Owner's Manual

Hydrobale Dew Simulator

Natural Dew Simulation Machine

HarvestTec™

EST. 1976

(intentionally blank)

Hydrobale Table of Contents

Introduction

The new Harvest Tec Hydrobale allows for the precise addition of hot water mist to windrowed alfalfa. The windrow will be as soft as if it had just received the ideal amount of natural dew. By spraying into the windrow prior to baling, moisture is added to all the plant material. The hot water mist softens the hay, giving the hay the appearance and test of hay made with natural dew.

Right and Left sides are determined by facing in the direction of forward travel.

Requirements

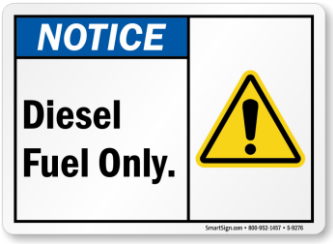
- Tractor size and horsepower
    - Min 80 horsepower, approximately 9,000lbs, 1000 rpm PTO

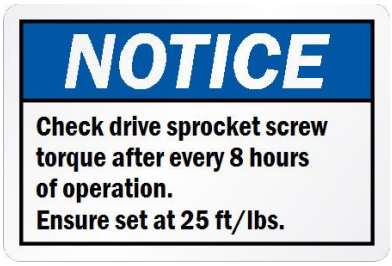
Below is an example of the Hydrobale and tractor setup.

Safety

Carefully read all the safety signs in this manual and on the equipment before use. Keep signs clean and in clear view. Replace missing or damaged safety signs. Replacement signs are available from your local authorized dealer. Keep your Hydrobale in proper working condition. Unauthorized modifications to the system may impair the function and/or safety of the machine. Carefully read and understand all the safety signs before installing or servicing the Hydrobale.

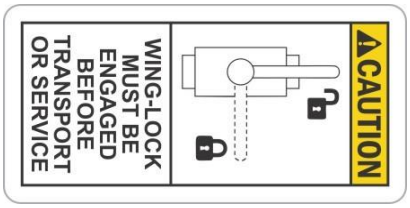
Safety Decal Definitions

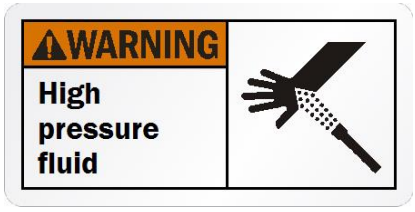
<table>
<tr>
<td> 

DCL-720-03</td>
<td> 

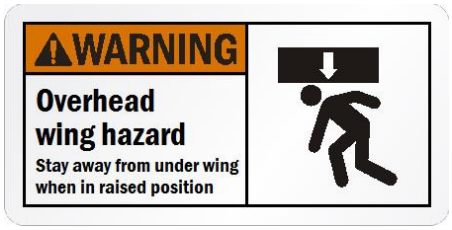
DCL-720-06</td>
</tr>
<tr>
<td> 

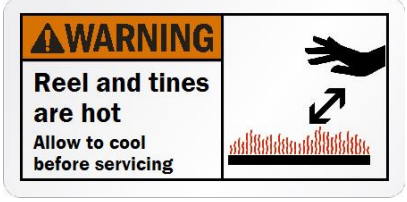
DCL-720-04</td>
<td> 

DCL-720-05</td>
</tr>
<tr>
<td> 

DCL-720-07</td>
<td> 

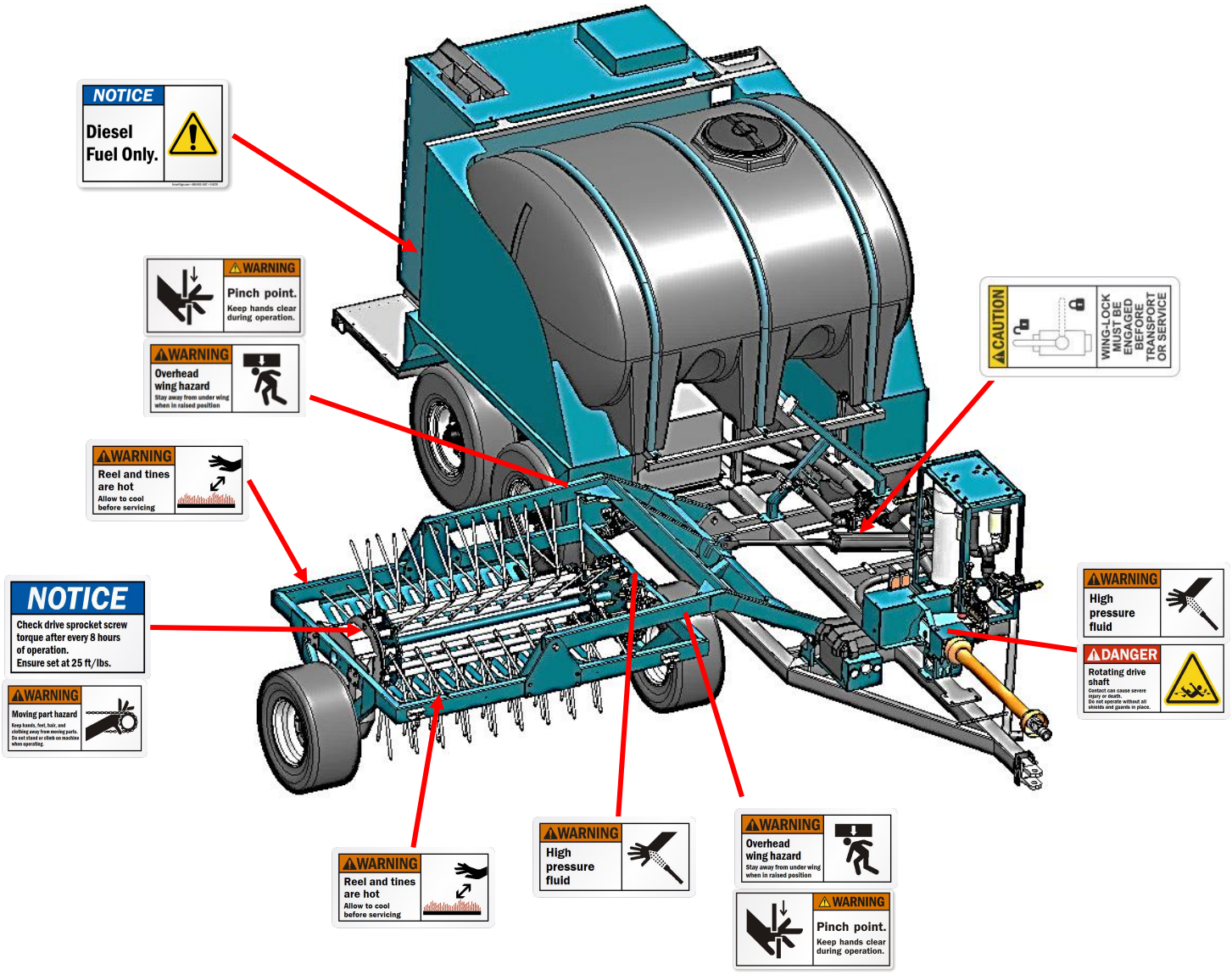
DCL-720-08</td>
</tr>
<tr>
<td> 

DCL-720-09</td>
<td> 

DCL-720-10</td>
</tr>
<tr>
<td> 

DCL-720-11</td>
<td></td>
</tr>
</table>

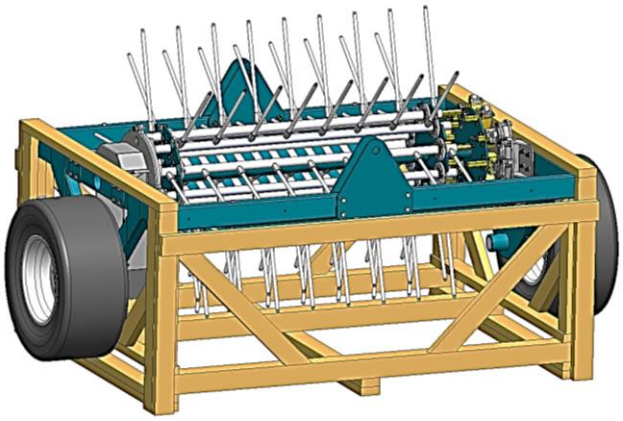
Safety Decal Locations



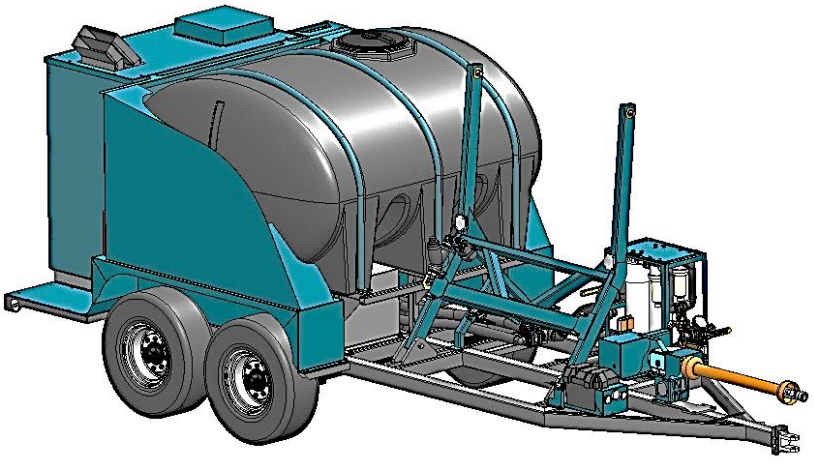
Setup

Unloading the machine

Unload the reel skid assembly and the cart assembly shown below and remove packaging. The reel skid is designed to be handled from the front side (valves to the right) with pallet forks.



Reel Skid Assembly



Cart Assembly

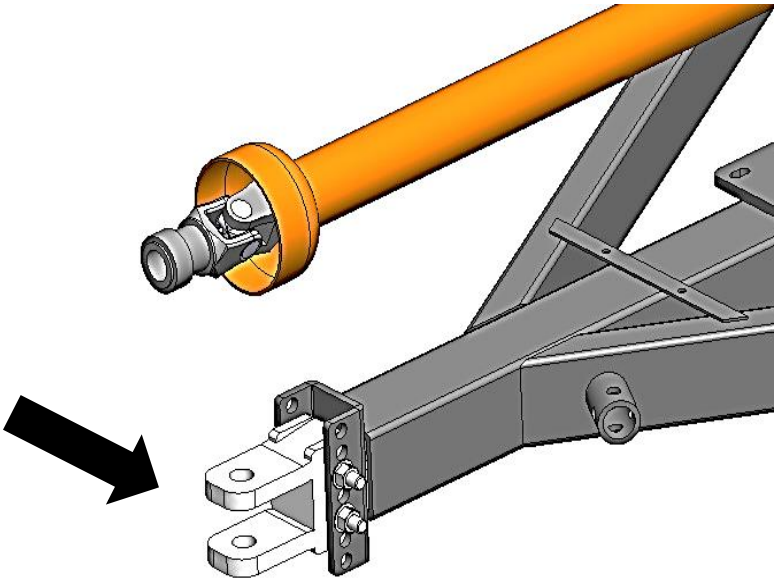
Hooking up Tractor to Hydrobale

1. Connect the tractor to the cart assembly with a 1” draw pin (below).

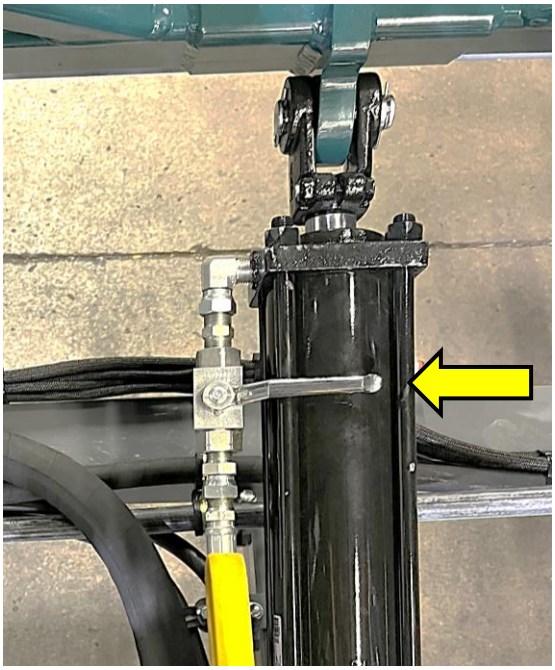
2. Adjust the front hitch position to level the cart assembly to the tractor drawbar. The hitch can be moved up or down as needed.

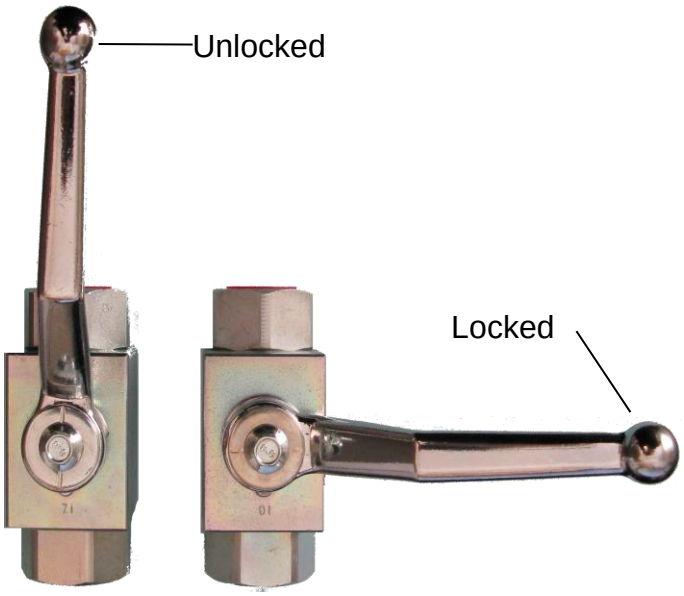
3. Connect the PTO, hydraulic hoses, and cab control harness. Secure hoses/wires away from the PTO to avoid damage.

Note: No PTO Driveline included if the Hydrobale is ordered from factory with optional Hydraulic Drive.



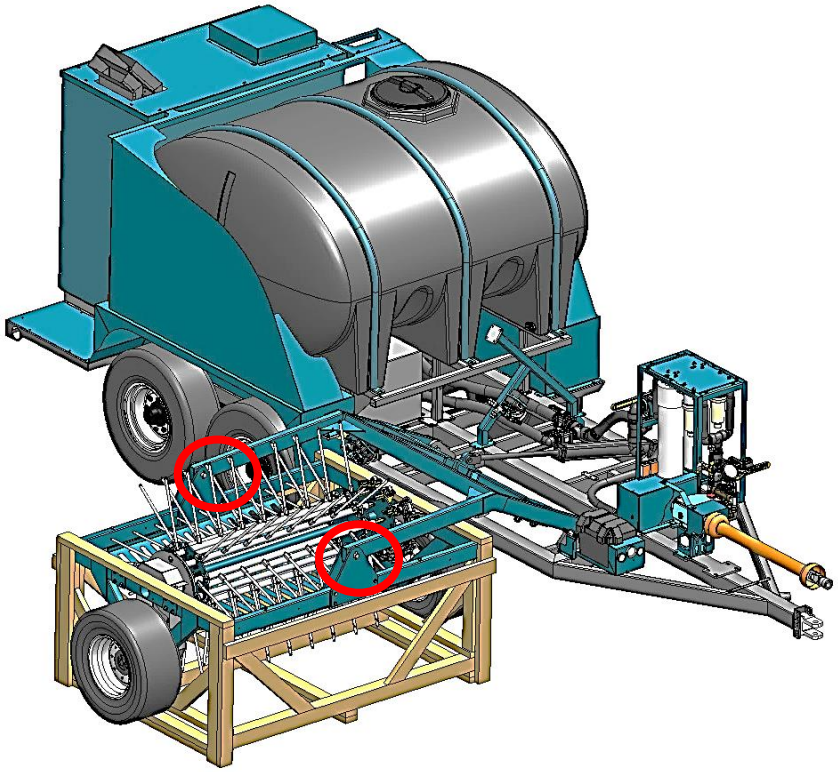
4. Turn the hydraulic valve to the unlocked position.



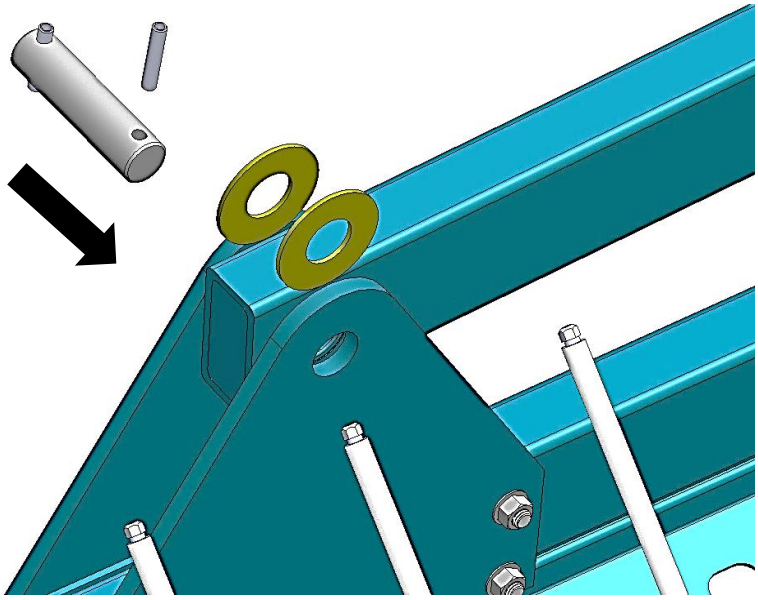


Connecting the Reel

1. Position the reel skid assembly next to the cart assembly. Lower the lift arm partially with the hydraulics and adjust the reel so it is aligned with the lift arms. *Valve side goes towards the cart (below).
2. Align the holes in the lift arms with the mounting holes in the reel frame.

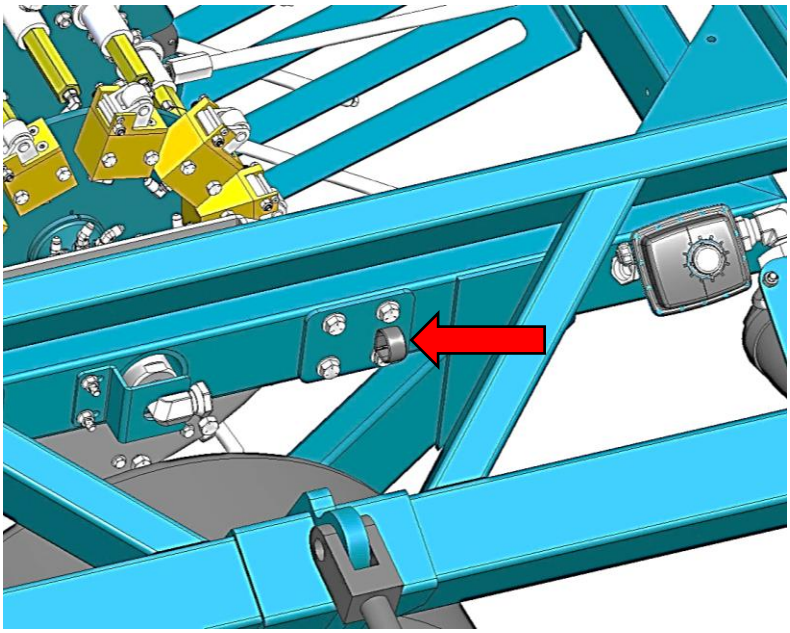


3. Install the Pins & bushings (found in the cart parts box) as shown below. The bushings go on each side of the lift arm, between the arm and the reel lifting brackets. After the pins and bushings have been installed, install the roll pins in each end of the pivot pins. Lift the connected reel assembly slowly to remove it from the reel shipping skid, then raise it to full transport position so the lift arm is resting against the stops.



Connecting Hoses

Lower the reel from the transport position to the field operating position so both reel tires are on the ground. Connect the stainless steel 3/4" water line attached to the lift arm to the swivel on the reel. Secure to the reel frame using the supplied jiffy clip. Remove one of the lower reel mounting bolts and fasten the clip in that location.

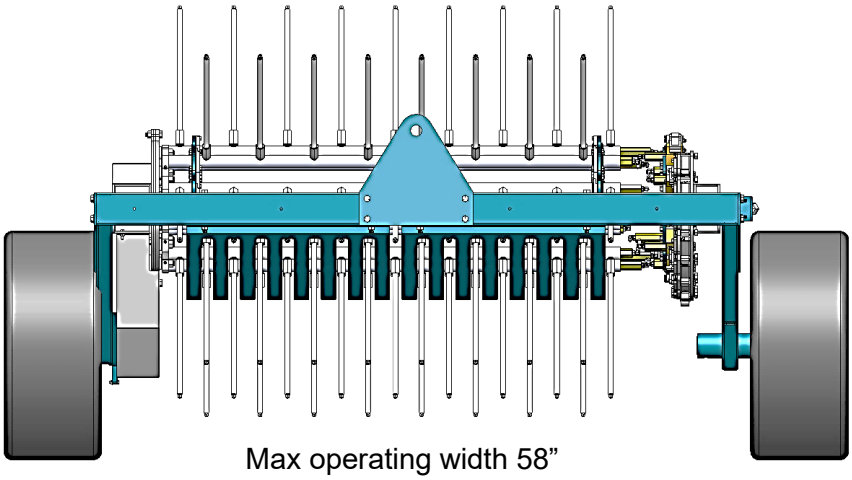


Connection location on the reel assembly

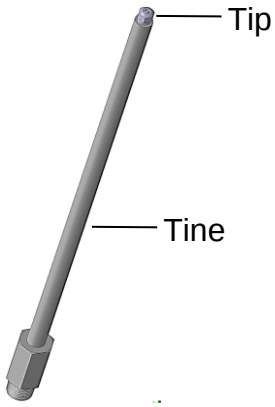
Above view of the water line reel connection

Machine Setup
Installing Tines & Tips

The reel assembly is shipped with 65 tines installed, each with a size MW11 tip. There are 20 plugs installed on the outermost holes of the cross tubes that can be removed using a 3/8” Allen wrench and replaced with additional tines & tips (below right), if operating in wide windrows.



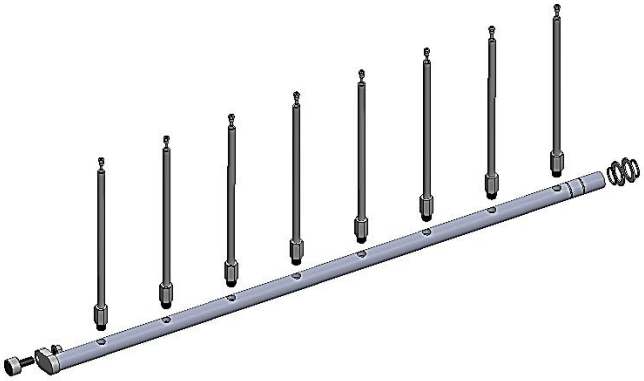
Max operating width 58”
with 85 tines installed.



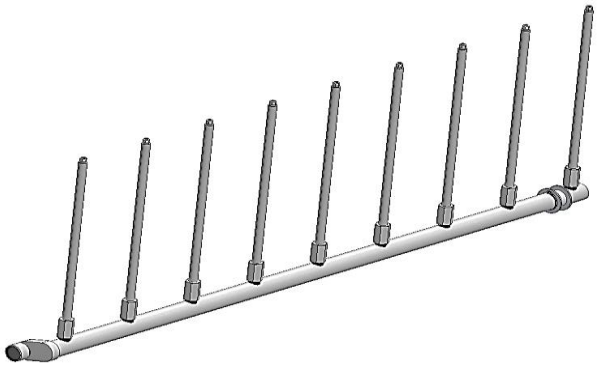
Tine / Tip Assembly

Tine Assemblies

Below are illustrations of the 8 and 9-Tine Cross Tube Assemblies located on the reel assembly. There are five of each cross-tube assemblies (below) in the reel.



8-Tine Cross Tube Assembly (x5)



9-Tine Cross Tube Assembly (x5)

Every cross tube has an additional tine location on each end that is plugged with ½” NPT plugs in the stock configuration. If the width of the windrow is wider than 45.5” covered by the initial 65 tine & tip assembles installed, adding additional tines/tips will be necessary. Remove the plugs using a 3/8” Allen and add in the new tine & tip assemblies. Each additional set of 10 tines/tips will increase the width of coverage by 6.5” with a maximum increase of 13”. It is recommended to use Teflon tape or liquid thread sealant on the threads and tighten to approximately 100ft/lbs.

Tip and tine assemblies can also be removed and replaced with plugs to reduce the coverage for thin, light, or narrow windrows. ***For two windrows that are raked together and are laying side by side forming a ‘valley’ between the two windrows, it may be beneficial to remove a row or two of tines in the center of the reel and move them to the outside to prevent applying too much moisture to the lighter material between the two windrows.*

Tip Rate Chart

Use the chart below to determine the output (GPM) required by the dew simulator based on the field (ton/acre, swath width, desired speed) and windrow (# of trips active) conditions. If tips need to be changed, a 7/16" wrench or socket will be required to remove the tip currently installed. MW5 and MW11 tips, as well as additional tines, can be purchased as spare parts from Harvest Tec. **Do not use a socket and impact driver to remove or install tips as thread damage will occur. For convenience, the YELLOW multi-purpose tool is mounted to the rear of the reel frame and can be used to remove/install tines/tips.

(Optional) MW5

Pump PSI	Trips Active	65 Tips	70 Tips	75 Tips	80 Tips	85 Tips
400	5	3.2	3.6	3.9	4.2	4.6
400	7	4.2	4.6	4.9	5.3	5.8
400	9	5.4	5.9	6.4	6.9	7.5
400	11	6.4	6.9	7.5	8.1	8.6
600	5	3.6	4.0	4.4	4.8	5.2
600	7	4.8	5.2	5.6	5.9	6.5
600	9	6.1	6.7	7.3	7.9	8.4
600	11	7.3	7.9	8.4	9.2	9.8
800	5	4.1	4.5	4.9	5.4	5.8
800	7	5.4	5.8	6.2	6.6	7.3
800	9	6.9	7.5	8.1	8.8	9.4
800	11	8.1	8.8	9.4	10.3	10.9
1000	5	4.5	5.0	5.4	5.9	6.4
1000	7	5.9	6.4	6.9	7.3	8.0
1000	9	7.6	8.3	9.0	9.7	10.4
1000	11	9.0	9.7	10.4	11.4	12.1
1200	5	4.9	5.4	6.0	6.5	7.0
1200	7	6.5	7.0	7.5	8.0	8.8
1200	9	8.3	9.1	9.8	10.6	11.4
1200	11	9.8	10.6	11.4	12.4	13.2

MW11

Pump PSI	Trips Active	65 Tips	70 Tips	75 Tips	80 Tips	85 Tips
400	5	5.5	6.1	6.7	7.3	7.9
400	7	7.3	7.9	8.5	9.1	9.9
400	9	9.3	10.2	11.1	12.0	12.8
400	11	11.1	12.0	12.8	14.0	14.9
600	5	6.6	7.3	8.0	8.7	9.4
600	7	8.7	9.4	10.1	10.8	11.9
600	9	11.2	12.2	13.3	14.3	15.3
600	11	13.3	14.3	15.3	16.7	17.8
800	5	7.7	8.5	9.3	10.1	11.0
800	7	10.1	11.0	11.8	12.6	13.8
800	9	13.0	14.2	15.4	16.6	17.9
800	11	15.4	16.6	17.9	19.5	N/A
1000	5	8.8	9.7	10.6	11.6	12.5
1000	7	11.6	12.5	13.4	14.3	15.7
1000	9	14.8	16.2	17.6	19.0	N/A
1000	11	17.6	19.0	N/A	N/A	N/A
1200	5	9.9	10.9	11.9	13.0	14.0
1200	7	13.0	14.0	15.1	16.1	17.7
1200	9	16.6	18.2	19.7	N/A	N/A
1200	11	19.7	N/A	N/A	N/A	N/A

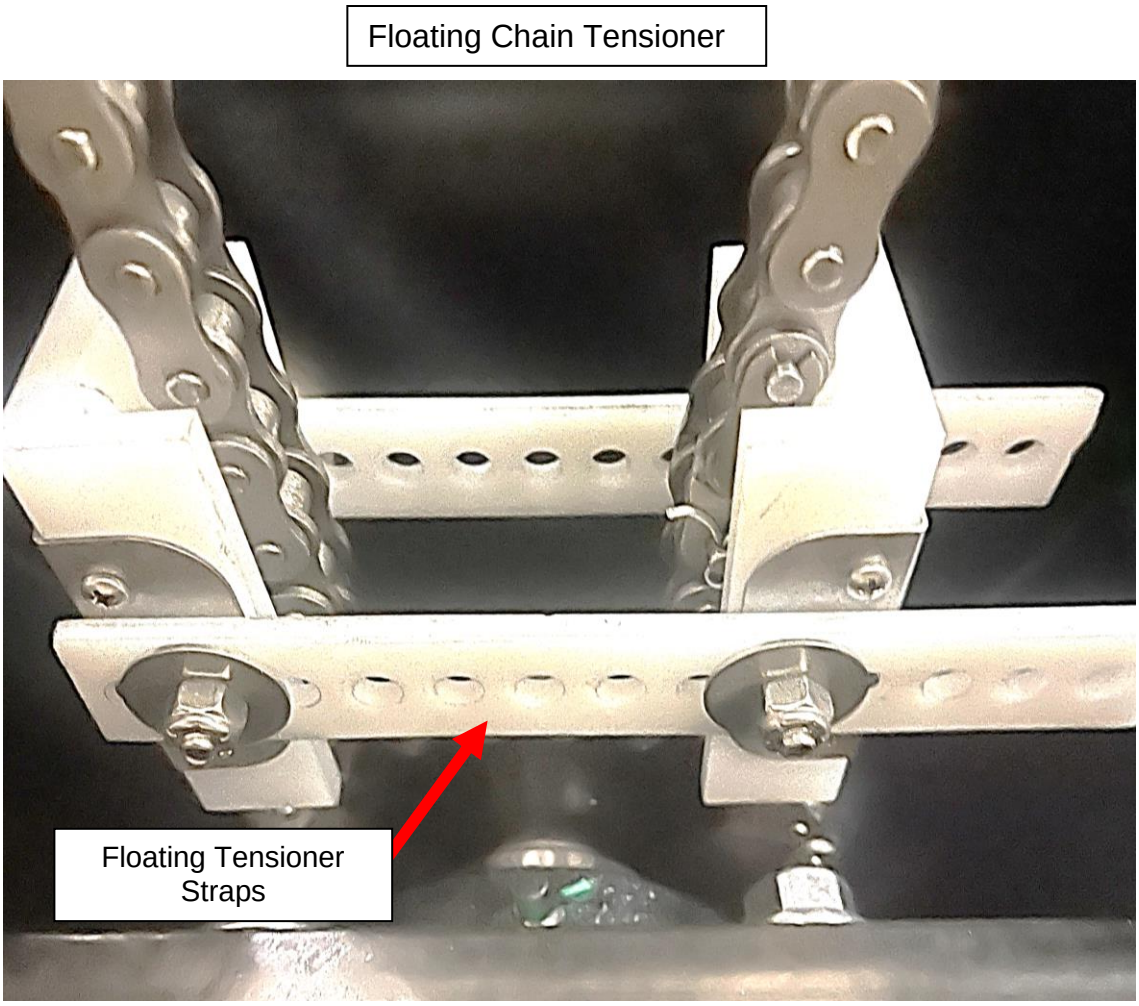
Drive Chain

The Hydrobale comes with a drive chain installed, which allows the reel to be ground driven at a rate where rotation of the reel matches forward movement. This gearing allows the tines to enter and exit the windrow without significant disturbance or movement of the windrowed material.

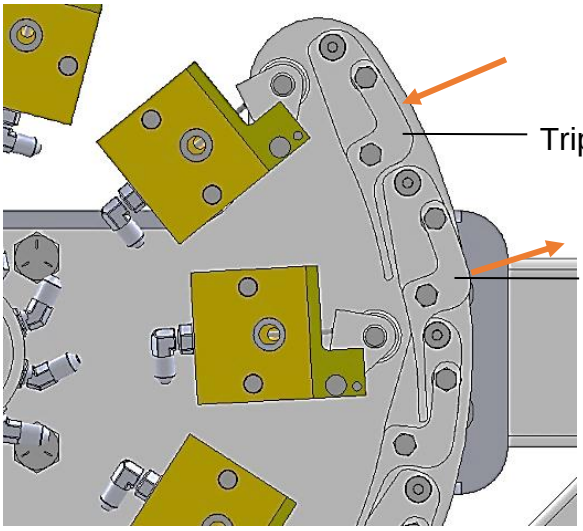
Removal of the Ground Drive Chain

In heavy windrow conditions, it is possible to remove the ground drive chain and allow the windrow itself to turn the reel rather than relying on the chain. This normally takes a minimum of two windrows raked together for a field yielding over 1.50 ton per acre. This can prevent material buildup in conditions where the tines are not exiting the windrow without pulling excess stems into the wrap guard.

To reinstall the drive chain, route the chain around the lower sprocket on the drive hub and connect it with the master link at the top. Attach the floating chain tensioner around the chain and secure with the supplied Nylock nuts. Choose a hole in the adjustment straps that allow the tensioner to float freely up and down while still providing good contact on the sprockets.



Trip Sections



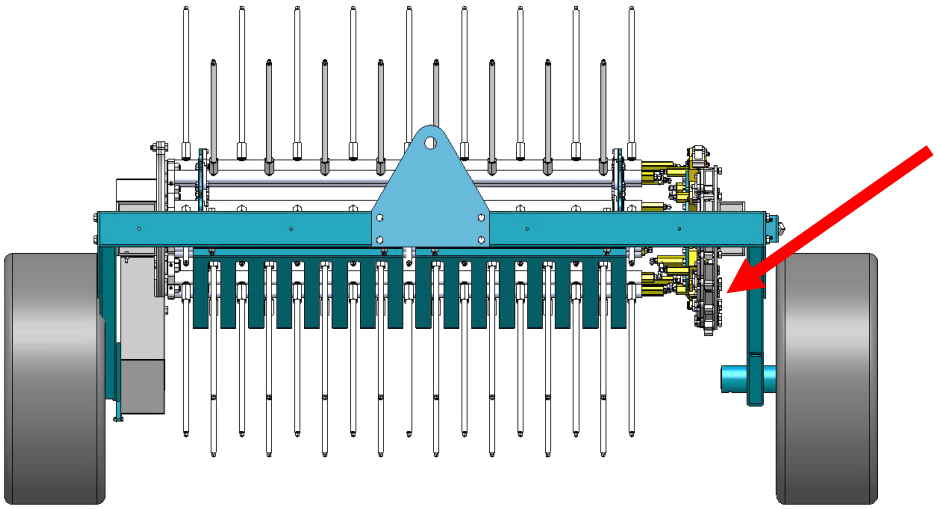
The trip sections shown (left) will determine when each cross-tube section will spray as the reel assembly rotates.

Adjusting Trip Sections

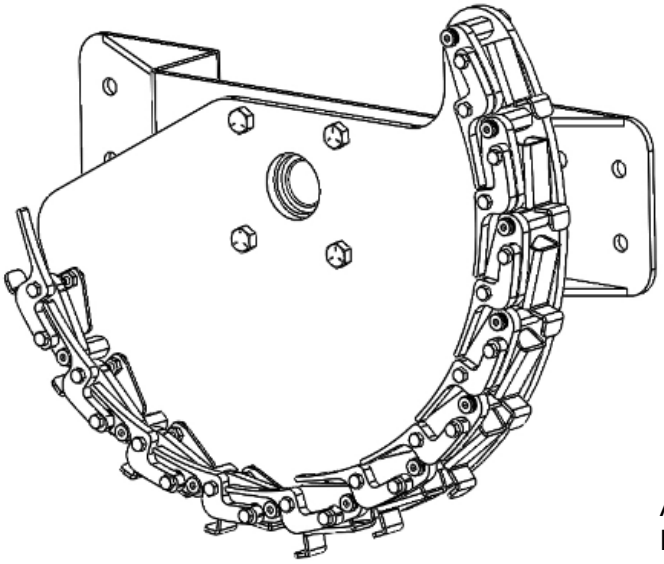
Adjust trip sections that are active based on windrow size/shape/and condition.

- If the windrow is tall and fluffy, adjust the sections so the tines turn on as soon as they enter the windrow.
- If the windrow is shorter, shut off the leading trip sections so the tines do not turn on until they are about to enter the hay.
- If less water is required to be added to the windrow, turn off rear trip sections so the tines don't spray the entire time they're in the windrow.
- If there is moisture in the bottom of the windrow but the top 2/3 of the windrow is dry, turn off trip sections at the bottom of the arc so the tines turn on as they enter the windrow, turn off for the bottom 1/3, then turn back on until they exit the windrow.

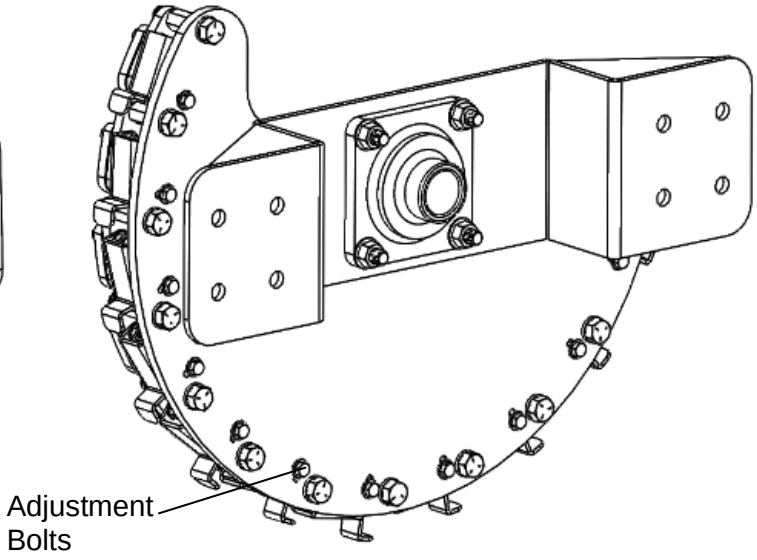
To activate, loosen the adjustment bolt on the backside of the valve plate with a 3/8" wrench. Rotate the reel so the rear of the trip section is contacting a valve roller, slide the assembly up in the slot until the roller is pressed down, then retighten the bolt while holding it down so it doesn't back off while tightening. To deactivate sections, loosen the bolt, slide out in the slot away from the valves, then retighten in position.



Adjusting Trip Sections (continued)



Front View Reel Trip Section



Rear View Reel Trip Section

-Loosen and adjust inwards to activate section, then tighten while holding in.
-Loosen and adjust outwards in slot to deactivate section, then tighten.
- ¼-20 bolt torque is about 5 ft-lbs.

Description of Electric Valves and Sensors

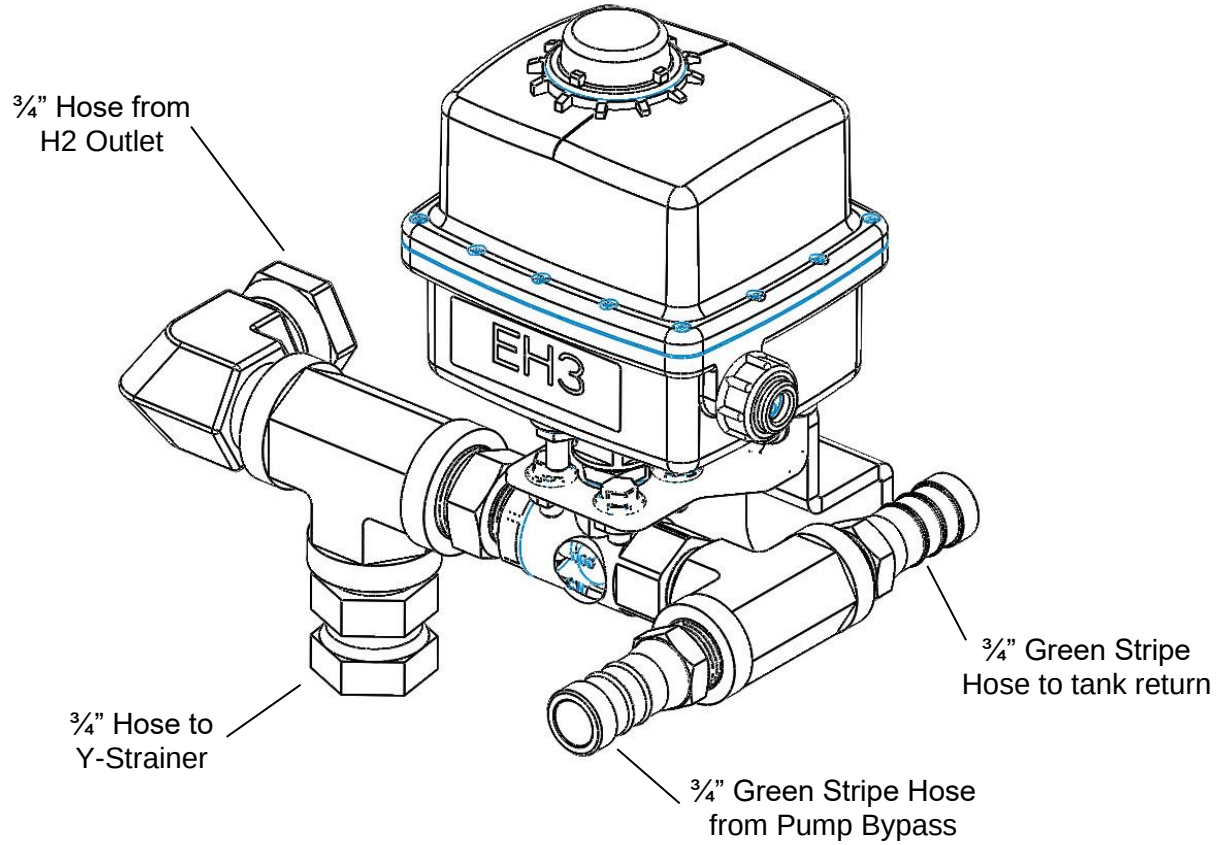
Reel Valve

This 2-way KZ valve is located on the lift arm. When inactive, this valve is normally closed. In its normally closed state, fluid from the outlet of heater #2 is not allowed to go to the reel and is returned to the tank. When it is open, fluid is allowed to flow to the reel. Under normal operating conditions this valve works in conjunction with the Arm Switch. While the reel is in the air, it remains closed, and water is returned to the tank. If the reel is lowered into operating position and the Arm Switch is activated, this valve will open, allowing water to flow to the reel.

Warmup Valve

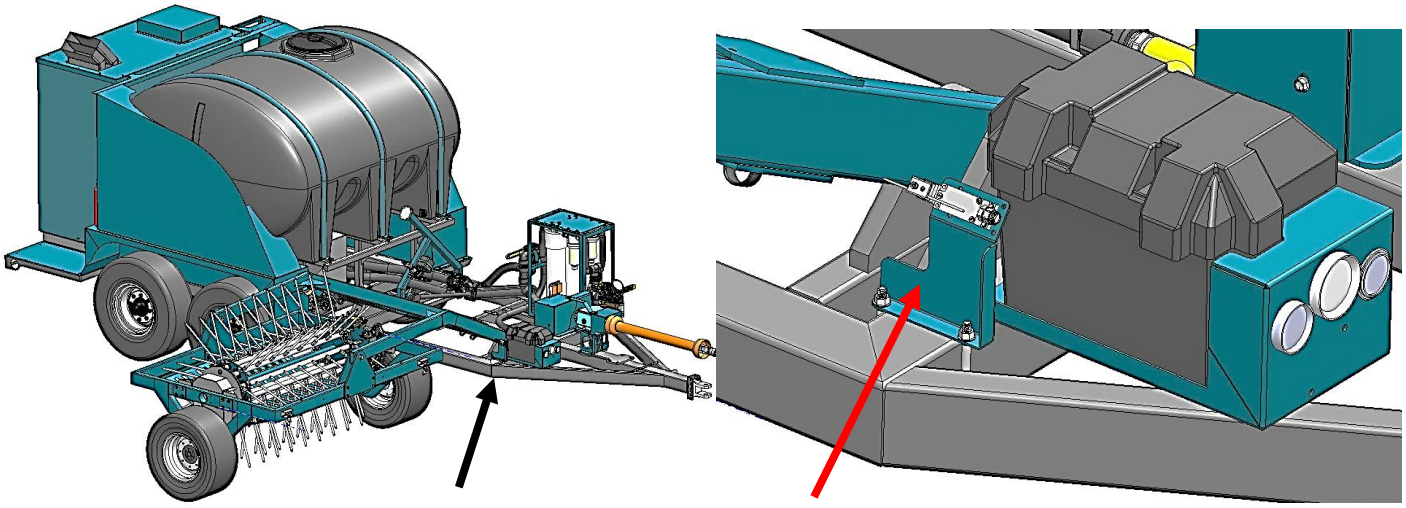
The 2-way Warmup Valve is located on the Lift Arm Support in front of the tank. The valve is on the outlet side of heater #2 and is normally open. During normal operation, the Warmup Valve is activated opposite of the Reel Valve. When the Arm Switch senses the Reel in operating position, it closes the Warmup Valve and opens the Reel Valve, directing flow out the reel. When the Lift Arm is up, it directs flow back to the tank.

During a warmup or prime sequence, the Warmup Valve slider is activated on the main screen of the control. This closes the Reel Valve on the Lift Arm and forces the Warmup Valve to stay open, allowing flow that has gone through the heaters to be returned to the supply tank until the output temp reaches 200F. Once the water temp reaches 200F, the warmup valve will automatically close and shut off on the main screen, forcing the heated, pressurized water out to the reel. The warmup valve is used for initial priming (allowing bypass water back to tank) and for initial heating of the system so water is not sprayed on the ground until after the temperature has reached 200F.



Arm Switch

The Arm Switch is located towards the front of the machine on the right side of the lift arm (shown below). This is a mechanical switch that is activated when the reel lift arm is in the field operating position (down).The arm switch must be active for the 2-way Warmup Valve to close and the Reel Valve to open, directing water to the reel. When the arm switch is deactivated, flow from the heaters is recirculated back to the tank.

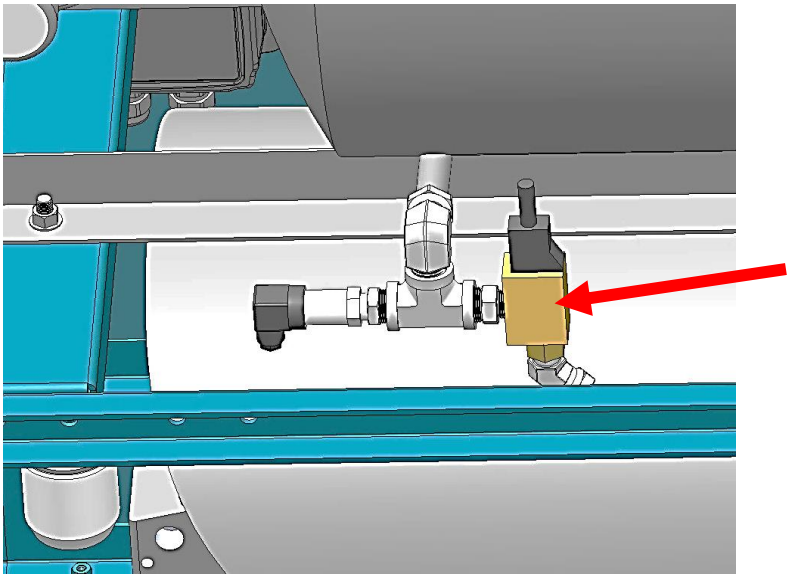


For instance, if you are treating a windrow and raise the reel 12” off the ground, either when turning at the headland or stopping in the windrow, the arm switch becoming deactivated will cause the 2-way Warmup Valve to open and the Reel Valve to close, diverting flow to the tank and shutting off flow to the reel. Similarly, for the heaters to run, the arm switch must be active, so when the reel is raised the heaters will automatically turn off. Additionally, the Flow Switch must sense flow for the burners to fire.

**For system priming and diagnostics, the Arm Switch can be overridden by the “ARM OVERRIDE” button on the controller. Activating that button will cause the 2-way Reel Valve to open and the Warmup Valve to close, allowing flow to go to the reel and the heaters to fire, regardless of arm position.

Flow Switch

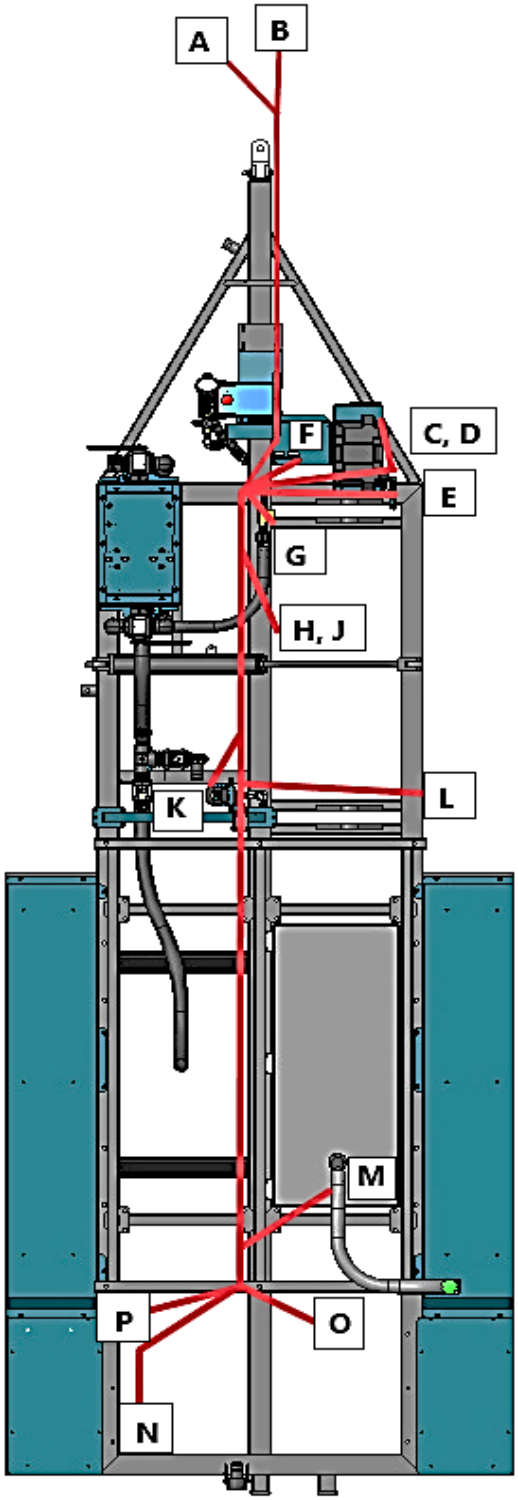
The flow switch is a safety sensor located at the inlet to Heater #1 that detects flow going through the heaters. When flow is detected, the internal circuit closes and allows the burner motors to run. When flow is absent and the internal circuit is opened, all electrical power to the burner motors is turned off.



Installing Controls

1. Connect the 12-Pin drawbar extension harness (006-7722D) to the 12-pin connector on the cart harness (006-7722A), then route into tractor cab. Secure the harness to avoid damage.
2. Mount the Cab Controller (006-7721X) securely to the Control U-Bracket (001-7230) in the tractor cab using knobs on each side.
3. Connect the 12-pin extension harness to the Controller (006-7721X).

Wiring Diagram



Cart Harness 006-7722A

A - Perimeter Nozzle Control
B - Cab Controller
C - Power Connections
D - Fuel Gauge Connections
E - Arm Switch
F - Heater Lights
G - Flow Meter
H - PN Pump #1
J - PN Pump #2
K - Warmup Valve
L - Reel Valve
M - Fuel Level Sender
N - Temp_IN Sensor
O - Temp_OUT Sensor
P - Rear Controller

Initial Operation

Turning on the Dew Simulator

The Dew Simulator controller will turn on by activating the red switch at the bottom of the control. For the controller to turn on, it must be connected to the cart harness. Ensure the Hydrobale battery is charged (12v+).

Priming the system

1. Begin by filling the tank. To fill the tank, hook a 2” male coupler to the front 3-way valve on the Dual Filter Assembly and turn the front valve to the “Fill” position (outwards) and the rear 3-way valve to the “Fill” position (inwards). Also make sure the 2-way valve on the Inlet Manifold behind the Dual Filter Assembly is open to the tank. Fill the supply tank until the water level is higher than the filter assembly. This will help priming by gravity feeding the system.
2. Once the tank is filled high enough, return the valves on the Dual Filter to the “Operate” position.
3. Initial priming of the system should be done with the heaters turned off. To begin, power ON the Cab Control. Check to make sure that the Heater 1 and Heater 2 sliders are in the OFF position.
4. Lower the reel so it is approximately 12” above the ground.

Wing in Transport Position

Wing in Operating Position

5. Turn the tractor PTO on and run at a fast idle. The pump will prime the filters and start returning water back to the tank. This will be indicated by the actual flow rate (GPM) being displayed on the screen. It may be necessary to purge the large filters of air. This can be done by pressing the red button on top of each large filter assemblies until no more air is visible in the bowls.
6. After about 30 seconds, activate the “ARM OVERRIDE” button on the main screen. You may hear the 2-way valve on the Lift Arm open. Run the machine on “ARM OVERRIDE” until the system fully primes, and fluid starts spraying out of the nozzles on the reel.
7. Activate the “WARMUP VALVE” button on the main screen. You may hear the warmup valve open. This will allow the water that is being pumped to the reel to be bypassed back to the supply tank.
8. At this point, the system is primed, and the heaters may be turned on.

Determining Operation Settings

On the second screen of the control (SETUP) under the Field Setup header, input the estimated Ton/Acre yield of the field (2.00), desired driving speed in mph (usually matched w/ baler speed →6.0mph), and swath width, measured in feet (30.0).

After inputting the field setup settings, input the moisture setup settings, including the starting moisture content (8.0%), desired moisture content (15.0%), and the desired water temp (240F).

Note: Field and Moisture Setup values are an approximation. These initial settings help to determine the starting pressure setting and flow rate. Adjustments may need to be made to actual output as crop conditions are observed. This can vary in each application. These inputs do not affect the output of the machine; the user must make physical adjustments to alter the actual flow rate and pressure.

Based on the condition and size of the windrow, input under the Machine Setup header the number of trip sections that are active (5-11), the number of tips installed (65-85), and the size of the tips installed (either 5 for MW5's or 11 for MW11's) *standard size is 11. In most situations, the number of tips installed and the tip size will not need to be changed, unless tines are added/removed between cuttings.

Once the input values for the field, moisture, and machine setup settings are entered, the Target GPM and SET PRESSURE values will be calculated. **Based on the number of tines installed (usually a function of windrow width) and the Target GPM, reference the tip charts to confirm that your tip size is correct. If you tend to operate at lower GPM (<9GPM), it may be beneficial to run the MW5 tips. **the SET PRESSURE value should be between 300 and 1200 PSI. If your calculated pressures are outside of those ranges, modification may need to be made to 1.) desired driving speed, 2.) trip sections, or 3.) # of tips.

Setting Pressure

Before setting the pressure, make sure that the number of trip sections active on the reel is appropriate for the windrow conditions and matches the value input on the control. Then, with the reel lowered about 12" off the ground and the system primed, activate the Arm Override button, and turn the PTO on. Run the PTO at approximately 800 rpm. Adjust the pressure relief valve on the back of the pump until the gauge matches (approximately +/- 50 PSI) the SET PRESSURE value from the cab control.

After the pressure is set, turn off the arm override. This will cause the flow to divert back to the tank until the reel is lowered to the operating position.

Warming Up System

To reduce the waste of water, the warmup valve can be used to bypass the water coming out of the heaters to the tank until it reaches 200F, at which time the valve will close, and water will be directed to the reel.

Start with the reel raised 12" above the ground, system primed, arm override button activated, and the warmup valve button activated.

Turn on Heater 1 and Heater 2. The buttons on the screen will show blue, but the indicator lights for the heaters (on the alternator shield) will not be illuminated, indicating that the heaters are not firing.

Turn on the PTO and run at approximately 800rpm. As soon as a flow is measured, the heaters will turn on and start heating, indicated by the orange lights being illuminated on the alternator shield.

Since the warmup valve is activated (open), the heated water will flow to the tank until the output temperature reaches 200F. Once the output temperature reaches 200F, the warmup valve will automatically close, forcing the heated water out of the reel. At this time, water will flow out of the reel and the heaters will continue to run until the Arm Override button is turned off. After that, the heaters will not run until the reel is in the operating position (down).

The output temperature can be observed on the main screen of the controller on the lower left side, below the target temperature. Once the system has reached 205F, it will display an "OK" operating status (shown in the top center of the main screen). Once the system reaches 205F or "OK", you can turn off the arm override button, which will cause the 2-way valve to close and the heaters to turn off. At this point, you are ready to operate.

Operating

Once the system has been heated up, you can proceed to treating windrows. With the PTO still running, you can lower the reel to the operating position and pull into the windrow running at the 'desired mph' to match the baler's speed. The arm switch will control the opening/closing of the 2-way valves. When the reel is in the operating position, the heaters will turn on and off as needed to achieve a stable output temperature close to the target temperature. This can be observed by watching the indicator lights for heater 1 and heater 2 on the alternator shield near the pump.

While operating, ensure that the gauge pressure that you set remains close to the Set Pressure value (calculated by the control). You can also observe your target vs actual GPM on the lower right side of the main screen of the controller. Pressure and Actual GPM's can be adjusted slightly by throttling up or down. **Do not exceed 1000 rpm on the PTO or 1200 PSI on the pump pressure.

Control Box

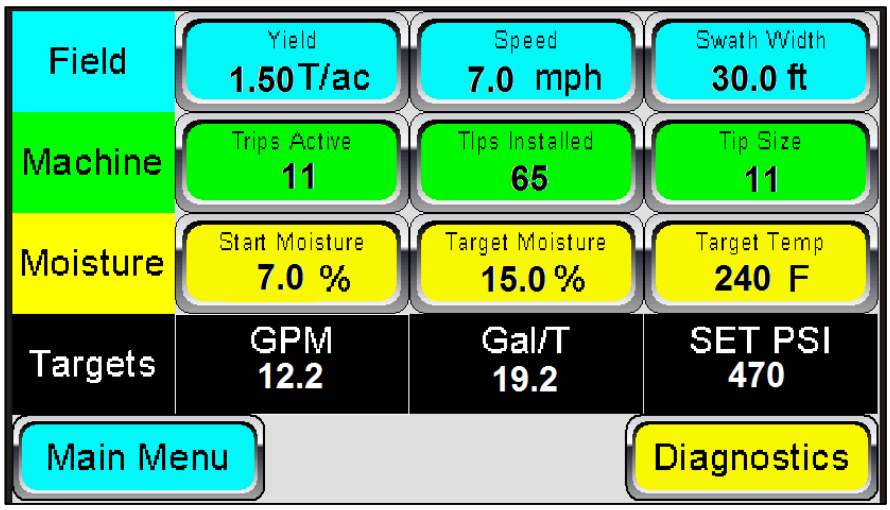
Hydraulic Drive Control (optional)

If the Hydrobale is equipped with the optional hydraulic drive, it will come with a BRAND controller, pictured on the right. This controller needs to be connected to key power (red) and ground (black) in the cab. The two blue wires run to the electronic hydraulic valve. This control must be turned ON to allow hydraulic flow through the valve.

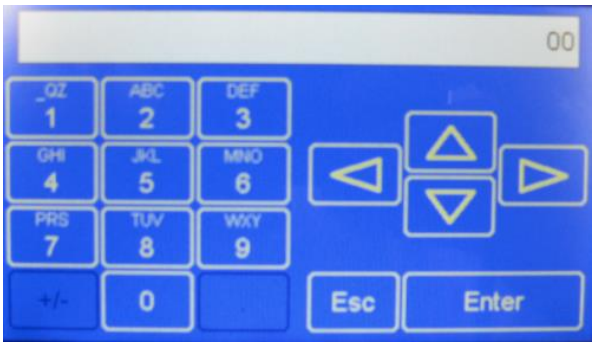
The dial on the control ranges from 0 to 100 and indicates the percent of hydraulic flow allowed through the valve. This system operates at 0-15gpm hydraulic flow. Normal operating ranges for the Hydrobale are typically in the 40-80 range. This control allows for the precise adjustment of water flow through the Hydrobale without having to exit the cab to make physical adjustments on the machine.

Screen Definition (Control)

Setup Screen



Field Setup Screen Steps



1. Input the estimated Tons/Acre expected to be produced in the field by pressing the “Yield” cell. When selecting any of the input cells the screen shown on the right will appear. Pressing Enter will save the information.
2. Input the Target MPH, typically matching the baler speed, by pressing the “Speed” cell.
3. Input the width of the windrow (ft) by pressing “Swath Width”.
4. Input the number of Trips Active. Refer to Adjusting Trip Sections if unsure on how to activate Trips.
5. Input the number of tips installed by pressing “Tips Installed”.
6. Input the tip size being used by pressing “Tip Size”.
7. Input the starting moisture content in the field by selecting the “Start Moisture” cell.
8. Input the target moisture content by pressing “Target Moisture”.
9. Input the target temperature by pressing “Target Temp”.
10. After the information has been updated press the Main Menu button to move to the main screen.

Note: Only Target Temp input affects machine operation. All other inputs simply provide Target Pressure and GPM for operator to manually set on the machine.

Min & Max Levels

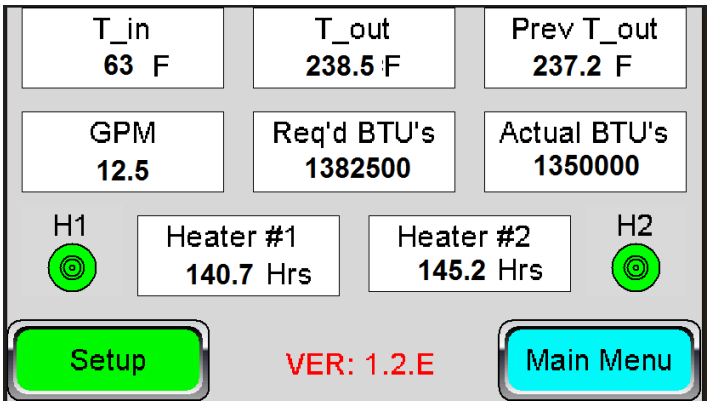
Target GPM and Gal/T will be automatically populated after the field details have been input.

Set Pressure information will be populated after the field details have been input. Use this information to adjust the pressure valve on the pump.

The chart below shows the output range for the available tip sizes.

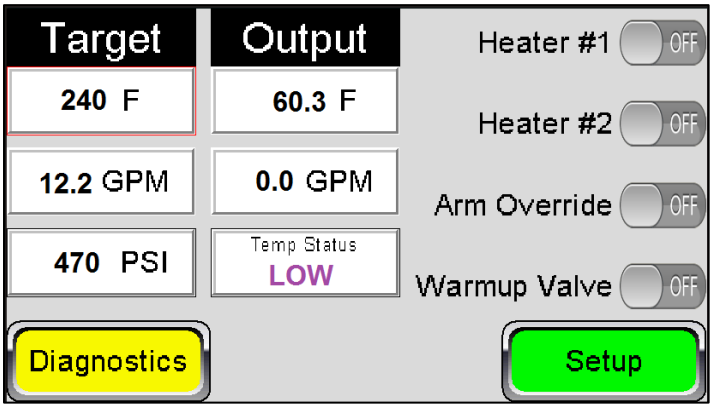
Min GPM MW5 Tips: 2.1	Min GPM MW11 Tips: 7.5	Minimum PSI Set: 300
Max GPM MW5 Tips: 12.0	Max GPM MW11 Tips: 20.0	Maximum PSI Set: 1200

Diagnostic Screen:



T_in: Temperature at the inlet to Heater #1
T_out: Temperature at the outlet of Heater #2
Prev T_out: Temperature measured at T_out, 5 seconds prior
GPM: Gallons per minute flowing into the pump
Req'd BTU's: BTU's required based on the inputted variables to obtain target Temp
Actual BTU's: BTU's currently being produced
Heater #1 Hrs: Number of hours that heater #1 has been firing, not overall machine hours
Heater #2 Hrs: Number of hours that heater #2 has been firing, not overall machine hours
H1 & H2 Lights: Indicate when heaters are firing
Software Version: Indicates version of software and language (E=English)

Main Screen:



Tab Descriptions

1. **Heater #1:** Used to turn on the heater located on the top of the stacked heater skid.
   - PTO must be running, flow meter must have reading, flow switch must sense flow, and arm switch or arm override must be active for heater to turn ON.
2. **Heater #2:** Used to turn on the heater located on the bottom of the stacked heater skid.
   - PTO must be running, flow meter must have reading, flow switch must sense flow, and arm switch or arm override must be active for heater to turn ON.
3. **Target Temp:** Displays the temperature you have selected as the desired temp to output (220F-260F).
4. **Output Temp:** Displays the temperature of the water being applied.
5. **Operating Temp Status:** Will display the status of the water heat Low, Ok, or High (<205=Low, 205-270=OK, >270= High).
6. **Target PSI:** Displays the Target PSI determined from SETUP screen inputs (300-1200 PSI).

Main Screen (continued)

7. **Arm Override:** This function will allow water to flow to the reel assembly by bypassing the arm switch, allowing flow to the reel when it is not in the operating position (12" above the ground)
8. **Warmup Valve:** Used for initial warming of water in combination with Arm Override.
   - With PTO running and Dew Sim reel lifted 12" off the ground turn **ON** Heater #1, Heater #2, Arm Override, and Warmup Valve. Warmup Valve function recirculates water back to the tank until Output Temp reaches 200 deg F, at which point the Warmup Valve will automatically turn **OFF** and direct flow to the reel.

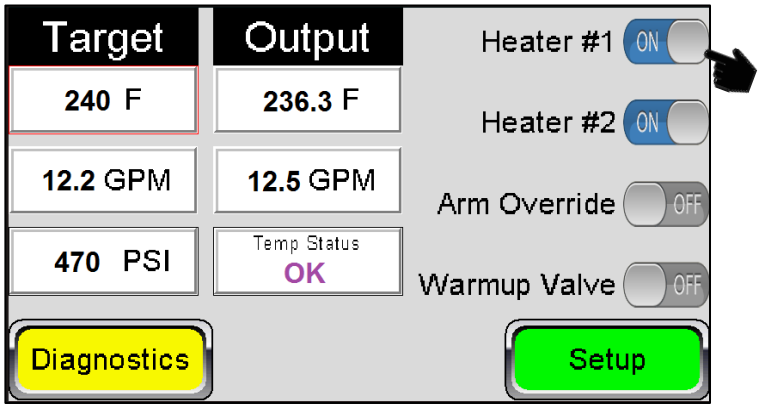
9. **Target GPM:** Displays the Gallons per Minute determined from SETUP screen inputs.

10. **Actual GPM:** Display the Gallons per Minute being applied. This is the most observed value during operation. Establish a baseline and adjust accordingly as conditions change.

11. **Setup:** This selection will navigate the control to the Setup Screen.

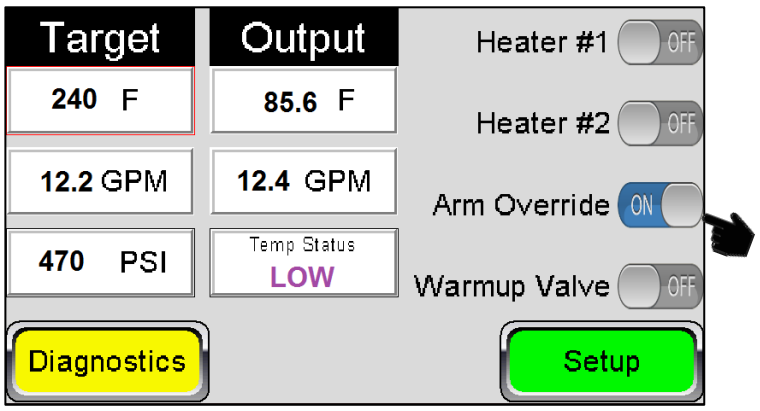
Heater #1 & #2

Prior to turning on heaters lift reel assembly 12" above the ground.



- Turn on Heaters #1 & 2 by pressing the OFF button. ON will display and appear in Blue when Heaters 1 & 2 are active.
- Heater is firing when the indicator light on the alternator shield is illuminated.
- Heater Firing Requirements:
  1) Heater switch ON
  2) Arm Override Switch ON
  3) Requires Flow

Arm Override



- Activate *Arm Override* by sliding the button right. ON will display and appear in blue to indicate the Arm Override is active.

Located towards the front of the machine on the right side, is a mechanical switch that senses when the reel lift arm is in the field operating position. The arm switch is active when it senses the lift arm. The arm switch must be active for the 2-way valve on the arm to open, directing flow out to the reel. When the arm switch is deactivated (normally closed), flow from the pump is circulated back to the tank.

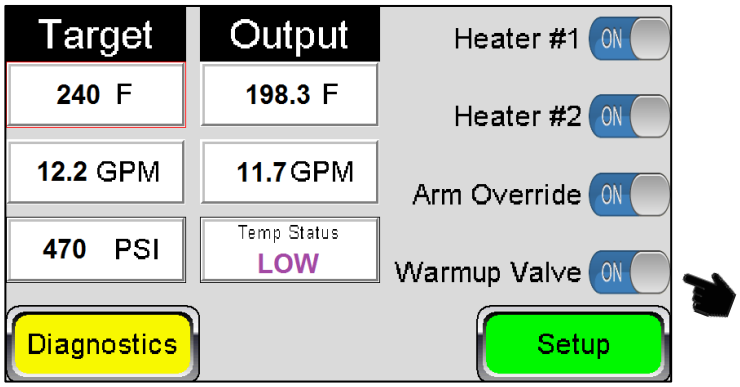
For instance, if you are treating a windrow and raise the reel 12” off the ground, either when turning at the headland or stopping in the windrow, the arm switch becoming deactivated will cause the 2-way valve on the arm to close and circulate water back to the tank, shutting off flow to the reel.

Arm Override (continued)

Similarly, for the heaters to run with the reel up, the Arm Override switch must be active, otherwise when the reel is raised the heaters will automatically turn off. Additionally, the system must also be seeing flow (flow switch active) before the heaters fire.

**For system priming and diagnostics, the arm switch can be overridden by the “ARM OVERRIDE” button on the controller. Activating that button will cause the 2-way valve on the arm to open and allow flow to go to the reel regardless of the lift arm position.

Warmup Valve (Slider)



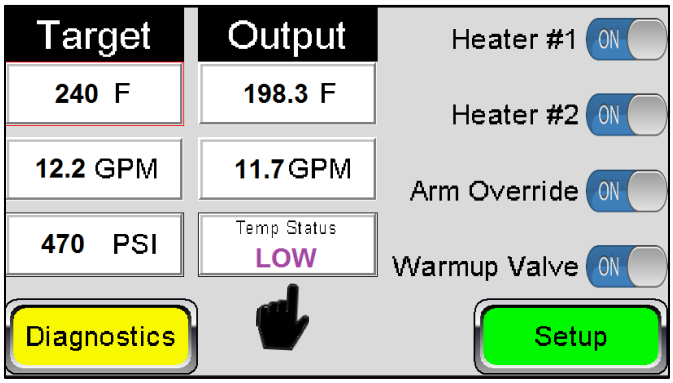
- Active *Warmup Valve* by sliding the button right. ON will display and appear in Blue.
- The Warmup Valve button will stay activated until it is either manually turned off by sliding the button to the left, or until the Output Temp has exceeded 200F, at which time the warmup valve will automatically deactivate.

The 2-way warmup valve is located on the lift arm support, in front of the tank. The valve is on the outlet side of heater #2 and is normally open. When activated on the main screen of the control, in combination with the Arm Override, it opens and allows pressurized flow that has gone through the heaters to be returned to the supply tank. When the heaters are activated and heating water, the warmup valve will allow heated water to be bypassed back to the supply tank until the water temperature reaches 200F.

Once the water temp reaches 200F, the warmup valve will automatically close and shut off on the main screen, forcing the heated pressurized water out to the reel. The warmup valve is used for initial priming (allowing bypass water back to tank) and for initial heating of the system so water is not sprayed on the ground until after the temperature has reached 200F.

- Target Temp / Output Temp (Display)
  Target Temp can be adjusted. The recommended temp is approximately 240F degrees.

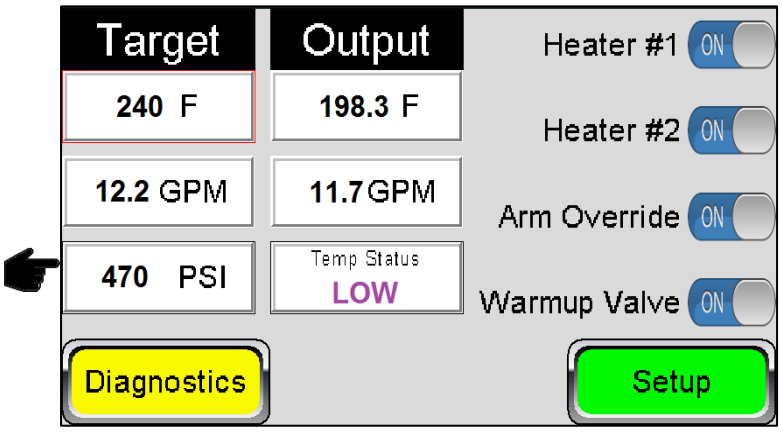
Operating Temp Status

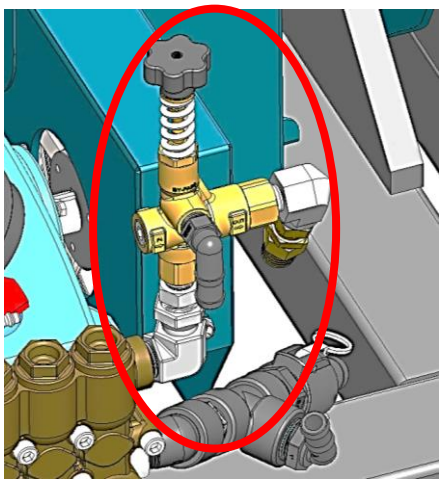


The Operating Temp Status display area will show if the output temperature of the water from the burners is at an adequate temperature by displaying Low, Ok or High.

Low - Temp under 205 degrees **Ok** - Temp 205-270 degrees **High** - Temp above 270 degrees

Target PSI (Display)

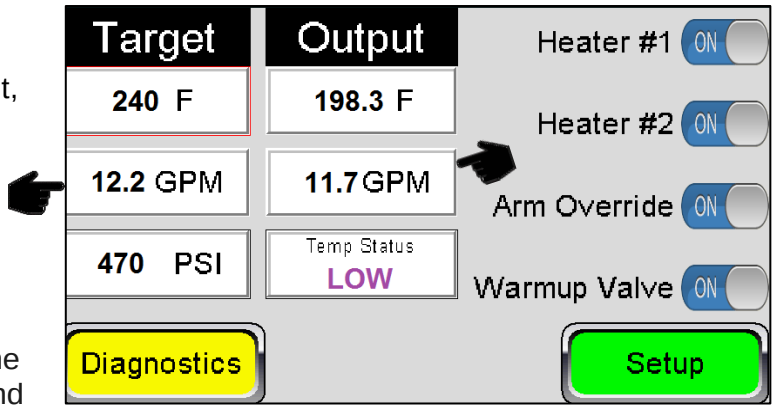




Once the setup screen has the information input, the Target PSI will display. After the PSI info is displayed, go to the Dew Simulator, and adjust the PSI regulation valve on the pump (shown above right).
*Tractor PTO needs to be at operating speed and Arm Override active to adjust system pressure.

Target GPM / Actual GPM (Display)

Once the setup screen has had the information input, the Target Gallons per Minute (GPM) will display. The Actual GPM will show the amount of the water being applied.



Operation of the Dew Simulator

When the reel is on the ground, the hydraulics should be in the **FLOAT POSITION.** This allows the lift arm to pivot and follow the contours of the ground while eliminating "down pressure" on the reel frame.

The reel is designed to straddle the windrow as the tractor drives alongside it. While operating in the field, it is not advised to turn at the headlands with the reel in the down position. You don't have to raise the reel completely, but when turning around in the field, lift the reel 1-2 feet off the ground, enough to deactivate the arm switch and allow water flow to be diverted back to the tank. This will conserve water and reduce stress on the wheel hubs.

Keep an eye on the level of the fluid in the tank. Running the coils dry while very hot may cause damage. It is recommended to turn off the heaters before running the tank dry and refill. If you stop before you run the system dry, you can hook up a 2" quick coupler to the dual filter assembly, flip the valves, and use the pump to fill the tank. Otherwise you can use an external pump or pressurized line and hook up to the dual filter assembly.

To fill through the dual filter assembly (recommended), both valves must be turned to the "fill" positions, opposite from their "operate" positions. Hook up a 2" male coupler to the front 3-way valve and pump water into the tank. If using the Hydrobale pump to fill the tank, only the front 3-way valve needs to be turned. Filling through the filter system will remove any contaminants and sediment in the water supply.

When filling is completed, shut off the fill source and return the 3-way ball valves to the "operate position".

Field Operation

The re-moisturizing of hay before baling will take some learning by the operator and some consideration for the situational variety of field conditions. Here are some important factors to keep in mind:

1. It will take between a few seconds and 20 minutes for the moisture to soak into the alfalfa and soften the plant depending on conditions. Application of excess water will require additional wait time for the excess moisture to evaporate.
2. The added water will eventually evaporate from the windrow over time. More rapidly in low humidity or windy conditions. No wind: 10+ minutes, wind up 10 mph: <10 minutes.
3. Other conditions, such as ground moisture, humidity and windrow density could affect these recommendations. Start with these but keep feeling the hay to determine what works best. Once the most optimum interval is determined, **keep the gap between the dew simulator and baler constant.**
4. It is recommended to use the Hydrobale in fully cured windrows. Use caution to not over-apply water when stem moisture is present.

INTERVAL GUIDELINES BETWEEN TREATING AND BALING		
WIND CONDITION	**TEMPERATURE**	**SUGGESTED INTERVAL**
low (under 10 mph)	under 80° F	10+ minutes
high (10+ mph)	under 80° F	<10 minutes
low (under 10 mph)	80-90° F	10 minutes
high (10+ mph)	80-90° F	5 minutes
low (under 10 mph)	over 90° F	<5 minutes
high (10+ mph)	over 90° F	<1 minute

Note: In hot, dry, and windy conditions it is beneficial to reduce water flow and follow directly behind the baler. Increase distance and water flow as conditions allow.

Using Eradicate+

When operating the Hydrobale with hard water, Harvest Tec recommends using Eradicate+ to reduce scale buildup within the system. Eradicate+ can be added directly to the water tank while filling with water and will stay suspended. It has been engineered to keep the minerals, especially calcium, magnesium, and iron suspended while the water is being heated. Refer to the chart below.

ERADI(Ca)TE

A Water Conditioner

PRODUCT DATA SHEET

Product Description

ERADI(Ca)TE is a specialty water conditioner designed to prevent hard water scale build-up in pivot and drip irrigation systems.

Common hard water scale formation is commonly the result of calcium carbonate precipitation and accumulation in equipment employing hard water.

ERADI(Ca)TE will bind with calcium, magnesium and iron, preventing the formation of common hard water scale.

ERADI(Ca)TE can also be used to treat water prior to diluting fertilizers, herbicides, and pesticides; promoting maximum glyphosate efficacy and minimizing insoluble solids that can form when minerals precipitate with phosphates. (Precipitated solids can inhibit uniform application rates and/or plug sprayer nozzles.)

Application Rates

For most applications, a rate of 8 oz. per 100 gallons of water is sufficient. Use the graph to determine precise application rates.

Calcium (ppm)	OZ. /100 gallons
100	1
200	2
300	4
400	5
500	7
600	8
700	10
800	11
900	13
1,000	15
1,100	16
1,200	18

Appearance

- Transparent to Light Yellow Liquid
- Mild Odor

Technical Specifications

- Specific Gravity 1.4
- PH (1% solution) 5-6
- Salt out point, -11° F

Packaging

- 5-gallon non-returnable plastic pails
- 55-gallon non-returnable drums

Storage Stability

- 36 months in sealed containers

Product Data Sheet **ERADI(CA)TE**

Important Notice Regarding the Attached Information:

The statements, technical information and recommendations contained in the accompanying document(s) are based on tests and data that are believed to be reliable. Further, as the actual use of our products by others is beyond our control, no guarantee of any kind is made as to the effects of such use, or the results to be obtained, whether the use is made in accordance with the recommendations or suggestions contained herein or otherwise. The accompanying document(s) is not contractual and NOTHING HEREIN CONSTITUTES A REPRESENTATION OR WARRANTY THAT THE GOODS

DESCRIBED ARE FIT FOR A PARTICULAR PURPOSE OF A CUSTOMER or that their use does not conflict with any existing patent rights. The exclusive source of any warranty and of any other customer rights whatsoever is on the invoice. Also, since the accompanying data sheet(s may be provided by electronic media, we cannot guarantee the accuracy or originality hereof. Any alterations made to the accompanying document(s) other than by corporate headquarters is expressly prohibited.

Maintenance

If you are unsure how to perform any of the maintenance steps have your local authorized dealer perform the tasks or contact Harvest Tec.

Maintenance Schedule

	Daily	10 hrs	25 hrs	Season
Chain tension	X			
Check Filters (002-4319A & 002-4321E)	X			
Replace large, 5m filters				X
Descaling heaters				X
Change heater fuel filters				X
Check pump oil level	X			
Grease PTO driveline			X	
Check Valve Seals	X			
Grease wheel bearings				X
Grease cam follower bearings		X		
Check tightness of set screws on reel shaft			X	
Check for leaking connections/hoses	X			
Grease flange bearings on both ends of reel and on drive wheel shaft			X	
Verify valve trip adjustment/settings	X			
Check valve rollers			X	
Remove and clean Nozzles			X	
Alternator belt tension / voltage output		X		

Preventative Maintenance Check List

- Check tightness of fittings before use.
- Valve rollers spin freely.
- Check filters for debris or damage.
- Check battery voltage before operating. Use an external charger if below 12.0v.
- Check alternator belt tension, observe voltage and amperage output while running.
- Blow out water between cuttings and before freezing conditions.
- Grease reel bearings and cam roller bearings.

Maintenance Details

How to check pump oil level

- Pump oil level can be checked by viewing the sight glass on the reel side of the pump, fluid level should be to the top of the sight glass. Use only CAT Pump oil (009-7227oil -21 oz. Two required for oil change)
- Oil should be changed after first 50 hours of use. Then seasonally or every 500 hours.

Chain tension

- Observe floating tensioner blocks for excessive wear. If the chain is loose, move adjustment straps in one hole on front and rear blocks. If the chain is still loose, replace.

Battery Voltage

- Before each season, or after an extended break, be sure to check the Hydrobale battery voltage. A “charged battery” should maintain around 12.5v, if not, use an external charger to “top off” the battery before running the systems alternator.
- Using the Hydrobale’s alternator to charge a dead battery is not recommended and may cause premature failure.

Cleaning Filters

- Before each use, remove the smaller, coarse filter from the Dual Filter Assembly (002-4319A) and check for debris/build up. Clean these filters with water and a soft brush.
- The large (5 micron) filter on the Dual Filter Assembly (002-4322E) can be rinsed off, but if there are signs of flow restriction or degradation, they will need to be replaced. These filters can be ordered from Harvest Tec or another online source.
    - OEM PN: SpiroPure SP-DD-5005-20BB
- Check the Y-Strainer filter (002-4321E) daily for debris and damage. To remove, use the yellow tool on the Y-strainer to unscrew the end cap. This filter can be cleaned with a brush and scale remover such as CLR. If the mesh has separated from the cage or the filter is deformed, it will need to be replaced to prevent debris from clogging components in the reel.

Greasing

- Grease cam follower bearings after using the machine to push any water out. These bearings only need about ½ pump. Over greasing can push the end cap out and prevent proper lubrication in the future.
- Grease PTO knuckles, reel bearings, drive hub bearings, and spindle hub on valve side of reel.

Clean Burners

- Open the cover on the burner ignitor and blow compressed air through the air bands, fan, and forward towards the electrodes to remove dust and buildup on the air intake. It may be necessary to remove the electrode and clean the ignitor tips and fuel nozzle as well.

Heater Coil Descaling Procedure

In time, a heating coil will accumulate calcium, lime, or mineral scale deposits. The severity of scale build-up will depend on the hardness or mineral content of your water supply. Scaling will first start on the inner windings of a coil, then become less severe as it progresses through the outer coil windings. It is possible for the inner coil windings to become partially clogged, and in some instances, completely plugged before scale or mineral deposits can be noticed in fittings at the coil discharge outlet.

If your water has a high mineral content or hardness, a preventive maintenance schedule to descale the coil at the end of each season, prior to winterizing, is recommended. The use of Eradicate+ will minimize scale buildup, but not remove it once it is there.

Before you begin -- There are different types of coil cleaning chemicals. It is recommended you contact Harvest Tec for the supply of the descaling kit, descaling chemicals, and instructions for use of these chemicals. If this is not possible, the instructions below should be closely followed:

1. A sulfamic acid powder, containing a corrosion inhibitor should be used to remove scale from coil.
2. In a clean 55-gallon drum (preferably plastic), mix 25lbs of acid powder into 25 gallons of water.
3. Turn off the water supply. Disconnect the suction hose coupler from the Pump Inlet. Connect the descaling kit suction line to the 1" inlet at the rear of the pump. Disconnect the ¾" hose to the reel and connect the descaling kit return line to the 3/4" outlet on the Y-strainer/Reel Valve. Insert both lines into the 55-gallon drum. Secure the end of the suction hose so the strainer is 3-4 inches above the bottom of the container.
4. Prior to turning on the PTO, activate the Arm Override on the cab controller. This will allow the cleaning solutions to be circulated through the heater coils and be returned to the 55-gallon drum. DO NOT ALLOW CLEANING SOLUTIONS TO THE REEL. Do not activate the Warmup Valve. This will allow the solution to be returned to the tank. Turn on the PTO and run at a high idle, circulate the acid solution through the system for 20-30 minutes. Whether the solution stops foaming or not, do not circulate for more than 30 minutes. Soon after the solution has started circulation, turn on Heater #1 and Heater #2 for approximately 10 seconds, then turn both heaters off. After 15 minutes of circulation, turn on Heater #1 and Heater #2 for approximately 10 seconds, then turn both heaters off. Heating the coils will help to break apart scale deposits. After circulation for 20-30 minutes total, turn off PTO.
5. Attach air hose to the Blowout Valve below the gauge on the pump. Use air to push excess acid solution into the drum. Remove the acid suction hose from the pump inlet. Reconnect the 1" line from the Dual Filter Assembly to the rear of the pump. Remove the 3/4" discharge hose from the 55-gallon drum and secure it to the dew simulator frame so it is aimed at the ground. DO NOT ALLOW CLEANING SOLUTION TO REEL. Ensure the tank has approximately 200 gallons of clean water in it, turn the water supply on. Turn the PTO back on at an idle and pump clear water through the system for three to five (3-5) minutes. Turn the PTO off.
6. Add one pint of household ammonia to the water in the tank. Turn off Arm Override. Turn the PTO on at approximately 700rpm and circulate this solution back into the tank for approximately five (5) minutes, then turn PTO off. Open the inner valve on the Intake Manifold and drain on ground. Close valve when done.
7. Refill tank with approximately 100 gallons of clean water. Turn on Arm Override and run the PTO at 700rpm to flush the system with clean water, discharging onto the ground for about 5 minutes or until the supply tank is empty. Turn off PTO and deactivate Arm Override on the cab controller.
8. Blow out he Hydrobale if preparing for winter storage. See "Winterizing Procedures".

CAUTION: Coil cleaning acids or chemicals are hazardous. Protective gloves, clothing, and safety glasses and face shield should be worn when handling. Dispose of drum contents (used acid solution) accordingly.

Winterizing Procedures

NOTE: Failure to properly winterize your machine may result in serious and costly damage to wetted components (pump, heater coils, and reel components) on the Hydrobale if your machine is exposed to freezing temperatures. Outlined is the recommended method for all occasions during freezing weather, including long-term storage. It is highly recommended that pressurized air be used to blow as much water as possible out of the system. Additionally, **Propylene Glycol based RV Antifreeze** can be used. Do not use an Ethanol based RV antifreeze. It is possible to reclaim some of the RV antifreeze to be used for subsequent use. When using this method, occasionally check the strength of your antifreeze, as there will be a slow but steady dilution through repeated use.

1. Drain the water tank by opening the inner valve on the Inlet Manifold.
2. Remove the bottom hose on the Dual Filter Assembly to drain. Remove each filter bowl. Empty and clean the filters.
3. With the reel slightly off the ground, disconnect the 3/4" supply line to the reel. Blow compressed air into the swivel elbow. Spin the reel by hand to allow any water trapped in the reel to be blown out. Secure the reel hose in a downward direction for the next steps.
4. Disconnect the 1" cam coupler between the flow meter and the pump inlet to allow water in the pump and intake line to drain out. Disconnect the bypass coupler from behind the pump as well. Use pressurized air to blow any water out of the intake line and flow meter.
5. Locate the 1/4" air coupler directly below the pressure gauge on the pump. Activate the Arm Override button on the controller to open the 2-way Reel Valve. Remove the clip then open the ¼" valve to force water out of the heaters and Y-Strainer. This may take a few minutes. Open the warmup valve to flush out the return and bypass hoses, then close the warmup valve. Once the system is blown out with air, remove the air coupler, close the valve, and reinstall the clip.
6. If Perimeter Nozzles are installed, remove the elbows on the pumps. Blow air through the pump head and the discharge hoses.
7. Place approximately 25 gallons of Propylene Glycol based RV antifreeze in a drum. Connect a hose to the inlet of the Hydrobale pump (1" cam coupler) and place the other end in the drum of RV antifreeze. Connect a 3/4" discharge line to the Y-Strainer outlet and place the discharge end into the drum.
8. Activate the Arm Override on the cab controller. Turn on the PTO and run at an idle to allow the system to draw RV antifreeze from the drum, prime, and circulate back to the drum. Allow the RV antifreeze to circulate back into the 55-gallon drum for 5 minutes. **DO NOT activate the Warmup Valve** on the cab controller. This will allow antifreeze to go into the tank. Turn off the PTO when RV antifreeze starts to exit the 3/4" high pressure discharge hose. Turn off the Arm Override on the cab controller.
9. To reclaim your RV antifreeze, repeat steps 4-5 to manually drain the reclaimable RV antifreeze from the system.
10. To return unit to operation, reconnect the 3/4" high pressure discharge hose to the reel swivel. Fill the supply tank with approximately 200 gallons of clean water (enough to bring water level above filter assembly). Turn on the water supply. Lower the reel to the operating position and turn on the PTO to flush the system of all remaining antifreeze until discharge water is clear.

Troubleshooting

1. Pump runs, but no flow or pressure at reel.

Possible Cause	Solution
1a. Water supply is turned off.	1a. Make sure the 2” valve is open to the tank and the valves on the Dual Filter Assembly are in “operate” position.
1b. Tank water level is below filter bowl	1b. Make sure the tank water level is above filters to allow gravity prime. Priming may be difficult with a low water level.
1c. The 2-way valve on the lift arm is closed.	1c. Reel is in transport position or reel is suspended above the ground; Arm Switch is not activated. Lower reel to operating position or activate Arm Override on cab controller to open valve.
1d. Warmup valve is open	1d. Warmup valve is open and allowing fluid to recirculate to tank, ensure Warmup valve button is deactivated on cab controller
1e. Plugged filters	1e. Check and clean the screens/filters on the dual filter assembly as well as the Y-strainer on the lift arm.

2. Pump runs rough, pulsation of discharge hose, and pressure low.

Possible Cause	Solution
2a. Pump not primed	2a. Follow priming sequence, purge large filters on the dual filter assembly.
2b. Inadequate fluid supply	2b. tank level low, add fluid to tank
2c. Inlet filter clogged	2c. Remove intake filters and clean.
2d. Air leak of considerable volume in pump inlet system.	2d. Check all suction fittings and lines for leaks. Pay attention to thread sealant on fittings and tightness of fittings and clamps – check water level in tank. Sufficient water depth must always be maintained in the tank during operation, and depth must account for slopes in the field.

3. Pump alternately runs smooth and rough, pressure fluctuates.

Possible Cause	Solution
3a. Air leaks in the suction inlet system. Frequency of pump roughness and pressure loss are dependent on severity of air leaks.	3a. Check for air leaks. Check lines and clamps.
3b. Fluid leak on discharge side of pump	3b. Visually inspect all fluid connections for loose fittings or damaged hoses.

4. Operating pressure excessive > 1250 PSI

Possible Cause	Solution
4a. Restricted discharge nozzle or plumbing	4a. Clean/Replace nozzles or components
4b. Pressure relief valve set to high, or PTO speed too high	4b. Reduce pressure setting, reduce PTO speed
4c. Restriction in coil	4c. See “Descaling Instructions”
4d. Insufficient number of valve trip sections activated	4d. Ensure that a minimum of 3 valve trip sections are up
4e. Blockage in fluid lines on reel assembly	4e. Blockage in lines, fittings, Y-Strainer, or nozzles on the reel assembly. Check the Y-Strainer filter, then with the unit running, suspend 12” above the ground. Activate Arm override and manually turn the reel to ensure all nozzles are spraying. Remove blocked nozzles, disassemble, and soak in CLR or similar cleaner. Reassemble. Blockages due to corrosion or sediment buildup are most likely found on nozzles, ends of tines, and 90-degree elbows. Replace blocked components as needed.

5. Heaters will not run motor, igniter, or pump fuel

Possible Cause	Solution
5a. Rear controller not connected	5a. Connect control, ensure harness is connected to each heater. Verify internal wiring connections are good inside heater housing.
5b. Arm Switch and Arm Override are both deactivated	5b. Active by lowering to operation position or activating Arm Override on cab control
5c. No flow of fluid being directed through heaters. Pump is not running, or fluid is being bypassed in pump.	5c. Turn on PTO and either lower to operational position or activate Arm override to direct fluid through the heaters
5d. Flow switch not activating.	5d. Ensure the flow switch is activated. Use multimeter to check continuity on the white and black wires out of the flow switch. When there is flow, there should be continuity. Gently tap the flow switch to unstick internals.
5e. Low battery voltage.	5e. Check battery voltage. Ensure that 12+v is getting to the burner motors. Use a voltmeter on the 4-pin plug.

6. Burner motor runs, but burner will not ignite.

Possible Cause	Solution
6a. Fuel tank empty.	6a. Add diesel to fuel tank.
6b. Fuel pump air-locked -- pump lost prime when fuel tank ran dry. Changed fuel pumps and did not install fuel bypass plug in pump.	6b. Use a small container to catch fuel flow from the fuel pump. Open the bleed screw on the fuel pump and allow it to run until steady stream of fuel flows, catching it in the container. Turn heater on after to check for fire. NOTE: Always install bypass plug in fuel pump when installing a new pump, or you will have to prime each time the tank runs dry.
6c. The fuel filter or fuel line fitting is plugged -- considerable air leak in inlet line or fitting.	6c. Check for or consider need for change of fuel filter -- check for fuel flow through outlet fitting on bottom of fuel tank. Sludge build-up over time can plug the fitting -- check inlet line, fittings and clamps for security and possible air leaks. If pump fails to prime after above replace fuel pump.

6d. Motor blowing spark away from fuel nozzle	6d. Adjust air settings on heater as needed
6e. Igniter damaged, or in contact with nozzle	6e. Reference Beckett manual to troubleshoot igniter damage. Ensure the igniter is not shorted to nozzle, as will result in no spark. Adjust Ignitor tips.
6f. Low fuel pump pressure.	6f. Check fuel pump pressure, adjust or replace it if needed. (Pressure should be checked by an authorized technician).
6g. Dirty fuel nozzle or igniter.	6g. Clean or Replace fuel nozzle, blow off fan and flame retention head around the igniter tips and fuel nozzle.
6h. Improper air adjustment setting.	6h. Adjust setting. White smoke = too much air, Black smoke = too little air.
6i. Ignitor tips are worn or out of place	6i. Use gauge or refer to Beckett Manual for ignitor spacing.
6j. Battery voltage too low	6j. Make sure battery is charged and blowers/ignitors are receiving 12.5+ volts. Low voltage can result in poor ignition.
6k. Ignitor failure	6k. While blowers are running and heater turned ON, remove two screws on the ignitor cover to observe spark from the springs to the electrodes. If nothing, allow ignitor to cool. If it is still not sparking, the ignitor may need to be replaced. Indicator light and igniter share the same power source.
6l. Blown fuse	6l. Check the red, 10A fuses in the rear heater control box. If damaged, replace. The 10A fuses run the ignitor, fuel solenoid, and indicator lights.
6m. Bad Fuel solenoid	6m. While running and heater turned ON, remove the black plug from the green fuel solenoid on the left side of the burner. Check the pins on the plug for voltage. Replace solenoid if there is voltage but no fuel getting through. Verify by removing fuel line between solenoid and burner.

7. Excessive smoke from exhaust stack.

NOTE: There are several causes for dirty fires of oil burners in general. Only the more likely or plausible reasons are noted.

Possible Cause	Solution
7a. Not enough combustion air, or too much combustion air.	7a. White smoke on startup, too much air, reduce adjustment band setting on burner housing. Black smoke on startup, not enough air, increase adjustment band setting on burner housing. Check system voltage. Less than 12.5v to the blowers will cause them to spin slower and provide less air flow. NOTE: Final burner adjustments are best made after the combustion chamber is hot. Wait five (5) minutes after startup for final adjustment.
7b. Poor grade of fuel -- dirty or restricted fuel supply -- loose fuel nozzle -- leak between fuel nozzle adapter and fuel pipe of ignitor assembly.	7b. Use only recommended fuels. Check for restricted fuel inlet to pump, or air leaks. Remove burner housing and check for a loose fuel nozzle or fuel nozzle adaptor and tighten. **NOTE: Just before a fuel filter, fuel nozzle screen, or a fuel pump internal filter screen plugs up, the burner will start smoking excessively**.
7c. High altitude -- unit manufactured at a lower elevation and shipped to elevation of 5,000 ft. or above.	7c. Change to a fuel nozzle approximately ¼ GPH smaller and increase fuel pump pressure by 15-25 PSI to make up for fuel loss with better atomization Replace with the same type of nozzle, “A” and “B” nozzle, and at the same angle. See optional tip in parts breakdown.
7d. Fuel pump pressure too low -- or too high for size and angle of fuel nozzle.	7d. Maintain fuel pump pressure between 100 PSI and 140 PSI. Pressures below 100 PSI may cause delayed ignition and dirty burns through collapsing of the fuel pattern. Pressures more than 140 PSI may provide more fuel for the size and angle of the fuel nozzle than the combustion area will allow.

8. Excessive fumes from exhaust stack. Does not smoke -- burns eyes, acrid smell.

Possible Cause	Solution
8a. Air adjustment band on burner open too wide.	8a. Close air band.
8b. Burner has been worked on and air handler parts altered.	8b. Do not change the size of the blower fan or remove retention head on the burner assembly. If the fuming condition is too excessive and cannot be removed by air band adjustment, contact Harvest Tec. NOTE: delayed ignition will also create excessive fumes.

9. Excessive temperature of discharge water.

Possible Cause	Solution
9a. T_in or T_out temperature sensors not working properly, system not receiving proper feedback	9a. If either temperature sensor is not functioning properly, replace. Observe for any inconsistent or improper readings.
9b. Water pump delivery volume has decreased.	9b. Maintain appropriate flow rate

10. Inadequate temperature rise of discharge water.

Possible Cause	Solution
10a. Inlet water supply cold.	10a. Too many BTUs required to achieve desired temperature. Reduce flow requirement. Run Warmup cycle at a high flow rate to increase temperature of supply tank.
10b. Heating coil closing off with scale	10b. See descaling instructions.
10c. Burners not firing efficiently or one burner not igniting.	10c. See “Burner motor runs, but burner will not ignite”.

11. Low voltage or amperage

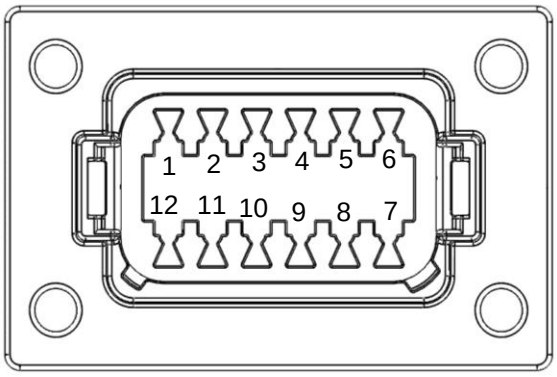
Possible Cause	Solution
11a. Loose Alternator belt, often accompanied by an audible squealing.	11a. Check belt tension. Tighten by removing alternator shield, loosening top adjustment bolt, and pulling out on alternator then, retightening top bolt. There should be minimal deflection in the belt.
11b. Alternator failure.	11b. If the alternator has experienced prolonged use while overheated it may be damaged and require replacement.
11c. Dead / weak battery	11c. If control has been left on, battery has been frozen, or prolonged testing without running the alternator/charging system, the battery may have been damaged. Use an external charger to slow-charge the battery, then load test it. If it fails the load test, it will need to be replaced to prevent damage to the alternator.
11d. Loose connections on power cables.	11d. Make sure power cables have good, clean connection and are tight on alternator studs, ammeter, and battery.

Pin Outs

Note: Plugs are viewed from the front side of the harness connection.

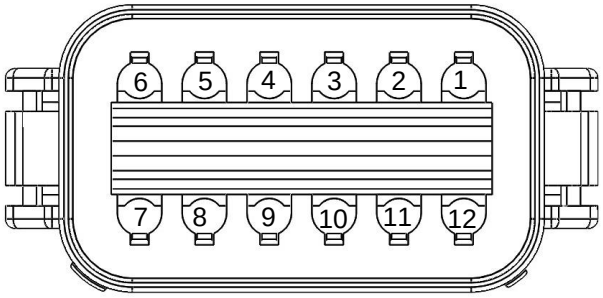
Connection to Cab Controller (DT04-12PA-L012)

Pin 1	Red	12v+ Bat Power IN
Pin 2	Black	Ground
Pin 3	Orange	12v+ Key Power
Pin 4	White	Arm Override +
Pin 5	Green	Heater 1 Relay -
Pin 6	Yellow	Heater 2 Relay -
Pin 7	Gray	Warmup Valve +
Pin 8	Yellow/White	Flow Meter Signal
Pin 9	Green/White	T_in Signal +
Pin 10	Blue/White	T_out Signal +
Pin 11	N/A	Plugged
Pin 12	N/A	Plugged



Cart Harness 006-7722A at drawbar (DT06-12SA)

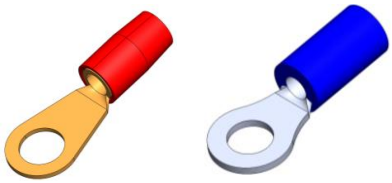
Pin 1	Red	12v+ Bat Power IN
Pin 2	Black	Ground
Pin 3	Orange	12v+ Key Power
Pin 4	White	Arm Override +
Pin 5	Green	Heater 1 Relay -
Pin 6	Yellow	Heater 2 Relay -
Pin 7	Gray	Warmup Valve +
Pin 8	Yellow/White	Flow Meter Signal
Pin 9	Green/White	T_in Signal +
Pin 10	Blue/White	T_out Signal +
Pin 11	N/A	Plugged
Pin 12	N/A	Plugged



Note: Cab Controller to Drawbar Harness (006-7722D) is a through-wire extension. Use pinouts from Cab Controller connection and Cart Harness (006-7722A) at drawbar for diagnostics.

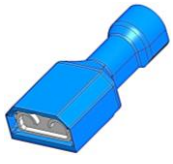
Power Connections (C)

Wire 1	Red	BAT_RELAY B
Wire 2	Black	BAT_GND
Wire 3	Orange	Key 12V+_BatR+
Wire 4	Black	BAT_GND_BatR-



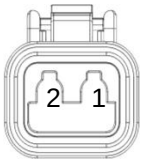
Fuel Gauge Connections (D)

Wire 1	Gray	Fuel_1-SEND
Wire 2	Brown	Fuel_2-SIG
Wire 3	Orange	KEY 12V+_FuelG
Wire 4	Black	BAT_GND_FuelG



Arm Switch (E) (DT06-2S)

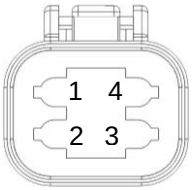
Pin 1	Orange	Key 12v+_ArmSw
Pin 2	White	Arm Switch +



Pin Outs (continued)

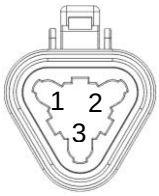
Heater Lights (F) (DT06-4S)

Note: This pinout also refers to the connections at the rear heater control between 006-722E and 006-722D



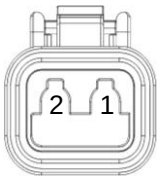
Pin 1	Red	H1 Light +
Pin 2	Black	H1 Light GND
Pin 3	Blue	H2 Light +
Pin 4	Black	H2 Light GND

Flow Meter (G) (DT06-3S)



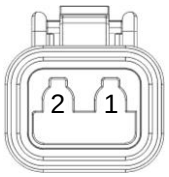
Pin 1	Orange	Key 12v+ to Flow
Pin 2	Black	Bat_GND to Flow
Pin 3	Yellow/White	Flow Sig+

PN Pump 1 (H) (DT06-2S)



Pin 1	Blue	PNP1_+
Pin 2	Purple	PNP1_-

PN Pump 2 (J) (DT06-2S)



Pin 1	Gray	PNP2_+
Pin 2	Brown	PNP2_-

Warmup Valve (K)

Pin A	Orange	Key 12v+_WarmV+
Pin B	Black	Bat_GND_WarmV
Pin C	Gray	WarmV_Sig+

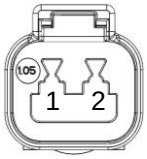
Reel Valve (L)

Pin A	Orange	Key 12v+_ReelV+
Pin B	Black	Bat_GND_ReelV
Pin C	White	ReelV_Sig+

Fuel Level Sender Connections (M)

Wire 1	Gray	Fuel_1-SEND
Wire 2	Brown	Fuel_2-SIG

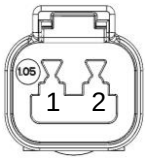
Temp In Sensor Assembly (N) (DT04-2P)



Pin 1	Orange	Key 12v+_T-in
Pin 2	Green/White	T_in Sig +

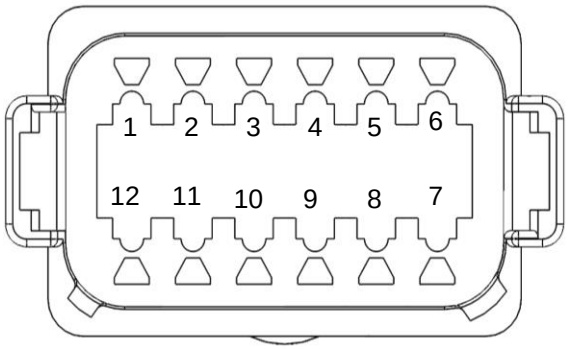
Pin Outs (continued)

Temp Out Sensor Assembly (O) (DT04-2P)



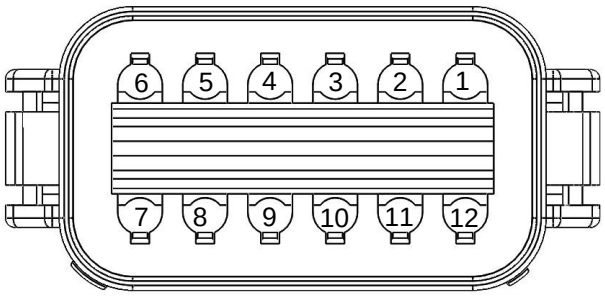
Pin 1	Orange	Key 12v+_T-out
Pin 2	Blue/White	T_out Sig +

Rear Controller plug (P) at main harness (DT04-12PA)



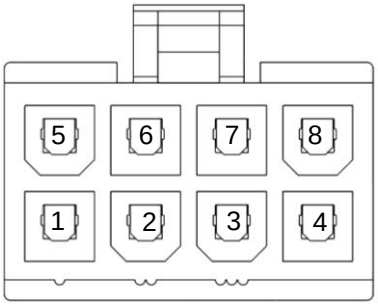
Pin 1	Purple	PNP1_-
Pin 2	Brown	PNP2_-
Pin 3	Orange	Key_12V+ to RearC
Pin 4	White	ReelV_Sig+
Pin 5	Green	H1R_GND
Pin 6	Yellow	H2R_GND
Pin 7	Gray	WarmV_ON
Pin 8	N/A	N/A
Pin 9	Red	H1 Light+
Pin 10	Black	H1 Light GND
Pin 11	Blue	H2 Light +
Pin 12	Black	H2 Light GND

Rear Controller IN (006-722D) (DT06-12SA)



Pin 1	Purple	PNP1_-
Pin 2	Brown	PNP2_-
Pin 3	Orange	Key_12V+ Key
Pin 4	White	ReelV_Sig+
Pin 5	Green	H1R_GND
Pin 6	Yellow	H2R_GND
Pin 7	Gray	WarmV_ON
Pin 8	N/A	N/A
Pin 9	Red	H1 Light+
Pin 10	Black	H1 Light GND
Pin 11	Blue	H2 Light +
Pin 12	Black	H2 Light GND

Rear Control IN internal wiring (006-722D) (Molex 39012080)

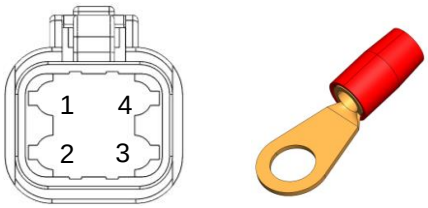


Pin 1	Orange	12V+ Key
Pin 2	White	ReelV +
Pin 3	Green	H1R -
Pin 4	Yellow	H2R –
Pin 5	N/A	N/A
Pin 6	Purple	PNP1_-
Pin 7	Brown	PNP2_-
Pin 8	Gray	WarmV +
	Red	HC 12V+
	Black	HC GND

Pin Outs (continued)

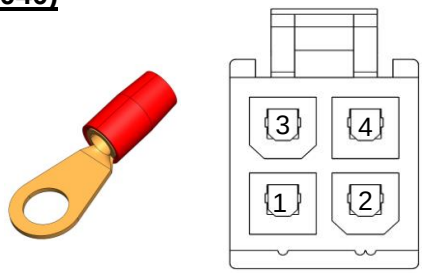
High Current Harness (006-7722B) (DTP06-4S)

Pin 1	Red	HC_12V+
Pin 2	Red	HC_12V+
Pin 3	Black	HC_GND
Pin 4	Black	HC_GND



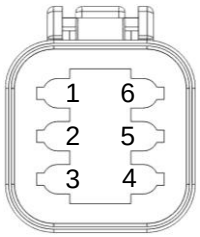
Rear Control OUT internal wiring (006-722D) (Molex 39012040)

Pin 1	Red	H1_Fuel/Ignite
Pin 2	White	Flow Switch IN
Pin 3	Blue	H2_Fuel/Ignite
Pin 4	Black	Flow Switch OUT
	Red	HC 12v+ Out
	Black	HC GND Out



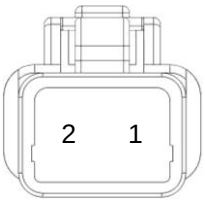
Fuel / Igniter for H1 and H2 (006-722D) (DT06-6S)

Pin 1	Red	H_Ignite + (1)
Pin 2	Red	H_Ignite + (2)
Pin 3	Red	H_Fuel +
Pin 4	Black	H_Ignite GND
Pin 5	Black	H_Fuel GND
Pin 6	N/A	



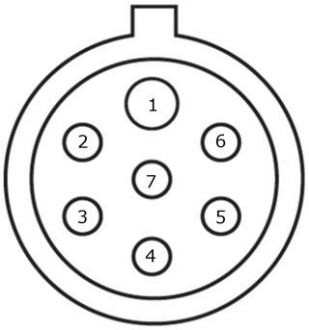
H1 / H2 Motor (006-722D) (DTP06-2S)

Pin 1	Red	H_Motor +
Pin 2	Black	H_Motor GND



Cart Light Harness (006-7722C) at drawbar

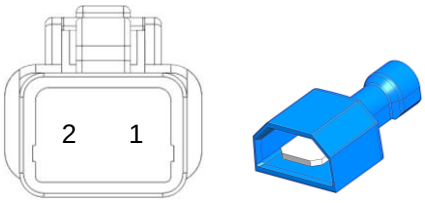
Pin 1	Blue	Ground
Pin 2	Black	Work
Pin 3	Yellow	LH Flash
Pin 4	Red	Auxiliary+
Pin 5	Green	RH Flash
Pin 6	Brown	Tail Lamp
Pin 7	N/A	N/A



Pin Outs (continued)

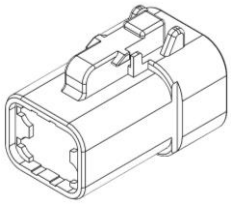
Tee Harness – Blower Fan (006-7722L)

Pin 1	Orange	H1_MTR 12V+
Pin 2	Black	H1_MTR GND
MQC	Orange	Fan 12V+
MQC	Black	Fan GND



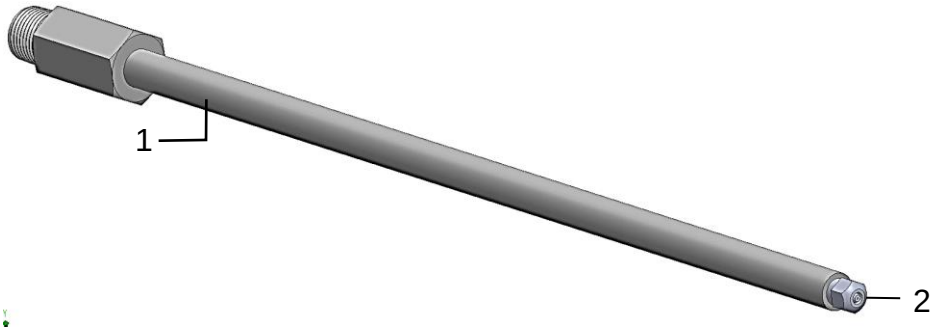
Perimeter Nozzle Control to Drawbar Harness (006-7717) (optional) (DTP06-4S)

Pin 1	Red	PN_Bat_12V+
Pin 2	Black	PN_Bat_Gnd
Pin 3	Blue	PNP1_+
Pin 4	Gray	PNP2_+



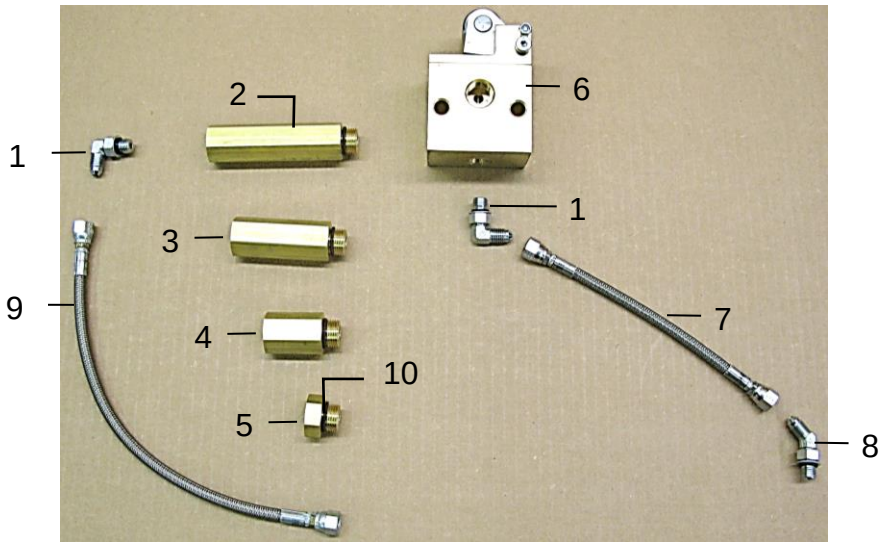
Parts Breakdown

Tine Assembly



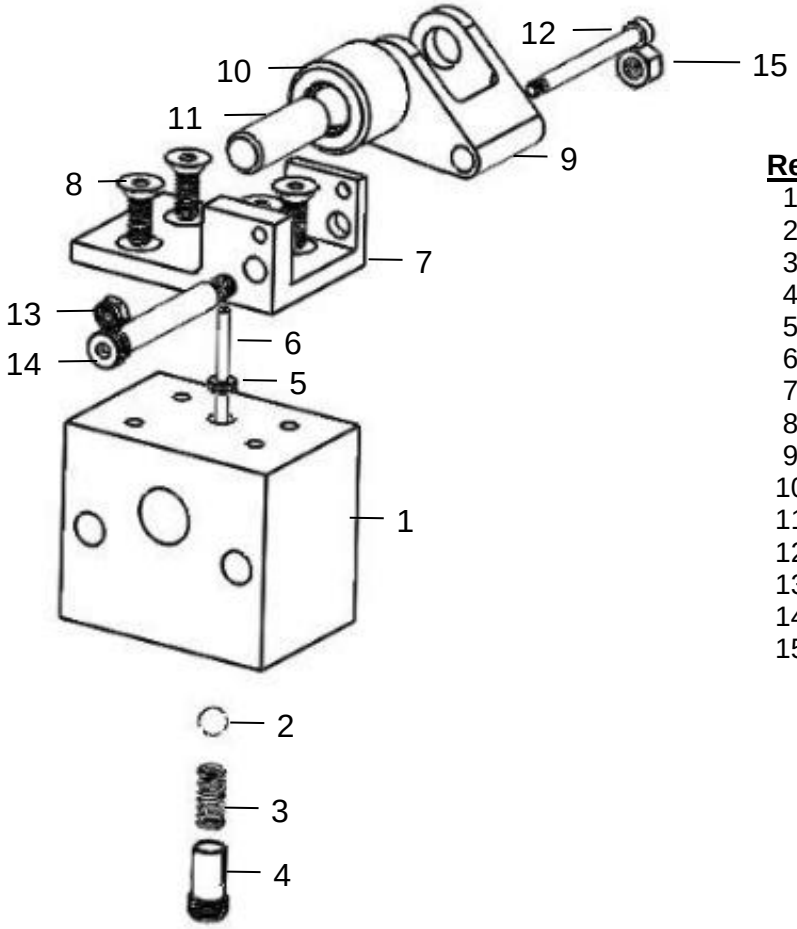
Ref	Description	Part #	Qty
1	Tine Assembly	001-7202	69
2	Tip for Tines (MW11)	004-7125	69
NP	Tip for Tines (MW5)	004-7123	
NP	½” NPT Plug	003-DSP12	20

Valve Assembly



Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	Elbow 1/4" x 1/4”	003-DS1414EL	20	6	Valve Assembly	001-7204	10
2	3 3/4” Brass Standoff	001-7105D	4	7	Valve Hose 8”	002-7204A	10
3	2 5/8” Brass Standoff	001-7105C	6	8	45 Deg Elbow 1/4x1/4"	003-DS1414EL45	10
4	1 1/2” Brass Standoff	001-7105B	6	9	Valve Hose 12.5”	002-7204B	10
5	3/8” Brass Standoff	001-7105A	4	10	O-Ring	001-7105G	20

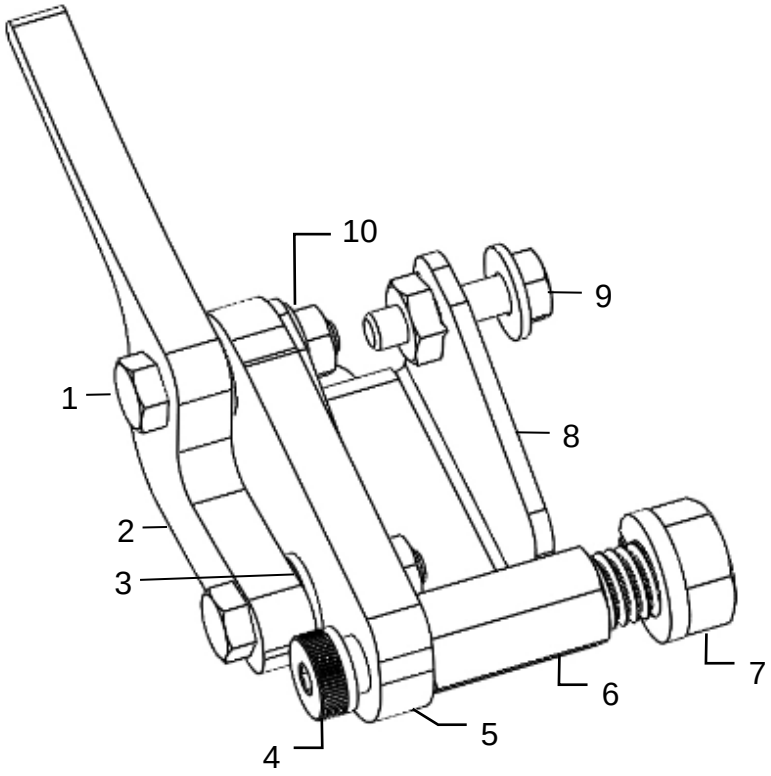
Valve Assembly Exploded View



Ref	Description	Part #	Qty
1	Valve Block	001-7204VD	1
2	Valve Ball	001-7104VF	1
3	Valve Spring	001-7104VG	1
4	Spring Retainer	001-7104VH	1
5	Quad Ring	001-7104VL	1
6	Plunger Pin	001-7104VE	1
7	Valve Plate	001-7204VB	1
8	Valve Screws	001-7204VK	4
9	Roller Bracket	001-7104VA	1
10	Roller	001-7204VI	1
11	Roller Pin	001-7204VJ	1
12	Stop Pin	001-7204VC	1
13	Stop Pin Nut	8-32 Nylock Nut	1
14	Pivot Pin	001-7204VB-2	1
15	Pivot Pin Nut	1/4"-20 Nylock Nut	1

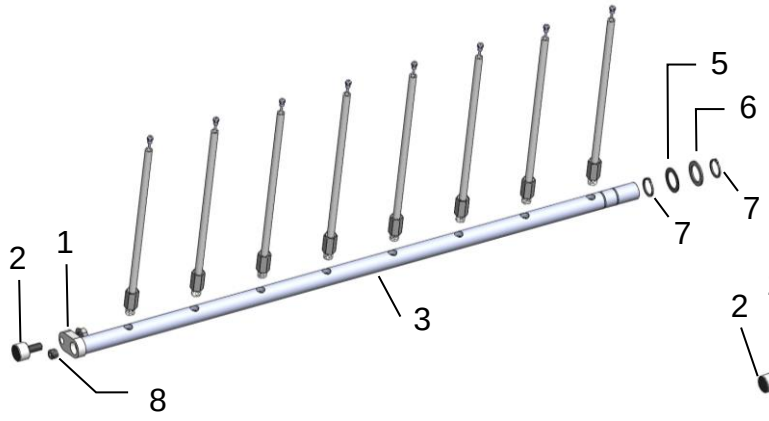
Valve Rebuild Kit 001-7204R
(Ref 2-6,12,14)

Valve Trip Assembly

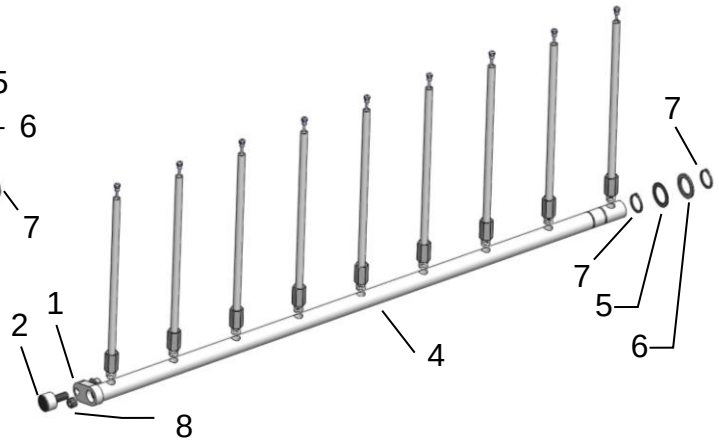


Ref	Description	Part #	Qty
1	Flange Bolt 1/4-20x1-1/4	Hardware	2
2	Trip Outline	001-7210C	1
3	1/4” Flat washer	Hardware	2
4	Shoulder Bolt	001-7210D	1
5	Trip Inside	001-7210B	1
6	5/16” – 1/2" Standoff	001-7210E	1
7	1/2-13x1 Flange Bolt	Hardware	1
8	Trip Bracket	001-7210FA	1
9	1/4-20x1 Flange Bolt	Hardware	1
10	1/4-20 Flange Nut	Hardware	2

Cross Tube Assemblies



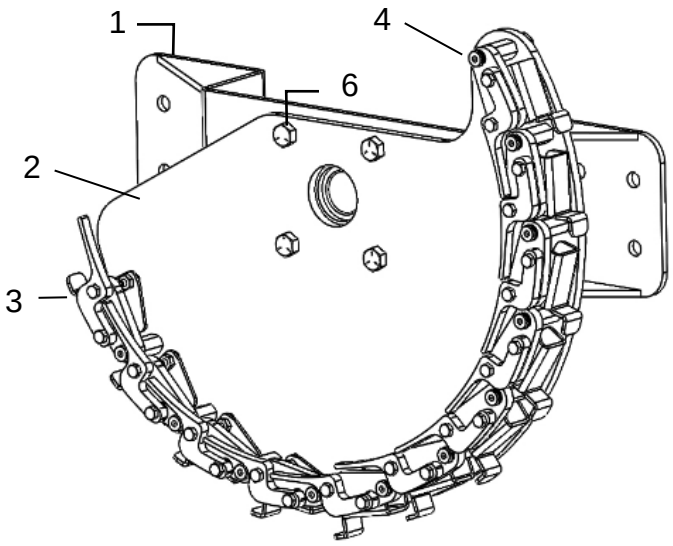
8-Tine Cross Tube Assembly (x5)



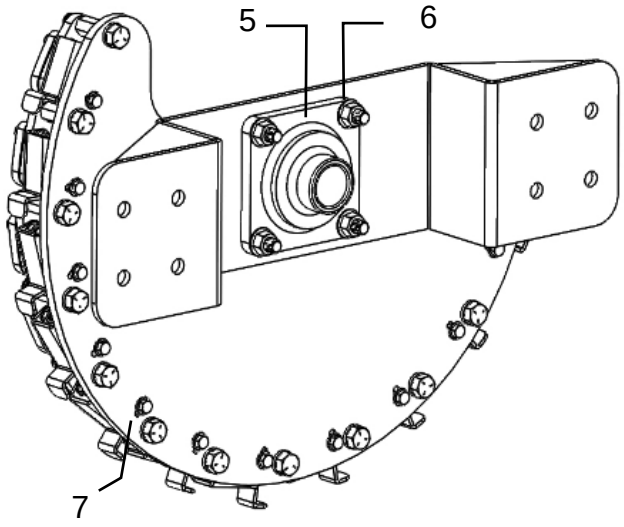
9-Tine Cross Tube Assembly (x5)

Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	Cam Grease Zerk	008-7121Z	1	5	Washer Thin .063”	001-7243D	1
2	1 1/2” Cam Bearing	008-7121	1	6	Washer Thick .125”	001-7243E	1
3	8-Tine X-Tube	001-7207	1	7	1 1/2" Snap Roto Clip	008-4577	2
4	9-Tine X-Tube	001-7206	1	8	½” NPT Plug	003-DSP12	1

Trip Assembly



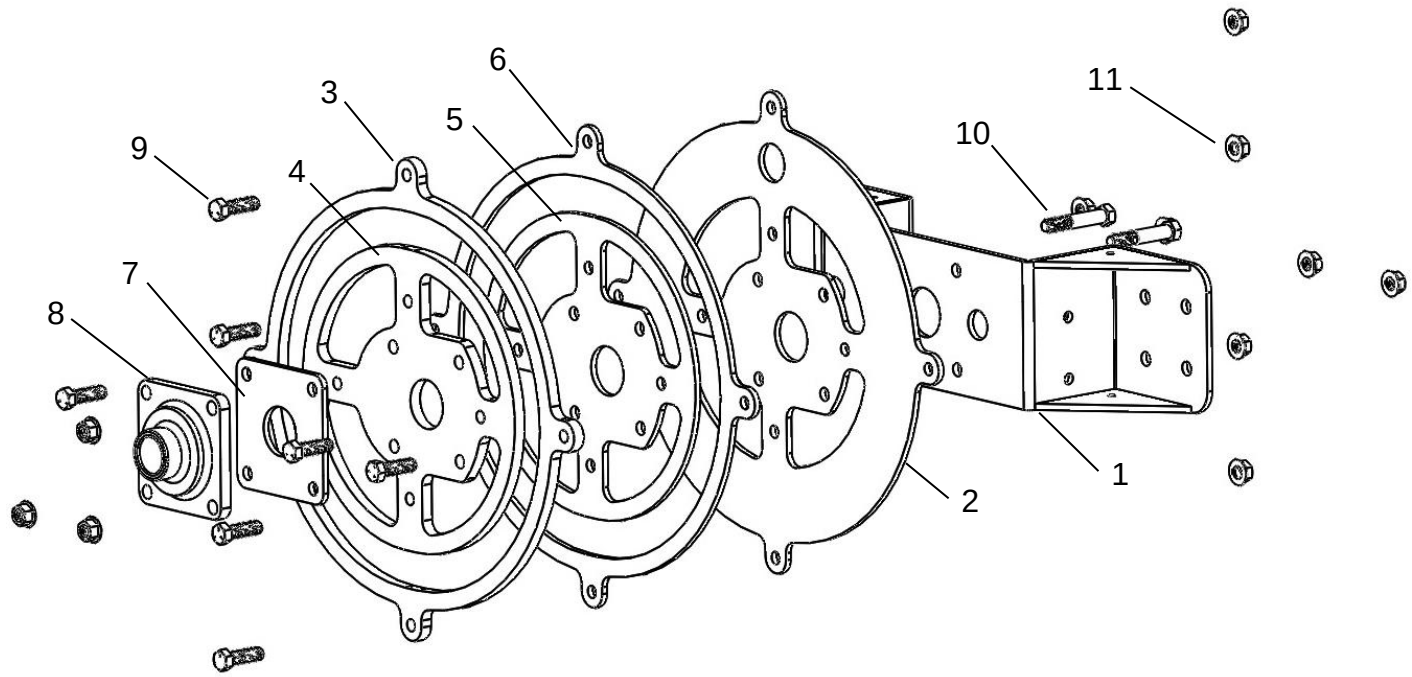
Inside View



Outside View

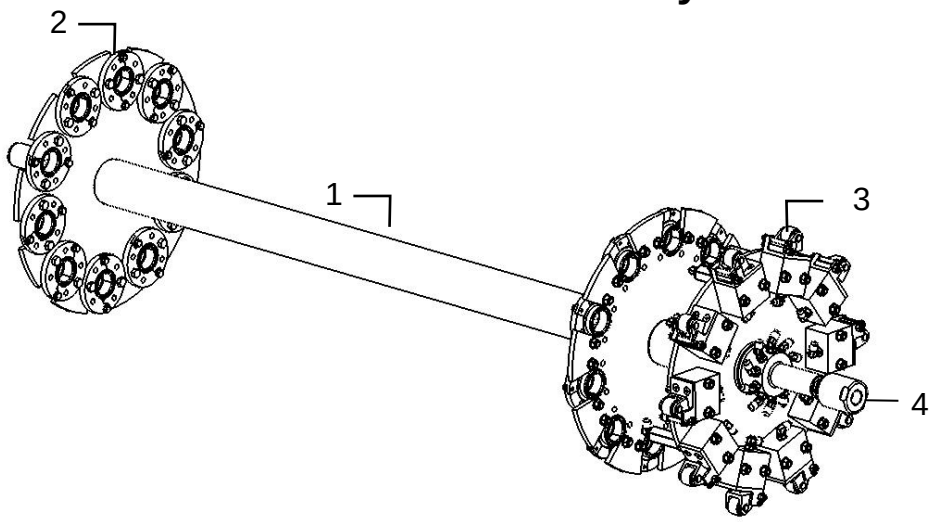
Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	Valve Side Bracket	001-7208	1	5	1 ½” Bearing 4 Bolt	008-7137	1
2	Trip Plate	001-7210A	1	6	1/2-13 x 2” Flange Bolt	Hardware	4
3	Valve Trip Assembly	Previous pg.	11	6	1/2-13 Flange Nut	Hardware	4
4	Shoulder Bolt SS	001-7210D	11	7	¼ x 1” Adjustment Bolt	Hardware	11

Cam Mount Assembly



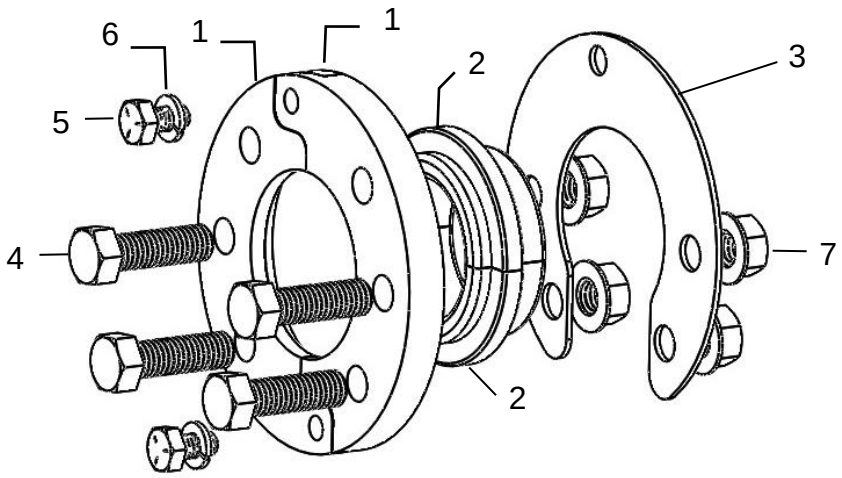
Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	Cam Side Bracket	001-7209	1	8	1 1/2" Bearing 4-Bolt	008-7137	1
2	Cam Track Back Plate	001-7203A	1	9	1/2-13 x 1 3/4" Flange Bolt	Hardware	8
3	Cam Track Outside Ring ½”	001-7203B	1	10	1/2-13 x 3” Flange Bolt	Hardware	4
4	Cam Track Inner Ring ½"	001-7203C	1	11	1/2-13 Flange Nut	Hardware	12
5	Cam Track Inner Ring ¼”	001-7203D	1				
6	Cam Track Outer Ring ¼"	001-7203E	1				
7	Cam Track Bearing Spacer	001-7203F	1				

Reel Dumbbell Assembly



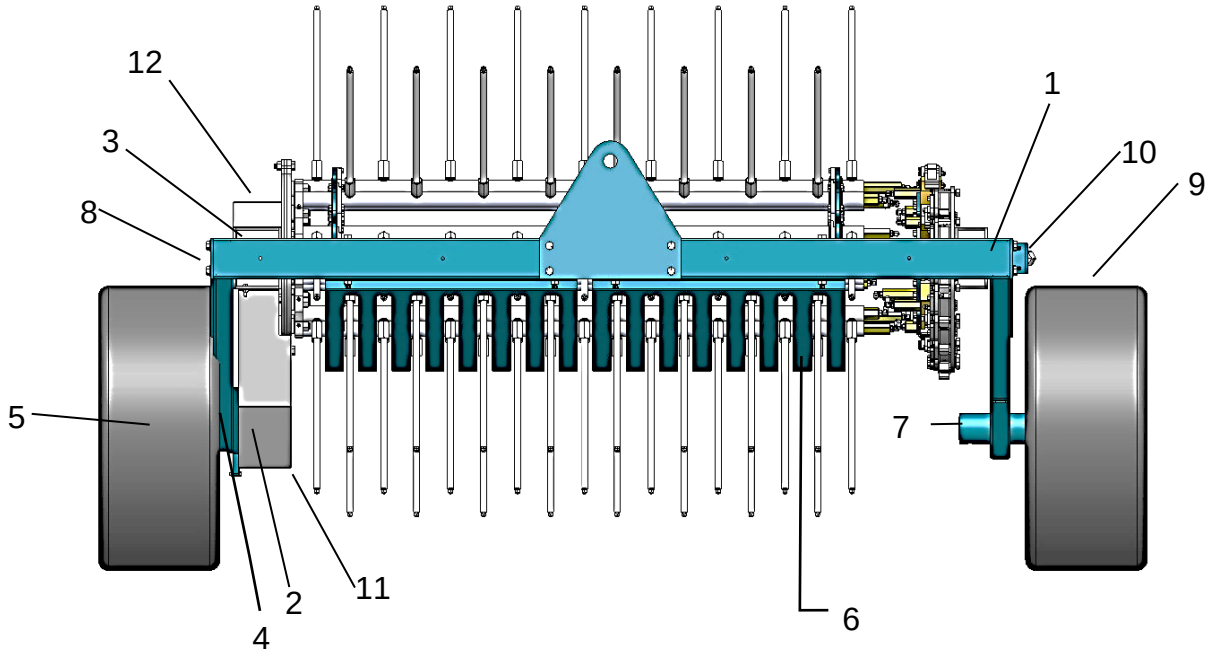
Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	Reel Dumbbell	001-7201	1	3	Valve Assem	001-7204	10
2	X-Tube Bearing Assm-Refer to Parts Bkd.		40	4	Inline Swivel	001-7222	1
				NP	Swivel Rebuild	001-7222RBK	

X-Tube Bearing Assembly



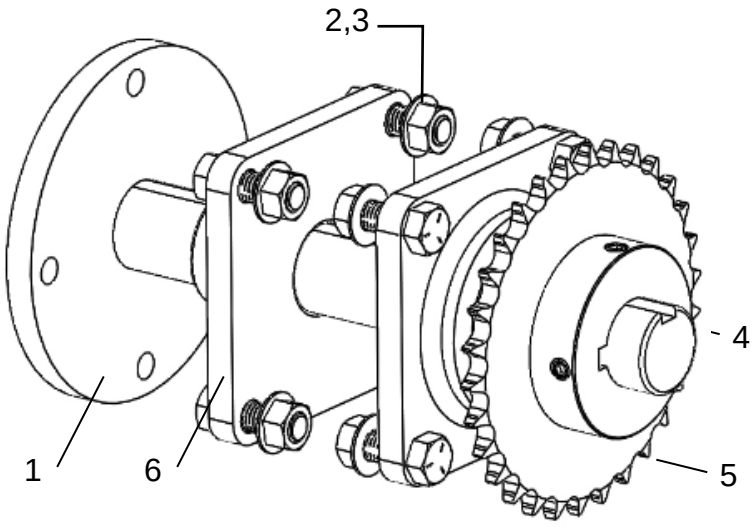
Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	X-Tube Holder	001-7243A	2	4	3/8”-16 x 1 1/4" Flange Bolt	Hardware	4
2	X-Tube Insert	001-7243B	2	5	1/4"-20 x 1/2" Hex Bolt	Hardware	2
3	X-Tube bearing Plate	001-7243C	1	6	1/4" Lock Washer	Hardware	2
				7	3/8”-16 Flange Nut	Hardware	4

Reel Assembly



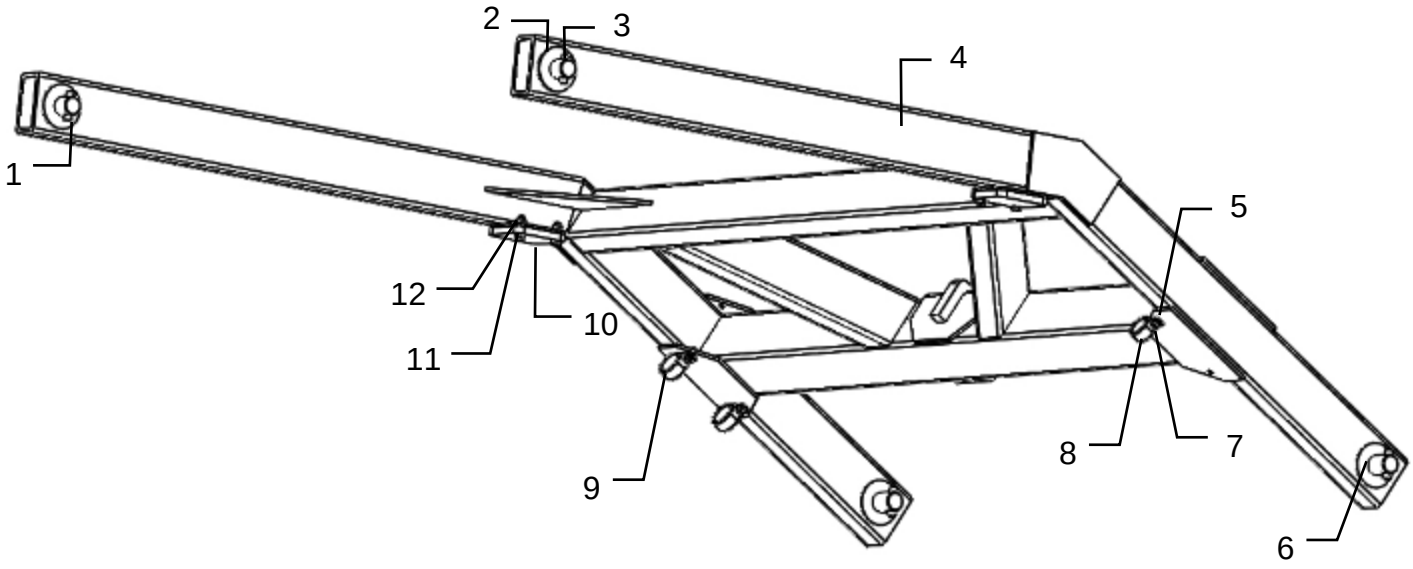
Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	Reel Frame Assembly	001-7218	1	11	Chain Shield	001-7233	1
2	1 ½” Drive Sprocket 26T	001-7124C	1	12	Top Chain Shield	001-7233B	1
3	1 ½” Cam Sprocket 30T	001-7124B	1	NP	Rim - 8 Bolt	008-7130XL	2
4	1 ½” Bearing Bolt-on	008-7137	2	NP	Lug Bolts ½-20	008-7130B	16
5	Drive Hub Assembly		1	NP	Roller Chain #50 - 40 link	008-7142	1
6	Windguard Assembly	001-7217	2	NP	Roller Chain Splice #50	008-7142A	1
7	Spindle Hub Assembly	001-7218B	1	NP	Roller Chain 1/2 Link #50	008-7142B	1
8	Reel Backing Plate	001-7209E	4	NP	Key 3/8” x 3/8” x 1 ½”	001-7124D	1
9	Reel Tire	008-7139XL	2	NP	Floating Chain Tensioner	001-7209FRCT	1
10	Swivel Jaw Bracket	001-7232	1	NP	Floating Tensioner Straps	001-7209FTS	2

Drive Hub Assembly



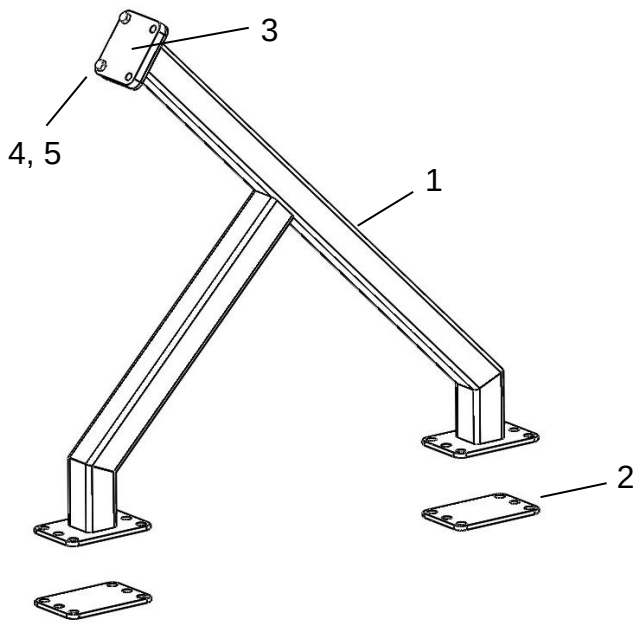
Ref	Description	Part #	Qty
1	Drive Wheel Shaft	001-7341	1
2	1/2-13 Flange Bolts	Hardware	8
3	1/2-13 Flange Nuts	Hardware	8
4	Key 3/8x3/8x1-1/2	001-7124D	1
5	Drive Sprocket 26T	001-7124C	1
6	1-1/2” Bearing	001-7137	2

Lift Arm Assembly



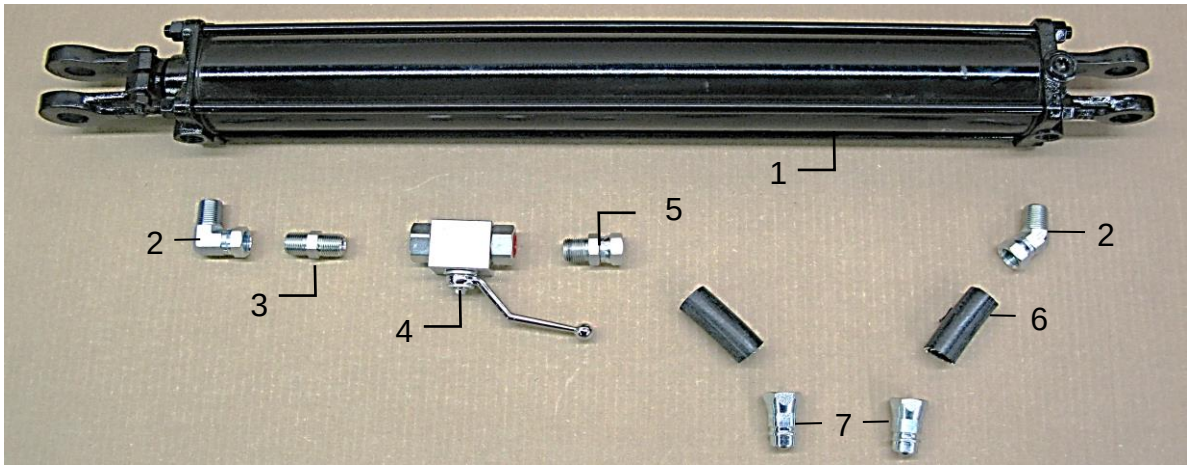
Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	Reel Pin	001-7216A	2	7	5/16”-18 Flange bolt	Hardware	2
2	Thrust Bushing	008-7146B	8	8	1” Jiffy Clip	008-9009	4
3	Zinc Roll Pins	001-7144	8	9	1 ½” Jiffy Clip	008-9112	2
4	Lift Arm Assembly	001-7211	1	10	Lift Arm Bumper	001-7223B	2
5	5/16-18 Flange nut	Hardware	2	11	3/8-16 Flange bolt	Hardware	4
6	Cart Pin	001-7216B	2	12	3/8-16 Flange nut	Hardware	4

Lift Arm Support Assembly



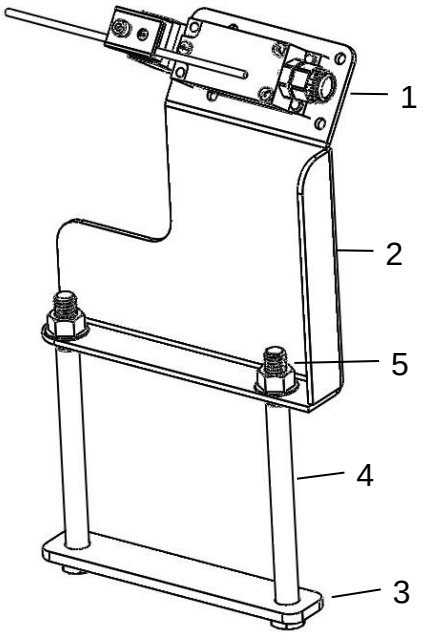
Ref	Description	Part #	Qty
1	Lift Arm Support	001-7323	1
2	Lift Arm Support Plate	001-7223A	2
3	Rubber Bumper	001-7223B	1
4	3/8”-16 x1 ¼” Flange Bolt	Hardware	2
5	3/8”-16 Flange Nut	Hardware	2
NP	1/2"-13x5” Flange Bolt	Hardware	6
NP	1/2"-13 Flange Nut	Hardware	6

Hydraulic Cylinder Assembly



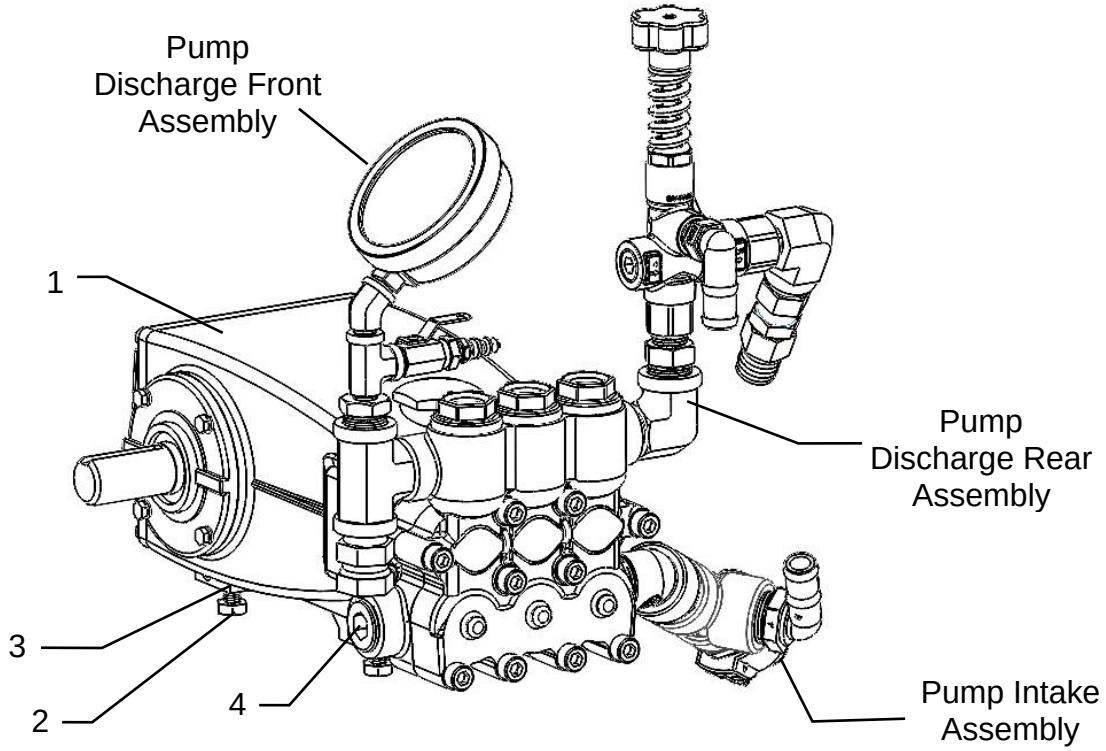
Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	3”x24” Hydraulic Cylinder	008-7132	1	5	Restrictor	003-9716	1
2	1/2" Swivel Elbow	003-DSEL1212	2	6	1/2” Hydraulic Hose 14’	002-9714	2
3	1/2" Nipple	003-DSM1212	1	7	Pioneer Coupler	003-9715	2
4	Ball Valve	002-2221	1				
5	Restrictor	003-9716	1				

Limit Switch Assembly



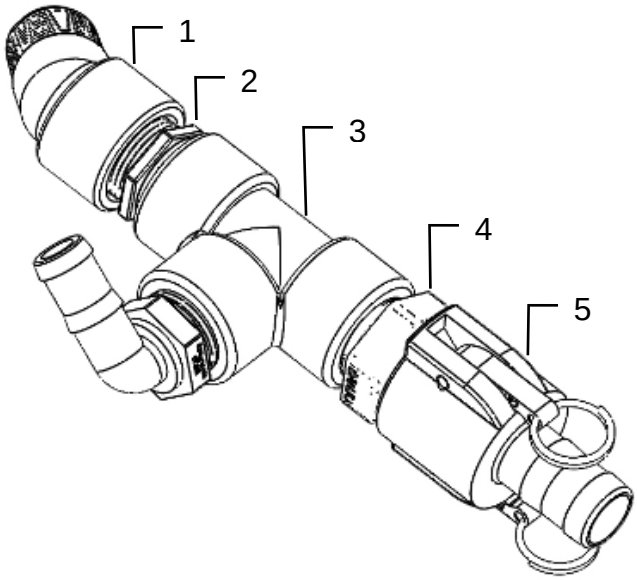
Ref	Description	Part #	Qty
1	Limit Switch Lift Arm	006-7200LS	1
2	Limit Switch Bracket	001-7221	1
3	Nozzle Backing Plate	001-7225	1
4	3/8”-16 x 5” Bolt	Hardware	2
5	3/8”-16 Flange Nut	Hardware	2

Pump Assembly



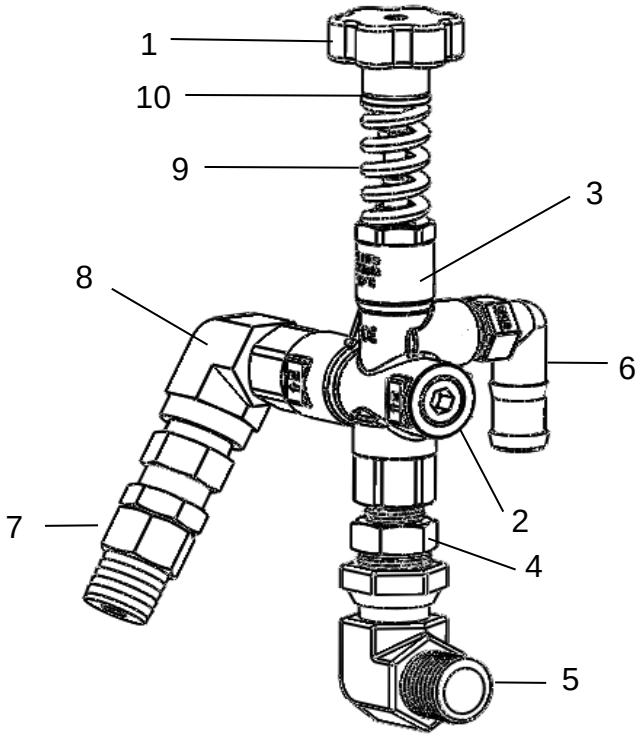
Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	720 Main Pump	007-7227	1	NP	Key M8x7x40	007-7227B	1
2	M10x1.0x25mm	Hardware	4	NP	PTO Shaft Cover	007-7227C	1
3	M10 Lock washer	Hardware	4	NP	PTO Driveline	008-7226	1
4	1” Pump Plug	003-DSP100	1	NP	Pump Oil	009-7227oil	2

Pump Intake Assembly



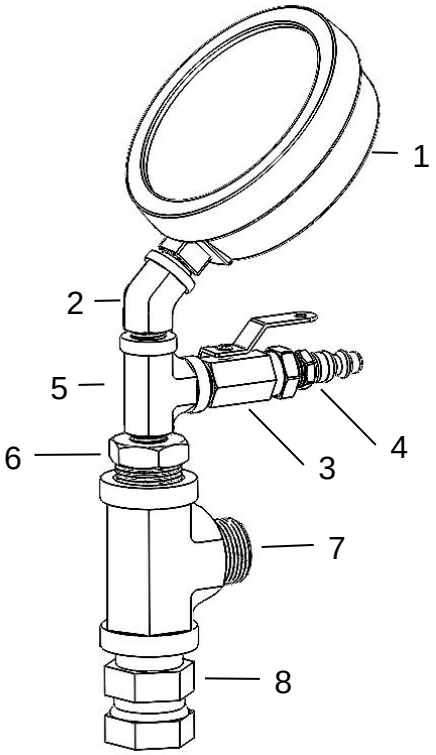
Ref	Description	Part #	Qty
1	45 Deg Street Elbow 1”	003-SE45100HP	1
2	1” Nipple	003-M100100HP	1
3	1” Tee	003-TT100HP	1
4	Male Coupler	002-2204O	1
5	1”x1” Female Coupler	002-2205J	1
6	1” NPT x ¾” HB Elbow	003-EL10034HP	1

Pump Rear Assembly



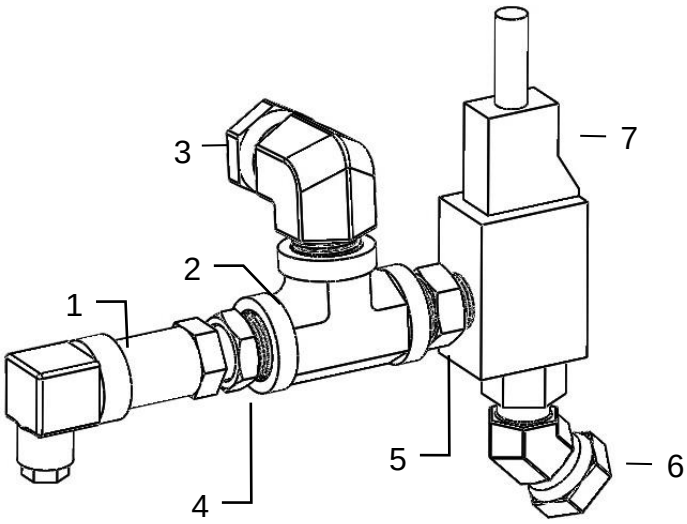
Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	Unloader Knob	002-7135L	1	6	½ x ¾” Elbow HB	003-EL1234HP	1
2	½” Regulator Plug	003-DSP12	1	7	Pop-Off Valve	002-7132	1
3	Unloader Valve	002-7133	1	8	½ x ¾” Street Elbow	003-DSSE1234	1
4	¾ x ½” Nipple	003-DSM3412	1	9	Regulator Spring	002-7133SP	1
5	¾” Swivel Elbow	003-DSEL3434S	1	10	Spring retainer washer	002-7133SRT	1

Pump Discharge Front



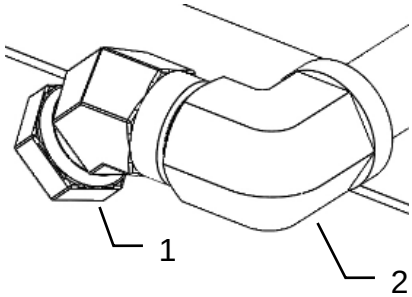
Ref	Description	Part #	Qty
1	4” Gauge (1500 PSI)	002-7236	1
2	¼ x ¼” St Elbow (45 Deg.)	003-DSSE4514	1
3	Valve – ¼” NPT M x F	002-2222	1
NP	Air Lock	001-7211E	1
4	Quick Disconnect Coupler	003-A1414AP	1
5	¼” Branch Tee	003-DSSETT14	1
6	¾ x ¼” Reducer Bushing	003-DSRB3414	1
7	¾” Branch Tee	003-DSBT34	1
8	¾ x ¾” Swivel	003-DSM3434S	1

H1 Inlet Assembly

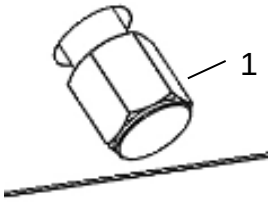


Ref	Description	Part #	Qty
1	Temperature Probe	006-4732	1
2	¾” Tee	003-DSTT34	1
3	¾” 90 Deg Swivel Elbow	003-DSEL3434S	1
4	¾ x ½” Reducer	003-DSRB3412	1
5	¾ x ½” Nipple	003-DSM3412	1
6	Flow Switch	006-4731	1
7	½ x ¾” 45 Deg Elbow	003-DSEL1234S	1

H1 Outlet Assembly



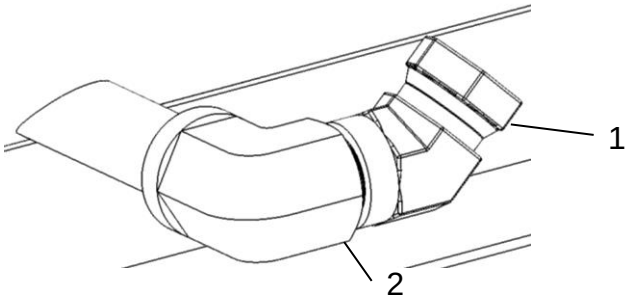
Ref	Description	Part #	Qty
1	¾” 90 Deg St Elbow	003-DSSE34	1
2	¾” 45 Deg Swivel	003-DSSE4534S	1



H1 Teeport Plug

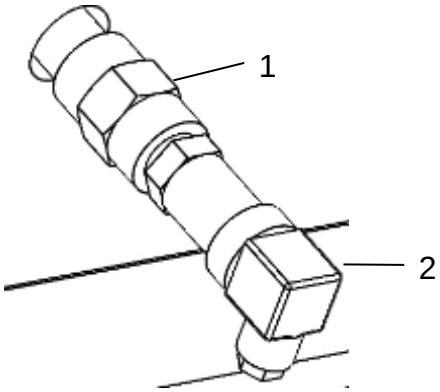
Ref	Description	Part #	Qty
1	¾" Female Plug	003-DSP34F	1

H2 Inlet Assembly



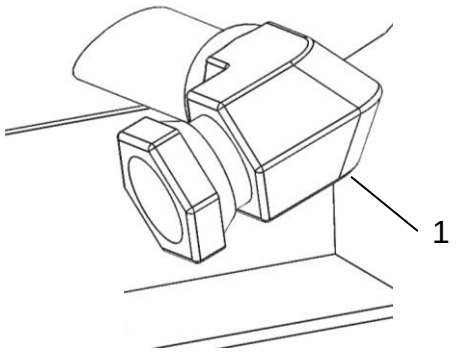
Ref	Description	Part #	Qty
1	¾" 45 Deg Swivel	003-DSSE4534S	1
2	¾" 90 Deg St Elbow	003-DSSE34	1

H2 Teeport Sensor



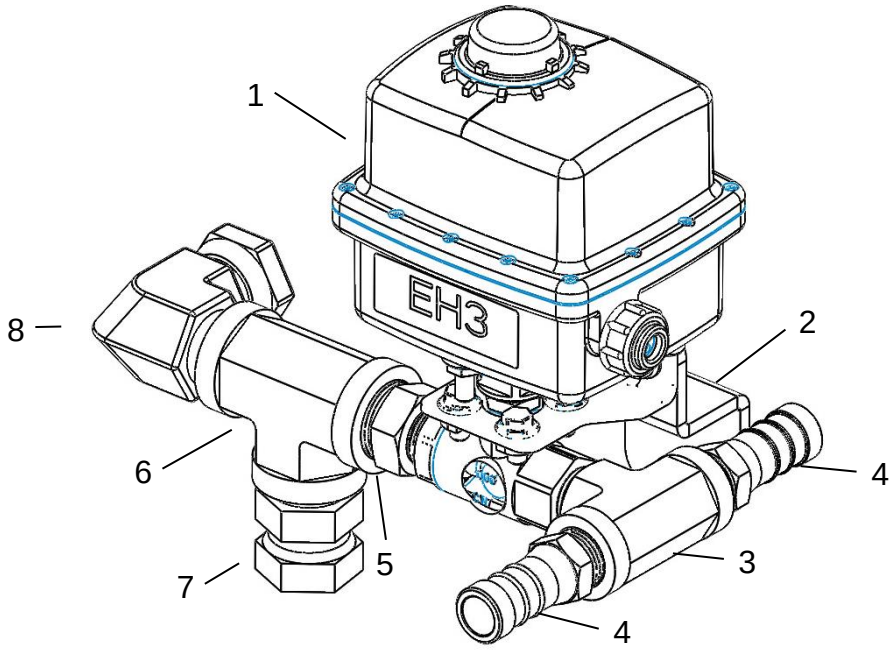
Ref	Description	Part #	Qty
1	¾ x ½" Nipple	003-DSM3412F	1
2	Temp Probe	006-4732	1

H2 Outlet Assembly



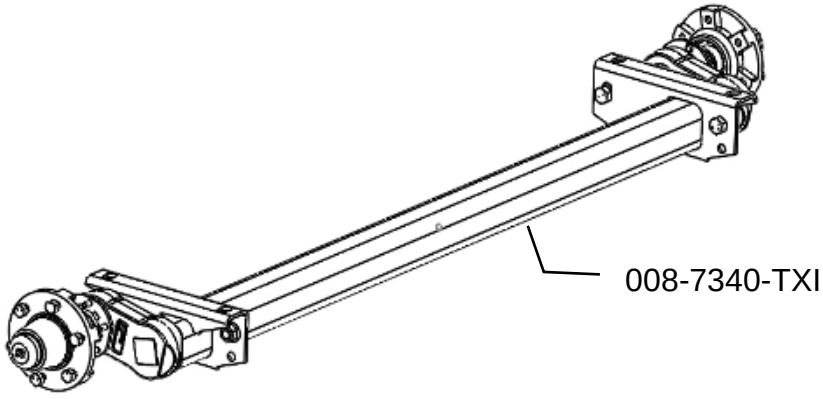
Ref	Description	Part #	Qty
1	¾" 90 Deg Swivel Elbow	003-DSSE3434FS	1

Warmup Valve Assembly

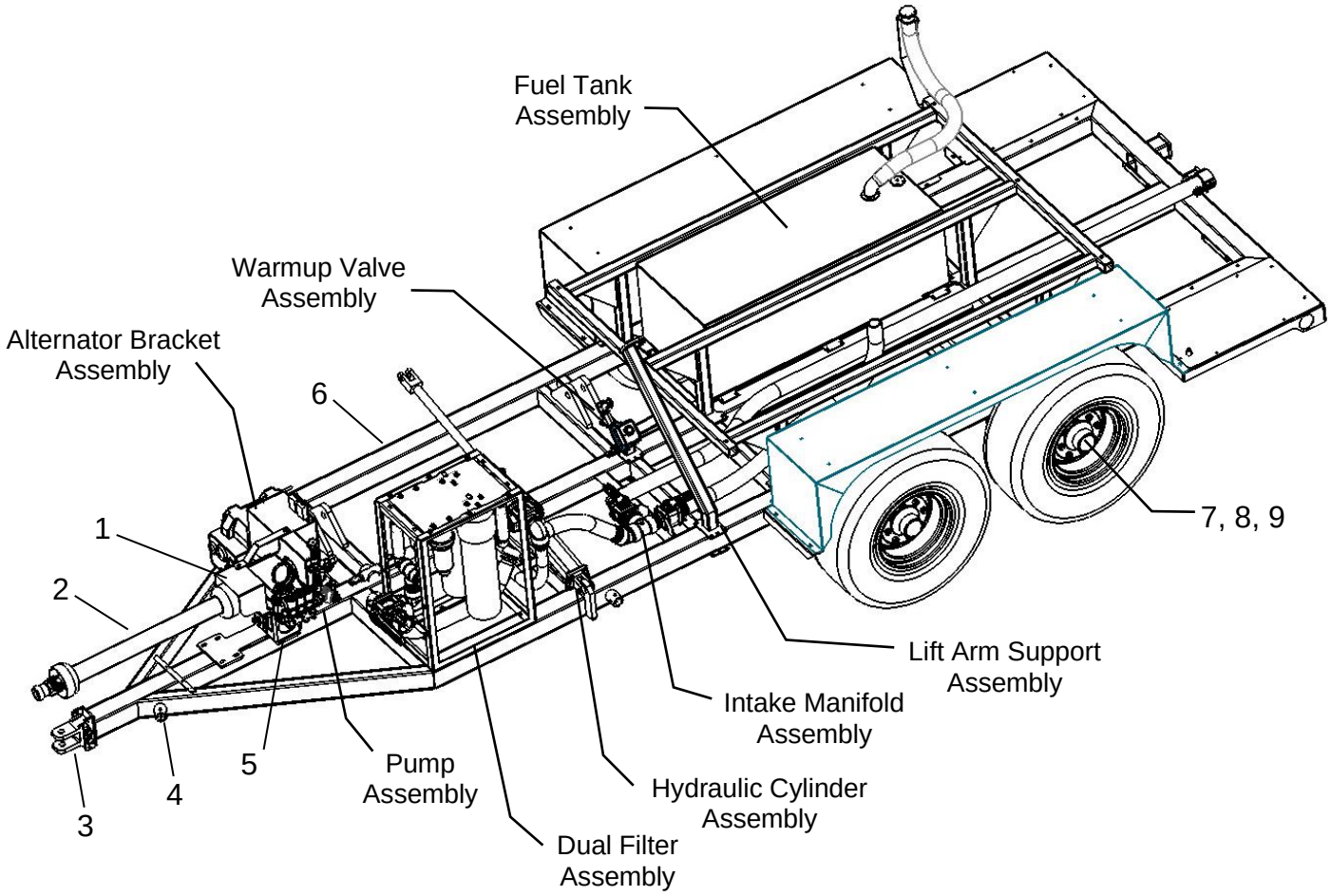


Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	½” Ball Valve	002-2203DV	1	6	¾” Tee FxFxF	003-DSTT34	1
2	Warmup Valve Bracket	001-7320WU	1	7	¾ x ¾” Swivel	003-DSM3434S	1
3	½” Tee FxMxF	003-DSBT12	1	8	¾” 90deg Swivel Elbow	003-DSEL3434S	1
4	½ MPT x ¾” HB	003-DS1234	2	NP	1/4-20 x ¾” Flange Bolt	Hardware	2
5	¾ x ½” Nipple	003-DSM3412	1	NP	1/4-20 Flange Nut	Hardware	2

Torsion Axle

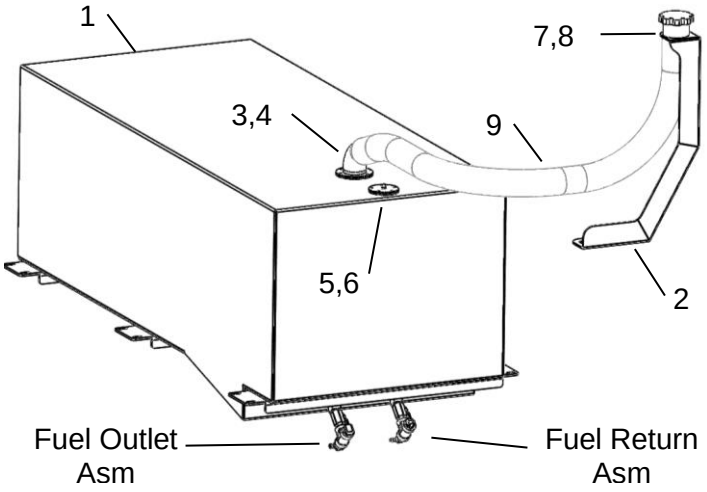


Cart Frame



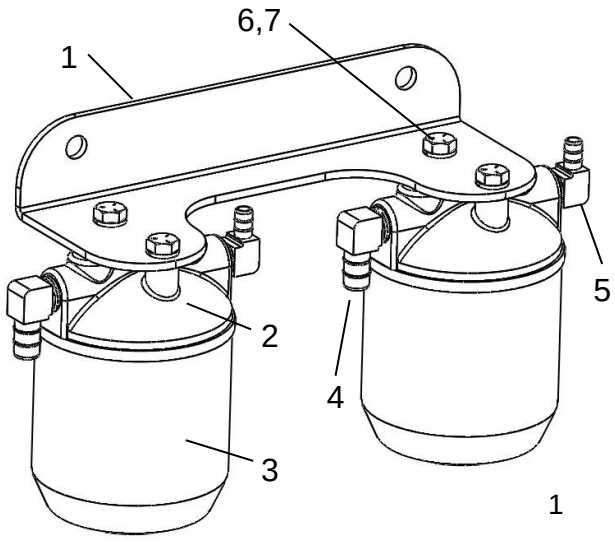
Ref	Description	Part #	Qty	Description	Part #	Qty
1	PTO Shield	001-7248	1	Pump Assembly	See Breakdown	1
2	PTO Driveline	008-7226	1	Dual Filter Assembly	See Breakdown	1
3	Clevis Hitch	001-7219A	1	Hydraulic Cylinder Asm	See Breakdown	1
4	Jack 5000#	008-7133	1	Intake Manifold Asm	See Breakdown	1
5	Pump Bracket	001-7220A	1	Lift Arm Support Asm	See Breakdown	1
6	Cart Frame Assembly	001-7320	1	Alternator Bracket Asm	See Breakdown	1
7	Torsion Idler Axle	008-7340-TXI	2	Warmup Valve Asm	See Breakdown	1
8	8 on 8” Rim	008-7331	4	Fuel Tank Asm	See Breakdown	1
9	Cart Tire	008-7240H	4			

Fuel Tank Assembly



Ref	Description	Part #	Qty
1	Fuel Tank	001-7312	1
2	Fuel Filler Bracket	001-7312K	1
3	70deg Fillneck 2”	001-7312E	2
4	Fillneck Gasket	001-7312H	1
5	Fuel Sending Unit	001-7312SU	1
6	Sending Unit Gasket	001-7312SUG	1
7	Top Fillneck	001-7312D	1
8	Diesel Cap	001-7312L	1
9	2” Softwall Hose 48”	001-7312J	1
NP	2” Hose Clamp	003-9006	2
	Fuel Outlet Asm		1
	Fuel Return Asm		1

Fuel Filter Assembly

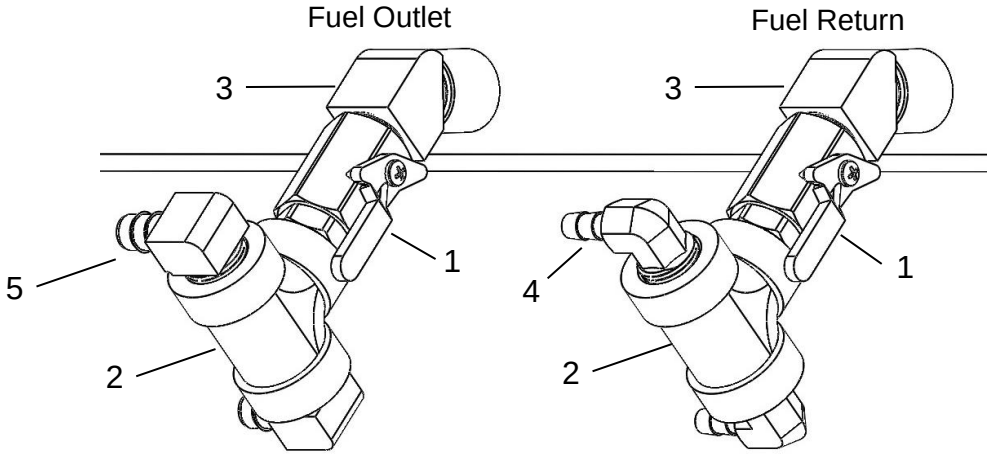


Ref	Description	Part #	Qty
1	Fuel Filter Bracket	001-7312K	1
2	Fuel Filter Base	007-7209B	2
3	Fuel Filter Element	007-7209FFE	2
4	¼ x 3/8” Fuel Elbow	003-EL1438BF	2
5	¼ x ¼” Fuel Elbow	003-EL1414BF	2
6	¼-20 x ½” Hex Bolt	Hardware	4
7	¼” Lock Washer	Hardware	4

007-7208FFA 1

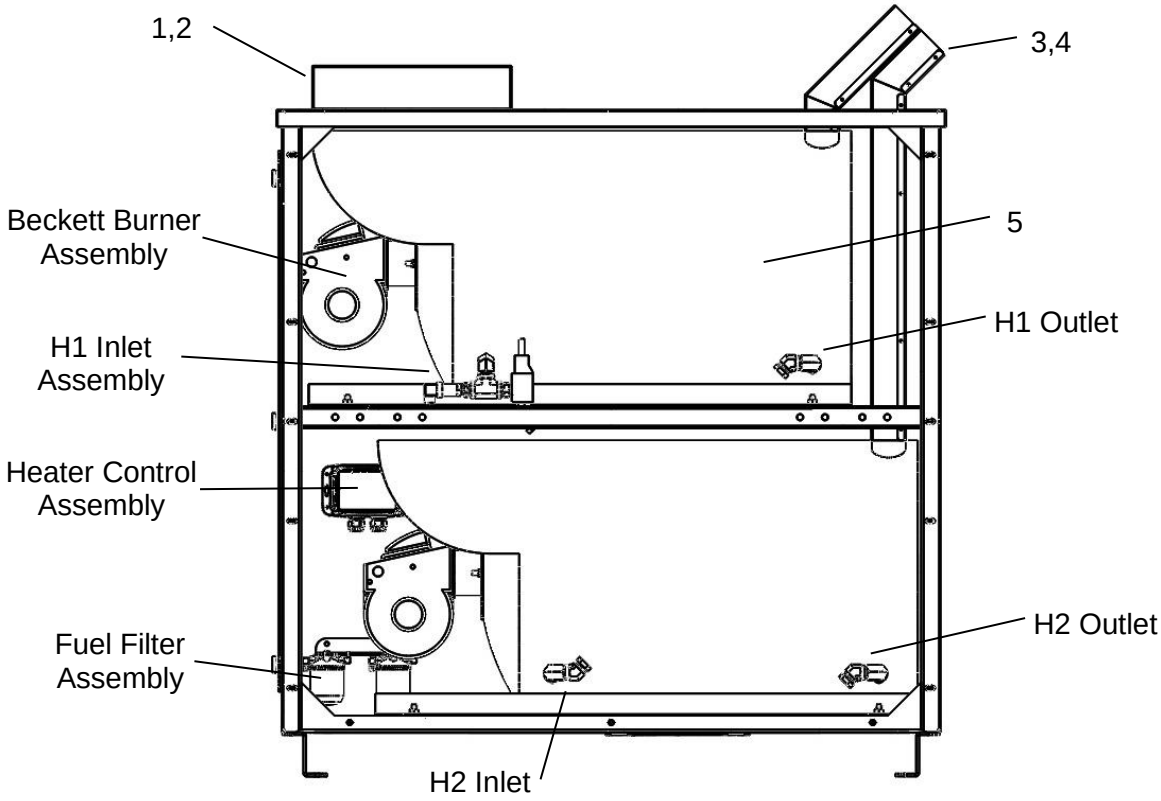
1

Fuel Outlet and Return



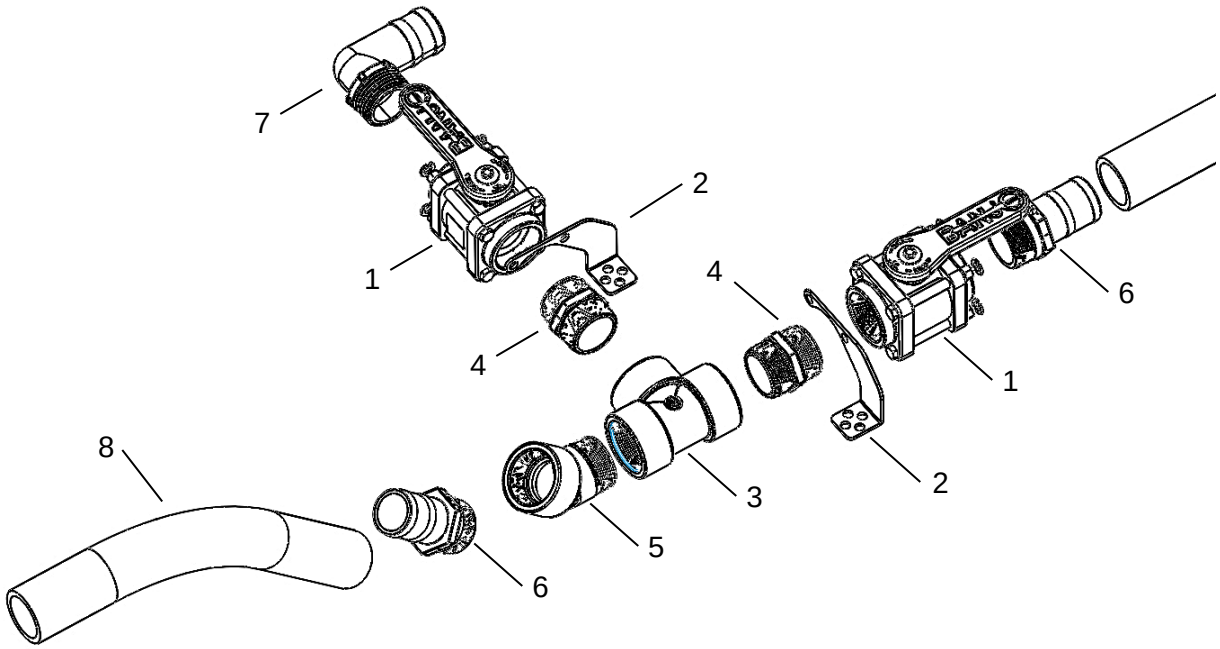
Ref	Description	Part #	Qty
1	3/8” Fuel Valve	002-2217	2
2	3/8” Tee	003-TT38BF	2
3	3/8” St Elbow 45 deg	003-SE4538BF	2
4	3/8 x ¼” Elbow	003-EL3814BF	2
5	3/8” x 3/8” Elbow	003-EL3838BF	2

Stacked Heater Skid Assembly



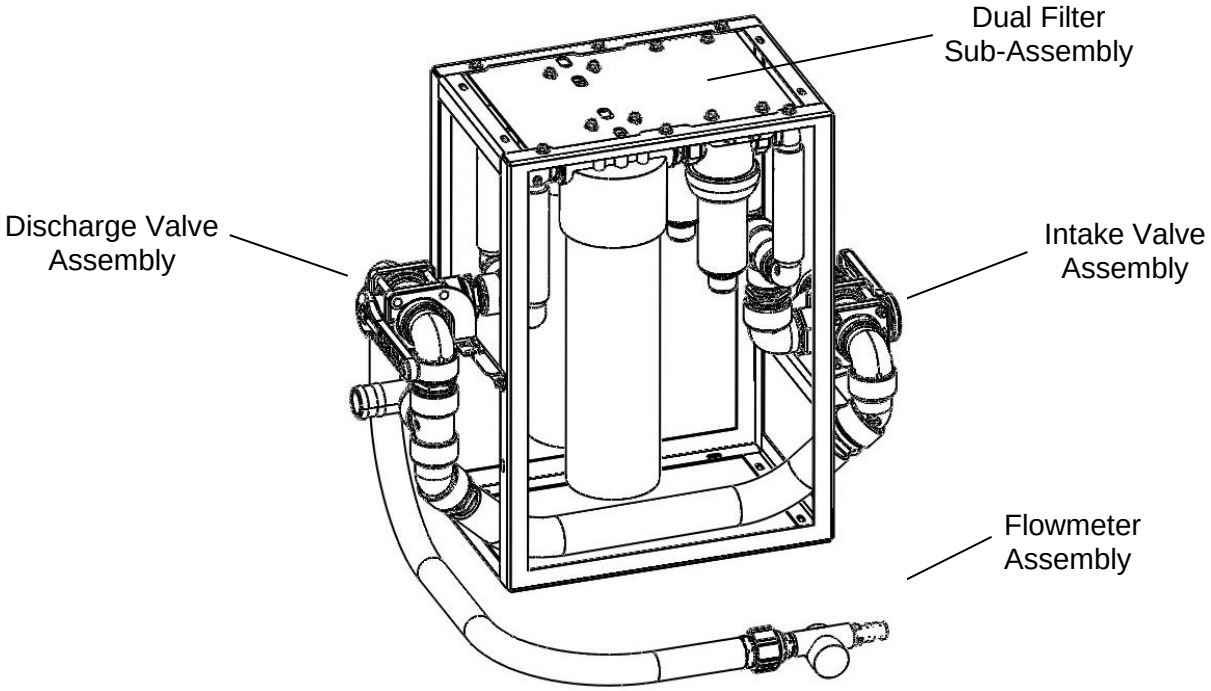
Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	HS Fan Shroud	001-7315MA	1	NP	Pump to H1 Inlet Hose	002-9240	1
2	Cooling Fan	006-7315MAF	1	NP	H1 Out to H2 In Hose	002-9034	1
3	Short Exhaust Stack	001-7315A	1	NP	H2 Out to Warm Valve	002-9144	1
4	Tall Exhaust Stack	001-7315D	1	NP	¼” ID Fuel Hose	002-9711B	10
5	SS Coil 24”	007-7210R	2	NP	3/8” ID Fuel Hose	002-9710B	10
	Beckett Burner Asm	See Breakdown	1		Fuel Filter Asm	See Breakdown	1
	H1 Inlet Asm	See Breakdown	1	NP	SS Coil w/ Insulation	007-7210CoilKit	
	Heater Control Asm	006-7723X	1				

Intake Manifold Assembly

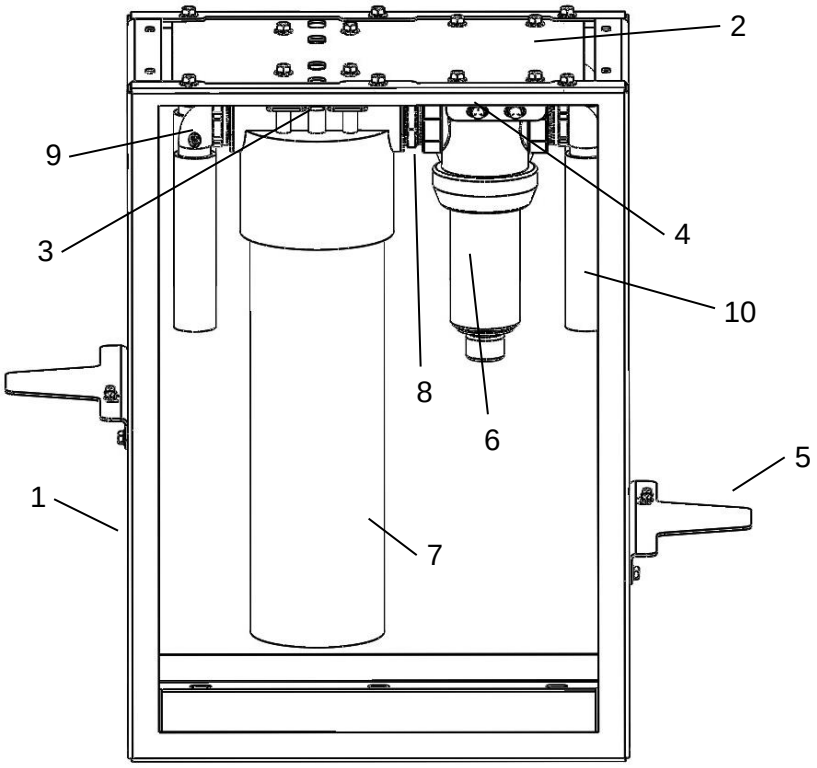


Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	2” Banjo 2-way valve	002-	2	6	2” NPT x 2” HB	003-A200200HP	2
2	Manifold Bracket	001-7320LX	2	7	2” Elbow 90deg	003-EL2020HP	1
3	2” Tee 2” x 2” x 2”	003-TT200HP	1	8	2” Suction Tubing	002-9004	7
4	2” Nipple	003-M200200HP	2	NP	2” Hose Clamp	003-9006	2
5	2” Street Elbow 45deg	003-SE45200HP	1	NP	5/16 x 1” self-tapper	Hardware	4

Dual Filter Assembly

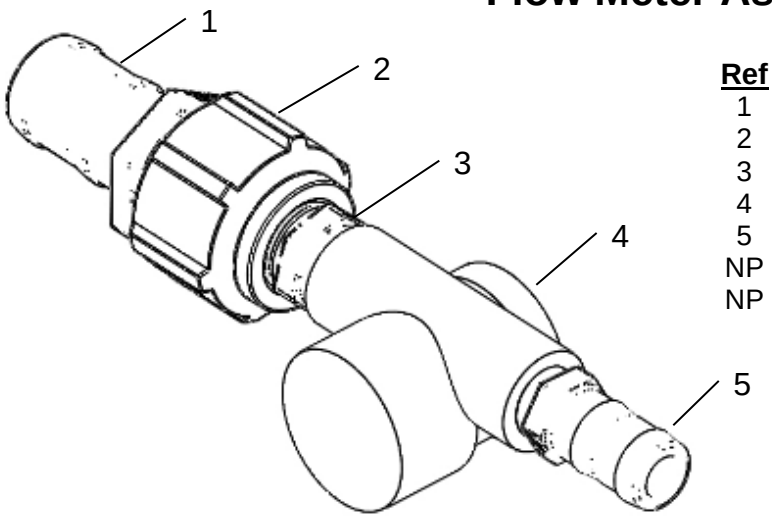


Dual Filter Sub-Assembly



Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	Water Inlet Frame	001-7200VL	1	6	Filter Asm. 120mesh	002-4319	2
2	Filter Mounting Plate	001-7320LC	1	7	Giant Filter Asm.	002-4322	2
3	20m Filter Bracket	001-7320LG	2	8	1.5” Nipple	002-9004	2
4	80m Filter Bracket	001-7320LD	2	9	1.5” Elbow	003-9006	4
5	3-Way Valve Bracket	001-7320LF	2	10	1.5” Suction Tubing	002-9008	4
NP	120 mesh filter only	002-4319A		NP	Hose Clamp for 1 ½”	003-9118	4
NP	20-micron giant filter (element only)	002-4322E		NP	Filter Bowl Gasket	002-4319D	
				NP	Filter Bowl only	002-4319F	
				NP	Filter Bowl Head	002-4319H	

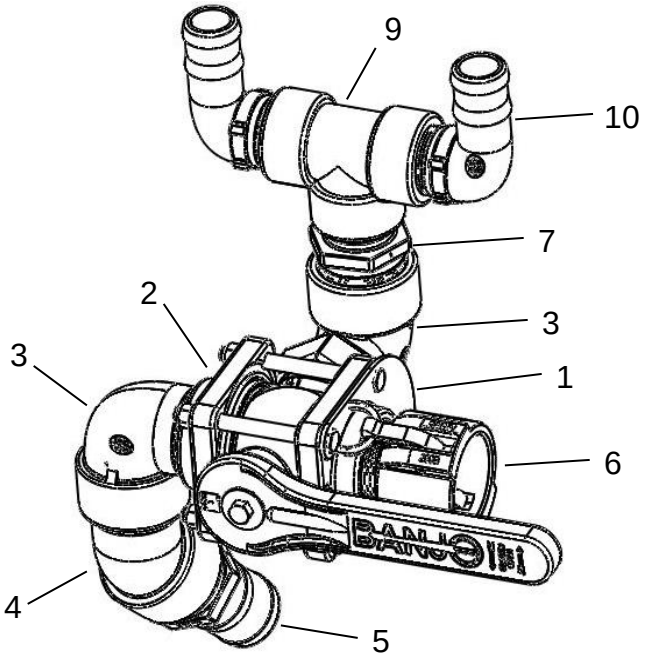
Flow Meter Assembly



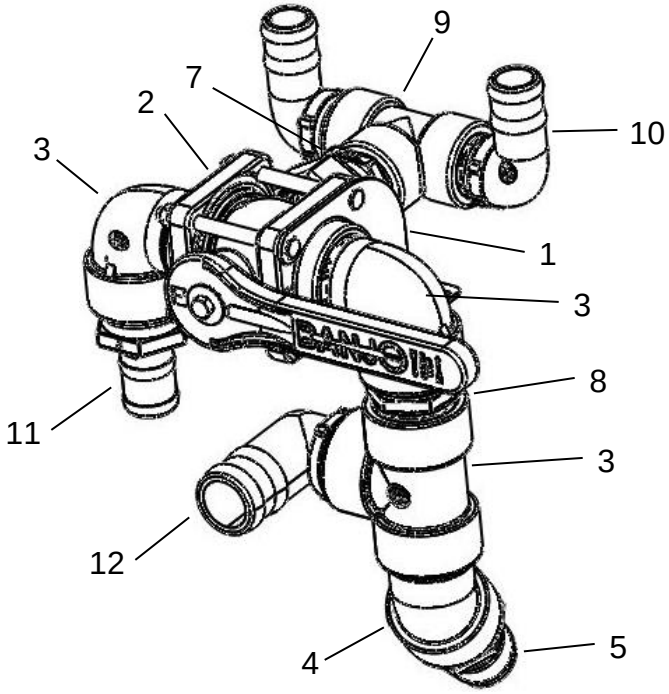
Ref	Description	Part #	Qty
1	1 ½ x 1 ½” Barb	003-A112112HP	1
2	1 ½” x 1” Union	003-M112100FHP	1
3	1” x ¾” Nipple	003-M10034HP	1
4	DS Flow Meter	006-4730R	1
5	¾ x 1” Hose Barb	003-A34100HP	1
NP	1 ½” Suction Hose	002-9008	3
NP	1” Suction Hose	002-9005	1

Dual Filter Intake and Discharge Valve

Intake Valve



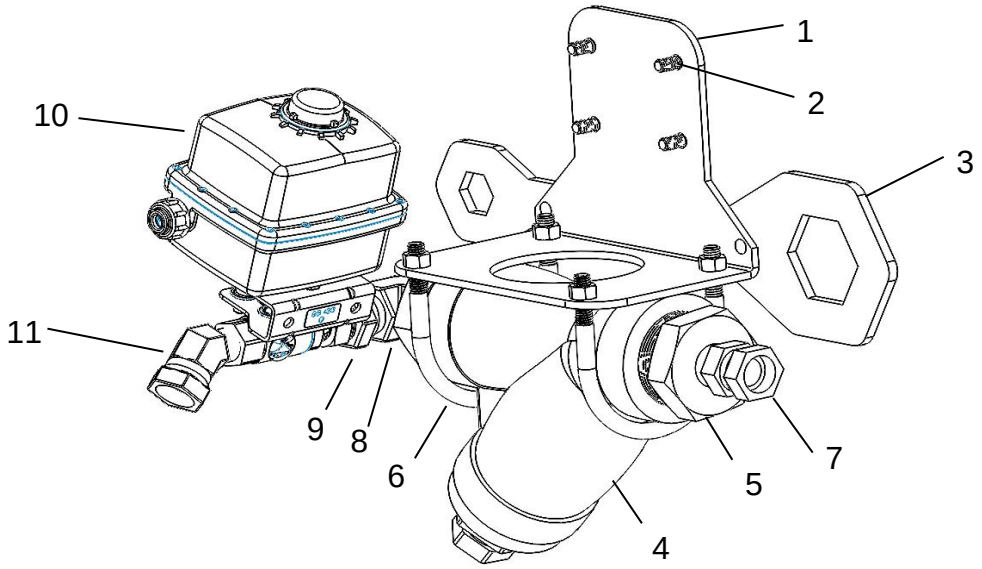
Discharge Valve



Ref	Description	Part #	Qty
1	3-Way Valve Bracket	001-7320LE	2
2	3-Way Valve 2”	002-2223	2
3	2” Street Elbow 90deg	003-SE200HP	4
4	2” Street Elbow 45deg	003-SE45200HP	2
5	2” NPTM x 2” HB	003-A200200HP	2
6	2” NPTM x 2” Coupler	002-2204G	1
NP	2” Coupler Plug	002-2205F	1
NP	Hose Clamp for 1 ½”	003-9118	4
NP	Hose Clamp for 2”	003-9006	3

Ref	Description	Part #	Qty
7	1.5” x 2” Nipple	003-M200112HP	2
8	2” x 2” Nipple	003-M200200HP	1
9	1.5” Tee	003-TT112HP	2
10	1.5” Elbow 90deg HB	003-EL112112HP	4
11	2” NPTM x 1.5” HB	003-A200112HP	1
12	2” Elbow 90deg HB	003-EL200200HP	1
NP	1.5” Suction Tubing	002-9008	4
NP	2” Suction Tubing	002-9004	3

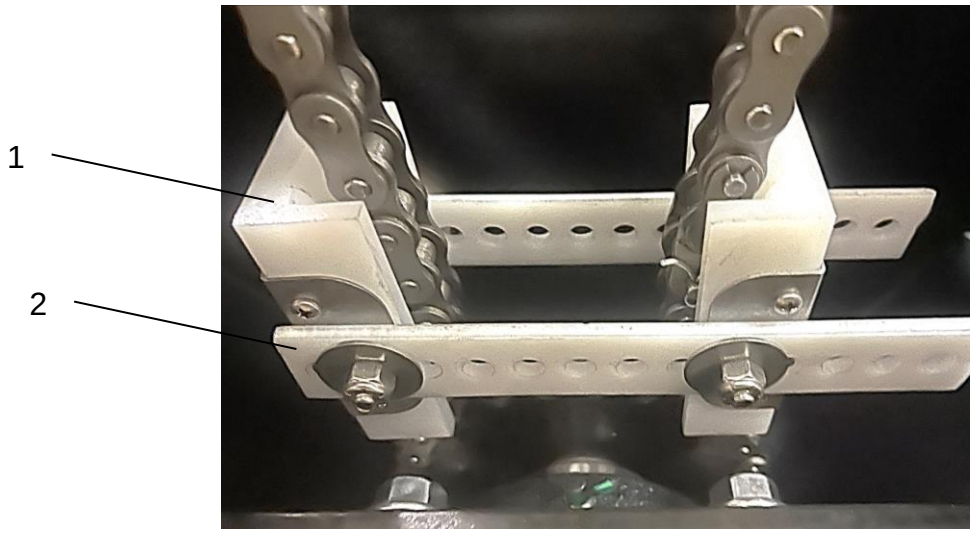
2” Y-Strainer / KZ Assembly



Ref	Description	Part #	Qty
1	2" Y-Strainer Bracket	001-7211B	1
2	5/16-18 x 1" TC	Hardware	4
3	Filter Wrench	001-7211C	1
NP	SS Hose Gauge	001-7211D	1
NP	Clip	008-4576	2
4	2" Y-Strainer Asm.	002-4321	1
5	Reducer 2" M ¾” F	003-DSRB20034	2

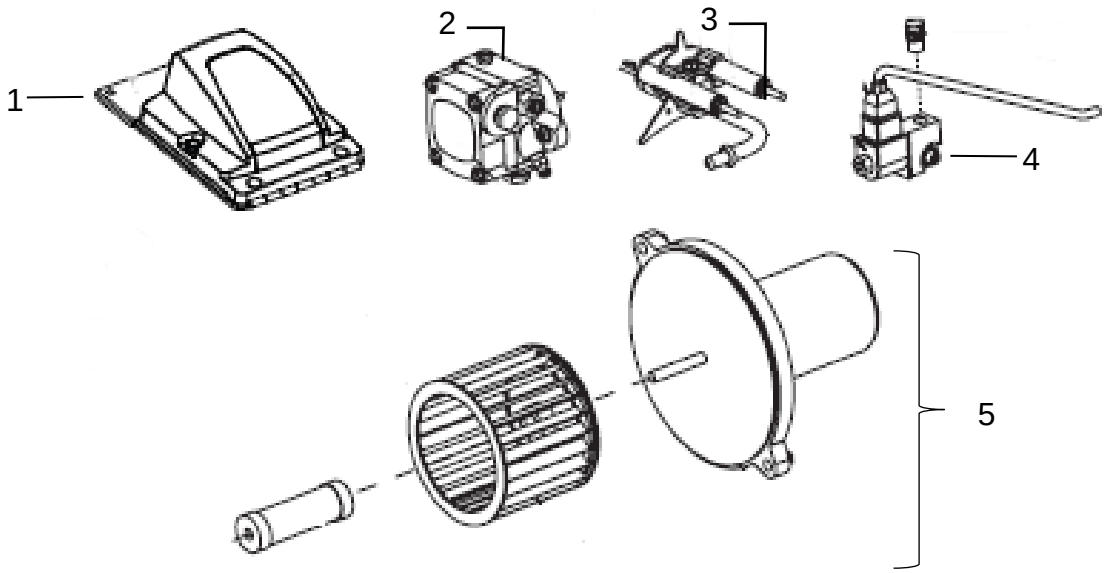
Ref	Description	Part #	Qty
6	U-bolt, 3/8 x 3 ½”	001-4714UBY	2
7	¾ x ¾” Swivel	003-DSM3434S	1
8	¾ x ¾” Swivel Elbow	003-DSEL3434S	1
9	¾ x ½” Nipple	003-DSM3412	1
10	½” SS 2-Way Valve	002-2203DV	1
11	½ x ¾” 45 Deg Elbow	003-DSEL1234S	1
NP	2” Y-Strainer Filter	002-4321E	
NP	2” Y-Strainer Gasket	002-4321G	

Chain Tensioner Assembly



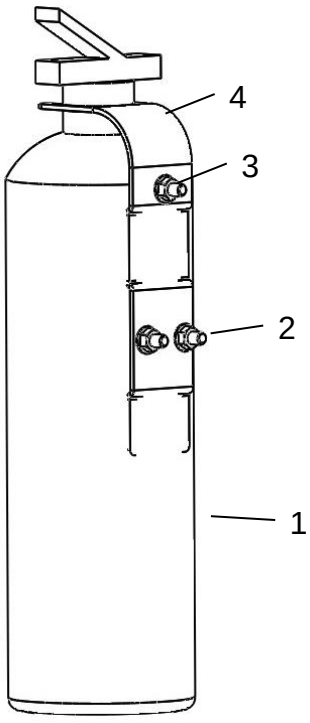
Ref	Description	Part #	Qty
1	Floating Roller Chain Tensioner	001-7209FRCT	1
2	Floating Tensioner Metal Straps	001-7209FTS	2

Burner Motor Replacement Parts



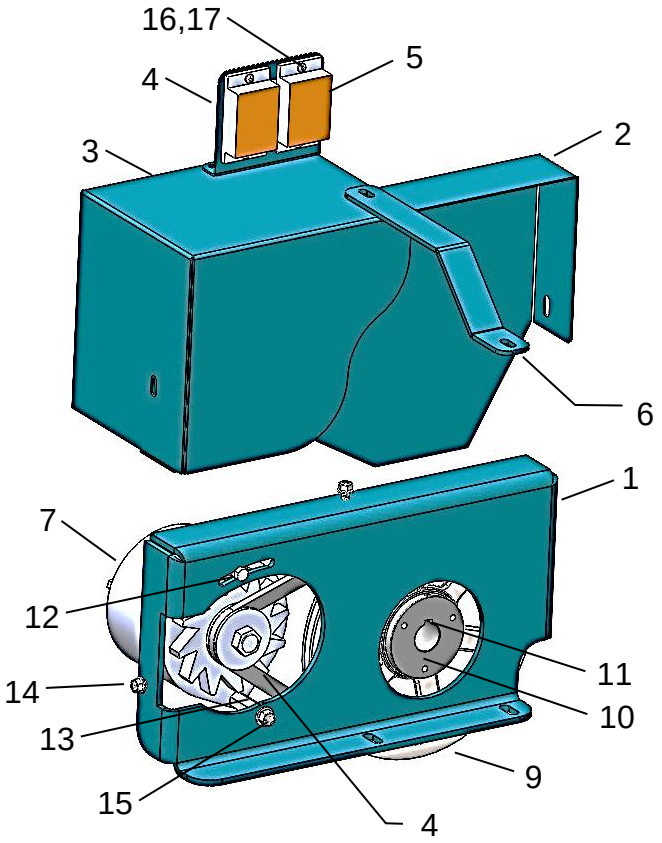
Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	Burner Igniter	007-7203	1	NP	Tip (optional, high altitude)	007-7207-4.0	2
2	Fuel Pump	007-7204	1	NP	Complete Burner Assembly	007-7201	1
3	Nozzle Assembly	007-7206	1	NP	Tip (Standard)	007-7207-4.5	2
4	Burner Shut Off Valve	007-7205	1	NP	Fuel Filter	007-7208	2
5	Burner Motor	007-7202	1	NP	Burner Gasket	007-7209GL	4

Fire Extinguisher Assembly



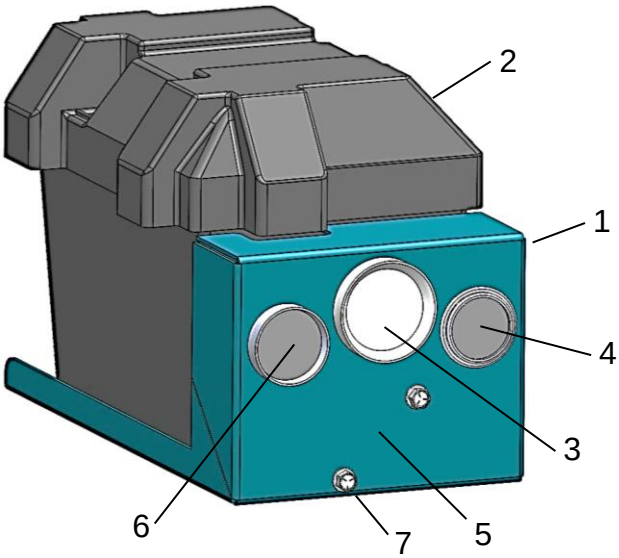
Ref	Description	Part #	Qty
1	Fire Extinguisher	008-8900	1
2	1/4-20 x ¾" Flange Bolt	Hardware	3
3	1/4-20 Flange Bolt	Hardware	3
4	Fire Extinguisher Bracket	001-7224J	1

Alternator Bracket Assembly



Ref	Description	Part #	Qty
1	Alternator Bracket	001-7220B	1
2	Alternator Cover	001-7220C	1
3	Alternator Shield	001-7220CA	1
4	Heater Light Bracket	001-7215C	1
5	Heater Light	006-7200HL	2
6	Alternator Support Brkt	001-7220E	1
7	Alternator 140 Amp	006-7221A	1
8	Alternator Belt 3VX400	006-7221B	1
9	Alternator Pulley	006-7221P	1
10	Alternator Hub	006-7221H	1
11	Key M8x7x40	007-7227B	1
12	5/16 x 1 ¾" Standoff	001-7221AS1	1
13	3/8 x 1 ¾" Standoff	001-7221AS2	1
14	5/16 x ¾" Flange bolt	Hardware	7
15	3/8 x 1" Flange bolt	Hardware	3
16	10-24 x 5/8 PH screw	Hardware	2
17	10-24 Nylock nut	Hardware	2

Battery Box Assembly



Ref	Description	Part #	Qty
1	Battery System Bracket	001-7321BB	1
2	Battery Box	001-7221BB	1
3	Battery Voltage Gauge	001-7221BVG	1
4	Alternator Ammeter Gauge	001-7221AAG	1
5	Battery Disconnect Relay	001-7221BDR	1
6	Fuel Gauge	001-7312FG	1
NP	Battery – Group 24DCM	006-7221BAT	1
NP	Alternator – Ammeter wire	006-006-7722G	1
NP	Ammeter – Relay wire	006-7722H	1
NP	Relay – Battery wire	006-7722J	1
NP	Alternator – Battery (black)	006-7722K	1
NP	5/16 x 1" Button Head Screw	Hardware	4
7	5/16 x ¾" Flange bolt	Hardware	2
NP	5/16" Flange Nut	Hardware	6

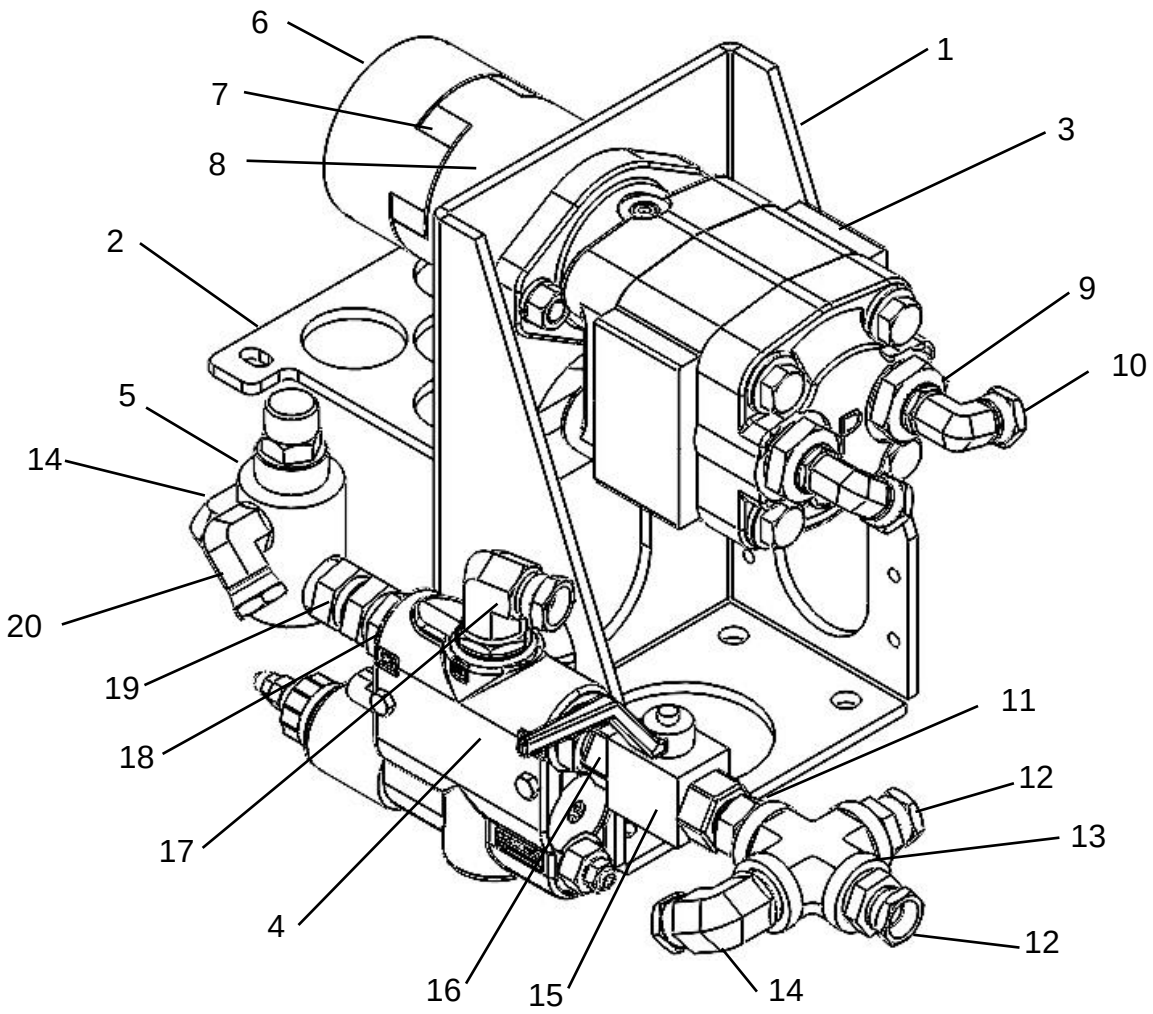
Tractor Parts

Ref	Description	Part #	Qty
1	Cab Control U-Bracket	001-7230	1
2	Cab Control Assembly	006-7721X	1
3	Cab to Drawbar Harness	006-7722D	1
4	Giant Filter Wrench	Miscellaneous	1
5	HD Cable Ties	Miscellaneous	1
6	SMV Decal	Miscellaneous	1
7	Hydrobale Owner’s Manual	Miscellaneous	1

Cart Parts

Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	PTO Driveline	008-7226	1	7	Fire Extinguisher	008-8900	1
2	2-1/2” x 8” Receiver Hitch	001-7219B	1	8	Tine Assembly (w/o tip)	001-7202	4
3	5/8” Receiver Pin & Clip	001-7219C	1	9	SS Valve Hose – 13.5”	002-7204B	2
4	Thrust Bushings	008-7246B	4	10	SS Valve Hose – 8”	002-7204A	2
5	Reel Pins	001-7216A	2	11	Tine Tip- MW11	004-7125	4
6	Zinc Roll Pins	001-7144	4				

OPTIONAL 030-0720HYD Hydraulic Drive Assembly



Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	Hyd. Motor Bracket	001-7220F	1	6	Love-Joy Coupler 30mm	001-7220JC	1
2	Hyd. Motor Support Brkt.	001-7220G	1	7	Love-Joy Spider	001-7220JA	1
3	Hydraulic Motor	007-7155	1	8	Love-Joy Coupler 1”	001-7220JB	1
4	Electric Hyd. Valve	007-7154	1	9	1” ORBM x ½” ORBF	003-DSM1ORB12ORB	2
5	Hyd. Relief Valve	007-7152	1	10	½” ORBM x ½” FPTF Swivel	003-DSEL12ORB12FS	2
NP	½” Hyd. Hose, 12.5”	002-9716-12	1	11	Nipple ¾ NPTM x ½ NPTM	003-DSM3412	1
NP	½” Hyd. Hose, 20”	002-9714-20	1	12	¾ NPTM x ½ NPTF Swivel	003-DSM3412S	2
NP	½” Hyd Hose, 26”	002-9714-24	1	13	¾” NPTF Cross	003-DSC34F	1
NP	½” Hyd. Hose, 68”	002-9714-68	1	14	¾ NPTM x ½ NPTF Swivel	003-DSEL3412FS	2
NP	½” Hyd. Hose, 80”	002-9714-80	1	15	½” Ball Valve	002-2221	1
NP	Check Valve	007-7153	1	16	¾ ORBM x ½ NPTM	003-DSM34ORB12M	1
NP	Hydraulic Coupler	003-9715	2	17	Elbow, ¾ ORBM x ½ NPTFS	003-DSEL34ORB12FS	1
				18	¾ ORBM x ¾ NPTM	003-DSM34ORB34M	1
				19	¾ NPTM x ¾ NPTFS	003-DSM3434S	1
				20	Elbow, ½ NPTM x ½ NPTFS	003-DSEL1212FS	1
				21	Elec. Hyd. Valve Control	006-7725	1

21

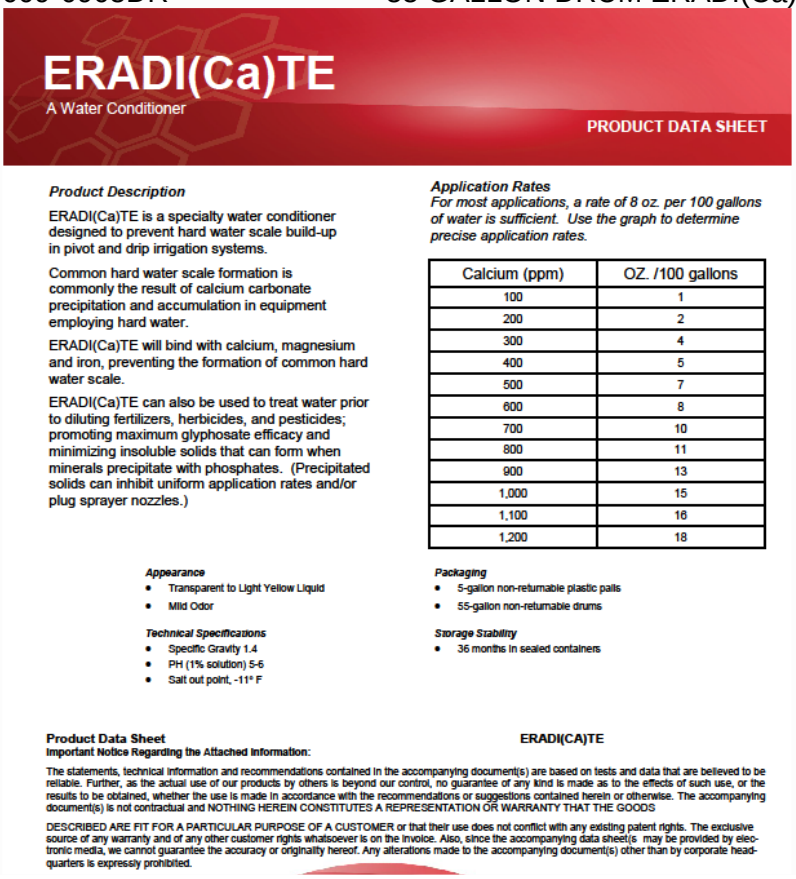
RECOMMENDED PARTS STOCKING LIST

ITEM	DESCRIPTION	QTY
001-7104VG	VALVE SPRING	5
001-7104VL	QUAD RING	10
001-7202	TINE ASSEMBLY	5
001-7204VE	1/8"X1 1/2" PLUNGER PIN SS	10
001-7204VJ	1/2" X 1 1/2" ROLLER PIN SS	1
001-7204R	VALVE REBUILD KIT	1
002-4319A	SCREEN 100 MESH	1
002-4321E	2" Y STRAINER 150 MESH	1
002-4321G	2" Y STRAINER GASKET	1
002-7204A	SS VALVE HOSE ASMBLY 8"	2
002-7204B	SS VALVE HOSE ASMBLY 13.5"	4
003-DSP12	½" CROSSTUBE PLUGS	10
004-7125	TIP FOR TINES - DEW SIM MW11	15
006-7221B	ALTERNATOR BELT	1

HARD WATER CONDITIONS

Common hard water scale formation is the result of calcium carbonate precipitation and accumulation in equipment employing hard water. ERADI(Ca)TE PLUS will bind with calcium, magnesium and iron, preventing the formation of common hard water scale. For hard water conditions contact Harvest Tec.

009-0905P	5 GALLON PAIL ERADI(Ca)TE PLUS
009-0905DR	55 GALLON DRUM ERADI(Ca)TE PL



ERADI(Ca)TE

A Water Conditioner

PRODUCT DATA SHEET

Product Description

ERADI(Ca)TE is a specialty water conditioner designed to prevent hard water scale build-up in pivot and drip irrigation systems.

Common hard water scale formation is commonly the result of calcium carbonate precipitation and accumulation in equipment employing hard water.

ERADI(Ca)TE will bind with calcium, magnesium and iron, preventing the formation of common hard water scale.

ERADI(Ca)TE can also be used to treat water prior to diluting fertilizers, herbicides, and pesticides; promoting maximum glyphosate efficacy and minimizing insoluble solids that can form when minerals precipitate with phosphates. (Precipitated solids can inhibit uniform application rates and/or plug sprayer nozzles.)

Application Rates

For most applications, a rate of 8 oz. per 100 gallons of water is sufficient. Use the graph to determine precise application rates.

Calcium (ppm)	OZ. /100 gallons
100	1
200	2
300	4
400	5
500	7
600	8
700	10
800	11
900	13
1,000	15
1,100	16
1,200	18

Appearance

- Transparent to Light Yellow Liquid
- Mild Odor

Technical Specifications

- Specific Gravity 1.4
- PH (1% solution) 5-6
- Salt out point, -11° F

Packaging

- 5-gallon non-returnable plastic pails
- 55-gallon non-returnable drums

Storage Stability

- 36 months in sealed containers

Product Data Sheet **ERADI(CA)TE**

Important Notice Regarding the Attached Information:

The statements, technical information and recommendations contained in the accompanying document(s) are based on tests and data that are believed to be reliable. Further, as the actual use of our products by others is beyond our control, no guarantee of any kind is made as to the effects of such use, or the results to be obtained, whether the use is made in accordance with the recommendations or suggestions contained herein or otherwise. The accompanying document(s) is not contractual and NOTHING HEREIN CONSTITUTES A REPRESENTATION OR WARRANTY THAT THE GOODS

DESCRIBED ARE FIT FOR A PARTICULAR PURPOSE OF A CUSTOMER or that their use does not conflict with any existing patent rights. The exclusive source of any warranty and of any other customer rights whatsoever is on the invoice. Also, since the accompanying data sheet(s) may be provided by electronic media, we cannot guarantee the accuracy or originality hereof. Any alterations made to the accompanying document(s) other than by corporate headquarters is expressly prohibited.

Harvest Tec LLC. Warranty and Liability Agreement

Harvest Tec, LLC. will repair or replace components that are found to be defective within 12 months from the date of manufacture. Under no circumstances does this warranty cover any components which in the opinion of Harvest Tec, LLC. have been subjected to negligent use, misuse, alteration, accident, or if repairs have been made with parts other than those manufactured and obtainable from Harvest Tec, LLC.

Our obligation under this warranty is limited to repairing or replacing free of charge to the original purchaser any part that in our judgment shows evidence of defective or improper workmanship, provided the part is returned to Harvest Tec, LLC. within 30 days of the failure. If it is determined that a non-Harvest Tec branded hay preservative has been used inside the Harvest Tec applicator system where the failure occurred, then Harvest Tec reserves the right to deny the warranty request at their discretion. Parts must be returned through the selling dealer and distributor, transportation charges prepaid.

This warranty shall not be interpreted to render Harvest Tec, LLC. liable for injury or damages of any kind, direct, consequential, or contingent, to persons or property. Furthermore, this warranty does not extend to loss of crop, losses caused by delays or any expense prospective profits or for any other reason. Harvest Tec, LLC. shall not be liable for any recovery greater in amount than the cost or repair of defects in workmanship.

There are no warranties, either expressed or implied, of merchantability or fitness for particular purpose intended or fitness for any other reason.

This warranty cannot guarantee that existing conditions beyond the control of Harvest Tec, LLC. will not affect our ability to obtain materials or manufacture necessary replacement parts.

Harvest Tec, LLC. reserves the right to make design changes, improve design, or change specifications, at any time without any contingent obligation to purchasers of machines and parts previously sold.

Revised 6/22

HARVEST TEC, LLC.
P.O. BOX 63
2821 HARVEY STREET
HUDSON, WI 54016 USA
PHONE: 715-386-9100
FAX: 715-381-1792
Email: info@harvesttec.com