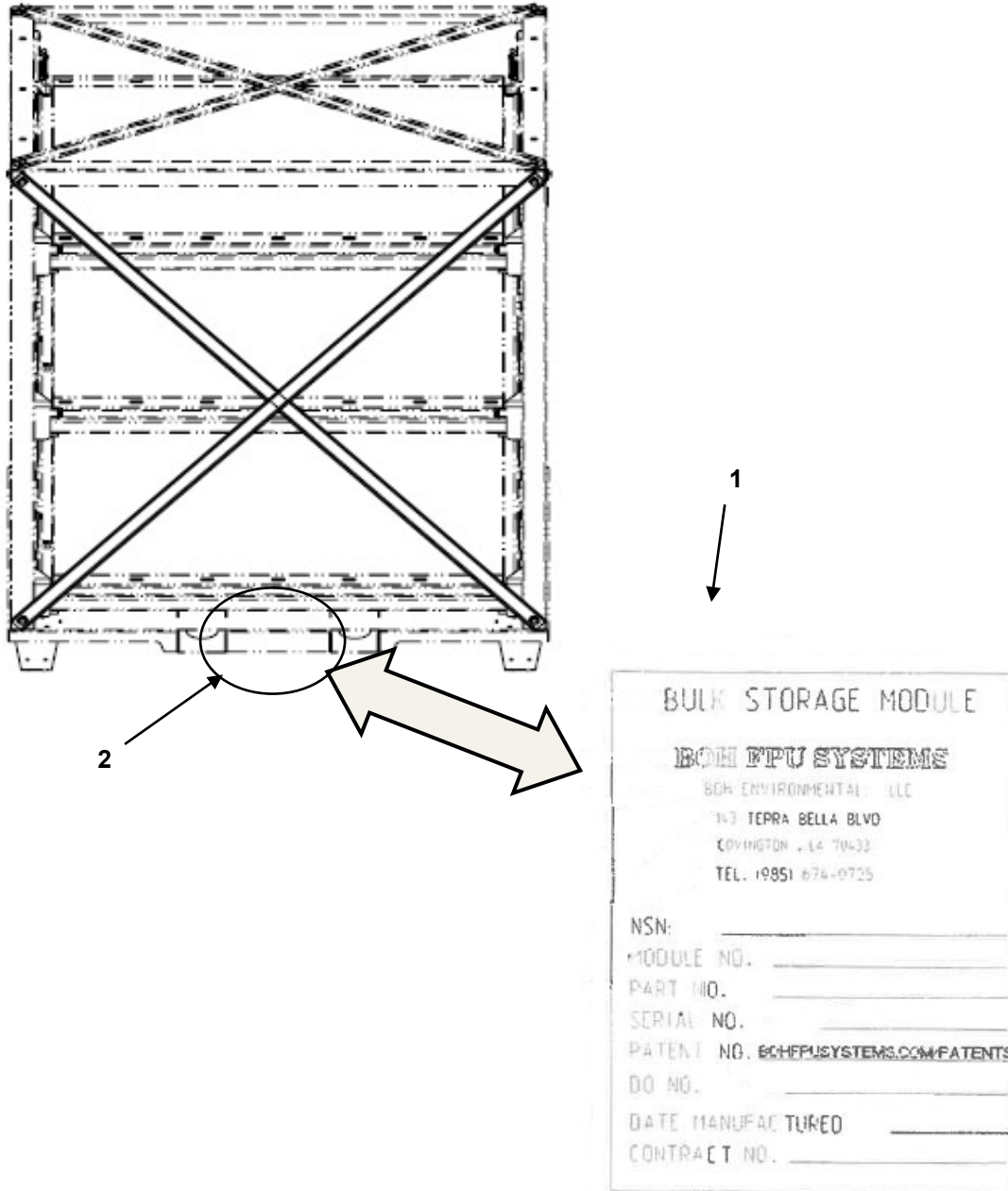
WARNING



Always operate one bulk tray or bin (1) at a time and return and secure the tray or bin (1) before operating another one. Ensure that both latch bolt levers (2) are latched and the tray or bin will not roll free. Failure to do so may cause injury or damage to equipment.

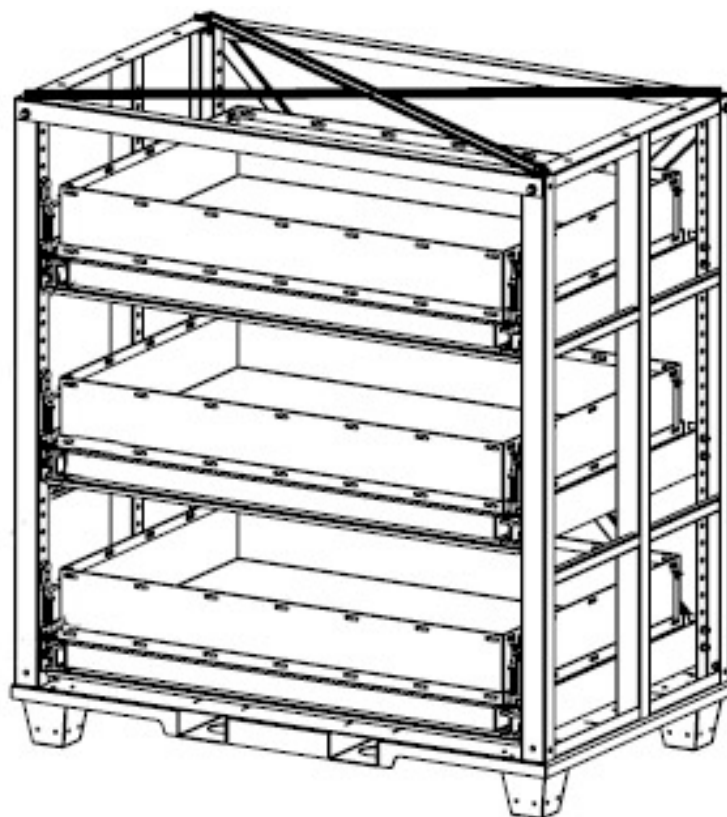
Module Data Tag Location

The Bulk Storage Module data tag (1) is located at the rear bottom of the module (2).



FPU BULK STORAGE/SHIPPING MODULE

The FPU BULK MODULE is basically the hull with optional shelves that can be easily installed to fit storage and transport needs. The Trays and Bins can be easily repositioned for various height requirements. The trays can be easily adapted to an 8 inch depth bin with a simple adapter kit.



**Configuration # 3
Three Bins 8" Deep**

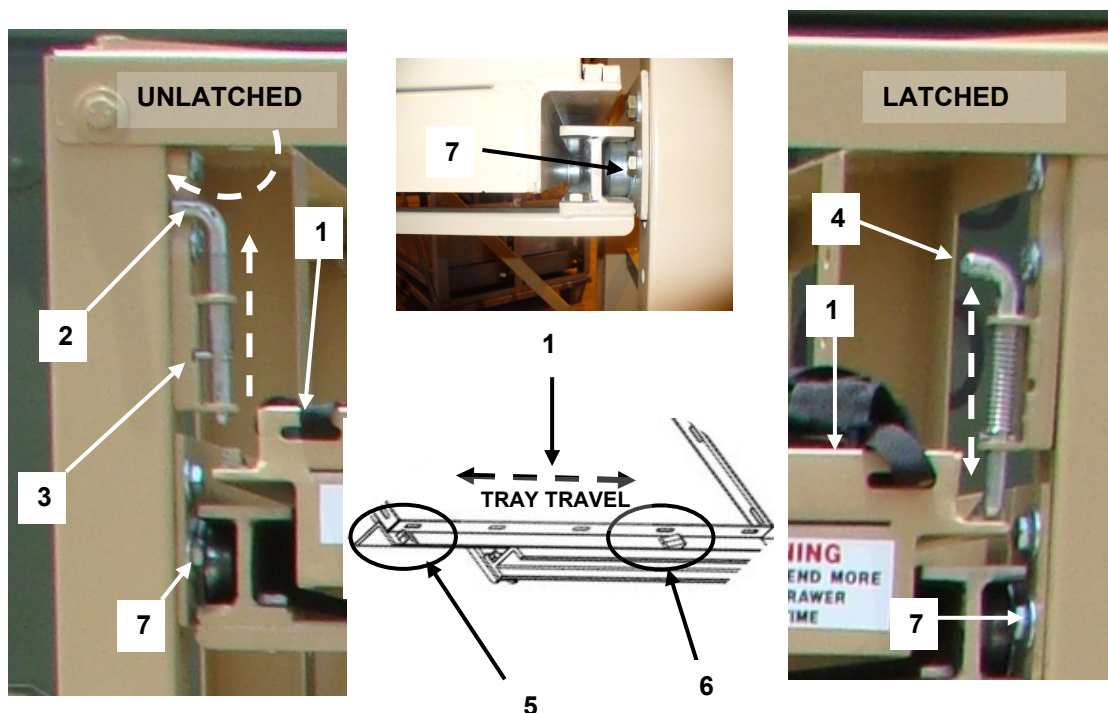
Tray or Bin Retaining Latch bolts and Stop Cams

The drawers are retained by a left and right spring-loaded latch bolt against a front stop cam.

1. To pull the tray or bin (1) out, raise and rotate left latch bolt (2) until the pin (3) is engaged in the retaining slot and remains in the up position.
2. Retain the tray or bin (1) position with the left hand and raise the right spring loaded latch bolt (4) and pull the tray or bin forward to move the front cams (5) past both latch bolts (2 and 4).
3. Once the tray or bin front cams (5) are past the latch bolts (2 and 4), release the right latch bolt (4) and rotate the left latch bolt (2) allowing them to freely ride on the tray or bin rail, between the front (5) and rear cams (6).
4. Pull the tray or bin (1) to the full out position until the rear cams (6) flat edge engages both latch bolts (2 and 4). This will prevent the tray or bin (1) from rolling back; the frame bolts (7) and rollers act as a stop to prevent the tray or bin (1) from coming completely out of the frame.
5. To return the tray or bin (1), raise and rotate left latch bolt (2) until the pin (3) is engaged in the retaining slot and remains in the up position.
6. Retain the tray or bin (1) with the left hand and raise the right spring loaded latch bolt (4) and push the tray or bin forward to move the rear cams past the latch bolts.
7. Once the tray or bin rear cams (6) are past the right latch bolt (4), release the right latch bolt to allow it to ride freely on the rail between the front and rear cams (6).
8. Push in the tray or bin (1), until the right latch bolt (4) rides over the front cam (5).
9. Rotate the left latch bolt until the retaining pin is disengaged from the retaining slot and ensure the latch pin is seated in front of the front cam.

NOTE

The right latch bolts (4) do not have a retaining pin and must be held in the unlatched position until they pass the front or rear cams (5 and 6).



Drawer Adjustment

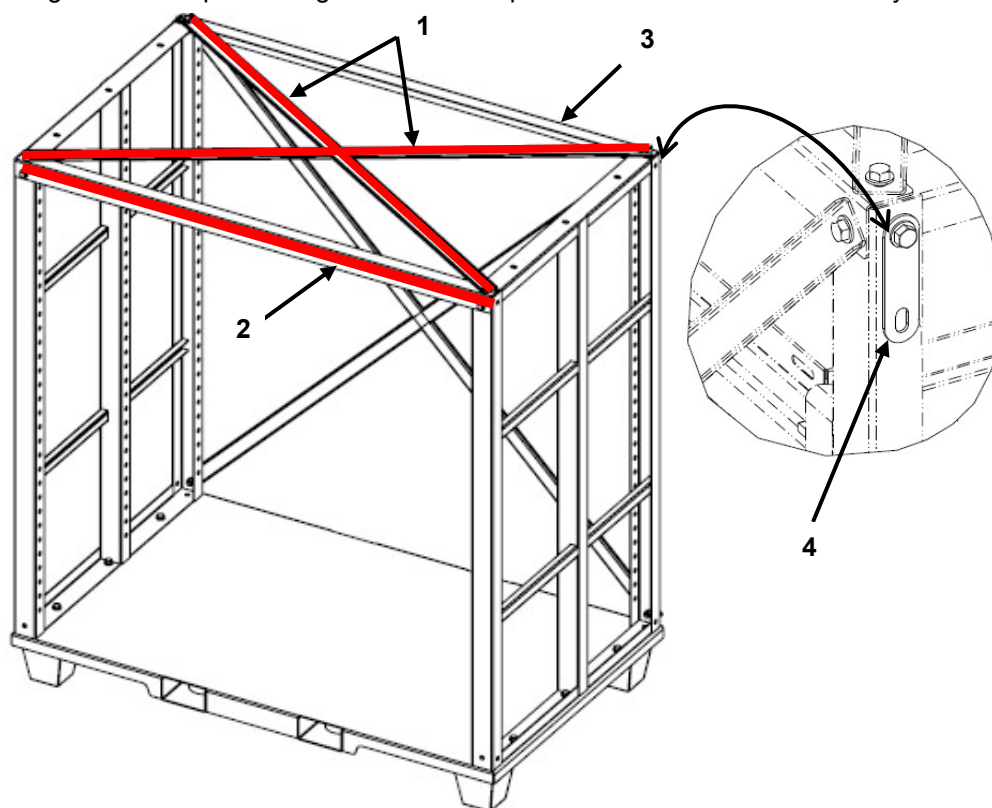
For drawer adjustment procedures, see Chapter 5 WP 0029.

WARNING

Never remove the top spreader bar (1) or top cross members (2) as this will cause the module and drawers to become unstable. Failure to comply could cause damage to equipment, serious injury or even death.

FPU Bulk Module Hull

The FPU Bulk Module has a sturdy hull (3) with a base with fork pockets and has side frames that have mounting holes for repositioning shelves and top and back cross bars for stability.



NOTE

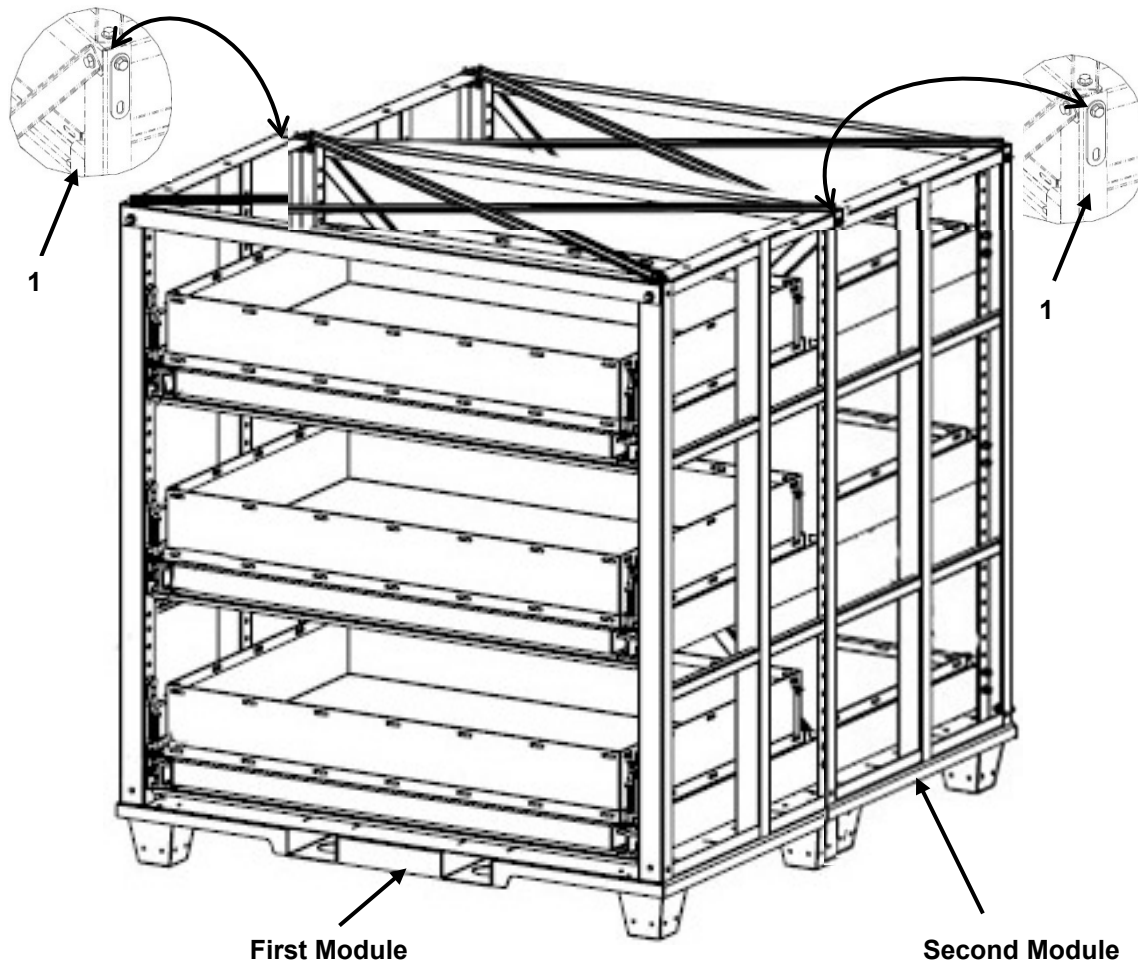
The hull (3) is provided with a rear securing bracket (4) on the right side to connect bulk modules back to back using the existing hull hardware.

Back to Back Connection

WARNING



In a warehouse setting, connect two FPU Bulk Modules back to back with the securing brackets (1) on the right rear to ensure a stable operating platform and prevent tipping of the unit. Always operate one tray or bin at a time and return and secure that tray or bin before operating another one. Ensure the latch bolt lever is engaged and the tray or bin will not roll free. Failure to do so may cause damage or injury.

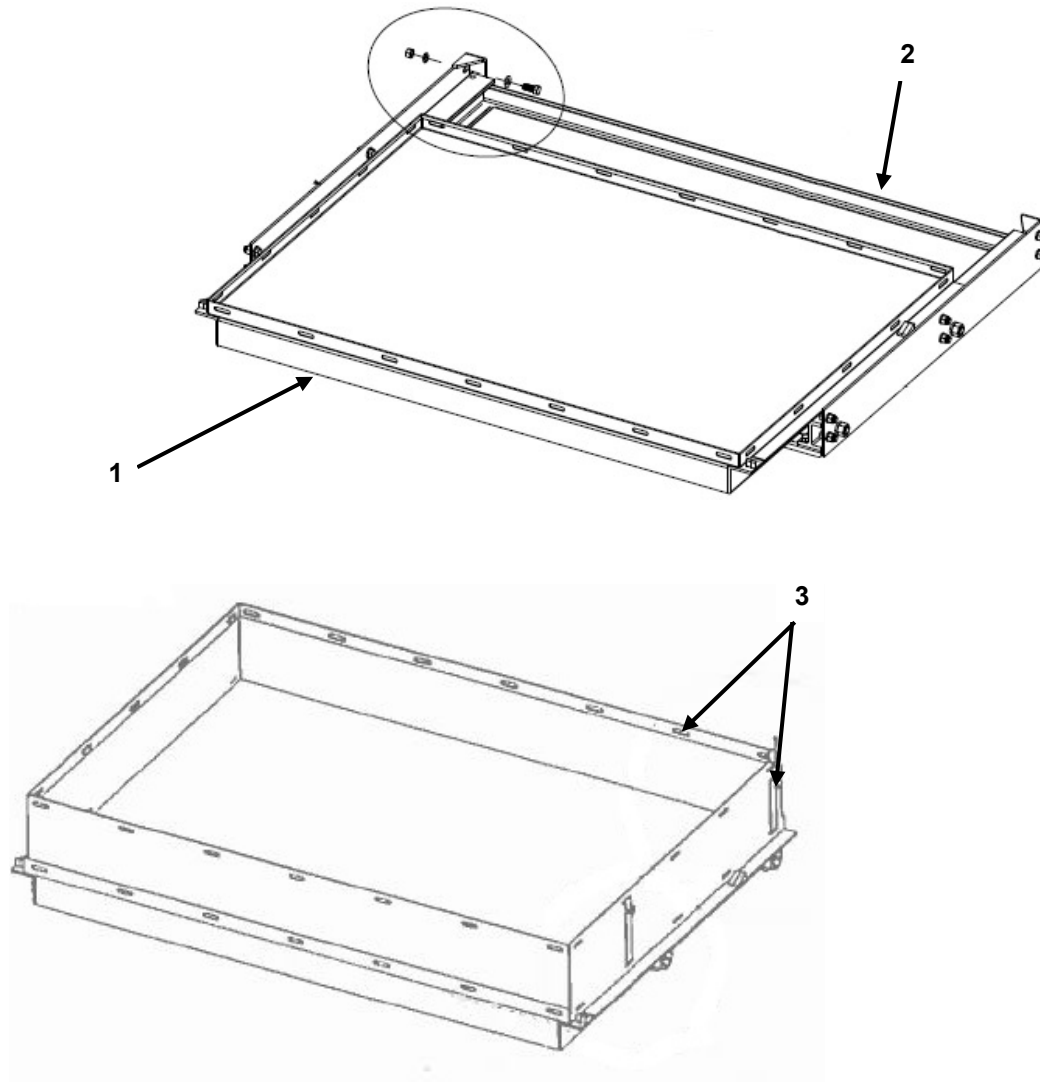


NOTE

Each hull is provided with one rear securing bracket (1) on the right side to connect bulk modules back to back using the existing hull hardware.

Tray or bin, Roller Hull and Side walls

The trays (1) are on roller bearings within a roller frame (2), so the trays or bins can be mounted in various positions. There is a kit with mounting brackets and side walls (3) to create a depth of 8" for the conversion of a tray to a bin.



WARNING



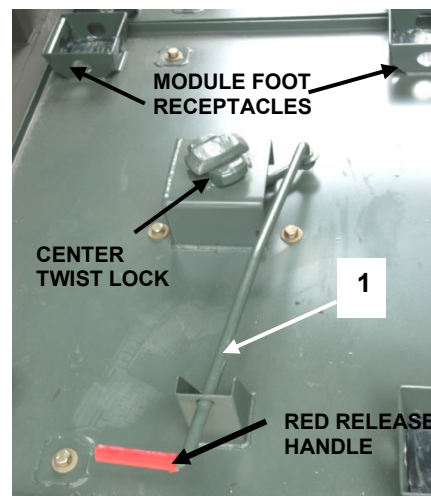
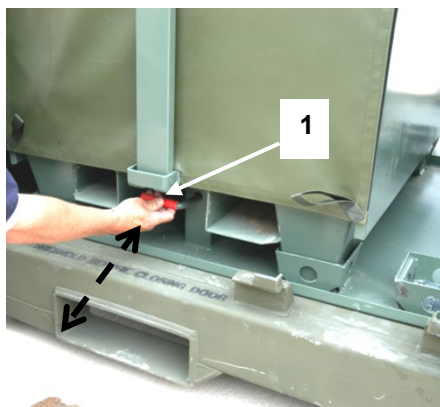
When storing batteries consult; Federal Specification Batteries, Storage, Industrial, Automotive, PPP-B-140C March 1, 1993

REMOVABLE CRADLE

Each removable cradle secures two FPU Standard Modules or one FPU Bulk Module in the rear section of the FPU-20-3 container using 4 receptacles with rubber pads and a center twist lock for each of the two positions provided. The center twist lock connects to a female receptacle located on the bottom of FPU Modules. Removable cradles are affixed to the 8-ft end of the FPU-20-3 container using twelve hex head bolts.

To lock FPU Modules into the FPU-20-3 container with removable cradle installed, push the red handles completely in, after module has been seated in position.

To remove the module, pull the red handle completely out.



REMOVABLE CRADLE

CAUTION

Verify that the module is properly seated and the red handle on the module-locking arm (1) is pushed completely to its closed and locked position.

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

FPU® SYSTEMS OPERATION MANUAL (INCLUDING REPAIR PARTS) EXPEDITIONARY CONTAINERIZED AUTHORIZED STOCKAGE LIST (ECASL) BOH FPU Field Pack-up Units

OPERATION OF FPU STANDARD STORAGE MODULES

BOH FPU STANDARD PARTS MODULES



STANDARD PARTS MODULES

BOH Environmental currently offers six classes (variations) of standard shipping/storage modules for the shipping/storage of small, intermediate and bulk parts. ECASL Systems can include up to four different modules including Module #21 (class 6), Module #22 (class 5), Module #23 (class 2), and Module #26 (class 1).

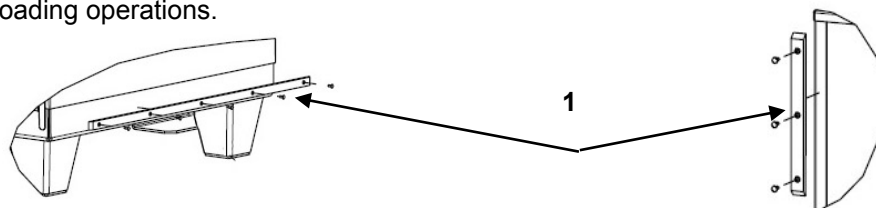
Modules measure 74" (H) x 34"(W) x 42"(D) and are capable of holding a cross section of drawers from 4" to 16" in depth. These drawers have a design-rated capacity from 200 to 400 lbs depending on drawer size. All drawers are full extension (40-inches) and allow full access to stowed material. Drawers are adjustable in 3-inch increments. Small to intermediate parts storage/shipping modules are available with 4-inch, 6-inch, 8-inch, 10inch, 12-inch, and 16-inch deep drawers.

Compartments are adjustable in 2" increments from front to back and vary side to side depending on the drawer size. Maximum drawer compartments in the ECASL System modules include:

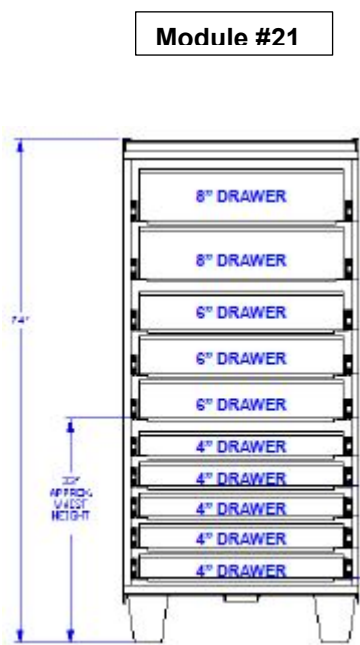
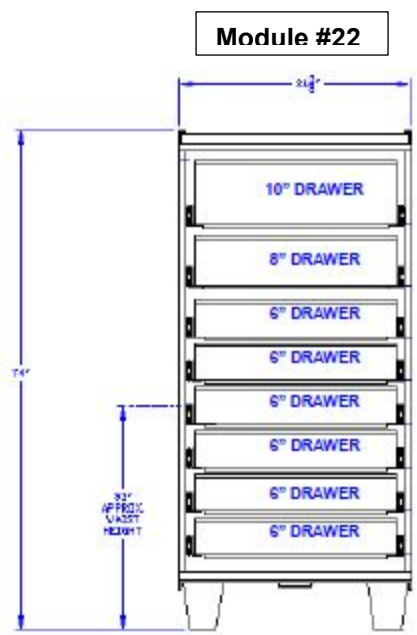
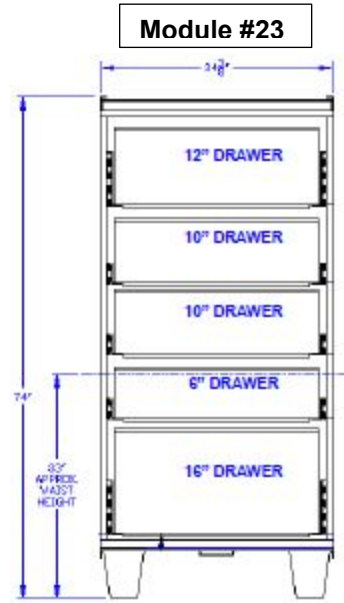
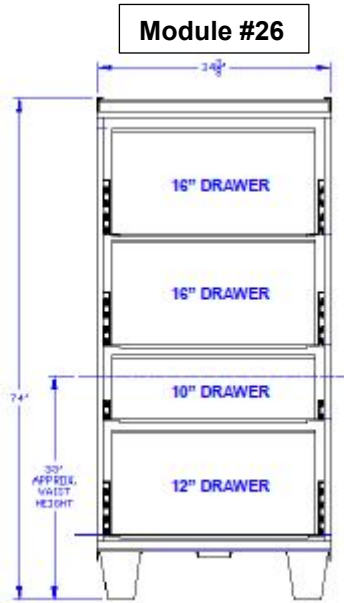
- Module #21: 308 standard compartments (expandable to 920)
- Module #22: 192 standard compartments (expandable to 720)
- Module #23: 48 standard compartments (expandable to 262)
- Module #26: 30 standard compartments (expandable to 186)

NOTE

All Modules are provided with non-metallic side and rear bumper strips (1) to prevent metal to metal contact during loading operations.

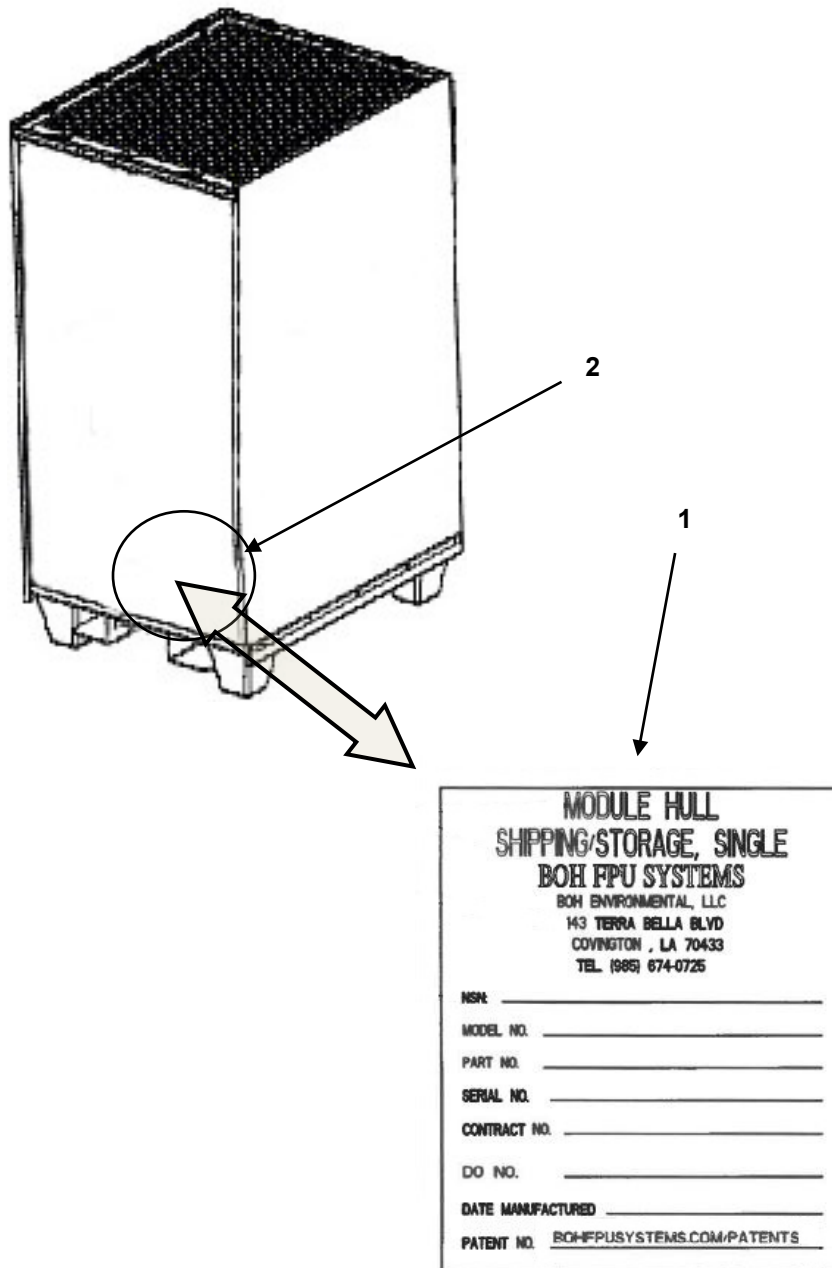


ECASL STANDARD PARTS MODULES



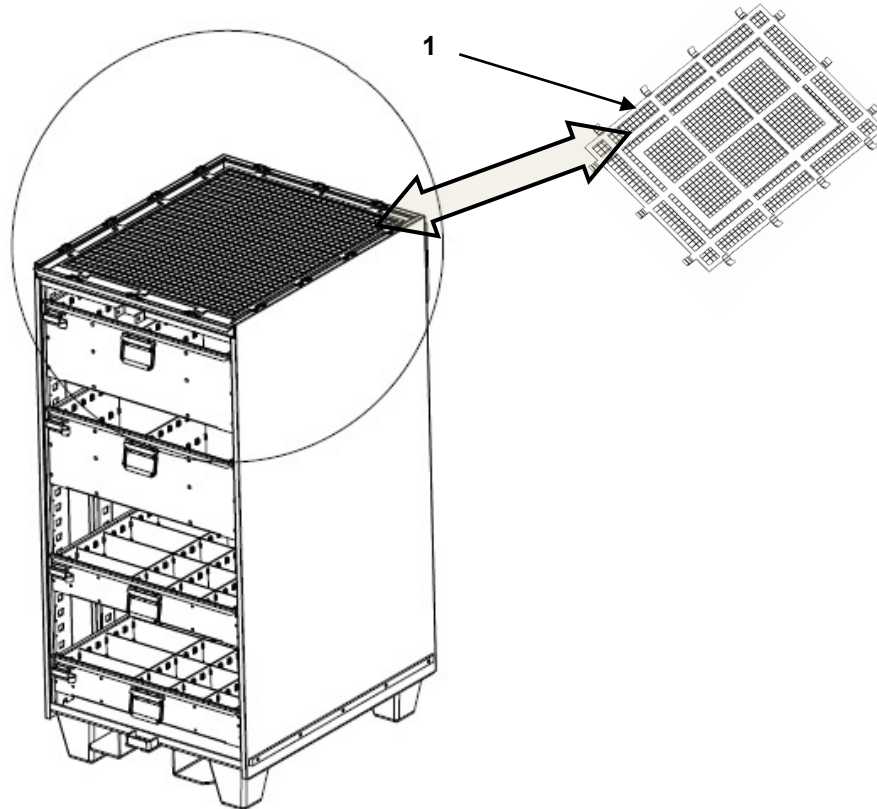
Module Data Tag Location

The module data tag (1) is located at the rear bottom right corner of the module (2).



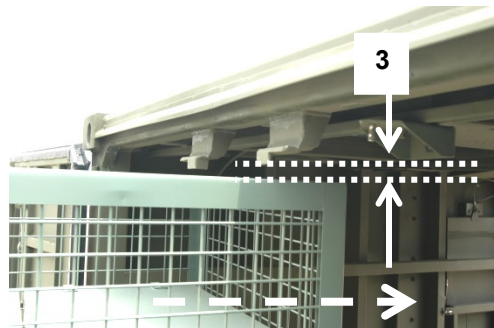
MODULE TOP LOW PROFILE BULK PAN

Each Standard module has a recessed bulk material, area on the top of the module with a restraint net (1).



CAUTION

Always consider the container loading and lifting clearance (3) before loading any modules with material.

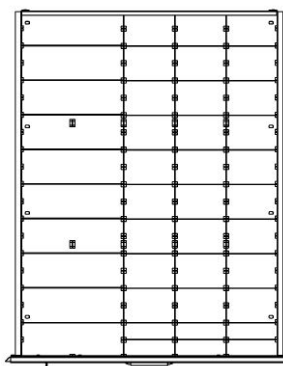
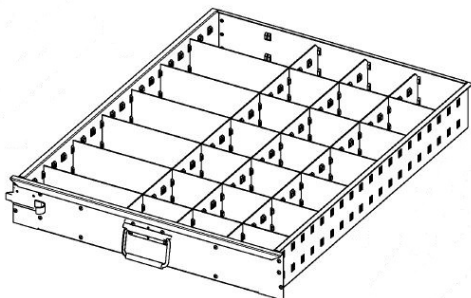


WARNING

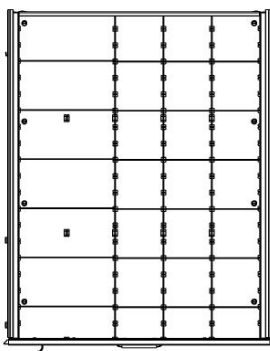
Keep clear and do not attempt to push material down while the module is being loaded.

MODULE DRAWERS

There are various prescribed divider sets provided with each size standard module drawer. The drawer divided segments can be customized with additional optional sets of dividers.



ALT. DRAWER
CONFIGURATION

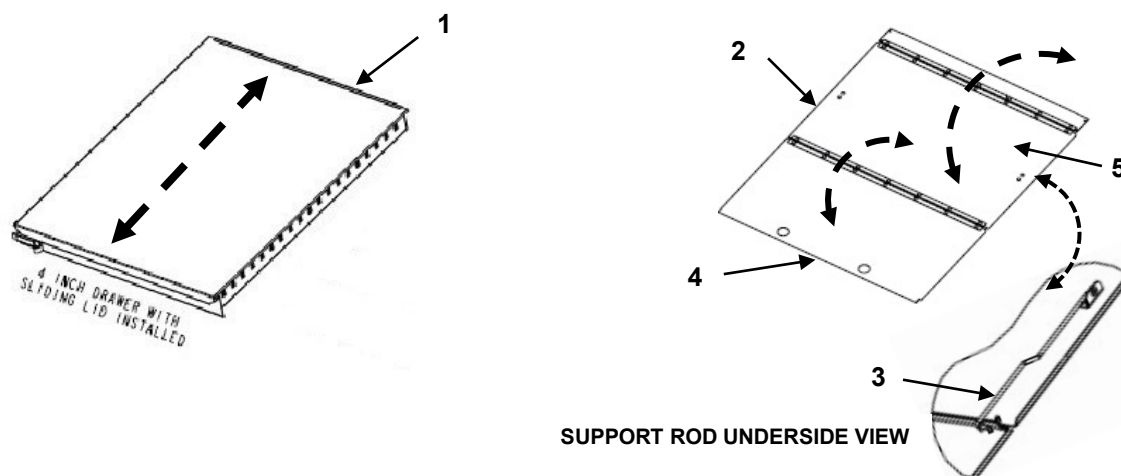


STANDARD DRAWER
CONFIGURATION

The drawer segments can be easily enlarged or reduced by simply adding or removing dividers.

THE FOUR INCH DRAWER COVERS

There are two versions of the 4" drawer lid to provide debris control and containment of very small parts during shipment. The sliding lid version (1) slides over the drawer from the front and covers all the dividers. An older folding lid version (2) is double hinged and has a support rod (3) located underneath each side. When the lid is raised the rod supports the lid for easy access to the material.



Note

The folding 4" drawer lid is an older version and is available, CAGE 1NSG3 P/N16020424

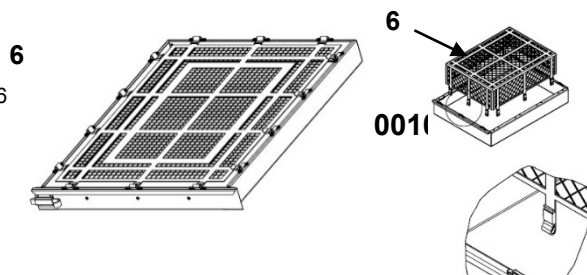
Opening Folding Lid Cover

1. Grasp the front portion of the lid (4) by the two front finger holes and lay it back onto the rear lid portion (5).
2. Grasp the front edge of the rear lid portion (5) and raise it until the support rods (3) are engaged and the lid (2) is supported in the fully open position.



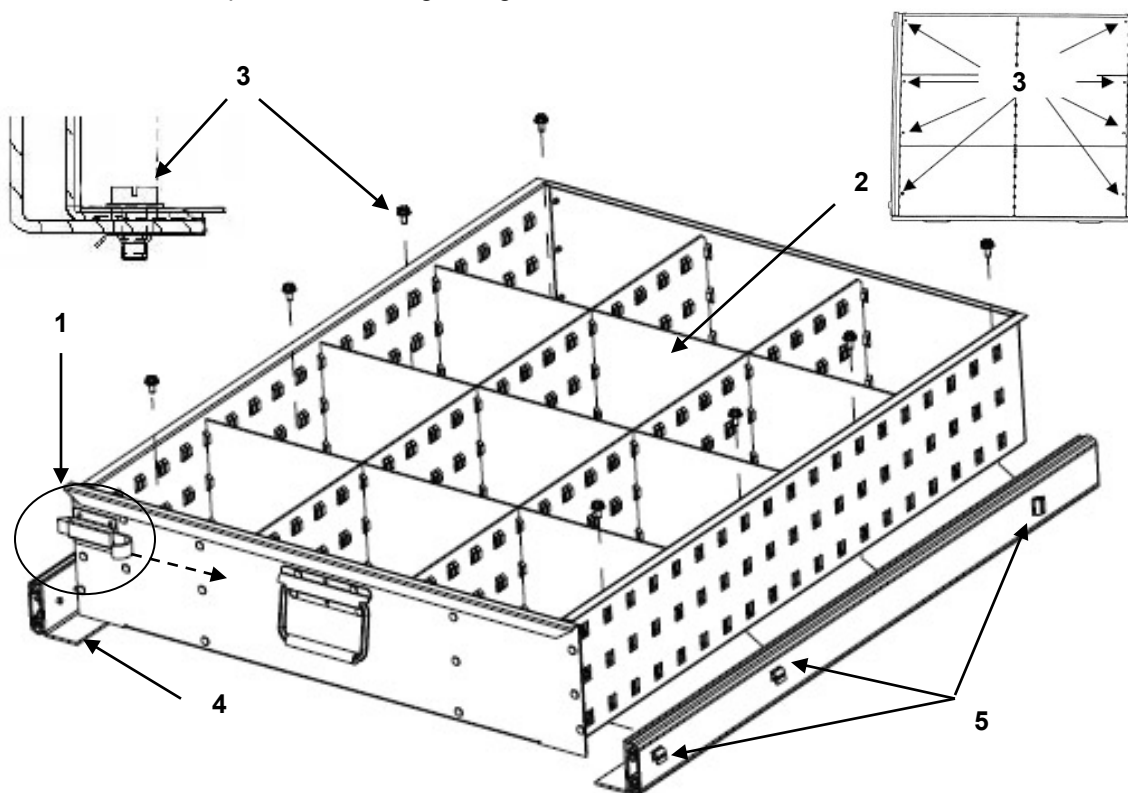
There is a 4" bulk drawer version with a net (6) secured through the use of footman loops (7) around the edge of the drawer.

BOH-PM-16-2
Chapter 2 Rev. 2.06



DRAWER REPLACEMENT

Although the standard modules come in prescribed drawer configurations, there are optional drawers of various sizes that can replace the existing configuration.

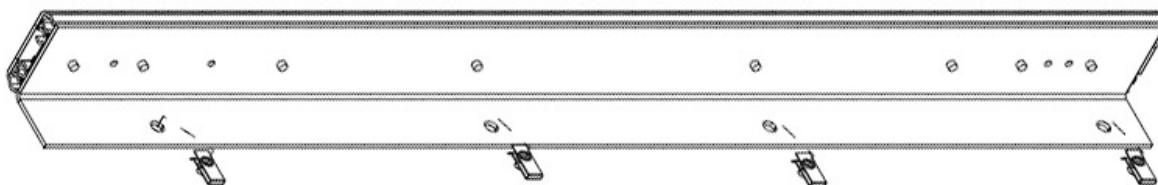


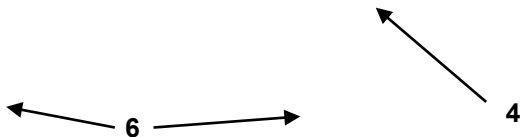
Drawer Removal

1. Release the slam latch (1) on the left side of the drawer.
2. Pull the drawer to the full out position.
3. Remove the material and divider set (2).
4. Remove the eight cap screws (3) on the interior of the drawer with the 7/16" socket wrench.
5. Lift the drawer from the bearing sliders (4).
6. Remove the two set screws that secure the slide to the module housing.
7. Use a block of wood and hammer to tap the sliders (4) up to disengage the tabs (5) and cleats.

Bearing Drawer Slides

The drawers are attached to the roller slides (4) by means of auto thread clips (6) and screws (3).

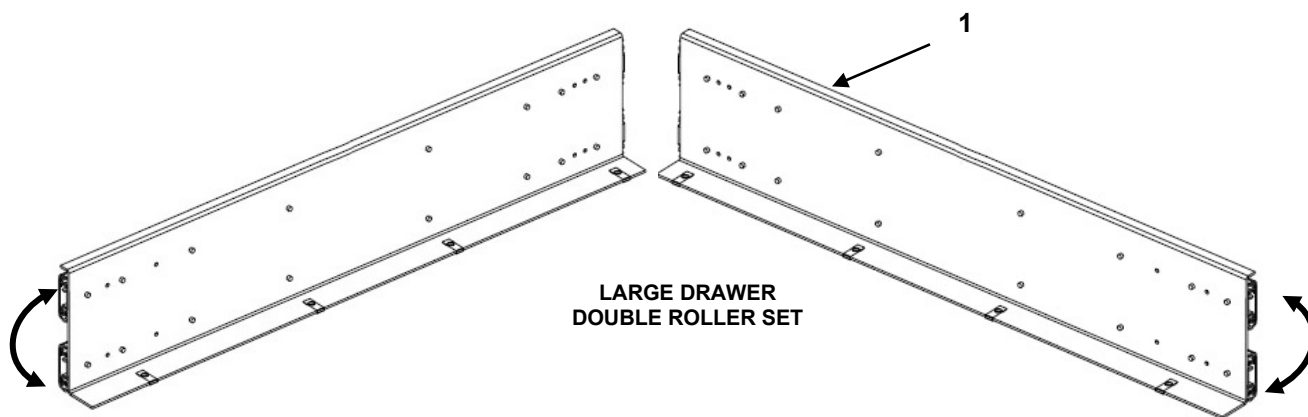




There are two sizes of drawer slides, a single roller and double rollers (1) for the large drawers.

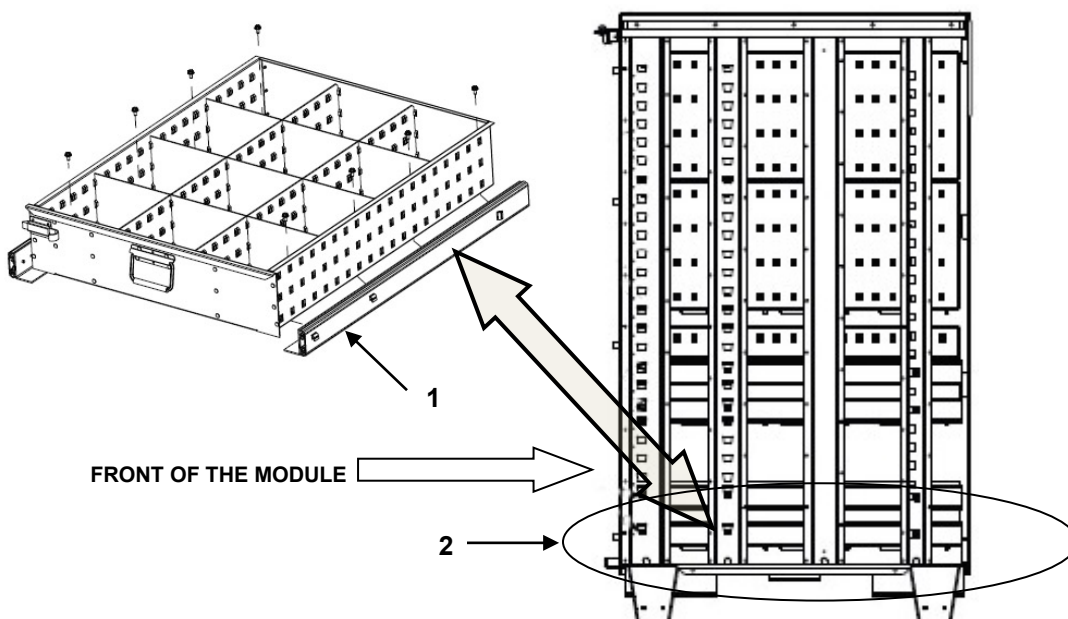
Note

The drawer slides (1) come in left and right pairs as part of a drawer replacement kit and are matched to the drawer size.



To attach the drawer slide

1. Align the three sets of tabs on the back of the slide and tab holes in the three uprights.
2. Tap the slide down with a block of wood until the slide is level and secure within the tabs.
3. Install the two set screws that secure the slide (1) to the module housing.
4. Insert the drawer and tighten the eight cap screws with the 7/16" wrench.
5. Push the drawer to the full in position till the slam latch is engaged.



**SIDE VIEW WITH SIDE PANEL
REMOVED FOR CLARITY****PADLOCK SECURITY BAR**

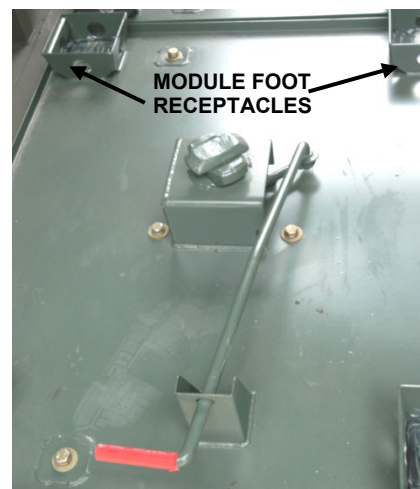
All Standard Modules material drawers are retained by means of a pad lockable security bar.

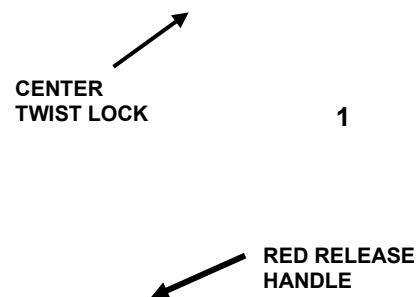
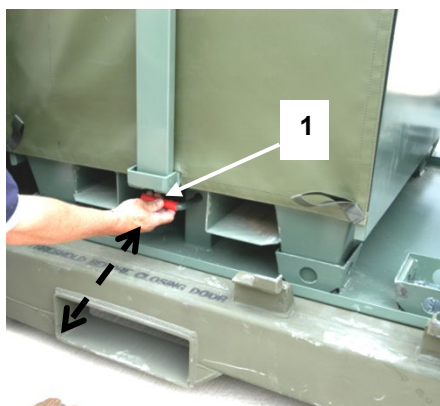
**REMOVABLE CRADLE**

Each removable cradle secures two FPU Standard Modules or one FPU Bulk Module in the rear section of the FPU-20-3 container using 4 receptacles with rubber pads and a center twist lock for each of the two positions provided. The center twist lock connects to a female receptacle located on the bottom of FPU Modules. Removable cradles are affixed to the 8-ft end of the FPU-20-3 container using twelve hex head bolts.

To lock FPU Modules into the FPU-20-3 container with removable cradle installed, push the red handles completely in, after module has been seated in position.

To remove the module, pull the red handle completely out.





REMOVABLE CRADLE

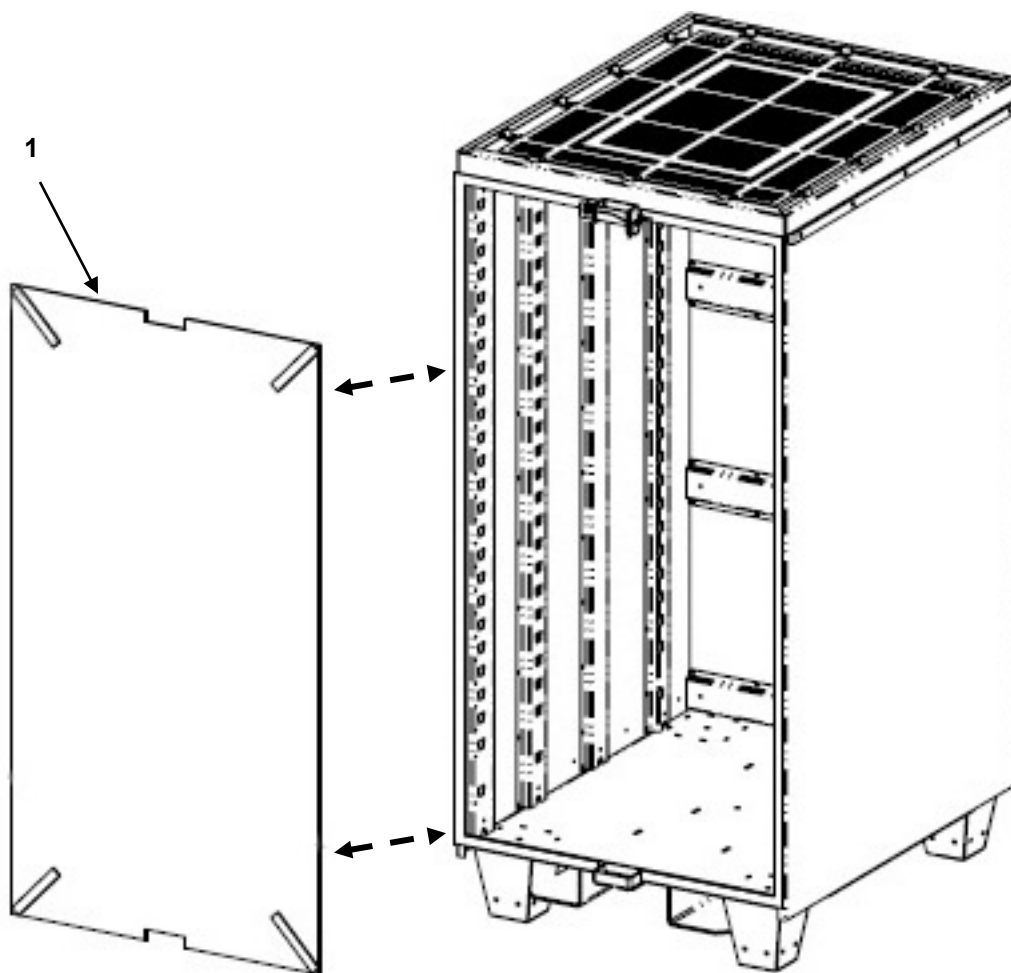
CAUTION

Verify that the module is properly seated and the red handle on the module-locking arm (1) is pushed completely to its closed and locked position.

STANDARD MODULE FRONT VINYL COVER

Each module is provided with a black vinyl weather protection fitted cover (1), for basic weather protection, attached by Velcro strips and removed by with nylon straps (2).

1. Place the cover (1) over the module front, attach with the hook and pile Velcro.



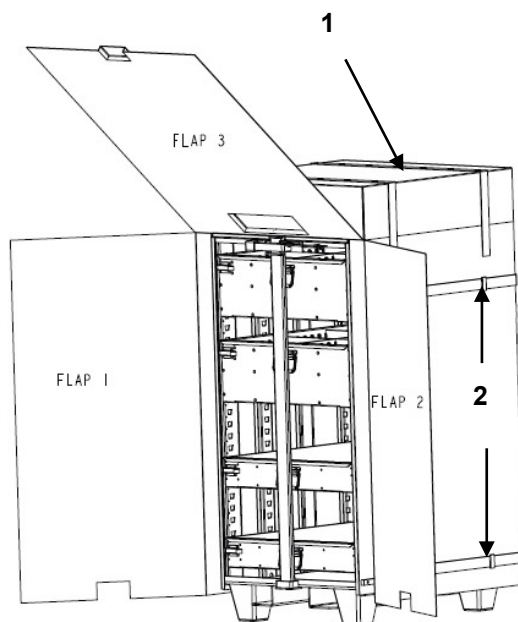
**Note**

Drawers removed for clarity

OPTIONAL VINYL WEATHER PROTECTION COVER

Optional black vinyl weather protection fitted cover (1) is attached by Velcro strips and adjustable nylon straps (2).

1. Place the cover (1) over the module. Fold over flap #1, then flap #2, then fold down flap #3 and adjust the straps (2).



Optional Module Casters

NOTE

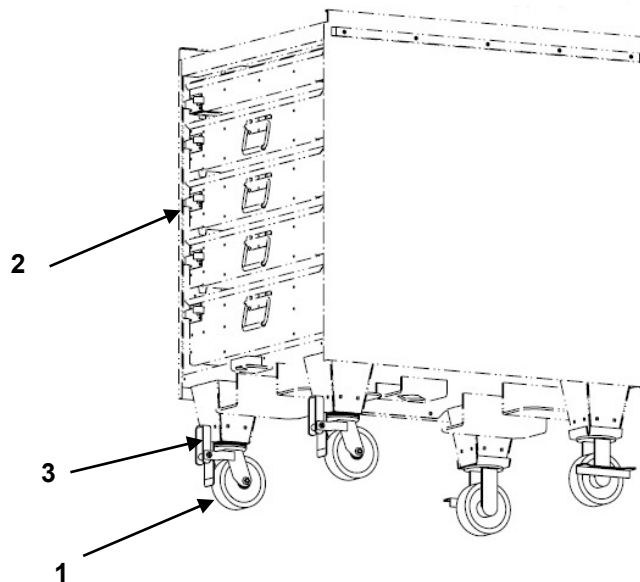
These casters (1) are not designed or intended to be used on the FPU Bulk Modules.

A set of casters (1), is available for ease of movement and positioning in a warehouse setting. The casters fit the Standard and specialized modules, mentioned in this manual.

These casters (1) are designed for concrete and other firm surfaces, and are not intended for dirt, sand, mud or snow.

NOTE

The casters with foot brake pedals (3), should always be installed in the front of the module (2). This position provides access to the locking foot brake pedals (3) and access to the front of the module (2).



WARNING

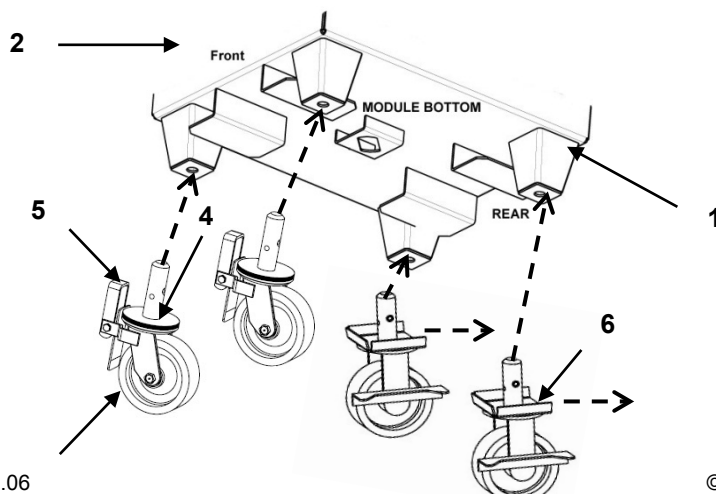


Never install these casters (1) in the FPU Bulk Module; the casters (1) would collapse under the extreme weight of the FPU Bulk Module load. Never attempt to roll a module with casters (1) up/down a ramp or incline. Failure to comply may cause injury, death or damage to the equipment.



Installing the Casters

1. MHE support is required to install the casters into the module feet (1).
2. Forklift tines, should maintain approximately 18-inches between the forklift-bridge and module (2), to prevent interference installing the casters.
3. A ground guide must be present during this operation and direct all movement of the MHE.
4. Elevate the desired module (2) approximately 3 feet to gain access to the holes in the module feet (1).
5. Position the front caster with the foot brake pedal (5) facing the front of the module (2).
6. From the right side of the module, insert the front caster (3), until the base (4) mates with the bottom of the foot (1).
7. Position the rear caster (7), with the open flange, facing the rear of the module (2).
8. Insert the rear caster (7) with the base opening (6) facing the rear until the base mates with the module foot (1).
9. Proceed to the left side of the module (2) and repeat steps 1 through 8.
10. With the casters in place, lower the module (2) to the ground.
11. Disengage the forklift.
12. Test the brakes by depressing both foot pedals (5) and attempting to move the module (2).
13. The module (2) should not move.
14. Release the brakes by raising the foot pedals (5) and move the module (2).
15. When the module (2) is in the storage position, set both brakes by depressing the foot pedals (5).



3

7 →

WARNING

Standard MHE practices apply; a ground guide will direct all MHE movement. Always operate the modules with casters on a level firm surface. Never attempt to roll a module with casters up/down a ramp or incline. Failure to comply may cause injury, death or damage to the equipment. Failure to set the brakes on the casters may cause unwarranted movement and may cause injury, death or damage to the equipment.

NOTE

The rigid casters (6) are no longer available as of February 2017. A module caster set will now include four swivel casters (3).

END OF WORK PACKAGE

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OPERATOR INSTRUCTIONS

FPU® SYSTEMS OPERATION MANUAL (INCLUDING REPAIR PARTS) EXPEDITIONARY CONTAINERIZED AUTHORIZED STOCKAGE LIST (ECASL) BOH FPU Field Pack-up Units

OPERATION UNDER UNUSUAL CONDITIONS

INITIAL SETUP:

ECASL Downloaded and Operating

Maintenance Level

Operator/Crew

Personnel Required

Two (plus one supervisor)

OPERATION UNDER UNUSUAL CONDITIONS

This work package provides instructions for the operation of the ECASL System under unusual conditions. These include adverse weather, nuclear, biological and chemical attack.

Operation in Rain and/or Mud

1. Provide an adequate drainage ditch to prevent standing water around the ECASL system components.
2. Secure all accessories and container during extremely harsh rain.

Operation in Extreme Heat

WARNING



In extreme heat, do not touch metal parts with bare hands. Severe skin damage may result.

Operation in Snow, Ice, or Extreme Cold

WARNING



In extreme cold, do not touch metal parts with bare hands. Severe skin damage may result.

Fording

The ECASL system components are not watertight. It should never be submerged in any depth of water or material damage may result. When mounted on a PLS, PLS trailer or HEMTT-LHS truck, hard-bottom water crossings no deeper than approximately two feet can be forded. When in doubt, refer to Unit Standard Operating Procedures.

Interim Nuclear, Biological, and Chemical (NBC) Decontamination Procedures

WARNING



The ECASL system components are NOT designed to be operated in contaminated NBC Environments. Do not operate this system in contaminated NBC environments. If possible, cease operation of the system prior to an NBC event and close all doors.

END OF WORK PACKAGE