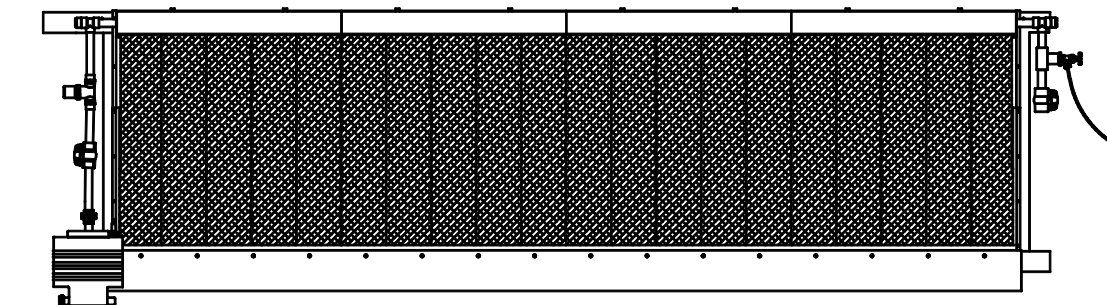
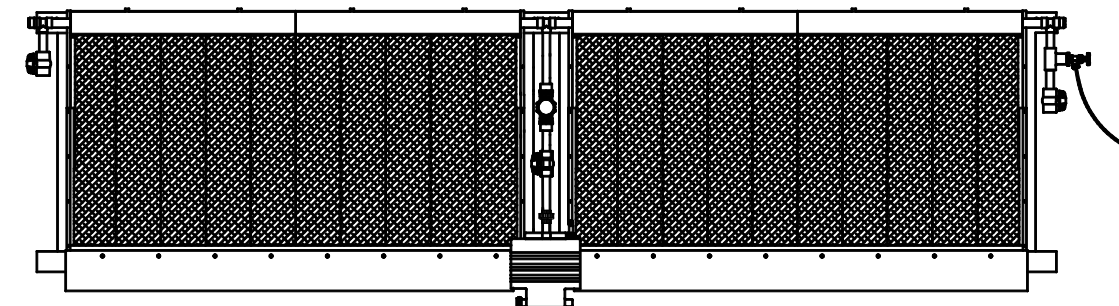


Turbo-Cool™ Closed Top 6" Recirculating Evaporative Cooling Installation & Operator's Instruction Manual



MV1644-006

Chore-Time Warranty

Egg Production Systems, a division of CTB Inc. (Chore-Time) warrants each new Chore-Time product manufactured by it to be free from defects in material or workmanship for one year from and after the date of initial installation by or for the original purchaser. If such a defect is found by the Manufacturer to exist within the one-year period, the Manufacturer will, at its option, (a) repair or replace such product free of charge, F.O.B. the factory of manufacture, or (b) refund to the original purchaser the original purchase price, in lieu of such repair or replacement. Labor costs associated with the replacement or repair of the product are not covered by the Manufacturer.

Conditions and Limitations

1. The product must be installed by and operated in accordance with the instructions published by the **Manufacturer or Warranty will be void.**
2. Warranty is void if **all components** of the system are not original equipment supplied by the **Manufacturer.**
3. This product must be purchased from and installed by an authorized distributor or certified representative thereof or the Warranty will be void.
4. Malfunctions or failure resulting from misuse, abuse, negligence, alteration, accident, or lack of proper maintenance shall not be considered defects under the Warranty.
5. This Warranty applies only to systems for the care of poultry and livestock. Other applications in industry or commerce are not covered by this Warranty.

The **Manufacturer** shall not be liable for any **Consequential or Special Damage** which any purchaser may suffer or claim to suffer as a result of any defect in the product. **“Consequential” or “Special Damages” as used herein include, but are not limited to, lost or damaged products or goods, costs of transportation, lost sales, lost orders, lost income, increased overhead, labor and incidental costs and operational inefficiencies.**

THIS WARRANTY CONSTITUTES THE MANUFACTURER'S ENTIRE AND SOLE WARRANTY AND THIS MANUFACTURER EXPRESSLY DISCLAIMS ANY AND ALL OTHER WARRANTIES, INCLUDING, BUT NOT LIMITED TO, EXPRESS AND IMPLIED WARRANTIES AS TO MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSES SOLD AND DESCRIPTION OR QUALITY OF THE PRODUCT FURNISHED HEREUNDER.

Chore-Time Distributors are not authorized to modify or extend the terms and conditions of this Warranty in any manner or to offer or grant any other warranties for Chore-Time products in addition to those terms expressly stated above. An officer of CTB, Inc. must authorize any exceptions to this Warranty in writing. The Manufacturer reserves the right to change models and specifications at any time without notice or obligation to improve previous models.

Effective: **Sept. 2009**

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Thank You

The employees of CTB Inc. would like to thank you for your recent Chore-Time purchase. If a problem should arise, your Chore-Time distributor can supply the necessary information to help you.

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General

Support Information

The Turbo-Cool 6" Recirculating Evaporative Cooling System is designed to help cool livestock and poultry houses. The system is shipped unassembled. Using this equipment for any other purpose or in a way not within the operating recommendations specified in this manual will void the warranty and may cause personal injury.

This manual is designed to provide installation, operation, and parts listing information. The Table of Contents provides a convenient overview of the information in this manual. The Table of Contents also specifies which pages contain information for the sales personnel, installer, and consumer (end user).

Safety Information

DANGER: Electrical Hazard

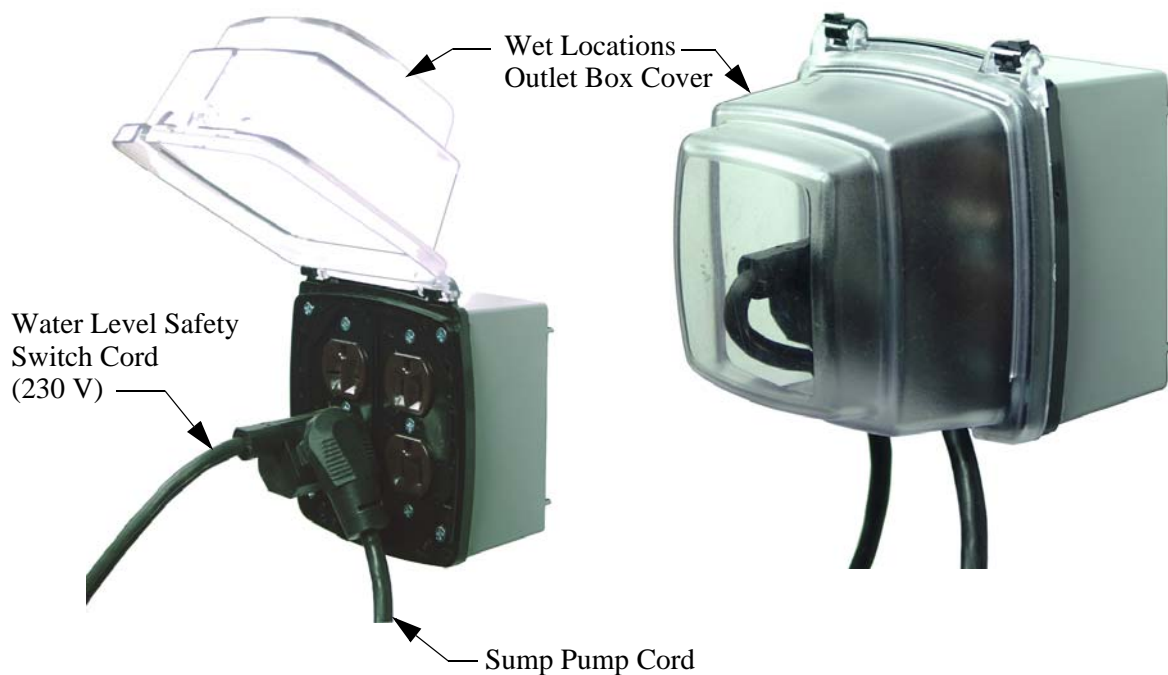
Ground all electrical equipment for safety.

All electrical wiring must be done by a qualified electrician in accordance with local and national electric codes.

Disconnect electrical power before inspecting or servicing equipment unless maintenance instructions specifically state otherwise.

Electrical Connection

Use a Wet Locations Outlet Box Cover when plugging the Sump Pump Cord into an outside Outlet.



Technical Information

Materials and Tools Required for Installation

Socket Wrench · 5/16" 3/8", and 7/16" Sockets · Teflon Tape
 PVC Cement · Utility Knife · Saw · Tape Measure · Chalk Line · Caulking
 · Pressure Treated Lumber for Framing **See Figure 2**

Required fresh water supply

Outside Air		Water Required in Gallons/Minute Per 100 sq. ft. of Pad * (l/min/m ²)
Temp in °F (°C)	% Relative Humidity	
110 (43)	10	3.1 (1.26)
110 (43)	20	2.5 (1.02)
100 (38)	20	2.3 (0.94)
100 (38)	30	1.9 (0.77)
100 (38)	40	1.5 (0.61)
95 (35)	40	1.4 (0.57)

*Assumes 80% pad efficiency and 425 fpm (2.2 m/s) air velocity through pad. For air velocities less than 425 fpm, the water requirement should be reduced by the ratio of the actual pad air velocity to 425 fpm. For example: given outside air conditions of 100° F, 40% RH, two 5' x 60' pads/house, and ten 48" fans producing 22,000 cfm @ .10" w.c., the total air flow is 10 x 22,000 = 220,000. The pad area is 2 x 5 x 60 = 600 sq. ft. The air velocity through the pads is the airflow divided by the pad area; 220,000 ÷ 600 = 367 fpm. From the chart 1.5 gpm is required per 100 sq. ft. of pad. Because the air velocity is less than 425 fpm the actual water requirement is 1.5 x 367 ÷ 425 = 1.3 gpm per 100 sq. ft. of pad. The total water required for the house is 1.3 x 600 ÷ 100 = 7.8 gpm.

Supply water pressure:

20 - 100 psi

Water Quality:

6 - 8 PH, salt concentration less than 40,000 ppm

Submersible Pump Options						Sump Kit Part No. / Maximum System Length (ft)		
Part No.	Model	PH	HZ	Run Amps	Start Amps	49046	49046-3	49043-4
52075	EP52X	1	60	3.4	7.2	65	75	
52074	EP72X	1	60	4.3	7.7	80	90	110
49367	DOC7T	3	50	1.6	6.4	65	75	
52075	EP52X	1	50	2.8	7.9	50	55	
52074	EP72X	1	50	3.2	8.5	65	75	90

Important!

Chore-Time strongly recommends that a good alarm system should be installed in confinement buildings to warn of power failure and high temperature.

Chore-Time also recommends that an alternate power source be available for confinement buildings in case of power failure.

Planning Information

System Layout:

The Sump Assembly can be installed anywhere within a system following these guidelines....

- The maximum length of the system is determined by the Pump used (see **Submersible Pump options on pg 5**). Maximum system length includes the length of system on both sides of the Sump in "Sump in the middle" and "around the corner" systems.
- A system can turn 90° around a corner with the use of a 50464 Corner Kit. Install the Sump on the wall with the longest Pad Length.
- The maximum amount of slope is 1-1/2" [38 mm] per system. The Sump end must be level with, or lower than the rest of the trough

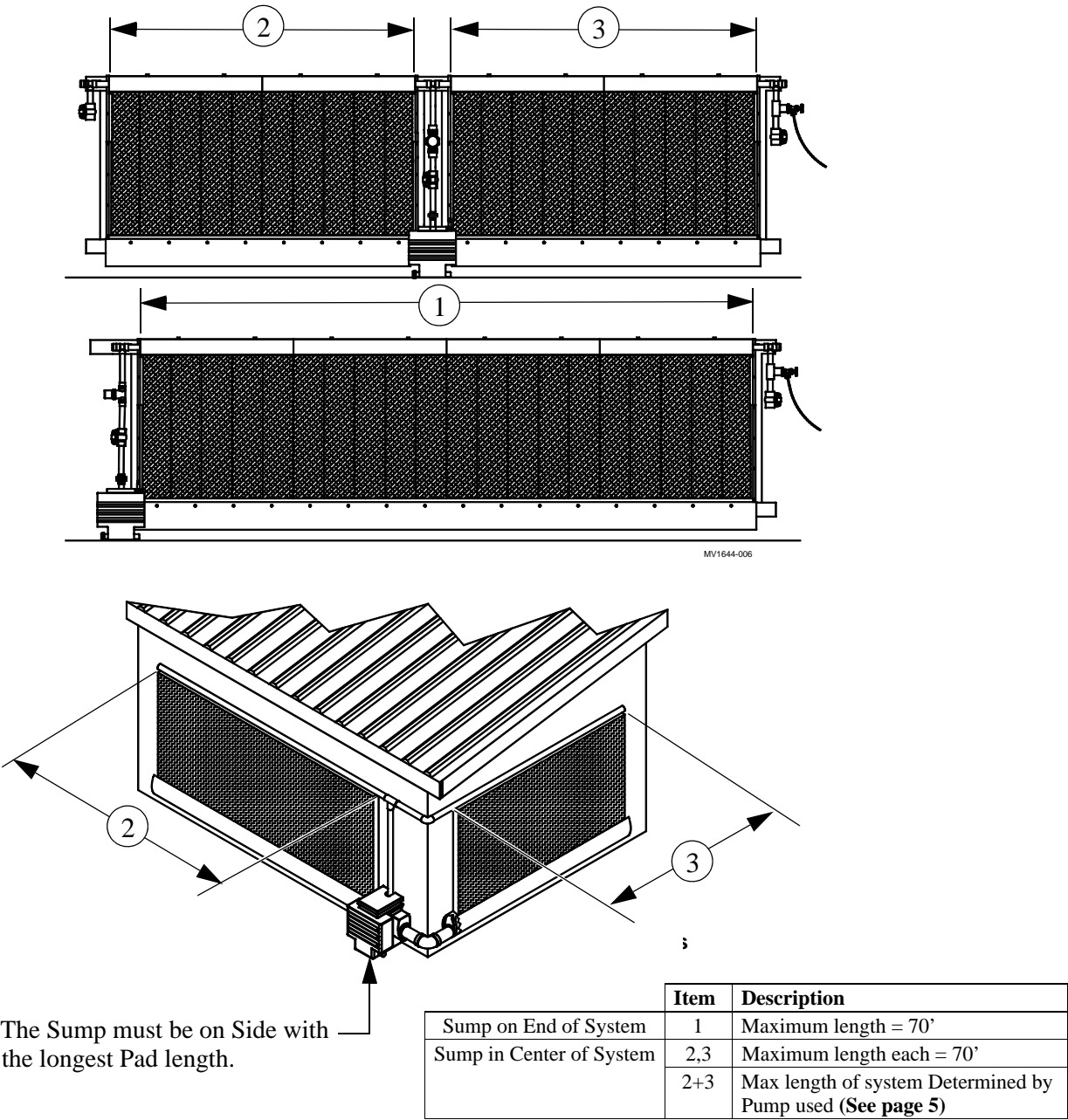


Figure 1. Sump locations

Framing Information

Figure 2 shows two options for installing the cooling pad relative to the tunnel curtain and provides information for the Evaporative Cooling System opening with Sump on either end. See **Figure 3** for opening information for Evaporative Cooling System with Sump in the middle

It is recommended to frame the Pad opening using treated lumber.

1. Determine the location of the bottom stringer. See **Figure 2, Item 3**.

Use Wood or Lag Screws to secure the Bottom Stringer to the Studs.
The Lower Stringer must be capable of supporting 30 lbs/ft [45 kg/m] plus 3 lbs/ft [4 kg/m] for each foot of Cooling Pad Height.

Example: A 6' Cooling Pad requires a Stringer capable of supporting 30 lbs/ft + (3 lbs/ft x 6') = 48 lbs/ft.

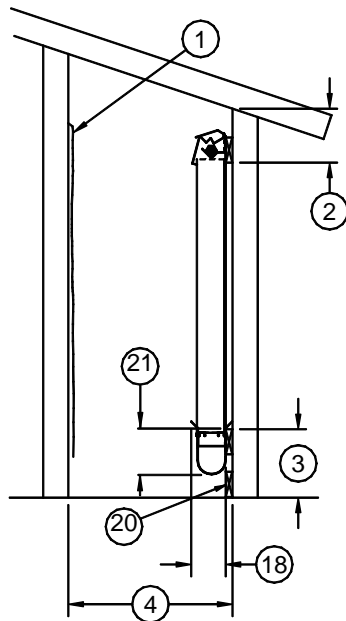
2. Determine the location of the top stringer. See **Figure 2, Item 8**. The distance between the top and bottom stringers should be 1-1/2" [38 mm] less than the height of the Evaporative Cooling Pads.

Example: For a 60" [1524 mm] tall Evaporative Cooling Pad the distance between the stringers would be 60" [1524 mm] - 1-1/2" [38 mm] = 58-1/2" [1486 mm].

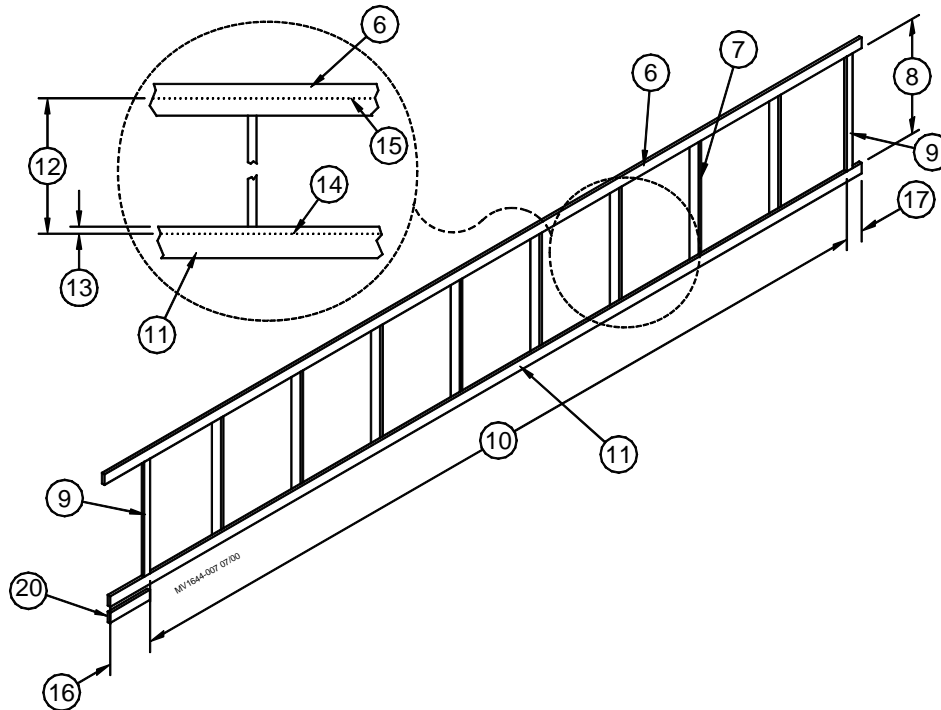
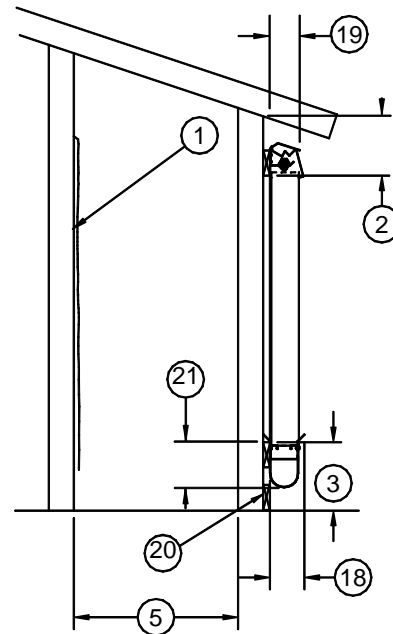
Note: **The slope (if any) of the top stringer must be the same as the bottom stringer.**

3. Snap a chalk line on the lower stringer at the locations specified in **Figure 2, Item 13**. This chalk line will determine the location of the lag screws for the Trough Supports.
4. Snap a chalk line on the top stringer at the locations specified in **Figure 2, Item 12 & 15**. This chalk line will determine the location of the Splash Plate lower holes.
5. A short section of 2 x 6 treated lumber (**Figure 2, Item 20**) is required beneath the Bottom Stringer at the Sump end to provide a back support for the Sump assembly.

Option 1



Option 2

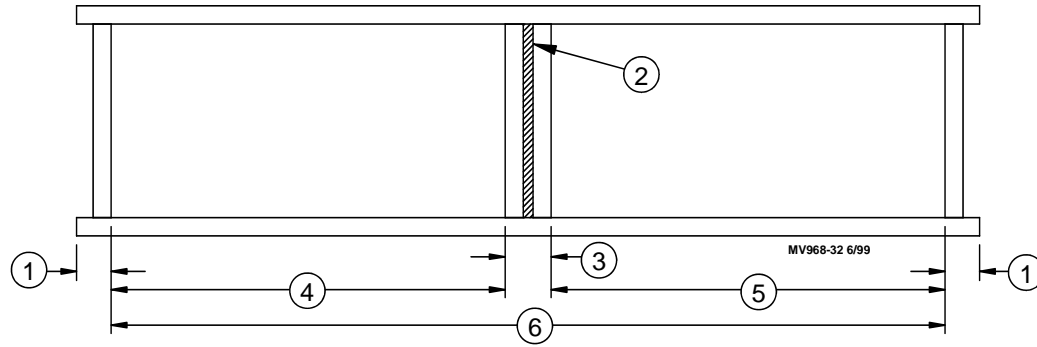


Item	Description
1	Curtain
2	6.5" [165.1 mm] Minimum Clearance
3	14-1/2" [368 mm] Minimum Clearance
4	30" - 36" [762 - 914 mm] Walkway
5	6" [152 mm] Minimum Clearance
6	2 x 6" [38 x 140 mm] Top Stringer
7	Wall Studs
8	Pad Height less 1-1/2" [38 mm]
9	End Framing
10	Width of Pad Bank
11	2 x 6" [38 x 140 mm] Bottom Stringer

Item	Description
12	Pad Height plus 2-3/4" [70 mm]
13	1-1/4" [32 mm]
14	Bottom Stringer Chalk Line
15	Top Stringer Chalk Line
16	19" [432 mm] for Sump Assembly
17	6" [152 mm] for Trough End Insert
18	7-1/2" [191 mm]
19	6" [152 mm]
20	2 x 6 Sump Back Support
21	Minimum Trough Clearance 9-1/4" [23.5 mm]
22	

Figure 2. Framing overview diagram (Sump at either end)

Framing Continued....



Item	Description
1	6" [152.4 mm] Minimum Clearance for Trough End Insert
2	Cover this opening
3	18" [458 mm]
4	1/2 Total System Length rounded to nearest 5' increment
5	Remainder of Total System Length
6	Total System Length plus 18" [458 mm]

Note: See Figure 2 for all other framing information

Figure 3. Frame opening dimensions for Sump in middle

Evaporating Cooling System Installation

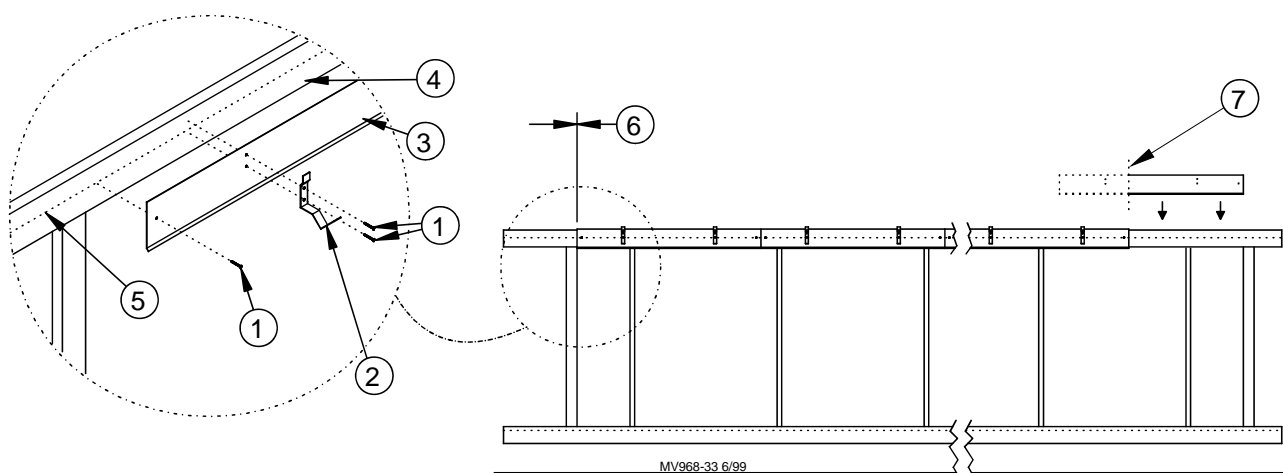
Splash Plate and Pipe Hanger Installation

Note: The end holes in the Splash Plate must align with the chalk line and the end of the first Splash Plate must be flush with the inside of the end framing. See Figure 4.

Secure the Splash Plates to the upper stringer, using a 10x1-1/4" screw at each end.

Secure the Pipe Hangers to the stringer, through the Splash Plate, using (4) 10x1-1/4" screws. The lower hole in the Pipe Hanger should align with the chalk line on the stringer.

Install the remaining Splash Plates butting them tightly end to end. If the last Splash Plate is too long to fit within the end framing, cut as shown (**Figure 4, Item 7**).



Item	Description
1	10 x 1-1/4" Screw
2	Pipe Hanger
3	Splash Plate
4	Upper Stringer
5	Chalk Line
6	Flush with edge of end framing
7	Cut here if too long

Figure 4. Splash Plate & Pipe Hanger Installation

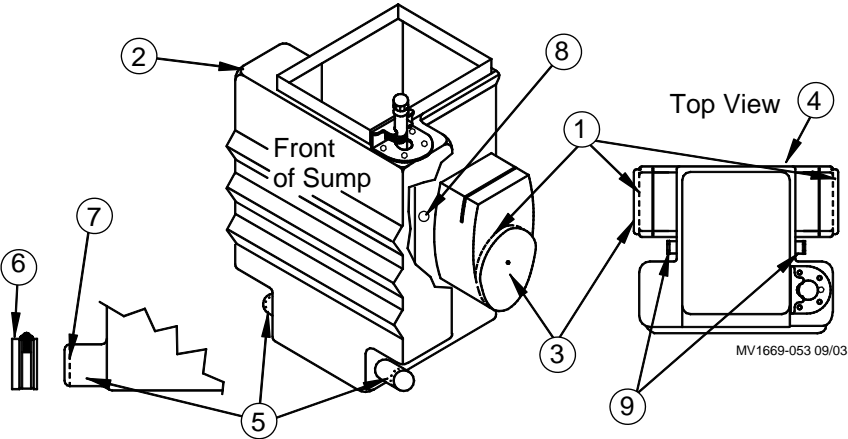
Note: If installing a large tank, refer to Chore-Time Instruction MV1697 (24" Trough Plumbing Kit).

Sump Preparation

Determine which side of the Sump will need to be modified before installation. If the Sump is to be installed to the right of the Trough, the left side of the Sump will need to be cut at the indicated cut line. If the Sump is to be installed to the left of the Trough, the right side of the Sump will need to be cut at the indicated cut line. To install the Sump in the middle of the system, cut both 1/2" Sump End Caps off the Sump. See Figure 5.

Decide which side of the Sump will be used for the drain and cut off that end (Figure 5, Item 5). Make cut for one drain only. Install the 1-1/2" Rubber Pipe Cap.

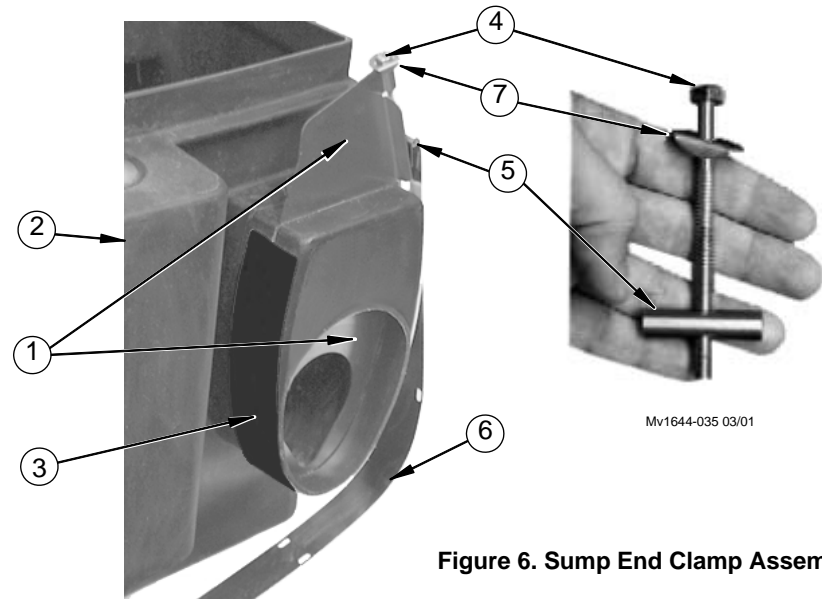
Decide which side of the Sump to install the Overflow Fitting. Using the dimples on either side of the Sump as a guide, drill a 3/4" hole and thread the hole with a 1/2-14 NPT tap. Install the 1/2" PVC Overflow Fitting in the hole. 1/2" PVC pipe can be attached to this fitting to channel overflow water to a drain.



Item	Description
1	Sump End Cap Cut Line
2	Sump
3	Sump End Cap
4	Side of Sump mounted to wall
5	Optional Drain Plug Locations
6	1-1/2" Rubber Pipe Cap
7	Drain Cut Line
8	Dimple Mark for Overflow
9	1/2" PVC Overflow Fitting

Figure 5. Cutting the Sump
Sump End Clamp Assembly

Place the 2" x 24" self adhesive tape around the Sump End and assemble the Clamp with the Insert as shown in Figure 6

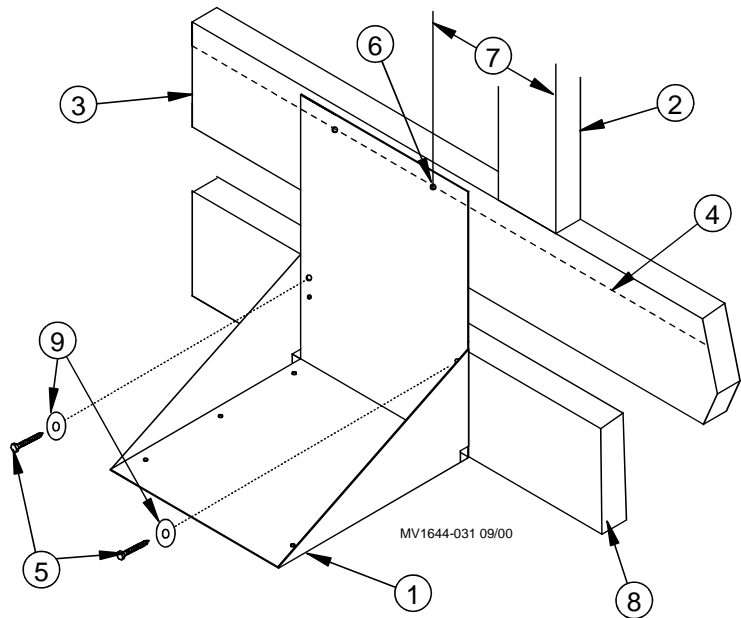


Item	Description
1	Sump End Insert
2	Sump
3	Self Adhesive foam tape
4	5/16-18" x 4-1/2" Clamp Bolt
5	5/16 -18 x 1-1/2" Clamp Nut
6	Clamp Strap
7	Insert Washer

Figure 6. Sump End Clamp Assembly

Sump Support Assembly

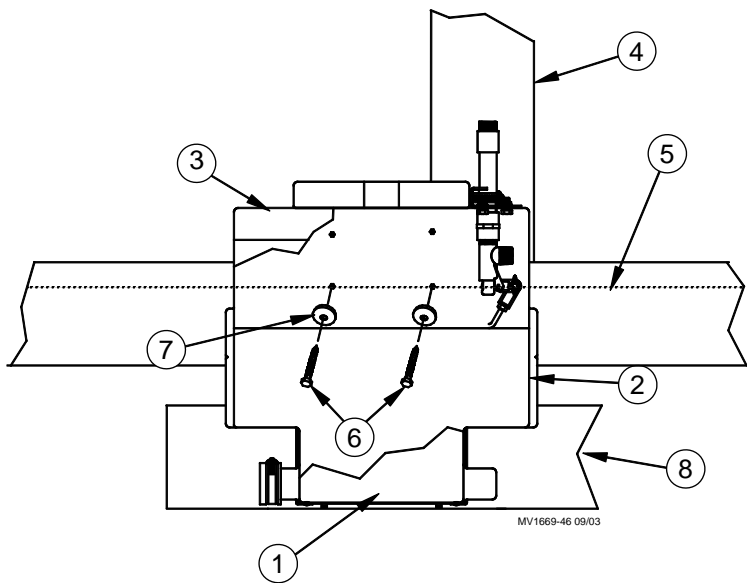
Align the top holes in the Sump Support Assembly with the Chalk Line on the Bottom Stringer, with the first top hole 6" [152 mm] away from the inside edge of the framed opening (See Figure 7, Items 2, 6, &7). Use two 1/4 x 1-1/2" Lag Screws and two Washers to fasten the Sump Support Assembly to the Lower 2 x 6 Sump Support as shown in Figure 7.



Item	Description
1	Sump Support Assembly
2	Inside Edge of Framed Opening
3	Bottom Stringer
4	Chalk Line
5	1/4 x 1-1/2" Lag Screws
6	1/4" Hole nearest Framed Opening
7	6" [152mm]
8	Lower 2 x 6 Sump Support
9	1/4 x 1" Washers

Figure 7. Sump Support Assembly

Align the bottom most set of 1/4" holes in the rear of the Sump with the 1/4" holes in the Sump Support Assembly (See Figure 8). Attach the Sump and Sump Support to the Bottom Stringer with two 1/4 x 1-1/2" Lag Screws and Washers.



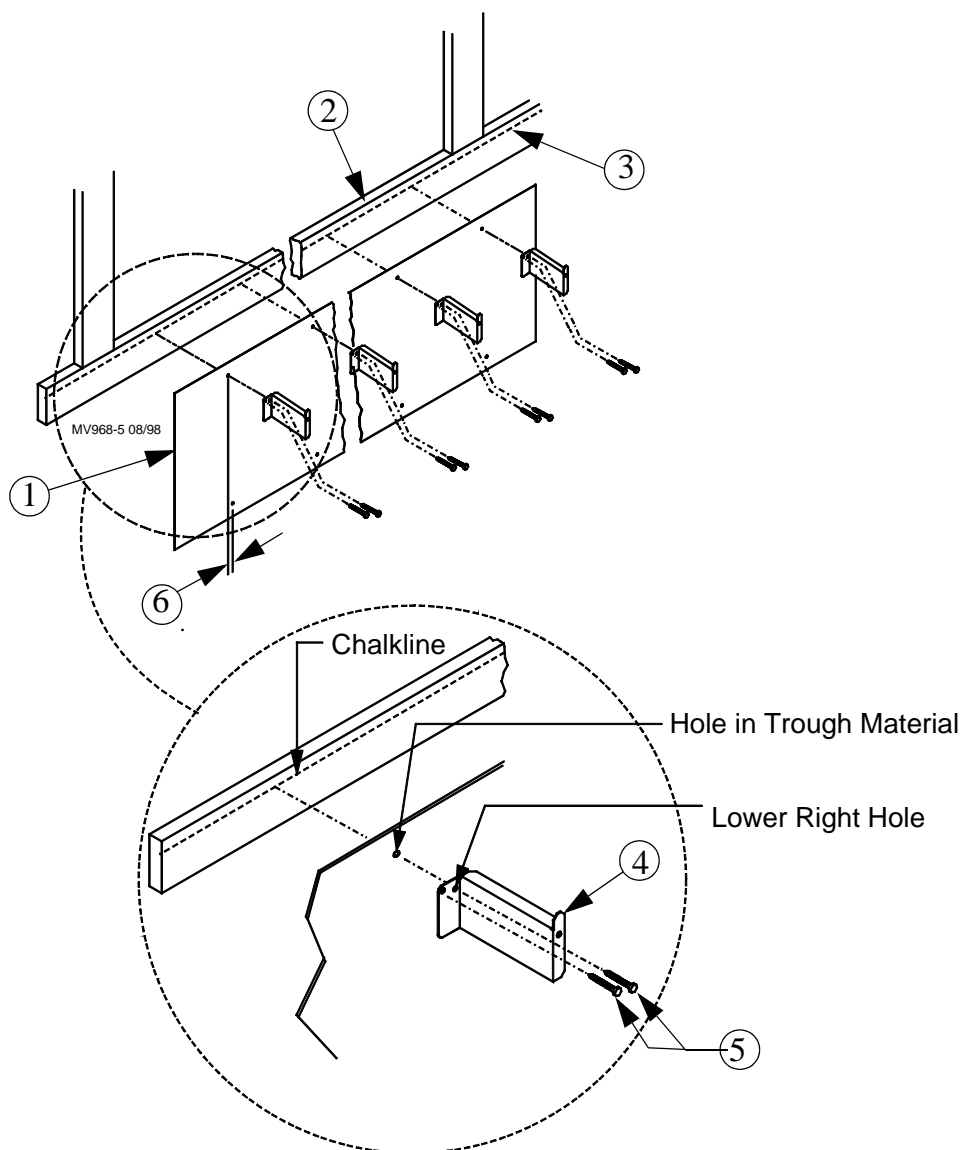
Item	Description
1	Sump Support Assembly
2	Trough end of Sump
3	Sump
4	Edge of Framed Opening
5	Bottom Stringer Chalk Line
6	1/4 x 1-1/2" Lag Screw
7	1/4" x 1" Washer
8	Lower 2 x 6 Sump Support

Figure 8. Attaching the Sump to the Bottom Stringer

Trough Installation

Orient the Trough with the top hole to the left of the bottom hole (See **Figure 9, Item 6**).

Hang the Trough from the Bottom Stringer beginning with one end of the Trough Material **against** the Sump, and the top holes in the Trough Material aligned with the Chalk Line. The top holes in the Trough Material and the Chalk Line mark the location for the Trough Supports. Use two 1/4 x 1-1/2" Lag Screws to attach each Trough Support and Trough Material to the Bottom Stringer as shown in **Figure 9**.

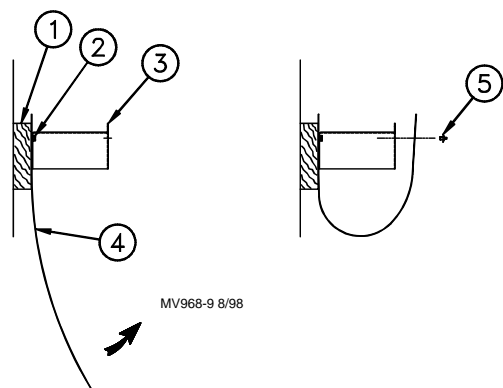


Item	Description
1	Trough Material
2	Bottom Stringer
3	Chalk Line
4	Trough Support
5	1/4 x 1-1/2" Lag Screw
6	Top Hole Offset to left of Bottom Hole

Figure 9. Installing the Trough

Form the Trough into a "U" shape as shown in **Figure 10** and fasten the Trough to the Trough Support using the 1/4" Drive Rivets. Insert the 1/4" Drive Rivet through the hole in the Trough and the Trough Support. Use a hammer to hit the 1/4" Drive Rivet head to lock it in place. Repeat the process for each Trough Support.

Wipe the inside of the Trough at each end to remove debris that may prevent sealing.

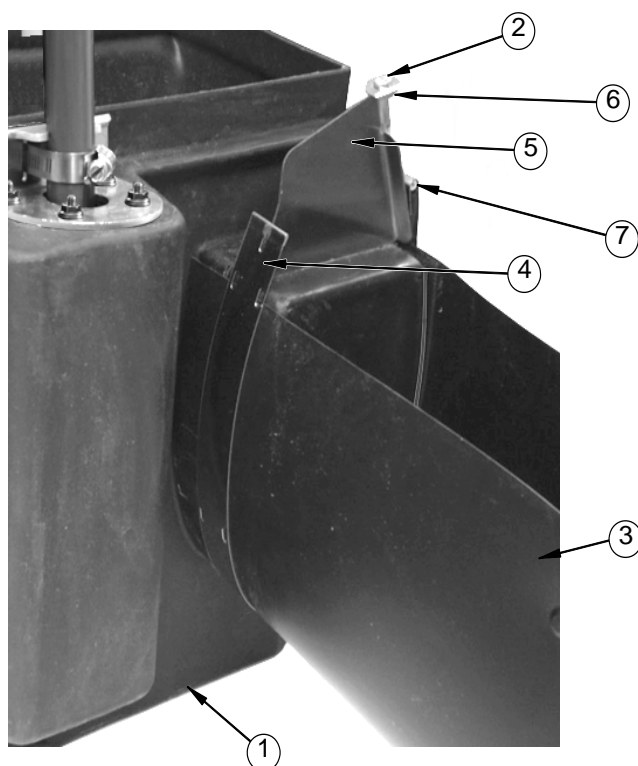


Item	Description
1	Bottom Stringer
2	1/4 x 1-1/2" Lag Screw
3	Trough Support
4	Trough Material
5	1/4" Drive Rivet

Figure 10. Forming the Trough

Sump End Insert Assembly

At the Sump end hook the free end of the Clamp Strap to the Sump End Insert and tighten the 1/4" clamp bolt to seal the joint between the Trough and the Sump.

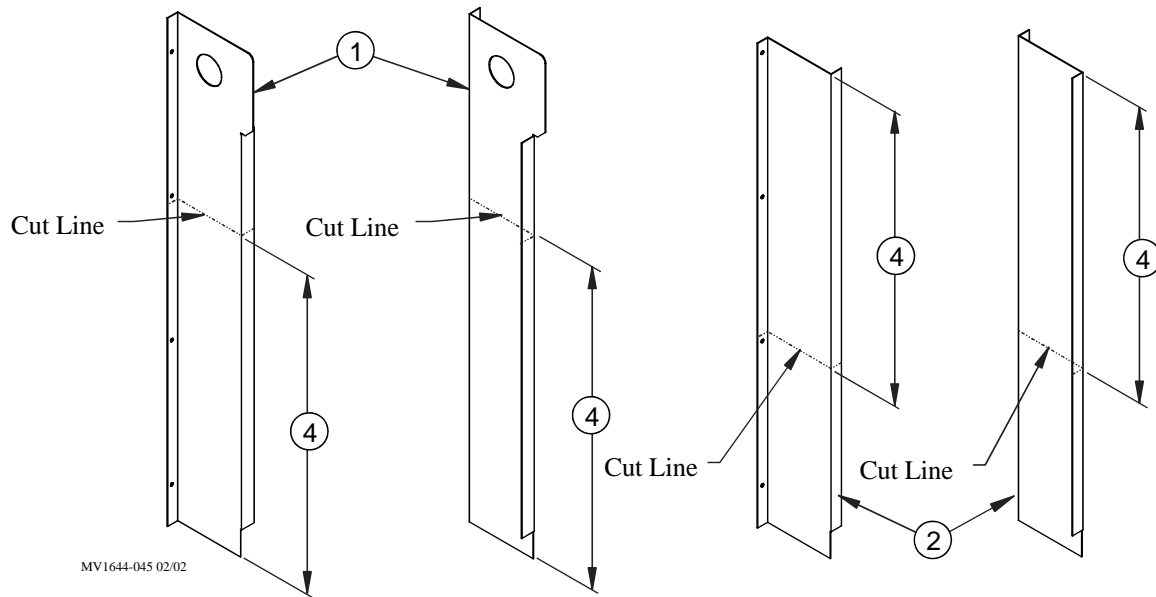


Item	Description
1	Sump
2	5/16" Clamp Bolt
3	Trough
4	Clamp Strap
5	Sump End Insert
6	Insert Washer
7	Clamp Nut

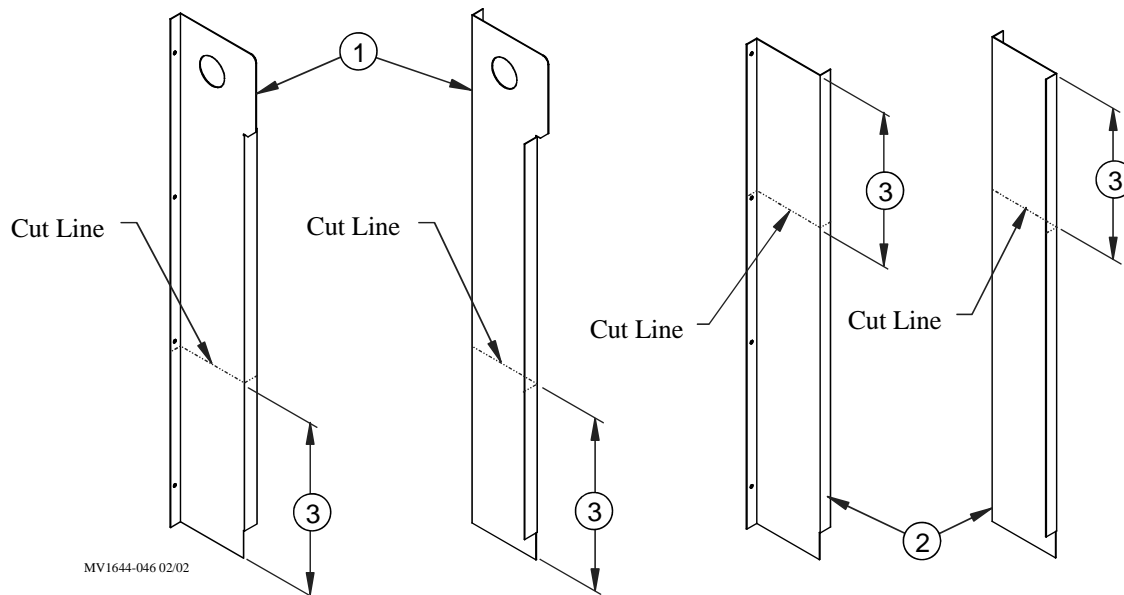
Figure 11. Sump End Insert Assembly

End Panel Installation

If you have a 2 foot, or 3 foot system the End Panels need to be cut down as shown in **Figure 12** below; then assembled as shown in **Figure 13**. For all other systems go straight to the next page for installation.



Cut Line for 2 foot System



Cut Line for 3 foot System

Item	Description
1	Upper End Panels
2	Lower End Panels
3	12" [304.8 mm]
4	24" [609.6 mm]

Figure 12. Cutting End Panels for 2 and 3 foot systems

1. Apply a bead of silicone caulk to the end 2 x 4 as shown in Figure 13.
2. Install the Upper End Panel flush with the inside edge of the end 2 x 4 with the top hole aligned with the Chalk Line on the Top Stringer. Use a #10 x 1-1/4" Screw through the top hole in the Upper End Panel to secure the End Panel in position.
3. Overlap the lower End Panel on the outside of the Upper End Panel to provide proper watershed. Align the holes in the Upper and Lower End Panels keeping the Panels flush with the inside edge of the end 2 x 4. Use #10 x 1-1/4" Screws to attach the End Panels to the end 2 x 4's.

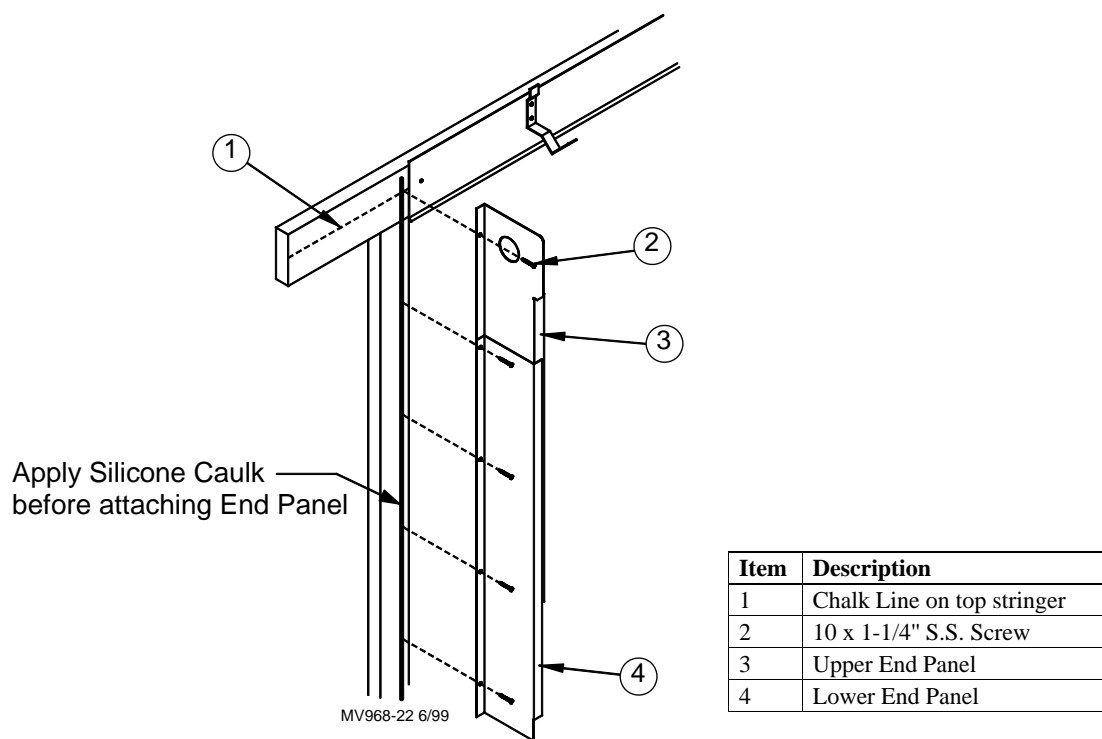


Figure 13. End Panel Installation

Distribution Pipe Installation

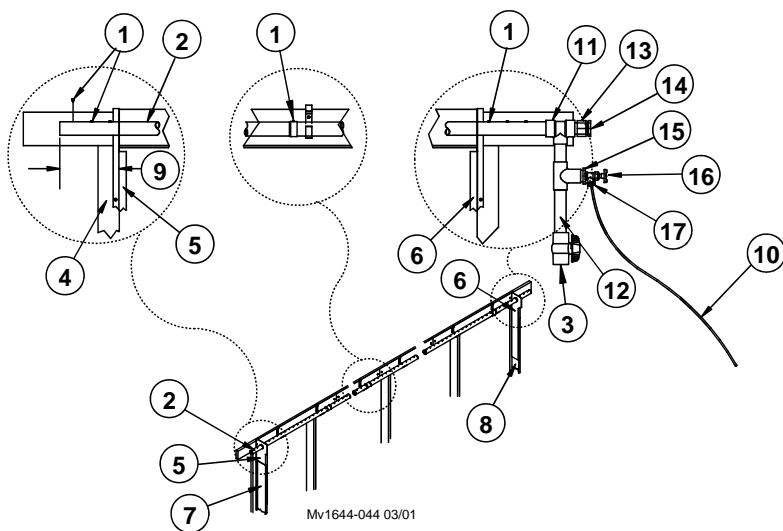
1. Trim 3" off the non-belled end of one Distribution Pipe.
2. Set this Distribution Pipe on the Pipe Hangers above the Sump end of the Trough.

Note: The belled end must be away from the Sump end. See Figure 14.

3. Assemble the remaining Distribution Pipes by inserting the straight end of one pipe into the belled end of another. Align a hole in the belled end with the hole in the straight end and join the pipes using a 1/4 x 1/2" Screw through these holes. It is not necessary to glue the distribution pipes together.
4. At the Sump End of the system the Distribution Pipe should extend 8"[20.32 cm] beyond the edge of the End Panel (**See Figure 14, Item 9.**)

The Pipe should extend past the opposite End Panel.

5. Install a 1/4 x 1/2" Screw in each spray hole that falls outside the End Panels (at either end).
6. **Bleed-Off Valve and sediment trap installation:** At the end of the Distribution Pipe, opposite the Sump end, install the PVC fittings as shown in **Figure 14**. Use two pieces of 1-1/2" PVC pipe cut 6"-12" long. For systems with the Sump in the center of the system, Bleed-Off Valve fittings are installed only at one end of the Distribution Pipe.
7. **Bleed-Off Hose:** Route the Bleed-Off Hose (**Figure 14, Item 18**) to a drain for waste water. **Do not** run the Bleed-Off Hose back into the Trough.



Item	Description
1	1/4 x 1/2" S.S. Screw
2	5' Distribution Pipe
3	1-1/2" Ball Valve
4	Framing @ Sump End
5	Upper End Panel (L.H.)
6	Upper End Panel (R.H.)
7	Lower End Panel (L.H.)
8	Lower End Panel (R.H.)
9	8" [20.32 cm] Approximately at Sump end
10	1/4" Bleed-off Hose
11	2" x 1-1/2" PVC Tee
12	1-1/2" PVC Pipe Sediment Trap
13	Adapter, 2" PVC SPIG x FIPT
14	Plug 2" PVC MPT
15	Bushing Reducer 1-1/2" x 3/4"
16	3/4" Water Bleed-off Valve
17	Hose Barb Cap

Figure 14. Distribution Pipe Installation

End Panel Support Installation

Install the End Panel Support using #10 x 1-1/4 screws, as shown **Figure 15**. The End Panel Supports hold the End Panels perpendicular to the Top Stringer.

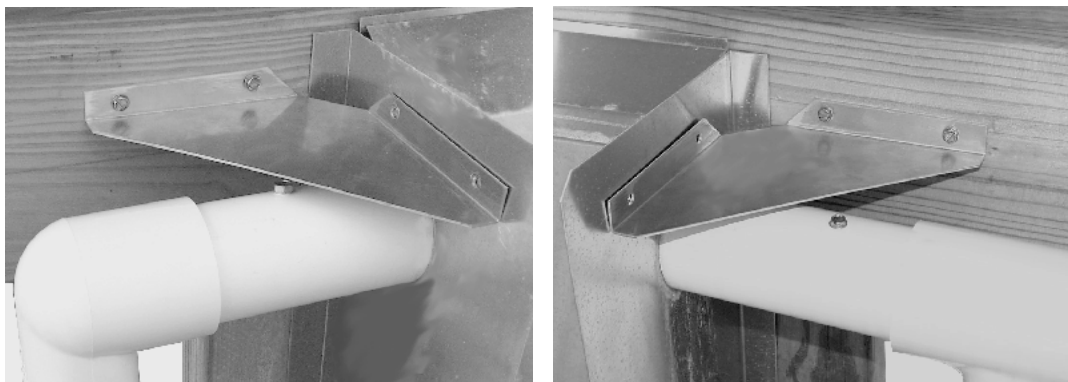


Figure 15. End Panel Support Installation

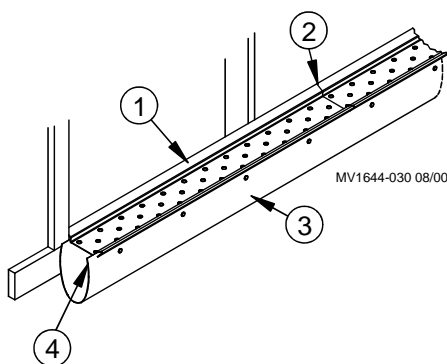
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Pad Support Installation

Set the Pad Supports on the Trough Supports, as shown in **Figure 16**. The front edge of the Trough should be captured inside the cavity on the front of the Pad Support.

Butt the Pad Supports end to end, beginning at one End Panel. It may be necessary to trim the length of the last Pad Support. The Pad Supports should extend to both End Panels.

Note: Sump components and End Panels not shown for clarity.



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Item	Description
1	Pad Support
2	Pad Supports butted together
3	Trough
4	Front edge of Trough

Figure 16. Pad Support Installation

Caulking of End Panel

Fill the joint at the rear of each end panel with caulking (not supplied) as shown in **Figure 17** below.

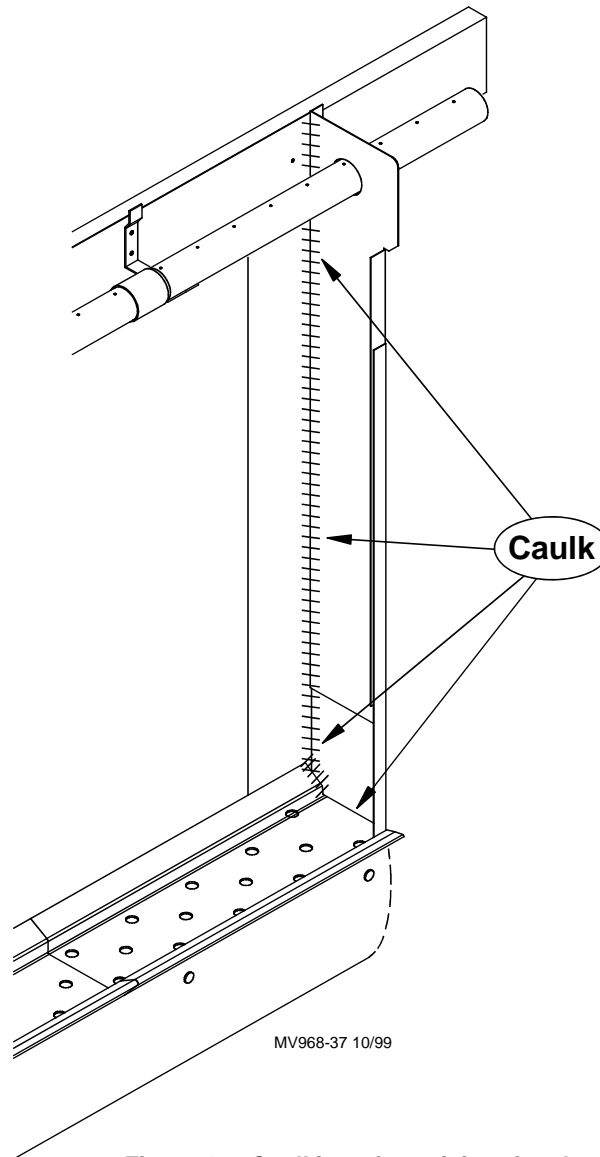
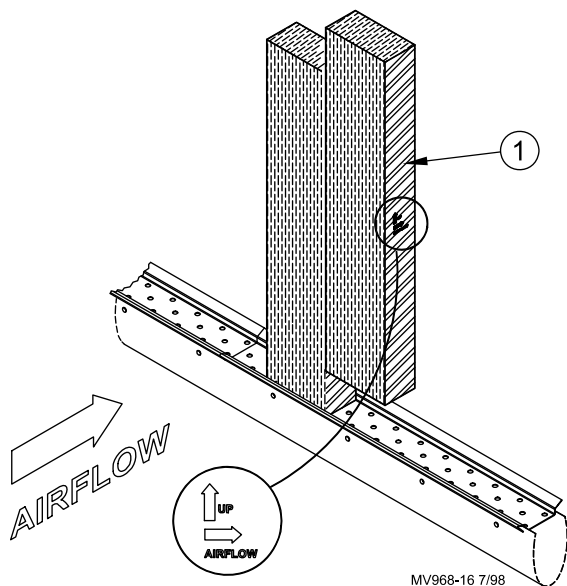


Figure 17. Caulking of rear joint of end panel

Evaporative Cooling Pad and Cover Installation

- Beginning at one end, set the Evaporative Cooling Pads on the Pad Supports. See **Figure 18**. The top of the Pads should be against the Splash Plate and directly below the Distribution Pipe.
- Make sure the Pads are properly oriented.
- **MUNTERS and/or GENERAL SHELTERS Pads:** Refer to the directional arrows on the side of the pads.
- Make sure the first pad is against the End Panels.
- Push Pads tightly together and keep as vertical as possible.



Item	Description
1	Munters and/or General Shelters Pad

Figure 18. Pad Installation

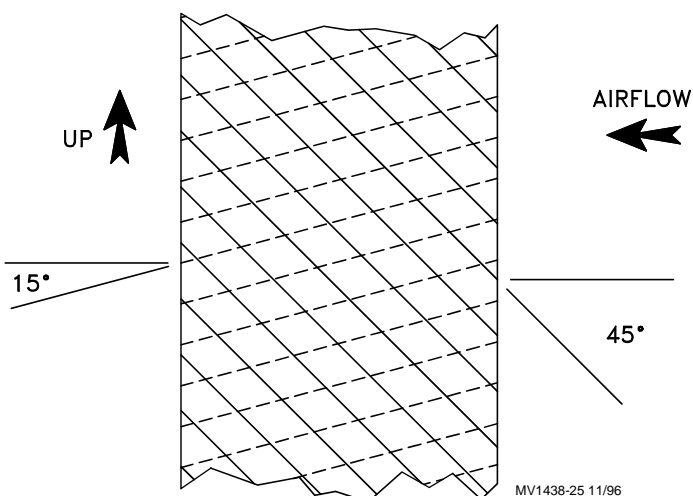
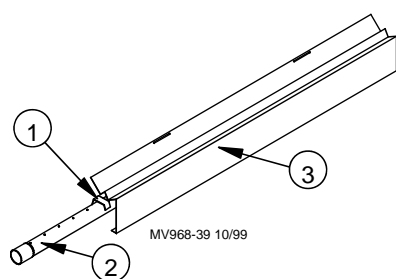


Figure 19. Pad Orientation (cut-away view of side of Pad)

Cooling Pad and Cover Installation Continued.....

- Set the Covers on the Pipe Hangers, as shown in **Figure 21**, Step 1.
- Slide the Cover Locks onto the Pipe Hangers, as shown in **Figure 21**, Step 2.
- If a hole in the Distribution Pipe aligns with a seam between covers install a Jet Deflector over the hole as shown in **Figure 20**.
- Repeat steps 1-3 until all the Evaporative Cooling Pads are installed. The Covers should butt end to end.
- The Evaporative Cooling Pads may be trimmed as required using a handsaw, to fit inside the End Panels.



Item	Description
1	Jet Deflector
2	Distribution Pipe
3	Cover

Figure 20. Jet Deflector

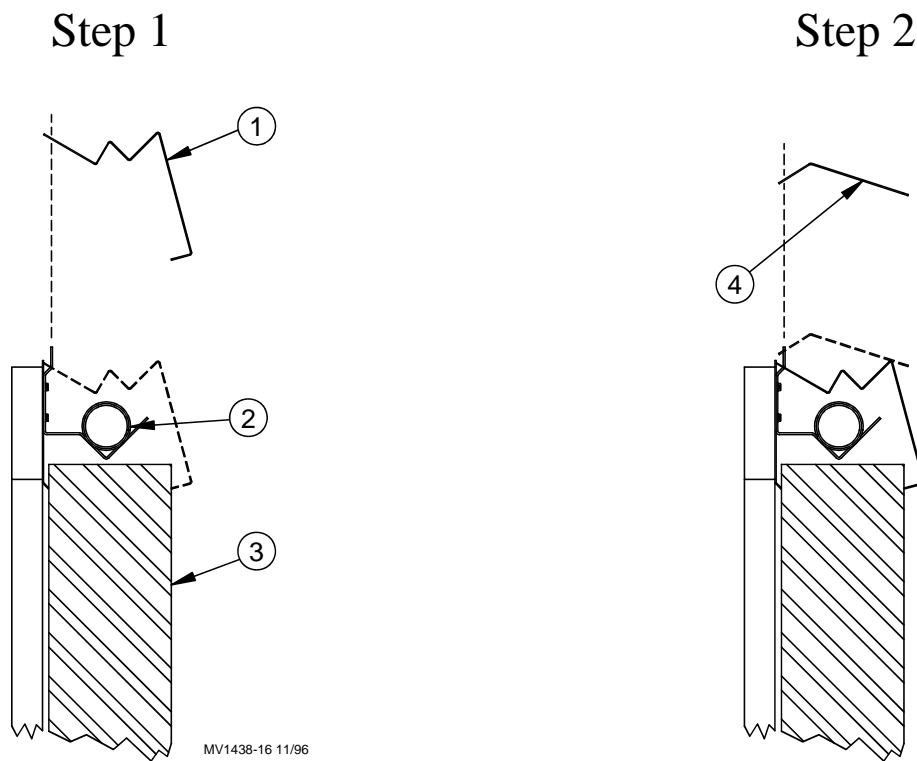


Figure 21. Cover and Cover Lock Installation

Cooling Pad and Cover Installation Continued.....

- If the last Cover is too long, trim the Cover as shown in **Figure 22** and overlap it with the previous Cover. Use (2) 10 x 1/2" Screws to join the Covers together.

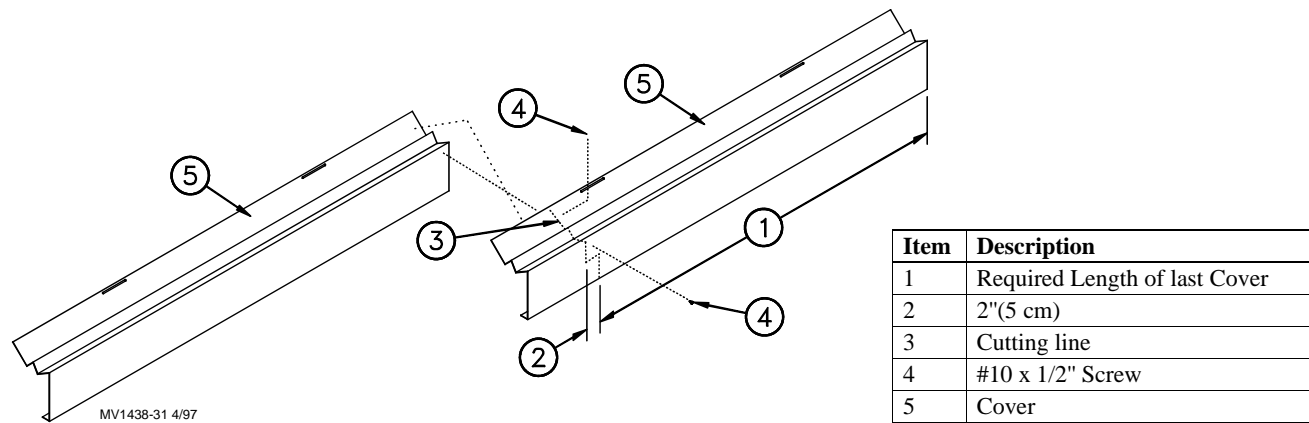
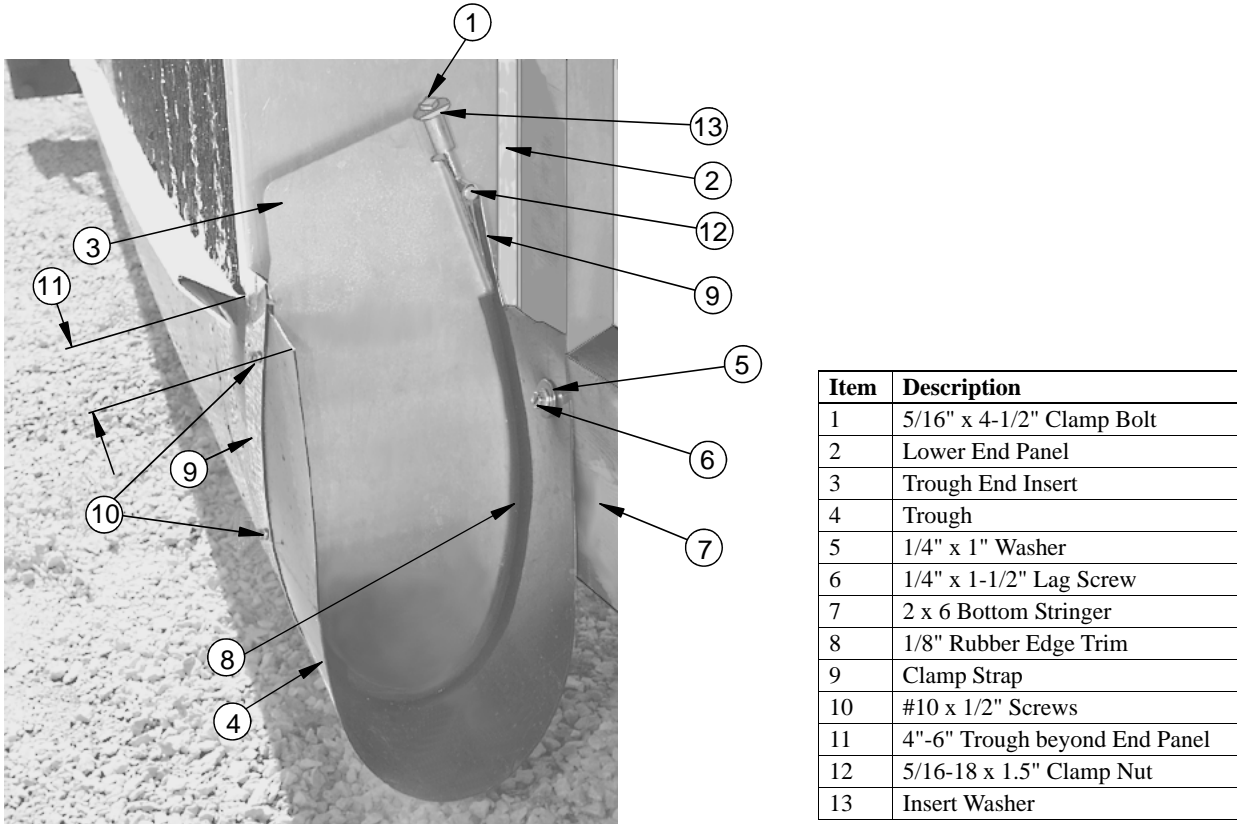


Figure 22. Cover Trimming and Assembly

Trough End Insert Installation

On the Trough end opposite the Sump, cut off the Trough leaving 4"- 6" of Trough extending beyond the End Panel. Assemble the Trough End Insert assembly as shown in **Figure 23**. Be sure the Insert is centered on the Clamp Strap before tightening the Clamp Bolt. Install two #10 x 1/2" Screws through the Clamp Strap into the Trough as shown in **Figure 23, Item 10**. Be sure the Screws are on the exterior side of the Trough End Insert. Screw the Trough to the 2 x 6 Bottom Stringer using a 1/4"x1-1/2" Lag Screw and a 1/4"x1" Washer. (**Figure 23, Items 5 & 6**)



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Figure 23. Trough End Insert Installation

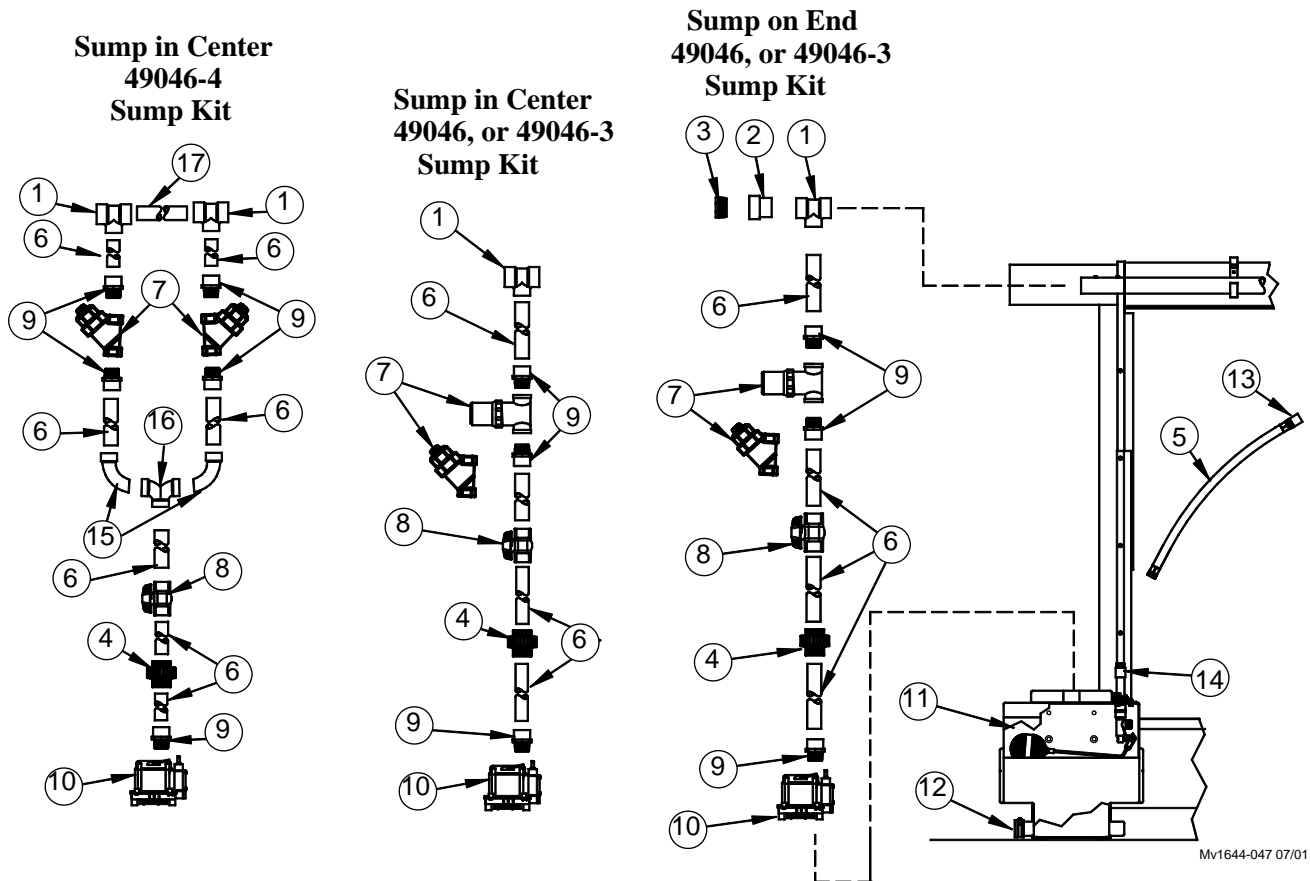
Sump Components Installation

Assemble the Sump Components as shown in **Figure 24**, beginning at the Pump. The lengths of 1-1/2" PVC Pipe **Item 6** will vary depending on desired Valve height, pad height, etc.

Use teflon tape on threads as required. Use PVC glue on slip connections.

Attach an electrical plug (if not supplied) to the Sump Pump electrical cord.

Flush all dirt from the water supply lines. Install the Garden Hose to the water supply and connect to the inlet on the Sump.



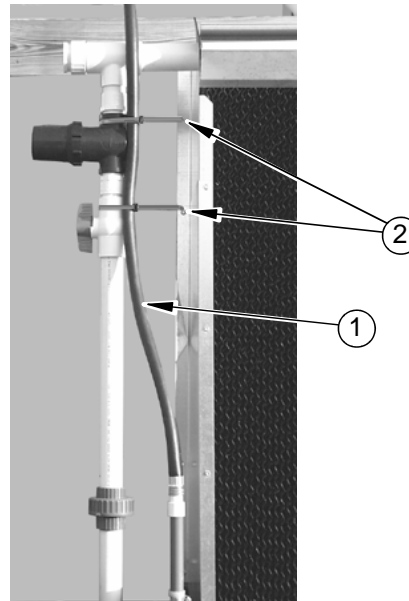
Item	Description
1	1-1/2 x 2 x 2" PVC Tee
2	Adapter, 2" PVC
3	Plug 2" PVC Pipe MPT
4	1-1/2" Union
5	Water Supply Inlet Hose
6	1-1/2" PVC Pipe
7	1-1/2" FNPT Strainer Assembly (Sump Kit 49046) 1-1/2" "Y" Strainer Assembly (Sump Kit 49046-3)
8	1-1/2" Ball Valve

Item	Description
9	1-1/2" PVC Adapter
10	Sump Pump
11	Sump
12	1-1/2" Rubber Pipe Cap
13	Garden Hose to 3/4" Pipe Adapter
14	Sump Water Inlet
15	Elbow, 1-1/2 Long Sweep 1/4 bend
16	PVC Y, 1.5 Double 1/4 Bend
17	2" PVC Pipe x 8"

Figure 24. Distribution Pipe Installation

Securing Water Supply Inlet Hose

Secure the Water Supply Inlet Hose (**Figure 25, Item 1**) with Cable Ties as shown to keep it from moving around. Movement of the Hose could cause the Float Valve to operate incorrectly.



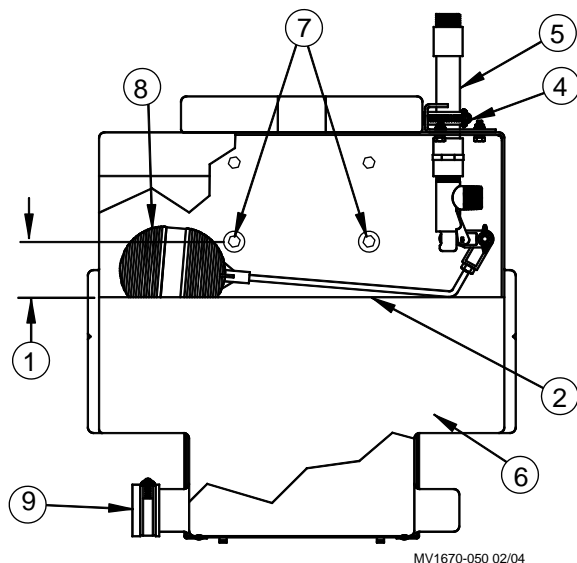
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Item	Description
1	Water Supply Inlet Hose
2	Cable Tie with UV Stabilizer

Figure 25. Securing the Water Supply Inlet Hose

System Start-Up

1. Partially fill Trough with water.
2. Flush dirt and debris from the Trough by removing the Sump Drain Cap (**Item 9, Figure 26**).
3. Refill system with water. With the Hose Clamp loose, raise/lower the 3/4" Pipe to adjust the Initial Water Level. Check that the Float Ball is not rubbing against the side of the Sump. The Initial Water Level should be 2"- 3" below the Mounting Screws in the back of the Sump. Retighten the Hose Clamp. (See **Figure 26. Below**)



Item	Description
1	2"-3" [51mm-76mm]
2	Initial Water Level
3	PVC Float Valve
4	Hose Clamp
5	3/4" PVC Pipe
6	Sump
7	Sump Mounting Screws
8	Float Ball
9	1-1/2" Rubber Pipe Cap

Figure 26. Adjusting Initial Water Level

After the system runs for a while and turns off, the water level will rise 1.5-3.0" above the level it was initially set at.

4. Open the valve in the pump discharge pipe.
5. Flush dirt and debris out of the Distribution Pipe by running the Pump with the 1-1/2" Ball Valves opened. After flushing the pipe out, close the 1-1/2" Ball Valve at the end opposite the Sump.
6. With the Pump running, adjust the 1-1/2" Ball Valve ,at the Sump end, so the height of the water jets is 4" to 6" [101 mm to 152 mm] above the top of the Distribution Pipe at the end opposite the Sump.
7. If bleed-off is to be used, Adjust the Bleed Off Valve to a flow rate of 0.25 gpm per 100 sq ft. of Evaporative Cooling Pad.

The correct amount of bleed-off depends on the amount of minerals and chemicals in the water.

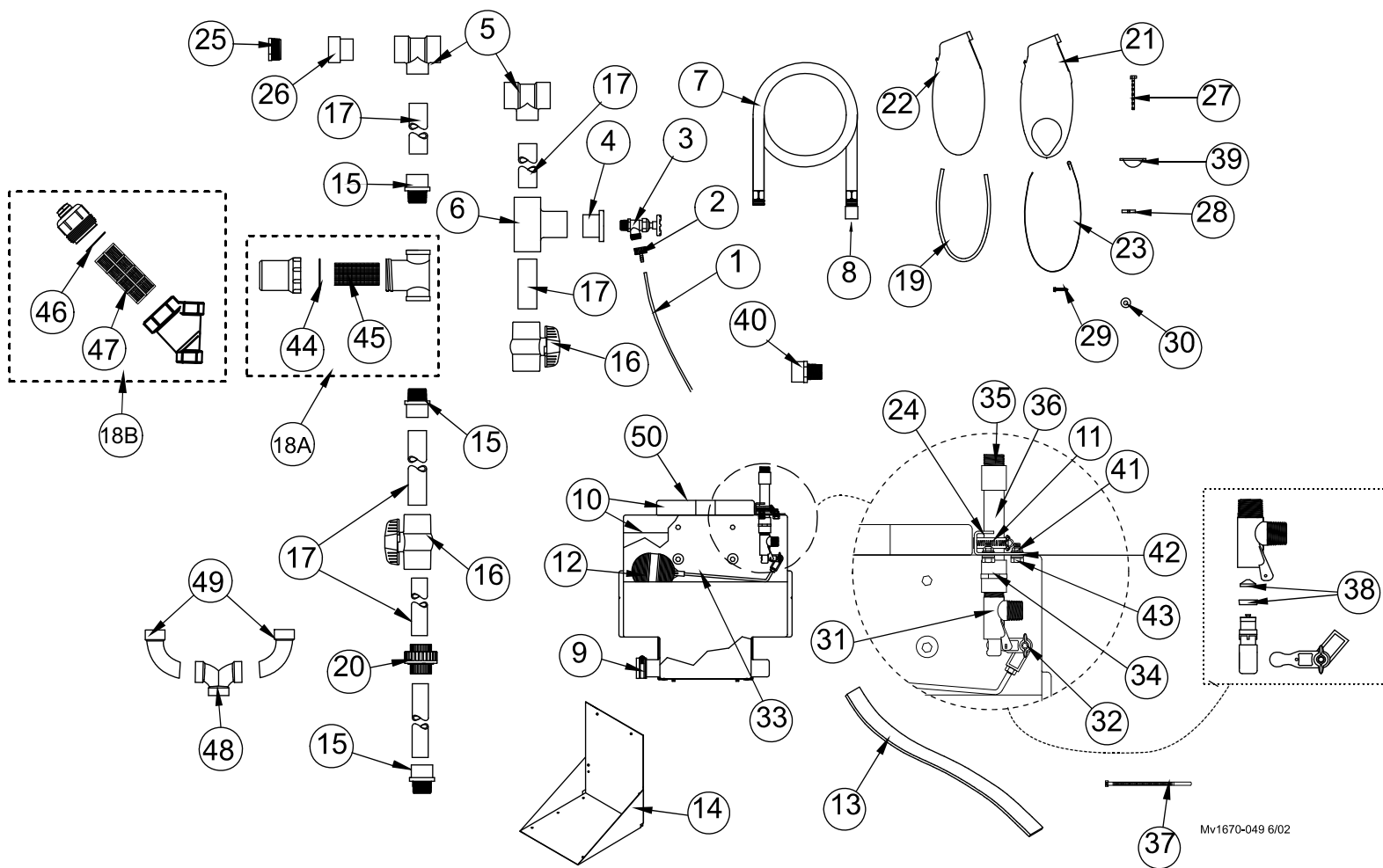
The bleed off rate can be adjusted over time, but should be maintained high enough to prevent mineral deposits from accumulating on the face of the Evaporative Cooling Pad.

System Operation & Maintenance

1. Reduce the mineral and chemical build-up in water by;
 - a). Bleeding water off the system. Begin by adjusting the Bleed-Off Valve to drain .25 gpm/100 sq ft. of Cooling Pad while the Pump is running. Increase the bleed-off rate if minerals build up on the face of the Cooling Pad
 - b). Draining all the water from the system once a week during operating season. Increase the frequency if minerals build up on the face of the Cooling Pad.
2. Shade the pads as much as possible to minimize algae growth.
3. Allow the pads to dry out completely once every 24 hours to kill algae.
4. Reduce the number of times the pad is wetted and dried out each day to maximize pad life.
5. Clean the strainer regularly to maintain a sufficient supply of water to the pads.
6. Periodically check the jets of water from the top of the Distribution Pipe. The jets should spray approximately 4" to 6" [102 mm to 152 mm] straight upward at the end of the Distribution Pipe opposite the Sump.
7. Keep the Distribution Pipe holes free of debris. A 5/32" drill bit may be used to clean the holes or a large round brush may be attached to 3/4" pvc pipe and pushed through the Distribution Pipe to clean out the holes. The 2" Pipe Plugs at either end of the Distribution Pipe can be removed to allow cleaning brush access. Clogged holes may cause dry streaks and lead to clogging of the pad.
8. Regularly flush the Distribution Pipe by opening the 1-1/2" Ball Valve at the end of the sediment trap (**See Figure 14, Item 12**) and allowing the pump to run.
9. Periodically, gently hose and brush deposits from the face of the pads.
10. Completely drain the system for winter storage. Remove the Sump Drain Cap. Remove the Pump.
11. Avoid contaminants such as dust, fertilizers, and harsh cleaners.
12. The pH of the water being circulated through the system should be maintained at between 6 and 8 to prevent premature pad softening.
13. Check that Cooling Pads are installed correctly. See **Figure 20** through **Figure 22**.
14. The water holding capacity of pads increases as pads age. This extra water raises the Sump water level when the system shuts down. To prevent overflow at shut down, slightly lower the float level.

Parts Lists and Kits

Sump Kits 49046, 49046-3, and 49046-4



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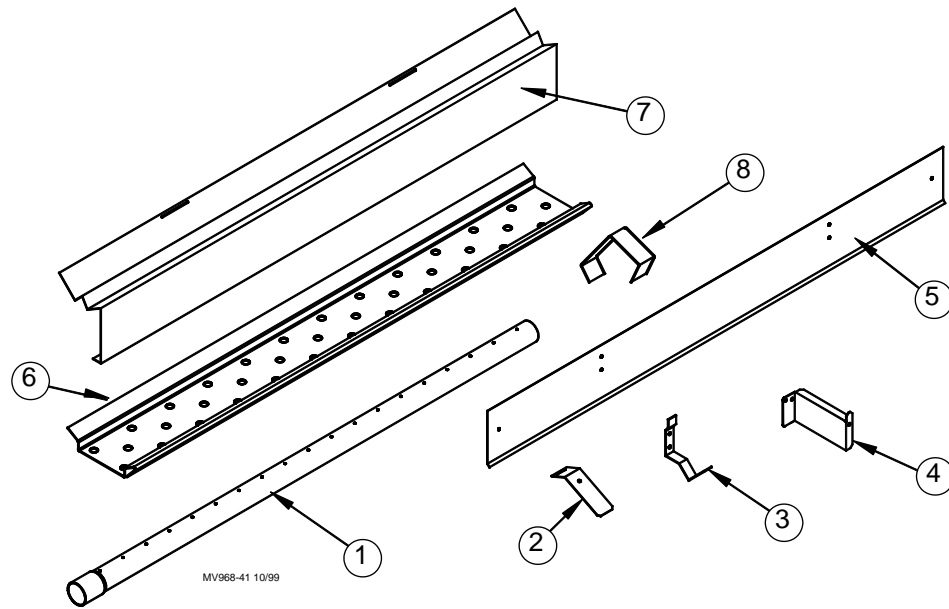
Part Numbers

Item	Description	Part No.	Qty
1	1/4" Black Bleed Off Hose	14454-144	1
2	Hose Barb Cap	24111	1
3	3/4" Bleed-off Valve	9255	1
4	1-1/2" x 3/4" Reducer Bushing	38672	1
5	1-1/2 x 2" x 2" PVC Tee	41427	2
6	1-1/2" PVC Tee	38618	1
7	Hose	36654	1
8	Garden Hose to 3/4" Pipe Adp.	14605	1
9	1-1/2" Rubber Pipe Cap	47939	1
10	Turbo Cool Sump	46339	1
11	1-1/2" SS Hose Clamp	3651	1
12A	Ball, Float (Sump Kit 49046)	45985	1
12B	Ball, Large Float (Sump Kits 49046-3, and 49046-4)	50797	
13	1-1/2 x 24" Foam Tape	41708-2	1
14	Sump Support Bracket Assembly	46448	1
15	1-1/2" PVC Adapter	38627	3
16	1-1/2" PVC Valve	44039	2
17*	1-1/2 x 5' PVC Pipe	38677	2
18A	1-1/2" FNPT Strainer Assembly (Sump Kit 49046)	38731	1
18B	1-1/2" "Y" Strainer Assembly (Sump Kit 49046-3)	48546	1
	" (Sump Kit 49046-4)	"	2
19	Trim, 1/8" Rubber Edge	46310-1	1
20	1-1/2" Union	44040	1
21	Insert,Sump End	46033	1
22	Insert, Trough End	46309	1
23	Strap, Insert Clamp	46100	2
24	Sump Inlet Support Bracket	48471	1
25	Plug 2" PVC MPT	45749	2
26	Adapter 2" PVC Spig x FIPT	45748	2
27	Bolt, 5/16-18 x 4-1/2	52607	2

Item	Description	Part No.	Qty
28	5/16-18 x 1.5" Nut	52606	2
29	Screw, 1/4 x 1-1/2 Lag	41561	3
30	Washer, 1/4 x 1	2955-52	3
31A	Valve,PVC Float .30 Orifice (Sump Kit 49046)	45989	1
31B	Valve,PVC Float .50 Orifice (Sump Kits 49046-3, and 49046-4)	48545	1
32	Nut, 1/4-20 S.S.	7145	1
33A	Rod, Float 12" 73° (Sump Kit 49046)	46202	1
33B	Rod, Float 10" 65° (Sump Kits 49046-3, and 49043-4)	50845	1
34	Adapter, 3/4" PVC Female	8160	1
35	Adapter, 3/4" FS x GHT	14605	1
36	Pipe, 3/4" x 9-1/2" PVC	7514-11	1
37	Cable Tie with UV Stabilizer	48103	2
38	PVC Valve Seal Kit (Repair Part)	46428	-
39	Washer Insert	52609	2
40	Overflow fitting	9067	1
41	1/4-20 SS Hx Flg. Nut	46298	4
42	.281 x .625 x .066 SS Washer	8915	4
43	1/4-20 x .625 SS Bolt	4404-7	4
44	O-Ring, (Repair Part for 38731 T-Strainer)	46427	-
45	Screen SS 20 Mesh (Repair Part for 38731 T-Strainer)	46426	-
46	Seal, (Repair Part for 48546 Y-Strainer)	50731	-
47	Screen, SS 20 Mesh (Repair Part for 48546 Y-Strainer)	51742	
48	PVC Y, 1.5 Double 1/4 Bend (Sump Kit 49046-4)	51302	1
49	Elbow, 1-1/2 Long Sweep 1/4 bend (Sump Kit 49046-4)	51301	2
50	Sump Lid (Replacement)	50108	-
--	Maintenance Card	MV1672	1

* The 5' PVC Pipe is not supplied with the Sump Kits (Part No. 49046, 49046-3, or 49046-4). It is included with the End Panel Kit (Part No. 41482) or the 44979-xx Pad Frame Kit.

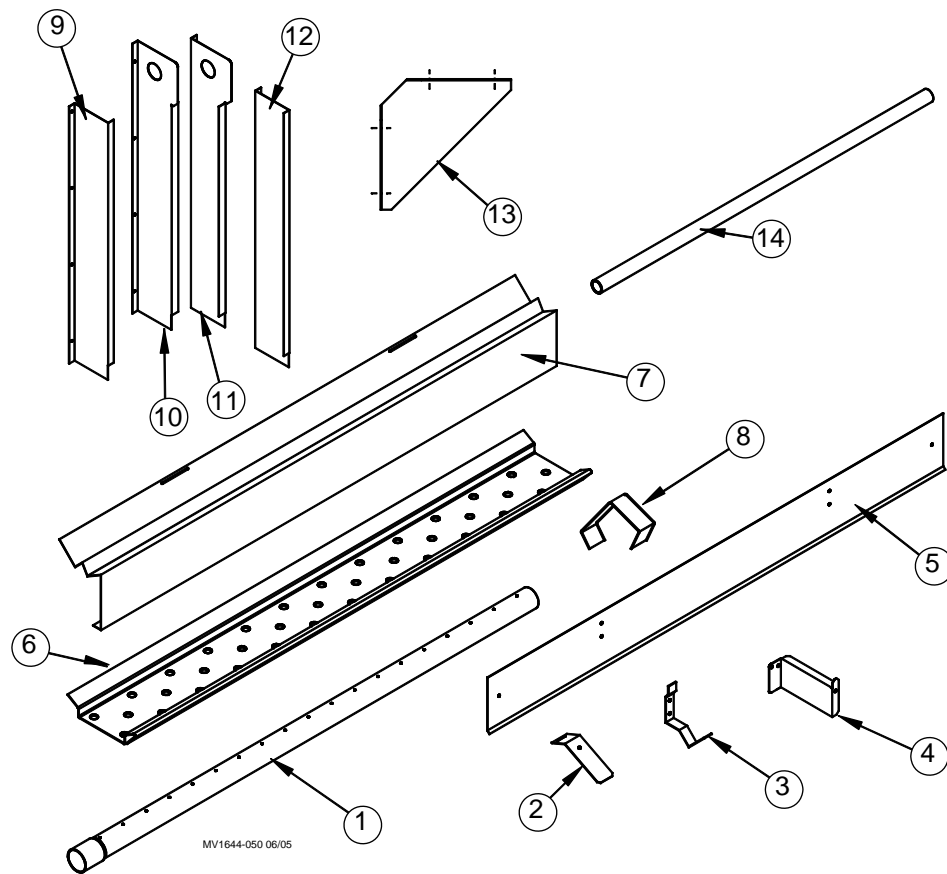
Distribution Kit Part No's. 41481-5 (5') and 41481-20 (20')



Item	Description	Part No.	Qty 5'	Qty 20'
1	2 x 5' Distribution Pipe	41333	1	4
2	Cover Lock	38352	2	8
3	Pipe Hanger	38351	2	8
4	Trough Support	41345	4	16
5	Splash Plate	38357	1	4
6	Pad Support	41344	1	4
7	Evaporative Pad Cover	38355	1	4
8	Jet Deflector	44526	1	4
--	1/4 x 1-1/2" SS Lag Screw	41561	4	16
--	10 x 1-1/4" SS Screw	36703	6	24
--	1/4 x 1/2" SS Screw	46689	1	4
--	1/4" Drive Rivet	45697	4	16

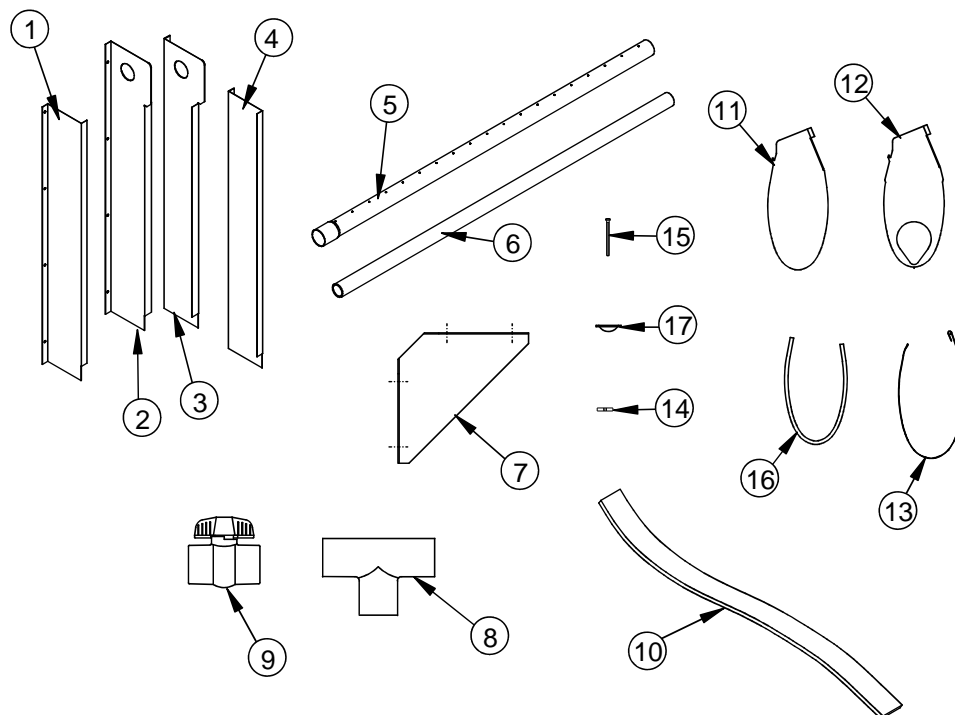
***The 41481-5 Distribution Kit includes appropriate components for a 5' evaporative cooling line. The 41481-20 Distribution Kit includes components for a 20' evaporative cooling line.**

Distribution Kit Part No's. 44979-XX (20' to 110' Systems)



Item	Description	Part No.
1	2 x 5' Distribution Pipe	41333
2	Cover Lock	38352
3	Pipe Hanger	38351
4	Trough Support	41345
5	Splash Plate	38357
6	Pad Support	41344
7	Evaporative Pad Cover	38355
8	Jet Deflector	44526
9	Evap. End Lower Panel (L.H.)	38733-2
10	Evap. End Upper Panel (L.H.)	38356-2
11	Evap. End Upper Panel (R.H.)	38356-1
12	Evap. End Lower Panel (R.H.)	38733-1
13	End Panel Support	44391
14	1.5 x 5 ft PVC SCH40 Pipe	38677
--	1/4 x 1-1/2 Lag Screw	41561
--	10 x 1-1/4" SS Screw	36703
--	1/4" Drive Rivet	45697
--	1/4 x 1/2" SS Screw	46689
XX = System Length 20'-110' in Increments of 5		

End Panel Kit Part No. 41482 and Center Panel Kit Part No. 46345

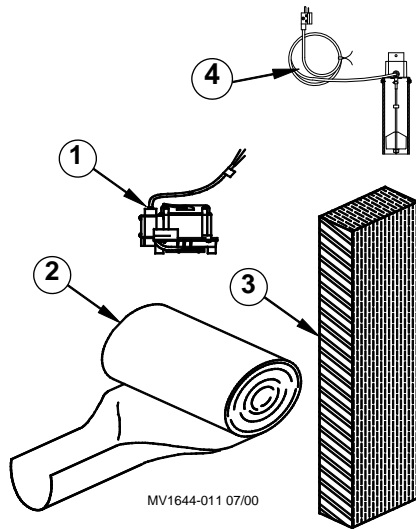


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Item	Description	Part No.	Quantity	
			End Panel Kit	Center Panel Kit
1	Evap. End Lower Panel (L.H.)	38733-2	1	1
2	Evap. End Upper Panel (L.H.)	38356-2	1	1
3	Evap. End Upper Panel (R.H.)	38356-1	1	1
4	Evap. End Lower Panel (R.H.)	38733-1	1	1
5	2 x 5' Distribution Pipe	41333	1	----
6	1-1/2 x 5' PVC Pipe	38677	2	----
7	End Panel Support	44391	2	2
8	2" x 2" x 1-1/2" PVC Tee	41427	----	1
9	1-1/2" Ball Valve	44039	----	1
10	2 x 24" Foam Tape	41708-2	----	1
11	Insert, Trough End	46309	----	1
12	Insert, Sump End	46033	----	1
13	Strap, Insert Clamp	46100	----	2
14	Nut, 5/16-18 Special	52606	----	2
15	Bolt, 5/16-18 x 4-1/2	52607	----	2
16	Trim, 1/8" Rubber Edge	46310-1	----	1
17	Insert Washer	52608	----	2
--	10 x 1-1/4" SS Screw	36703	23*	18
--	1/4 x 1-1/2" SS Lag Screw	41561	7*	----
--	1/4" Drive Rivet	45697	5	----
--	1/4 x 1/2" SS Screw	46689	15	----

*Includes at least 5 extra pieces to cover any lost hardware.

Miscellaneous Components



Item	Description	Part No. **
1	Pump (see chart on page 6)	-----
2*	Trough 24" wide, (100 mil) 15" hole spacing	49184-XX
3**	Cooling Pads: Munters Celdek 45°/15° 6" x 12" x 4 foot 6" x 12" x 5 foot 6" x 12" x 6 foot	38624-4 38624-5 38624-6
3**	Cooling Pads: General Shelters 45°/15° 6" x 12" x 3 foot 6" x 12" x 4 foot 6" x 12" x 5 foot 6" x 12" x 6 foot	46389-3 46389-4 46389-5 46389-6
4	Water Level Safety Switch 230V 115V	46700 46700-1

Part Numbers listed are for pads with coating on inlet side, shipped from Milford

*Round up to the nearest 5' Trough lengths are available from 5' to 140' Example: 49184-100 is a 101' roll of Trough, 49184-50 is a 51' roll of trough.

**Add a "D" to the *part number* (xxxxx-3D) for drop shipped pads.24

Add a "N" to the *part number* (xxxxx-3N) for pads without coating on the inlet side.

Add a "B" to the *part number* (xxxxx-3B) for pads with coating on the inlet and bottom side of the pad.



**Made to work.
Built to last.**

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Revisions to this Manual

Page No.	Description of Changes
Various	Added Sump Lid replacement part no. changed maximum PH level. Removed Obsolete Pads. Added maximum system length for 52074 pump at 50Hz.

Contact your nearby Chore-Time distributor or representative for additional parts and information.

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