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## ***Falcon*** FA5000E

16.5ft/5m Aluminum Covered Spray Boom  
with Electric Folding System



Assembly, Parts and Operator's Manual

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## DCSS Forward

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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 kph), 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 lifts drops up into the air, more commonly referred to as 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

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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.

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 is required for the assembly of large equipment, especially when lifting or exertion is required. When removing and assembling the center and the wings of the spray boom out of the original shipping box, use recommended lift points (see installation instructions).
- Always use clean tools of the proper size and specification to match the hardware and specific job.
- 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.

### 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.
- This boom should only be mounted on sprayers that are equipped with a clean water tank for the operator's use with a minimum capacity of 15 liters. This tank is to be totally isolated from the other parts of the machine and shall be fitted with a tap which can be opened without being continuously pressed.
- 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).
- Stay clear of the pinch points and areas where the sprayer moves under power. Areas of concern include but are not limited to the following: 1) When the center section is folding up and the wing lockup dampers come to rest in the wing lockup yokes, stay clear of the lockup yokes, fixed and float arm assemblies, center actuators and center wheel mount assembly pivot points. 2) As the wings are folded up, stay clear of the wing lift pivots, actuators and all pivot points in that area. 3) As the wings are folding down from the vertical position the wing shroud overlaps the center shroud and presents a hazard of pinching, stay clear of this area. 4) When the wings break away, take caution when manually reloading the breakaway tube into the break latch of any pinch points.
- Any maintenance intervention, in particular welding, shall only be undertaken after the spray boom has been thoroughly rinsed.

## Transport Safety

- 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 sprayer has been designed in wind tunnels to control airflow around and behind the sprayer this minimizes drift and allows safe spraying in windy conditions. [See literature.]

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

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### Application Tips

Always use clean filtered water in the sprayer tank.

Your DCSS is supplied with ceramic insert tips. Ceramic material is one of the hardest in the world; it greatly increases the life of your 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.

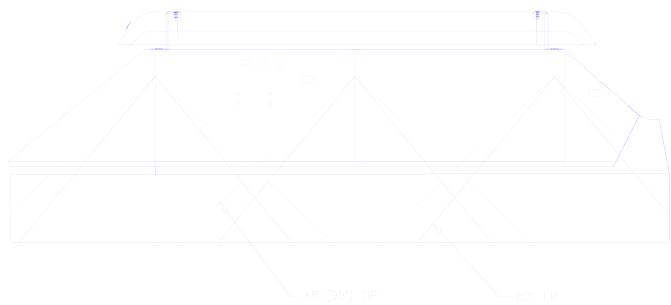
### Nozzles

Caution: The Falcon covered boom was designed to use 80° tips, 110° tips will not work.

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 80° tips, as these tips will provide the most uniform spray pattern in the DCSS. If a flat fan is used that is greater than 80° the spray will hit the end of the curtain and the center sections wheels causing drip.

**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. 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.

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

# Application Rate Tables

Table 1: American Application Rates at 20" Nozzle Spacing – 80 Degree Tips

Rogers Part #	Tip Number	Tip Mfg	Liquid Press psi	Liq. Pres s bars	Cap. /noz. gpm	U. S. GALLONS PER ACRE					U. S. GALLONS PER 1000 SQ. FT.				
						2.5	3	4	5	7	2.5	3	4	5	7
						mph	mph	mph	mph	mph	mp h	mp h	mp h	mp h	mph
01369	8001VS (100 mesh)	Teejet	30	2.07	0.087	10.3	8.6	6.4	5.1	3.7	0.24	0.20	0.15	0.12	0.08
			40	2.76	0.100	11.9	9.9	7.4	5.9	4.2	0.27	0.23	0.17	0.14	0.10
			50	3.45	0.112	13.3	11.1	8.3	6.6	4.7	0.30	0.25	0.19	0.15	0.11
			60	4.14	0.122	14.5	12.1	9.1	7.3	5.2	0.33	0.28	0.21	0.17	0.12
00827 13351	80015VS or API-80015 (100 mesh)	Teejet	30	2.07	0.130	15.4	12.9	9.6	7.7	5.5	0.35	0.29	0.22	0.18	0.13
			40	2.76	0.150	17.8	14.9	11.1	8.9	6.4	0.41	0.34	0.26	0.20	0.15
			50	3.45	0.168	19.9	16.6	12.5	10.0	7.1	0.46	0.38	0.29	0.23	0.16
			60	4.14	0.184	21.8	18.2	13.6	10.9	7.8	0.50	0.42	0.31	0.25	0.18
05876 14384	8002VS or AXI-8002 (50 mesh)	Teejet	30	2.07	0.173	20.6	17.1	12.9	10.3	7.3	0.47	0.39	0.29	0.24	0.17
			40	2.76	0.200	23.8	19.8	14.9	11.9	8.5	0.54	0.45	0.34	0.27	0.19
			50	3.45	0.224	26.6	22.1	16.6	13.3	9.5	0.61	0.51	0.38	0.30	0.22
			60	4.14	0.245	29.1	24.2	18.2	14.5	10.4	0.67	0.56	0.42	0.33	0.24
05877 14385	8003VS or AXI-8003 (50 mesh)	Teejet	30	2.07	0.260	30.9	25.7	19.3	15.4	11.0	0.71	0.59	0.44	0.35	0.25
			40	2.76	0.300	35.6	29.7	22.3	17.8	12.7	0.82	0.68	0.51	0.41	0.29
			50	3.45	0.335	39.8	33.2	24.9	19.9	14.2	0.91	0.76	0.57	0.46	0.33
			60	4.14	0.367	43.6	36.4	27.3	21.8	15.6	1.00	0.83	0.62	0.50	0.36
05878 14061	8004VS or AXI-8004 (50 mesh)	Teejet	30	2.07	0.346	41.2	34.3	25.7	20.6	14.7	0.94	0.79	0.59	0.47	0.34
			40	2.76	0.400	47.5	39.6	29.7	23.8	17.0	1.09	0.91	0.68	0.54	0.39
			50	3.45	0.447	53.1	44.3	33.2	26.6	19.0	1.22	1.01	0.76	0.61	0.43
			60	4.14	0.490	58.2	48.5	36.4	29.1	20.8	1.33	1.11	0.83	0.67	0.48
05879 14386	8005VS or AXI-8005 (50 mesh)	Teejet	30	2.07	0.433	51.4	42.9	32.2	25.7	18.4	1.18	0.98	0.74	0.59	0.42
			40	2.76	0.500	59.4	49.5	37.1	29.7	21.2	1.36	1.13	0.85	0.68	0.49
			50	3.45	0.559	66.4	55.3	41.5	33.2	23.7	1.52	1.27	0.95	0.76	0.54
			60	4.14	0.612	72.7	60.6	45.5	36.4	26.0	1.67	1.39	1.04	0.83	0.59
05880 14387	8006VS or AXI-8006 (50 mesh)	Teejet	30	2.07	0.520	61.7	51.4	38.6	30.9	22.0	1.41	1.18	0.88	0.71	0.50
			40	2.76	0.600	71.3	59.4	44.6	35.6	25.5	1.63	1.36	1.02	0.82	0.58
			50	3.45	0.671	79.7	66.4	49.8	39.8	28.5	1.82	1.52	1.14	0.91	0.65
			60	4.14	0.735	87.3	72.7	54.6	43.6	31.2	2.00	1.67	1.25	1.00	0.71
05881	8008VS (50 mesh)	Teejet	30	2.07	0.693	82.3	68.6	51.4	41.2	29.4	1.88	1.57	1.18	0.94	0.67
			40	2.76	0.800	95.0	79.2	59.4	47.5	33.9	2.18	1.81	1.36	1.09	0.78
			50	3.45	0.894	106.3	88.5	66.4	53.1	37.9	2.43	2.03	1.52	1.22	0.87
			60	4.14	0.980	116.4	97.0	72.7	58.2	41.6	2.67	2.22	1.67	1.33	0.95
13674 14414	ER8010 or XR8010SS	Wilger	30	2.07	0.866	102.9	85.7	64.3	51.4	36.7	2.36	1.96	1.47	1.18	0.84
			40	2.76	1.000	118.8	99.0	74.3	59.4	42.4	2.72	2.27	1.70	1.36	0.97
			50	3.45	1.118	132.8	110.7	83.0	66.4	47.4	3.04	2.53	1.90	1.52	1.09
			60	4.14	1.225	145.5	121.2	90.9	72.7	52.0	3.33	2.78	2.08	1.67	1.19
14330	ER80125	Wilger	30	2.07	1.083	128.6	107.2	80.4	64.3	45.9	2.94	2.45	1.84	1.47	1.05
			40	2.76	1.250	148.5	123.8	92.8	74.3	53.0	3.40	2.83	2.13	1.70	1.21
			50	3.45	1.398	166.0	138.4	103.8	83.0	59.3	3.80	3.17	2.38	1.90	1.36
			60	4.14	1.531	181.9	151.6	113.7	90.9	65.0	4.16	3.47	2.60	2.08	1.49
14040 14415	MR8015 or XR8015SS	Wilger	30	2.07	1.299	154.3	128.6	96.5	77.2	55.1	3.53	2.94	2.21	1.77	1.26
			40	2.76	1.500	178.2	148.5	111.4	89.1	63.6	4.08	3.40	2.55	2.04	1.46
			50	3.45	1.677	199.2	166.0	124.5	99.6	71.2	4.56	3.80	2.85	2.28	1.63
			60	4.14	1.837	218.2	181.9	136.4	109.1	77.9	5.00	4.16	3.12	2.50	1.78
14195	MR8020	Wilger	30	2.07	1.732	205.8	171.5	128.6	102.9	73.5	4.71	3.93	2.94	2.36	1.68
			40	2.76	2.000	237.6	198.0	148.5	118.8	84.9	5.44	4.53	3.40	2.72	1.94
			50	3.45	2.236	265.6	221.4	166.0	132.8	94.9	6.08	5.07	3.80	3.04	2.17
			60	4.14	2.449	291.0	242.5	181.9	145.5	103.9	6.66	5.55	4.16	3.33	2.38

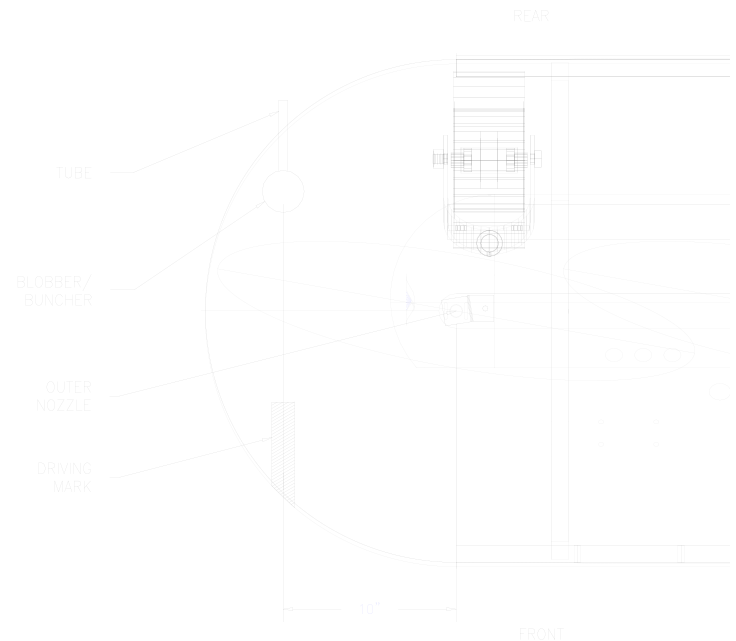
Table 2: Metric Application Rates at 20" Nozzle Spacing (.05 meters) – 80 Degree Tips

Rogers Part #	Tip Number	Tip Mfg	Liq- uid Press psi	Liq- uid Press bars	Cap /noz. gpm	U. S. GALLONS PER ACRE					Liters/Hectare				
						2.5	3	4	5	7	4	4.8	6.4	8	11.2
						mph	mph	mph	mph	mph	kph	kph	kph	kph	kph
01369	8001VS (100 mesh)	Teejet	30	2.07	0.087	10.3	8.6	6.4	5.1	3.7	96	80	60	48	34
			40	2.76	0.100	11.9	9.9	7.4	5.9	4.2	111	93	69	56	40
			50	3.45	0.112	13.3	11.1	8.3	6.6	4.7	124	103	78	62	44
			60	4.14	0.122	14.5	12.1	9.1	7.3	5.2	136	113	85	68	49
00827 13351	80015VS or API-80015 (100 mesh)	Teejet	30	2.07	0.130	15.4	12.9	9.6	7.7	5.5	144	120	90	72	52
			40	2.76	0.150	17.8	14.9	11.1	8.9	6.4	167	139	104	83	60
		Albuz	50	3.45	0.168	19.9	16.6	12.5	10.0	7.1	186	155	116	93	67
			60	4.14	0.184	21.8	18.2	13.6	10.9	7.8	204	170	128	102	73
05876 14384	8002VS or AXI-8002 (50 mesh)	Teejet	30	2.07	0.173	20.6	17.1	12.9	10.3	7.3	192	160	120	96	69
			40	2.76	0.200	23.8	19.8	14.9	11.9	8.5	222	185	139	111	79
		Albuz	50	3.45	0.224	26.6	22.1	16.6	13.3	9.5	248	207	155	124	89
			60	4.14	0.245	29.1	24.2	18.2	14.5	10.4	272	227	170	136	97
05877 14385	8003VS or AXI-8003 (50 mesh)	Teejet	30	2.07	0.260	30.9	25.7	19.3	15.4	11.0	289	240	180	144	103
			40	2.76	0.300	35.6	29.7	22.3	17.8	12.7	333	278	208	167	119
		Albuz	50	3.45	0.335	39.8	33.2	24.9	19.9	14.2	373	310	233	186	133
			60	4.14	0.367	43.6	36.4	27.3	21.8	15.6	408	340	255	204	146
05878 14061	8004VS or AXI-8004 (50 mesh)	Teejet	30	2.07	0.346	41.2	34.3	25.7	20.6	14.7	385	321	240	192	137
			40	2.76	0.400	47.5	39.6	29.7	23.8	17.0	444	370	278	222	159
		Albuz	50	3.45	0.447	53.1	44.3	33.2	26.6	19.0	497	414	310	248	177
			60	4.14	0.490	58.2	48.5	36.4	29.1	20.8	544	453	340	272	194
05879 14386	8005VS or AXI-8005 (50 mesh)	Teejet	30	2.07	0.433	51.4	42.9	32.2	25.7	18.4	481	401	301	240	172
			40	2.76	0.500	59.4	49.5	37.1	29.7	21.2	555	463	347	278	198
		Albuz	50	3.45	0.559	66.4	55.3	41.5	33.2	23.7	621	517	388	310	222
			60	4.14	0.612	72.7	60.6	45.5	36.4	26.0	680	567	425	340	243
05880 14387	8006VS or AXI-8006 (50 mesh)	Teejet	30	2.07	0.520	61.7	51.4	38.6	30.9	22.0	577	481	361	289	206
			40	2.76	0.600	71.3	59.4	44.6	35.6	25.5	666	555	417	333	238
		Albuz	50	3.45	0.671	79.7	66.4	49.8	39.8	28.5	745	621	466	373	266
			60	4.14	0.735	87.3	72.7	54.6	43.6	31.2	816	680	510	408	292
05881	8008VS (50 mesh)	Teejet	30	2.07	0.693	82.3	68.6	51.4	41.2	29.4	770	641	481	385	275
			40	2.76	0.800	95.0	79.2	59.4	47.5	33.9	889	741	555	444	317
			50	3.45	0.894	106.3	88.5	66.4	53.1	37.9	994	828	621	497	355
			60	4.14	0.980	116.4	97.0	72.7	58.2	41.6	1088	907	680	544	389
13674 14414	ER8010 or XR8010SS	Wilge r	30	2.07	0.866	102.9	85.7	64.3	51.4	36.7	962	802	601	481	344
			40	2.76	1.000	118.8	99.0	74.3	59.4	42.4	1111	926	694	555	397
		Teejet	50	3.45	1.118	132.8	110.7	83.0	66.4	47.4	1242	1035	776	621	444
			60	4.14	1.225	145.5	121.2	90.9	72.7	52.0	1360	1134	850	680	486
14330	ER80125	Wilge r	30	2.07	1.083	128.6	107.2	80.4	64.3	45.9	1202	1002	752	601	429
			40	2.76	1.250	148.5	123.8	92.8	74.3	53.0	1388	1157	868	694	496
			50	3.45	1.398	166.0	138.4	103.8	83.0	59.3	1552	1294	970	776	554
			60	4.14	1.531	181.9	151.6	113.7	90.9	65.0	1701	1417	1063	850	607
14040 14415	MR8015 or XR8015SS	Wilge r	30	2.07	1.299	154.3	128.6	96.5	77.2	55.1	1443	1202	902	721	515
			40	2.76	1.500	178.2	148.5	111.4	89.1	63.6	1666	1388	1041	833	595
		Teejet	50	3.45	1.677	199.2	166.0	124.5	99.6	71.2	1863	1552	1164	931	665
			60	4.14	1.837	218.2	181.9	136.4	109.1	77.9	2041	1701	1275	1020	729
14195	MR8020	Wilge r	30	2.07	1.732	205.8	171.5	128.6	102.9	73.5	1924	1603	1202	962	687
			40	2.76	2.000	237.6	198.0	148.5	118.8	84.9	2222	1851	1388	1111	793
			50	3.45	2.236	265.6	221.4	166.0	132.8	94.9	2484	2070	1552	1242	887
			60	4.14	2.449	291.0	242.5	181.9	145.5	103.9	2721	2267	1701	1360	972

## Foam Marker Installation Considerations

Mount the foam marker tank etc. as instructed by the manufacturer. Run hoses along the spray hoses under the shrouds as much as possible. Be sure to go around the back of the breakaway hinge point and into the wing, along the top of the 2in x 2in (5cm x 5cm) tube to the end. Ensure no plumbing or hardware gets into the spray pattern as dripping or stripping may occur. If the blobber is small enough, locate it inside the shroud with the tube or buncher going out the back such that it drops the blob just past the lower edge of the curtain. It must be located 10in (25cm) along the centerline of the shroud from the end tip. This places the blobber where it is protected from branches etc. plus positions the blob where both the front and rear curtain should hit it on the return pass, smearing it out which will help it dissipate. Put a large mark on the front of the shroud the same distance from the tip and drive such that the foam blob lines up with the mark. This will ensure proper overlap and provide even coverage. Under certain conditions large foam blobs will suffocate the grass underneath them. This can be minimized by smearing the foam and by using the

smallest blob possible. Some operators replace the large blobber supplied with a ½ inch (1.25 cm) hose running down the back edge of the curtain.



## Installation Instructions

### Removing spray boom from box

Once the top of the box has been opened 2 people are required to unload the wings and center section. Grab under the edge of the shroud near the end (curved section) and the frame that sticks out of the shroud for lifting the wing. On the center section the black painted round tubes (approx 1.75in (4.4cm) dia, breakaway tubes) are recommended lifting points for removing the center section out of the box. Table 1 below is a list of wing and center section weights. When using lifts, attach straps to same points as mentioned for manual lifting.

Table 1 Component weights

Model	5.0 meter Alum.	5.0 meter Steel	6.0 meter Alum.	6.0 meter Steel
Wing weights (lbs/kg)	45/20	62/28	64/29	84/38
Center weight (lbs/kg)	129/59	169/77	129/59	169/77

### Center Frame Section

The initial step to setting up your new Falcon covered boom is to install the boom mount tubes on the back of the sprayer. Attach mounting kit to rear of sprayer frame (see applicable instructions with mounting hardware). The boom mount tubes consist of 2 single 2 inch (5 cm) square tubes, the top and bottom tubes are 62 & 70 inches (157 & 178 cm) long respectively. U-bolt/bolt these tubes solid to the frame and centered on the back of the machine. The top of the lower tube should be approximately 20.5 inches (52 cm) from the ground, and the top of the upper tube 31 inches (79cm) from the ground.

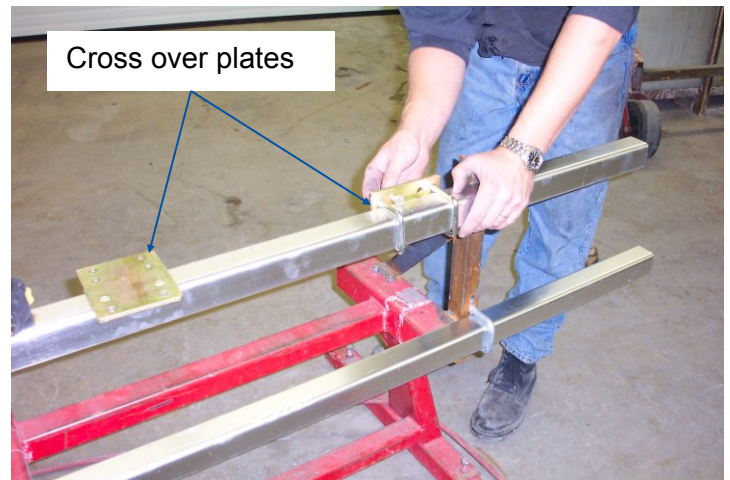


Figure 1



Boom Mount Tubes

Figure 2



Cross Over Plates

Figures 1 & 2 above show the boom mount tubes and the top crossover plates for mounting to the frame of the JDHD 200 frame (also used on the JDHD 300). Drawing on page 27 show a details for mounting crossover plates and lower pinching plates.

Once the boom mount tubes are installed, install the center flow monitor support assembly by sliding the u-bolts along the top boom mount tube. Typically the monitor is installed on the right side of the unit as shown below in figure 3.

Figure 3



Center Flowmonitor Assembly

Next mount the fixed arms on the ends of the boom mount tubes as shown in figure 4 (fixed arms are labeled “left” & “right” as relating to the forward direction of the unit). When tightening the u-bolts on the fixed arms make sure that they are tight to the boom mount tubes, are vertical and clear the fenders, wheels and hoses of the unit. The bottom boom mount tube should stick out about 3.75 inches (9.5 cm) past the bottom of the fixed arm plate as shown below in figure 5.

Figure 4



Fixed Arm Installation

Figure 5



Fixed Arm Installation

Once the boom mount tubes are installed you are ready to set up the center section. One easy way to do this is to place the center shroud assembly on a pair of saw horses. Slide the castor fork assembly through the center wheel mount as shown in figure 6. Note do not over tighten nut on top of castor fork. Loosen top nylock nut just enough to allow castor wheel to spin freely. Next install float arms and actuators as shown in figures 7 & 8. Note the actuators should be completely extracted, and slider bushings should be facing inward.

Figure 6



Castor Wheel

Figure 7



Float Arms

Figure 8



Actuator Install

With the help of an assistant, remove center assembly from the sawhorses and roll unit along side of fixed arms that were mounted on the boom mount tubes, as shown below in figure 9. When attaching the fixed arms to the float arm assemblies, make sure that the bolts run from the inside out (i.e. nuts should be facing outward).

Figure 9



Center Section Installation

To adjust the tilt of the center section, loosen the nylock nuts which hold the actuator bracket of the center actuators. Note castor wheels must be turned underneath shroud (in forward rolling position), have one person tilt the end of the boom to level shroud, brackets will slide along 1 inch (2.5 cm) steel tube, tighten nuts when level.

Figure 10



Center Section Adjustment



## Wing Sections

To install the wings break away the breakaway tubes on the center section as shown below in figure 11. Lift and insert wing as shown in figure 12.

Figure 11



Breakaway Tubes

Figure 12



Wing Installation

Push breakaway tube back into spring loaded holder and set wing down using a saw horse to prop up end of wing. Install castor wheel by inserting castor fork bolt through bushings in wing as shown below in figure 13. Be sure that nylock nut on top of castor wheel is set so that the wheel castors freely. Install wing lockup damper as shown below in figure 14.

Figure 13



Castor Wheel Install

Figure 14



Wing Damper Install

Set wing back down on the floor and install the rear stabilizer bar. Insert one end into back end of the breakaway tube and insert cotter pin to hold in place. Before tightening bolt on the other end of the stabilizer bar to the wing frame, have someone push or pull on the end of the shroud to line up the center and wing frame. Looking along the top of the center section and the wing, they should be lined up, use the adjustment in the stabilizer bar to accomplish this. Tighten bolt provided in arm, use washer on slotted side.

Figure 15



Stabilizer Bar Installation

The next step is to have someone hold the wing in the vertical position (see figure 16) with the actuator in its shortest position and tighten all bolts for the wing actuator mounts. This should align the wing to rest in the yokes on the fixed arms, if alignment is out, loosen bolts that hold actuator and slide bracket as required.

Figure 16



Installing Actuator

Install airfoils as shown in figure 17. Long airfoil standoff should be towards the front, short towards the back.

Figure 17



Standoff Installation

Figure 18



Airfoil Installation

**Manual Fold**

Mounting channels replace the wing lift arms, figure 19. Using the slots in the channels, adjust manual catch arm to hook wing in the vertical position. Actuators are replaced with rigid steel lock arms figure 20.

Figure 19



Wing Lift Channels

Figure 20

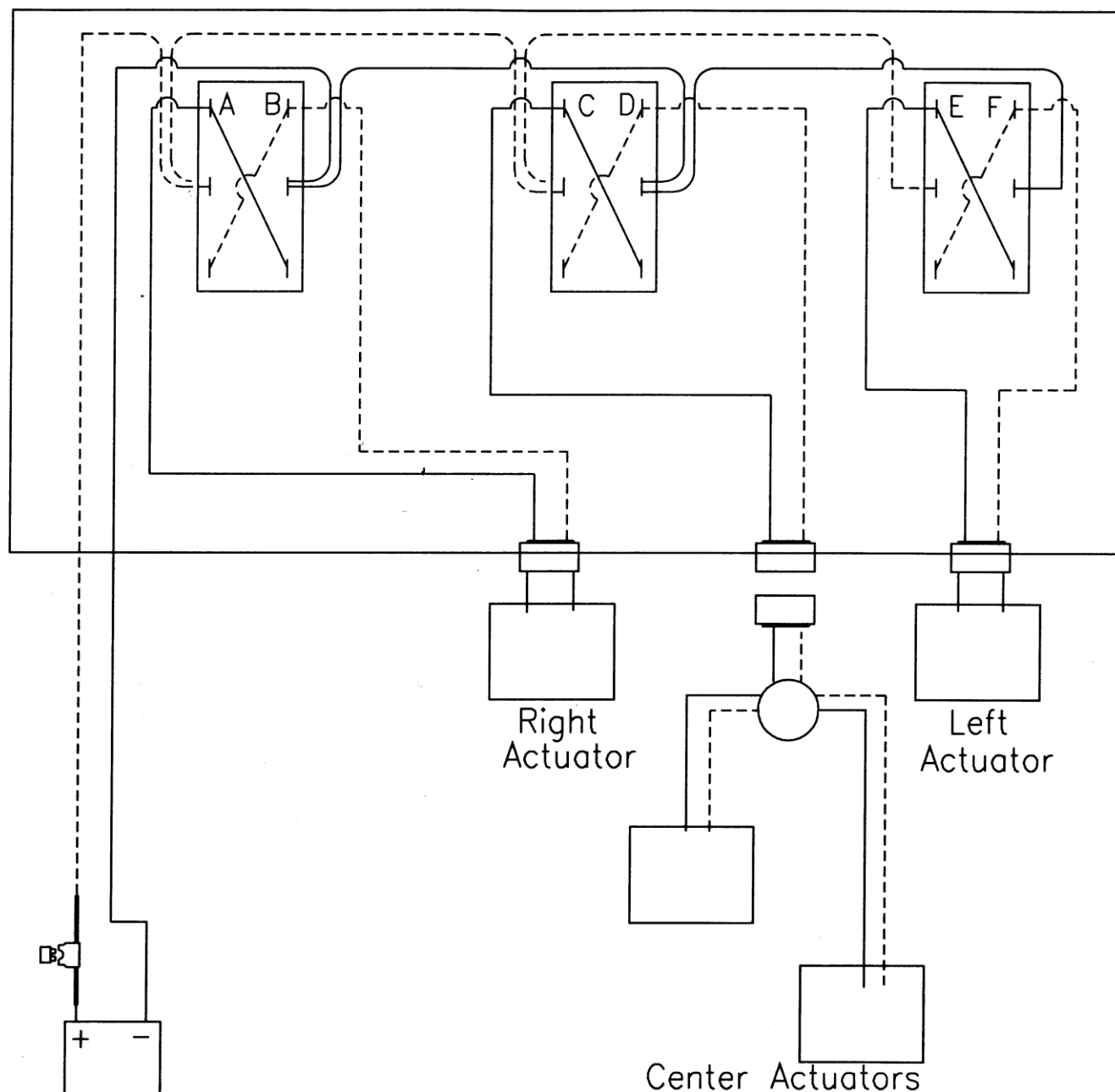


Manual Center Lock Arm

## PROGATOR JDHD 200 & 300 WIRING (pre 2009)

Your wiring harness should include 3 toggle switches, 3 actuator feed wires, 1 power wire and 1 split kit. Using the existing holes in the John Deere control panel for the wing actuators mount 2 of the toggle switches for the Falcon wings. The third switch can either be placed in a vacant hole location or a new hole needs to be added to the panel. Install actuators wires and power wire from front control panel to rear of machine. (Be sure wires are clear of exhaust parts and moving framework) See Figure 21 for details on hooking up wires to actuators and toggle switches.

Figure 21



Actuator Wiring for JDHD200 Sprayers (Pre 2009)

# Final Assembly Checklist

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## Mechanism Checks

Boom Level: Sitting on a level pad adjust the angle of the boom by adjusting the center lock bar or actuator mount angle with the bolts on the upper arm to level the boom front to back with half a load of water in the sprayer.

Breakaway Catches: The breakaway catch should release with a good push (45 lbs/20.5 kg) exerted at the transport catch 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.

Wing Folding: For manual fold, pivot wing into the vertical position and hook the latch in the slot provided. For electric option retract the actuator, the wing should rise 90° if not adjust the actuator mount so the wing rotates into the transport lock.

The Float Arms: The float arms should be free to move up and down without interference. The wheel mount will float down until it hits on the lower cross bar in the field or in transport. Avoid running hoses, wires, etc. between these moving parts.

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.
- c) Check all fasteners to see that they are tightened firmly, or allowed to pivot if required.
- 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<sup>®</sup>, 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.

Transport position allows convenient access to the spray tips.

### 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.

## Operating Instructions

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### Operating the Folding Mechanism

**Caution:** Be sure to unlock the transport lock when lowering the boom. If left locked the electric actuator may bend the boom.

Manual Folding To and From Transport Position: Lift the wing up using handle and lock it up with the catch. Then lift the manual lift lock arm using wing lockup damper, pull the boom forward until it stops and then rotate it down into the transport or service position and lock in place with the D-ring. Caution avoid all pinch points as boom parts are being rotated.

Electric Boom Folding To and From Transport Position: After the wings are up in transport position, operate the actuator to rotate the complete boom into the full transport position. As the boom leaves the ground, check the position of the wings relative to the transport arms on the side plate assemblies. Check that the wing lockup damper rests in the wing lockup yokes and lock the wings in place with the wing lockup pins. Caution avoid all pinch points as boom parts are being rotated.

Reverse the procedure to fold the booms out for field position. Fully extend the actuator mechanism for field operations or retract fully for transport. When spraying, retract the actuator for the boom to lift the wing over sand traps etc. The wing falling into a sand trap or hitting the lip may cause the breakaway to let go.

### Plumbing System Operation

Nozzle Bodies: Nozzle bodies are equipped with diaphragm check valves to prevent dripping. Valves close when the system pressure drops below 15 psi (1 bar). Valve bodies contain filter screens. Spray tips and screens are retained with quick connect caps. Keep alternate sets of tips in other caps for quick tip changing. See assembly diagram in appendix.

Spray Monitor Manifold: Each column monitors the flow to each nozzle. Check the instruction sheet in the appendices of this manual to change the ball in the column to match the flow rate of the spray tips. If the balls are not even, the low balls indicate plugged or partially plugged nozzles.

### Breakaway Operation

Should the wing hit a large or fairly heavy object on the field, the wing will pivot back out of the way. Stop and shut off the sprayer immediately. Reset the boom manually after such an incident. Swing the boom forward and the catch mechanism will lock the boom in place. Note be aware of all pinch points while the boom is being reset.



## Driving Considerations

The four wheels under the boom enable the shroud and the curtain to follow the contours of the land. They are small and are subject to damage if left on the ground during fast rough transport. Fully lift the boom for transport. Do not back up over curbs etc, the boom may be damaged.

## Maintenance

- 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.

## Trouble Shooting

---

### 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 too tight load will reduce their life, if too loose, hammering will reduce life.

### Spray Hitting End of Boom/Curtain

The spray booms are designed for true 80° spray tips. If 95° or 110° tips have been installed, spray will hit the end curtains and drip.

### DCSS Wings do not Hit the Lock-Up Brackets when Folded for Transport

Be sure the wing actuators are fully retracted. Adjust the wing actuator mount clamps on the center frame so the DCSS wing fits into the lock up brackets.

### DCSS Breaks Away Too Easily

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

## Tracking

The wheels have been placed in front so they do not run over the spray. However the weight of the prime mover and in extreme situations, the boom 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.

## Striping

At end of Shroud – check:

- ⇒ If tips are spraying at a greater angle than 80°.
- ⇒ High tip pressure, over 40psi (2.8 Bar), will cause a wider spray pattern by extending the spray pattern angle.

Between Tips – check:

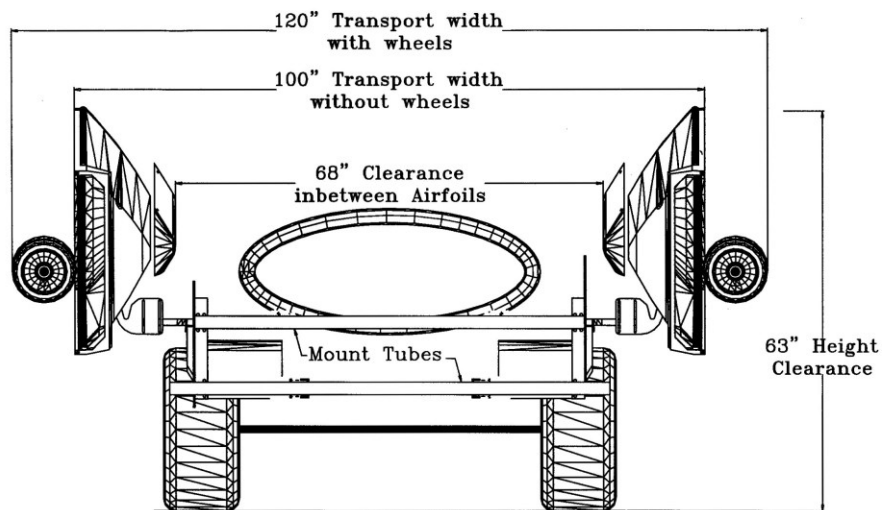
- ⇒ Low tip pressure will cause a narrower pattern. Actual tip pressure should be as close to 40 psi (1.7 - 2.8 bar) as possible.
- ⇒ Check tip screens to see if they are plugged.

## Blocked Nozzles

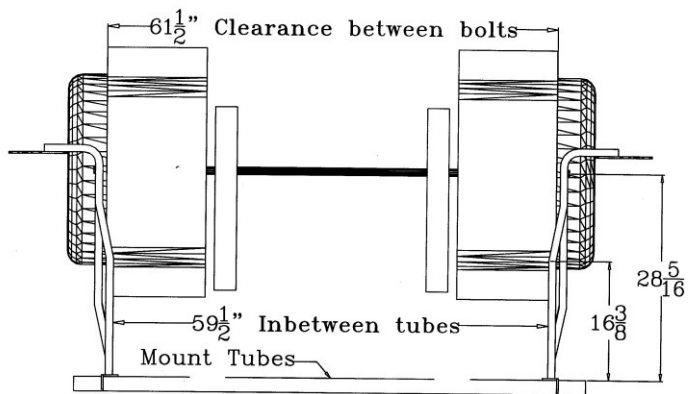
If a nozzle becomes blocked, turn the sprayer off and completely fold up the spray boom (ie fold into transport position). Note that the spray lines could still be pressurized. Therefore prior to removing the cap on the nozzle body, proper safety equipment should be worn, (ie gloves, eye protection,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

## Mounting Clearances

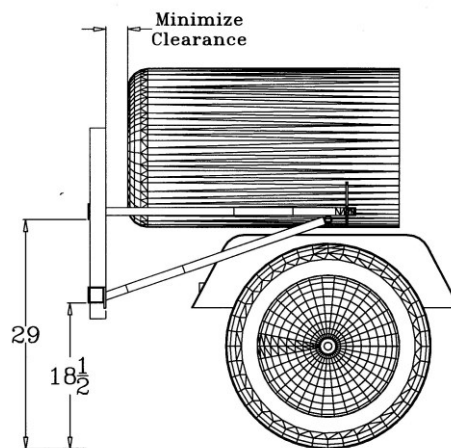
To check if you can mount the boom on your sprayer make sure that it will fit inside the dimensions own below.



REAR VIEW



TOP VIEW



SIDE VIEW

Center Boom Assembly Part # 13491

**Part # 14477**

NOTE: POLY RIM (1) AND FOAM TIRE (6) ARE NOT SOLD SEPARATELY.

ITEM		QTY		PART #		DESCRIPTION	
1	1	1	1	13485	CENTER FRAME, HP 4 NOZ.		
2	2	1	1	13489	BREAKAWAY TUBE		
3	2	1	1	13486	CENTER WHEEL MOUNT		
4	2	1	1	13485	CENTER FORK ASSEMBLY		
5	1	1	1	13501L	WING STABILIZER BAR, LEFT		
6	1	1	1	13501R	WING STABILIZER BAR, RIGHT		
7	1	1	1	13517J	SHROUD, HP 4 NOZ. CENTER GRN		
8	4	1	1	01068	PLUG, TUBE, SQ. PLASTIC 2"		
9	2	1	1	13493	BUSHING, NYLON WING STAB.		
10	2	1	1	13494	BUSHING, NYLON WING PIVOT		
11	1	1	1	13475L	BREAK LATCH, LEFT		
12	1	1	1	13475R	BREAK LATCH, RIGHT		
13	2	1	1	05431	BOLT, 3/8"x1", PLD		
14	22	1	1	00956	NUT, NYLOCK, 3/8NC, PLD		
15	6	1	1	12587	UBOLT, 3/8"x2"x3", PLD		
16	4	1	1	14043	WASHER, 3/4" MACHINE		
17	4	1	1	05550	NUT, NYLOCK, 3/4" PLD		
18	2	1	1	13710	SPRING, CPRN, 8725x4.875x.162		
19	2	1	1	01393	BOLT, 3/8"x6", PLD		
20	2	1	1	13847	CENTER SHROUD SUPPORT		
21	1	1	1	13480	SHROUD SUPPORT, FRONT		
22	2	1	1	05432	BOLT, 3/8"x1.5", PLD		
23	8	1	1	00957	WASHER, FLAT, 3/8" PLD		
24	3	1	1	01070	BOLT, 1/4NCx2, PLD		
25	3	1	1	09754	WASHER, 1/4" FENDER		
26	15	1	1	00968	NUT, NYLOCK, 1/4" PLD		
27	2	1	1	13678	BOLT, 3/4NCx6-1/2, PLD		
28	1	1	1	13684	FLEXISIELD, BLK 10"x84 5"		
29	2	1	1	13484a	FLEXISIELD, BLK 10"x6"		
30	1	1	1	13484b	FLEXISIELD, BLK 10"x61.5"		
31	2	1	1	05457	BOLT, 5/8"x4.5", PLD		
32	2	1	1	01051	NUT, NYLOCK, 5/8NC, PLD		
33	2	1	1	12361	PIN, HITCH, 3/32" x 1.5"		
34	3	1	1	13478	STANDOFF, BACK (SHORT)		
35	3	1	1	13479	STANDOFF, FRONT (LONG)		
36	12	1	1	01154	BOLT, 1/4NCx3/4, PLD		
37	1	1	1	13483	AIRFOIL, 68"		
38	2	1	1	00967	NUT, NYLOCK, 1/2NC, PLD		
39	2	1	1	00963	BUSHING, CASTOR WHEEL		
40	4	1	1	14091	BUSHING, NYL 3/4x5/8x1/2 W/FLG		
41	4	1	1	14127	BRACE CENTER FRAME, R		
42	1	1	1	14192R	BRACE CENTER FRAME, L		
43	4	1	1	05437	BOLT, 3/8"x3", PLD		
44	2	1	1	14477	WHEEL POLY ASSY 3/4ID		
45	2	1	1	13001	SPACER WHEEL 3/4" BRG		

**ROGERS SPRAYERS INC.**

01/05/2004

MERV BILINSKI

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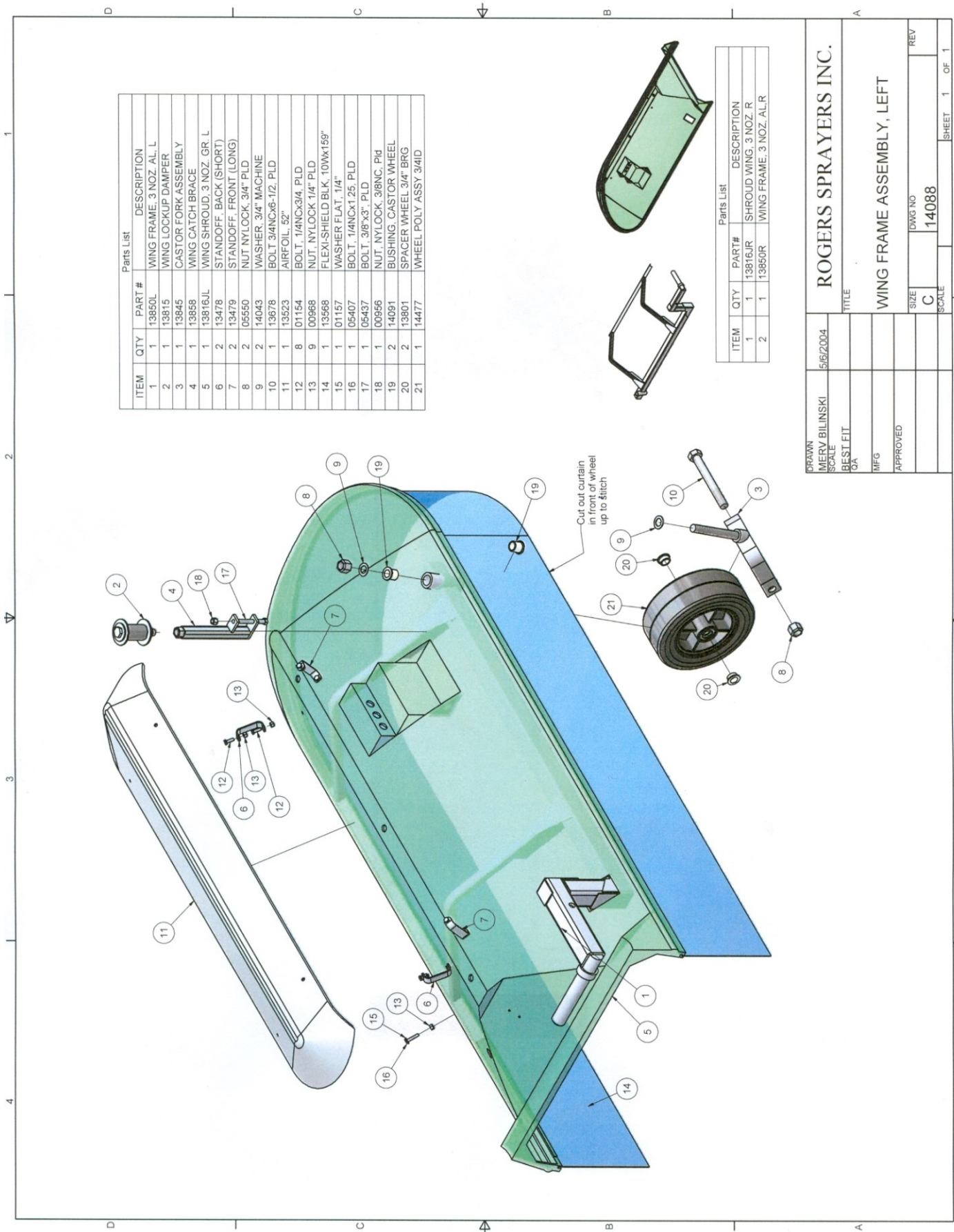
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SHEET

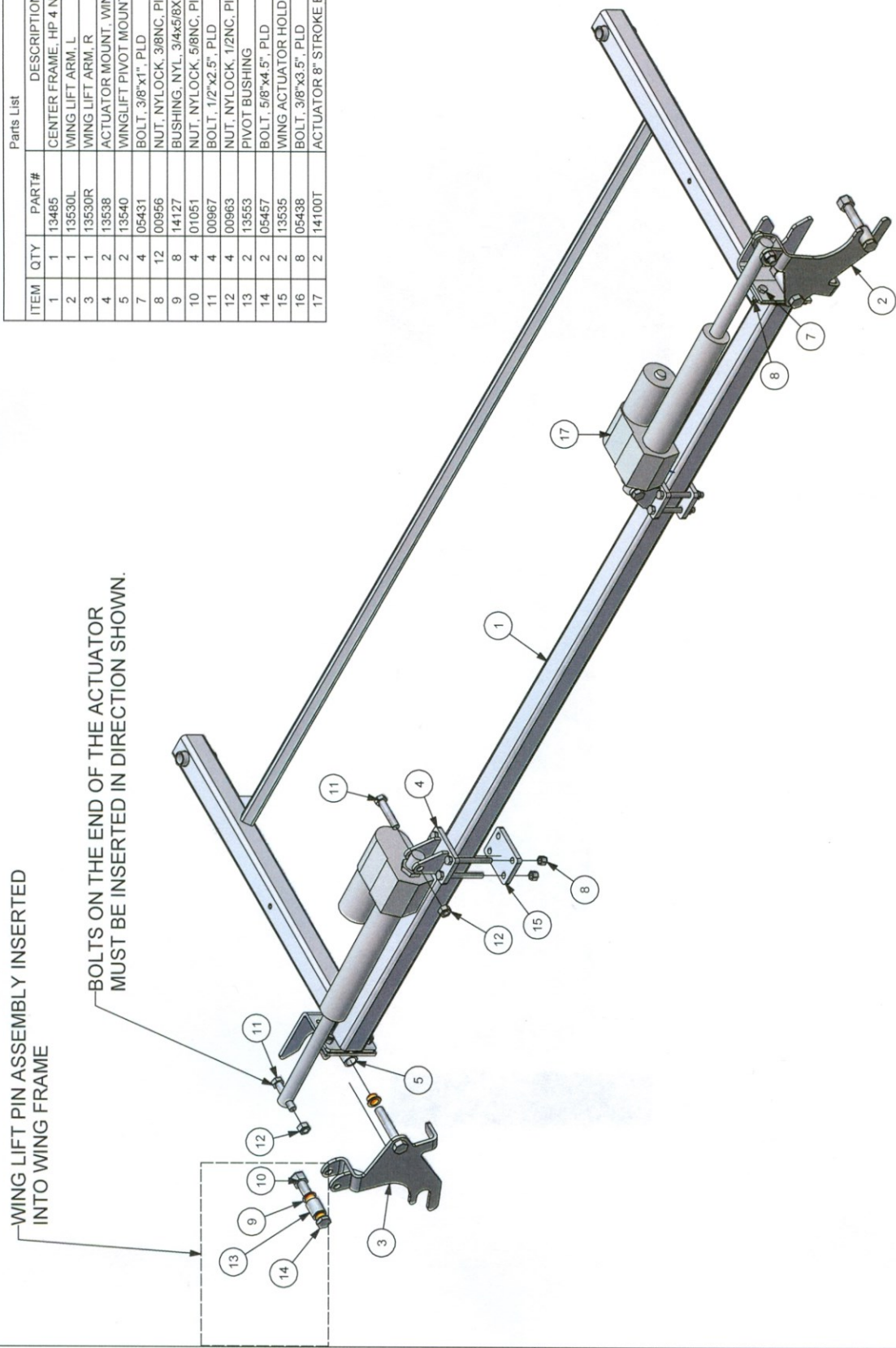


Wing Frame Assembly Part # 14088



Wing Lift Assembly

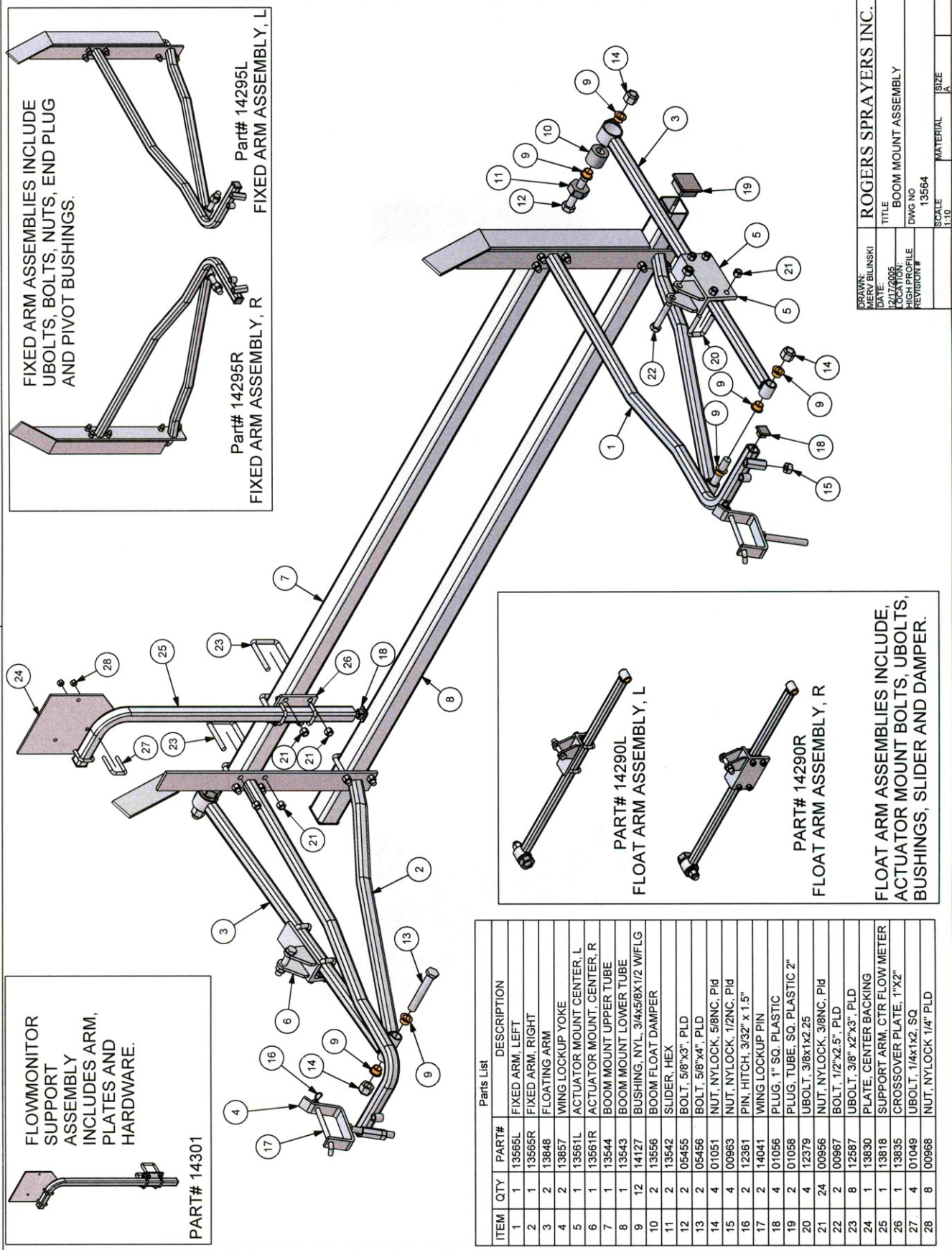
Parts List		
ITEM	QTY	PART# DESCRIPTION
1	1	13485 CENTER FRAME, HP 4 NOZ.
2	1	13530L WING LIFT ARM, L
3	1	13530R WING LIFT ARM, R
4	2	13538 ACTUATOR MOUNT, WING
5	2	13540 WINGLIFT PIVOT MOUNT
7	4	05431 BOLT, 3/8"x1", PLD
8	12	00956 NUT, NYLOCK, 3/8NC, PLD
9	8	14127 BUSHING, NYL, 3/4x5/8x1/2 W/FLG
10	4	01051 NUT, NYLOCK, 5/8NC, PLD
11	4	00967 BOLT, 1/2"x2.5", PLD
12	4	00963 NUT, NYLOCK, 1/2NC, PLD
13	2	13553 PIVOT BUSHING
14	2	05457 BOLT, 5/8"x4.5", PLD
15	2	13535 WING ACTUATOR HOLDPLATE
16	8	05438 BOLT, 3/8"x3.5", PLD
17	2	14100T ACTUATOR 8" STROKE B/S TILT



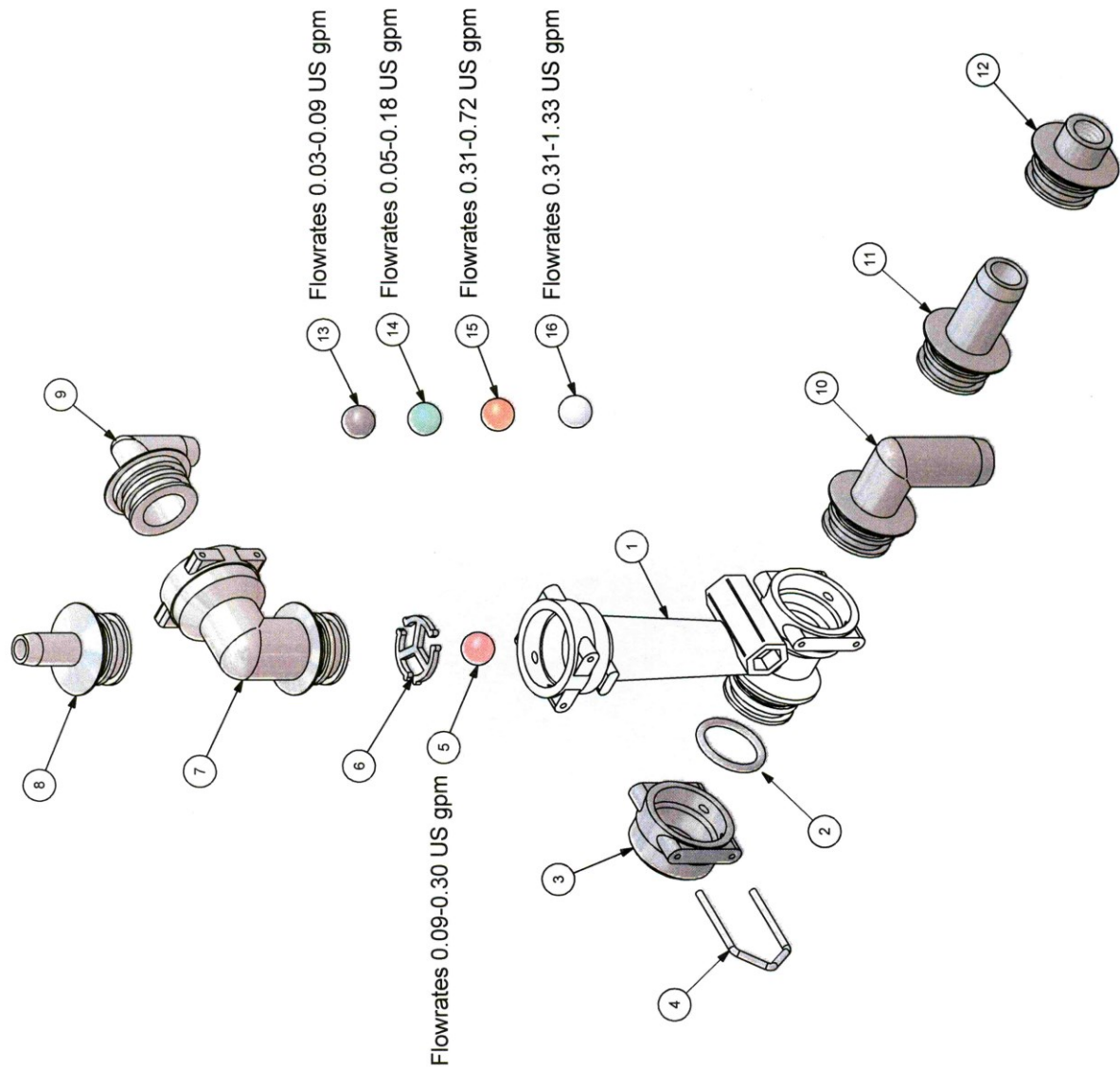
DRAWN: MERV BILINSKI		ROGERS SPRAYERS INC.	
DATE: 8/9/2005	TITLE: WING LIFT ASSEMBLY PARTS	DWG NO	
LOCATION: HIGH PROFILE	REVISION #	SCALE: BEST FIT	MATERIAL: A
Wing Lift Assembly		SIZE	



# Boom Mount Assembly Part # 13564



ORC Rotometer Parts Part # 11992

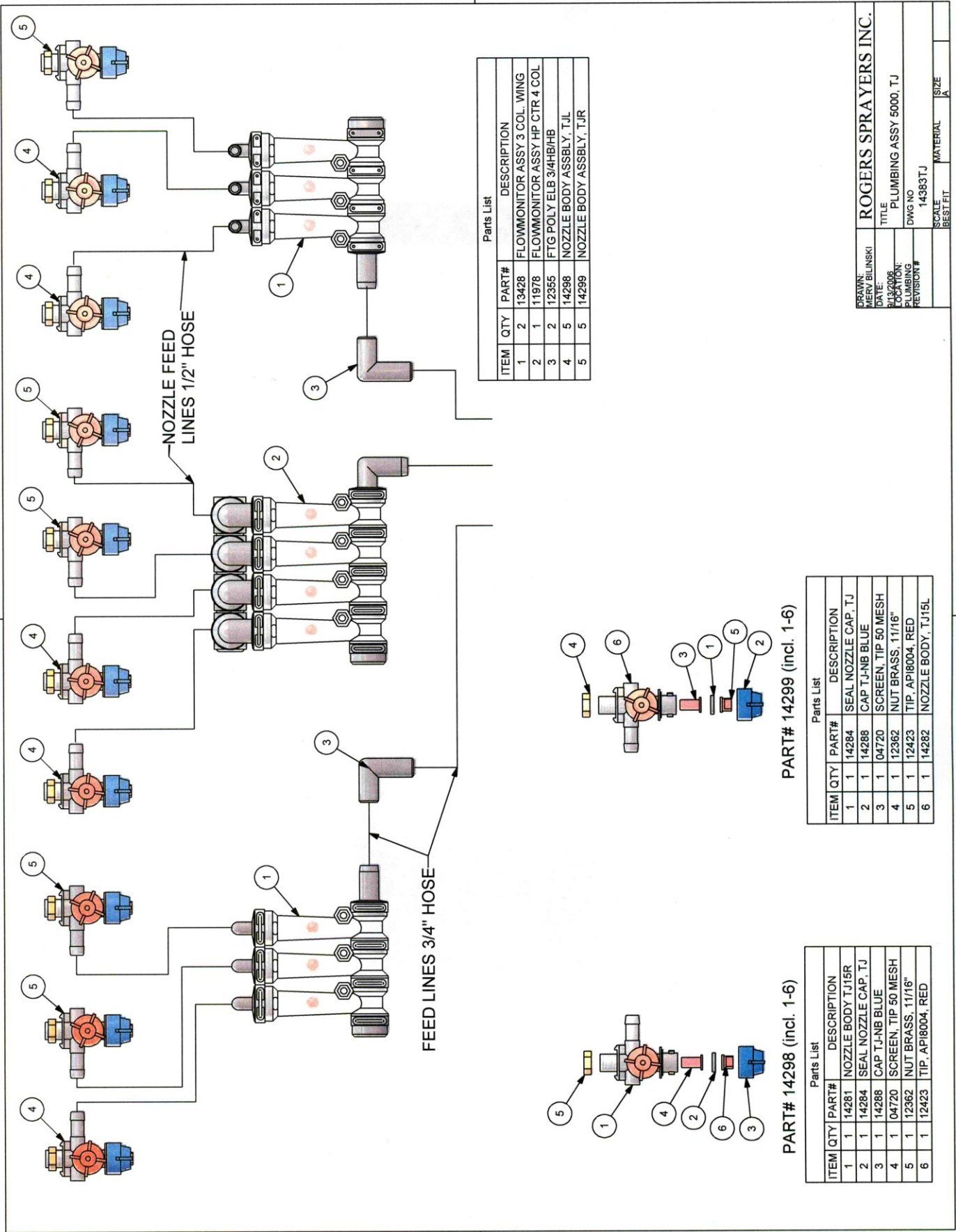


Parts List		
ITEM	QTY	PART# DESCRIPTION
1	1	00889 FLOWMONITOR ORC BODY
2	1	11984 O-RING ORC
3	1	00909 FTG POLY ORC CAP
4	1	11976a ORC CLIP
5	1	11990 BALL FI CELCON 0.09-0.3 USGPM
6	1	11989 ORC BALL RETAINER
7	1	01115 FTG POLY ELB ST MORC x 1/2HB
8	1	11975 FTG POLY ADPT MORC x 1/2HB
9	1	00906 FTG POLY ELB MORC x 1/2HB
10	1	00905 FTG POLY ELB MORC x 3/4HB
11	1	12727 FTG POLY ADPT MORC x 1/4FNPT
12	1	01118 BALL FI POLY 0.03-0.09 USGPM
13	1	01119 BALL FI POLY 0.05-0.18 USGPM
14	1	11965 BALL FI GLASS 0.31-0.72 USGPM
15	1	11991 BALL FI SS 1/2\"

DRAWN: MERV BILINSKI		ROGERS SPRAYERS INC.	
DATE: 4/15/2008		TITLE: ORC ROTOMETER PARTS	
BY: J. BILINSKI		DWG NO: 11992	
CHECKED: J. BILINSKI		SCALE: BEST FIT	
REVISION #		MATERIAL: A	
		SIZE: A	



Plumbing Assembly 5000, TJ Part # 14383TJ



Parts List		
ITEM	QTY	DESCRIPTION
1	2	FLOWMONITOR ASSY 3 COL. WING
2	1	FLOWMONITOR ASSY HP CTR 4 COL
3	2	FTG POLY ELB 3/4HB/HB
4	5	NOZZLE BODY ASSBLY, TJL
5	5	NOZZLE BODY ASSBLY, TJR

DRAWN: MERV BILINSKI		ROGERS SPRAYERS INC.	
DATE: 9/13/2008		TITLE: PLUMBING ASSY 5000, TJ	
CHECKED: [blank]		DWG NO: 14383TJ	
REVISION #		SCALE: BEST FIT	
		MATERIAL: [blank]	
		SIZE: A	

JD HD 200 Mounting Instructions

ISOMETRIC VIEW

DETAIL A

DETAIL B

Mount Center Flow Indicator where most Visible

Parts List		
ITEM	QTY	DESCRIPTION
1	2	BOTTOM PINCHING PLATE
2	1	13565R
3	1	13565L
4	2	13857
5	1	HD200 FRAME, 2004
6	2	13547
7	2	13860
8	1	13543
9	1	13544
10	8	05431
11	6	12587
12	22	00956
13	2	05432
14	1	13835
15	1	13830
16	1	13818

DRAWN  
MERYL BILINSKI

SCALE  
BEST FIT

DATE  
24/12/2003

TITLE  
JDHD 200 MOUNTING INSTR.

SIZE  
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OF 1

ROGERS SPRAYERS INC.

JDHD 200 MOUNTING INSTR.

10/03 JDHD200 MOUNTING INSTRUCTIONS

**DECLARATION OF CONFORMITY**  
(According to ISO/IEC Guide 22 And EN 45014)

**We,** ROGERS SPRAYERS INC.  
813B 50-TH STREET EAST  
SASKATOON, SASKATCHEWAN. S7K 3Y5

**declare that the following product:**

SPRAY BOOM, MODELS WA5000, WA5000E, WA6000, WA6000E, WS5000,  
WS5000E, WS6000, WS6000E, FA5000, FA5000E, FA6000, FA6000E, FS5000,  
FS5000E, FS6000, FS6000E  
PEDESTRIAN BOOM MODELS WG3, WG4, WG6, FG3, FG4, FG6  
PEDESTRIAN SPRAYER MODELS WE3, WE4, WE6, FE3, FE4, FE6

**is in conformity with the provisions of the following European Directives:**

**Council Directive 98/37/EC; as amended by 98/79/EEC:**

**And the following standards:**

SS-EN 907

**Done at** SASKATOON, SASKATCHEWAN, CANADA **on** SEPTEMBER 25, 2006

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## **ROGERS SPRAYERS INC.**

813B - 50th Street East  
Saskatoon, SK S7K 3Y5  
Canada

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Web: [www.rogerssprayers.com](http://www.rogerssprayers.com)