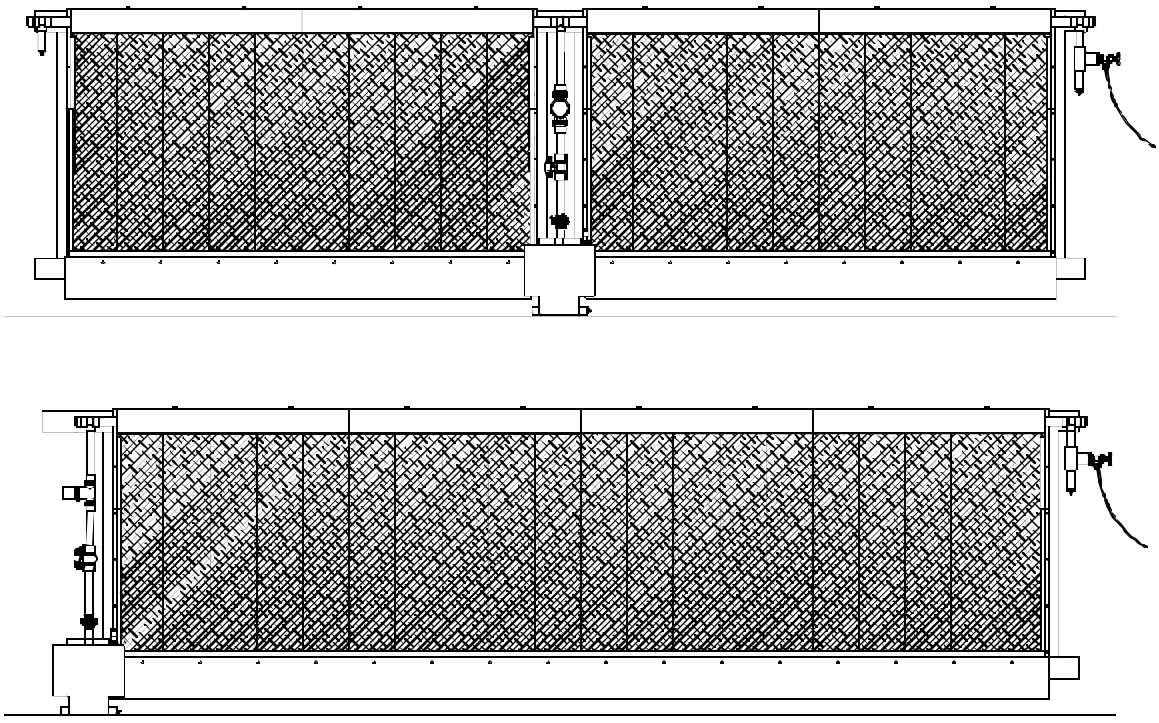
CHORE-TIME

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



MV1644-006

June 2001 **MV1651A**

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: **June 2001**

Chore-Time Equipment
A Division of CTB, Inc.
P.O. Box 2000 • Milford, Indiana 46542-2000 • U.S.A.
Phone (219) 658-4101 • Fax (877) 730-8825
Email: ctb@ctbinc.com • Internet: http//www.ctbinc.com

Thank You

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

Contents

* Legend: C = Customer (end user), D = Distributor (sales), I = Installer of equipment

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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.

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 ·
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 *
Temp in °F	% Relative Humidity	
110	10	3.1
110	20	2.5
100	20	2.3
100	30	1.9
100	40	1.5
95	40	1.4

*****Assumes 80% pad efficiency and 425 fpm air velocity through pad

Supply water pressure:
10 - 100 psi

Water Quality:
6 - 9 PH, salt concentration less than 40,000 ppm

Submersible Pump Options									
Pump Part No.	Model	HP	Electrical Specifications					Maximum Pad Length	Automatic Water Level Shut-Off Switch
			Volts	HZ	PH	Start Amps	Run Amps		
44060	6E-CIM	1/3	230	60	1	7	4.8	50	No
42986	9E-CIM	4/10	230	60	1	9	6	60	No
42987	10E-CIM	1/2	208/240	60	1	20	5	70	No
42987	10E-CIM	1/2	208/240	50	1	20	5	50	No

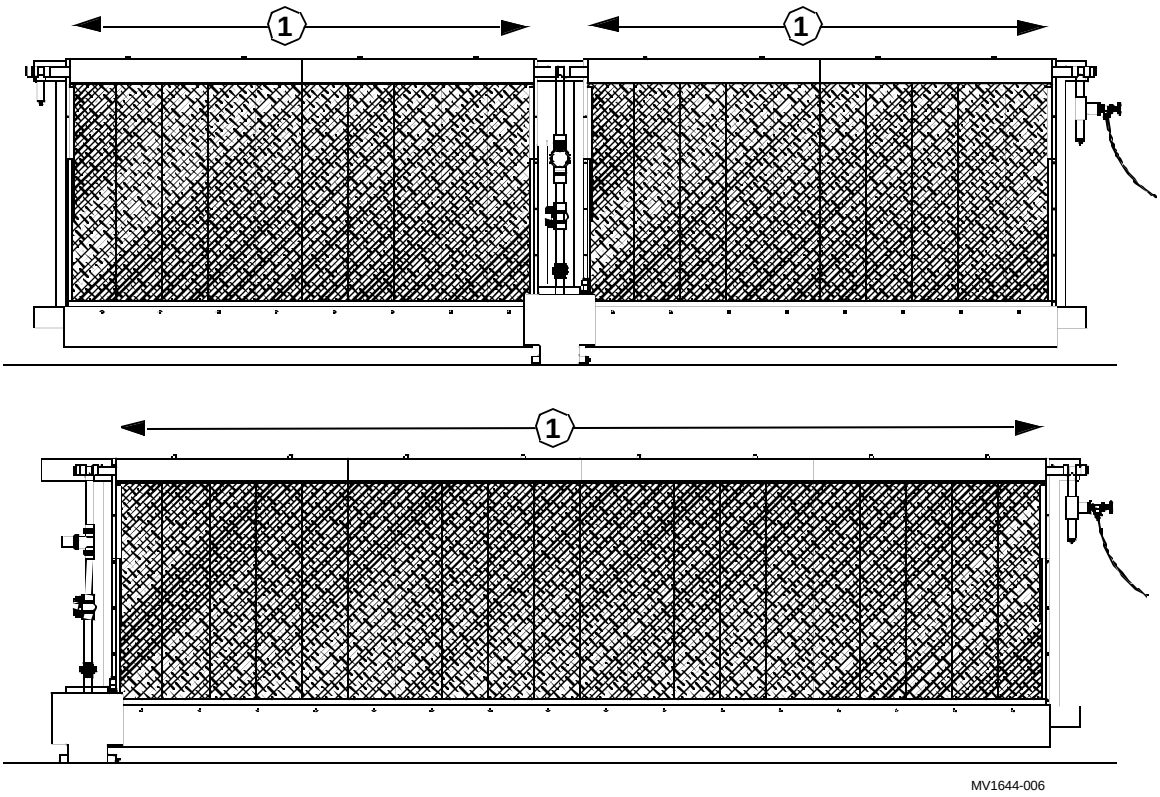
Important! **Chore-Time Equipment strongly recommends that a good alarm system should be installed in confinement buildings to warn of power failure and high temperature.**

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.



Item	Description
1	Maximum length = 70’

Figure 1. Optional Sump locations

The maximum length of Cooling Pad on either side of the Sump Assembly is 70', 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 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 with Washers to secure the bottom Stringer to the Studs at a minimum of every 4". 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 1-1/2" *[38 mm]* less than the height of the Evaporative Cooling Pads.

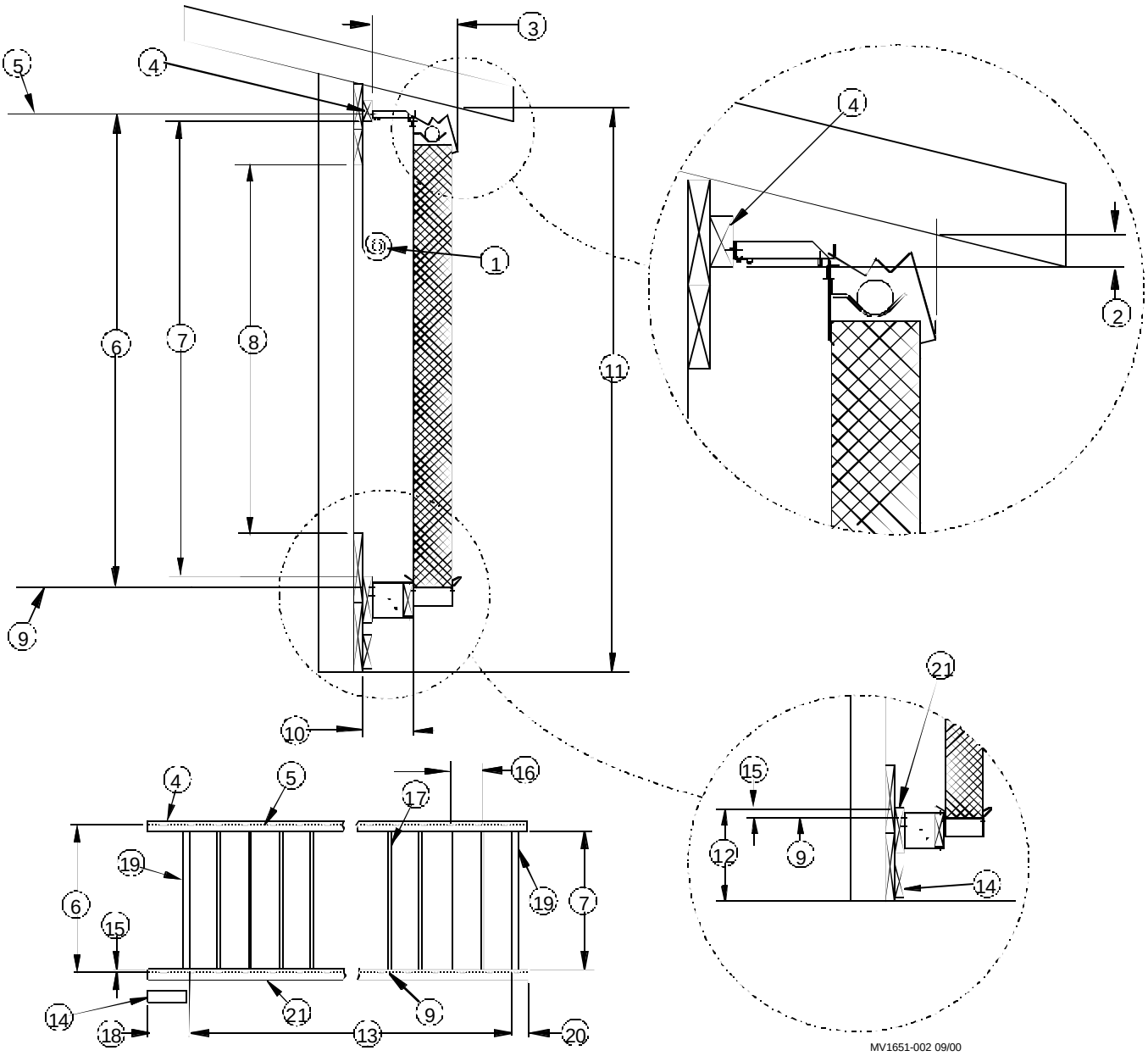
Example: For a 60" *[1524 mm]* tall Evaporative Cooling Pad the distance between the stringers would be 60" *[1524 mm]* - 1-1/2" *[38 mm]* = 58-1/2" *[1486 mm].*

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 1-3/4" below the top edge (**Figure 2**, **Item 9)**. This chalk line will determine the location of the lag screws for the Bottom Stand-Off Brackets.

4. Snap a chalk line on the top stringer at the locations specified in **Figure 2**, **Item 5**. This chalk line will determine the location of the Top Cover Mounting holes.

5. A short section of 2 x 6 lumber (Figure 2, Item 20) is required beneath the bottom stringer at the sump end to provide a back support for the sump assembly.

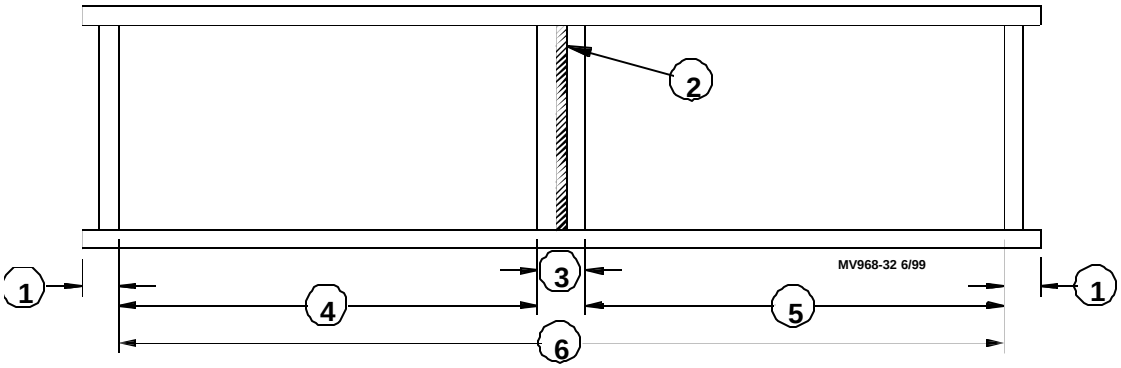


Item	Description
1	Curtain
2	2-1/4" [57 mm] Minimum Clearance
3	13-3/4" [349 mm]
4	2x4 [38 mm x 89 mm] Minimum Top Stringer
5	Top Stringer Chalk Line
6	Pad Height plus 5" [127 mm]
7	Pad Height plus 2" [38 mm] Maximum
8	Pad Height minus 12" [305 mm]Minimum
9	Bottom Stringer Chalk Line
10	8" [203 mm]
11	Pad Height Plus 19-3/4" [502 mm] Minimum
12	15-1/2" [394 mm] Minimum
13	Width of Pad Bank

Item	Description
14	2 x 6 [38 mm x 140 mm] Sump Back Support
15	1-3/4" [44 mm]
16	Minimum Stud Spacing 24" [610 mm] Recommended
17	Wall Studs
18	19" [432 mm] Minimum
19	2 x 4 [38 mm x 89 mm] End Framing
20	6" [152 mm] for Trough End Insert
21	2 x 8" [38 x 191 mm] Bottom Stringer
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]*

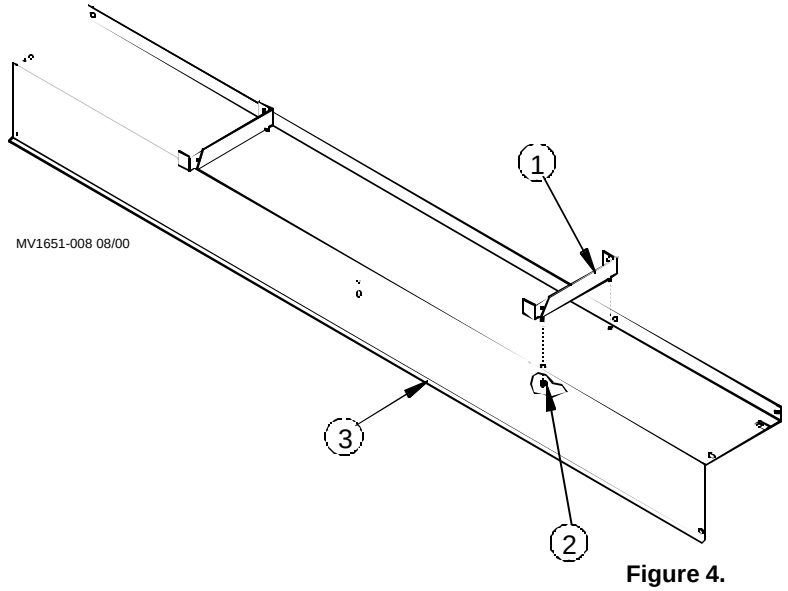
Note: See Figure 2 for all other framing information

Figure 3. Frame opening dimensions for Sump in middle

Evaporating Cooling System Installation

Top Cover Support Bracket Assembly

Use the 1/4-20 hex flange nuts to attach two Top Cover Support Brackets to each Top Cover (**See Figure 4 Below**).



Item	Description
1	Top Cover Support Bracket
2	1/4-20 Hex Nut
3	Stand-Off Top Cover

Figure 4.

Right End Stand-Off Cover Installation

Identify the Right-End Stand-Off Cover. This Cover does not have a notch in the end of the cover. Beginning at the right end of the system, install the (Right-End) Top Stand-Off Cover (**Figure 5, Item 2**) with the right edge of the cover flush with the right edge of the framed opening, and the mounting holes in the Cover aligned with the chalk line on the top stringer (**Figure 5**). Use three 1/4" x 1-1/2" Lag Screws (**Item 6**) to mount the Right-End Top Stand-Off Cover (**Item 2**) to the Top Stringer through the first three mounting holes from the right end of the Cover. (**Figure 5**)

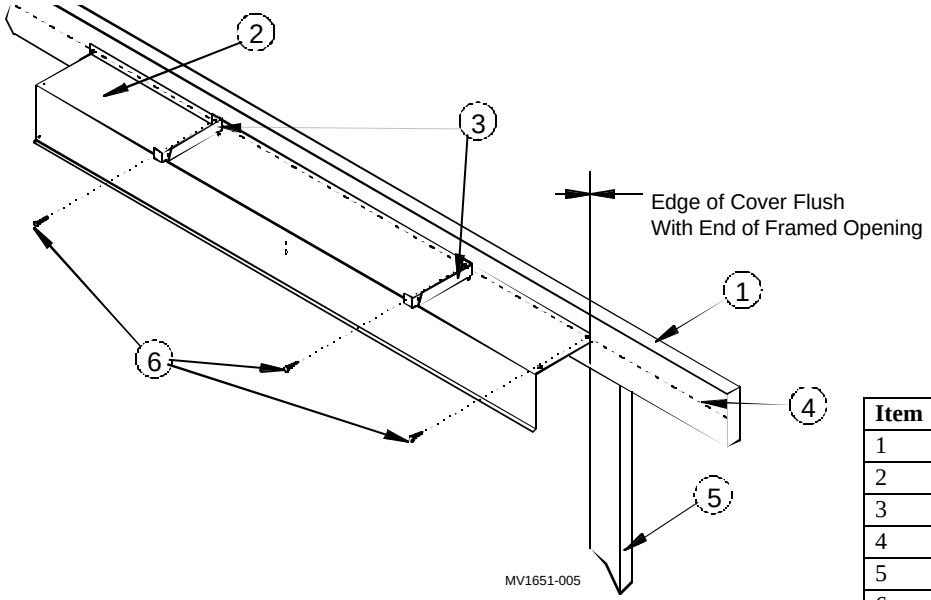


Figure 5. Right End Stand-Off Cover Installation

Item	Description
1	Top Stringer
2	Stand-Off Top Cover (Right End)
3	Stand-Off Top Support
4	Chalk Line
5	End Framing
6	1/4 x 1-1/2" Lag Screws

Stand-Off Top Cover Installation (Notched)

Attach a Notched Stand-Off Top Cover (**Item 3, Figure 6**) to the top stringer with the hook on the end of the cover fully engaged with the Right End Stand-Off Cover. Use three 1/4"x1-1/2" Lag Screws to attach the Notched Stand-Off Cover to the Top Stringer through the first three mounting holes from the right end of the Cover (**See Figure 6**). Repeat this process until all of the Top Covers are installed. Use two #10-1/2" Screws to close the gap between adjacent Stand-Off Top Covers (**See Figure 6)**.

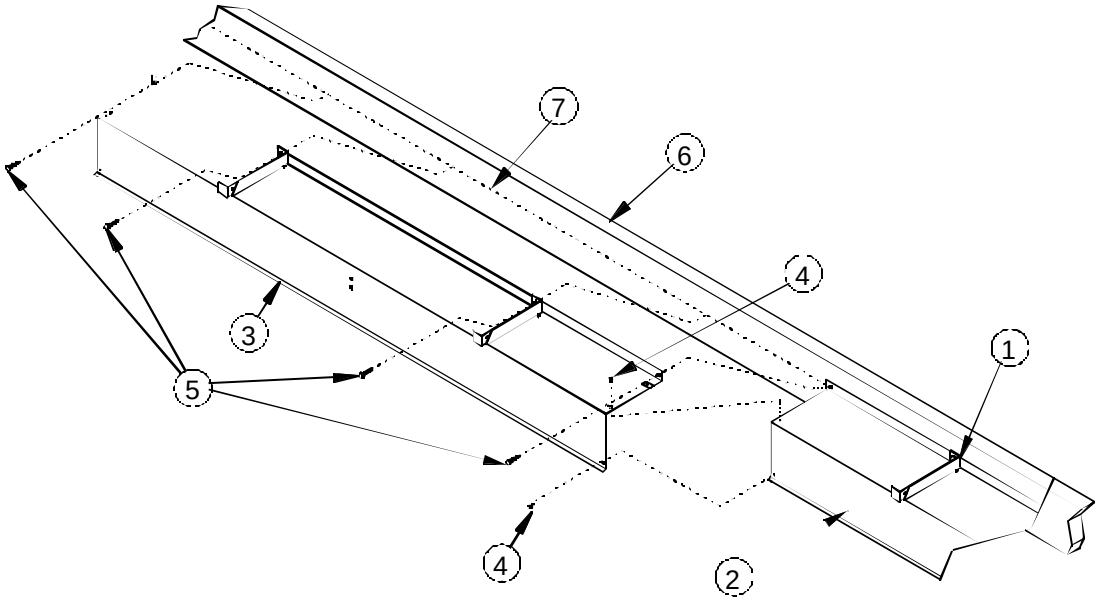


Figure 6. Right End Stand-Off Cover Installation

Item	Description
1	Stand-Off Top Support
2	Stand-Off Top Cover (Right End)
3	Stand-Off Top Cover (Notched)
4	#10-1/2" Screw
5	1/4-20 Lag Screw
6	Bottom Stringer
7	ChalkLine

Sump Back Support Brace Installation

Install the Right Hand and Left Hand Sump Back Support Braces with the top mounting holes aligned with the Chalk Line and 3-1/8" [76 mm], and 11-3/4" [298 mm] away from the inside edge of the framed opening respectively **(See Figure 7**). Use three 1/4 x 1-1/2 Lag Screws to fasten each Brace to the building with two Lag Screws in the top two holes in each brace.

Stand-Off Bottom Brackets Installation

Install the first Stand-Off Bottom Bracket (**Item 3, Figure 7**) with the top mounting hole 10" away from the edge of the framed opening and aligned with the Chalkline. Use two 1/4 x 1-1/2" Lag Screws (**Item 11, Figure 7**) to fasten each Bracket. Install the remaining Brackets, except for one, 20" apart and also aligned with the Chalkline. Install the last Bracket 4" beyond the inside edge of the framed opening and aligned with Chalkline **(See Item 14 Figure 7)**.

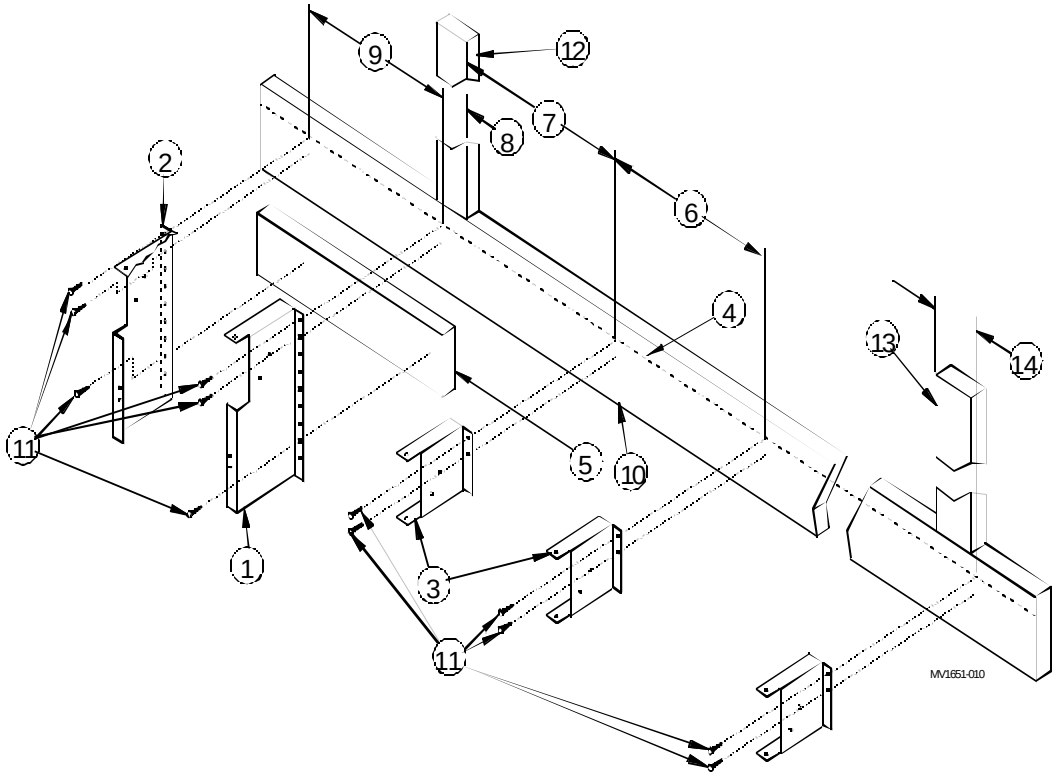


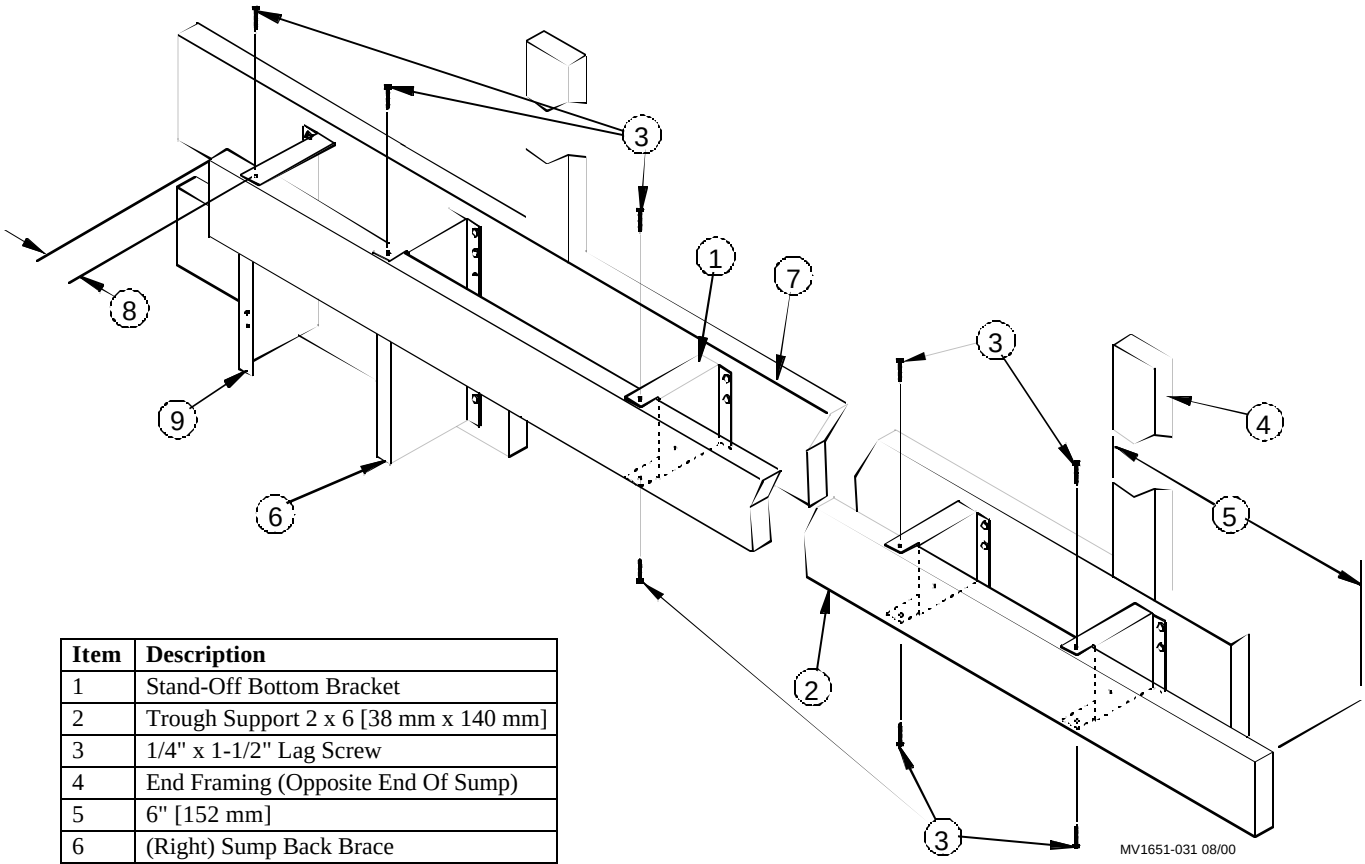
Figure 7. Sump End Support Bracket Installation

Item	Description
1	(Right) Sump Back Brace
2	(Left) Sump Back Brace
3	Stand-Off Bottom Bracket
4	Chalk Line
5	2 x 6 Sump Back Support
6	20" [508 mm] Between Brackets
7	10" [254 mm]
8	3-1/8" [79 mm]
9	11-3/4" [298 mm]
10	2 x 8 [38 mm x 191 mm] Bottom Stringer
11	1/4" x 1-1/2" Lag Screw
12	Inside Edge of Framed Opening at Sump End
13	End of Framed Opening Opposite Sump End
14	4" [102 mm]

Trough Support 2 x 6 Installation

Mount the Trough Support 2 x 6 (**Item 6, Figure 9**) to the face of the Bottom Brackets. On the Sump End of the system the Trough Support 2 x 6 should extend 3" to 4"[76 mm to 102 mm] beyond the outer Stand-Off Sump Support Bracket (**See Item 7, Figure 9).** Fasten theTrough Support 2 x 6 to the Sump Support Brackets and the Bottom Brackets with 1/4" x 1-1/2" Lag Screws (**Item 3, Figure 9**). Use Lag Screws through the top and bottom Holes of the Bottom Brackets.

At the end opposite the Sump the Trough Support 2 x6 should extend 6" beyond the edge of the framed opening **(Item 5, Figure 9**). If necessary, trim the Trough Support 2 x 6 to length so that the seam between the adjacent 2 x 6's is at least 3" [76 mm] away from each Bottom Bracket.



Item	Description
1	Stand-Off Bottom Bracket
2	Trough Support 2 x 6 [38 mm x 140 mm]
3	1/4" x 1-1/2" Lag Screw
4	End Framing (Opposite End Of Sump)
5	6" [152 mm]
6	(Right) Sump Back Brace
7	2 x 8 [51 mm x 191 mm] Bottom Stringer
8	3"-4" [76 mm - 102 mm]
9	(Left) Sump Back Brace

Figure 9. Trough Support Stringer Installation

Securing The Trough Support 2 x 6 Ends

Align and secure the adjacent ends of the Trough Support 2 x 6's with Connecting Brackets and two 1/4" x 1-1/2" Lag Screws (**See Figure 10**). The Connecting Brackets are required on top. If a Trough Support 2 x 6 is twisted, use a Bracket on bottom as well (**See Figure 10**). Two Connecting Brackets are provided for a seam every 10' [3048 mm] on the Trough Support 2 x 6

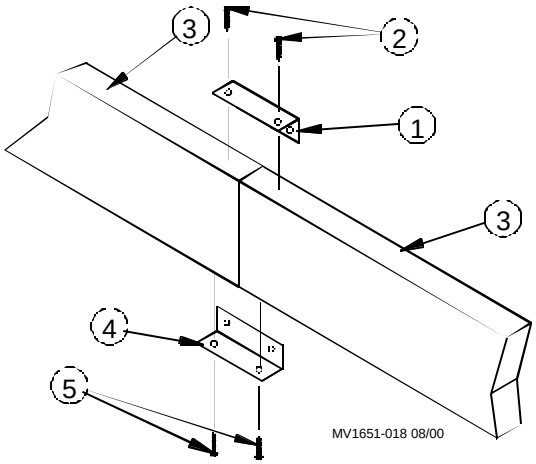


Figure 10. Securing Trough Support 2 x 6 Ends

Item	Description
1	Connecting Bracket
2	1/4" x 1-1/2" Lag Screw
3	Trough Support 2 x 6
4	Optional Connecting Bracket
5	Optional Lag Screws

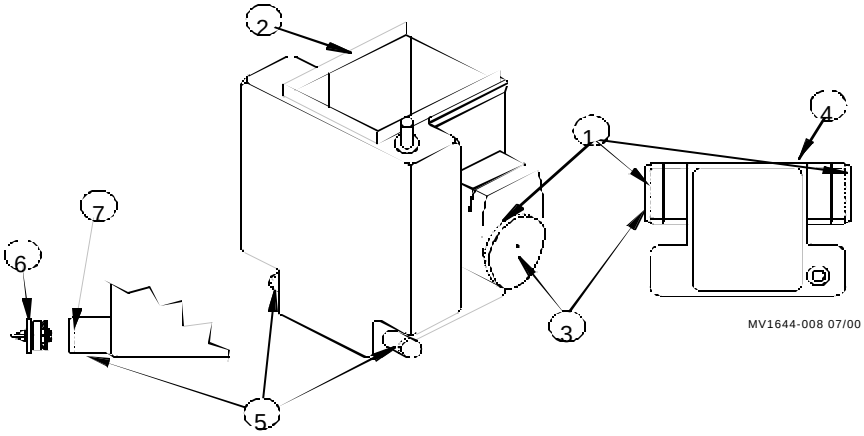
Sump Preparation

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 11)**.

Decide which side of the Sump will be used for the drain and cut off that end.

NOTE: Make cut for one drain only.

Install the 1-1/2" Drain Plug.



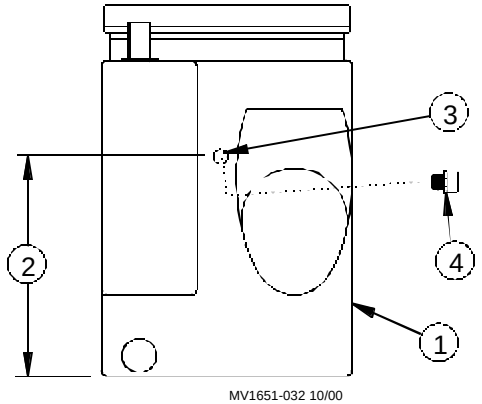
Item	Description
1	Sump End Cap Cut Line
2	Sump
3	1/2" Sump End Cap
4	Side of sump mounted to wall
5	Optional Drain Plug Locations
6	1-1/2" Drain Plug
7	Drain Cut Line

Figure 11. Cutting the Sump

Sump Overflow Installation

An Overflow can be installed on either side of the Sump in the location shown. To install an overflow,15

drill a 3/4" [19 mm] hole in the location shown in Figure 12, and then tap the hole using a 1/2-14 NPT tap. Apply teflon tape to a 1/2" PVC Male Adapter and screw it into the tapped hole. 1/2" PVC pipe can be routed from this fitting to a drain location if desired.



Item	Description
1	Sump
2	13"
3	Hole for Overflow Drain
4	1/2" PVC Male Adapter

Figure 12. Cutting the Sump

Sump End Tape Application

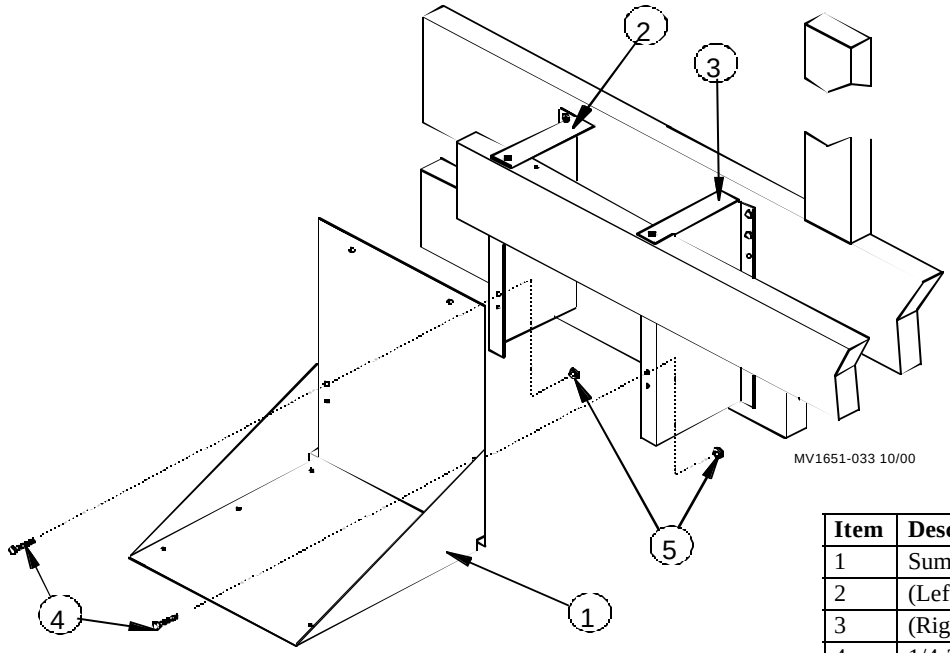
Place the 2" x 24" self adhesive tape on the Sump as shown in **Figure 13.**

Item	Description
1	Sump
2	Foam Tape

Figure 13. Sump End Tape Application

Sump Support Assembly

Use two 1/4-20 x 7/8" Bolts **(Item 4, Figure 14)** and two 1/4 x 20 Nuts **(Item 5, Figure 14)** to mount the Sump Support to the Sump Back Braces as Shown.



Item	Description
1	Sump Support Assembly
2	(Left) Sump Back Brace
3	(Right) Sump Back Brace
4	1/4-20 x 7/8 Bolt
5	1/4-20 Nut

Figure 14. Sump Support Assembly

Sump Installation

Align the two 1/4" holes in the rear of the Sump with the two 1/4" holes in the Sump Support. Attach the Sump to the Bottom Stringer with the two 1/4x1-1/2" Lag Screws and Washers. The Lag Screws should line up with the chalk line on the Botton Stringer and the edge of the Sump should line up with the edge of the framed opening (**See Figure 15 Below**).

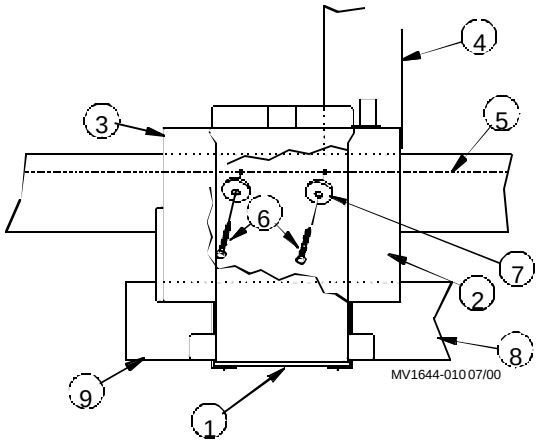
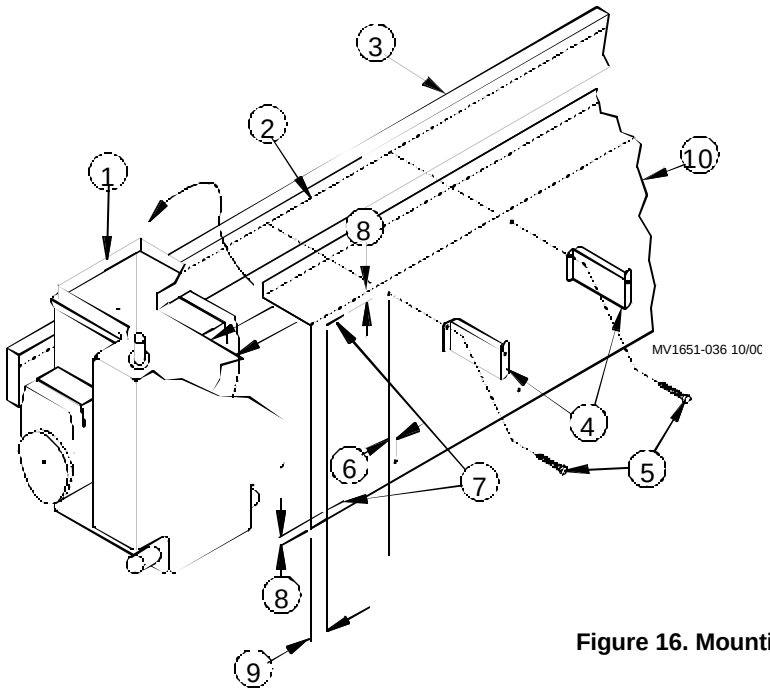


Figure 15. Mounting the Trough

Item	Description
1	Sump Support
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	Washer 1/4" x 1"
8	2 x 6 Sump Back Support
9	Cable loop

Trough Installation

Unroll the Trough and orient it with the top holes offset to the left of the bottom holes, and with the creases at the top **(See Figure 16)**. At the Sump End cut two, 2" slits in the Trough and bend the Trough at the two creases as shown in **Figure 16**. Hang the Trough from the Trough Support 2 x 6 beginning with one end of the Trough material against the Sump, and the top holes in the Trough aligned with the Chalk Line. The top holes in the Trough 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 to the Trough Support 2 x 6 as shown in **Figure 16**. Be sure the creases are formed in the Trough before mounting it to the 2 x 6. Wipe the inside of the Trough at each end to remove debris that may prevent sealing.

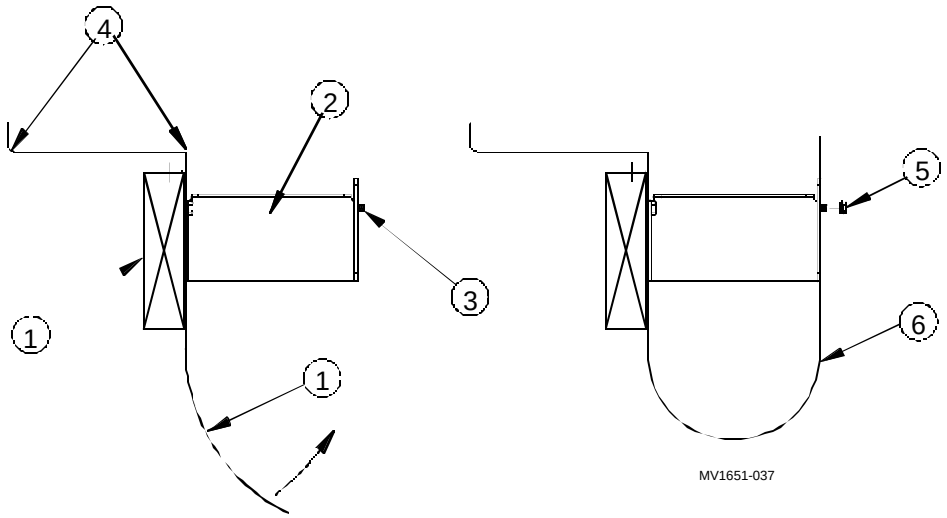


Item	Description
1	Sump
2	Chalk Line
3	Trough Support 2 x 6
4	Trough Support
5	1/4 x 1-1/2" Lag Screw
6	Top Holes Offset to Left of Bottom Holes
7	2" Slits cut for Clamp Straps
8	1"
9	2"
10	Trough

Figure 16. Mounting the Trough

Trough Installation Continued.....

Form the Trough into a "U" shape as shown in **Figure 17** and hook the holes, in the front of the Trough, over the 1/4" studs in the Trough Supports. Use the 1/4" Hex Washer Nuts to secure the front of the Trough to the Trough Supports. Repeat the process for each Trough Support..

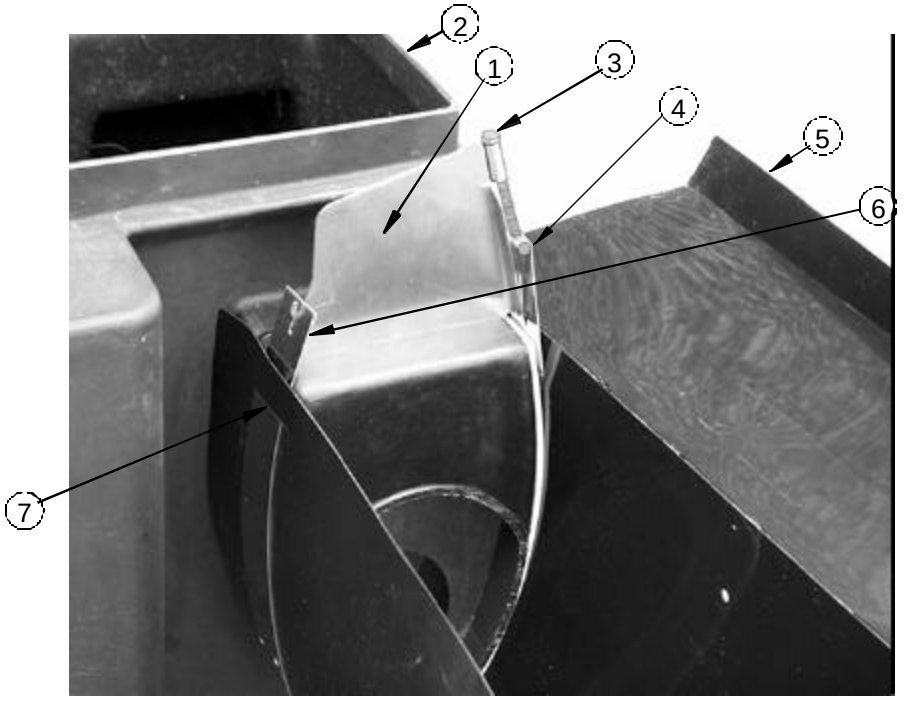


Item	Description
1	Trough Support 2 x 6
2	1/4" Stud
3	Formed Creases in Trough
4	Trough Material
5	1/4 Hex Washer Nut
6	Trough

Figure 17. Forming the Trough

Sump End Insert Assembly

Slide the Sump End Insert Into the Slit in the Sump. Route the Clamp Strap through the 2" slits cut in the Trough as shown in **Figure 18**..



Item	Description
1	Sump End Insert
2	Sump
3	1/4" x 3-1/2" Clamp Bolt
4	1-1/2" Clamp Nut
5	Trough
6	Clamp Strap
7	2" Slit

Figure 18. Sump End Insert Assembly

End Panel Installation

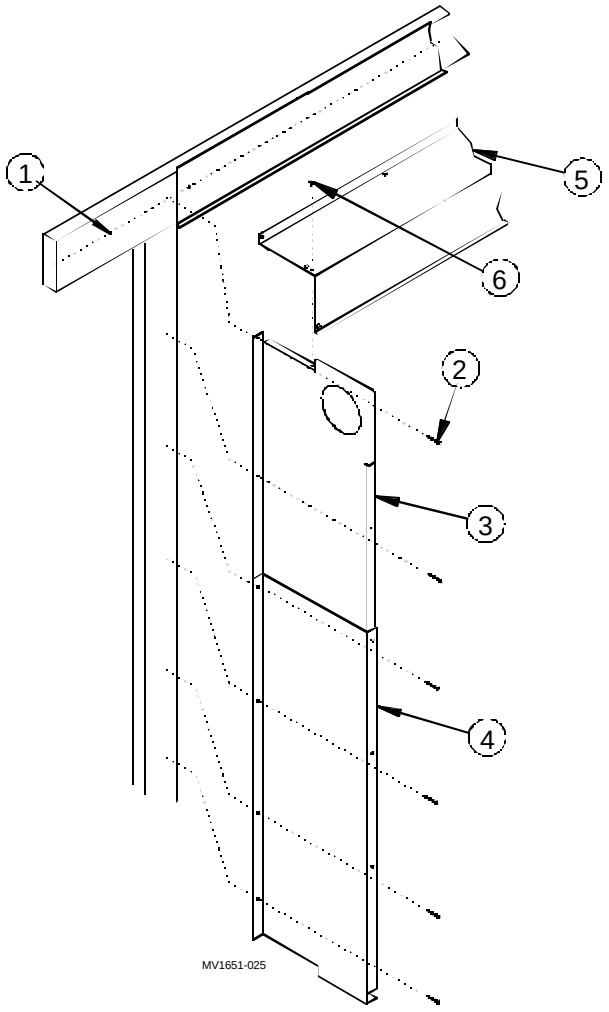
Install the End Panels flush with the inside of the opening (at both ends).

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 Hangers (**See Figure 19)**. Secure the Upper End Panels to the top stringer using the #10 x 1-1/4" Screws, as shown in **Figure 19**.

2. Use #10 x 1/2" Screws **(Item 6, Figure 19)** to attach Upper End Panel to Top Cover.

3. The Lower End Panels should overlap on the outside of the Upper End Panels to provide proper watershed.

4. Align mounting holes in the upper and lower end panels and secure the end panels to the frame using the #10 x 1-1/4" Screws **(Item 2, Figure 19)**.



Item	Description
1	Chalk Line on top stringer
2	10 x 1-1/4" S.S. Screw
3	Upper End Panel
4	Lower End Panel
5	Notched Standoff Top Cover
6	#10 x 1/2" Screw

Figure 19. End Panel Installation

Distribution Pipe Installation

1. Set a Distribution Pipe on the Pipe Hangers above the inlet end of the Trough.

Note: The belled end must be away from the sump end (See Figure 20).

2. Assemble the Distribution Pipes by inserting the straight end of one pipe into the belled end of another. It is not necessary to glue the Distribution Pipes together.

   IMPORTANT: The spray holes, in the Distribution Pipes, MUST all be aligned and pointing straight up.

3. Verify that the spray holes are in alignment, then install a #10 x 1/2" S.S. Screw at each bell to secure the 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 Item 9, Figure 20).**

   The Pipe should extend past the opposite end 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 20**. 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 (**Item 18, Figure 20**)to a drain for waste water. **Do not** run the Bleed-Off Hose back into the Trough.

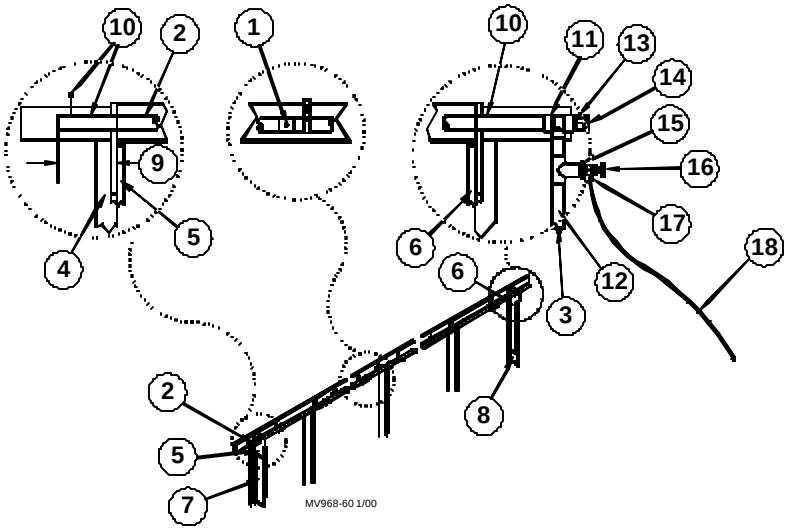


Figure 20. Distribution Pipe Installation

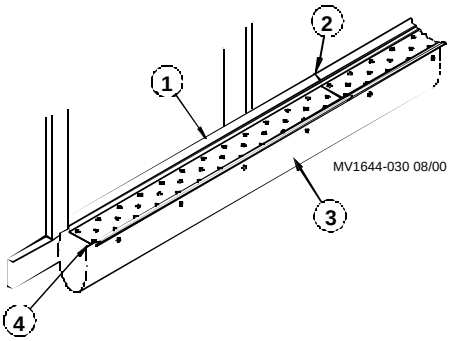
Item	Description
1	#10 x 1/2" S.S. Screw
2	5' Distribution Pipe
3	1-1/2" Mechanical Gripper Plug
4	Framing
5	Upper End Panel (R.H)
6	Upper End Panel (L.H.)
7	Lower End Panel (R.H.)
8	Lower End Panel (L.H.)
9	8" [20.32 cm] Approximately at Sump End
10	1/4 x 1/2" Screw
11	2" x 1-1/2" PVC Tee
12	1-1/2" 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
18	1/4" Bleed-off Hose

Pad Support Installation

Set the Pad Supports on the Trough Supports, as shown in **Figure 21**. 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.



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

Figure 21. 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 22 Below**.

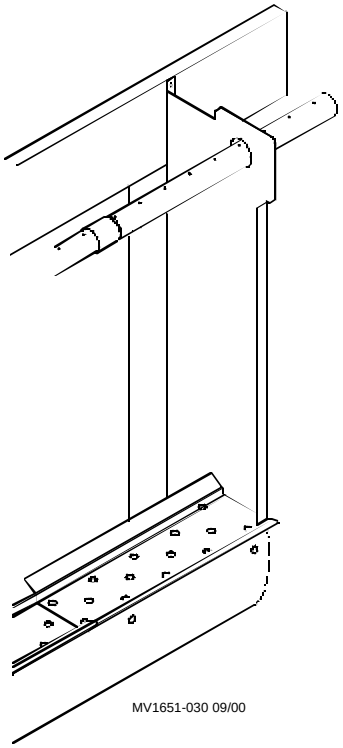


Figure 22. Caulking of rear joint of end panel

Evaporative Cooling Pad and Cover Installation

- Beginning at one end, set the Evaporative Cooling Pads on the Pad Supports (**See Figure 23)**. 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 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 24** 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.

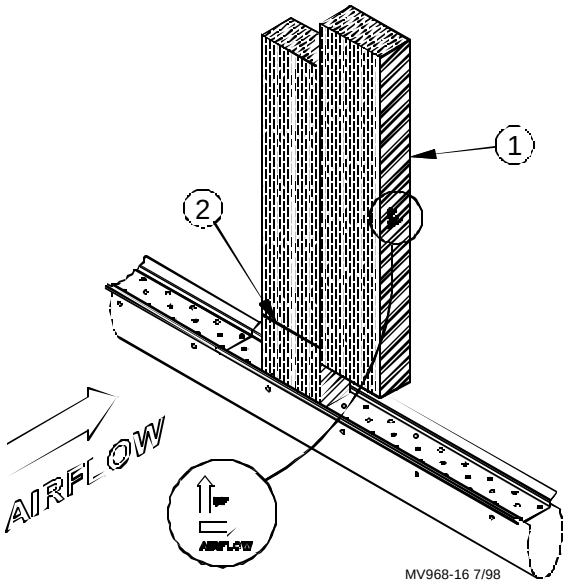


Figure 23. Pad Installation

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

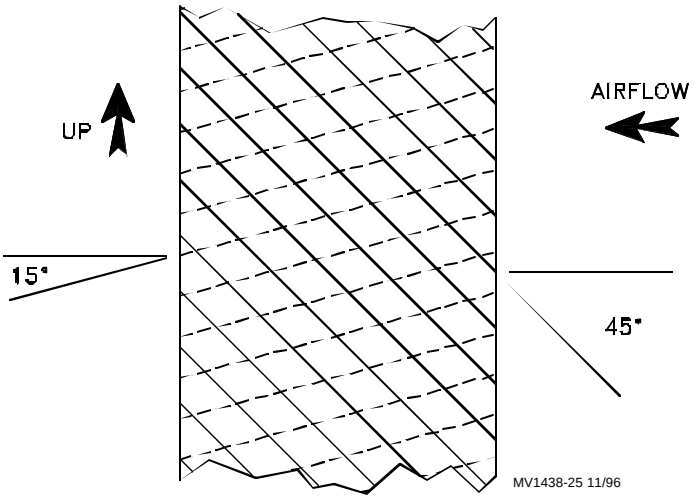
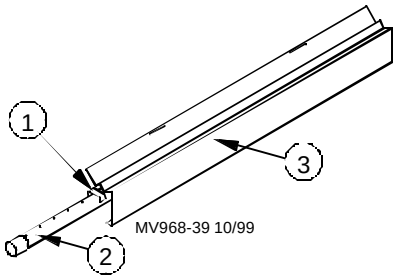


Figure 24. Pad Orientation (cut-away view of side of Pad)

Cooling Pad and Cover Installation Continued.....

- Set the Covers on the Pipe Hangers, as shown in **Figure 26**, Step 1.
- Slide the Cover Locks onto the Pipe Hangers, as shown in **Figure 26**, 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 25.**
- 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 25. Jet Deflector

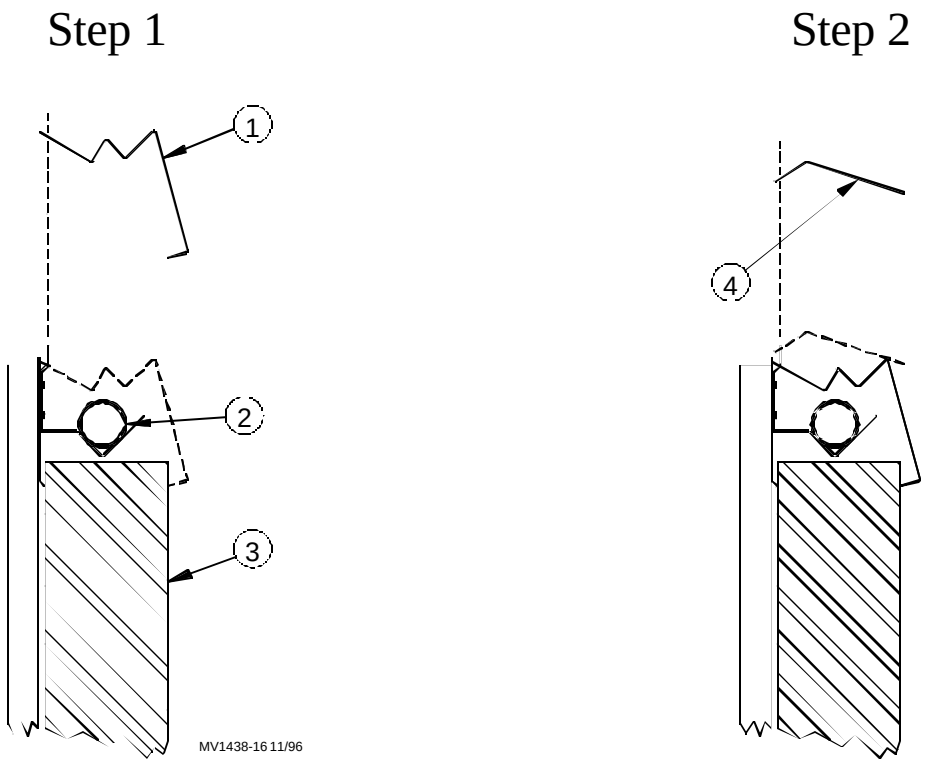


Figure 26. Cover and Cover Lock Installation

Cooling Pad and Cover Installation Continued.....

- If the last Cover is too long, trim the Cover as shown in **Figure 27** and overlap it with the previous Cover. Use (2) 10x1/2" Screws to join the Covers together.

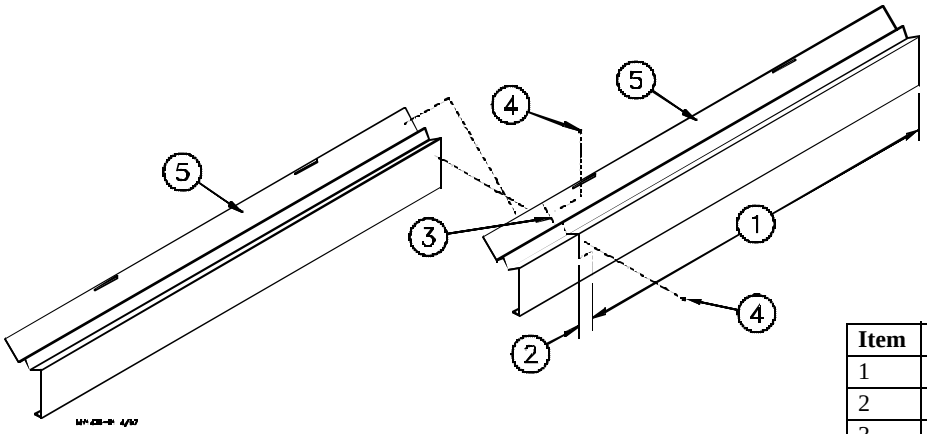
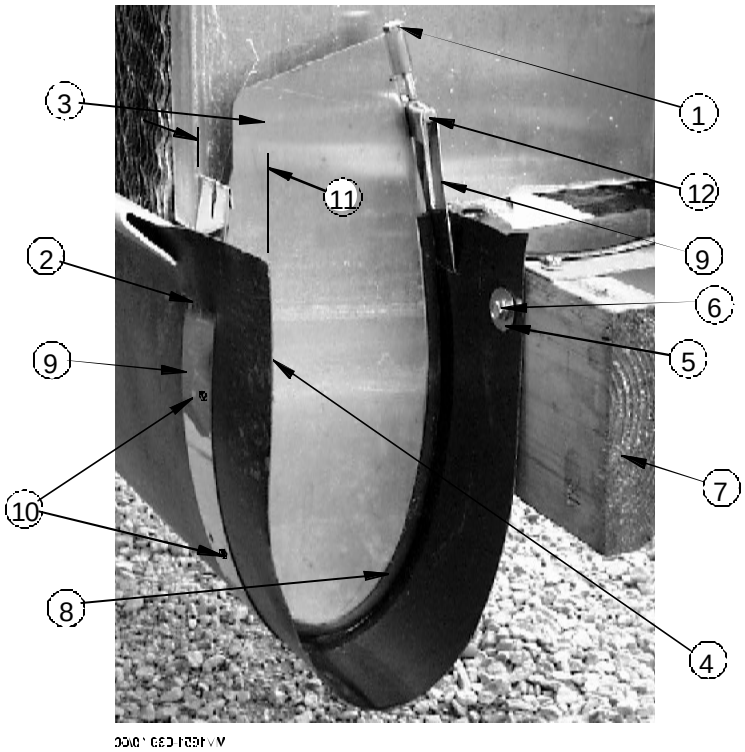


Figure 27. Cover Trimming and Assembly

Item	Description
1	Required Length of last Cover
2	2"(5 cm)
3	Cutting line
4	#10 x 1/2" Screw
5	Cover

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 28**. 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 28**. Be sure the Screws are on the exterior side of the Trough End Insert. Screw the Trough to theTrough Support 2 x 6 using a 1/4"x1-1/2" Lag Screw and a 1/4"x 1" Washer (**Items 5 and 6, Figure 28**).



Item	Description
1	1/4" x 3-1/2" Clamp Bolt
2	2" Slit in Trough
3	Trough End Insert
4	Trough
5	1/4" x 1" Washer
6	1/4" x 1-1/2" Lag Screw
7	Trough Support 2 x 6
8	1/8" Rubber Edge Trim
9	Clamp Strap
10	#10 x 1/2" Screw
11	4"-6" Trough beyond End Panel
12	1-1/2" Clamp Nut

Figure 28. Trough End Insert Installation

Sump Components Installation

Assemble the Sump Components as shown in **Figure 29**, beginning at the Pump. The lengths of 1-1/2" PVC Pipe **Item 6** will vary depending on desired Valve height, pad height, etc.

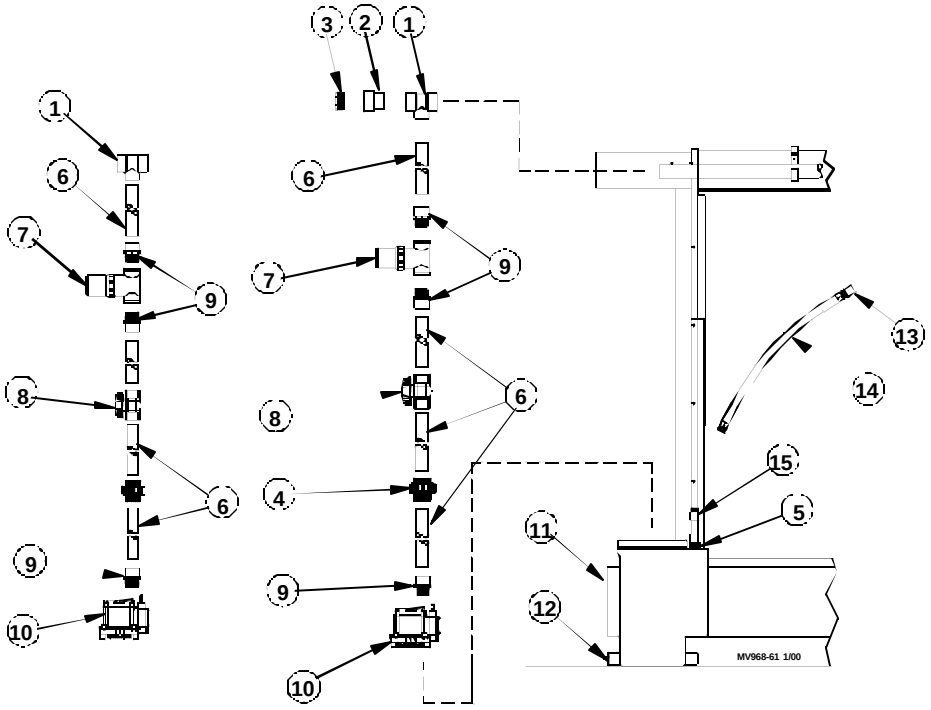
Use teflon tape on threads as required. Use PVC glue on slip connections.

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

Note: For pumps with water level safety switch make sure the vent hose inside the electrical cord is not obstructed.

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

Sump in Center **Sump on End**



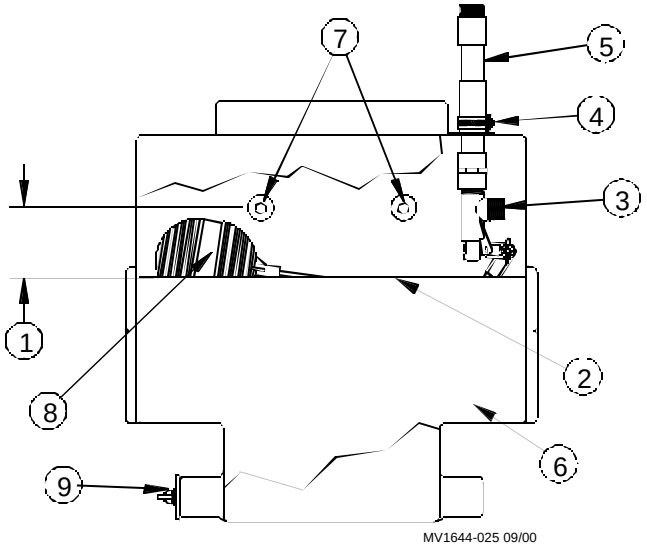
Item	Description
1	1-1/2 x 2 x 2" PVC Tee
2	Adapter, 2" PVC
3	Plug 2" PVC Pipe MPT
4	1-1/2" Union
5	Water Level Adj. Hose Clamp
6	1-1/2" PVC Pipe
7	Strainer
8	1-1/2" Ball Valve
9	1-1/2" PVC Adapter

Item	Description
10	Sump Pump
11	Sump
12	1-1/2" Mechanical Gripper Plug
13	Garden Hose to 3/4" Pipe Adapter
14	Water Supply Inlet Hose
15	Sump Water Inlet

Figure 29. Distribution Pipe Installation

System Start-Up

1. Partially fill Trough with water.
2. Flush dirt and debris from the Trough by removing the Sump Drain Plug.
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" -4" below the Mounting Screws in the back of the Sump. Retighten the Hose Clamp. (**See Figure 30. Below**)



Item	Description
1	2"-4"
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

Figure 30. Adjusting Initial Water

After the system runs for a while and turns off the water level will rise 1.5-2.0" 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" Pipe Plug removed from the end of the Distribution Pipe. Replace the 1-1/2"' Pipe Plug.
6. With the Sump Pump running, adjust the 1-1/2" Ball Valve so the height of the water jets is 4" to 6" *[101 mm to 152 mm]* above the top of the Distribution Pipe.
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

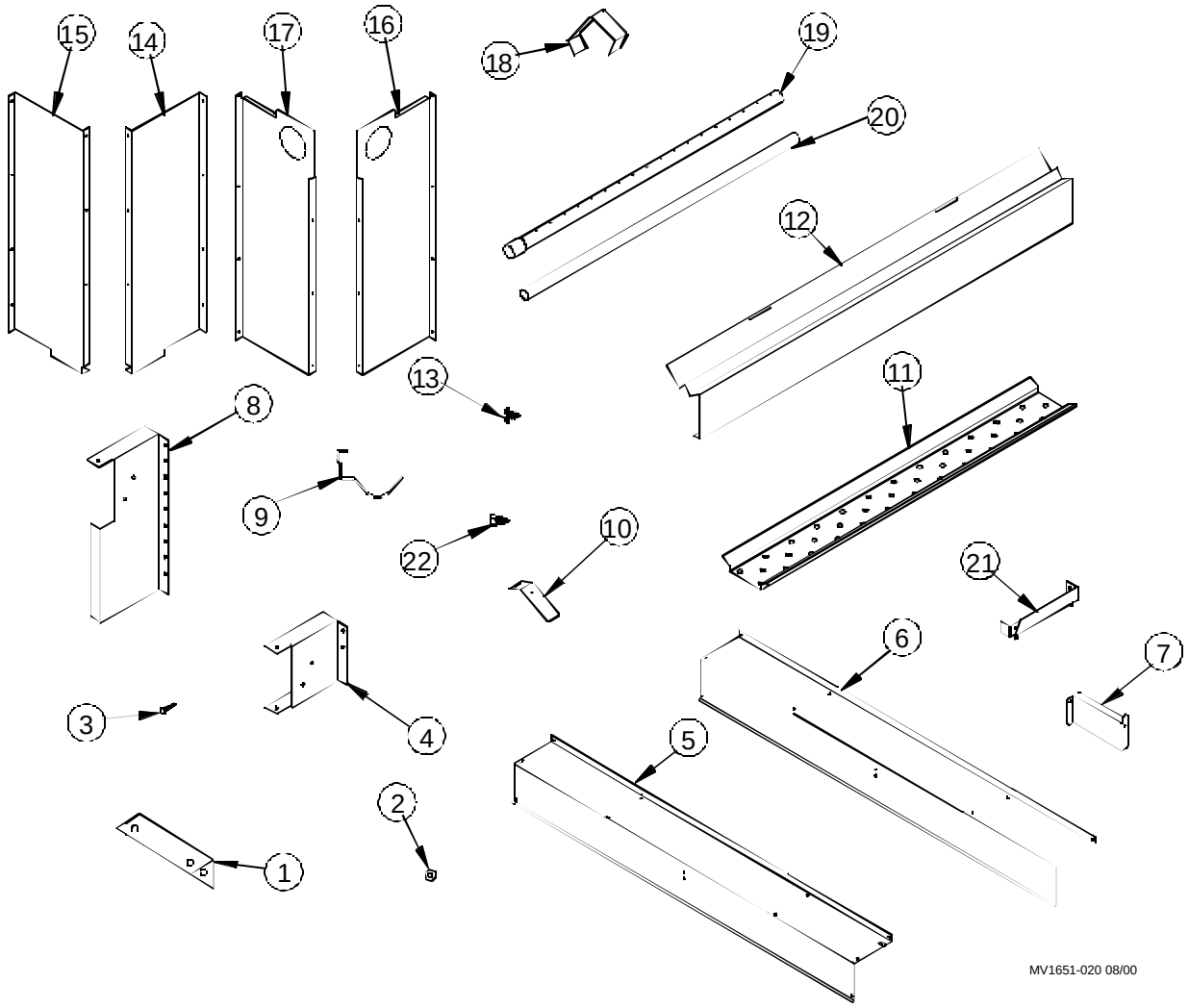
1. Reduce the mineral and chemical build-up in water by;

   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.
7. Keep the Distribution Pipe holes free of debris. Use a 5/32" drill bit to clean plugged holes. Clogged holes may cause dry streaks and lead to clogging of the pad.
8. Every three months, the entire water system should be drained, disinfected and flushed to help prevent algae growth.
9. Regularly flush the Distribution Pipe by removing the 1.5" plug at the end of the sediment trap (**See Item 12, Figure 29**) and allowing the pump to run.
10. Periodically, gently hose and brush deposits from the face of the pads.
11. Completely drain the system for winter storage. Remove the Sump Drain Plug. Remove the Pump.
12. Avoid contaminants such as dust, fertilizers, and harsh cleaners.
13. The pH of the water being circulated through the system should be maintained at between 6 and 9 to prevent premature pad softening.
14. Check that Cooling Pads are installed correctly (**See Figure 23 and 24)**. Periodically check and clean the Screen on the inlet of the Water Float Valve. If the Water Float Valve fails to shut off the flow of water, disassemble and clean the valve. Check that the holes in the center of the Valve Diaphragm and Housiing are not plugged with debris.

Parts Lists and Kits

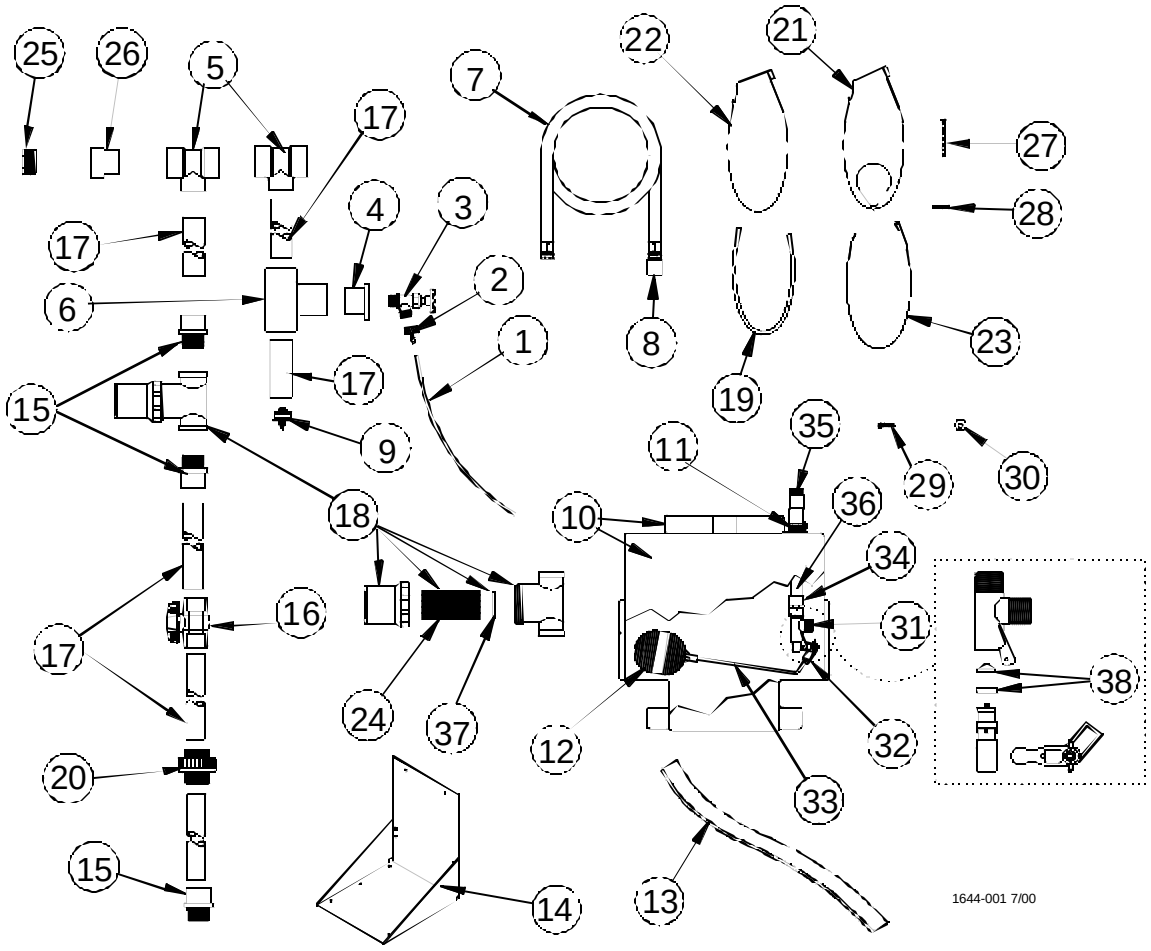
Turbo-Cool Pad Frame with Stand-Off Kit P/N 46352-XX



Item	Part No.	Description
1	44379	Connecting Bracket
2	46298	1/4-20 Hex Nut
3	41561	1/4-1-1/2 Lag Screw
4	46186	8" Stand-Off Bottom Bracket
5	46283	Notched Stand-Off Top Cover
6	46286	Right End Stand-Off Top Cover
7	46180	Turbo Cool Trough Hanger
8	46187	8" Sump Back Stand-Off Brace
9	46297	Wire Pipe Hanger
10	38352	Cover Lock
11	41344	Turbo Cool Pad Support
12	38355	6" Evap. Pad Cover
13	38613	#10 x 1/2 Hex Hd Screw
14	46185-1	Lower Right End Stand-Off EndPanel
15	46185-2	Lower Left End Stand-Off EndPanel

Item	Part No.	Description
16	46184-1	Upper Right Stand-Off End Panel
17	46184-2	Upper Left Stand-Off End Panel
18	44526	Jet Deflector
19	41333	2" x 5’ PVC Distribution Pipe
20	38677	1-1/2 x 5' PVC Pipe
21	46282	Stand-Off Top Support
22	21119	1/4 x 1/2 SHML Screw

Sump Kit Part No. 46340

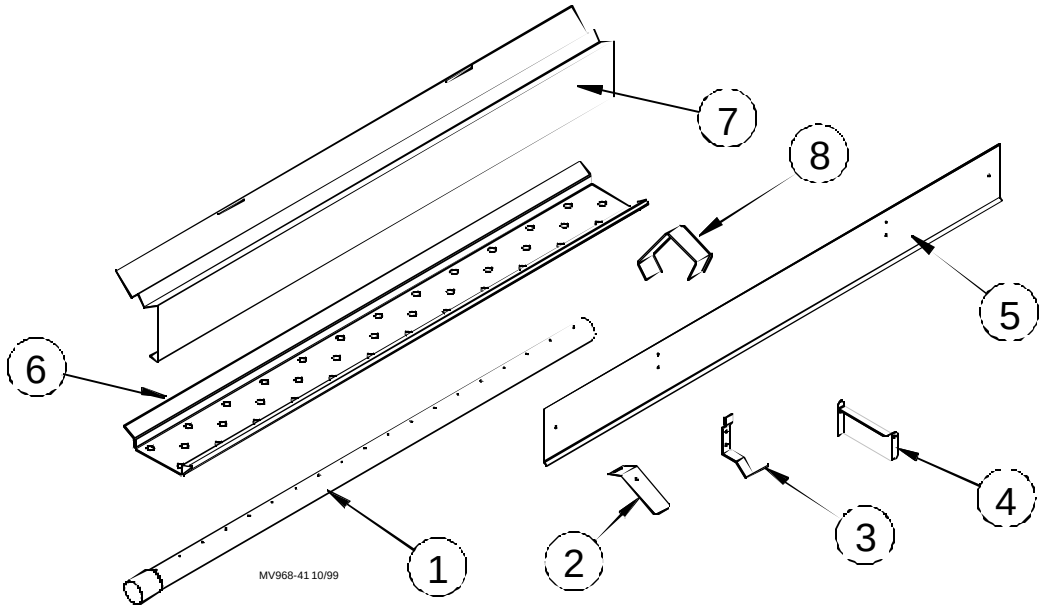


Item	Description	Part No.	Qty
1	1/4" Black Bleed Off Hose	14454-144	1
2	Hose Barb Cap	24111	1
3	3/4" Bleed-off Valve	9255	1
4	1-1/2" x 3/4" Reducer Bushing	38672	1
5	1-1/2 x 2" x 2" PVC Tee	41427	2
6	1-1/2" PVC Tee	38618	1
7	Hose	36654	1
8	Garden Hose to 3/4" Pipe Adp.	14605	1
9	1-1/2" Drain Plug	38476	2
10	Turbo Cool Sump	46339	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	Cable, loop 39"	46015	1
15	1-1/2" PVC Adapter	38627	3
16	1-1/2" PVC Valve	44039	1
17*	1-1/2 x 5' PVC Pipe	38677	2
18	Strainer	38731	1

Item	Description	Part No.	Qty
19	Trim, 1/8" Rubber Edge	46310-1	1
20	1-1/2" Union	44040	1
21	Insert,Sump End	46003	1
22	Insert, Trough End	46309	1
23	Strap, Insert Clamp	46100	2
24	Sump Support	44512	1
25	Plug 2" PVC MPT	45749	2
26	Adapter 2" PVC Spig x FIPT	45748	2
27	Bolt, 1/4-20 x 3-1/2	4404-15	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	45989	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 FGHT	14605	1
36	Pipe, 3/4" x 9-1/2" PVC	7514-11	1

* The 5' PVC Pipe is not supplied with the Sump Kit (Part No. 46340). It is included with the End Panel Kit (Part No. 41482).

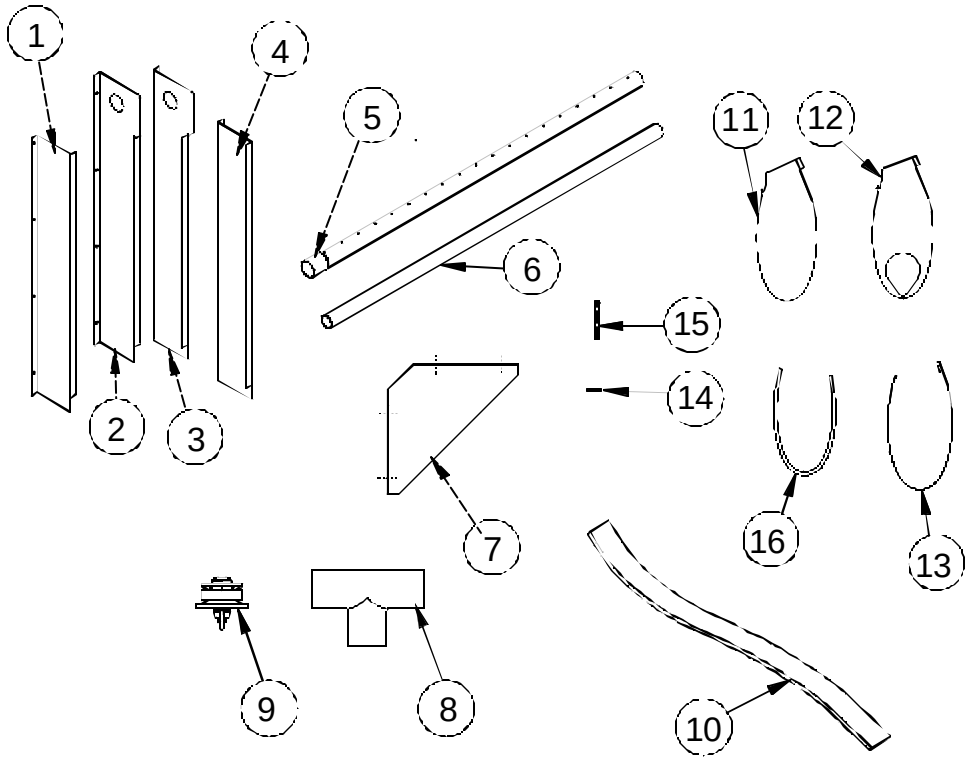
Distribution Kit Part No's. 41481-5 and 41481-20



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
--	10 x 1/2" SS Screw	38613	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.

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

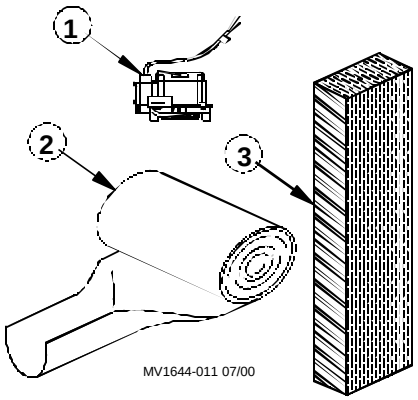


MV1644-002 07/00

			Quantity	
Item	**Description**	**Part No.**	**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" Drain Plug	38476	----	1
10	2 x 24" Foam Tape	41708-2	----	2
11	Insert, Trough End	46309	----	1
12	Insert, Sump End	46033	----	1
13	Strap, Insert Clamp	46100	----	2
14	Nut, 1/4-20 Special	46192		2
15	Bolt, 1/4-20 x 3-1/2	4404-15	----	2
16	Trim, 1/8" Rubber Edge	46310-1	----	1
--	10 x 1/2" SS Screw	38613	5*	----
--	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" Screw	21119	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*	PP Black Trough 24" inside with holes	42044-X
3	Cooling Pads: Munters Celdek 45°/15°	
	6" x 12" x 3 foot	38624-3
	6" x 12" x 4 foot	38624-4
	6" x 12" x 5 foot	38624-5
	6" x 12" x 6 foot	38624-6
3**	Cooling Pads: Glacier Core 45°/15°	
	6" x 12" x 3 foot	38752-3
	6" x 12" x 4 foot	38752-4
	6" x 12" x 5 foot	38752-5
	6" x 12" x 6 foot	38752-6
3	Cooling Pads: General Shelters 45°/15°	
	6" x 12" x 3 foot	46389-3
	6" x 12" x 4 foot	46389-4
	6" x 12" x 5 foot	46389-5
	6" x 12" x 6 foot	46389-6
3	Cooling Pads: Munters Mi-T Cool 45°/15°	
	6" x 12" x 3 foot	38751-3
	6" x 12" x 4 foot	38751-4
	6" x 12" x 5 foot	38751-5
	6" x 12" x 6 foot	38751-6

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 140' Example: 42044-100 is a 101' roll of Trough, 42044-50 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

Made to work.
Built to last.

Revisions to this Manual

Page No.	Description of Change

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

CTB Inc.
P.O. Box 2000 • Milford, Indiana 46542-2000 • U.S.A.
Phone (219) 658-4101 • Fax (877) 730-8825
E-Mail: ctb@ctbinc.com • Internet: http//www.ctbinc.com

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