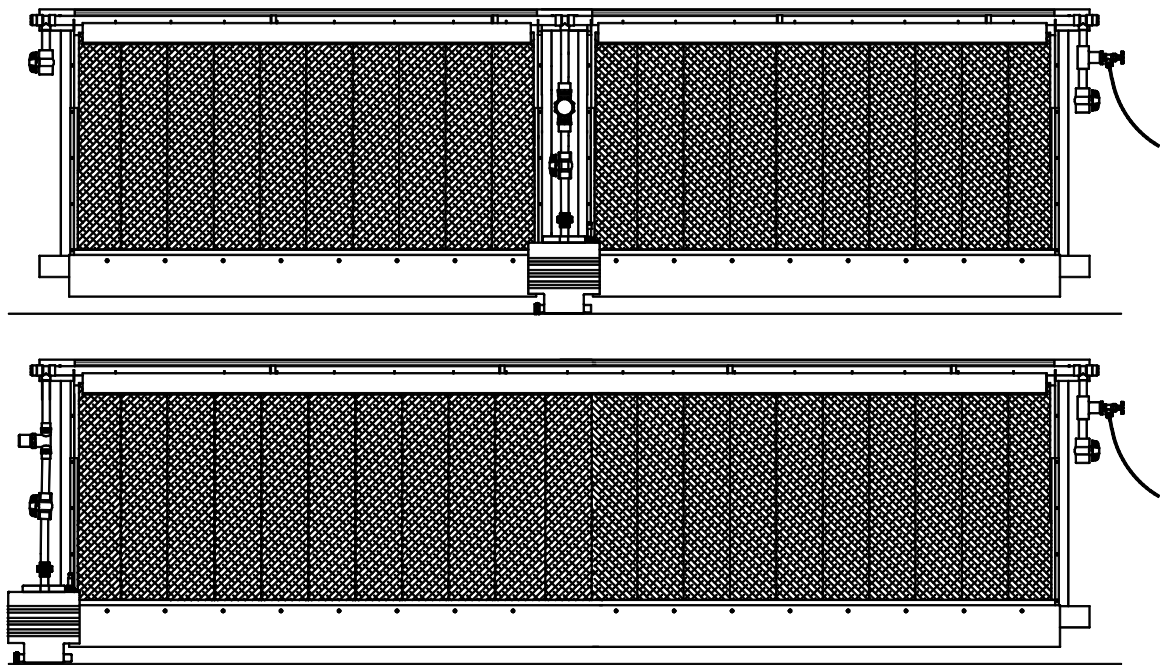


Turbo-Cool™ With Open Top 6" Recirculating Evaporative Cooling Installation & Operator's Instruction Manual



Mv1669-018 04/01

Chore-Time Warranty

Chore-Time Equipment ("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: **February 2006**

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Thank You

The employees of Chore-Time Equipment 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™ With Open Top 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

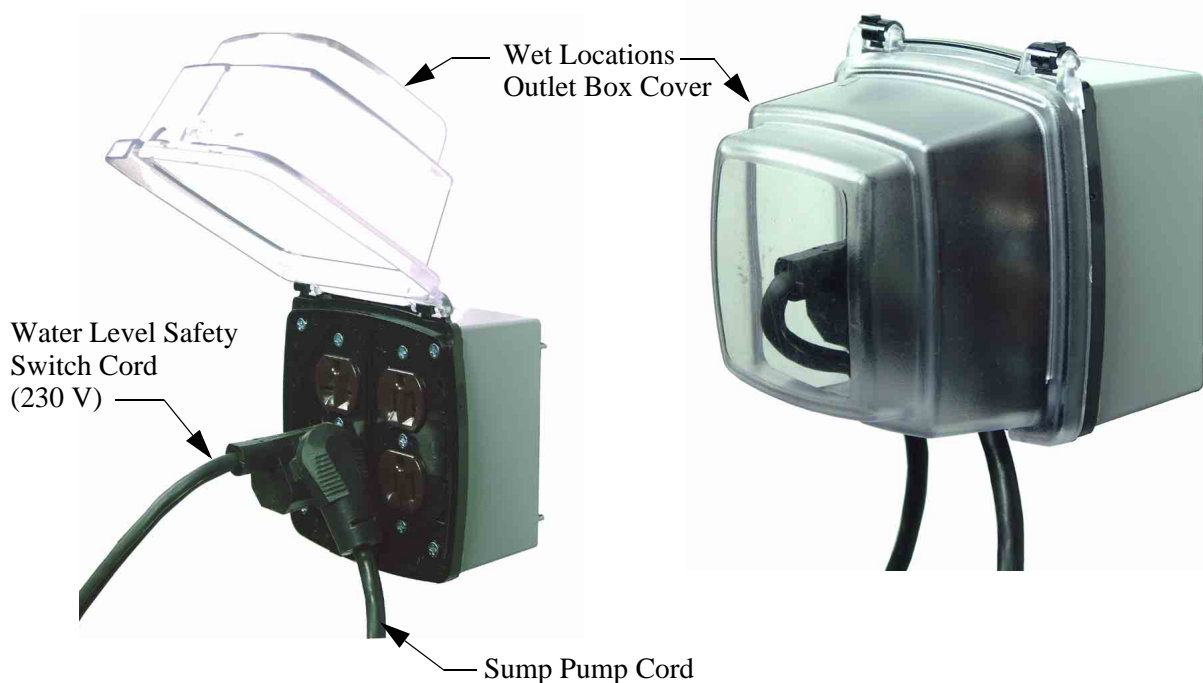
Ground all electrical equipment for safety.

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

Chore-Time Recommends using 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	2.9 (1.18)
110 (43)	20	2.4 (.97)
100 (38)	20	2.2 (0.90)
100 (38)	30	1.8 (0.73)
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.

	PVC Float Valve-PS75LS (Sump Kit 49046)	PVC Float Valve-PS75SS (Sump Kit 49046-3)
Flowrate @ 10 psi (gpm)	5 gpm	8 gpm
Flowrate @ 20 psi (gpm)	7 gpm	11 gpm
Maximum Water Pressure	100 psi	50 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
49843	EP52X	1	60	3.4	7.2	65	75
49842	EP72X	1	60	4.3	7.7	80	90
49367	DOC7T	3	50	1.6	6.4	65	75
49843	EP52X	1	50	2.8	7.9	50	55
49842	EP72X	1	50	3.2	8.5	65	75

Important!

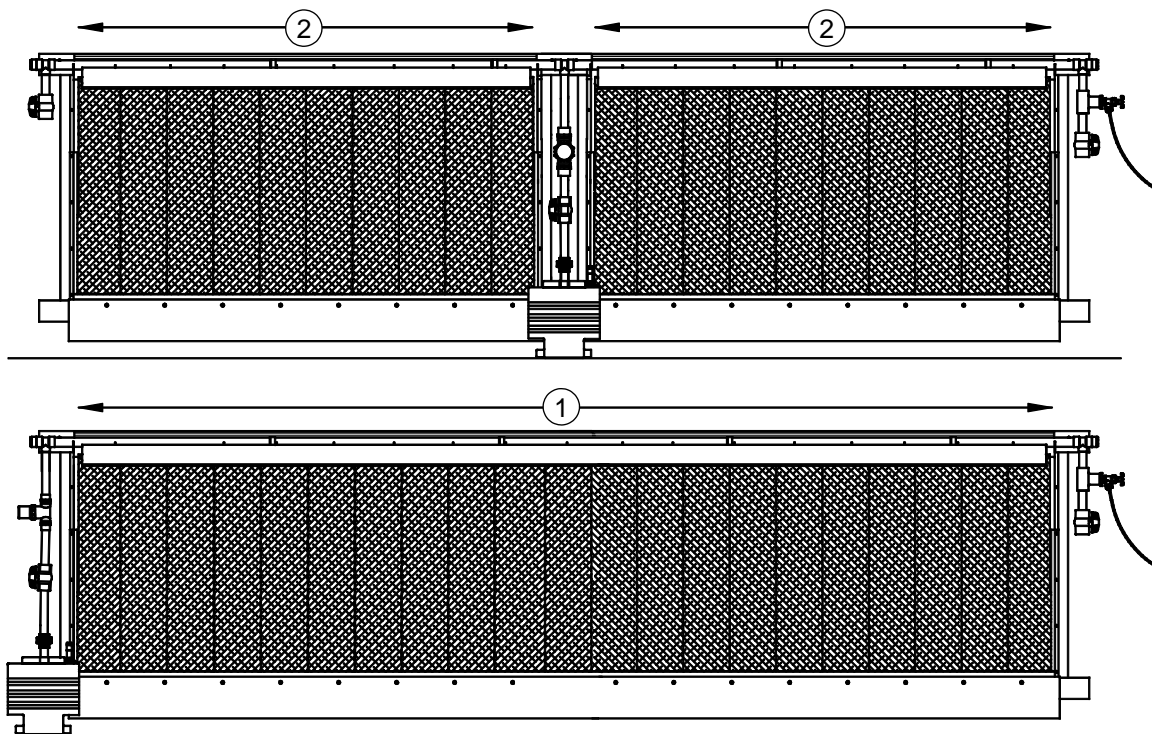
Chore-Time Equipment strongly recommends that a good alarm system should be installed in confinement buildings to warn of power failure and high temperature.

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

Planning Information

System Layout:

The Sump Assembly may be installed at either end of the system or in the middle.



MV1669-047 09/03

Item	Description
1	Maximum length = 70'
2	Maximum length = 90'

Figure 1. Optional Sump locations

The maximum length of Cooling Pad on either side of the Sump Assembly is 90', if the cooling system is longer than 70' the Sump must be installed in the middle of the system.

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.

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.

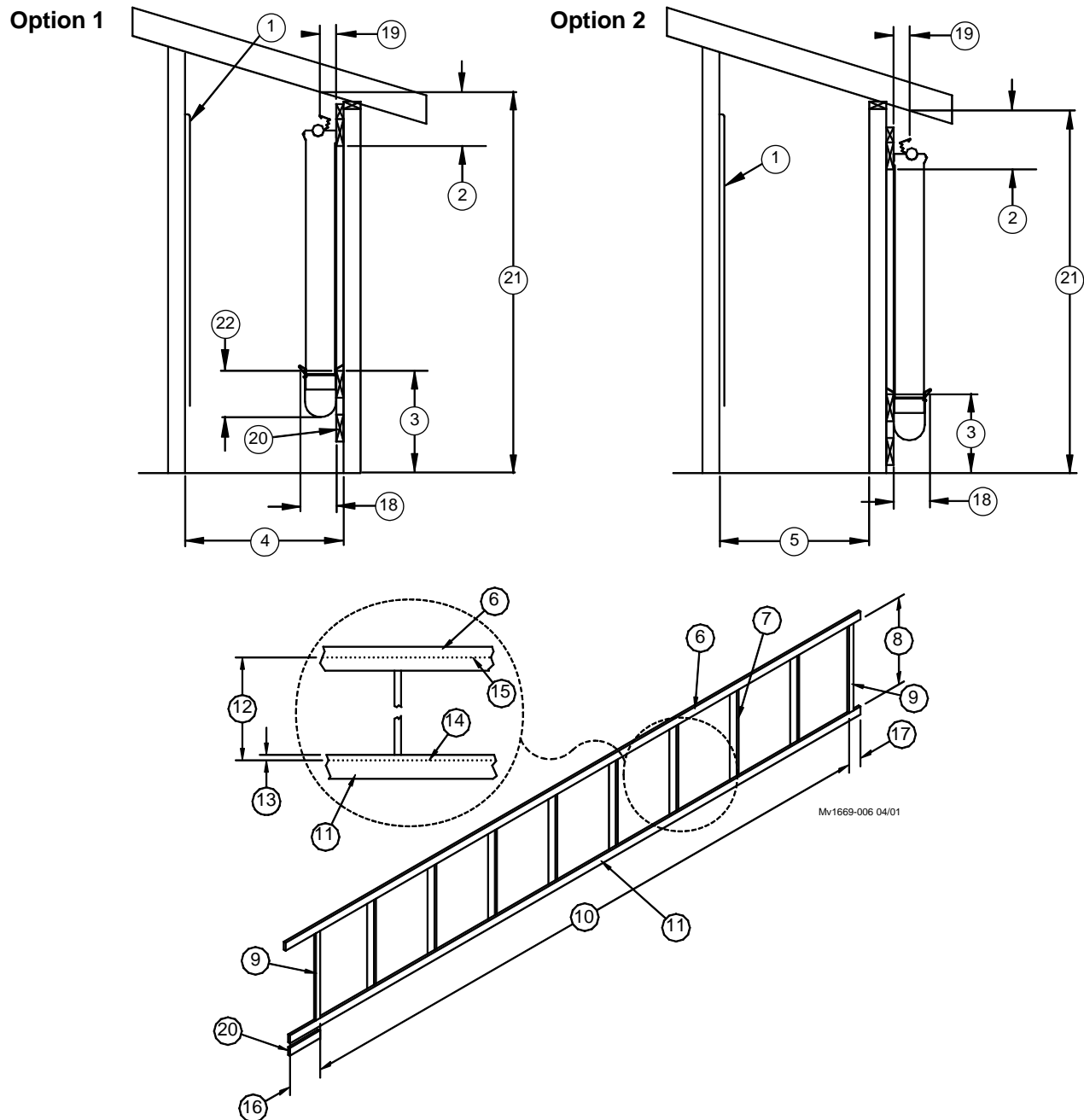
2. Determine the location of the top stringer. See **Figure 2, Item 8**. The distance between the top and bottom stringers should be approximately 2" [51 mm] less than the height of the Evaporative Cooling Pads.

Example: For a 60" [1524 mm] tall Evaporative Cooling Pad the distance between the stringers would be 60" [1524 mm] - 2" [51 mm] = 58" [1473 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.

Framing Diagrams for Systems with Sump at the End.

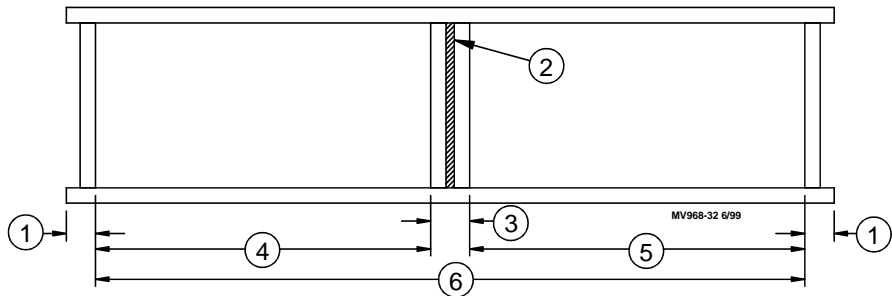


Item	Description
1	Curtain
2	7.5" [191 mm] Minimum Clearance
3	14-1/2" [368 mm] Minimum Sump Clearance
4	30" - 36" [762 - 914 mm] Walkway
5	6" [152 mm] Minimum Clearance
6	2 x 6" [38 x 140 mm] Top Stringer
7	Wall Studs
8	Pad Height less 2" [51 mm]
9	End Framing
10	Width of Pad Bank
11	2 x 6" [38 x 140 mm] Bottom Stringer

Item	Description
12	Pad Height plus 2" [51 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	3" [76 mm]
20	2 x 6 Sump Back Support
21	Pad Height plus 20" Min. Clearance
22	Minimum Trough Clearance 9-1/4" [23.5 mm]

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

Framing for System with Sump in the Middle



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

Pipe Support and Splash Guard Installation

Install the first Pipe Support at the Sump End 15" from the inside edge of the framed opening with the hole on the Top Stringer Chalk-Line. Line up the holes in the Pipe Support with the holes in the Splash Guard and use a 1/4 x 1-1/2 Lag Screw to fasten the Pipe Support and Splash Guard to the Top Stringer (See Figure 4). Install a Pipe Support at each Splash Guard hole location making sure to keep the Splash Guard pulled so as not to have any wrinkles. Cut the excess plastic about an inch past the inside edge of the framed opening on both ends of the system (See Figure 4).

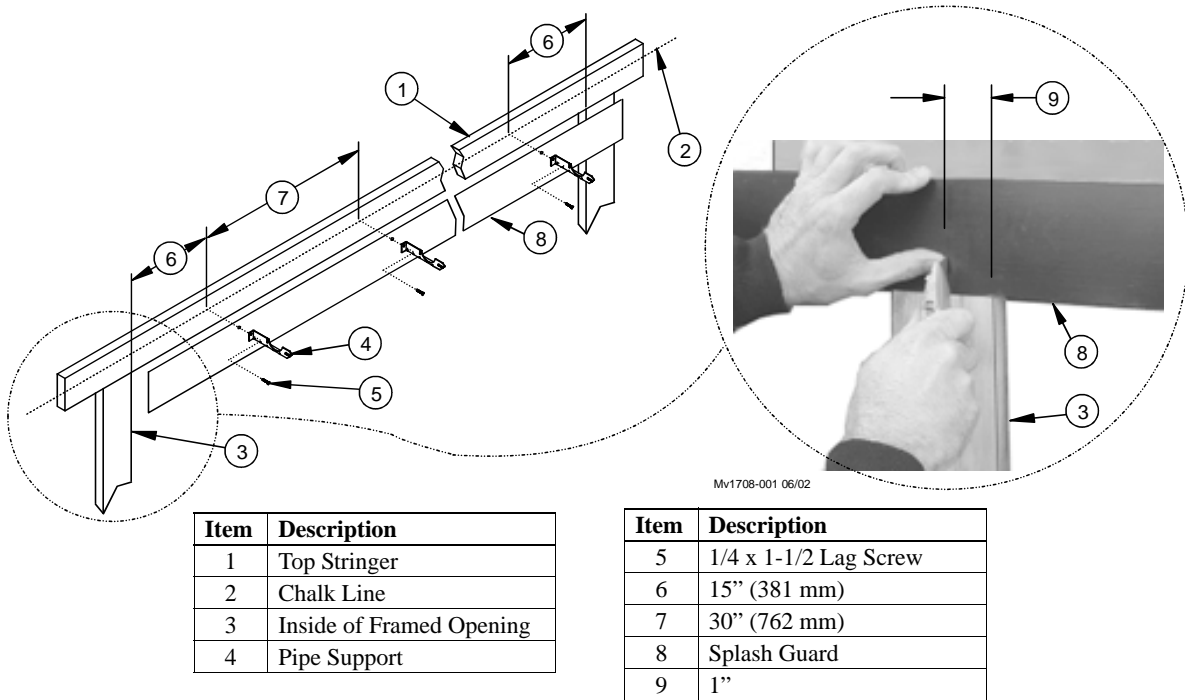


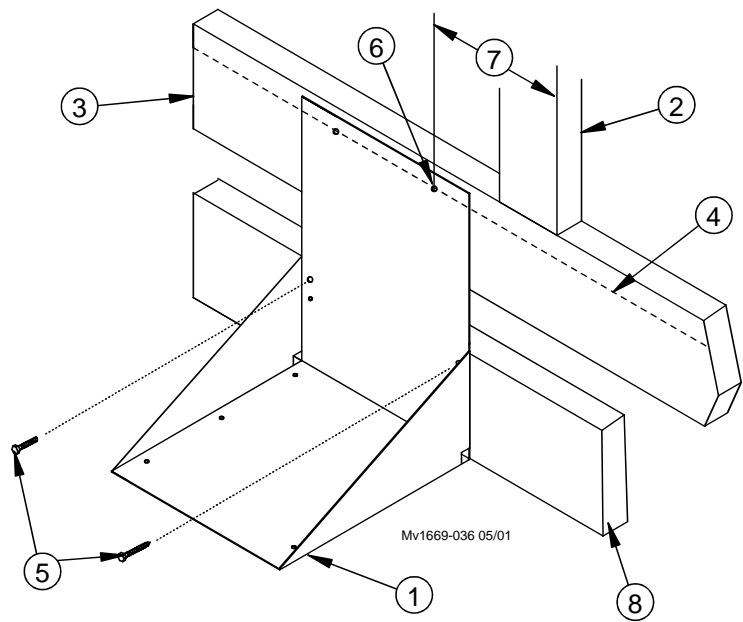
Figure 4. Pipe Support and Splash Guard Installation

Evaporating Cooling System Installation

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

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 5, Items 2, 6, &7**). Use two 1/4 x 1-1/2" Lag Screws to fasten the Sump Support Assembly to the **Lower** 2 x 6 Sump Support as shown in **Figure 5**. The top holes will be used later to attach the Sump to the Bottom Stringer.



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

Figure 5. Sump Support Assembly

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. A short hand saw works nicely for this. **See Figure 6.**

Decide which side of the Sump will be used for the drain and cut off that end (**Figure 6, 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 and Install the 1/2" PVC Overflow Fitting in the hole. The 1/2" PVC pipe can be attached to this fitting to channel overflow water to a drain. Use a 1/2" PVC Pipe Plug to Plug the hole on the opposite end of the Sump.

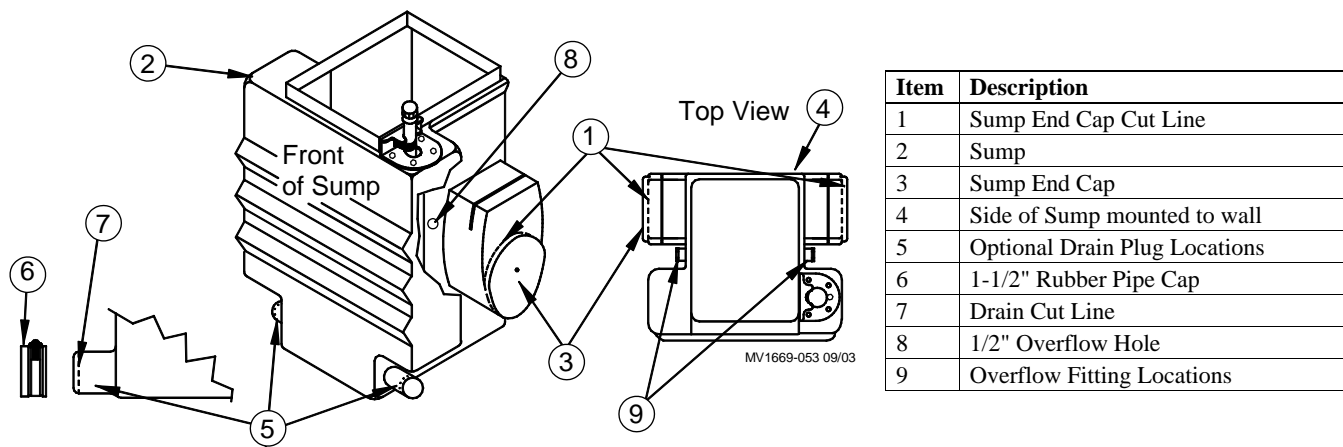


Figure 6. Cutting the Sump

Sump End Clamp Assembly

Place the 2" x 24" self adhesive tape around the Sump End as shown **below**. Slide the Sump-End (The one with the hole in it) Insert into place. Note: the direction of the Insert bolt for easier access later with a Screw gun. Assemble the Clamp with the Insert as shown leaving the Clamp Strap hang loose. The Strap will be used to attach the trough later in the assembly process. (**See Figure 7 below**).

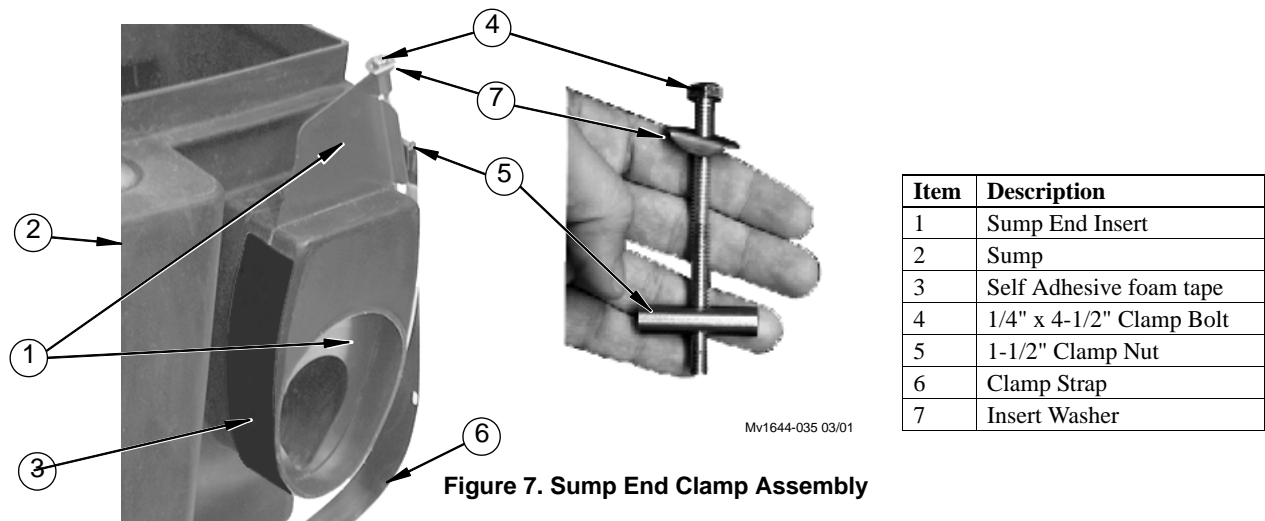
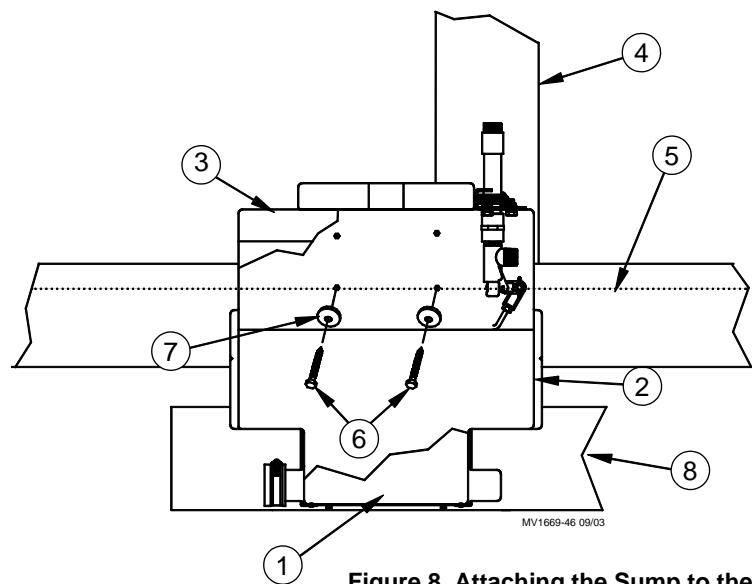


Figure 7. Sump End Clamp Assembly

Attaching the Sump

Align the top set of 1/4" holes in the rear of the Sump with the two 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.



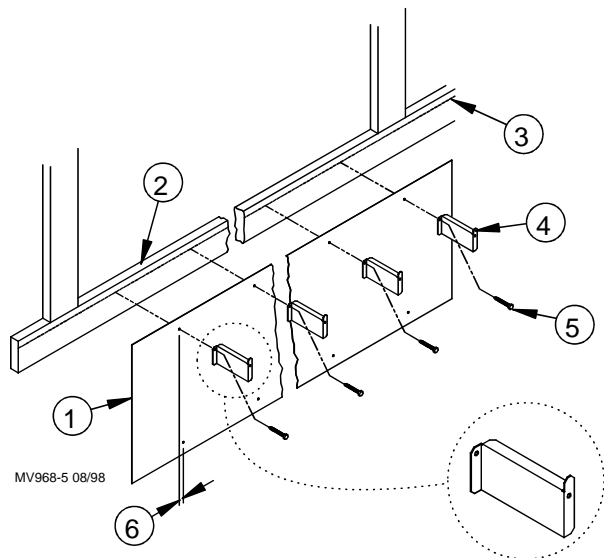
Item	Description
1	Sump Support Assembly
2	Trough end of Sump
3	Sump
4	Edge of Framed Opening
5	Bottom Stringer Chalk-Line
6	1/4 x 1-1/2" Lag Screw
7	1/4" x 1" Washer
8	Lower 2 x 6 Sump Support

Figure 8. Attaching the Sump to the Bottom Stringer

Trough Installation

Orient the Trough so that the Pattern of holes on top are offset to the left of the holes across the bottom (See Figure 9, Item 6).

Hang the Trough from the Bottom Stringer beginning with one end of the Trough Material **against** the Sump (See Figure 11, page 13), 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 the 1/4 x 1-1/2" Lag Screws to attach the Trough Supports and Trough Material to the Bottom Stringer as shown in Figure 9.



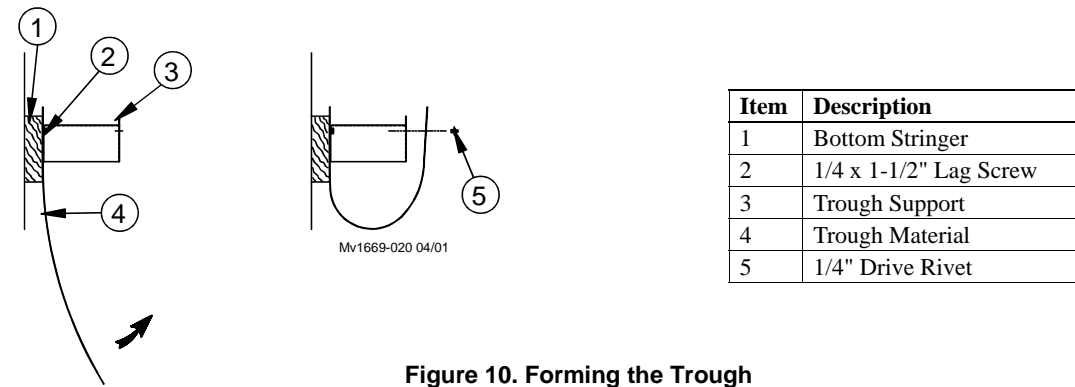
Item	Description
1	Trough Material
2	Bottom Stringer
3	Chalk-Line
4	Trough Support
5	1/4 x 1-1/2" Lag Screw
6	Top Hole Offset to left of Bottom Hole

Figure 9. Installing the Trough

Trough Installation Continued....

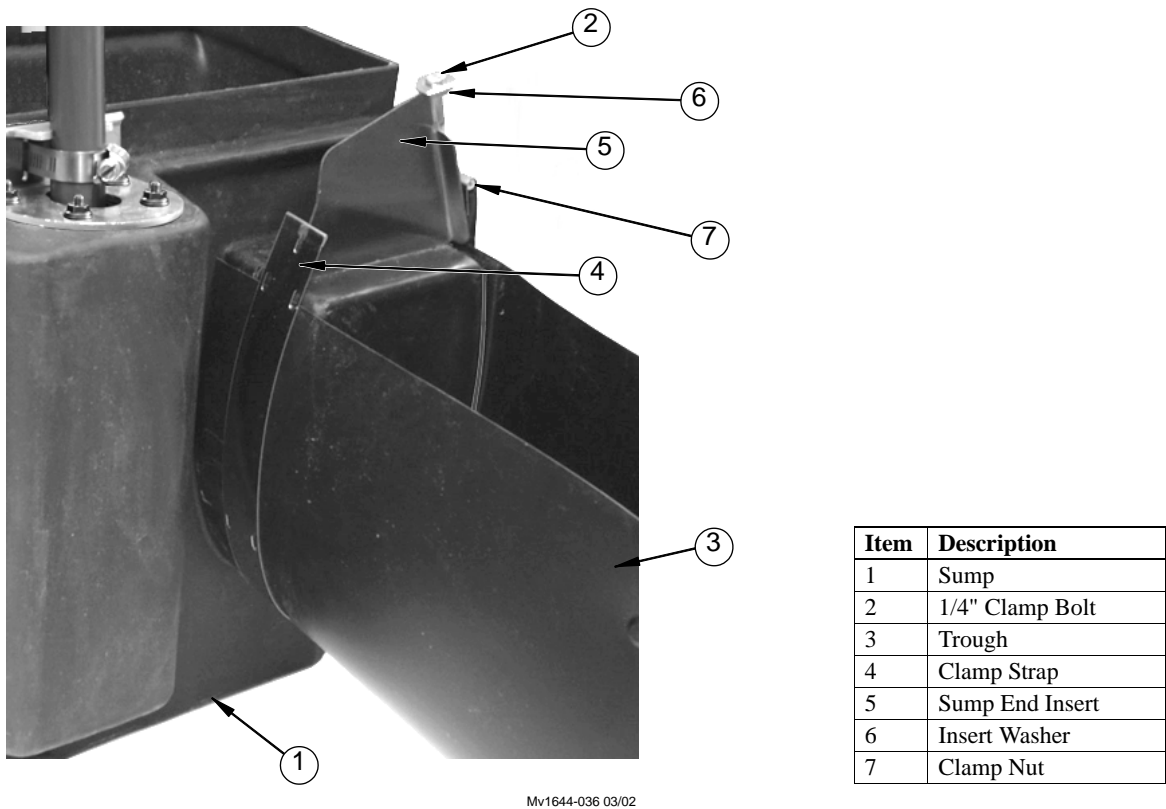
Form the Trough into a "U" shape as shown in **Figure 10** and fasten the Trough to the Trough Support using the 1/4" Drive Rivets. Insert the 1/4" Drive Rivet through the hole in the Trough and the Trough Support. Use a hammer to hit the 1/4" Drive Rivet head to lock it in place. Repeat the process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

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



Attaching the Trough to the Sump

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.

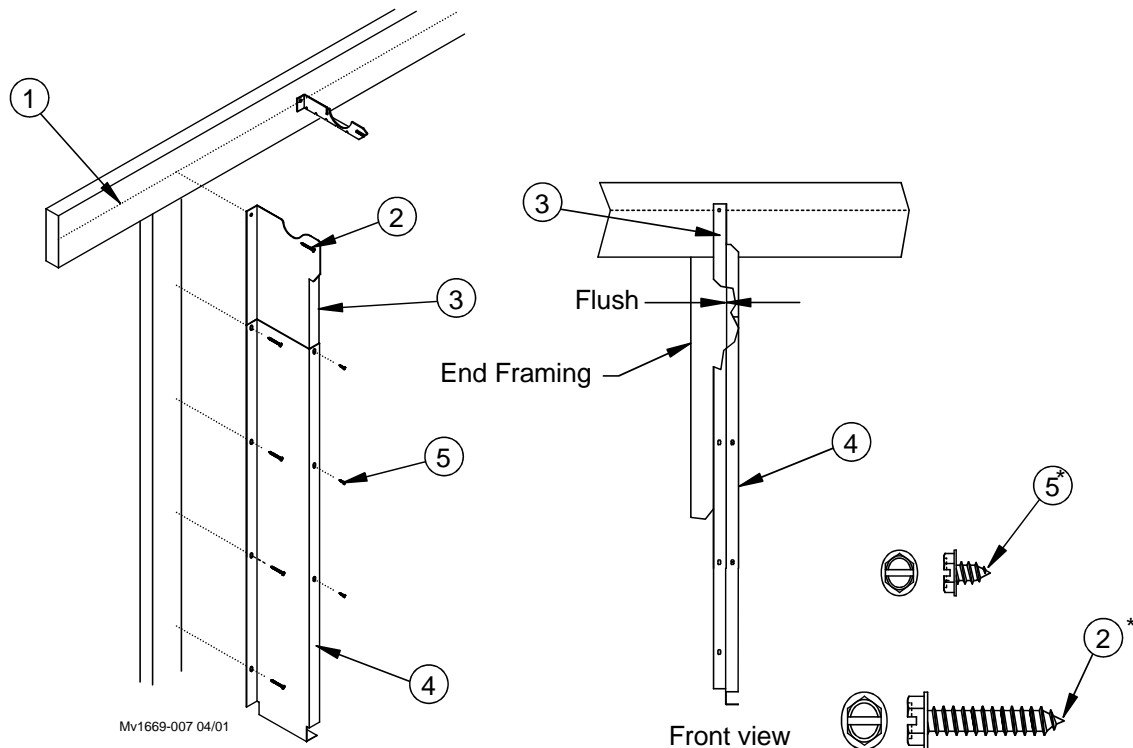


End Panel Installation

First install the end panels at the Sump end. Install the End panels opposite the Sump end after installing the Deflectors (next step); this makes the system assemble easier due to small variations in system length.

Install the End Panels flush with the inside of the framed opening. (**Figure 12 below**)

1. Locate the top mounting hole (in the flange of the Upper End Panels) on the Chalk-Line. This will properly align the hole for the Distribution Pipe with the Pipe Supports. See **Figure 12**. Use a level to check that the End Panels are vertical. Secure the Upper End Panels to the top stringer using the 1/4 x 1-1/2" Screws, as shown in **Figure 12**.
2. The Lower End Panels should overlap on the outside of the Upper End Panels to provide proper watershed.
3. Align mounting holes in the upper and lower end panels and secure the end panels to the frame using the 1/4 x 1-1/2" Lag Screws (**Item 2, Figure 12**).
4. Join the front flanges of the End Panels with the #10 x 1/2 Screws (**Item 5, Figure 12**).

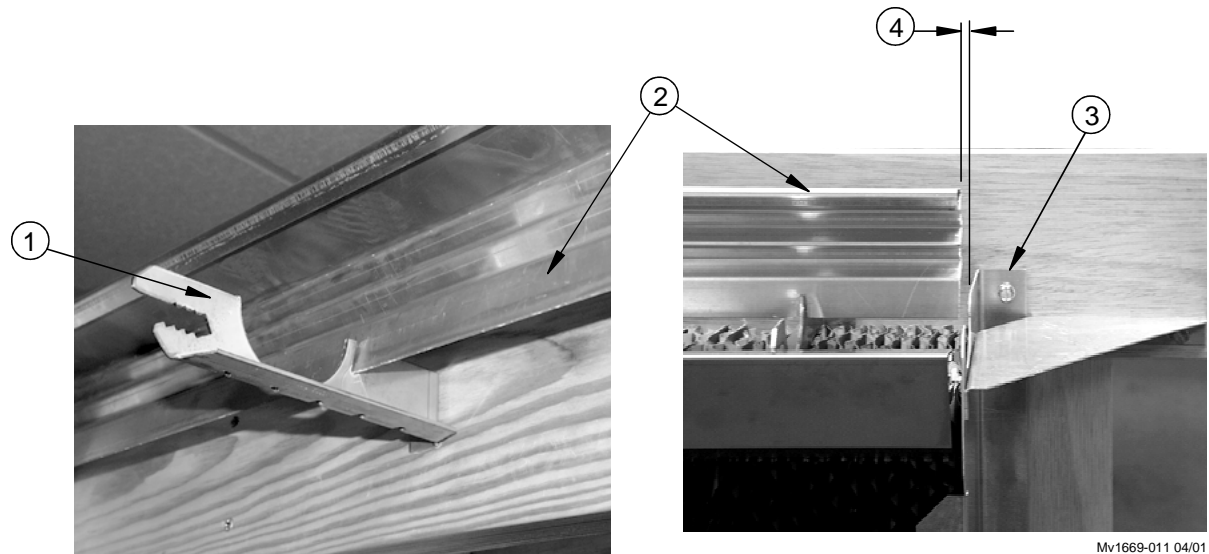


Item	Description
1	Chalk-Line on top stringer
2	1/4 X 1-1/2" S.S. Screw
3	Upper End Panel
4	Lower End Panel
5	#10 x 1/2 S.S. Screw
*Not actual size; shown for comparison only	

Figure 12. End Panel Installation

Water Deflector Installation

Install Deflectors on the Pipe Supports as shown **below** in **Figure 13**. Use the Deflector Couplers to cover the joint between adjacent Deflectors.



Item	Description
1	Pipe Support
2	Water Deflector
3	End Panel
4	1/8"

Figure 13. Water Deflector Installation

Install the remaining End Panels leaving a 1/8" gap between the last Deflector and the End Panels.(**Figure 13. above**)

Distribution Pipe Installation

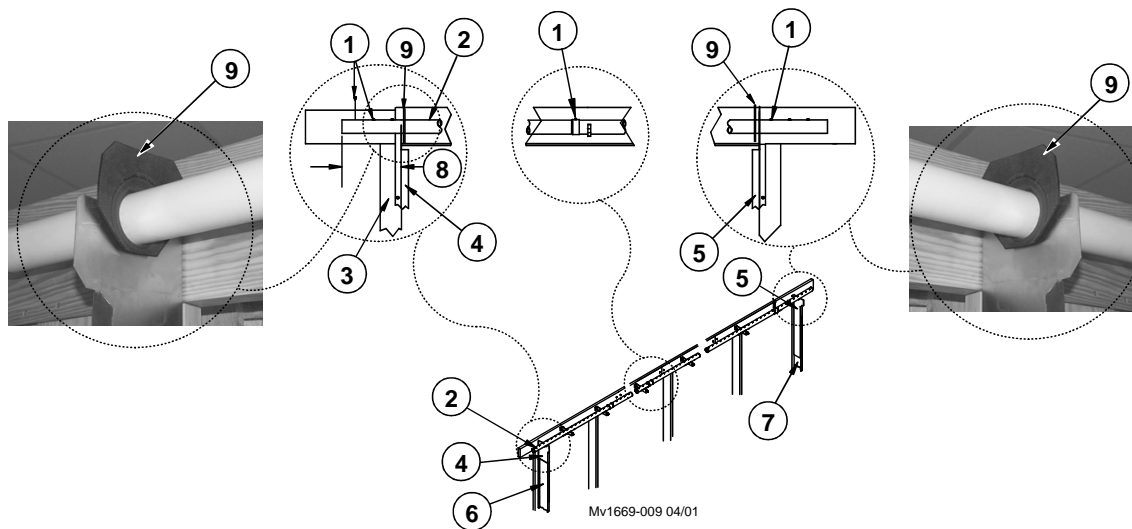
1. Set this Distribution Pipe on the Pipe Hangers above the Sump end of the Trough.

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

2. 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.
3. 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 8)

The Pipe should extend at least 6" past the the opposite End Panel.

4. Install a 1/4 x 1/2" Screw in each spray hole that falls outside the End Panels at either end.
5. Install Distribution Pipe Gasket inside the End Panels at both ends of the system as shown below in Figure 14.

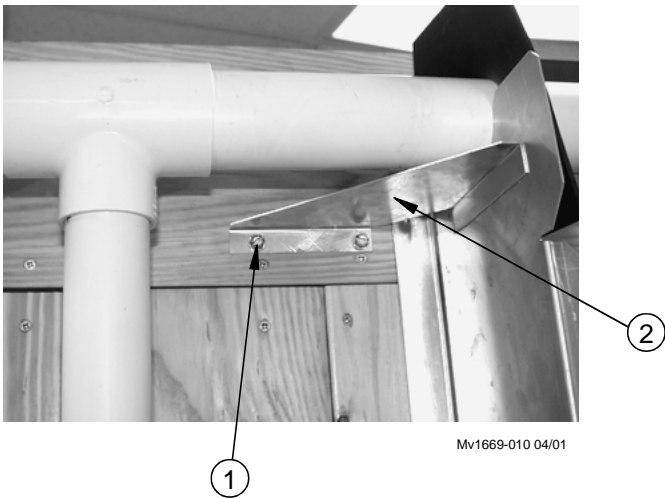


Item	Description
1	1/4 x 1/2" S.S. Screw
2	5' Distribution Pipe
3	Framing @ Sump End
4	Upper End Panel (L.H.)
5	Upper End Panel (R.H.)
6	Lower End Panel (L.H.)
7	Lower End Panel (R.H.)
8	8" [20.32 cm] Approximately at Sump end
9	Distribution Pipe Gasket

Figure 14. Distribution Pipe Installation

End Panel Support Installation

Install the End Panel Support at both ends using 1/4 x 1-1/2 Lag Screws, as shown in **Figure 15**. The End Panel Supports hold the End Panels against the Pads and keep them perpendicular to the Top Stringer.



Item	Description
1	1/4 x 1-1/2 Screws
2	End Panel Support

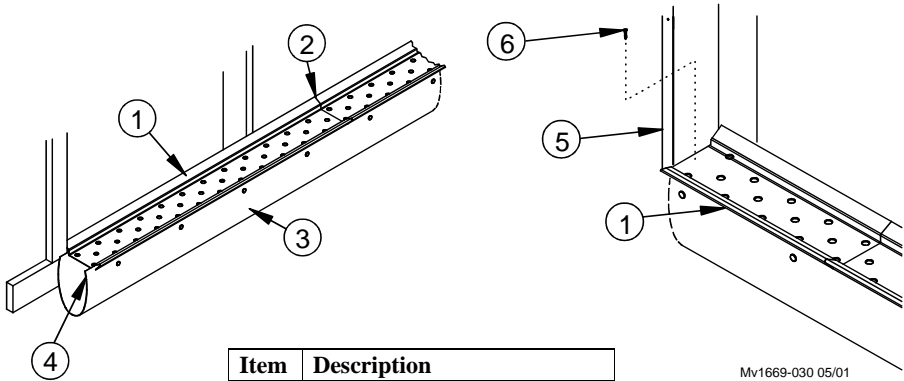
Figure 15. End Panel Support Installation

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 the Sump End End Panels. The length of the last Pad Support can be trimmed if it is too long to fit in the remaining space. Attach the Pad Support at either end to the flange in the Lower End Panel with a #10 x 1/2" SS Screw. (See **Figure 16**, below)

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



Item	Description
1	Pad Support
2	Pad Supports butted together
3	Trough
4	Front edge of Trough
5	Lower End Panel
6	#10 x 1/2 SS Screw

Figure 16. Pad Support Installation

Caulking the End Panels

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

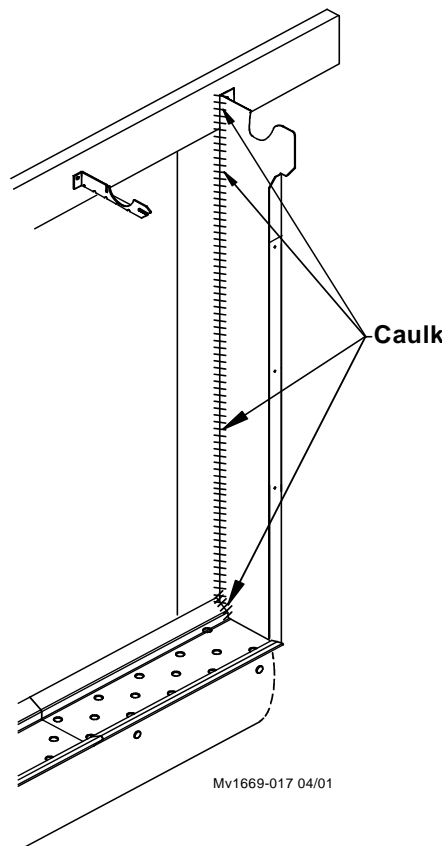
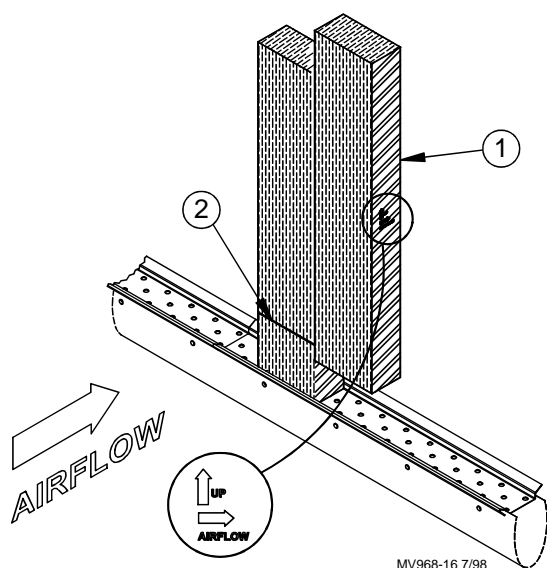


Figure 17. Caulking the End Panels

Evaporative Cooling Pad 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 Top Stringer and directly below the Distribution Pipe.
- Make sure the Pads are properly oriented.
- **MUNTERS and GENERAL SHELTERS Pads:** Refer to the directional arrows on the side of the pads.
- **GLACIER COR Pads:** May have a black stripe which indicates the bottom end of pads and the air inlet side of the pads. If no stripe is present, refer to **Figure 19** to determine the proper pad orientation based on the direction of the pad flutes vs. direction of incoming air flow.
- Make sure the first pad is against the End Panels.
- Push Pads tightly together and keep as vertical as possible.
- It may be necessary to use a hand-saw to trim the last Pad to fit the remaining opening.



Item	Description
1	Munters Pad and General Shelters
2	Glacier Cor Pad

Figure 18. Pad Installation

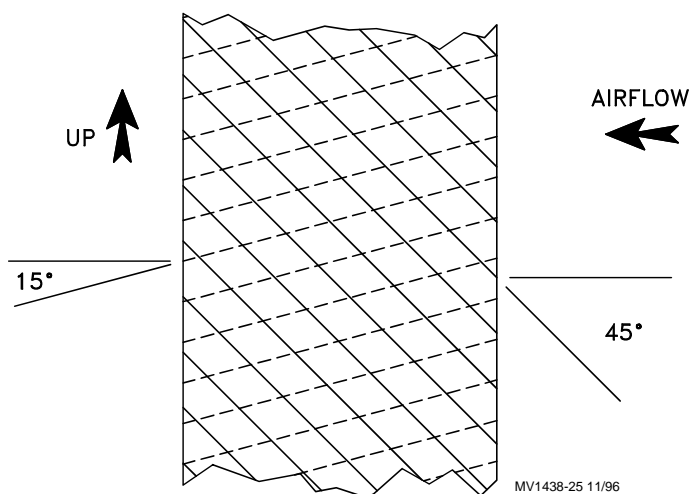


Figure 19. Side of Pad

Pad Retainer Installation

Install the Pad Retainer as shown in **Figure 20. below**. Lock the Pad Retainer in place by tapping it with the heel of your hand (**Figure 20**). Cover the joint between adjacent Pad Retainers with the Pad Retainer Couplers.

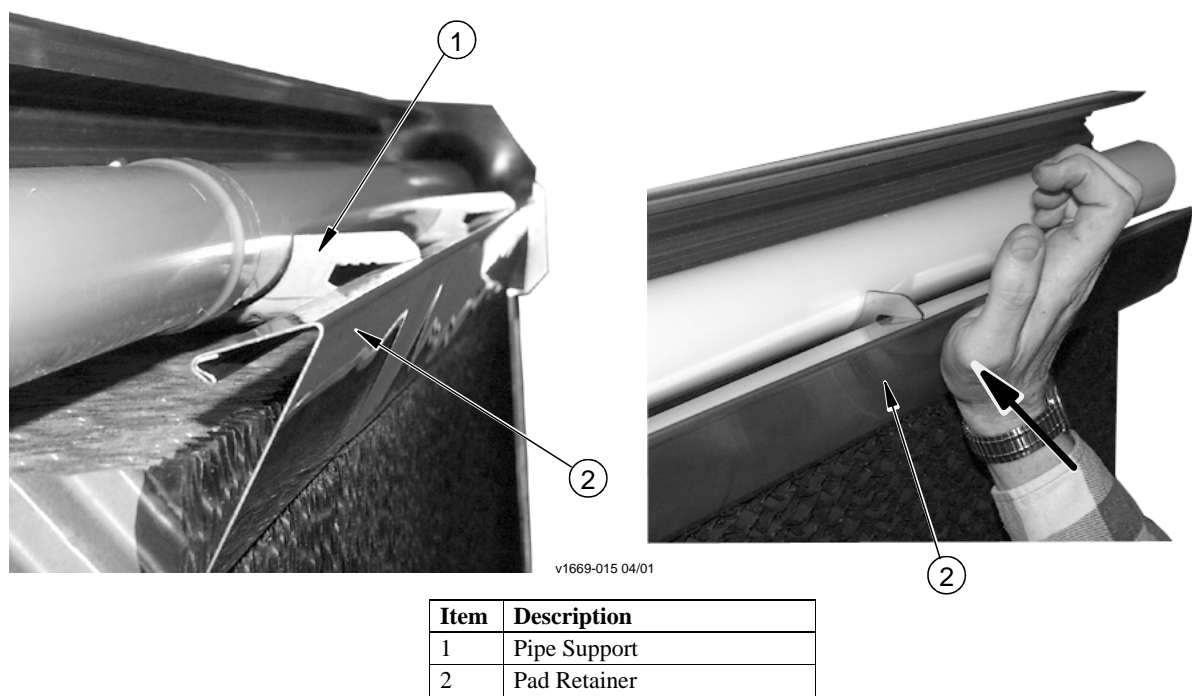


Figure 20. Pad Retainer Installation

For future reference, to remove the Pad Retainers, grasp and twist the Pad Retainers as shown in **Figure 21. below**.

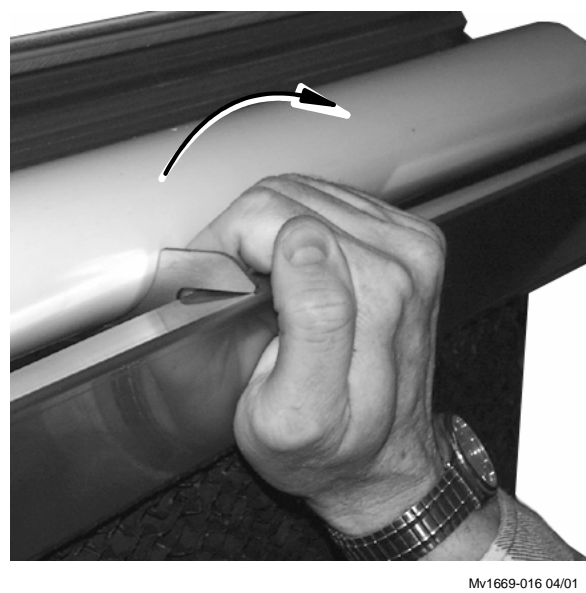


Figure 21. Removing the Pad Retainer

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 22**. 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 22, 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 22, Items 5 & 6**)

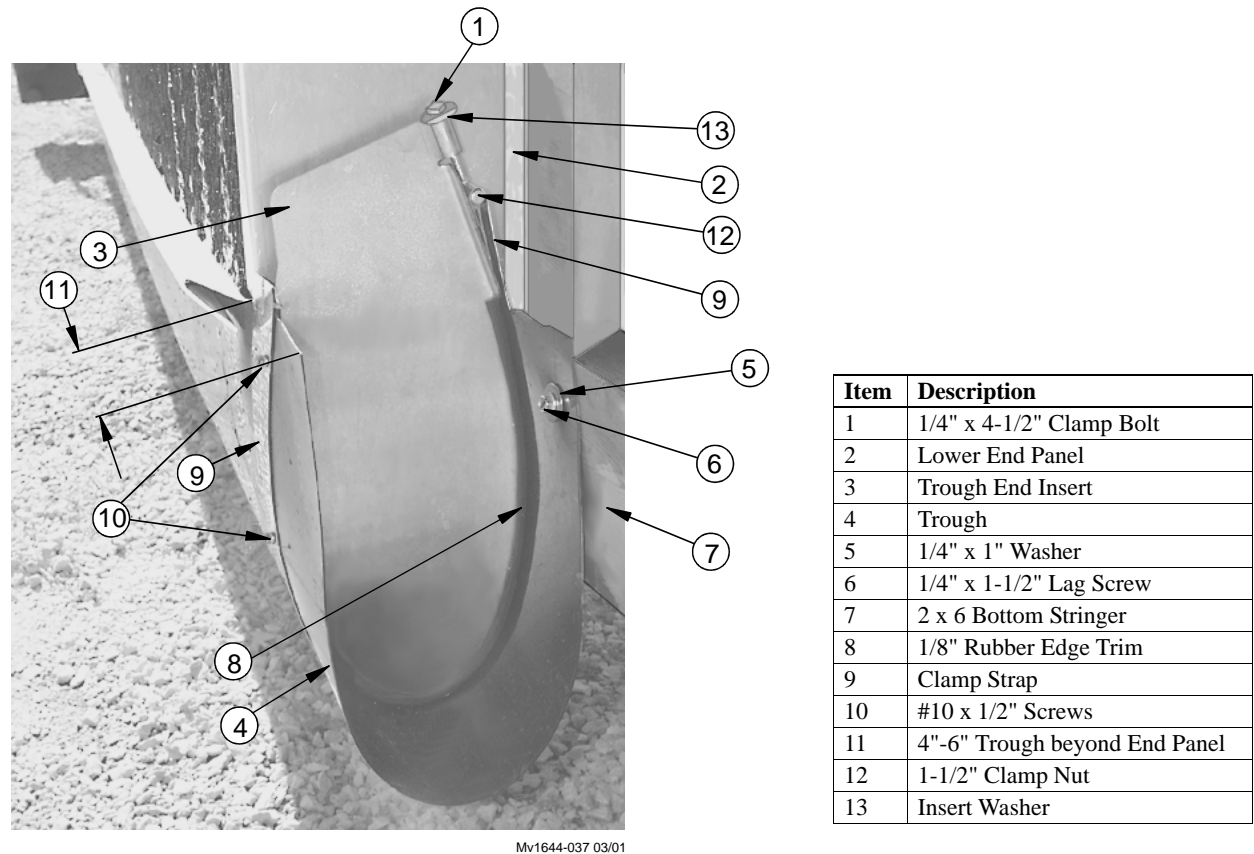


Figure 22. Trough End Insert Installation

Distribution Pipe Orientation

Orient the Distribution Pipe so there is approximately 2" from the Distribution Pipe Gasket to the first hole in the Distribution Pipe at the Sump End of the system as shown in **Figure 23** below.

Rotate the Distribution Pipe so the water jet spraying from the holes will hit the deflector about 3/4" from the rear of the Deflector as shown in **Figure 23** below. Maintain this orientation of the Distribution Pipe while gluing the pvc fittings on to both ends of the Distribution Pipe.

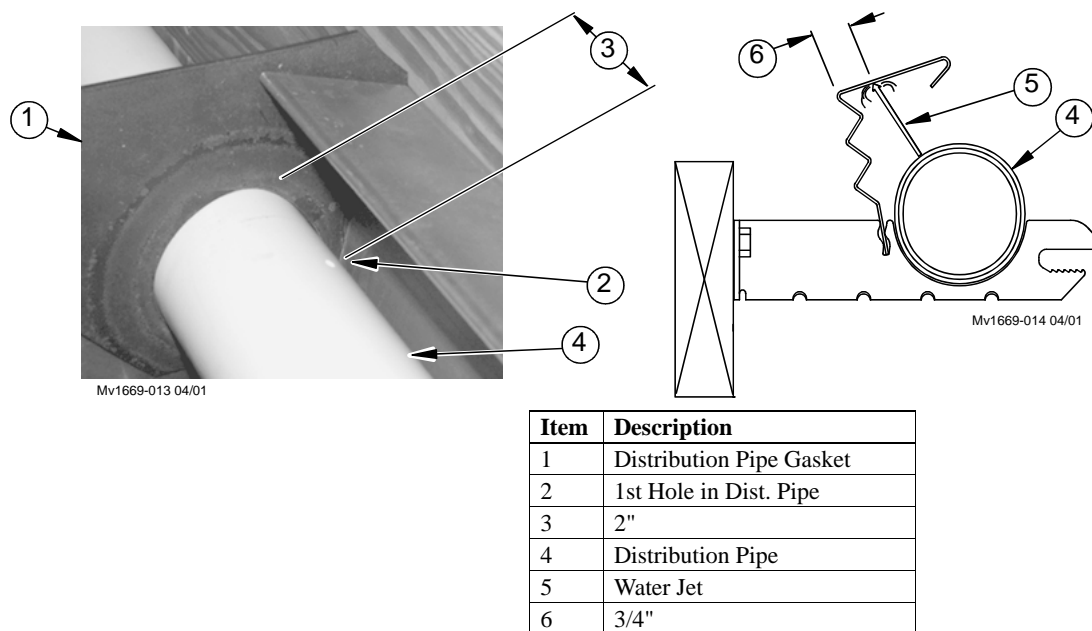


Figure 23. Orientating the Distribution Pipe

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.

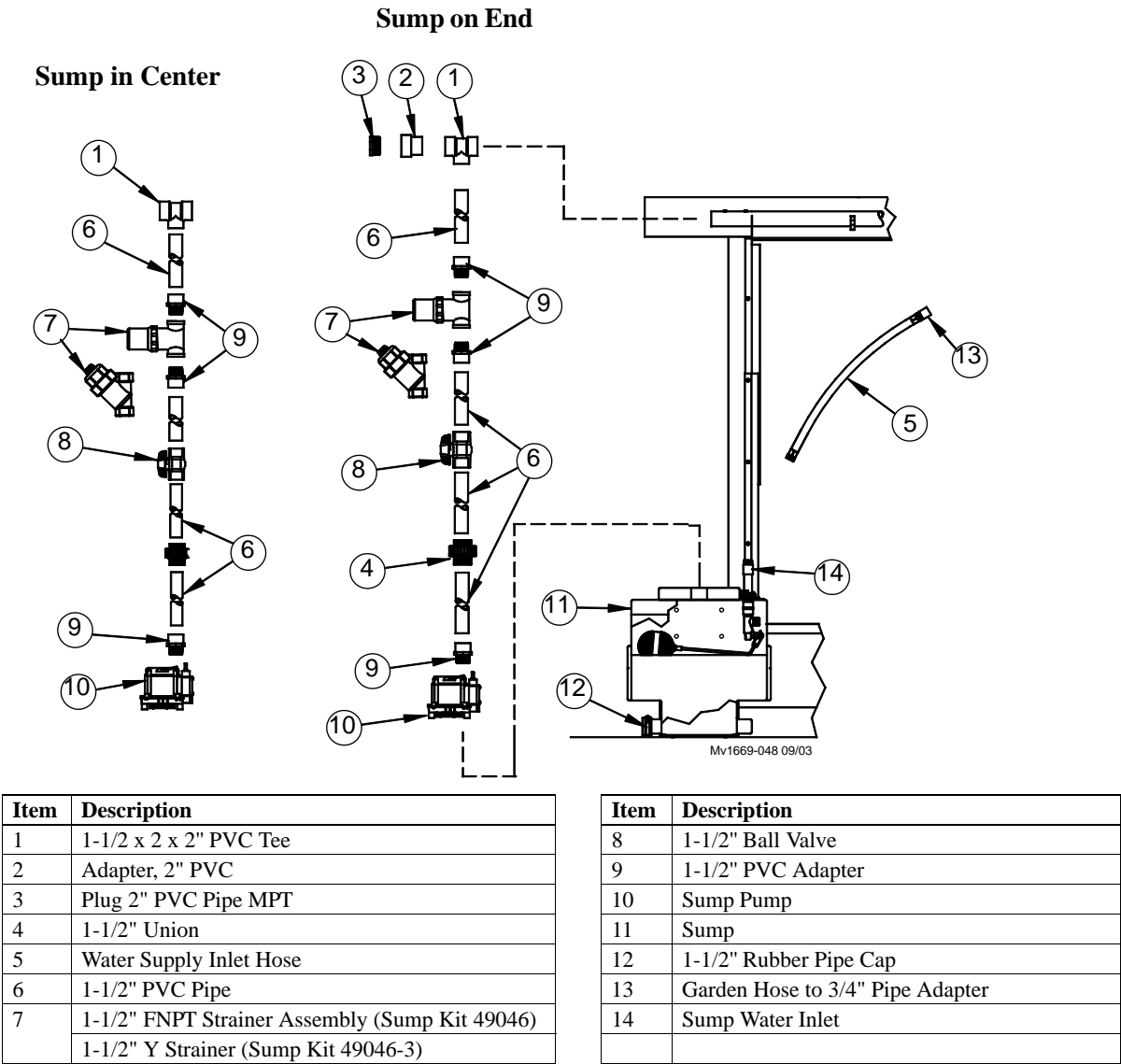


Figure 24. Sump Components Installation

Sediment Trap Installation

Install Sediment Trap Parts as shown below in **Figure 25**.

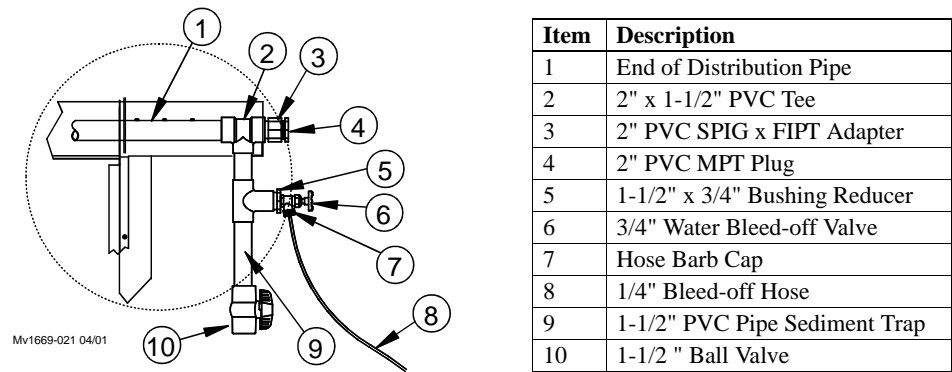
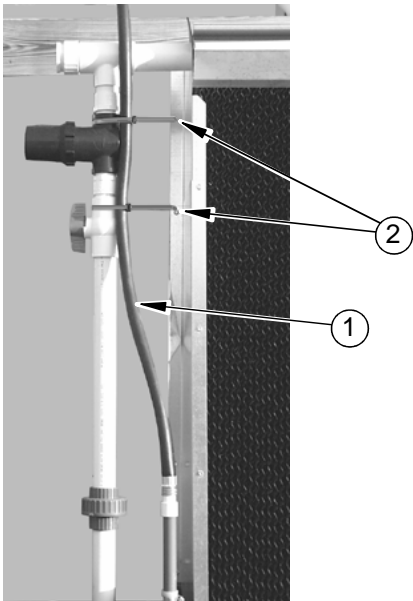


Figure 25. Sediment Trap Installation

Securing Water Supply Inlet Hose

Secure the Water Supply Inlet Hose (**Figure 26, Item 1**) to keep it from moving around. Movement of the Hose could cause the Float Valve to operate incorrectly.



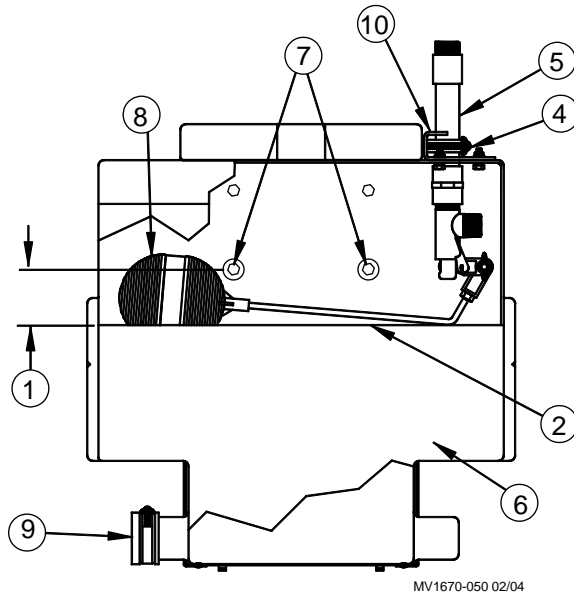
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Item	Description
1	Water Supply Inlet Hose
2	Cable Tie with UV Stabilizer

Figure 26. 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.
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 27. 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
10	Sump Inlet Support Bracket

Figure 27. Adjusting Initial Water Level

Note: 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, open the Ball Valve above the pump as wide as possible without excess water splashing out of the system.
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.

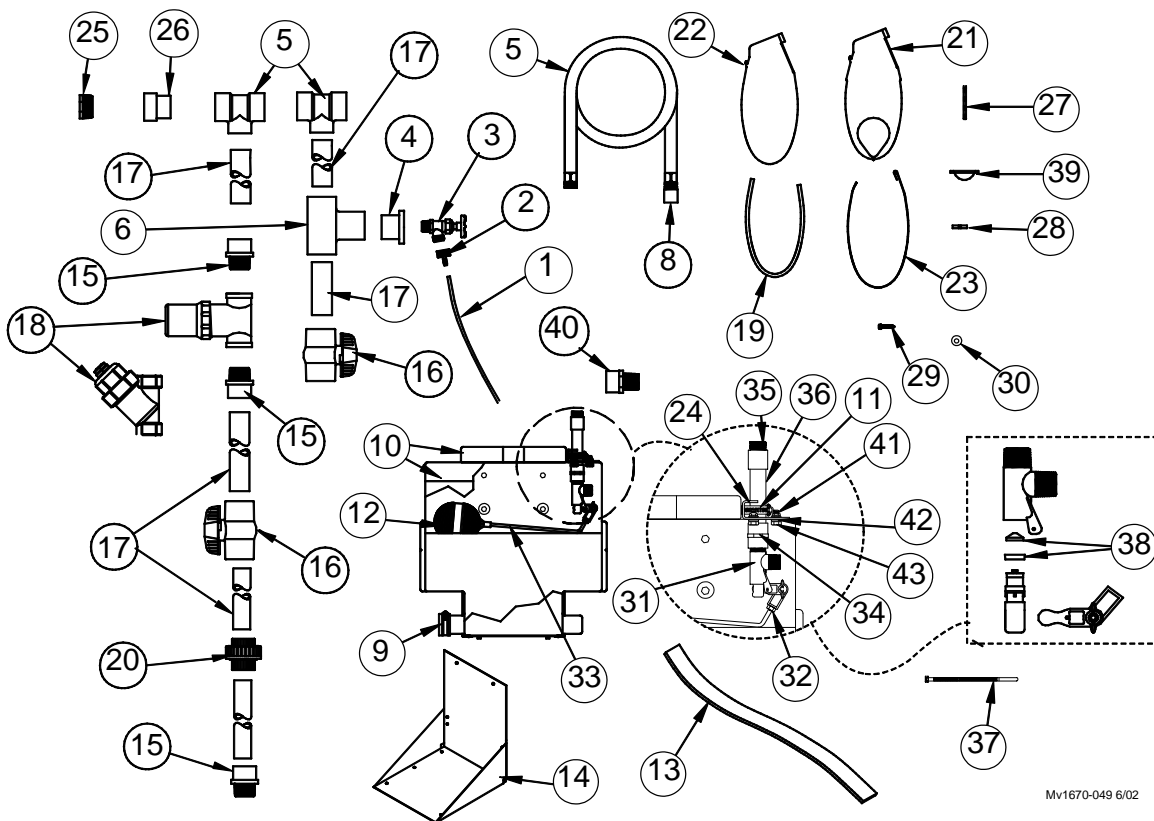
The bleed off rate can be adjusted over time, but should be maintained high enough to prevent mineral deposits from accumulating on the face of the Evaporative Cooling Pad.

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.
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 25, Item 9**) 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 18, and 19.**
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 Kit 49046 (Up to 70' Systems) & 49046-3 (75' to 90' Systems)

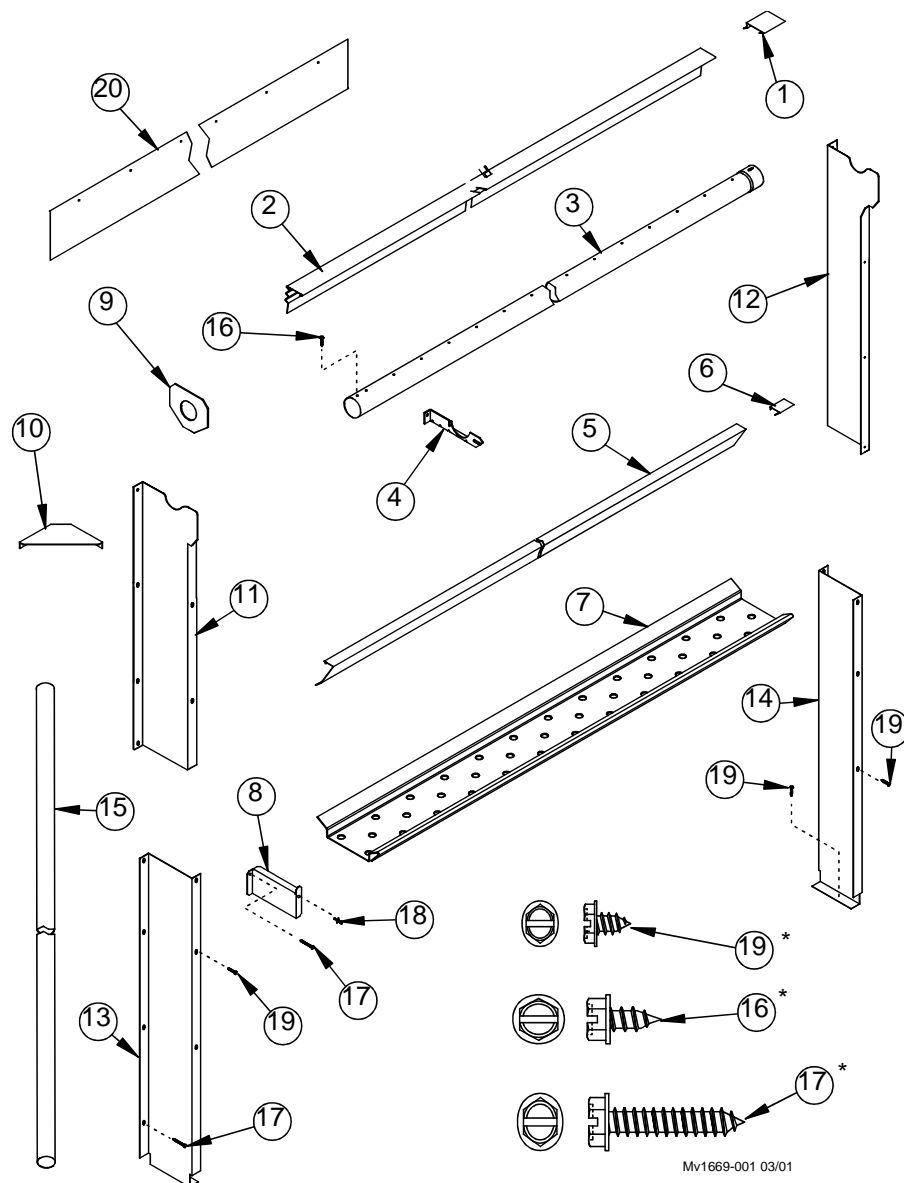


Item	Description	Part No.	Qty
1	1/4" Black Bleed Off Hose	14454-144	1
2	Hose Barb Cap	24111	1
3	3/4" Bleed-off Valve	9255	1
4	1-1/2" x 3/4" Reducer Bushing	38672	1
5	1-1/2 x 2" x 2" PVC Tee	41427	2
6	1-1/2" PVC Tee	38618	1
7	Hose	36654	1
8	Garden Hose to 3/4" Pipe Adp.	14605	1
9	1-1/2" Rubber Pipe Cap	47939	1
10	Turbo Cool Sump	49047	1
11	1-1/2" SS Hose Clamp	3651	1
12	Ball, Float	45985	1
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
18	1-1/2" FNPT Strainer Assembly (Sump Kit 49046)	38731	1
	1-1/2" "Y" Strainer Assembly (Sump Kit 49046-3)	48546	1
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

Item	Description	Part No.	Qty
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, 1/4-20 x 4-1/2	4404-2	2
28	1-1/2" Clamp Nut	46192	2
29	Screw, 1/4 x 1-1/2 Lag	41561	3
30	Washer, 1/4 x 1	2955-52	3
31	Valve, PVC Float-PS75LS (Sump Kit 49046)	45989	1
	Valve, PVC Float-PS75SS (Sump Kit 49046-3)	48545	1
32	Nut, 1/4-20 S.S.	7145	1
33	Rod, Float 12" 65°	46202	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	46428	-
39	Washer Insert	46504	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
--	Maintenance Card	MV1672	1

*The 5' PVC Pipe is not supplied with Sump Kits (49046 and 49046-3). It is included with the 46587-XXX Pad Frame Kit.

46587-XX Kit, TURBO-COOL™ Frame w/Open Top



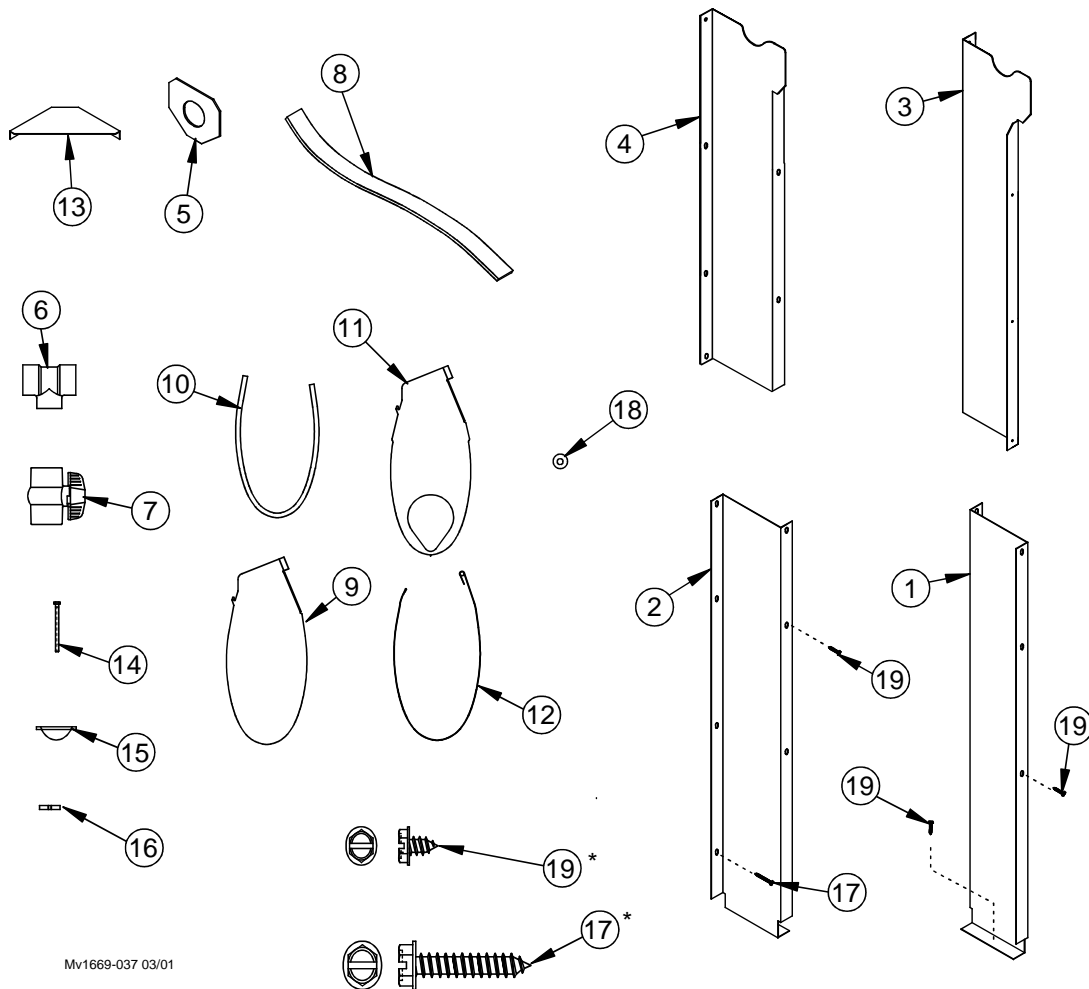
Item	Description	Part No.
1	Deflector Coupler	46558
2	Deflector	46557
3	Distribution Pipe PVC 2"	41333
4	Pipe Support	46551
5	Pad Retainer	46550
6	Pad Retainer Coupler	46669
7	TURBO COOL™ Pad Support	41344
8	TURBO COOL™ Trough Hanger	41345
9	Dist. Pipe End Gasket	46585
10	End Panel Support	44391

Item	Description	Part No.
11	Evap. End Upper LH End Panel	46556-2
12	Evap. End Upper RH End Panel	46556-1
13	Evap. End Lower LH End Panel	46555-2
14	Evap. End Lower RH End Panel	46555-1
15	1.5 x 5ft. PVC Sch40 Pipe	38677
16	1/4 x 1/2 SS HXWH Screw	46689
17	1/4 x 1-1/2 SS HXWH Lag Screw	41561
18	1/4" BLK NY Rivet	45697
19	#10 x 1/2 SS HH SM Screw	38613
20	TURBO COOL™ Splash Guard	47682-XX

XX = System Length 5'-90' in Increments of 5

*Not exact size; shown for comparison purposes only

46725 Center Panel Kit (to install in center of a system)

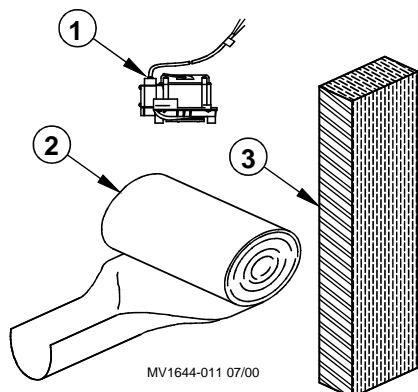


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Item	Description	Part No.
1	RH Lower End Panel	46555-1
2	LH Lower End Panel	46555-2
3	RH Upper End Panel	46556-1
4	LH Upper End Panel	46556-2
5	Pipe Gasket	46585
6	2x2x1.5 PVC Tee	41427
7	1.5 PVC Ball Valve	44039
8	2" x 2' Foam Tape	41708-2
9	Trough Insert	46309
10	1/8 Round Rubber Trim	46310-1

Item	Description	Part No.
11	Sump Insert	46033
12	Clamp Strap	46100
13	End Panel Support	44391
14	1/4-20 x 4.5 HH Bolt	4404-2
15	.25 x 1 Insert Washer	46504
16	1/4-20 x .38 Special Nut	46192
17	1/4 x 1-1/2 Lag Screw	41561
18	1 x .275 SS Washer	2955-52
19	#10-16 x .5 HH SS Screw	38613
*Not exact size; shown for comparison purposes only		

Miscellaneous Components



Item	Description	Part No. **
1	Pump (see chart on page 5)	-----
2*	Trough 24" wide, (100 mil) 15" hole spacing	49184-XX
3**	Cooling Pads: Munters Celdek 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	38624-3 38624-4 38624-5 38624-6
3**	Cooling Pads: Glacier Cor 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	38752-3 38752-4 38752-5 38752-6
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

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 160' 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

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

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Built to last.**

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Revisions to this Manual

Page No.	Description of Change
5	Removed obsolete Pump Options
32	Added Note:

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

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