CHORE-TIME®

Poultry Production Systems

Installation and Operators Manual

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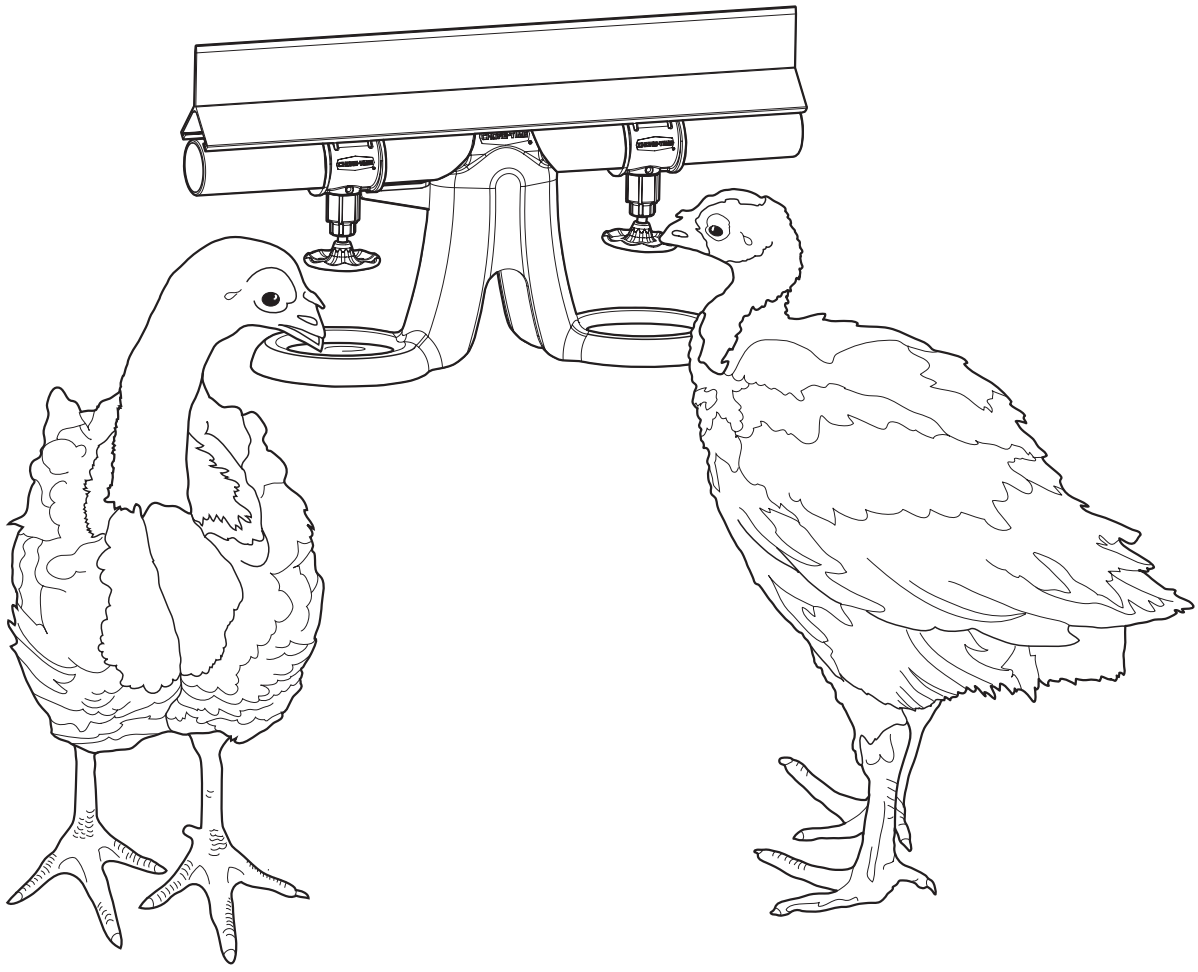
ADVANTI-FLOW®

Poult Nipple Watering System



November 2008

MW2323B

Warranty

C**hore-Time Poultry 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 (1) year from and after the date of initial installation by or for the original purchaser. If such a defect is found by Chore-Time to exist within the one-year period, the Chore-Time 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, mismanagement, negligence, alteration, accident, or lack of proper maintenance, or from lightning strikes, electrical power surges or interruption of electricity shall not be considered defects under the Warranty. Corrosion, material deterioration and/or equipment malfunction caused by or consistent with excessive additions of chemicals, minerals, sediments or other foreign elements with the product 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.

Chore-Time 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 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.

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Effective: **August 2008**

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Thank You

The employees of CTB, Inc. 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

Topic Page

About This Manual

The intent of this manual is to help you in two ways. One is to follow step-by-step the order of assembly for your product. The other way is for easy reference if you have questions in a particular area.

Important: Read ALL instructions carefully before starting construction.

Important: Pay particular attention to all SAFETY information.

- *Metric measurements are shown in millimeters and in brackets, unless otherwise specified.* " " equals inches and " ' " equals feet in English measurements. Examples: 1" *[25.4]*, 4' *[1219]*
- Optional equipment contains necessary instructions for assembly or operation.
- Very small numbers near an illustration (*i.e.*, 1257-48) are identification of the graphic, not a part number.

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Safety Information

Caution, Warning and Danger Decals have been placed on the equipment to warn of potentially dangerous situations. Care should be taken to keep this information intact and easy to read at all times. Replace missing or damaged safety decals immediately.

Using the equipment for purposes other than specified in this manual may cause personal injury and/or damage to the equipment.

Safety–Alert Symbol

This is a safety–alert symbol. When you see this symbol on your equipment, be alert to the potential for personal injury. This equipment is designed to be installed and operated as safely as possible...however, hazards do exist.

Understanding Signal Words

Signal words are used in conjunction with the safety–alert symbol to identify the severity of the warning.

DANGER indicates an imminently hazardous situation which, if not avoided, **WILL** result in death or serious injury.

WARNING indicates a potentially hazardous situation which, if not avoided, **COULD** result in death or serious injury.

CAUTION indicates a hazardous situation which, if not avoided, MAY result in minor or moderate injury.

Safety Instructions

Follow Safety Instructions

Carefully read all safety messages in this manual and on your equipment safety signs. Follow recommended precautions and safe operating practices.

Keep safety signs in good condition. Replace missing or damaged safety signs.

Decal Descriptions

DANGER: Electrical Hazard

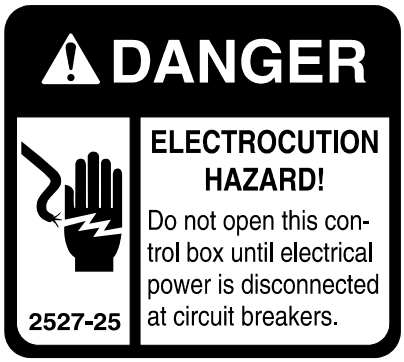
Disconnect electrical power before inspecting or servicing equipment unless maintenance instructions specifically state otherwise.

Ground all electrical equipment for safety.

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

Ground all non-current carrying metal parts to guard against electrical shock.

With the exception of motor overload protection, electrical disconnects and over current protection are not supplied with the equipment.



General

Support Information

The Chore-Time Nipple Watering System has been designed to provide water to poultry types. 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 comprehensive planning and installation information. The table of contents provides a convenient overview of the information in this manual.

General Information

It is extremely important to maintain good water quality. Good water quality maximizes performance of the equipment, minimizes maintenance and repair, and increases the life of the system. The water should be free of foreign particles.

Pump the well prior to hookup of the system to clear sand, mud, or debris. Chore-Time recommends a water test by a reputable water treatment company in the area. Water treatment and/or extra filtration may be required, depending on the water test results.

Chore-Time recommends an incoming water pressure between 25 psi *[172.4 kPa]* minimum and 35 psi *[241.4 kPa]* maximum for use with the 9275 or 36802-2 control panel.

For an incoming water pressure between 40 psi *[275.9 kPa]* minimum and 125 psi *[862 kPa]* maximum it is recommended to use a 35308 step regulator. A pressure of 45 psi *[310.3 kPa]* is best. It is recommended to use the step regulator for regulating the water pressure through the control panel at 25 psi *[172.4 kPa]* up to a maximum of 35 psi *[241.4 kPa]*.

For every 28" *[711 mm]* drop in height, water pressure increases one pound. Measure the operating pressure at the water line height.

Incoming water supply should be at least a 1" *[25 mm]* diameter incoming line (preferably PVC) from a single well. If there are two or more supply wells, the supply line should be larger. Other factors such as, the distance from the well(s) to the filter control panel and other equipment which requires water could demand larger lines.

The suspension system must be correctly installed to insure proper operation of the system. This manual includes the suspension installation information.

The Chore-Time ADVANTI-FLOW® Poult Nipple Drinker is available with nipples spaced six, eight, ten, or twelve on 10' *[3 m]* **see figure 1.**

Number of Nipples	Spacing "D"
6	34" *[863.6 mm]*
8	24" *[609.6 mm]*
10	18" *[457.2 mm]*
12	14" *[355.6 mm]*

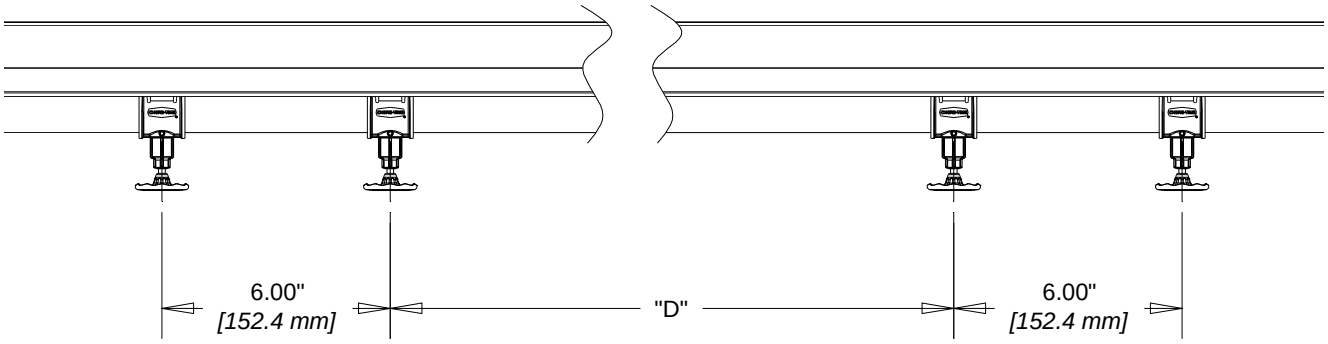


Figure 1. Nipple Spacing

Water lines up to 500' *[152 m]* may be supplied using (1) inlet assembly. Water lines over 500' *[152 m]* must be split (typically in the center of the house) and supplied with (2) inlet assemblies. However the management of the lines over 250' *[76 m]* becomes more critical. They must be kept very level, flushed, and cleaned several times per flock.

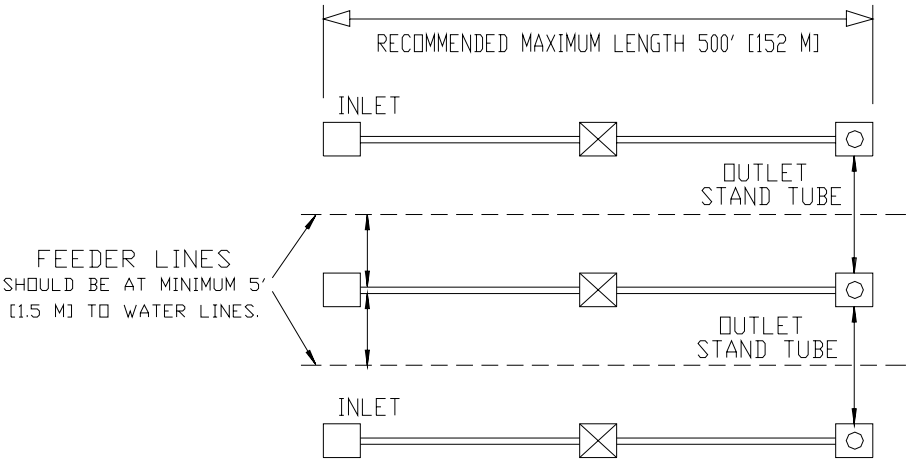
Manufacturer's Recommendations: Birds per Nipple

Weeks of Age	Recommended number birds per nipple
0-6	10-16 birds per nipple

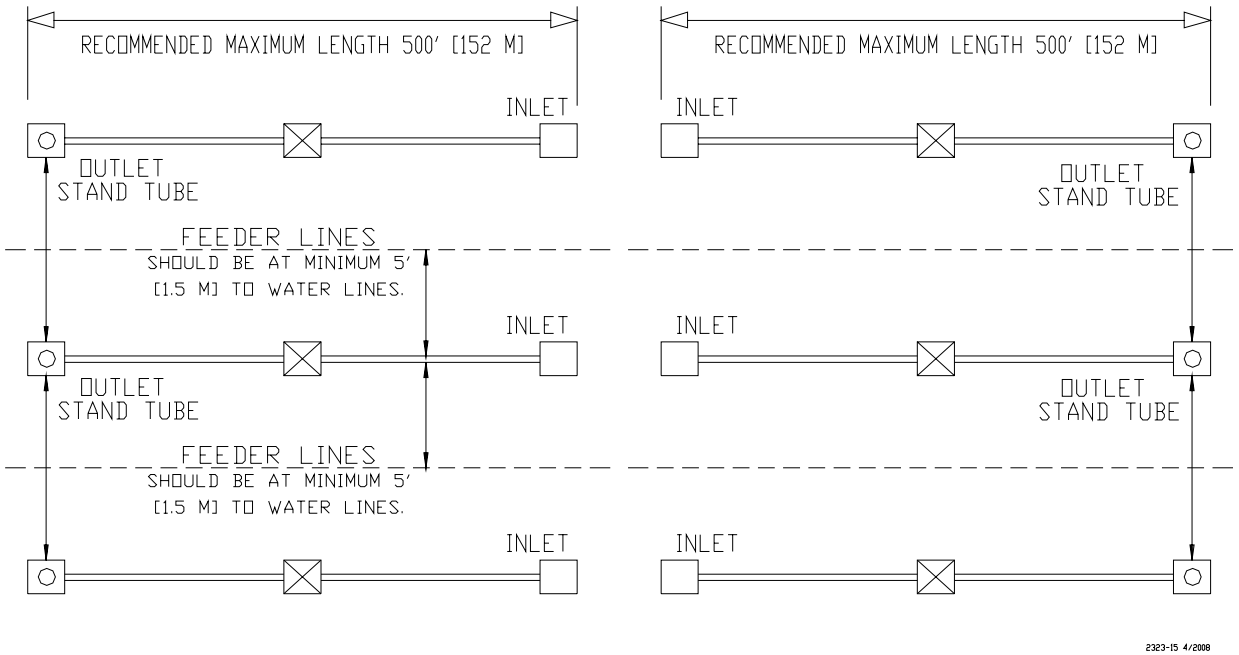
Planning the System layout

The diagrams below reflect approved system layouts. Use these diagrams as guidelines. Your system layout may be different.

Preferred Layouts



⊠ MID LINE AIR REMOVER KIT (NEEDED FOR LINES ABOVE 150' [46 M] LONG)



Suspension System Installation

The following installation instructions are for standard installations.

1. Determine where the water line is to be installed. Mark a straight line on the ceiling or rafters at this point using string or chalk line, or winch cable temporarily attached with staples or nails.
2. For installations using wood trusses, the standard screw hook or the optional ceiling hook may be used to hold the pulley assemblies.
   For installations using steel trusses, the ceiling hooks are available to hold the pulley assemblies.
   Screw hook installations: Install screw hooks along the line at 8' *[2.4 m]* or 10' *[3 m]* intervals.
   Screw the threads all the way in to prevent bending. The opening of the hooks must point away from the direction the cable pulls. See **Figure 2**

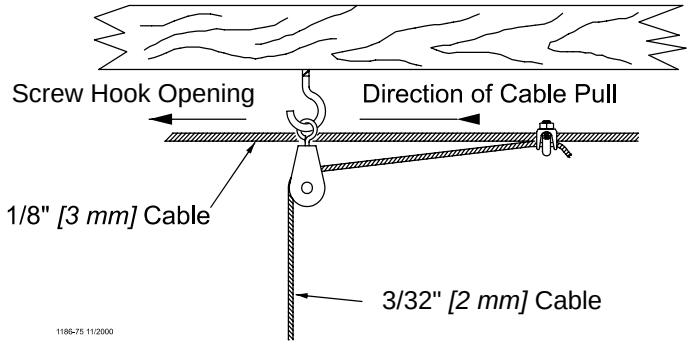


Figure 2. Screw Hook Installation

   Ceiling hook installations: Install ceiling hooks along the line at 8' *[2.4 m]* or 10' *[3 m]* intervals. If the ceiling hook is to be secured with bolts or self-tapping screws, install as shown in **Figure 3**. The ceiling hooks may be welded in place, if desired, instead of bolting.

Note: If the distance the waterer is to be raised is greater than the distance between the pulleys, offset the pulleys from each other approximately 3" *[75 mm]*.

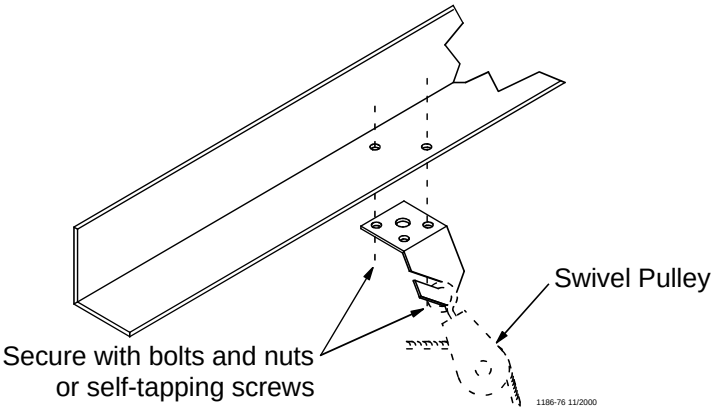


Figure 3. Ceiling Hook Installation

3. After the screw hooks or ceiling hooks have been secured to the trusses, install the pulley assemblies as shown in **Figures 2 & 3**. Make sure the screw hooks or ceiling hooks are pointing in the proper direction (opposite the winch).
4. Mount the split drum winch as shown in **Figure 5**. Mount the winch to the ceiling or on a 2 x 8" *[50x200 mm]* board spanning at least two rafters for support. Use at least (4) 1/4" lag screws (not supplied) to secure winch to support.

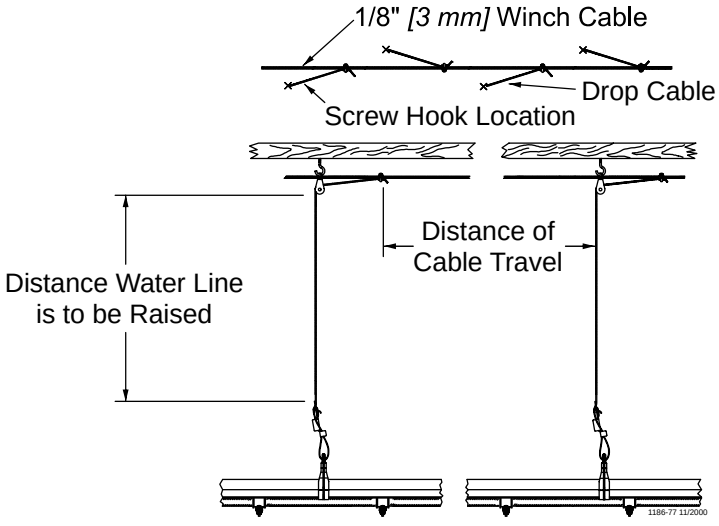


Figure 4. Offset the Screw/Ceiling Hooks

5. Bolt the winch to the bracket, as shown in **Figure 5**.

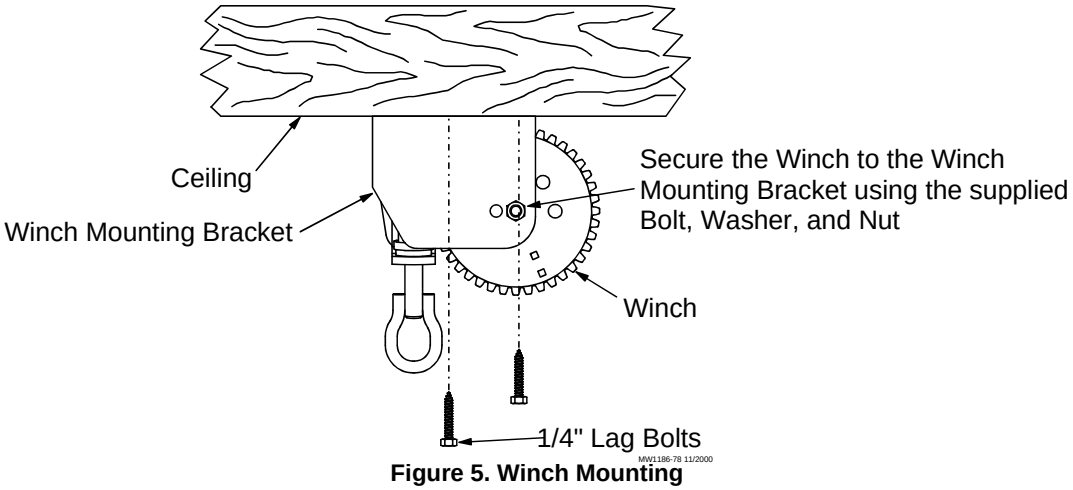


Figure 5. Winch Mounting

6. Attach one end of the 3/16" *[4.8 mm]* cable to the winch as shown in **Figure 6**. Unroll the cable along the length of the water line.

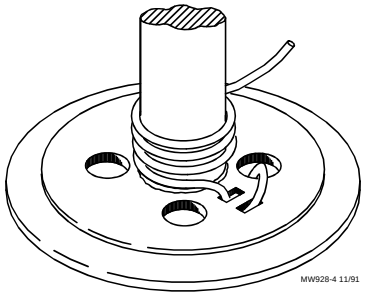


Figure 6. Cable Wrap on Drum

7. Cut a section of the 3/32" *[2.3 mm]* cable for each suspension drop. The cable should be approximately three feet *[91 cm]* longer than the distance from the floor to the ceiling so that it can be attached at the top and bottom.
   Route the cable around the swivel pulley and attach to the main cable, using a clamp.

Helpful Hint: It may be necessary to fasten a weight to the end of the main cable to maintain tension while connecting the drop lines, etc.

8. Cable drop installations: Install an cable adjustment leveler on each suspension drop. **See Figure 7**.
   Cord drop installations: Install a cord adjustment leveler on each suspension drop. **See Figure 7**.

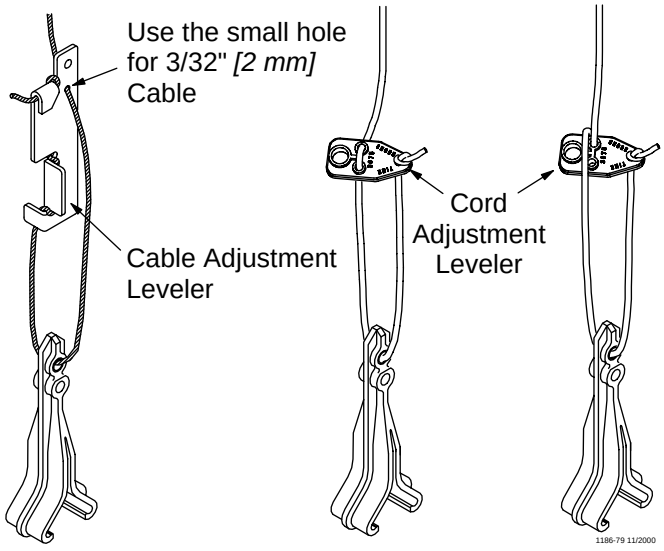


Figure 7. Suspension Drop Installation Options.

Assembling and Hanging the Water Line

Raise the suspension to a convenient working height.

A nail apron may be used to carry suspension hangers, channel connectors, couplers, and cable adjusters.

Figure 8 identifies several of the primary components used with the nipple waterer.

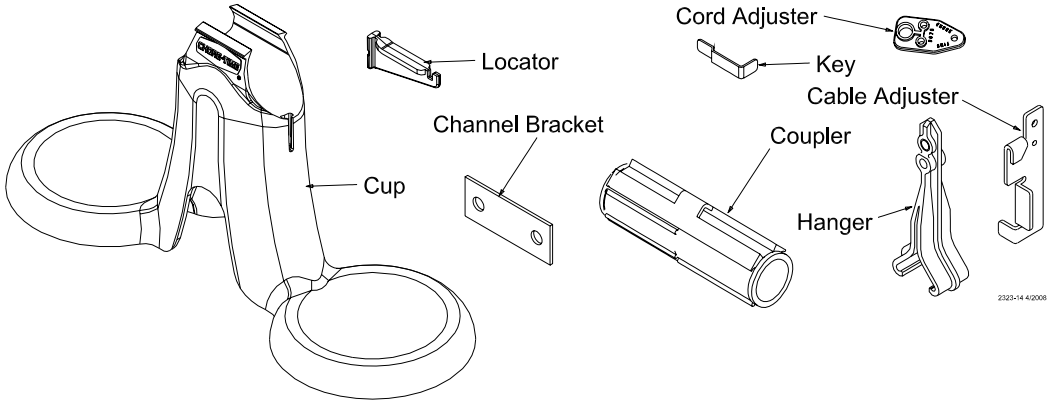


Figure 8. Nipple Waterer Components

Cup Installation

1. Install the locator to the cup as shown, **see figure 9.**

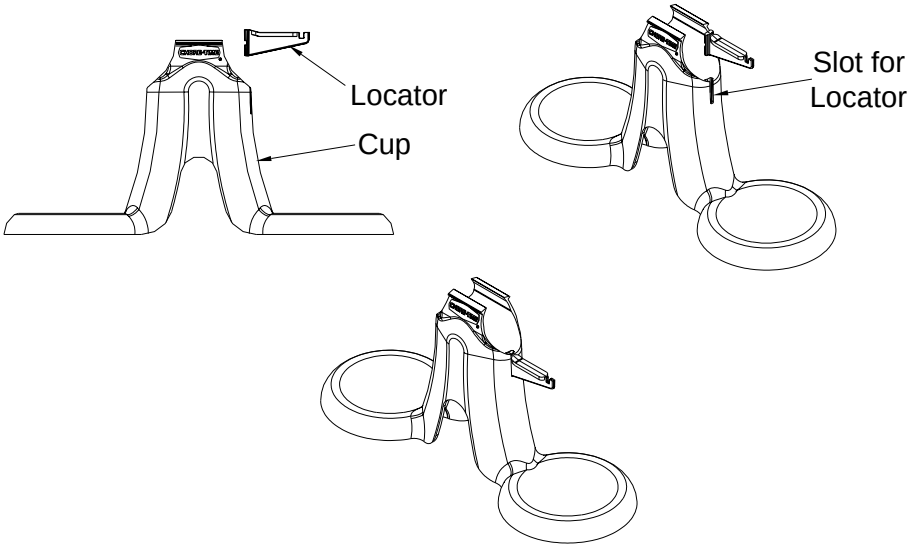


Figure 9. Locator Installation

2. Install cup and locator to the pipe assembly.
3. Turn pipe assembly over and install cup over the water pipe. The cup is to be located between a pair of saddle assemblies, **see figure 10.**

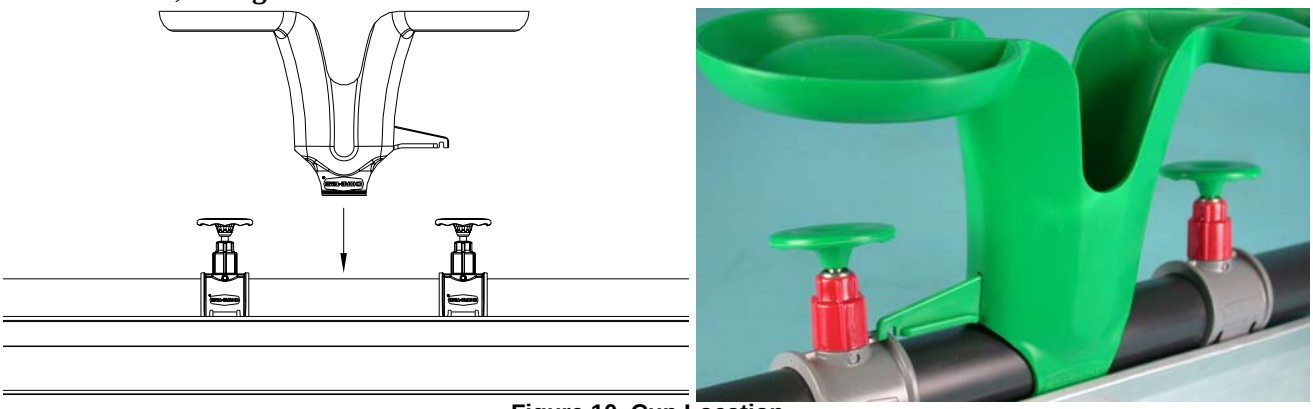


Figure 10. Cup Location

4. Line up slot in locator with rib on the saddle assembly, **see figure 11.**
5. Lock one side of the cup under the channel.

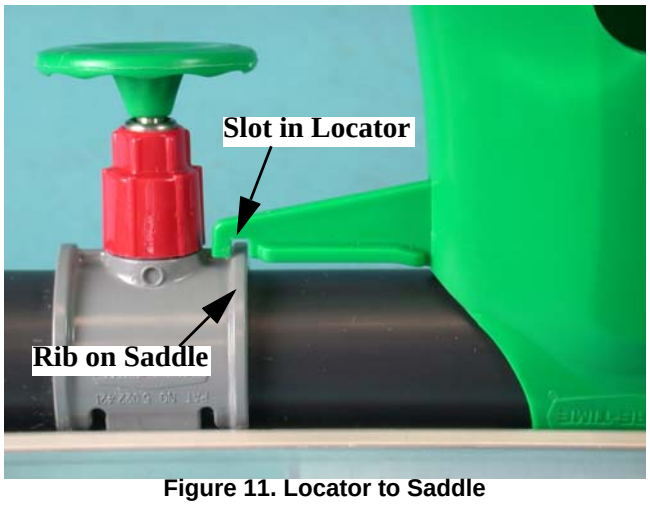
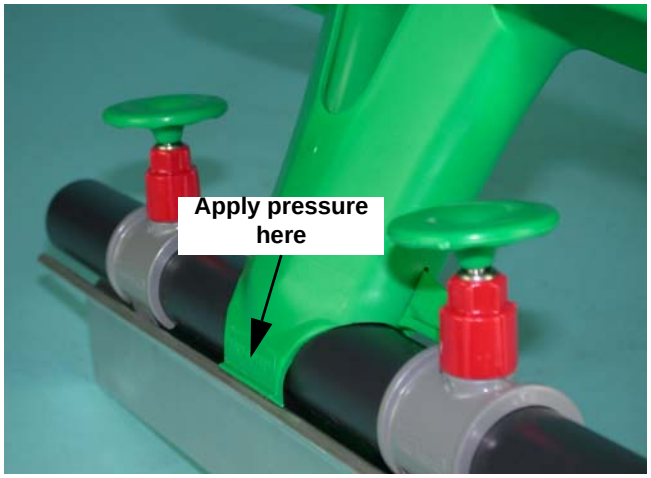


Figure 11. Locator to Saddle

6. Apply pressure to the unlocked side of the cup, **see figure 12.**
7. Rotate cup while applying pressure to the unlocked side of the cup until snapped in place. The cup will now hang straight down and in-line with the nipple assemblies.



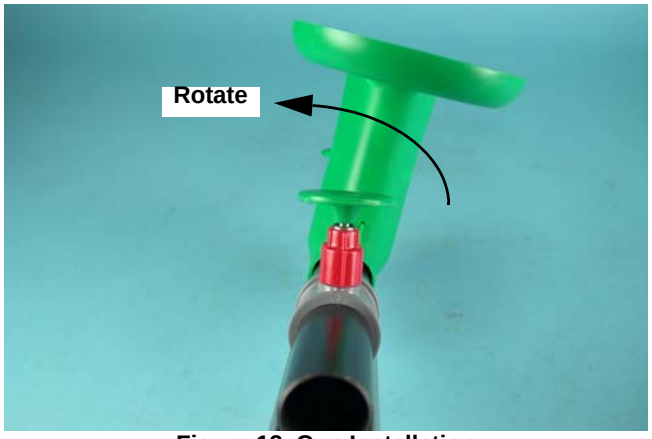


Figure 12. Cup Installation

Suspend Water Lines

Suspend the watering line every 8' *[2.4 m]* or 10' *[3 m]* at the suspension drops, as shown **Figure 13**.

1. Route the suspension cable through the top hole of the suspension hanger and around the cable adjuster as shown.
2. Assemble the suspension hanger over the channel at every suspension drop.
3. Additional suspension hangers need to be installed every 2' *[610 mm]* down the water line. These additional suspension hangers will not be connected to the suspension cable.

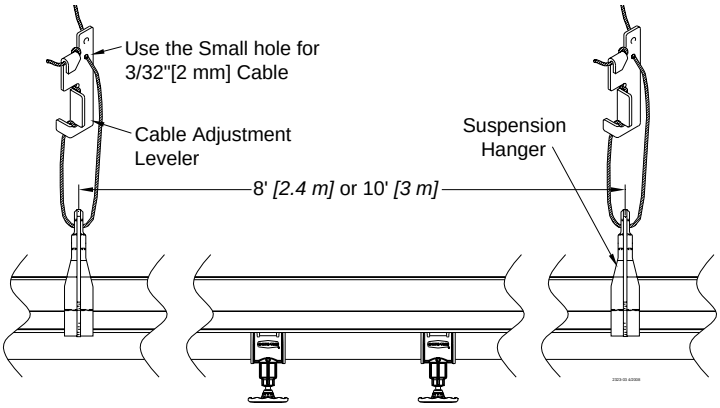


Figure 13. Suspension Hanger Location

Install Coupling Assembly

Install coupling assembly on the end of the water pipe, as shown in **Figure 14**. Insert the pipe until it contacts the stop rib inside the coupler assembly.

Note: It may be necessary to lubricate the inside of the coupler with water to allow for easy installation.

Insert the next pipe into the other end of the coupler assembly until the support channels meet.

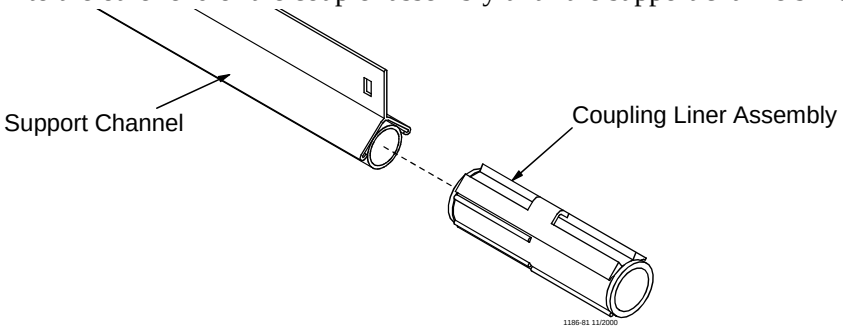


Figure 14. Coupling Assembly Installation

Make sure the water pipes are fully inserted into the coupling assembly.

Note: The support channels will be butted against each other when the coupling is properly installed.

Loosely attach the channel bracket with the supplied 10-24 screw and 10-24 kep nuts to the support channel, as shown in **Figure 15**. Connect the second screw through the channel bracket into the second support channel. Once installed, tighten screws and nuts. This will prevent the water lines from separating at the joints.

If a key will be used for installation, insert the key into the first support channel, as shown in **Figure 15**. Insert the tab of the key through the hole in the second channel support. Once installed, bend the tab to secure in place. This will prevent the water lines from separating at the joints.

Note: When an anti-roost system is to be installed it is recommended to use the channel bracket in place of the key.

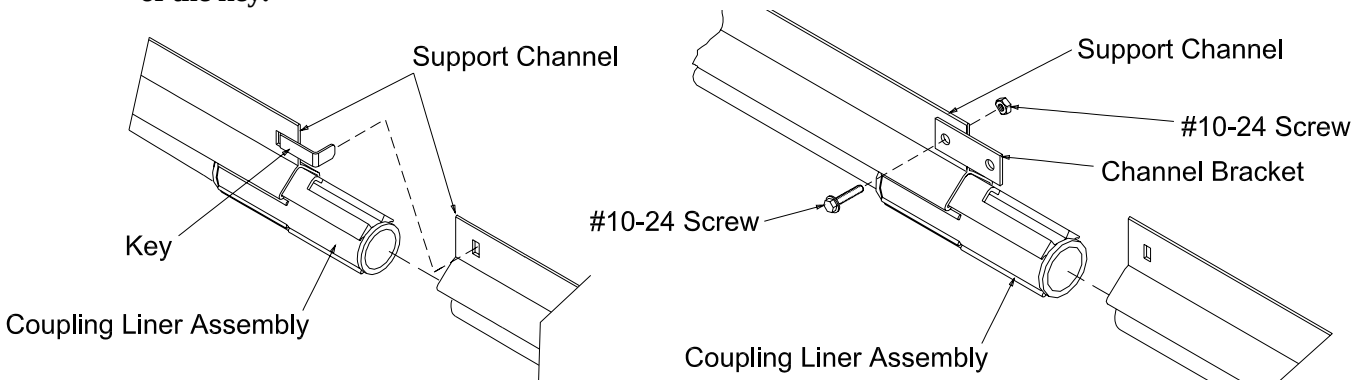


Figure 15. Securing the Water Line together

Mid-Line Stand Tube

One mid-line stand tube is required for every 150' *[46 m]* of nipple water line. See **Figure 16**.

1. Insert the water pipe into the body.
2. The support channel will slide into the channels on top of the body.
3. The support channel should then be assembled to the support bracket with the supplied 10-24 stainless steel screw and lock nut.

Repeat this procedure on the opposite side of the Mid-Line Stand Tube Kit.

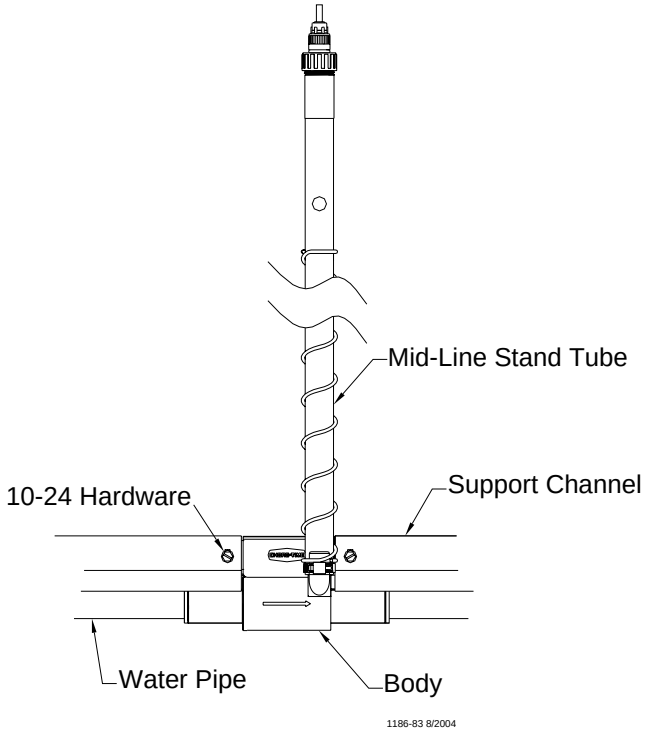


Figure 16. Mid-Line Stand Tube Installation

Optional Mid-Line Shut-Off Valve:

The mid-line shut-off valve may be located at any convenient location along the water line, except next to a joint.

1. Determine the desired location for the mid-line shut off valve.
2. Use a flat screwdriver to carefully pry 3 or 4 saddles away from the support channel. This will allow easy access to the water pipe for cutting.
3. Use PVC pipe cutters to cut a section out of the water pipe, **see figure 17.** The shut-off valve may be used as a template to determine the required size of the cut.
4. Apply PVC cement to the couplers on the mid-line shut-off valve assembly.
5. Install the mid-line shut-off valve on the water line.
6. Reinstall the saddles, previously loosened, in the support channel.

Note: Chore-Time recommends installing a mid-line stand tube at the first joint before a mid-line shut-off valve to insure proper air removal from the water line.

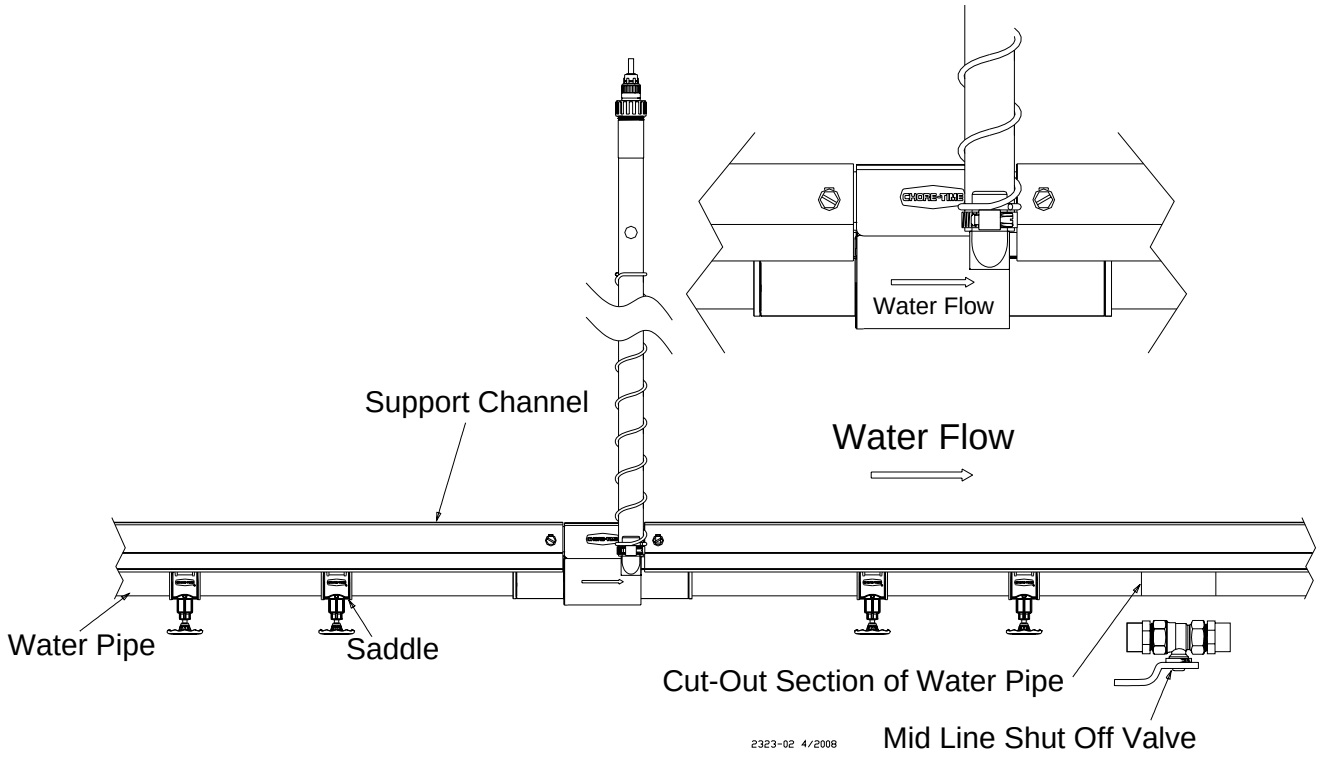


Figure 17. Mid-Line Shut-Off Valve Installation

Optional Slope Compensator:

The slope compensator is used in houses that have a gradual slope over the length of the system. The slope compensator allows the water pressure to be re-adjusted along the line.

- The inlet end of the slope compensator must be at the top of the slope.
- The arrow must point in the direction of water flow. Do not attempt to push water uphill.
- The maximum amount of drop between the inlet assembly and the slope compensator, between two slope compensators, or between the slope compensator and the outlet assembly is 4 inches *[100 m]*, **see figure 18.**
- The maximum number of slope compensators to be used on any one water line is six.
- The maximum amount of slope over any water line is 28 inches *[71 cm]* of drop, **see figure 18.**

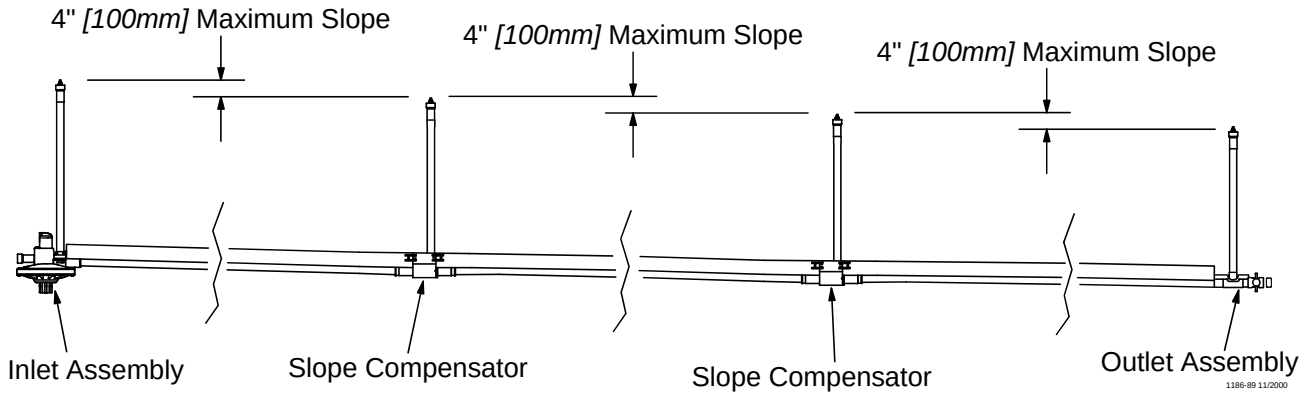


Figure 18. Slope Compensator Assembly Installation

Outlet Assembly

The outlet end must be located within 6"*[152 mm]* of a suspension drop line. This may require adding an additional suspension drop line or cutting the last section of water line to stop within 6"*[152 mm]* of an existing drop line.

Before installing the outlet assembly, make sure the end of the water pipe is flush with the end of the support channel. Install the outlet assembly securing the water line with PVC cement, as shown in **Figure 19**.

If the water line was shortened to terminate under a suspension drop line, it may be necessary to drill a hole in the support channel for the 10-24 truss head screw and lock nut. The hanger may be used as a template to determine proper hole location.

Assemble the stand tube and clamp to the stand tube outlet by sliding the tube over the barbs and tightening the hose clamp. Now push and twist the stand tube spring over the tube and barbs.

DO NOT USE LUBRICANT, ONLY USE WATER TO EASE STAND TUBE INSTALLATION.

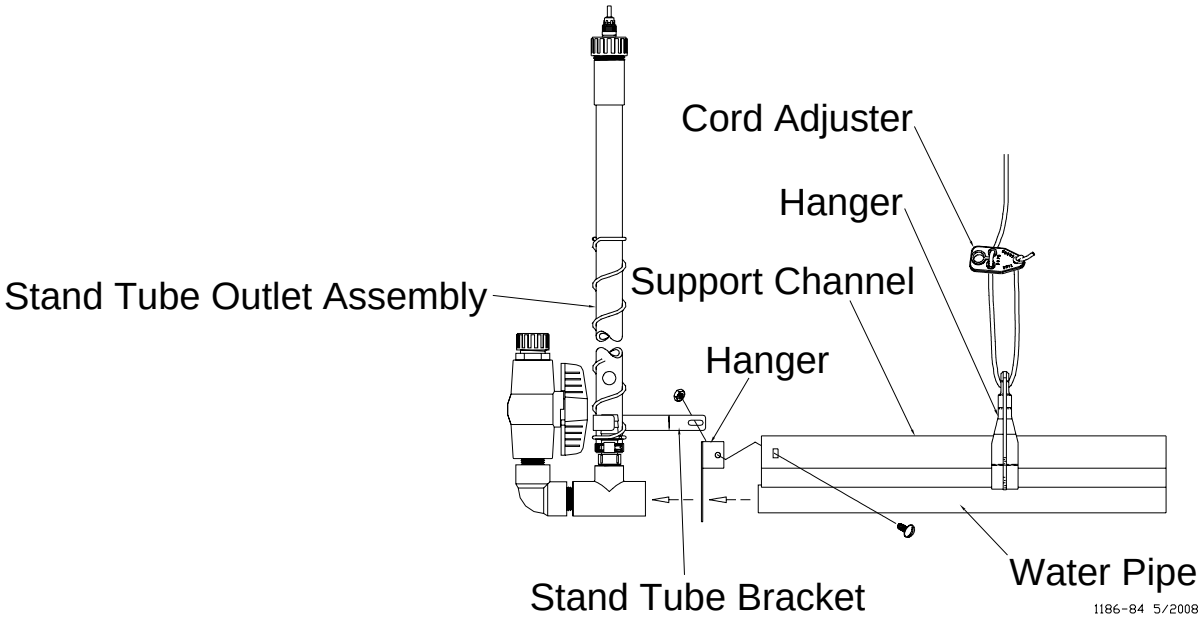


Figure 19. Outlet Assembly Installation

Regulator Assembly

Assemble and install the regulator assembly, as shown in **Figure 20**.

1. Glue the included NH male adapter fitting or optional street ell and NH male adapter fitting to the inlet. **Be careful not to get glue inside the inlet**.
2. Slide the outlet end of the regulator over the watering pipe, **it helps to wet the black outlet liner**, and into the end of the channel.
3. Slide the regulator bracket into the hole provided in the channel with the included #10-24 x 5/8" hex washer head screw and #10-24 hex nut.
4. Assemble the stand tube and clamp to the stand tube outlet by sliding the tube over the barbs and tightening the hose clamp. Now push and twist the stand tube spring over the tube and barbs. **DO NOT USE LUBRICANT!**

DO NOT USE LUBRICANT, ONLY USE WATER TO EASE STAND TUBE INSTALLATION.

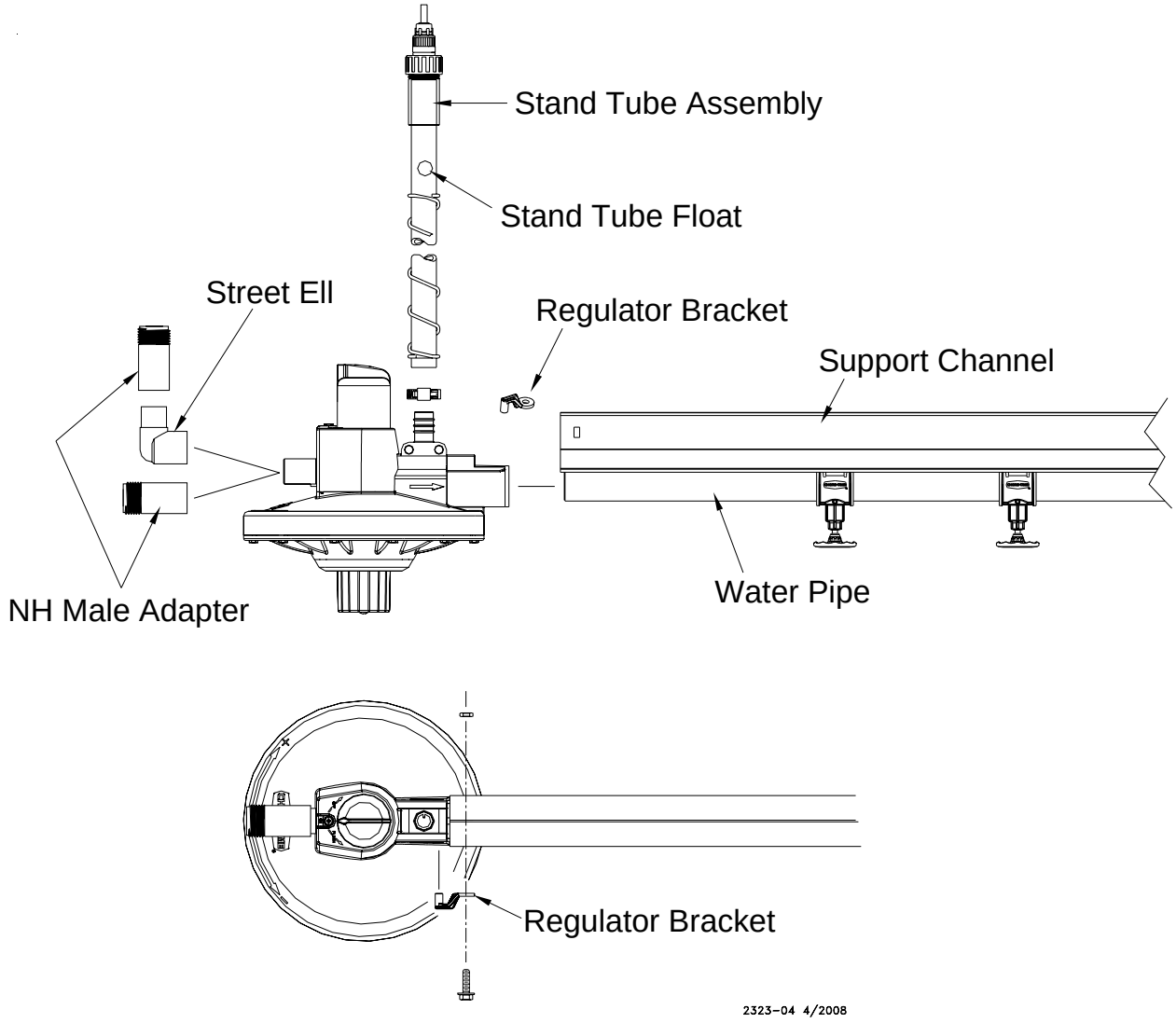


Figure 20.Regulator End Components

Regulator Operation

The VOLUMATIC™ Water Regulator can be shut off by turning the Selector Knob clockwise until it stops. To turn on the regulator, turn the selector knob until it points to the ON position indicated on the regulator. To activate the Flush mode turn the selector knob fully counter-clockwise until it stops.

Optimum incoming pressure is 25 - 35 psi *[172 - 241 kPa]*. The VOLUMATIC Water Regulator can operate at pressures as high as 50 psi *[345 kPa]* however the life of the regulator seat and diaphragm will be shortened. Also, the supply hose must be of high quality and rated for the increased pressure.

When flushing, make sure the outlet line is clear of restrictions. Excessive back pressure can damage the regulator.

When using the manual adjustment version of the regulator, the water column is set by turning the manual adjustment knob on the bottom of the regulator in the direction shown on the regulator.

Important: When increasing the water column, as soon as resistance is noticed, stop turning the manual adjustment knob or damage will occur.

Filter Control Panel Installation

The filter control panel is used to remove foreign material from the incoming water, and, if necessary, add medication to the water.

The step down regulator and gauge assembly is used to reduce the water pressure supplying the filter control panel. Adjust the operating pressure as recommended 25 psi *[172.4 kPa]* to 35 p.s.i. *[241.4 kPa]*.

The filter control panel and step down regulator should be installed in a convenient location where incoming and outgoing water supply lines can be easily run. The control panel must be out of the reach of birds.

The filter control panel is shipped secured to a mounting board. The mounting board and filter control panel should be secured to wall or post using lag bolts (not supplied).

The step down regulator and gauge assembly is shipped un-assembled. Assemble the step down regulator and gauge assembly components as specified in the instruction (MW1052) shipped with the kit.

Connect the step down regulator and gauge assembly to the filter control panel, as shown in **Figure 21**.

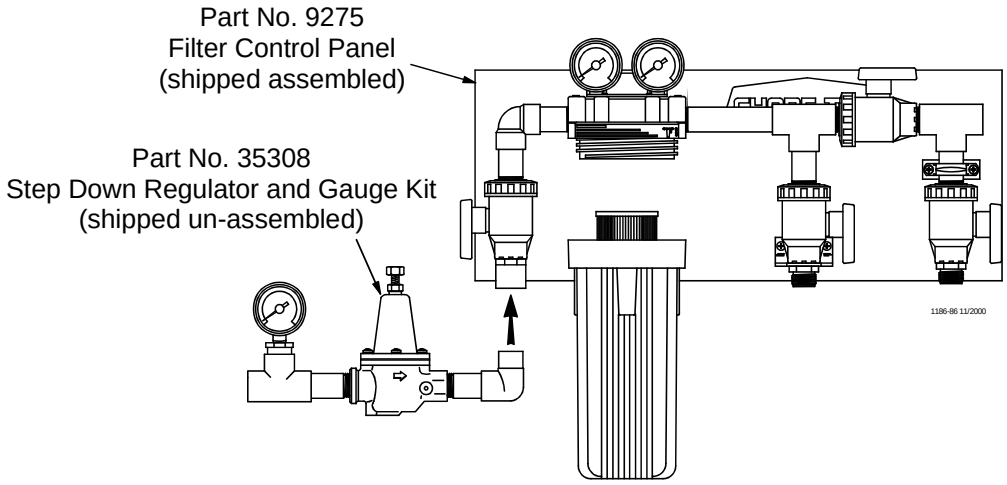


Figure 21. Control Panel Installation

Flushable Filter Control Panel Installation

(optional alternative to the standard Filter Control Panel)

The flushable filter control panel is used to remove foreign material from the incoming water, and, if necessary, add medication to the water. This control panel features a filter that may be removed, cleaned, then reinstalled.

Two versions of the filter control panel are available.

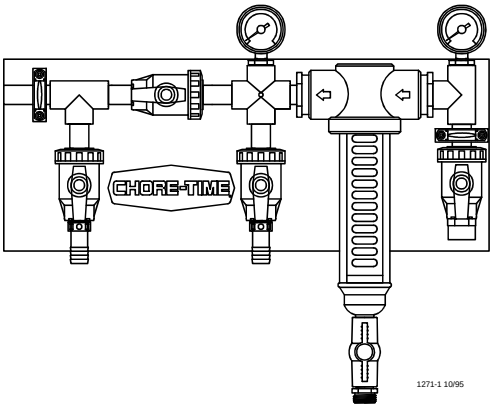
The low pressure version is designed to accommodate gravity flow systems with 3 - 10 psi *[20.68 - 68.95 kPa]*. Do not exceed 15 psi *[103.42 kPa]* with this control panel, or damage will occur to the gauges.

Systems with 11+ psi *[75.84+ kPa]* should use the high pressure control panel and a step down regulator (order separately).

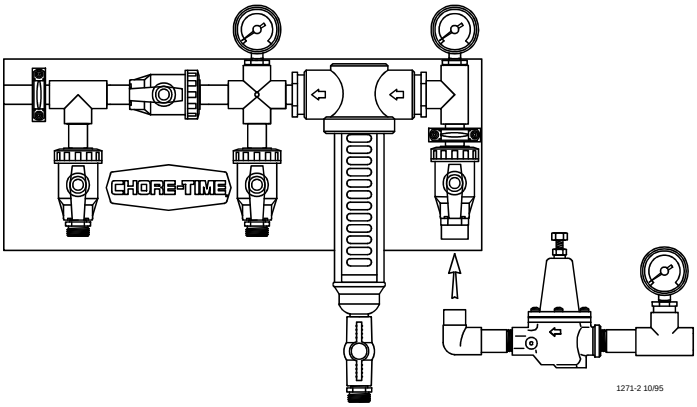
The filter control panel should be installed in a convenient location where incoming and outgoing water supply lines can be easily run. The control panel must be out of the reach of birds.

The filter control panel is shipped secured to a mounting board. The mounting board and filter control panel should be secured to wall or post using lag bolts (not supplied).

The gauge assembly is shipped un-assembled. Assemble the gauge assembly components as specified in the instruction (MW1052) shipped with the kit.



Low Pressure Control Panel
Part Number 36802-1
(3-10 psi *[20.68 - 68.95 kPa]*



High Pressure Control Panel
Part Number 36802-2
(11+ psi *[75.84+ kPa]*

Anti-Roost Installation

The anti-roost system prevents the birds from setting on the water line. **Figure 22** shows an overview of the anti-roost system.

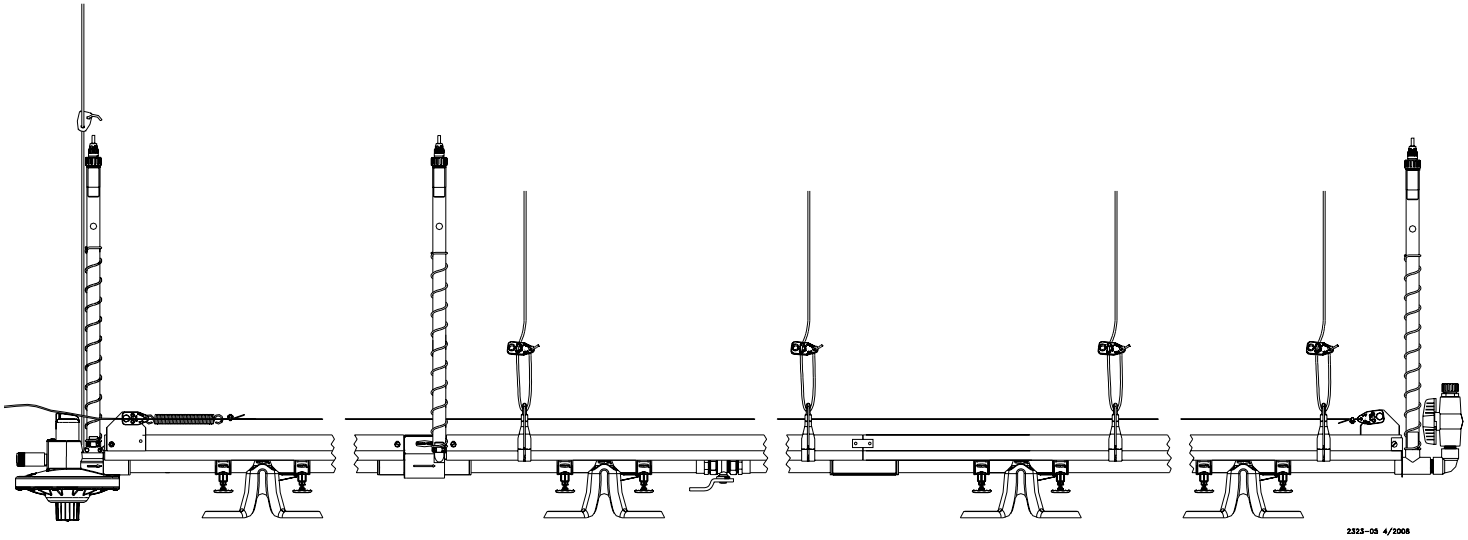


Figure 22. Anti-Roost System Overview

1. Make certain that an anchor plate with adjustment leveler is installed at the beginning and end of each anti-roost line. See **Figure 23**.
2. When an anti-roost system is to be installed the channel bracket must be used in place of the key to connect the channels together.
3. Install a suspension hanger every 24" *[610 mm]*
4. Beginning at the first suspension hanger, thread the training cable the full length of the anti-roost line. Allow approximately 24" *[610 mm]* extra and cut the cable.
5. Create a small loop with the cable and a cable clamp.
6. Connect the cable loop to the adjustment leveler/anchor plate.
7. Install a spring on the adjustment leveler/anchor plate near the inlet assembly.
8. Pull the cable taught and create a small loop with the cable and a cable clamp.
9. Connect the cable to the spring.
10. The spring should be stretched to an overall length of approximately 8" *[203 mm]*. Adjust as required.
11. Repeat the above procedure on each of the anti-roost lines.
12. **Optional Equipment:** Secure the poultry trainer to a wall or post near the water line.
    Chore-Time recommends wiring the poultry trainer into separate electrical circuit that can be switched at the door.
    Refer to the instructions supplied with the poultry trainer for wiring information.
    Note: Make sure that the support channel is attached to a ground (to insure proper operation of the poultry trainer). Also when mid-line stand tubes are used a jumper wire will need to be installed to continue electrical current. See **Figure 23**.

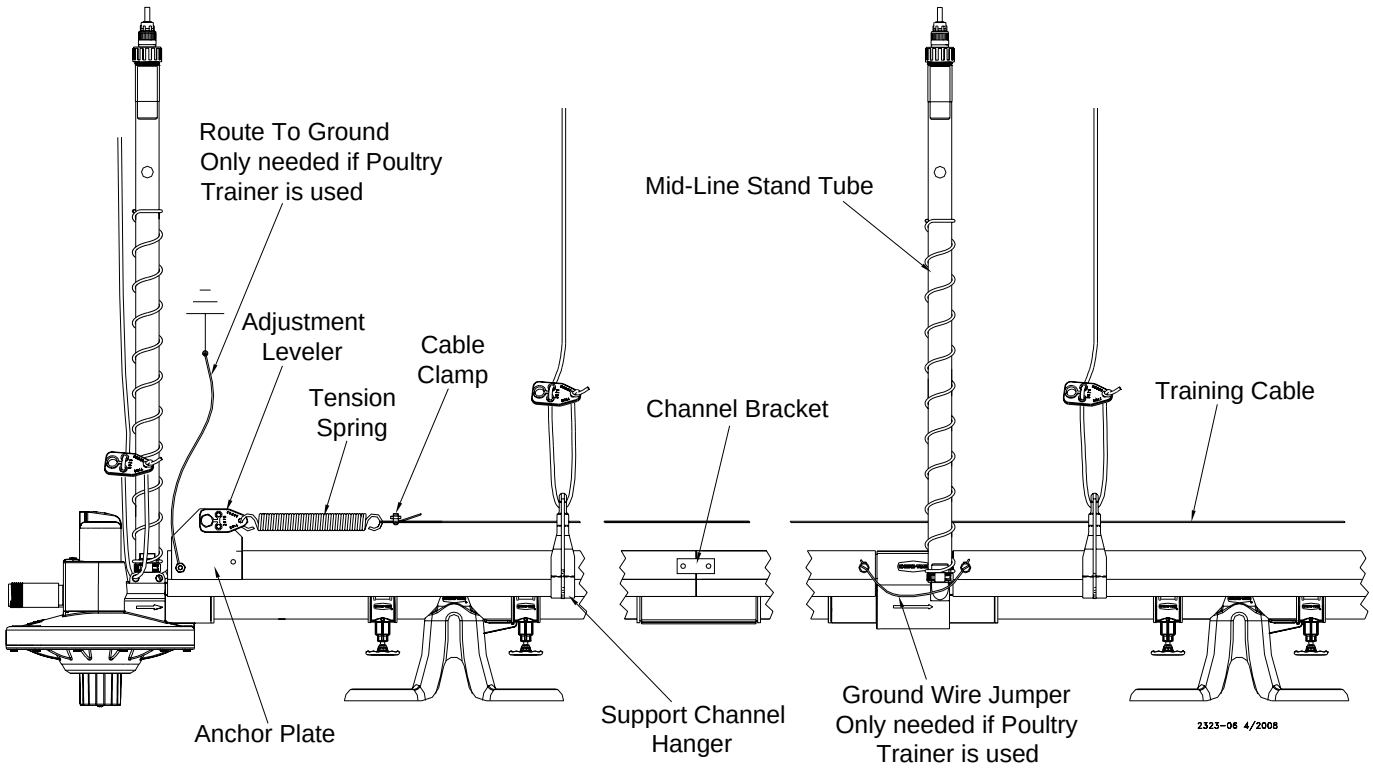


Figure 23. Anti-Roost Components

Installing the Flush System

The flush system provides convenient one-man system purging.

Chore-Time recommends flushing one line at a time to maximize the cleaning in each line.

The hose, PVC pipe and connections must be purchased locally.

Install the flush components as shown in **Figure 24**.

1. Notice that the exit line must exit through the building wall at a minimum height of 72" *[182.8 cm]* above floor level.

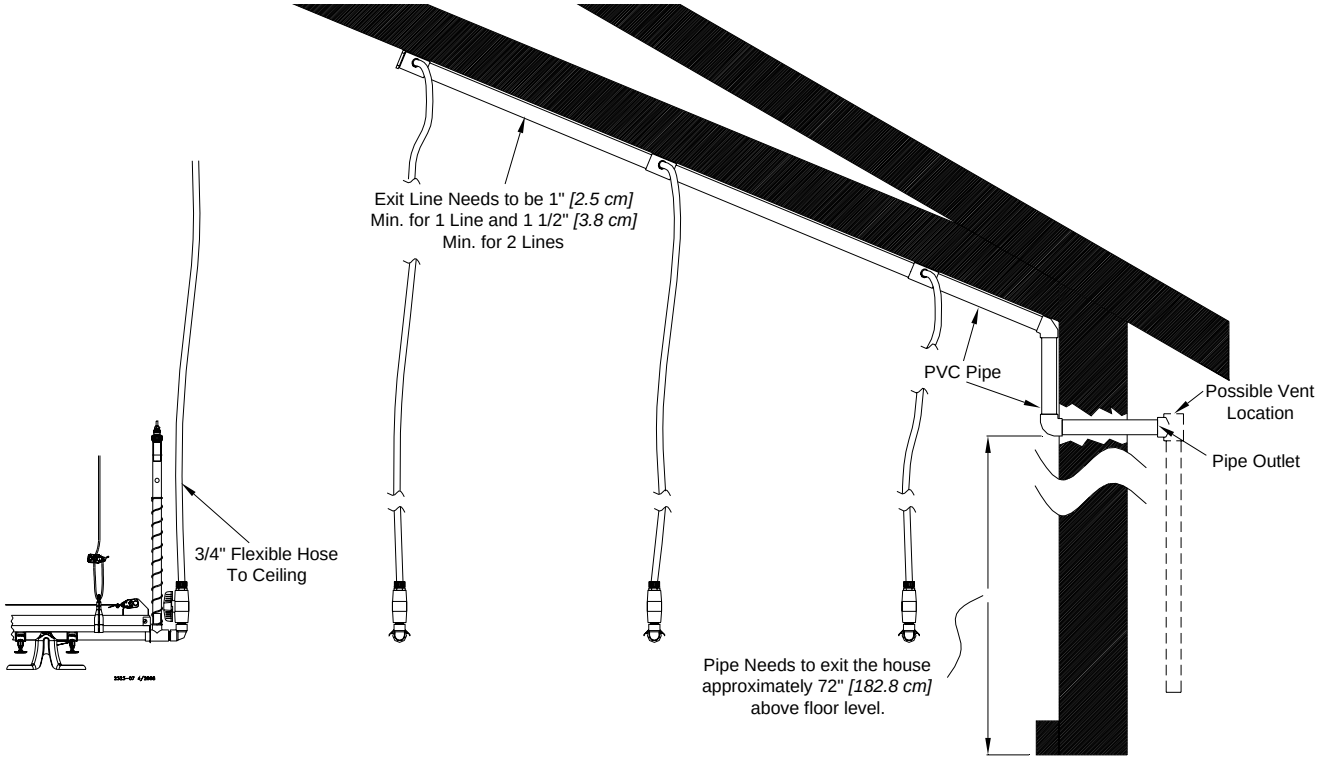


Figure 24. Flush System Component Layout Diagram

2. The exit line needs to be 1" *[2.5 cm]* minimum for 1 flushing line. To connect multiple flushing lines together (as shown) the exit line needs to be 1 1/2" *[3.8 cm]* minimum for 2 flushing lines.
3. The exit line should be attached to the ceiling of the house and must exit out the side wall of the house. This line needs to be at an adequate height to allow clearance for any equipment used in the house. It may be necessary to route the exit line out both sides of the house to ensure water leaves the exit line.
4. Measure and cut the plumbing to the required lengths for your individual system.
5. The hose attached to the end of the watering line that extends up to the exit line is to be made of a flexible material.

Note: A siphon will be created during flush if the PVC pipe outlet is at or below the level of the top of the stand tube in the house at grow-out.

If it is not possible to have the pipe outlet above the top of the stand tube a vent must be installed. The vent must be above the top of the stand tube at all times during operation of the watering system.

PDS™ Flush Control

Optional PDS™ (Pneumatic Drinking System) controls can be used with VOLUMATIC™ regulators as a option to the standard manual flush regulators.

PDS controls are programmable controls which can provide automatic flushing cycles. These controls also provide a central place to flush watering lines along with pressure adjustment which regulates the water column height.

4-8 station PDS control

12-32 station PDS control

The PDS control is available in station increments of 4(ie. 12, 16, 20...). Each station is capable of controlling up to 2 individual VOLUMATIC™ regulators. For example a 12 station control can regulate and flush up to 24 individual regulators.

Available control part numbers:

Part Number	Number of stations
49000-4	4
49000-8	8
46772-12	12
46772-16	16
46772-20	20
46772-24	24
46772-28	28
46772-32	32

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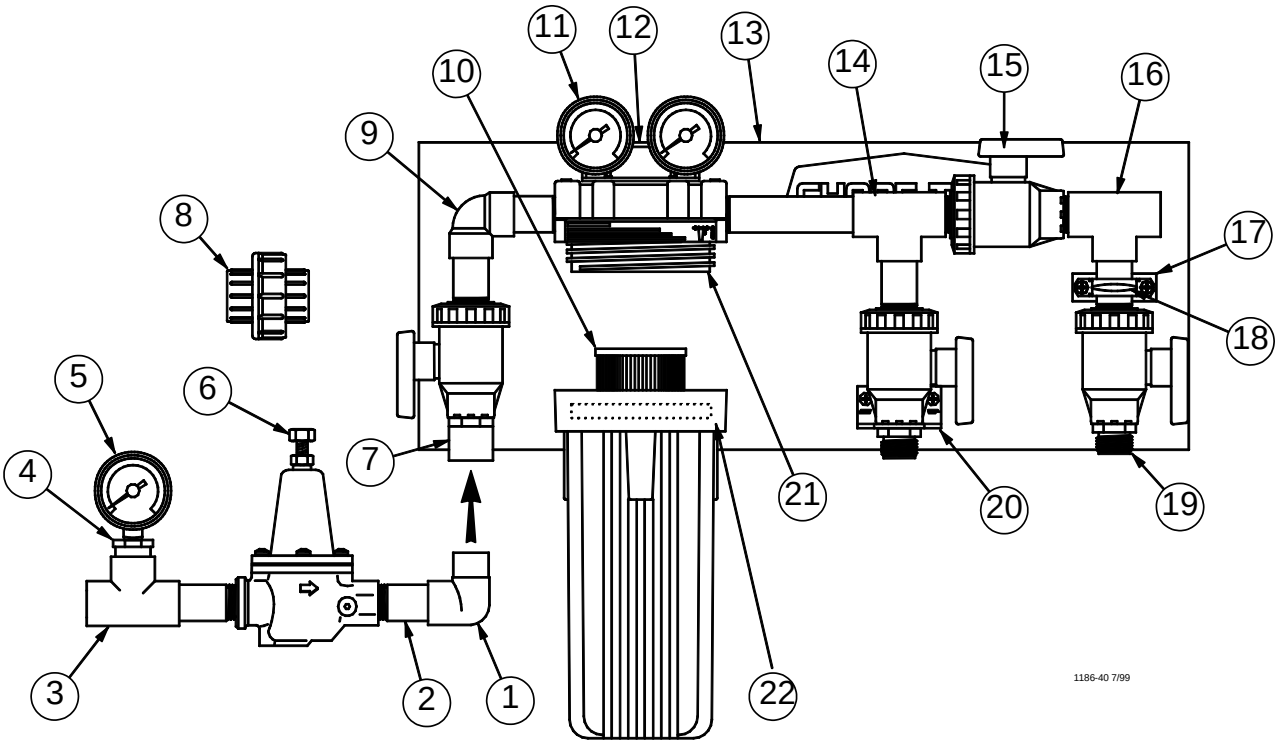
Parts Listing

Filter Control Panel with Step Regulator



Item	Description	Part No.
1*	3/4" PVC Street Ell	30138
2*	3/4" Threaded PVC Nipple	7531-1
3*	3/4" PVC Tee	7538
4*	3/4 x 1/4 Reducer Bushing	7789
5*	High Press. Water Gauge	7191
6*	Regulator	29951
7**	3/4" PVC Male Adapter	34100
8*	Union	8137
9**	Filter Inlet Assembly	8141
10**	10 Micron Filter Cartridge (Optional)	13145
	20 Micron Filter Cartridge (Standard)	7723
11**	High Press. Water Gauge	7191
12**	Filter Mounting Bracket	35302
13**	Mounting Board	35303
14**	Filter Outlet Assembly	35304
15**	3/4" Quarter Turn Valve	36720
16**	Medicator Outlet Assembly	35305
17**	Standoff Block	35300
18**	Plastic Conduit Clamp	35301
19**	3/4" Nylon Adapter	7543
20**	Medicator Connector Brace	35307
21**	Water Filter	35309
22	O-Ring	9191

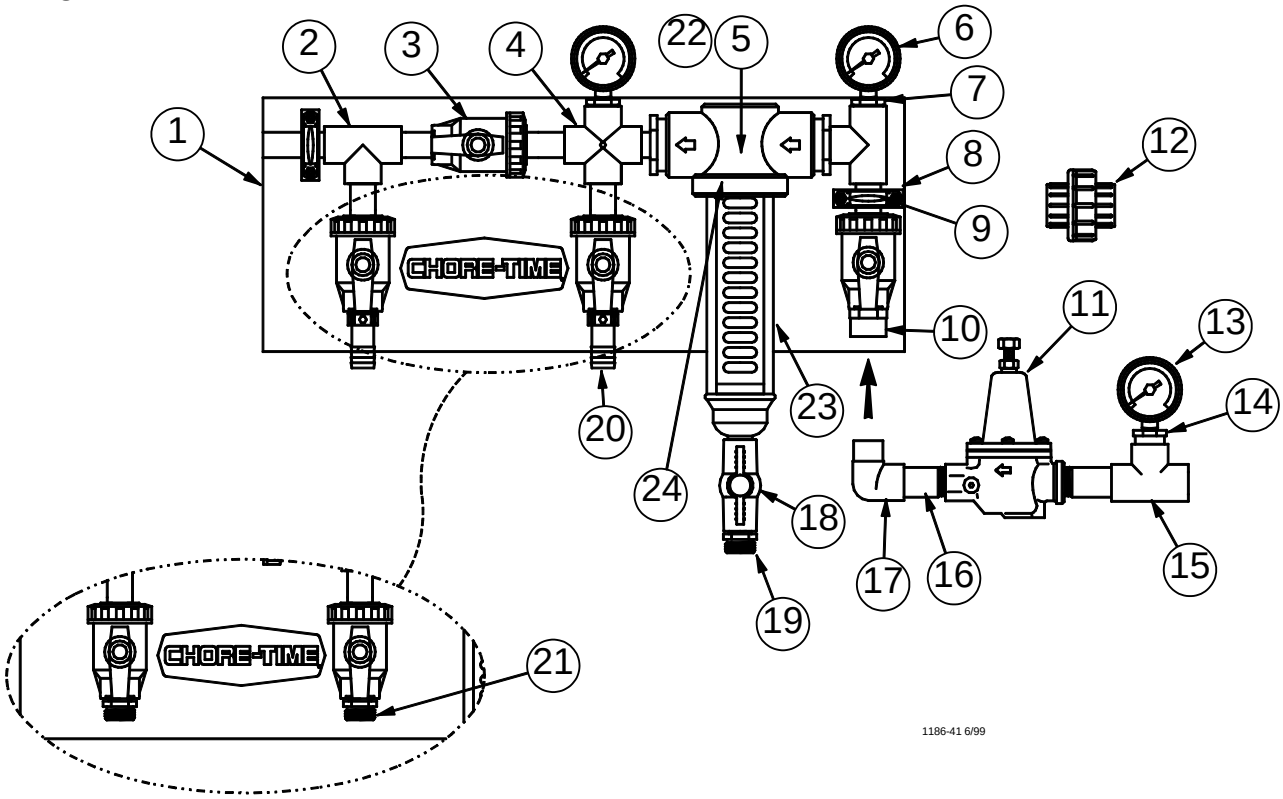
***These components may be ordered as an assembly under Part No. 35308.**

****These components may be ordered as an assembly under Part No. 9275.**

Flush able Filter Control Panel

Low Pressure: 36802-1

High Pressure: 36802-2



		36802-1	36802-2
Item	Description	Part No	Part No
1	Mounting Board	35303	35303
2	Meditator Outlet Assembly	36805	36805
3	3/4" Valve	36720	36720
4	3/4" Cross	7536	7536
5	Filter Inlet Assembly	36810	36810
6	Pressure Gauge	27722	7191
7	3/4" x 1/4" Reducer Bushing	7789	7789
8	Standoff Block	35300	35300
9	3/4" Plastic Conduit Clamp	35301	35301
10	3/4" PVC Male Adapter	9229	9229
11*	Step Regulator	29951	---
12*	Union	8137	---

		36802-1	36802-2
Item	Description	Part No	Part No
13*	High Pressure Gauge	7191	---
14*	3/4" x 1/4" Reducer Bushing	7789	---
15*	3/4" PVC Tee (S x S x S)	7538	---
16	3/4" Threaded PVC Nipple	7531-1	---
17	3/4" PVC Street Ell	30138	---
18**	1/2" Ball Valve	34961	34961
19**	Nylon Adapter	29141	29141
20	3/4" Barb x 3/4" Pipe Adapter	27422	---
21	3/4" Male Adapter (Nylon)	---	7543
22	Flush able Filter	36806	36806
23**	Filter Cover	46993	46993
24	O-Ring Kit	36807	36807

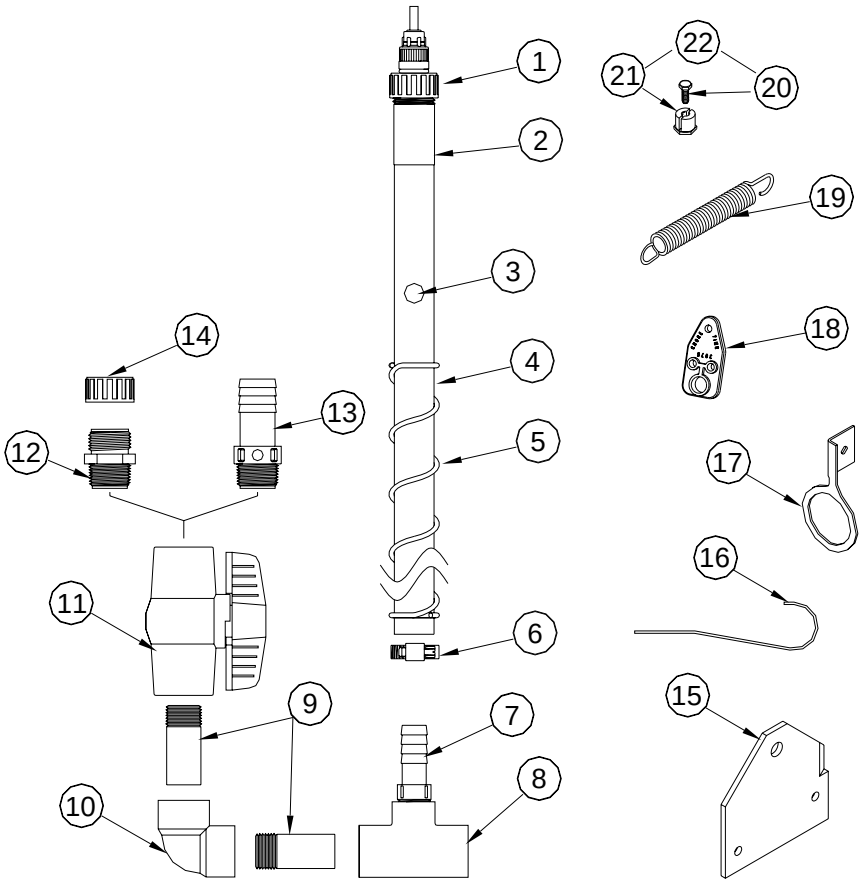
These parts may be ordered separately, if needed.

Description	Part No.
1/2 Pint PVC Cement	6303-3
Replacement 140 Mesh Filter	36809
Flush able Filter Assembly	36810

***Items not included with the flush able filter control panel. They may be ordered separately as a assembly, Part No. 35308.**

****Included with Item 5.**

Stand Tube Outlet Assembly

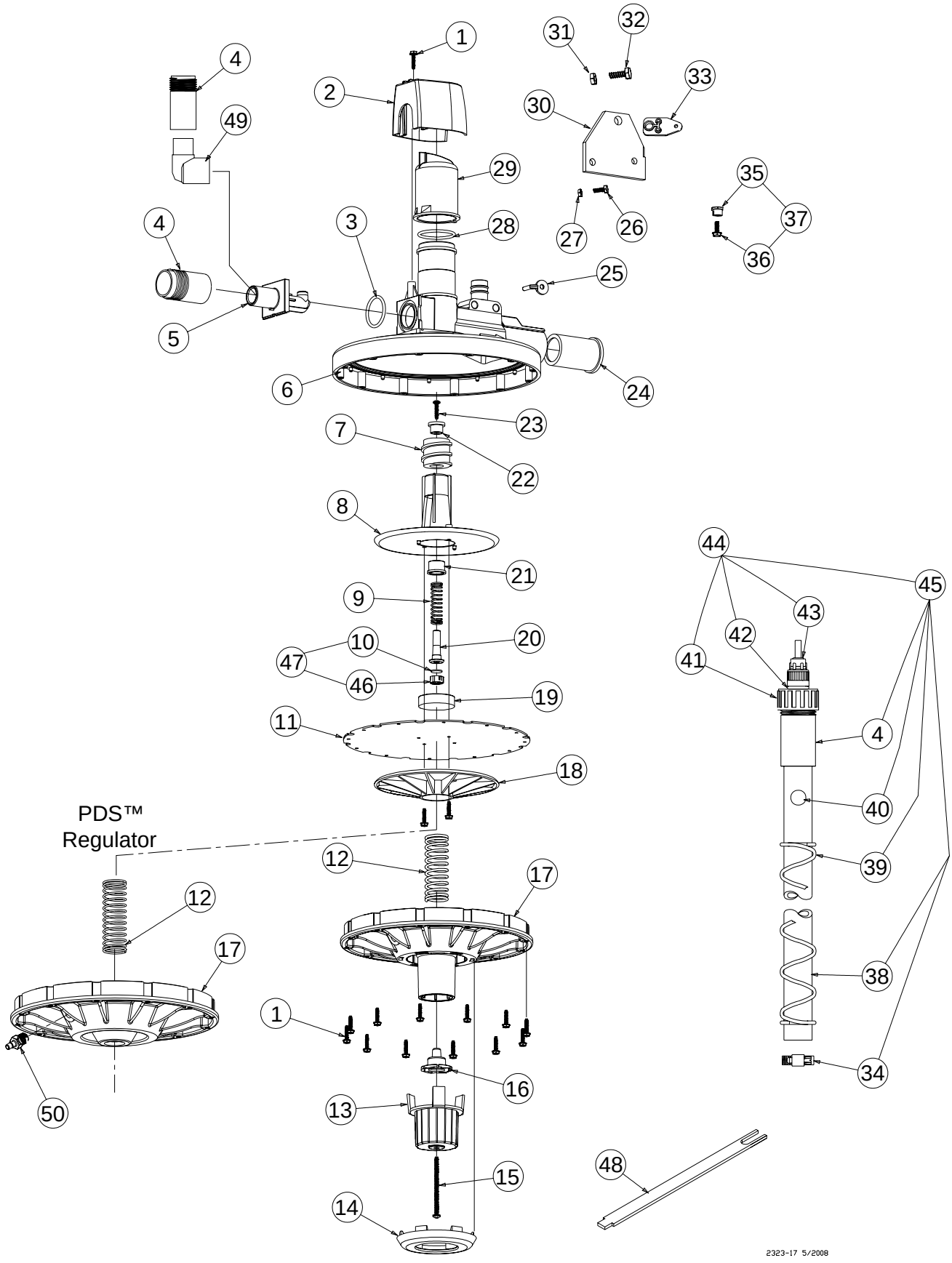


		35779-4	35779-5	35779-7	35779-8
Item	**Description**	**Part No.**	**Part No.**	**Part No.**	**Part No.**
1*	Breather Cap Assembly	45703	45703	45703	45703
2*	Male Adapter Fitting	25098	25098	25098	25098
3*	Stand Tube Float Ball	37142	37142	37142	37142
4*	Flexible Tubing	36840-1	36840-1	36840-1	36840-1
5*	Spring	36839-1	36839-1	36839-1	36839-1
6	Hose Clamp	49529	49529	49529	49529
7	1/2" Male Adapter	47881	47881	47881	47881
8	Reducing Tee	34777	34777	34777	34777
9	3/4" x 2" Threaded PVC Pipe	7531-4	7531-4	7531-4	7531-4
10	3/4" S x T Ell	7558	7558	7558	7558
11	3/4" Ball Valve	35781	35781	35781	35781
12	3/4" Nylon Adapter	7543	7543	---	---
13	3/4" Male Adapter	---	---	29422	29422
14	Hose Cap (Washer Included)	9811	9811	9811	9811
15**	Anchor Plate	---	42807	42807	---
16	Stand Tube Bracket	33900	33900	33900	33900
17	Hanger	35481	35481	35481	35481
18**	Adjustment Leveler	---	3075	3075	---
19**	Extension Spring	---	25353	25353	---
20**	#10-24 x 3/8" Machine Screw	---	1951	1951	---
21**	#10-24 Slotted Nut	---	1840	1840	---
22**	Cable Clamp	---	1826	1826	---

***These items may be ordered as a stand tube assembly, Part No. 39245 for standard length (20") stand tube or Part No. 39245-1 for longer (34.5") stand tube.**

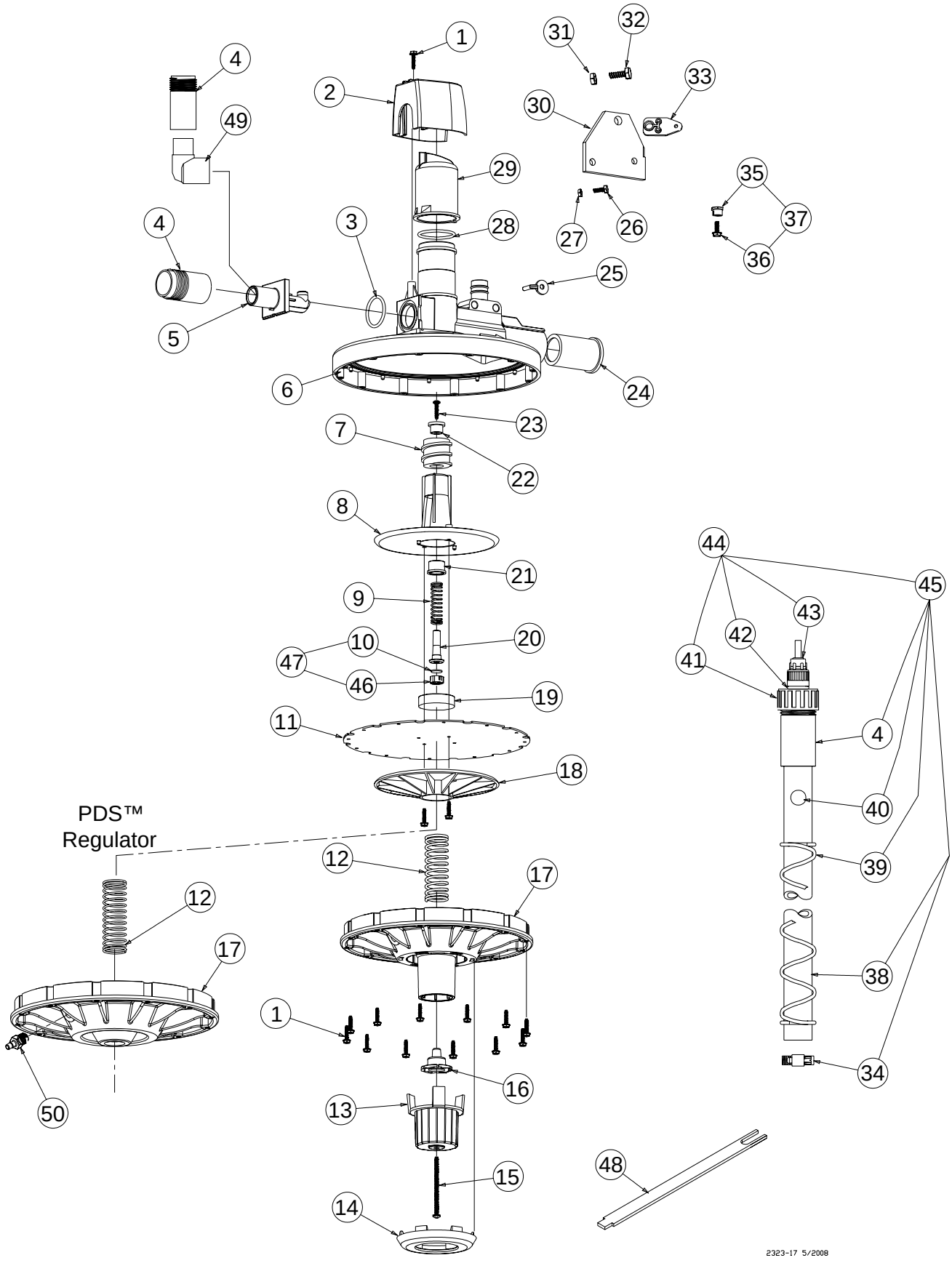
****These items are required if the anti-roost system is used.**

Manual Adjustment Regulator Assembly



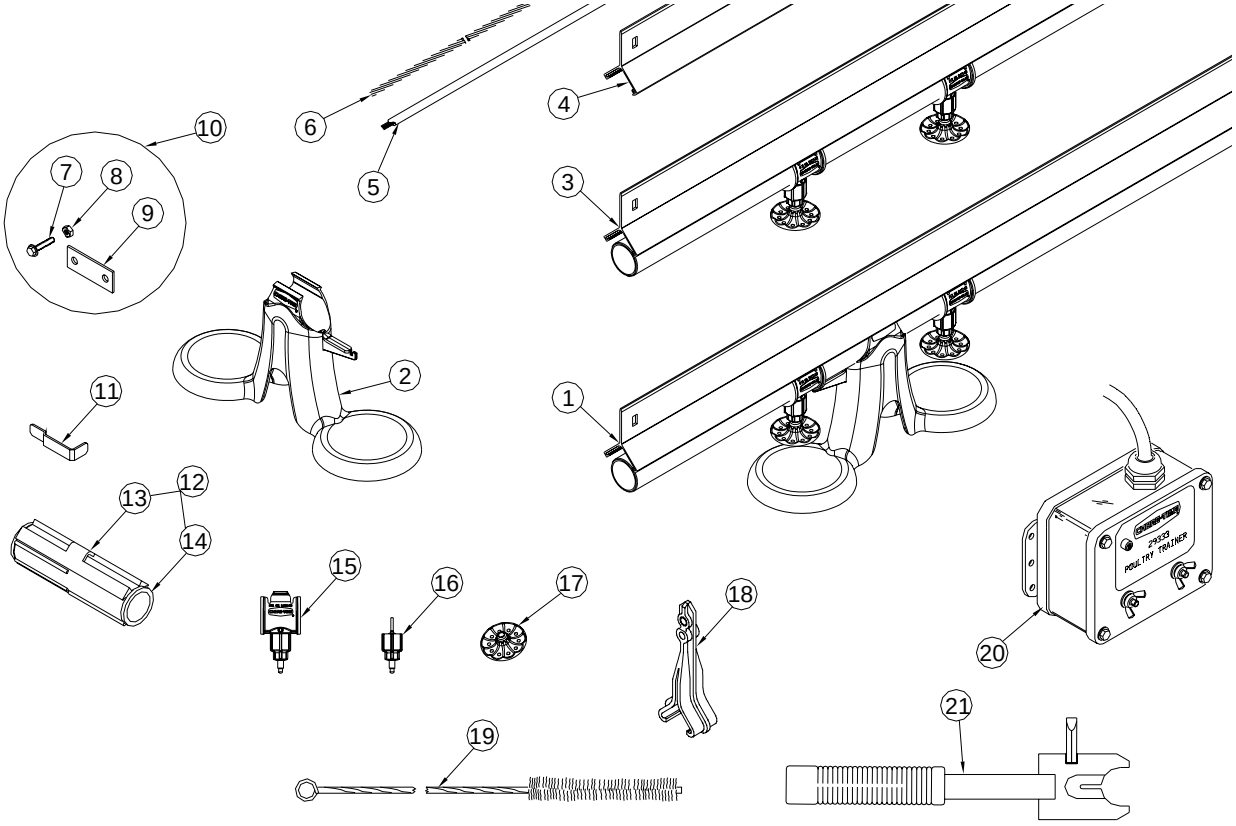
Item	Description	Manual Adjustment Standard Regulator 42400-1 Part No.	Manual Adjustment Standard Regulator with Anti-Roost 42400-21 Part No.	Manual Adjustment Standard Regulator without Stand Tube 42400-5 Part No.
1	#6-20 x 5/8" Hex Washer Head Screw	44946	44946	44946
2	Shroud	42390	42390	42390
3	O-Ring	29118	29118	29118
4	NH Male Adapter Fitting	25098	25098	25098
5	Inlet Orifice	42190	42190	42190
6	Top Half Regulator	42174	42174	42174
7	Barrel	42172	42172	42172
8	Top Diaphragm Plate	42182	42182	42182
9	.375" ID x 1.75" Spring	42392	42392	42392
10	Seat	48225	48225	48225
11	Diaphragm	42181	42181	42181
12	.78" ID x 2.80" Spring	42393	42393	42393
13	Adjustment Knob	42184	42184	42184
14	Knob Retainer	42173	42173	42173
15	#8-18 x 2-1/2" Pan Head Screw	42387	42387	42387
16	Follower	42183	42183	42183
17	Bottom Regulator Half	42180	42180	42180
18	Diaphragm Plate	42177	42177	42177
19	Diaphragm Center Support	42186	42186	42186
20	Seat Holder	42189	42189	42189
21	Seat Holder Sleeve	42187	42187	42187
22	Seat Holder Cap	42176	42176	42176
23	#6-20 x 5/8" Pan Head Screw	42386	42386	42386
24	Half Liner	36501	36501	36501
25	Regulator Bracket	44866	44866	44866
26	#10-24 Hex Head Screw	1876	1876	1876
27	#10-24 x 5/8" Hex Nut	313	313	313
28	O-Ring	42389	42389	42389
29	Selector Knob	42178	42178	42178
30	Anchor Plate	---	42807	---
31	5/16" Nut	---	2145	---
32	5/16" Bolt	---	2046	---
33	Adjustment Leveler	---	3075	---
34	Hose Clamp	49529	49529	---
35	#10-24 Slotted Nut	---	1840	---
36	#10-24 Hex Head Screw	---	1951	---
37	Cable Clamp	---	1826	---
38	Flexible Tube	36840-1	36840-1	---
39	Stand Tube Spring	36839-1	36839-1	---
40	Blue Ball	37142	37142	---
41	Hose Cap	9811	9811	---
42	O-Ring	8598	8598	---
43	Breather Valve	46487-1	46487-1	---
44	Breather Cap Assembly	45703	45703	---
45	Stand Tube Assembly	39245	39245	---
46	Seat Cup	48199	48199	48199
47	Seat Cup and Seat	42188	42188	42188
48	Seat Installation Tool (Optional)	48688	48688	48688
49	1/2" Street Elbow (Optional)	33895	33895	33895
50	Hose Barb	---	---	---

PDS™ Controlled Regulator Assembly



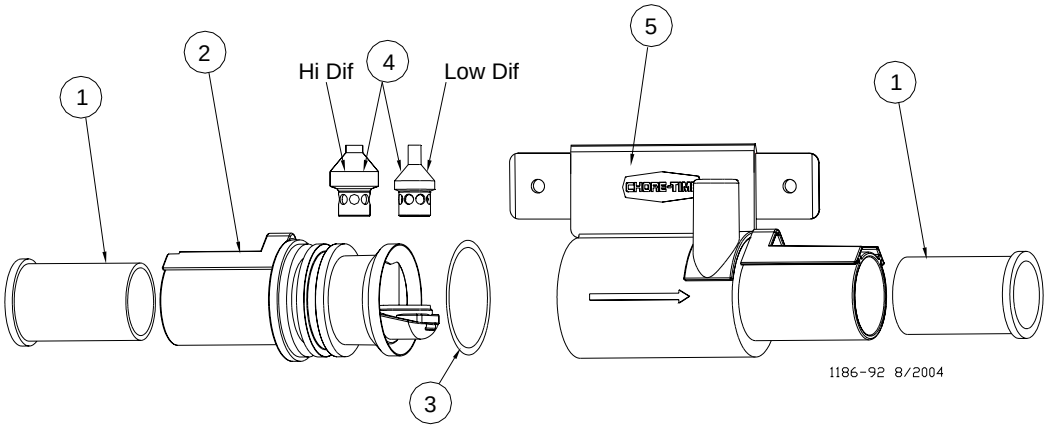
Item	Description	PDS™ Controlled Standard Regulator 42400-2 Part No.	PDS™ Controlled Standard Regulator with Anti-Roost 42400-22 Part No.	PDS™ Controlled Standard Regulator without Stand Tube 42400-6 Part No.
1	#6-20 x 5/8" Hex Washer Head Screw	44946	44946	44946
2	Shroud	42390	42390	42390
3	O-Ring	29118	29118	29118
4	NH Male Adapter Fitting	25098	25098	25098
5	Inlet Orifice	42190	42190	42190
6	Top Half Regulator	42174	42174	42174
7	Barrel	42172	42172	42172
8	Top Diaphragm Plate	42182	42182	42182
9	.375" ID x 1.75" Spring	42392	42392	42392
10	Seat	48225	48225	48225
11	Diaphragm	42181	42181	42181
12	.78" ID x 2.80" Spring	42394	42394	42394
13	Adjustment Knob	---	---	---
14	Knob Retainer	---	---	---
15	#8-18 x 2-1/2" Pan Head Screw	---	---	---
16	Follower	---	---	---
17	Bottom Regulator Half	42179	42179	42179
18	Diaphragm Plate	42177	42177	42177
19	Diaphragm Center Support	42186	42186	42186
20	Seat Holder	42189	42189	42189
21	Seat Holder Sleeve	42187	42187	42187
22	Seat Holder Cap	42176	42176	42176
23	#6-20 x 5/8" Pan Head Screw	42386	42386	42386
24	Half Liner	36501	36501	36501
25	Regulator Bracket	44866	44866	44866
26	#10-24 Hex Head Screw	1876	1876	1876
27	#10-24 x 5/8" Hex Nut	313	313	313
28	O-Ring	42389	42389	42389
29	Selector Knob	42178	42178	42178
30	Anchor Plate	---	42807	---
31	5/16" Nut	---	2145	---
32	5/16" Bolt	---	2046	---
33	Adjustment Leveler	---	3075	---
34	Hose Clamp	49529	49529	---
35	#10-24 Slotted Nut	---	1840	---
36	#10-24 Hex Head Screw	---	1951	---
37	Cable Clamp	---	1826	---
38	Flexible Tube	36840-1	36840-1	---
39	Stand Tube Spring	36839-1	36839-1	---
40	Blue Ball	37142	37142	---
41	Hose Cap	9811	9811	---
42	O-Ring	8598	8598	---
43	Breather Valve	46487-1	46487-1	---
44	Breather Cap Assembly	45703	45703	---
45	Stand Tube Assembly	39245	39245	---
46	Seat Cup	48199	48199	48199
47	Seat Cup and Seat	42188	42188	42188
48	Seat Installation Tool (Optional)	48688	48688	48688
49	1/2" Street Elbow (Optional)	33895	33895	33895
50	Hose Barb	50820	50820	50820

Nipple Line Assembly and Components



Item	Description	Part No.
1	ADVANTI-FLOW® Drinker Assembly with Cups	
	Standard Flow Standard Channel 40" Spacing w/Cups	51327-3
	Standard Flow Standard Channel 30" Spacing w/Cups	51327-4
	Standard Flow Standard Channel 24" Spacing w/Cups	51327-5
	Standard Flow Standard Channel 20" Spacing w/Cups	51327-6
	High Flow Standard Channel 40" Spacing w/Cups	51328-3
	High Flow Standard Channel 30" Spacing w/Cups	51328-4
	High Flow Standard Channel 24" Spacing w/Cups	51328-5
	High Flow Standard Channel 20" Spacing w/Cups	51328-6
2	ADVANTI-FLOW® Cup Package	51326
3	ADVANTI-FLOW® Drinker Assembly	
	Standard Flow Standard Channel 40" Spacing	51271-2
	Standard Flow Standard Channel 30" Spacing	51272-2
	Standard Flow Standard Channel 24" Spacing	51273-2
	Standard Flow Standard Channel 20" Spacing	51274-2
	High Flow Standard Channel 40" Spacing	51271-1
	High Flow Standard Channel 30" Spacing	51272-1
	High Flow Standard Channel 24" Spacing	51273-1
	High Flow Standard Channel 20" Spacing	51274-1
4	Standard Support Channel	35482-1
5	Training Wire (165 FT)	28994-165
	Training Wire (330 FT)	28994-330
6	1/16" Training Cable (1 FT)	1922
	1/16" Training Cable (5000 FT)	1922-5000
7	#10-24 x 3/8" Hex Washer Head Screw	25124
8	#10-24 Kepnut	27725
9	Channel Bracket	46208
10	Channel Bracket Kit (40 Brackets per Kit)	46209-40
11	Support Channel Key	35480
12	Coupling Liner Assembly	35763
13	PVC Coupling Body	34318
14	Coupling Liner	34319
15	ADVANTI-FLOW® High Flow Saddle Assembly	51275-1
	ADVANTI-FLOW® Standard Flow Saddle Assembly	51275-2
16	ADVANTI-FLOW® High Flow Valve Assembly	51270-1
	ADVANTI-FLOW® Standard Flow Valve Assembly	51270-2
17	ADVANTI-FLOW® Disk	51266
18	Support Channel Hanger	33824-1
19	Pipe Brush	29465
20	Poultry Trainer	29333
21	Assembly Tool	41247

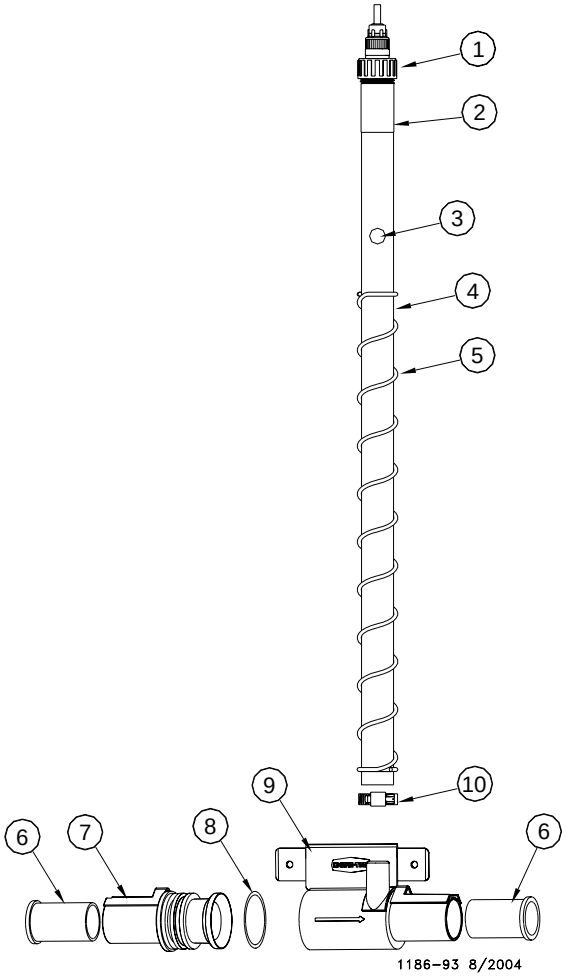
Slope Compensator Assembly



		Low Dif 36500-3L	Hi Dif 36500-3H
Item	**Description**	**Part No.**	**Part No.**
1	Half Liner	36501	36501
2	Inlet Assembly	46472	46472
3	O-Ring	44015	44015
4	Plunger	46450	46451
5	Compensator Outlet	40902-1	40902-1
--	Stand Tube Assembly (Shown Below)	39245	39245

Mid Line Stand Tube Assembly: 49607-1

Item	Description	Part No.
1	Breather Cap Assembly	45703
2	3/4" Male Adapter	25098
3	Blue Ball	37142
4	Flexible Tubing 20"	36840-1
5	Stand Tube Spring	36839-1
6	Half Liner	36501
7	Inlet Assembly	46464
8	O-Ring	44015
9	Compensator Outlet	40902-1
10	Hose Clamp	49529
--	Ground Wire	36500W



Miscellaneous Kits and Components

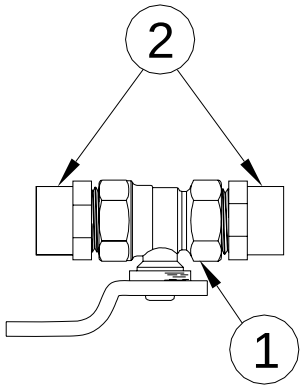
Miscellaneous Hose Components

Description	Part No.
Female 3/4" Hose Coupling Kit	7812
3/4" NPT x 3/8" Hose Barb	37141
3/8" Nylon Hose Clamp	37144
3/4" Female Swivel Fitting	50401
Hose Clamp	7187
3/4" ID Rubber Hose	*47820-0

***47820-0 is available in lengths of 50', 100', 150' and 200'.**
The numbers following the dash represent the length of hose (47820-50 is 50' of hose).

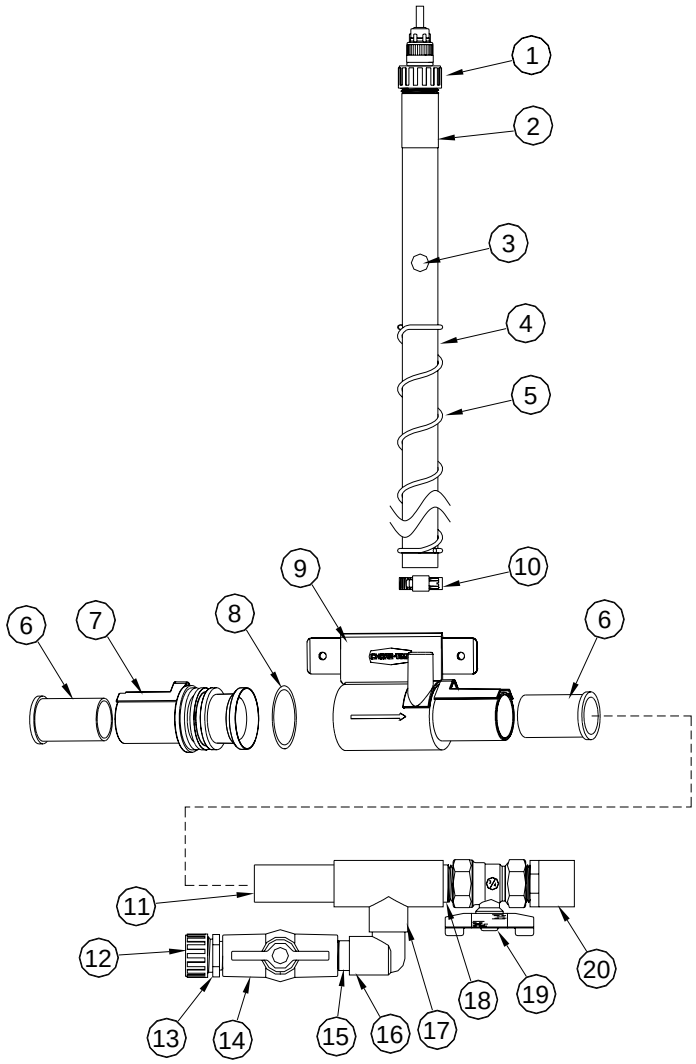
Mid Line Shut-Off Kit: 29658

Item	Description	Part No
1	3/4" Quarter Turn Valve	29623
2	3/4" PVC Male Adapter	9229



Mid Line Shut-Off Kit with Flush: 34939-2

Item	Description	Part No
1*	Breather Cap Assembly	45703
2*	3/4" Male Adapter	25098
3*	Blue Ball	37142
4*	Flexible Tubing	36840-1
5*	Stand Tube Spring	36839-1
6	Half Liner	36501
7	Inlet Assembly	46464
8	O-Ring	44015
9	Compensator Outlet	40902-1
10	Hose Clamp	49529
11	3/4" x 3" PVC Pipe	9205-4
12	3/4" Hose Cap	9811
13	1/2" NPT x 3/4" NH Nylon Adapter	29141
14	1/2" Ball Valve	34961
15	1/2" x 1 1/2" Threaded PVC Pipe	34960-1
16	1/2" Street S x S PVC Ell	33895
17	3/4 x 3/4 x 1/2" S x S x S PVC Tee	7534
18	3/4 x 1 7/16" Threaded PVC Pipe	7531-5
19	3/4" Ball Valve	29623
20	3/4" S x T PVC Male Adapter	9229
--	Ground Jumper Wire	36500W



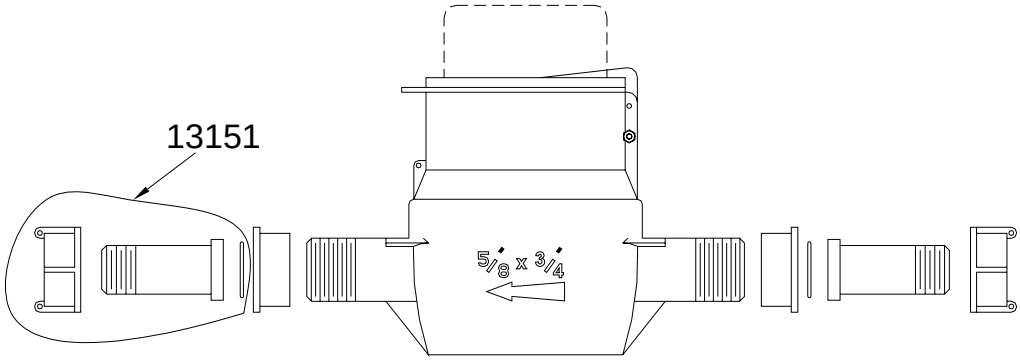
***These items may be ordered as a stand tube assembly, Part No. 39245 for standard length (20") stand tube or Part No. 39245-1 for longer (34.5") stand tube.**

Water Medicator

Description	Part No.
Chemilizer (1-100 Ratio)	41778-1

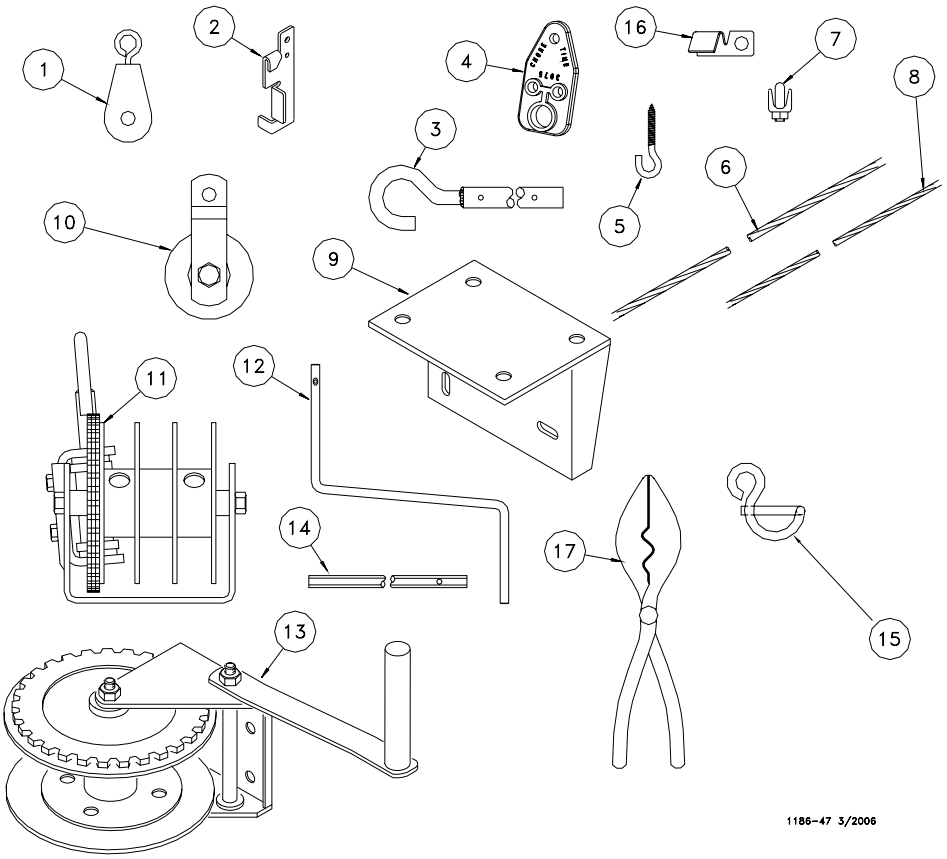
Water Meters

Important: Line must be flushed out before installing water meters. Bleed air out of the water line, running air through the water meter will damage it.



Description	Part No	Replacement Head
3/4" Water Meter with Connectors (Liter)	13228-L	47634-L
3/4" Water Meter with Connectors (Gallon)	13228-G	47634-G
3/4" Water Meter with Pulsar and Connectors (Liter)	13228-LP	47634-LP
3/4" Water Meter with Pulsar and Connectors (Gallon)	13228-GP	47634-GP
Water Meter Connectors	13151	

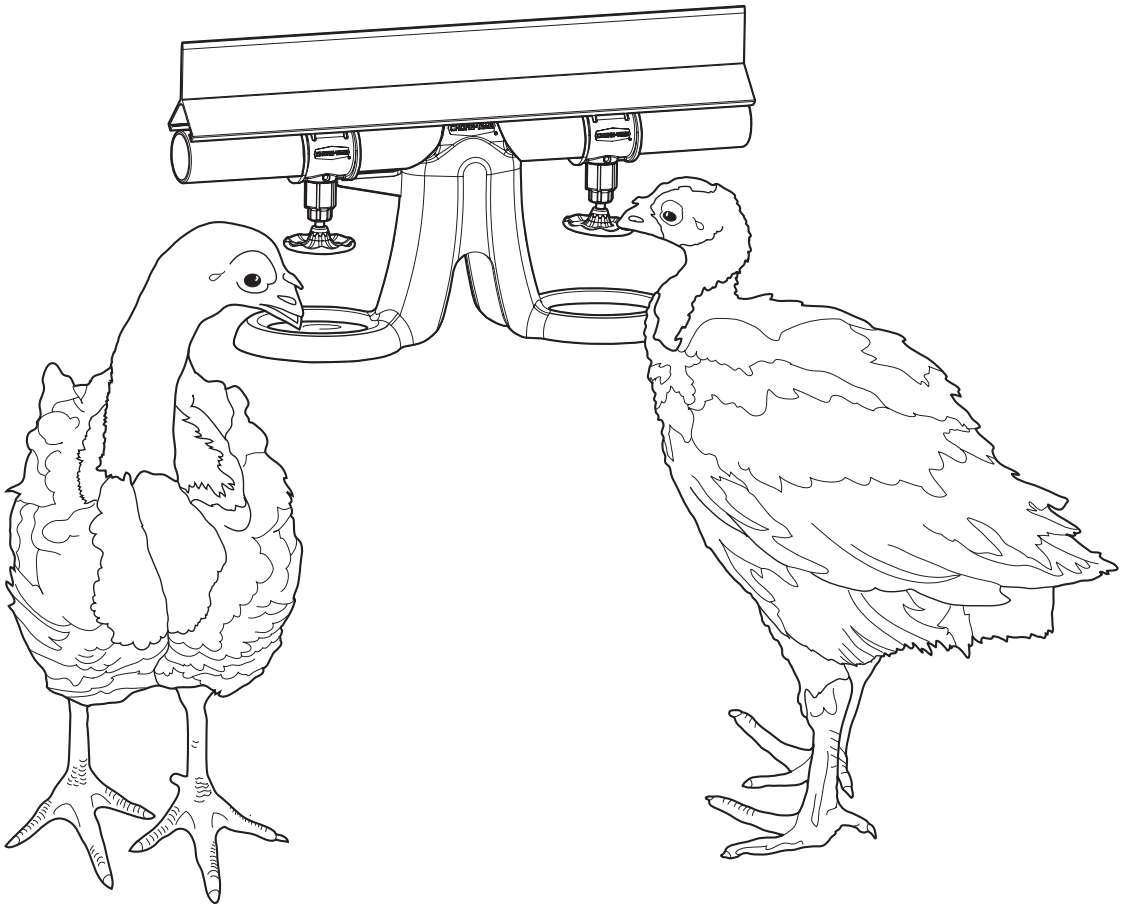
Suspension System Components:



Item	Description	Part No.
1	Pulley with Swivel Hook	44577
2	Cable Lock	14337
3	Winch Drive Tube (4 ft.)	2884-1
	Winch Drive Tube (8 ft.)	2884-2
4	Rope Adjustment Leveler	3075
5	Screw Hook (Standard)	1214
	Screw Hook (Large)	2041
6	1/8" Cable	27975
7	1/8" Cable Clamp	14898
8	3/32" Drop Cable	4937
9*	Winch Bracket with Hardware	1193
10	Pulley	44596
11	Split Drum Winch	29428
12	Handle Shank	2885
13**	Hand Winch	1212
14	Drill Adapter Shaft	2886
15	Winch Handle Pin	3761
16***	Open 1/8" Cable Eyelet (Package of 100 pcs)	44598-100
17	Crimping Tool	44599
--	1/8" Rope	9247

***Winch bracket to be used with hand winch only.**
****Hand winch is recommended for systems up to 150 ft *[46 m]* only.**

CHORE-TIME ADVANTI-FLOW® Management Guideline



Weeks of Age	Water Column Height	
	Inches	cm
0 - 2	3 - 8	7.6 - 20.3
2 - 4	8 - 12	20.3 - 30.5
4 - 6 plus	12 - 20	30.5 - 50.8

- Water column height should be adjusted so water is present in the catch cups after one week, if the catch cups are empty the water column should be adjusted accordingly.
  Be cautious adjusting the water column aggressively during the first week, this *could* increase mortality by making the nipples trigger harder.
- Drinker height should be managed so the disc is below the beak as shown in the picture above. Birds should not have to bend over, or reach excessively to trigger the disc.
- For maximum performance results and ideal house conditions, Chore-Time recommends starting birds with the ADVANTI-FLOW® Drinking system.

Note: The information provided in the tables is for reference only. It is up to the operator to use this guideline as a starting point to operate the system. Operator judgement of actual on site conditions may require modification to this management guideline.

Operational Guidelines

Topic	Recommendations
Initial Start-Up Procedure	1.Thoroughly flush the water lines. 2. Set incoming water pressure to 25 psi *[172 kPa]* at the step regulator on the filter control panel. 3. Level the shavings under the water line to eliminate high/low spots. 4. Adjust the inlet regulators on the lines to the stand tube float corresponds to the recommended setting. Make sure there is water at the outlet sight tube and air is bled from the line. The indicator ball should be visible during operation. 5. Check the outlet assemblies and stand tubes to make sure water is passing throughout the system.
Bird Placement Procedure	Immediately before birds are housed, trigger all the nipples to ensure some water is present in the catch cups. Also, this ensures all nipple valves are working properly.
Operation During Bird Grow-Out	• Monitor drinker height based on the average bird size of the flock, See "CHORE-TIME ADVANTI-FLOW® Management Guideline" on page 38. **Improper drinker height can lead to negative effects on bird performance.** • Monitor water level in catch cups, See "CHORE-TIME ADVANTI-FLOW® Management Guideline" on page 38. • Monitor floor conditions under water lines.
Maintenance Between Batches	1. Clean water lines with solution, See "Guide to Cleaning Water Lines" on page 40. 2. Check pressure drop across water filter - clean or replace if necessary. 3. Check regulator, shut-off valves, stand tube(s), and coupling assemblies for proper operation. 4. Adjust the cable levelers so the water lines are level. 5. Maintain house temperature above freezing or drain the lines thoroughly. Also drain regulator(s). 6. Clean stand tubes.
Precautions	• Do not over chlorinate. The maximum concentration is 2.5 ppm (parts per million) for extended periods and 5 ppm for flushing only. • If medication or other chemicals are added to the water, flush lines immediately after use, then chlorinate as specified. Allow at least 24 hours before adding additional chemicals (such as iodine, citric acid, etc.) or vitamins to the water, See "Guide to Cleaning Water Lines" on page 40.

Management Troubleshooting Guidelines

Problem	Cause	Solution
Catch Cups are Dry	Water Column is too low.	Increase water column height incrementally until desired water level is achieved.
	Nipples are obstructed or clogged due to build-up.	Clean with solution, See "Guide to Cleaning Water Lines" on page 40.
Floors are wet under drinker line	Drinker line is too high or low.	Adjust drinker height to the recommended guidelines,
	Water column is too high.	Decrease water column height and increase ventilation and/or heat.
Poor Water Consumption	Drinker line is too high or low	Adjust drinker height to recommended management guidelines.
	Water column height too low	Increase water column height incrementally until desired water level is achieved.
	Nipples are obstructed or clogged due to build-up	Clean with solution, See "Guide to Cleaning Water Lines" on page 40.
Feed accumulation in cup	Drinker lines to close to feeder lines	See planning the system for recommended distance.
	System height is too low	Raise the system to the recommended management guidelines.

Component Troubleshooting Guidelines

Problem	Cause	Solution
Nipples are leaking	Foreign material preventing proper valve operation.	Trigger nipple a few times to see if leak stops. If leak persists, disassemble valve, clean, and reassemble. Replace valve components and saddle if leak persists.
Leaking above cap assembly	Cap not properly tightened.	Tighten cap on saddle.
	Damaged saddle or cap.	Replace saddle or cap, nipple may not need to be replaced.
Leaking between saddle and PVC pipe	Damaged saddle.	Replace saddle nipple may not need to be replaced.
Leaking at coupler assembly	Damaged (flexible) coupler liner or damaged coupler.	Replace coupler liner and/or the PVC coupler.
Leaking or damaged regulator assembly	Damaged fittings or improperly installed fittings	Replace damaged or defective fitting(s). It may be necessary to order a union to reconnect the regulator fittings.
Stand tube not working properly, Attempts to adjust regulator have no effect on stand tube water column height.	• Depending on water quality and management techniques, the stand tube may require more frequent cleaning. • Stand tube is air-locked. • No activity on drinker valves. • Damaged cap or regulator.	1. Remove hose cap on top of stand tube. 2. Use a brush (available through Chore-Time) to thoroughly clean the stand tube. 3. Bend the flexible tube to allow the water and/or foreign material to exit the tube. 4. Clean and reassemble the components and check for proper water level. 5. Drinker valves must be triggered for water column height to change. 6. Repair or replace damaged cap or regulator.
	Drinker lines to close to feeder lines	See planning the system for recommended distance.
	System height is too low	Raise the system to the recommended management guidelines.

Guide to Cleaning Water Lines

Important: Chore-Time strongly recommends a regular cleaning program to eliminate water line contaminants.

WARNING: Mixing of incompatible chemicals can result in violent explosions or create combustible and toxic gases. Such chemicals pose a definite threat to personal health and safety.

Chore-Time does not recommend mixing chemicals without a specific formula provided by a reputable company.

Standard Cleaning Procedure

1. Mix the cleaning solution as indicated below.
2. Fill watering system with solution.
3. Allow solution to remain in lines 1 to 3 hours.
4. Flush system 1 minute per 100'*[30.5 m]* with clean water using high pressure.
5. Check filters, valve, and nipples for clogging from debris.
6. Adjust regulator pressure to normal operating pressure.

Regular Maintenance

The watering system should be cleaned one day every two weeks during the production cycle using a proportioner and **ONE of the following** stock solutions. Set the proportioner at 1 oz. (30 ml.) stock solution to 128 oz. (3785 ml.) of water.

- Vinegar stock solution = 64 fl. oz. (1893 ml.) white household vinegar + 64 fl oz. (1893 ml.) water
- Citric Acid stock solution = 1 pack (205 gm) citric acid + 128 fl. oz. (3785 ml.) water.

End of Grow Out Cleaning

A chlorine solution should run through the watering system, using a proportioner, at 1 fl. oz. (30 ml.) stock solution to 128 fl. oz. (3785 ml.) water. The solution should be administered during one of the last 3 days of the grow out. This cleans the whole system including the nipple drinkers and sterilizers the entire system for the next grow out cycle.

1. Chlorine stock solution = 1 fl. oz. (30 ml.) 5-1/4% bleach (or similar source of 5-1/4% sodium hyper chlorite) + 128 fl. oz. (3785 ml.) water. This solution will yield about 2 PPM (parts per million) chlorine in the drinkers with average water. **Do not** exceed this level for an extended period of time (otherwise, damage to the system may occur). Also **do not** exceed 5 PPM for flushing watering system.

After Administering Vitamins, Medication or other Chemicals

Chore-Time recommends flushing and chlorinating lines immediately after administering vitamins, medication or other chemicals. Failure to flush and chlorinate can result in bacteria build-up which can reduce or prevent water flow. **Do not** exceed 5 PPM of Chlorine stock solution when flushing watering system.

Between Flocks

The watering system should thoroughly cleaned between flocks. A stronger cleaning solutions may be used since birds will not be drinking the water. It is important to thoroughly flush the system (after 1 to 3 hours) with clean water to prevent storing high concentrates of cleaning solution in the watering system until the next flock is placed.

Use **ONE of the following** stock solutions for cleaning the system between flocks. Set the proportioner at 1 oz. of stock solution to 128 oz. (3785 ml.) water.

- Vinegar stock solution = 128 fl. oz. (3785 ml.) white household vinegar.
- Citric acid stock solution = 4 pack (205 gm) citric acid + 128 fl. oz. (3785 ml.) water.

The watering system should also be thoroughly drained in cold weather.

Water Quality

Hardness

Hardness is the calcium and magnesium content of a water supply. These minerals are responsible for scaling that forms in hot water heaters, plumbing lines, humidifiers, dishwashers and all other water using appliances. Water containing hardness minerals are generally classified as:

Soft Water	0 - 1.0 GPG
Slightly Hard Water	1.1 - 3.5 GPG
Moderately Hard Water	3.6 - 7.0 GPG
Hard Water	7.1 - 10.5 GPG
Very Hard Water	10.6 GPG or greater

Iron

Iron, when present in amounts of 0.3 ppm or higher, can cause a yellow or rusty appearance in water. It can also cause staining of clothing and water fixtures. Iron can be found in two forms, clear (dissolved) or red (oxidized) water iron. Water refiners are capable of removing both types of iron. Higher amounts of iron may require further treatment.

Iron Bacteria

Iron bacteria can be found in water supplies containing clear water iron. The bacteria use the clear water iron as a source of energy, and at the same time, convert the iron to the red water state. These bacteria are not considered a health hazard, but can plug plumbing lines, fixtures and appliances. These bacteria also promote localized corrosion and impart a taste and/or color to water. Effective treatment requires shock chlorination of all plumbing lines prior to the installation of any equipment. This is followed by the installation of a chemical feed pump feeding chlorine to eliminate the bacteria, and a clarifying filter to remove the residue.

Acid Water

The acid content of a water supply is measured and reported in terms of pH units. Acid water causes staining of plumbing fixtures and corrosion of plumbing systems, which may necessitate expensive repairs. Water with a pH of less than 6.8 is considered acidic. A pH of 6.0 to 6.7 indicates a moderately acidic supply and should be treated with a neutralizing filter. A pH of 4.0 to 5.9 is considered extremely acidic and should be treated with a chemical feed pump feeding neutralizing compound.

Aggressive/Corrosive Water

Aggressiveness of water is measured by the stability index (A calculation from several factors in a water supply). A stability index of 7.5 or higher indicates the water may be corrosive tendencies. This type of corrosion may attack plumbing and fixtures causing rusty or blue/green stains. The use of a phosphate crystal cartridge will help to eliminate this problem.

Taste and Odor

Objectionable tastes and/or odors can be dissolved minerals, gases, organic contamination, or from chlorination. Treatment requires the installation of taste and odor tank filter for the whole house or a taste and odor cartridge filter for individual faucets.

Hydrogen Sulfide

Hydrogen sulfide is a dissolved gas common in some water supplies. It is detected by a rotten egg taste and/or odor of the water. Proper treatment requires the installation of a chemical feed pump system feeding household chlorine bleach, followed by a sediment filter to remove the precipitation.

Sand, Silt or Sediment

Sand, silt or sediments are found in many water supplies. It is usually detected by a cloudy or hazy appearance when the water is first drawn. Treatment requires the installation of a sediment filter to remove the particles.

MADE TO WORK.

BUILT TO LAST.®

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

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