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# FM3500

## 11.5ft/3.5m Front Mount Covered Spray Boom



## Assembly, Parts and Operator's Manual

Version FM3500-1301

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# DCSS Forward

The Drift Containment Spray System (DCSS) was developed to give the industry an environmentally friendly and reliable way to apply liquids to turf. This system, designed in a wind tunnel and proven by government tests, contains the spray in a shroud that is sealed to the turf's surface. Tests show the DCSS has better drift control in winds of 24 mph (40 kph) than an open boom in winds of 6 mph (10 kmh), which virtually eliminates the wind problem in spraying.

The airfoil on top of the shroud is the key. It eliminates the uplifting eddy from behind the DCSS that flips drops up into the air to become drift on non-airfoil covered booms.

The DCSS is the most environmentally friendly and safe liquid applicator available in the world today. By using it you join the leading professionals around-the-world and protect the environment.

# Safety

Whenever pesticides are changed or before sprayer storage, clean sprayers thoroughly with a cleaning solution that neutralizes the chemical to prevent cross contamination. The solution used depends on the chemical to be removed from the sprayer. Check the chemical label for cleaning instructions.

Many people die or suffer serious injury in job related accidents every year due to carelessness. Know your machinery and be aware of potential hazards. Put safety first in all your operations.

Review all instructions and procedures outlined in this manual annually. Every operator must familiarize himself with the operating instructions of the sprayer.

## Assembly Safety

- Clear large area to fold booms out in field position.
- A minimum of two people are required for the assembly of large equipment, especially when lifting, removing and assembling the center and the wings of the spray boom out of the original shipping box.
- Always use clean tools of the proper size and specification to match the hardware and specific job.
- This unit when disconnected from the power unit, will tilt back unless rear legs are pinned in storage position.

## Operational Safety

- Shut down sprayer and power unit then wait for all parts to stop before adjusting, cleaning, or lubricating the power unit or sprayer.
- Before spraying an area familiarize yourself with any rocks, debris, trees, traps, ditches, or gullies that may be potentially dangerous. Plan the spraying route to avoid these hazards. When spraying, use individual section controls to reduce the amount of double spraying.
- Keep sprayer boom width in mind at all times. When turning, exercise caution and avoid any obstacles or other persons. Remember the boom takes a wider swing going around corners.
- Spray only chemicals that unit was designed for, (ie turf application). Do not use products for which unit was not designed, (ie PAINT, sealants, cleaning fluids, dust inhibitors, ice surfaces).
- Any maintenance intervention, in particular welding, shall only be undertaken after the spray boom has been thoroughly rinsed.

## Transport Safety

- Never transport sprayers faster than 10 mph (16km/h) with castor wheels on the ground.
- Reduce speed on rough terrain.
- For all sprayers ensure that booms are folded and/or locked securely for transport.
- If excessive buffeting of airfoil/curtains occurs reduce speed as damage may result.

## Minimize Chemical Drift

The ***Windfoil*** sprayer has been designed in wind tunnels to control airflow around and behind the sprayer to minimize drift, allowing safe spraying in windy conditions. Drift can blow off a field after it has been sprayed, especially in high winds. Reasonable caution should be taken, in order to spray effectively and safely.

> For maximum drift control, keep curtain in contact with the canopy to ensure a seal to it. Drift control is less effective when the wind blows the curtain off the turf canopy, breaking the seal between the curtain and the turf.

# General Spraying Information

## Application Tips

Always use clean filtered water in the sprayer tank.

Your DCSS is supplied with 80° insert tips. Calibrate frequently to confirm tip accuracy.

Ensure that the pressure at the supply end of the hose, used on hose reels, is sufficient to deliver the proper pressure at the hand unit.

Check the flow rate from all nozzles using the capacity calibration technique; see the Calibration section for tables and instructions. Use only clear water with no trace of chemicals when performing all calibration tests. Adjust the sprayer pressure to get the proper flow rate. The flow meters are not accurate enough in absolute terms to be used as a flow meter. In relative terms they are very accurate.

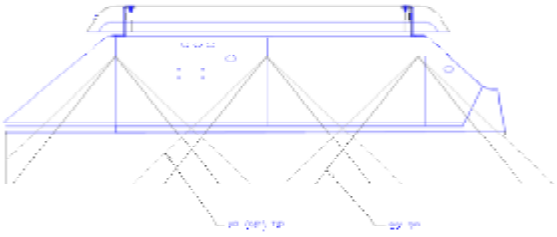
## Nozzles

> Caution: The FM Series Windfoil covered boom was designed to use 80° tips. 110° tips are not recommended. It is not recommended to mixed or interchange tips, (ie use 2 different brands, sizes, styles of tips at the same time).

Despite being the most important component for accurate uniform spraying application, nozzles are often neglected and abused. Nozzle flow rate depends on effective orifice size and the pressure.

As pressure increases, average droplet size decreases. If droplets are too small, drift may be excessive with conventional sprayers but not with the DCSS. With conventional sprayers, large droplets that are used to control drift can roll off plants without sticking. The DCSS will contain small droplets and allow them to be deposited on target plants. Small droplets are beneficial in that they increase coverage and with the DCSS drift is not a problem.

The spray patterns must overlap for even coverage but should not interfere with one another. Nozzles are set at a 10° angle so that one edge of its pattern will be just behind the edge of its adjacent spray pattern, evading interference with each other. The curtain must be in contact with the turf at all times to seal the shroud to the turf surface and contain the drops inside.



Use only conventional Tee Jet or AXI 80° tips, as these will provide the most uniform spray pattern in the ***Windfoil*** DCSS.

**Caution:** When spraying next to a flowerbed do not spray over the turf edge, as the spray will go

## Diaphragm Check Valve Nozzle Bodies

Diaphragm check valves close at 15 psi (1 bar) to prevent excessive dripping. Should the cap on the valve loosen or the check valve diaphragm become misaligned the body may leak. Stop the leak by tightening the check valve cap or remove the cap and inspect the seal for damage or improper assembly. To check for defective check valves when the spraying stop control has been actuated, the volume that drips from each nozzle should not exceed 2ml timed over a 5 minute period. The measuring is to start 8 seconds after the flow to the spray boom is shut off.

Nozzle caps are attached by engaging the cap and turning clockwise about a third of a turn. Self-aligning caps have a slot to align the tips. Ensure that the tips fit down into the slotted hole before installing caps on the diaphragm nozzle body assembly with the tip screen

## Calibration

As a tip wears the spray pattern distorts, output volumes usually increase and the droplet characteristics change. Recalibration may correct for output changes but cannot correct for spray pattern changes or the drop size generated.

Use only clear water with no trace of chemicals when performing all calibration tests. Rotate the DSCC up to calibrate and operate the sprayer at the desired pressure. Collect the output from each nozzle for 60 seconds, using an accurate measuring cup. Record the output from each nozzle. Replace nozzles that are more than 5% above or below the average reading, or has a visibly distorted pattern.

Actual sprayer speed, as determined from the tables below, will differ from the sprayer speedometer readings because of wheel slippage. Run a speed test in the field to be sprayed, and have the sprayer tank half full. The sprayer must be at full speed before starting the test run. To determine the speed discrepancy, mark off a distance as found on one of the tables below. Run the power unit over this distance, carefully noting the speedometer reading and recording the time to cover the distance. The actual speed traveled can be found for the specific distance and time to travel, using the table.

After the nozzles have been individually checked and matched, the sprayer should be calibrated to determine the correct speed for the desired application volume. Refer to the application rate table on the following page for typical application rates for different nozzles.

**Note:** Tip pressure is usually less than the pressure at the pump. Losses occur in valves, hoses, etc. Always check the flow by the above calibration method.

Table 5: Time (seconds) to travel a distance of:

| km/h | 10m | 25m | 50m | 100m | 200m |
|---|---|---|---|---|---|
| 1 | 36.0 | 90.0 | 180.0 | 360.0 | 720.0 |
| 1.5 | 24.0 | 60.0 | 120.0 | 240.0 | 480.0 |
| 2 | 18.0 | 45.0 | 90.0 | 180.0 | 360.0 |
| 2.5 | 14.4 | 36.0 | 72.0 | 144.0 | 288.0 |
| 3 | 12.0 | 30.0 | 60.0 | 120.0 | 240.0 |
| 4 | 9.0 | 22.5 | 45.0 | 90.0 | 180.0 |
| 5 | 7.2 | 18.0 | 36.0 | 72.0 | 144.0 |
| 6 | 6.0 | 15.0 | 30.0 | 60.0 | 120.0 |

Table 6: Time (seconds) to travel a distance of:

| mph | 10ft | 20ft | 50ft | 100ft | 200ft |
|---|---|---|---|---|---|
| 1 | 6.8 | 17.0 | 34.1 | 68.2 | 136.0 |
| 1.5 | 4.5 | 11.4 | 22.7 | 45.5 | 90.9 |
| 2 | 3.4 | 8.5 | 17.0 | 34.1 | 68.2 |
| 2.5 | 2.7 | 6.8 | 13.6 | 27.3 | 54.5 |
| 3 | 2.3 | 5.7 | 11.4 | 22.7 | 45.5 |
| 4 | 1.7 | 4.3 | 8.5 | 17.0 | 34.1 |
| 5 | 1.4 | 3.4 | 6.8 | 13.6 | 27.3 |
| 6 | 1.1 | 2.8 | 5.7 | 11.4 | 22.7 |

Table 1: American Application Rates at 10” Nozzle Spacing – 80 Degree Tips

## Application Rates, 10" Spacing
## 80 Deg. Tips

| Rogers Part # | Tip Number | Liquid Press psi | Capacity 1 nozzle gpm | U. S. GALLONS PER ACRE 2.5 mph | 3 mph | 4 mph | 5 mph | 7 mph | U. S. GALLONS PER 1000 SQ. 2.5 mph | 3 mph | 4 mph | 5 mph | 7 mph | Press bars |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05872 | 800067SS (200 mesh) | 30 | 0.058 | 13.8 | 11.5 | 8.6 | 6.9 | 4.9 | 0.32 | 0.26 | 0.20 | 0.16 | 0.11 | 2.07 |
| | | 40 | 0.067 | 15.9 | 13.3 | 9.9 | 8.0 | 5.7 | 0.36 | 0.30 | 0.23 | 0.18 | 0.13 | 2.76 |
| | | 50 | 0.075 | 17.8 | 14.8 | 11.1 | 8.9 | 6.4 | 0.41 | 0.34 | 0.25 | 0.20 | 0.15 | 3.45 |
| | | 60 | 0.082 | 19.5 | 16.2 | 12.2 | 9.7 | 7.0 | 0.45 | 0.37 | 0.28 | 0.22 | 0.16 | 4.14 |
| 01369 | 8001VS (100 mesh) | 30 | 0.087 | 20.6 | 17.1 | 12.9 | 10.3 | 7.3 | 0.47 | 0.39 | 0.29 | 0.24 | 0.17 | 2.07 |
| | | 40 | 0.100 | 23.8 | 19.8 | 14.9 | 11.9 | 8.5 | 0.54 | 0.45 | 0.34 | 0.27 | 0.19 | 2.76 |
| | | 50 | 0.112 | 26.6 | 22.1 | 16.6 | 13.3 | 9.5 | 0.61 | 0.51 | 0.38 | 0.30 | 0.22 | 3.45 |
| | | 60 | 0.122 | 29.1 | 24.2 | 18.2 | 14.5 | 10.4 | 0.67 | 0.56 | 0.42 | 0.33 | 0.24 | 4.14 |
| 00827 | 80015VS | 30 | 0.130 | 30.9 | 25.7 | 19.3 | 15.4 | 11.0 | 0.71 | 0.59 | 0.44 | 0.35 | 0.25 | 2.07 |
| | or | 40 | 0.150 | 35.6 | 29.7 | 22.3 | 17.8 | 12.7 | 0.82 | 0.68 | 0.51 | 0.41 | 0.29 | 2.76 |
| 15287 | AXI-80015 | 50 | 0.168 | 39.8 | 33.2 | 24.9 | 19.9 | 14.2 | 0.91 | 0.76 | 0.57 | 0.46 | 0.33 | 3.45 |
| | (50 mesh) | 60 | 0.184 | 43.6 | 36.4 | 27.3 | 21.8 | 15.6 | 1.00 | 0.83 | 0.62 | 0.50 | 0.36 | 4.14 |
| 05876 | 8002VS | 30 | 0.173 | 41.2 | 34.3 | 25.7 | 20.6 | 14.7 | 0.94 | 0.79 | 0.59 | 0.47 | 0.34 | 2.07 |
| | or | 40 | 0.200 | 47.5 | 39.6 | 29.7 | 23.8 | 17.0 | 1.09 | 0.91 | 0.68 | 0.54 | 0.39 | 2.76 |
| 14384 | AXI-8002 | 50 | 0.224 | 53.1 | 44.3 | 33.2 | 26.6 | 19.0 | 1.22 | 1.01 | 0.76 | 0.61 | 0.43 | 3.45 |
| | (50 mesh) | 60 | 0.245 | 58.2 | 48.5 | 36.4 | 29.1 | 20.8 | 1.33 | 1.11 | 0.83 | 0.67 | 0.48 | 4.14 |
| 05877 | 8003VS | 30 | 0.260 | 61.7 | 51.4 | 38.6 | 30.9 | 22.0 | 1.41 | 1.18 | 0.88 | 0.71 | 0.50 | 2.07 |
| | or | 40 | 0.300 | 71.3 | 59.4 | 44.6 | 35.6 | 25.5 | 1.63 | 1.36 | 1.02 | 0.82 | 0.58 | 2.76 |
| 14385 | AXI-8003 | 50 | 0.335 | 79.7 | 66.4 | 49.8 | 39.8 | 28.5 | 1.82 | 1.52 | 1.14 | 0.91 | 0.65 | 3.45 |
| | (50 mesh) | 60 | 0.367 | 87.3 | 72.7 | 54.6 | 43.6 | 31.2 | 2.00 | 1.67 | 1.25 | 1.00 | 0.71 | 4.14 |
| 05878 | 8004VS | 30 | 0.346 | 82.3 | 68.6 | 51.4 | 41.2 | 29.4 | 1.88 | 1.57 | 1.18 | 0.94 | 0.67 | 2.07 |
| | or | 40 | 0.400 | 95.0 | 79.2 | 59.4 | 47.5 | 33.9 | 2.18 | 1.81 | 1.36 | 1.09 | 0.78 | 2.76 |
| 14061 | AXI-8004 | 50 | 0.447 | 106.3 | 88.5 | 66.4 | 53.1 | 37.9 | 2.43 | 2.03 | 1.52 | 1.22 | 0.87 | 3.45 |
| | (50 mesh) | 60 | 0.490 | 116.4 | 97.0 | 72.7 | 58.2 | 41.6 | 2.67 | 2.22 | 1.67 | 1.33 | 0.95 | 4.14 |
| 05879 | 8005VS | 30 | 0.433 | 102.9 | 85.7 | 64.3 | 51.4 | 36.7 | 2.36 | 1.96 | 1.47 | 1.18 | 0.84 | 2.07 |
| | or | 40 | 0.500 | 118.8 | 99.0 | 74.3 | 59.4 | 42.4 | 2.72 | 2.27 | 1.70 | 1.36 | 0.97 | 2.76 |
| 14386 | AXI-8005 | 50 | 0.559 | 132.8 | 110.7 | 83.0 | 66.4 | 47.4 | 3.04 | 2.53 | 1.90 | 1.52 | 1.09 | 3.45 |
| | (50 mesh) | 60 | 0.612 | 145.5 | 121.2 | 90.9 | 72.7 | 52.0 | 3.33 | 2.78 | 2.08 | 1.67 | 1.19 | 4.14 |
| 05880 | 8006VS | 30 | 0.520 | 123.5 | 102.9 | 77.2 | 61.7 | 44.1 | 2.83 | 2.36 | 1.77 | 1.41 | 1.01 | 2.07 |
| | or | 40 | 0.600 | 142.6 | 118.8 | 89.1 | 71.3 | 50.9 | 3.26 | 2.72 | 2.04 | 1.63 | 1.17 | 2.76 |
| 14387 | AXI-8006 | 50 | 0.671 | 159.4 | 132.8 | 99.6 | 79.7 | 56.9 | 3.65 | 3.04 | 2.28 | 1.82 | 1.30 | 3.45 |
| | (50 mesh) | 60 | 0.735 | 174.6 | 145.5 | 109.1 | 87.3 | 62.4 | 4.00 | 3.33 | 2.50 | 2.00 | 1.43 | 4.14 |
| 05881 | 8008VS (50 mesh) | 30 | 0.693 | 164.6 | 137.2 | 102.9 | 82.3 | 58.8 | 3.77 | 3.14 | 2.36 | 1.88 | 1.35 | 2.07 |
| | | 40 | 0.800 | 190.1 | 158.4 | 118.8 | 95.0 | 67.9 | 4.35 | 3.63 | 2.72 | 2.18 | 1.55 | 2.76 |
| | | 50 | 0.894 | 212.5 | 177.1 | 132.8 | 106.3 | 75.9 | 4.87 | 4.05 | 3.04 | 2.43 | 1.74 | 3.45 |
| | | 60 | 0.980 | 232.8 | 194.0 | 145.5 | 116.4 | 83.1 | 5.33 | 4.44 | 3.33 | 2.67 | 1.90 | 4.14 |

# Installation Instructions

**Removing spray boom from box**

Once the top of the box has been opened 2 people are required to unload all the components of the Front Mount Sprayer. Do not lift any section from the curtain as this component might pull out of the hanger. Grab the frame component or under the edge of the shroud at a frame section for lifting. Table 1 below is a list of the approximate wing and center section weights.

## Centre Section Attachment

1. Using the 1½" square U-bolts supplied attach the tank mount to the back of the 1½" tubing farthest away from the power unit with the tank numbers facing away from the power unit. Attach the ¾" hose with the supplied gear clamp.
2. Using the 1½" square U-bolts supplied attach the boom pull upright tube(s) on the appropriate sides, see General Assembly DCSS for mounting parts layout
3. The boom pull upright tubes contain the stand legs and a D-ring necessary for storage purposes (FM3500 only).

## Center Frame Attachment

1. Place Center Frame in front of Mount Adapter. The pump and line strainer face away from the power unit.
2. The Center Frame attaches to the Mount Adapter with 1½" square U-bolts and 3/8" nylock nuts. Refer to Mount Adapter drawing where appropriate.

## Castor Frame and Wheel Attachment

1. Attach the Center Castor Frame to the Center frame via a Ø1" by 6" long pin. A cotter pin is provided to hold the 6" long pin in place.
2. Place a Castor Wheel Assembly in each of the wheel bushings of the Center Castor Frame placing the castor wheel spacers on the top of the bushings. The bushings are located to the extreme left and right of the front of the

## Wing Attachment

1. Place the left and right wings to the sides of the Center Frame. The wheels of the wings will locate to the outer rear of the sprayer and face toward the power unit.
2. Release the breakaway arm from the Center Frame.
3. Loosen the Guide ring that is on the Breakaway Arm.
4. Remove the 1/4" bolts holding the Wing Pivot U-Clamp to the wing and remove the Wing Pivot U-Clamps from the wing.
5. Place the Wing Pivot U-Clamps onto the Breakaway Arm and reattach the Wing to the U-Clamps.
6. Ensure that the U-Clamp is pressed up against the inside of the Breakaway Arm.
7. Tighten the 1/4" bolts holding the Wing Pivot U-Clamp to the Breakaway Arm.
8. Lock the Guide Ring into position tight against the Wing Pivot U-Clamp closest to the power unit.
9. Locate the two ropes and handles. Run one rope through the left wing rope cleat and the other the right rope cleat to the wing rope pull tab on the wing and tie a tight knot in the very end of the rope. Pull rope back out of the Rope Tab until the knot is tight against the Rope Tab.

## Plumbing Hookup

1. Attach the double cross plate supplied in the parts bag to the Valve Mount with ¼" square U-bolts. Attach Mount to the right upright on the Center frame with 1½" square U-bolts.
2. Adjust height of controls to suit your power unit and user preference. Use tie straps to secure the hoses neatly in place.
3. Attach the Backing Plate and Nozzle Flow Indicator to the Tank Mount using the ¼" x 2" lg bolts.
4. Locate the three ½" hoses from the Center Boom Section. Cut to desired length and hook the end of each hose to the hose barbs on the nozzle flow indicator. To avoid confusion, ensure that the position that each hose exits the shroud of the spray boom corresponds with the position it is installed on the nozzle flow indicator. Plastic, crimp type hose clamps are located in the parts box.

## Electrical Hookup

1. Route electrical harness along power unit frame. Avoid all pivot points and moving parts to avoid pinching or wearing into cable.
2. Plug cable into auxiliary 12V power outlet on power unit.
3. Tie cable securely to power unit.

# Final Assembly Checklist

## Mechanism Checks:

**1) Centre Boom Pivot**

Lift the wheels of the centre section off the ground and check that the boom centers itself. Adjust the springs on the boom mount to provide even pressure on the boom when centered. Loosen the nuts on the bolts on either side to balance the pressure.

**2) Breakaway Catches**

The breakaway catch should release with a good push (45lbs) exerted on the end of the boom, (toward the rear). Return the wing to its spray position and the catch should grab firmly. Engage the catch before folding the boom for transport.

The amount of force required for the breakaway catch to operate is adjustable by changing the position of the shim washers on the breakaway bolt from outside to inside to increase spring pressure if required.

**3) Wing Fold Stop**

Raise the wings, they should rise 90º and rest against the fold stop on the Boom Pull Mounts on the center frame. The fold stop positions the wing and secures it firmly when in the transport position. Adjust the position of the fold stop if necessary.

**4) Curtain**

Ensure curtain touches the turf. If not, move the castor wheel spacers from below the boom to on top of the boom mount.

**5) Check for Leaks**

Ensure all connections are leak free. If leaks occur, check connection to ensure it is tight.

## Testing After Assembly

After assembling the spray boom, check for field readiness. Points to consider are:

a) Remove the nozzle body caps with the spray tips and the tip screens. Flush the entire system with clear water. Install the tip screens and nozzle caps with spray tips. Check for proper alignment of the nozzle caps. Pressure test all the booms inspecting hose connections, nozzle caps, spray pattern and diaphragm nozzle bodies.
b) Move all hinge or swivel joints through the full arc of movement. Check for interference, ease of movement and grease.
c) Check all fasteners to see that they are tightened firmly.
d) Calibrate the sprayer and DCSS

## General Maintenance

### Cleaning

Sprayers need to be cleaned to prevent corrosion, cross contamination of chemicals and crop injury. Trace amounts of one chemical can react with another or carry over to the next spraying and cause crop damage, especially with pesticides. Long exposures with even small amounts of some chemicals can damage sprayer components either by corrosion or deposits of gums, etc. If you spray chemicals, such as RoundUp[â], that will damage turf always clean the unit especially well.

Always try to end the day with an empty tank; avoid contamination of water supplies and injury to plants or animals. Wash the sprayer and DCSS in a wash area that properly contains the wash water. Flush with clean water, preferably after each day's operation. However, if you plan to use the same material over several days, most chemicals may be kept in the tank overnight; the label usually indicates which may not. Rinse the outside of the sprayer. Surfactants combined with chemicals, when they are compatible, will provide some cleaning action in the sprayer. Spray the rinse over the application area.

Some chemical combinations (especially if oil is used) may produce a putty type paste (buttering out) in the sprayer tank and components, flushing with water after each load may prevent this accumulation. If water alone does not dissolve and remove the buildup, add a solvent. Allow paste to dissolve, then agitate and flush. Flush with detergent and finally with clean water. Check with your chemical agent.

Whenever pesticides are changed, or before sprayer storage, clean sprayers thoroughly with a cleaning solution that neutralizes the chemical to prevent cross contamination. The solution used depends on the chemical to be removed from the sprayer. Check the chemical label for cleaning instructions.

Remove nozzle tips and screens, clean them in a strong detergent solution (or kerosene) using a soft brush. Never use a metal probe to clean the orifice of a spray tip.

Follow the same safety precautions during cleaning as for applications. Use a respirator, rubber gloves, or other protective gear as may be directed by label instructions.

### Sunshine

Many plastic sprayer parts are degraded by ultra violet light, especially the nozzle flow indicators. Store the sprayer in the shade to extend the length of service.

### Winterizing

After the sprayer is thoroughly cleaned, put 2 to 5 gallons (7-19 litres) of rust inhibitor or RV antifreeze in the tank prior to the final flushing to help prevent corrosion. As the water is pumped from the sprayer, the antifreeze will leave a protective coating on the inside of the tank, pump, and plumbing. Remember that this unit has no inherent stability when not connected to the sprayer, thus for storage it should be partially disassembled. Remove wings, boom mount tubes, float arm assemblies with center actuators from center section, prior to storage.

## First Checks

During sprayer setup, test the operation of the spray tips, hoses and plumbing system with clear water. Refer to the sprayer maintenance and operation section found in this manual.

Clean sprayer tank and flush plumbing system with clean water.

Check line strainer and nozzle screens for residue and debris. Clean screens with clear water. Replace any screens that are torn or remain clogged after cleaning.

Check and clean nozzle tips. To ensure best performance calibrate spray tips. Refer to Calibration found in the General Spraying Information section of this manual. The frequency that you should perform calibration will vary based on the volume and type of spraying that is done.

Determine proper chemical mixture based on the specific chemical and spray tip size. Different size spray tips and nozzle screens are available through your Windfoil dealer.

## Using the Sprayer

Prepare to spray by turning on the power switch for the pump. Observe the pressure gauge on the Valve Mount. The pressure should rise slightly above the spray pressure desired for the specific tip type and chemical. The exact difference between the set pressure with no booms spraying and the spray pressure will depend on the size of tips and number of spray booms engaged.

Adjust the pressure regulator located on the Valve Mount to obtain the desired pressure.

Begin moving at the desired spray speed.

## DCSS Operation

If you wish to lift a boom, switch off the flow to the boom. Wait a couple of seconds so the mist under the boom can settle before lifting the boom.

Each wing can be lifted with the rope and secured in place by pulling the rope through the cleat on the top of the Valve Mount.

To disengage simply lift the rope to pull it out of the cleat. Store the excessive rope with the handle on the hook.

The wings are attached to your boom via the breakaway pin and pivot. If you strike an object with a wing, that wing should breakaway as a protection against damage.

## Maintenance

- Grease DCSS wing hinge points every 40 hours
- Check regularly that all fasteners are tight and secure.
- See the General Spraying Information section of this manual.
- Check wheel bearings every 10 hours and adjust if required. Check more often in rougher situations.
- It is recommended that any maintenance intervention, in particular welding, shall only be undertaken after the spray boom has been thoroughly rinsed. For center and wing frame cases the frame should be removed from the shroud to eliminate possible burning of the plastic.

## Leaking Nozzles

If 1 or 2 tips drip until the line is empty, check:
For deteriorated diaphragms
⇒ For material under the diaphragm
⇒ For a weak spring
⇒ For a deterioration of the diaphragm sealing surface

If all tips spray for more than 3 seconds after shut off, check:
⇒ To see if the sprayer shut off valve is leaking

If all tips spray for less than 3 seconds after shut off, check:
⇒ For air accumulation in the line
⇒ For swelling of the feed hoses

If the diaphragm leaks out the diaphragm spring body, check:
⇒ For loose spring body
⇒ For ruptured diaphragms
⇒ For misaligned diaphragm
⇒ For broken diaphragm body

## Wheel Bearing Failure

Check wheel bearings daily. If excessive wear is found, replace bearings. If bearings are to tight load will reduce their life, if to loose, hammering will reduce life.

## Spray Hitting End of Boom/Curtain

The spray booms are designed for true 80º spray tips. Any larger degree angle of tip will result in spray hitting the curtain. Also check for misaligned spray caps and nozzle bodies. All nozzle bodies must be mounted in the shroud such that the spray nozzle is pointing in the downward vertical position.

## DCSS Flops Sideways When Lifted

The bolts that adjust the tension on the DCSS boom mount bar spring may be to tight and are not equally pushing on the shroud mount bar. Put into transport position on level ground and loosen the bolt to increase the tension.

## DCSS Breaks Away Too Easily

Adjust the breakaway tension by putting washers in side the stops to increase spring compression.

## Tracking

The weight of the prime mover and in extreme situations, the wing wheels, will modify the turf and cause it to absorb more fertilizer or chemical. Some fertilizers and fungicides are very susceptible while others are not. The track will disappear within a few days.

## Stripping

At end of Shroud – check:

- ⇒ High tip pressure, over 40psi (2.8 Bar), will cause a wider spray pattern by extending the spray pattern angle.

Between Tips – check:

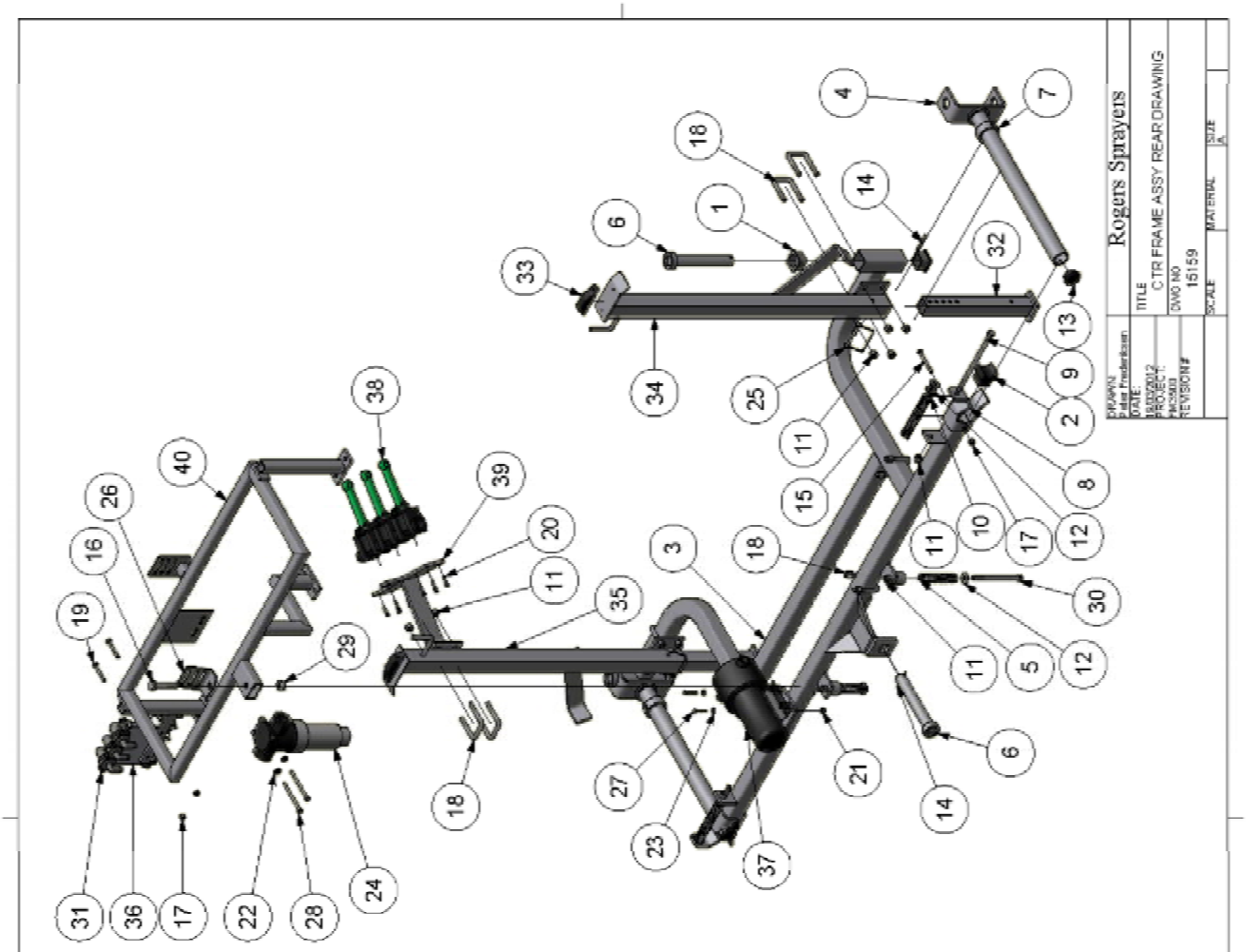
- ⇒ Low tip pressure will cause a narrower pattern. Actual tip pressure should be as close to 40 psi as possible for best results.

Tip screens to see if they are plugged.

## Blocked Nozzles

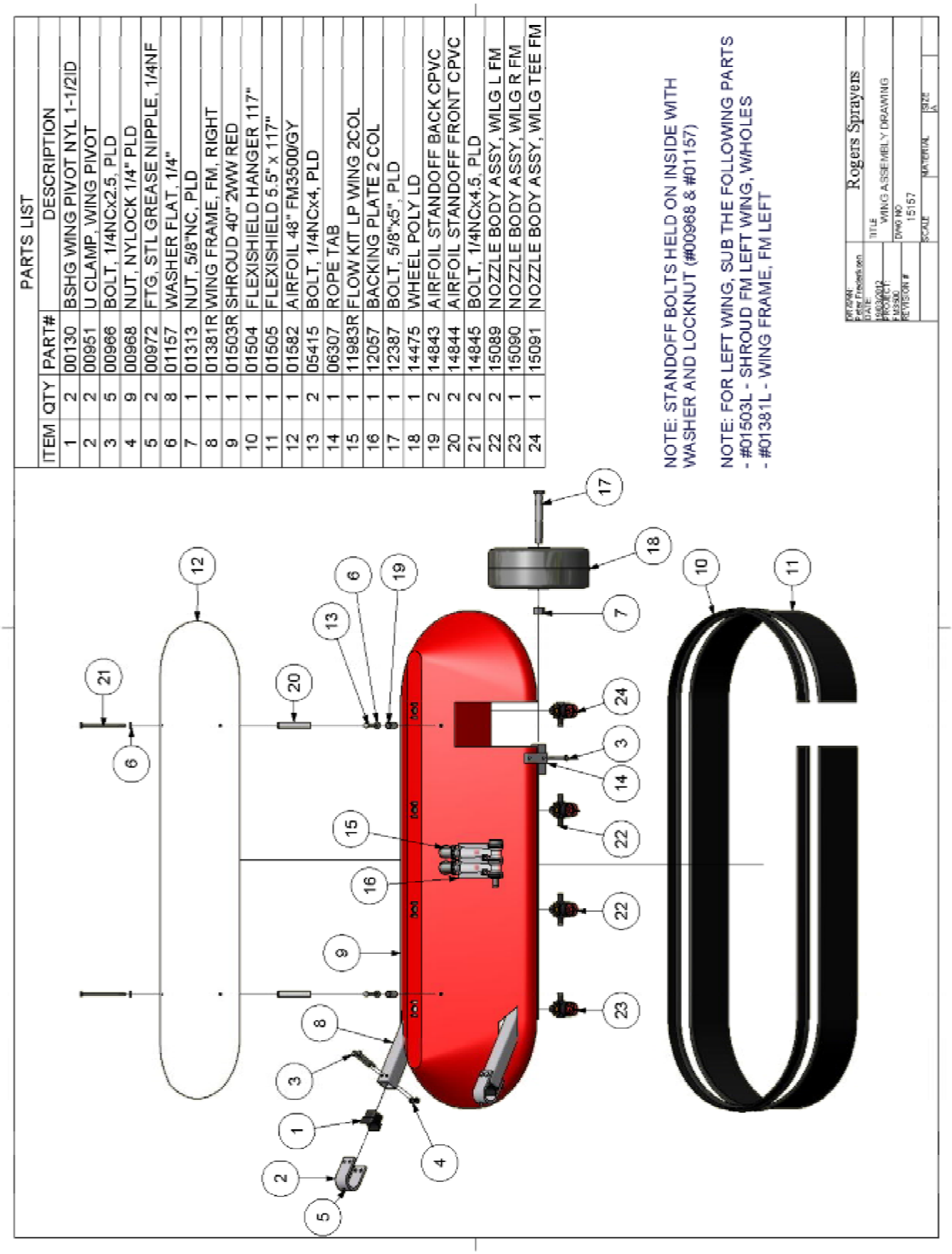
If a nozzle becomes blocked, turn the sprayer off and completely fold up the spray boom (ie fold into transport position). Note that the spray lines could still be pressurized. Therefore prior to removing the cap on the nozzle body, proper safety equipment should be worn, (ie gloves, eye protection, etc).

## Center Frame Assembly




| ITEM | QTY | PART# | DESCRIPTION |
|---|---|---|---|
| 1 | 4 | 00128 | BUSHING URETHANE 1.016ID |
| 2 | 2 | 00130 | BSHG WING PIVOT NYL 1-1/2ID |
| 3 | 1 | 00425 | CENTER FRAME |
| 4 | 2 | 00470 | BREAKAWAY ARM |
| 5 | 2 | 00690 | SPRING CPRN 7/16"ID X 5.125 LG |
| 6 | 3 | 00804 | HINGE PIN 1X6" |
| 7 | 2 | 00805 | COLLAR STL 2X1-9/16X3/4 PLD |
| 8 | 2 | 00814 | BRKWY CATCH STL PLD |
| 9 | 2 | 00954 | BOLT, 3/8"x7", PLD |
| 10 | 2 | 00955 | SPRING CPRN 7/16"ID X 5.125 LG |
| 11 | 22 | 00956 | NUT, NYLOCK, 3/8NC, Pld |
| 12 | 6 | 00957 | WASHER, FLAT, 3/8" PLD |
| 13 | 2 | 00961 | PLUG PLASTIC 1-1/4" ROUND |
| 14 | 3 | 00965 | PIN STL COTTER 3/16"x1-1/2" |
| 15 | 2 | 00966 | BOLT, 1/4NCx2.5, PLD |
| 16 | 1 | 00967 | BOLT, 1/2"x2.5", PLD |
| 17 | 6 | 00968 | NUT, NYLOCK 1/4" PLD |
| 18 | 9 | 01050 | UBOLT, 3/8"x1.5"x2.5", PLD |
| 19 | 2 | 01070 | BOLT, 1/4NCx2, PLD |
| 20 | 8 | 01152 | SCREW MACH. #10-24x3/4, TRUSS |
| 21 | 4 | 01153 | NUT, NYLOCK #10-24 PLD |
| 22 | 2 | 01157 | WASHER FLAT, 1/4" |
| 23 | 4 | 01183 | WASHER FLAT #10 |
| 24 | 1 | 01252 | STRAINER LINE 3/4FPT POLYGLASS |
| 25 | 2 | 01319 | PIN STL SQ. WIRE LOCK 1/4x2-1/2 |
| 26 | 1 | 05103 | STRAP HOLDER STL PLD |
| 27 | 4 | 05385 | SCREW MACH. C #10-24x1-1/4 |
| 28 | 2 | 05413 | BOLT, 1/4NCx3-1/2 PLD |
| 29 | 1 | 05611 | NUT, 1/2NC Pld |
| 30 | 2 | 06521 | BOLT, 3/8"x5", PLD |
| 31 | 1 | 11982 | FLOW INDICATOR 3 COLUMN |
| 32 | 2 | 12717 | LEG, STEINER FM |
| 33 | 2 | 12723 | CLEAT, PLASTIC, ROPE CLAMP |
| 34 | 1 | 13006L | BOOM PULL MT, L (LP FM) |
| 35 | 1 | 13006R | BOOM PULL MT, R (LP FM) |
| 36 | 1 | 13402 | PLATE BACK FLOWMONITOR WING |
| 37 | 1 | 14181 | PUPM 12V DEL 5850 SERIES |
| 38 | 3 | 14422 | VALVE MANUAL BOOM CONTROL TR |
| 39 | 1 | 14836 | VALVE MOUNT FM TR |
| 40 | 1 | 14854 | TANK FRAME ASSY 25GAL SQ. |

## Wing Frame Assembly



PARTS LIST

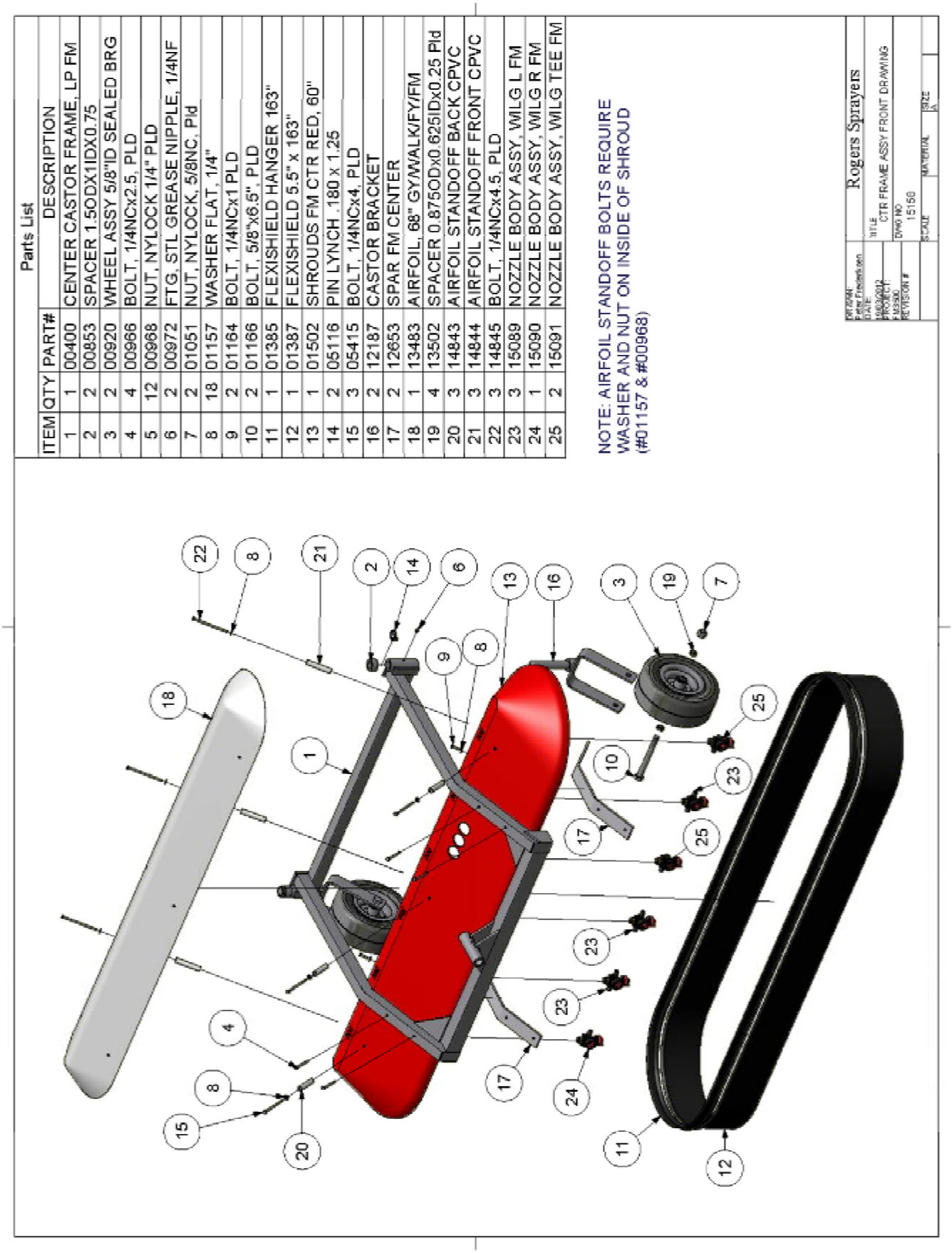
| ITEM | QTY | PART# | DESCRIPTION |
|---|---|---|---|
| 1 | 2 | 00130 | BSHG WING PIVOT NYL 1-1/2ID |
| 2 | 2 | 00951 | U CLAMP, WING PIVOT |
| 3 | 5 | 00966 | BOLT, 1/4NCx2.5, PLD |
| 4 | 9 | 00968 | NUT, NYLOCK 1/4" PLD |
| 5 | 2 | 00972 | FTG, STL GREASE NIPPLE, 1/4NF |
| 6 | 8 | 01157 | WASHER FLAT, 1/4" |
| 7 | 1 | 01313 | NUT, 5/8"NC, PLD |
| 8 | 1 | 01381R | WING FRAME, FM, RIGHT |
| 9 | 1 | 01503R | SHROUD 40" 2WW RED |
| 10 | 1 | 01504 | FLEXISHIELD HANGER 117" |
| 11 | 1 | 01505 | FLEXISHIELD 5.5" x 117" |
| 12 | 1 | 01582 | AIRFOIL 48" FM3500/GY |
| 13 | 2 | 05415 | BOLT, 1/4NCx4, PLD |
| 14 | 1 | 06307 | ROPE TAB |
| 15 | 1 | 11983R | FLOW KIT LP WING 2COL |
| 16 | 1 | 12057 | BACKING PLATE 2 COL |
| 17 | 1 | 12387 | BOLT, 5/8"x5", PLD |
| 18 | 1 | 14475 | WHEEL POLY LD |
| 19 | 2 | 14843 | AIRFOIL STANDOFF BACK CPVC |
| 20 | 2 | 14844 | AIRFOIL STANDOFF FRONT CPVC |
| 21 | 2 | 14845 | BOLT, 1/4NCx4.5, PLD |
| 22 | 2 | 15089 | NOZZLE BODY ASSY, W/LG L FM |
| 23 | 1 | 15090 | NOZZLE BODY ASSY, W/LG R FM |
| 24 | 1 | 15091 | NOZZLE BODY ASSY, W/LG TEE FM |

NOTE: STANDOFF BOLTS HELD ON INSIDE WITH WASHER AND LOCKNUT (#00968 & #01157)

NOTE: FOR LEFT WING, SUB THE FOLLOWING PARTS
- #01503L - SHROUD FM LEFT WING, W/HOLES
- #01381L - WING FRAME, FM LEFT

Rogers Sprayers

## Center Shroud Assembly



Parts List

| ITEM | QTY | PART# | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | 00400 | CENTER CASTOR FRAME, LP FM |
| 2 | 2 | 00853 | SPACER 1.50DX1IDX0.75 |
| 3 | 2 | 00920 | WHEEL ASSY 5/8"ID SEALED BRG |
| 4 | 4 | 00966 | BOLT, 1/4NCx2.5, PLD |
| 5 | 12 | 00968 | NUT, NYLOCK 1/4" PLD |
| 6 | 2 | 00972 | FTG, STL GREASE NIPPLE, 1/4NF |
| 7 | 2 | 01051 | NUT, NYLOCK, 5/8NC, Pld |
| 8 | 18 | 01157 | WASHER FLAT, 1/4" |
| 9 | 2 | 01164 | BOLT, 1/4NCx1 PLD |
| 10 | 2 | 01166 | BOLT, 5/8"x6.5", PLD |
| 11 | 1 | 01385 | FLEXISHIELD HANGER 163" |
| 12 | 1 | 01387 | FLEXISHIELD 5.5" x 163" |
| 13 | 1 | 01502 | SHROUDS FM CTR RED, 60" |
| 14 | 2 | 05116 | PIN LYNCH .180 x 1.25 |
| 15 | 3 | 05415 | BOLT, 1/4NCx4, PLD |
| 16 | 2 | 12187 | CASTOR BRACKET |
| 17 | 2 | 12653 | SPAR FM CENTER |
| 18 | 1 | 13483 | AIRFOIL, 68" GY/W/ALK/FY/FM |
| 19 | 4 | 13502 | SPACER 0.875ODx0.625IDx0.25 Pld |
| 20 | 3 | 14843 | AIRFOIL STANDOFF BACK CPVC |
| 21 | 3 | 14844 | AIRFOIL STANDOFF FRONT CPVC |
| 22 | 3 | 14845 | BOLT, 1/4NCx4.5, PLD |
| 23 | 3 | 15089 | NOZZLE BODY ASSY, WILG L FM |
| 24 | 1 | 15090 | NOZZLE BODY ASSY, WILG R FM |
| 25 | 2 | 15091 | NOZZLE BODY ASSY, WILG TEE FM |

NOTE: AIRFOIL STANDOFF BOLTS REQUIRE WASHER AND NUT ON INSIDE OF SHROUD (#01157 & #00968)

Rogers Sprayers

TITLE: CTR FRAME ASSY FRONT DRAWING

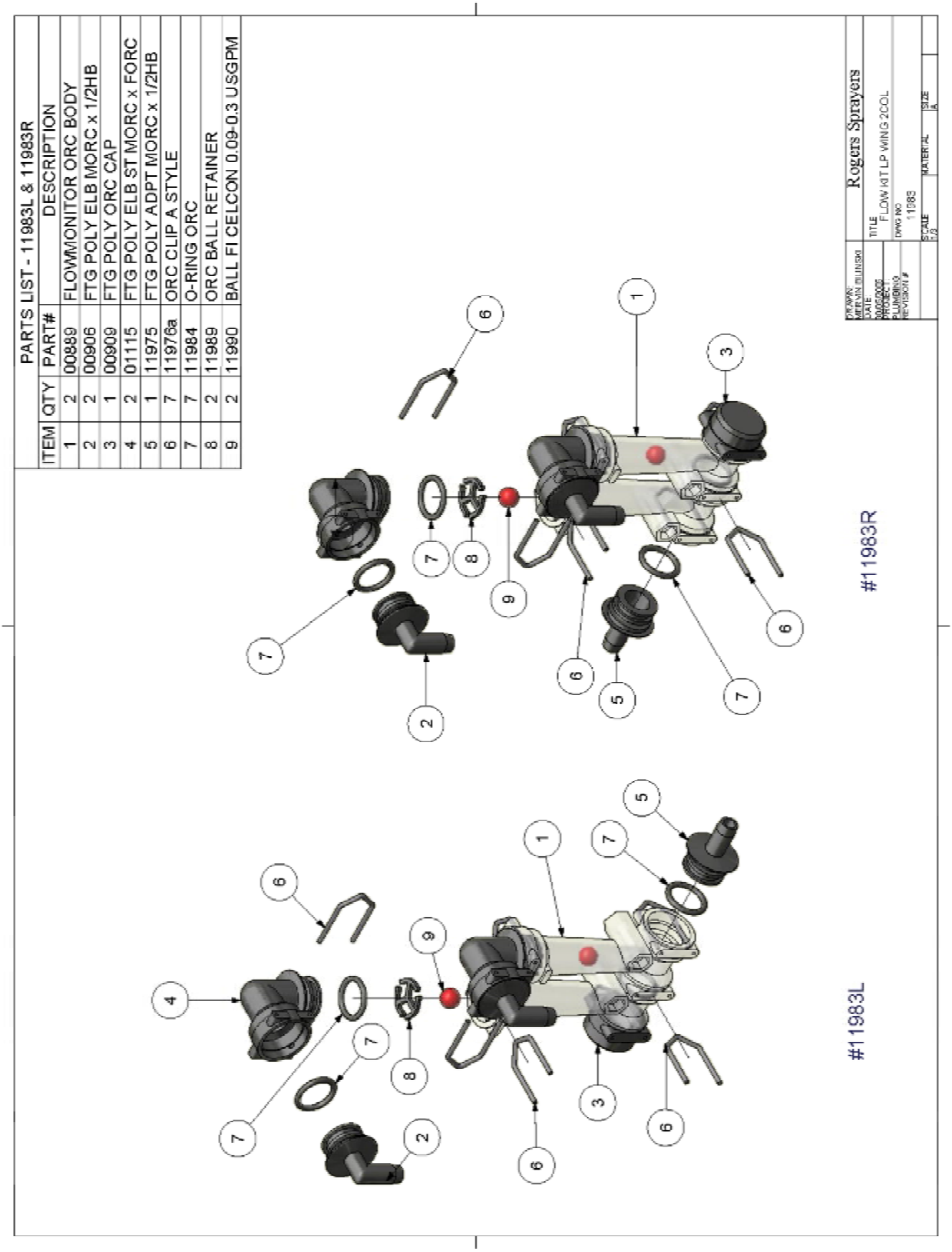
DWG NO: 15150

SIZE: A

## Flow Monitors / Rotometer Parts # 11983

PARTS LIST - 11983L & 11983R

| ITEM | QTY | PART# | DESCRIPTION |
|---|---|---|---|
| 1 | 2 | 00889 | FLOWMONITOR ORC BODY |
| 2 | 2 | 00906 | FTG POLY ELB MORC x 1/2HB |
| 3 | 1 | 00909 | FTG POLY ORC CAP |
| 4 | 2 | 01115 | FTG POLY ELB ST MORC x FORC |
| 5 | 1 | 11975 | FTG POLY ADPT MORC x 1/2HB |
| 6 | 7 | 11976a | ORC CLIP A STYLE |
| 7 | 7 | 11984 | O-RING ORC |
| 8 | 2 | 11989 | ORC BALL RETAINER |
| 9 | 2 | 11990 | BALL FI CELCON 0.09-0.3 USGPM |

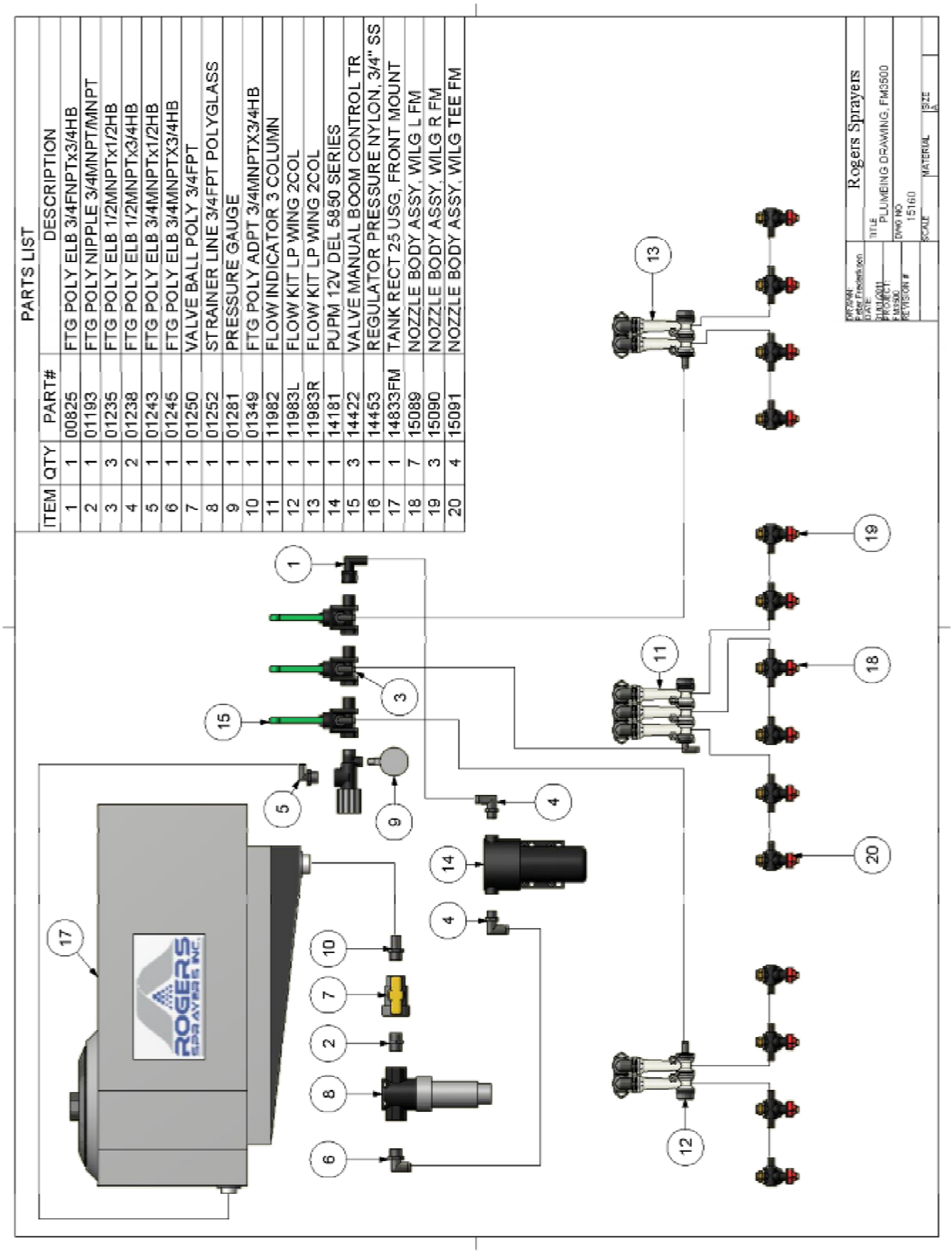



Rogers Sprayers

DRAWN: MERVIN BUNSEN
DATE: 10/05/2007
PROJECT: PLUMBING
REVISION #:

TITLE: FLOW KIT LP WING 2COL
DWG NO: 11983
SCALE: 1:2
MATERIAL:
SIZE: A

## Plumbing Assembly Part # 15160

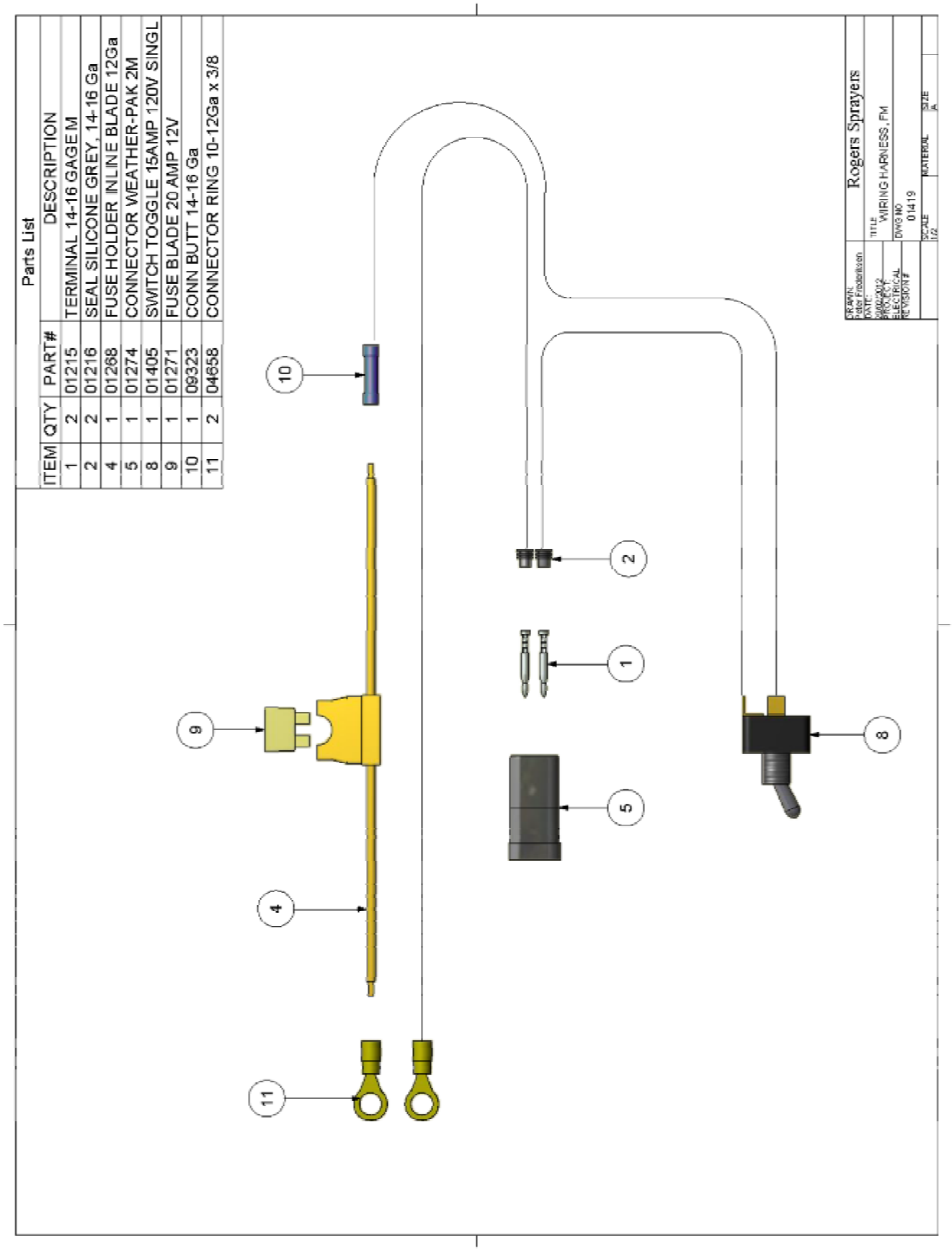


PARTS LIST

| ITEM | QTY | PART# | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | 00825 | FTG POLY ELB 3/4FNPTx3/4HB |
| 2 | 1 | 01193 | FTG POLY NIPPLE 3/4MNPT/MNPT |
| 3 | 3 | 01235 | FTG POLY ELB 1/2MNPTx1/2HB |
| 4 | 2 | 01238 | FTG POLY ELB 1/2MNPTx3/4HB |
| 5 | 1 | 01243 | FTG POLY ELB 3/4MNPTx1/2HB |
| 6 | 1 | 01245 | FTG POLY ELB 3/4MNPTX3/4HB |
| 7 | 1 | 01250 | VALVE BALL POLY 3/4FPT |
| 8 | 1 | 01252 | STRAINER LINE 3/4FPT POLYGLASS |
| 9 | 1 | 01281 | PRESSURE GAUGE |
| 10 | 1 | 01349 | FTG POLY ADPT 3/4MNPTX3/4HB |
| 11 | 1 | 11982 | FLOW INDICATOR 3 COLUMN |
| 12 | 1 | 11983L | FLOW KIT LP WING 2COL |
| 13 | 1 | 11983R | FLOW KIT LP WING 2COL |
| 14 | 1 | 14181 | PUPM 12V DEL 5850 SERIES |
| 15 | 3 | 14422 | VALVE MANUAL BOOM CONTROL TR |
| 16 | 1 | 14453 | REGULATOR PRESSURE NYLON, 3/4" SS |
| 17 | 1 | 14833FM | TANK RECT 25 USG, FRONT MOUNT |
| 18 | 7 | 15089 | NOZZLE BODY ASSY, WILG L FM |
| 19 | 3 | 15090 | NOZZLE BODY ASSY, WILG R FM |
| 20 | 4 | 15091 | NOZZLE BODY ASSY, WILG TEE FM |

Rogers Sprayers
TITLE: PLUMBING DRAWING, FM3500
DWG NO: 15160
SCALE | MATERIAL | SIZE A

## Electrical Assembly Part # 01419



Parts List

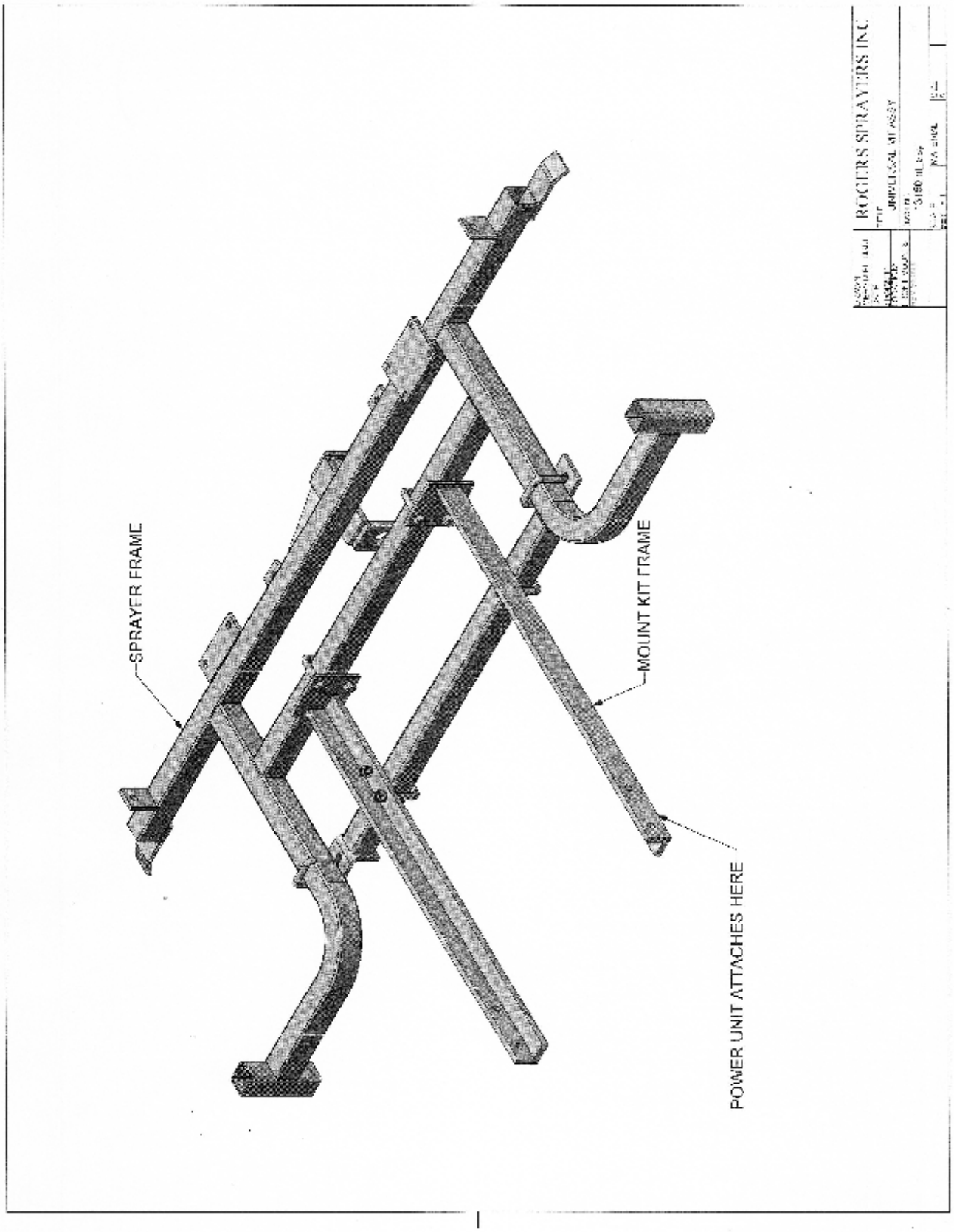
| ITEM | QTY | PART# | DESCRIPTION |
|---|---|---|---|
| 1 | 2 | 01215 | TERMINAL 14-16 GAGE M |
| 2 | 2 | 01216 | SEAL SILICONE GREY, 14-16 Ga |
| 4 | 1 | 01268 | FUSE HOLDER INLINE BLADE 12Ga |
| 5 | 1 | 01274 | CONNECTOR WEATHER-PAK 2M |
| 8 | 1 | 01405 | SWITCH TOGGLE 15AMP 120V SINGL |
| 9 | 1 | 01271 | FUSE BLADE 20 AMP 12V |
| 10 | 1 | 09323 | CONN BUTT 14-16 Ga |
| 11 | 2 | 04658 | CONNECTOR RING 10-12Ga x 3/8 |

Rogers Sprayers

DRAWN: Peter Frederiksen
DATE:
APPROVED
ELECTRICAL
REVISION #

TITLE: WIRING HARNESS, FM
DWG NO: 01419
SCALE: 1/2
MATERIAL
SIZE: A

## Universal Mount Assembly Part # 13150



***Rogers Sprayers Inc. (RSI)***
141 - 105th Street East
Saskatoon, SK S7N 1Z2 Canada

Tel.: (306) 975-0500 or (888) 975-8294
Fax: (306) 975-0499
Email: info@rogerssprayers.com

# ROGERS SPRAYERS INC OWNER WARRANTY AGREEMENT

***Windfoil*** Drift Containment Spray Systems (DCSS) are warranted to be free of factory defects under normal and intended use for a period of one (1) year from date of purchase to the original purchaser. Equipment must be setup in accordance with factory instructions and operated, maintained and used in accordance with the operator's manual. Equipment used for rental has a warranty period of forty five (45) days. Any customization or modifications to the original equipment voids warranty immediately.

RSI reserves the right not to warranty any items that are not directly manufactured by RSI. Such components need to be returned to the factory for inspection and tested by either RSI or the original manufacturer for defects. Examples of these parts include actuators, engines, pumps and electrical systems.

**All warranty Claims must be pre-authorized by the factory!**

To obtain warranty, all defective parts must be returned to the factory; in some cases, location of part might require only photo of defective part. RSI must be contacted to determine which route is required. RSI through its designated dealer or factory appointed representative will repair or replace, at its option, any or all parts that are proven to be defective free of charge.

RSI DOES NOT pay or reimburse for any travel time or investigation time to determine the defective part. Warranty labor will be based on the time required for RSI to replace only the part. Warranty labor rates and replacement times will be assessed yearly and will be included in a labor replacement sheet.

This warranty does not apply to damage caused by misuse, accident, acts of god, and/or operation without proper servicing. RSI will not be responsible for consequential damages; its liability is limited to replacement of parts.

Standard wear components (see list) such as belts, nozzles, screens, bearings, wheels, flow indicator bodies or flow indicator parts are only warranted for 30 days after original purchase.

RSI makes no other expressed, implied or statutory warranty; nor is anyone authorized to make any on our behalf.

## Complete your Warranty Registration online at www.rogerssprayers.com

The warranty registration is found on the Contact page of our website. The warranty registration **MUST** be filled out completely and submitted to RSI to activate the warranty. If you would prefer, a printable copy is also available online.

**It is our intention to manufacture durable, user-friendly products. Any suggestions you have as to how we may improve our equipment are greatly appreciated.**




ROGERS SPRAYERS INC.

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