



**BALTIMORE  
AIRCOIL COMPANY**



**HXV**

# **HXV Hybrid Cooler**

**RIGGING & ASSEMBLY INSTRUCTIONS**



**HXV Hybrid Coolers should be rigged and assembled as outlined in this bulletin.**

These procedures should be thoroughly reviewed prior to the actual rigging and assembly of the equipment to acquaint all personnel with procedures to be followed and to ensure that all necessary equipment will be available beforehand. If unusual circumstances require a departure from the procedures outlined in this manual, contact your local BAC Representative for guidance.



Be sure to have a copy of the certified drawings available for reference. If you do not have a copy of these drawings, or if you need additional information about this unit, contact your local BAC Representative for guidance. For reference, the model number and serial number of the unit will be on a label by the access door.



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# Introduction

**WARNING:** Failure to use designated lifting points can result in a dropped load causing severe injury, death, and/or property damage. Lifts must be performed by qualified riggers following BAC published Rigging Instructions, and generally accepted lifting practices. The use of a supplemental safety sling may also be required if the lift circumstances warrant its use, as determined by the rigging contractor.

**CAUTION:** Only personnel qualified to do so should undertake operation, maintenance and repair of this equipment. Proper care, personal protective equipment, procedures and tools must be used in handling, lifting, installing, operating, maintaining and repairing this equipment to prevent personal injury and/or property damage.



## Safety

Adequate precautions appropriate for the installation and location of these products should be taken to safeguard the equipment and the premises from damage and the public from possible injury. **The procedures listed in this manual must be thoroughly reviewed prior to rigging and assembly. Read all warnings, cautions, and notes detailed in the margins.**

When the fan speed of the unit is to be changed from the factory set speed, including the use of a variable speed device, steps must be taken to avoid operating at or near the fan's "critical speed" which could result in fan failure and possible injury or damage. Consult BAC on any such applications.

## Shipping

HXV Closed Circuit Cooling Towers are factory-assembled to ensure uniform quality with minimum field assembly. HXV models ship in three sections per cell (lower section, wet coil section, and dry coil section). For the dimensions and weights of a specific unit or section, refer to the certified drawings.

## Pre-Rigging Checks

When the unit is delivered to the jobsite, it should be checked thoroughly to ensure all required items have been received and are free of any shipping damage prior to signing the bill of lading.

**The following standard and optional parts and accessories should be inspected:**

- Sheaves and Belts
- Bearings
- Bearing Supports
- Fan Motor(s)
- Fan(s) and Fan Shaft(s)
- Float Valve Assembly(s)
- Water Distribution System
- Coil Surface
- Cold Water Basin Accessories
- Interior Surfaces
- Exterior Surfaces
- Combined Inlet Shields
- Spray Water Pumps
- Hail Guards
- Motor Removal System(s)
- Basin Heaters and Controls
- Access Platform(s)
- Ladder(s), Safety Cage(s), Safety Gate(s)
- Mating Surfaces Between Sections/ Modules
- Miscellaneous Items: All bolts, nuts, washers, and sealer tape required to assemble sections or component parts are furnished by BAC and shipped with the unit. A checklist inside the envelope attached to the side of the unit marked "Contractor's Installation Instructions" indicates what miscellaneous parts are included with the shipment and where they are packed.



### Unit Weights

Before rigging any unit, the weight of each section should be verified from the unit certified drawing. Unit print weights include the final assembled unit with all accessories. Accessory weights (found on the respective drawing) can be deducted from the total weight if the accessories will not be installed during rigging.

### Anchoring

Seven-eighths inch (7/8") diameter holes are provided in the bottom flange of the lower section for bolting the unit to the support beams. Refer to the suggested support drawing included in the submittal for location and quantity of the mounting holes. **The unit must be level for proper operation.** Anchor bolts must be minimum SAE J429 Grade 5 or ASTM A325, and are provided by others. The IBC rating is only certified with standard anchorage locations. Using alternate anchorage locations or alternate steel supports will void any IBC wind or seismic ratings. Contact your local BAC Representative for guidance.

### Nitrogen Charge

Dry coils shipped from the factory are charged with nitrogen to 10 psig. Relieve the pressure using the installed Schrader valve, and cut the caps from the connections. Wet coils shipped from the factory are charged with nitrogen to 15 psig. Relieve the pressure using the installed Schrader valve. Cut and bevel coil connections in accordance with generally accepted industrial practices. If the unit arrives without the holding charge in either coil, contact your local BAC Representative.

### Cold Weather Operation

These products must be protected by mechanical and operational methods against damage and/or reduced effectiveness whenever a unit is operated in freezing ambient conditions. Please refer to the *HXV Hybrid Cooler Operation and Maintenance Manual*, or contact BAC for recommended cold weather operation strategies.

### Location

All evaporative cooling equipment must be located to ensure an adequate supply of fresh air to the unit air intakes. When units are located adjacent to walls or in enclosures, care must be taken to ensure the warm, saturated, discharge air is not deflected and recirculated back to the air intakes.

Each unit should be located and positioned to prevent the introduction of discharge air into the ventilation system of any building. Refer to the submittal for cell orientation. For detailed recommendations on BAC equipment layout, contact your local BAC Representative for guidance.

### Warranties

Please refer to the Limitation of Warranties (located in the submittal package) applicable to and in effect at the time of the sale/purchase of these products.

### Unit Operation

Prior to start-up and unit operation, refer to the *HXV Hybrid Cooler Operation & Maintenance Manual* shipped with the unit.

#### Safety

#### Shipping

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**ATTENTION:** Before an actual lift is undertaken, ensure no water, snow, ice, or debris has collected in the basin or elsewhere in the unit. Such accumulations will add substantially to the equipment's lifting weight.



**NOTE:** Each unit must be located and positioned to prevent the introduction of discharge air into the ventilation systems of the building on which the unit is located and of adjacent buildings.

# 2

## HXV HYBRID COOLER

# Unit Rigging & Assembly

**WARNING:** Failure to use designated lifting points can result in a dropped load causing severe injury, death, and/or property damage. Lifts must be performed by qualified riggers following BAC published Rigging Instructions, and generally accepted lifting practices. The use of a supplemental safety sling may also be required if the lift circumstances warrant its use, as determined by the rigging contractor.

**NOTE:** For weight information, refer to the submittal drawing package.

**NOTE:** All single-cell and multi-cell units must be rigged one section at a time.



### Rigging

Refer to **Table 1** and **Figures 1, 6,** and **7** for each section's required minimum spreader bar length W1 and W2 (if applicable) and the recommended minimum vertical dimension "H". Refer to **Figures 1a, 1b,** and **1c** for dimension reference.

Failure to use lifting provisions can result in a dropped load causing severe injury, death, and/or property damage. Lifts must be performed by qualified riggers following BAC published Rigging Instructions, and generally accepted lifting practices. The use of a supplemental safety sling may also be required if the lift circumstances warrant its use, as determined by the rigging contractor.

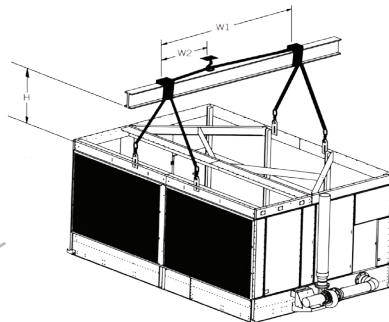


Figure 1a. Lower Section Lift

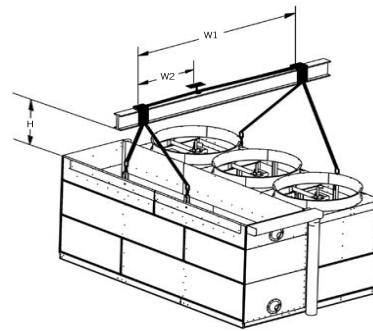


Figure 1b. Upper Section Lift

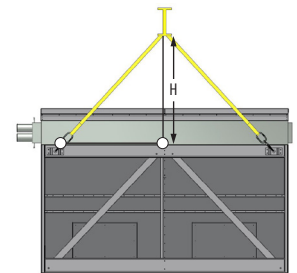


Figure 1c. Hood Lifting

Model Number	Lower Section			Wet Coil Section			Dry Coil Hood		
	H	W1	W2	H	W1	W2	H	W1	W2
HXV-1212x-x	4'-4"	11'-10"	5'-3"	5'-3"	11'-10"	4'-2"	5'-5"	11'-10"	5'-11"
HXV-1218x-x	5'-3"	11'-10"	5'-3"	8'-2"	11'-10"	4'-2"	8'-5"	11'-10"	5'-11"

Table 1. Cold Water Basin Water Levels (Measured from Inside the Cold Water Basin)

### Section Assembly of Three-Piece Cells

1. Remove any accessories shipped in the cold water basin.
2. Position the lower section on the unit supports and bolt in place.
3. Wipe any moisture and dirt from the perimeter mating flanges of the lower section.
4. After the lower section of the unit is in place, retract the lifting ears (where applicable) inside the unit to avoid interference when the upper section of the unit is positioned as illustrated in **Figure 2**.
5. Install flat butyl sealer tape (BAC part # 554000) supplied with the unit, as illustrated in **Figure 3**, on the mating flanges of the lower section in a continuous line. At each corner, allow 1" overlap.

6. Before lowering the upper section onto the lower section, be sure to line up the bolt holes using drift pins as illustrated in **Figure 4** (no fewer than one hole at each edge). Guide the upper section onto the lower section starting with a bolt hole at one corner and following down the flange. Also, ensure spray pump piping is aligned and coil connections are oriented as shown in unit submittal.
7. Secure the upper section in place using bolts supplied with the unit to ensure leak free operation. (**Figure 5**)
8. Before lifting the dry coil section, wipe any moisture and dirt from the perimeter mating flanges of the wet coil section.
9. Install flat butyl sealer tape (BAC part #554000) supplied with the unit, as illustrated in **Figure 3**, on the mating flanges of the wet coil section in a continuous line. At each corner, allow 1" of overlap.
10. Before lowering the dry coil section onto the wet coil section, be sure to line up the bolt holes using drift pins as illustrated in **Figure 4** (no less than one hole at each edge). Guide the dry coil section onto the wet coil section starting with a bolt hole at one corner and following down the flange.
11. Fasten the dry coil section in place using the supplied hardware near the corners and thread forming 5/16" x 3/4" screws in the middle of each face.
12. Connect spray pump riser piping using factory-supplied hardware.



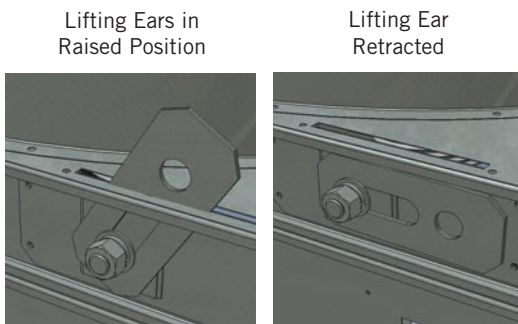
**NOTE:** All piping must be restrained to ensure no vertical or horizontal movement. All piping and supports are to be furnished by others. Piping must be independently supported, not from the unit. Refer to the certified drawing for details on the connection size, etc.



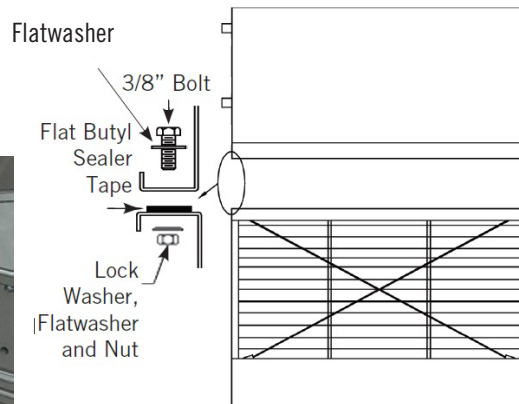
**NOTE:** IBC Rating is void if section assembly is not performed as described in this manual.



**WARNING:** Failure to use designated lifting points can result in a dropped load causing severe injury, death, and/or property damage. Lifts must be performed by qualified riggers following BAC published Rigging Instructions, and generally accepted lifting practices. The use of a supplemental safety sling may also be required if the lift circumstances warrant its use, as determined by the rigging contractor.



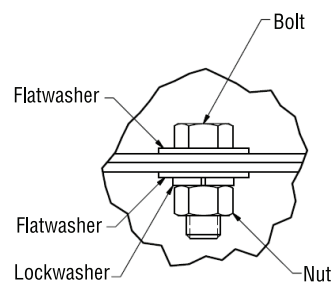
**Figure 2. Lifting Ears**



**Figure 3. Assembly of Unit Sections**



**Figure 4. Drift Pin Alignment**



**Figure 5. Typical Bolting**



**NOTICE:** The optional external service platform must be installed prior to installing the upper dry coil hood.



**NOTICE:** To avoid damage to the fan cowls do not allow the dry coil section to contact the fan cowls while lowering the dry coil section.

# Accessory Installation

**NOTICE:** Install the safety cages onto the ladders prior to installing the ladders onto the units.



## Safety Cage Installation (Optional)

If the safety cage is shipped separate from the ladder, reassemble the safety cage onto the ladder following the steps below.

1. Bolt the safety cage to the ladder using flat washers, lock washers, and nuts. Orient all fasteners with bolt heads inside the safety cage. See **Figure 6, Detail A** through **D** for fastening details at each cage attachment point.
  - The points where the safety cage attaches to the upper ladder bracket (**Figure 6, Detail B**) the hardware is shared with the brackets.
  - When attaching the safety cage at **Figure 6, Detail B**, verify the spacers are still sandwiched between the ladder bracket and the ladder side rail.
  - **Figure 6, Detail C** is typical at all attachment points between **Detail B** and **Detail D**.

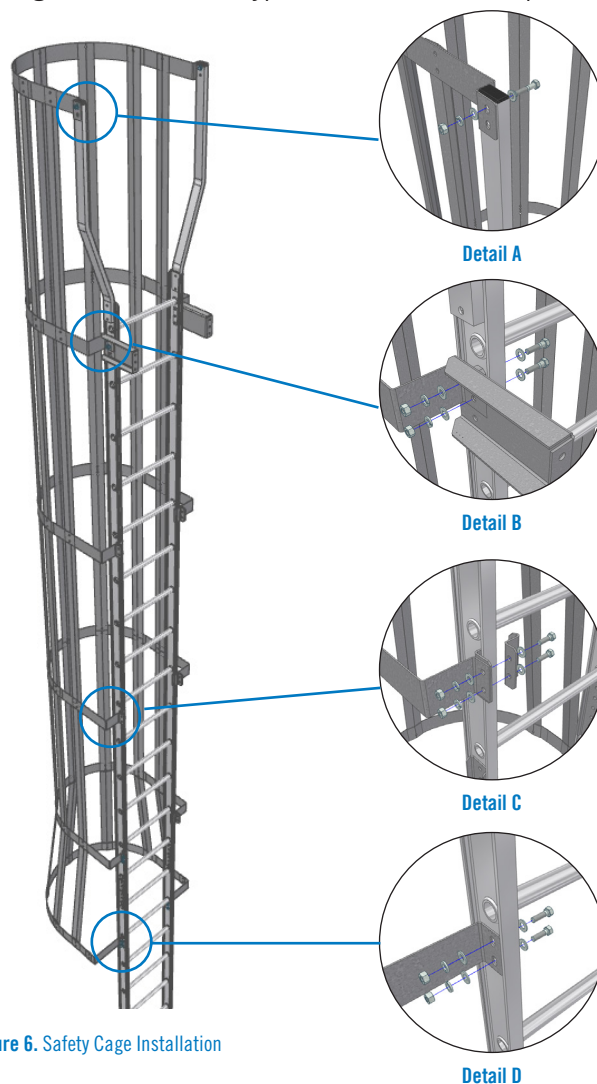


Figure 6. Safety Cage Installation





## Motor Davit Assembly Installation (Optional)

The removal system includes a davit assembly and a removable panel for each motor. The assembly is located on the side opposite of the air intake face to facilitate motor replacement.

1. Verify davit bracket(s) are already installed on the unit above the motor access panel(s).
2. Attach davit support(s) to davit bracket(s) with bolts, nuts, and lockwashers provided.
3. Lower davit arm into davit support. Relocate as necessary.

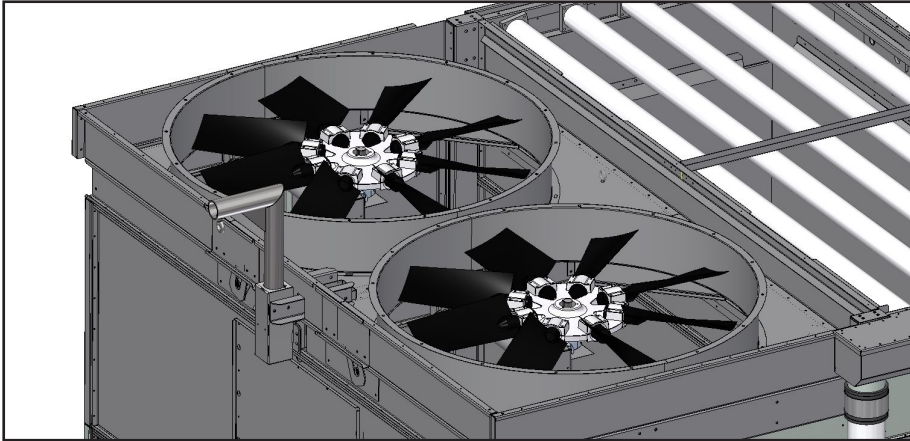


Figure 7. HXV Davit Arm

**NOTICE:** Install the safety cages onto the ladders prior to installing the ladders onto the units.

**NOTICE:** The external service platform must be installed prior to installing the upper dry coil hood.

**NOTE:**

1. Platform can be installed prior to rigging coil section for easier installation.

2. Platforms, ladders and safety cages can be added at the time of order or as an aftermarket item.

3. Safety gates are provided for all handrail openings as standard. All components are designed to meet current OSHA requirements at time of shipment.

**NOTE:** The internal service platform will already be in place.

## External Service Platform and Ladder Installation

Refer to **Figures 8** and **9** for your unit platform assembly.

1. Lift hang-on module(s) into place by inserting hanger into notch at the top of the unit, and secure to unit using 3/8" x 1 1/4" bolts. See **Detail A (Figures 8 and 9)**.
2. Slide clamps behind panel flange at bottom of hang-on module(s) supports, and secure to platform. See **Detail B (Figures 8 and 9)**.
3. If applicable, lift drop-in platform section(s) between mounted hang-on modules, and lower into position so that it rests on support channels. Bolt platform and railings into place using 3/8" x 1 1/4" bolts. See **Detail C (Figures 8 and 9)**.

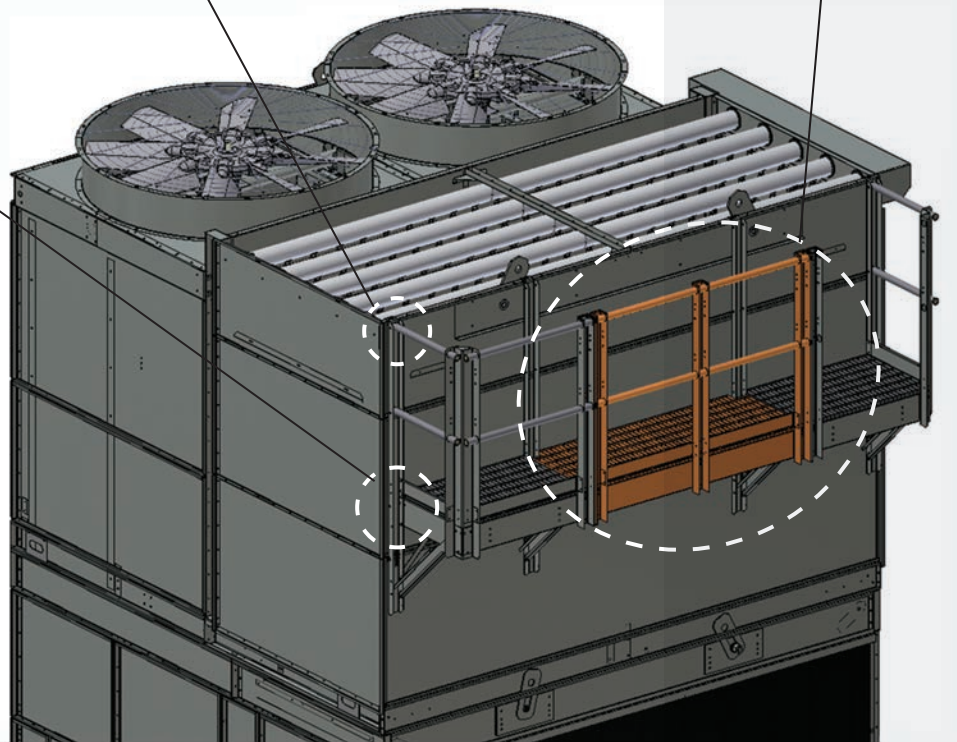
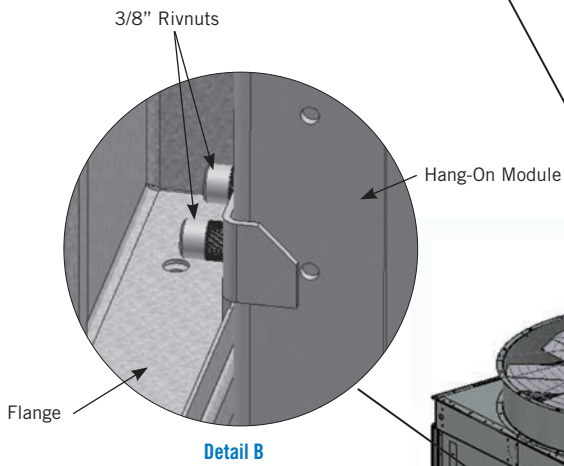
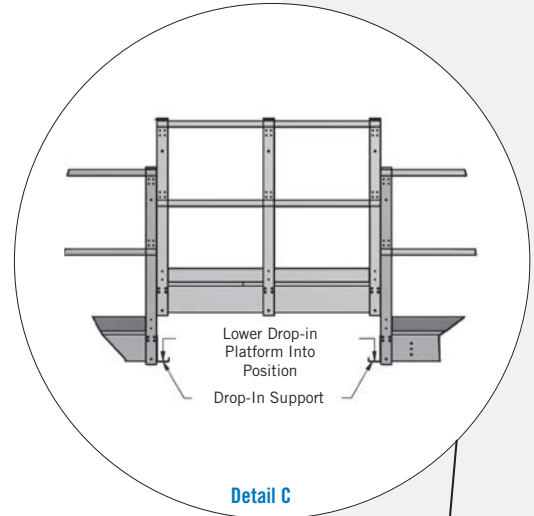
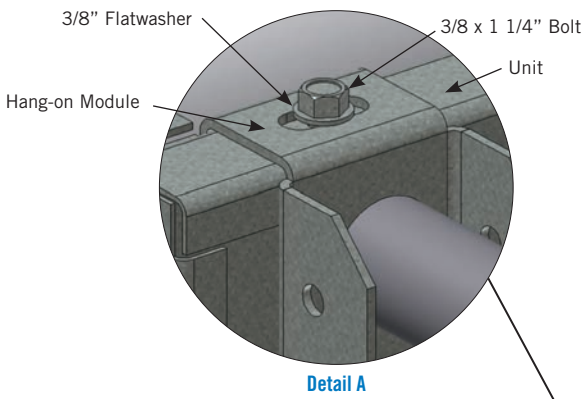
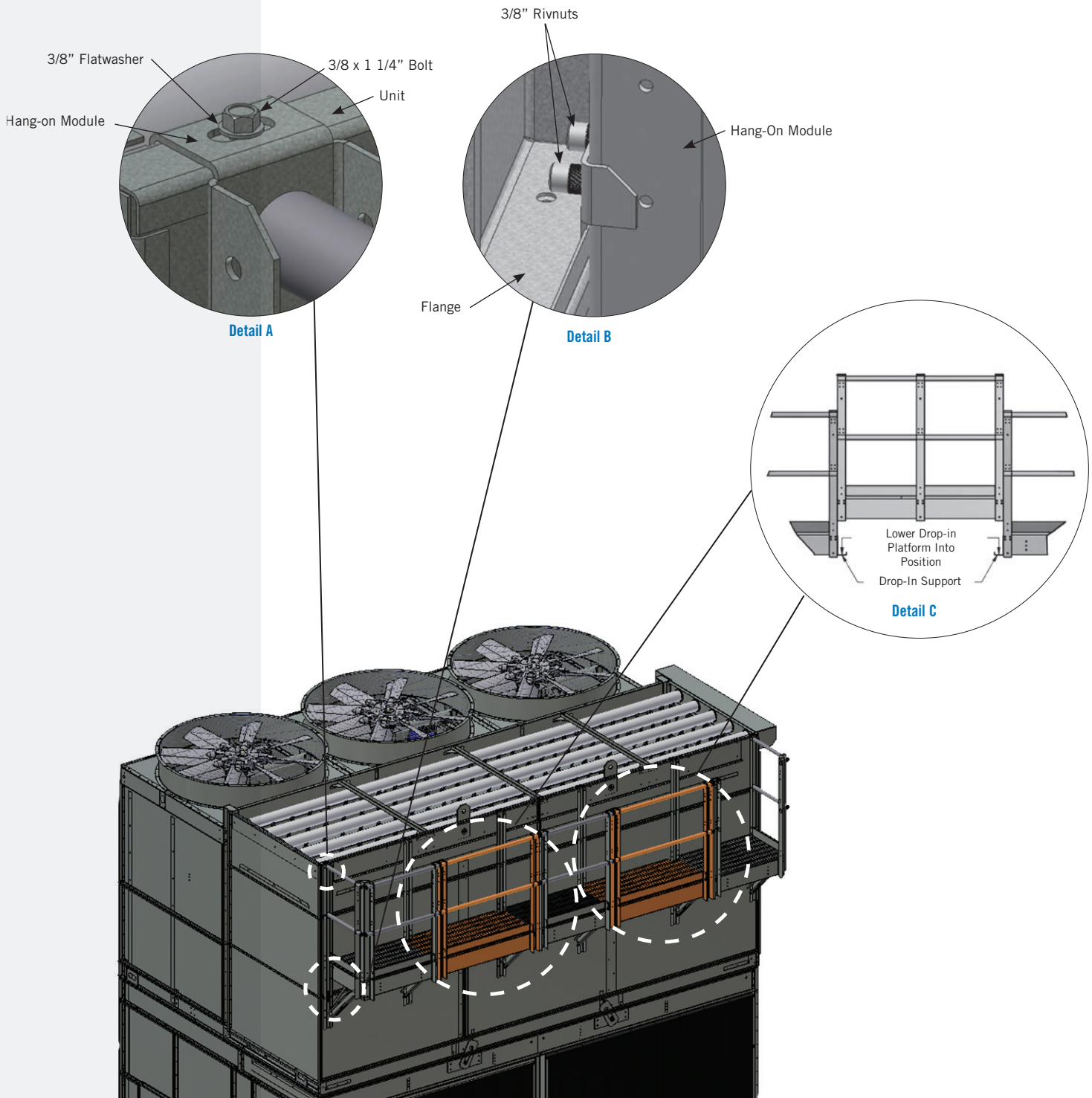
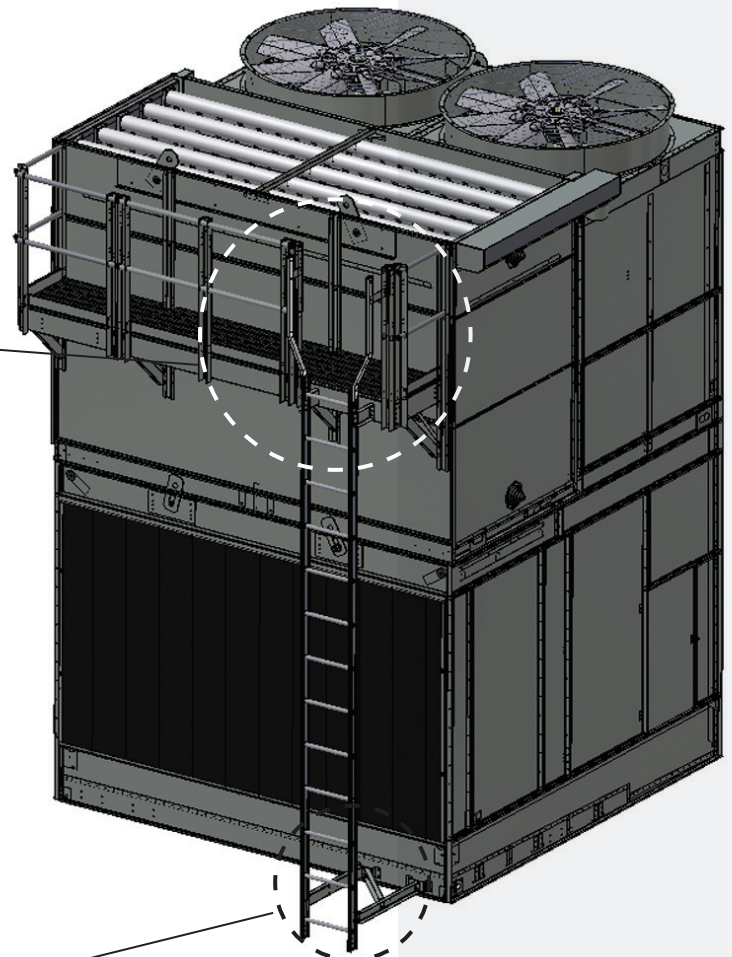
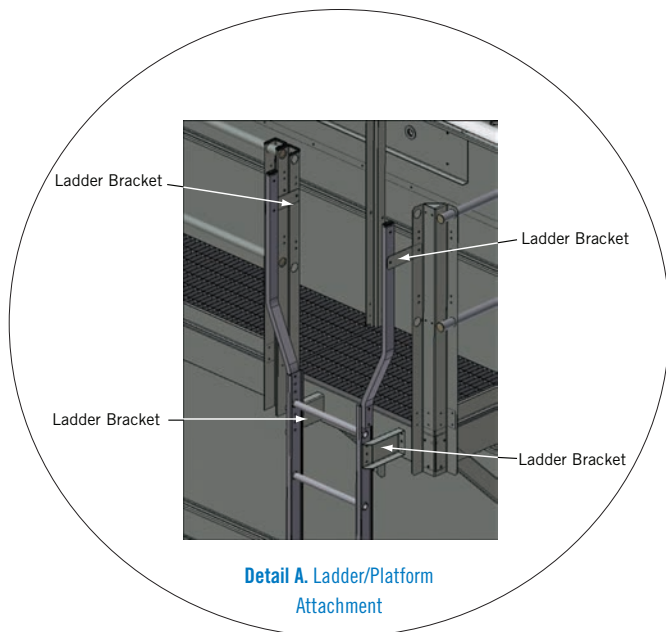


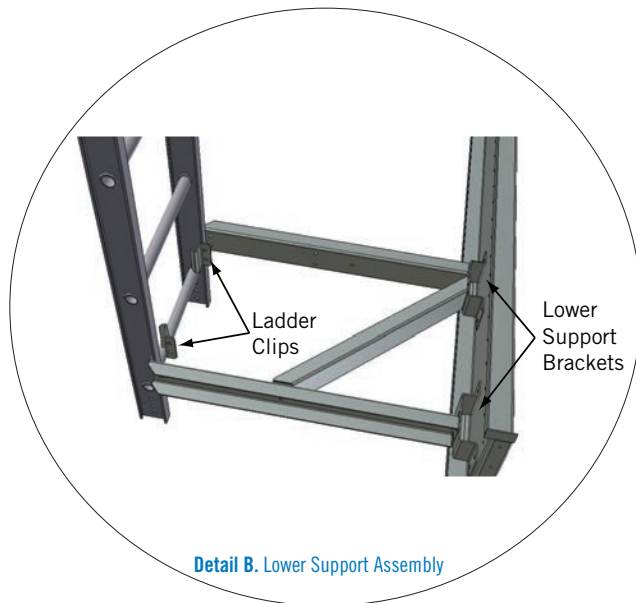
Figure 8. External Service Platform Assembly for 12' x 12' Units



**Figure 9.** External Service Platform Assembly for 12' x 18' Units



**Figure 10. External Ladder Assembly**



**NOTE:**

1. A left-hand ladder mount is shown. A right-hand ladder mount is located on the other side of the unit using the supplied holes in the casing panels.
2. Platforms, ladders and safety cages can be added at the time of order or as an aftermarket item.
3. Safety gates are standard for all handrail openings. All components are designed to meet OSHA requirements.

### External Service Ladder Installation (Optional)

1. Assemble lower support assembly as shown, and attach assembly to unit using the lower support bracket. See **Figure 10, Detail B**.
2. Attach ladder to platform utilizing provided bolts and attach lower support assembly using ladder clips provided.

## Internal Platform Ladder Installation (Optional)

For access to the motor and drive assemblies an internal ladder and upper service platform with handrails is available for select models.

1. Attach the six ladder brackets provided to the casing wall.
2. Secure the internal platform ladder to the ladder brackets.

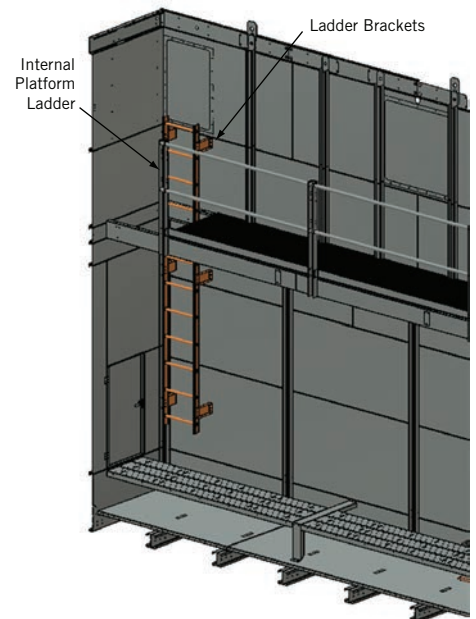


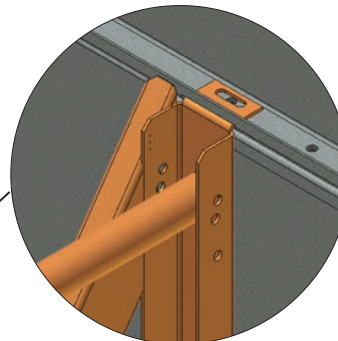
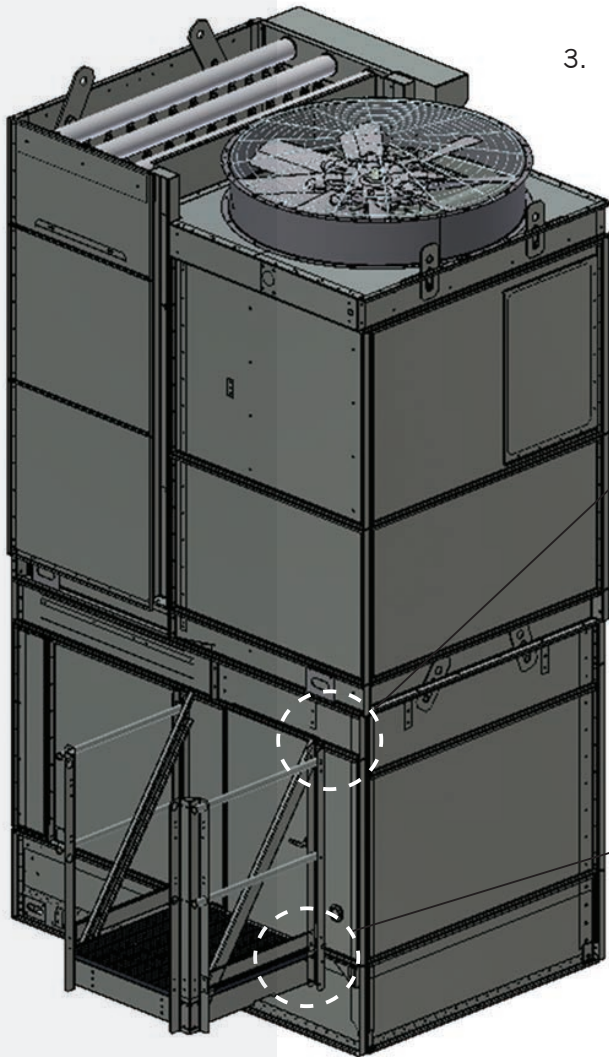
Figure 11. Internal Platform Ladder

**WARNING:** Ensure internal ladder is pinned in place and securely installed prior to use.

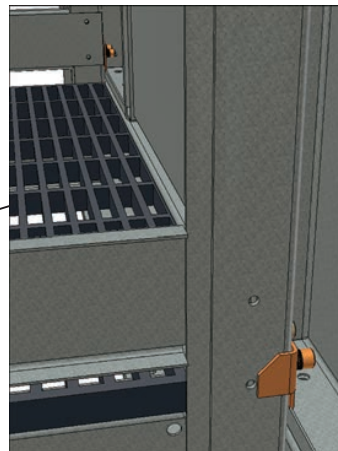


## Door Platform (Optional)

1. Insert hanger at top of platform into slots between panels and bolt into place. See **Figure 12, Detail A**.
2. Slide clamps behind panel flange at bottom of platform supports and secure to platform. See **Figure 12, Detail B**.
3. Attach and ladder and/or safety cage(s) per “External Service Ladder Installation” on **page 11** and “Ladder Safety Cage Installation” on **page 6**.



Detail A



Detail B

Figure 12. Door Platform



# Recommended Spare Parts

BAC's Factory Authorized Parts are manufactured to meet rigorous cooling tower duty specifications and are guaranteed to fit your unit and perform as original equipment.

BAC Factory Authorized Parts can also be ordered through your local BAC Representative. In addition, most BAC Representatives maintain a local inventory of commonly used parts.

Even with this fast delivery capability, it is still recommended that certain essential, emergency repair parts be maintained in your local inventory to minimize any potential downtime.

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## Recommended Spare Parts

- Nozzles
- Pump
- Vibration Cutout Switch
- Makeup System Components
- Motors
- Belts
- Driver Sheave
- Driven Sheave
- Fan Shaft
- Fan Bushing
- Heater
- Strainer Screens
- Removable Strainer Hood
- A full parts list can be found in the submittal

COOLING TOWERS

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CLOSED CIRCUIT COOLING TOWERS

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ICE THERMAL STORAGE

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EVAPORATIVE CONDENSERS

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**HYBRID PRODUCTS**

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