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WGF11

15ft/4.5m Aluminum Covered Spray Boom with Electric Folding System



Assembly, Parts and Operator's Manual

Version WGF2010

Table of Contents

DCSS Forward 3

Safety 3

General Spraying Information 4

Application Rate Tables 6

Foam Marker Installation Considerations 8

Installation Instructions 8

Final Assembly Checklist 16

General Maintenance 17

Operating Instructions 17

Trouble Shooting 18

Center Boom Assembly 20

Wing Frame Assembly 21

Boom Mount Assembly 22

Rotometer Assembly, Parts Details 23

Plumbing Assembly, DCSS 24

Tire Assemblies 25

Wiring Assembly Toro 1250 26

Wiring Assembly Toro 5700 27

Wiring Assembly Toro 200gal Workman 28

Addendum Toro Workman Wiring Assembly 29

Addendum Toro 1250 Wiring Assembly 30

CE Declaration of Conformity 31

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 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.

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 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 rest ring 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

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 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 NEW GF Series Windfoil covered boom was designed to use 110° tips. 80° tips are not recommended. To use 80° tips the nozzle will have to be respaced for adequate overlap. 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 110° tips, as these tips will provide the most uniform spray pattern in the DCSS.

Caution: When spraying next to a flowerbed do not spray over the turf edge, as the spray will go under the curtain and onto the flowers.

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

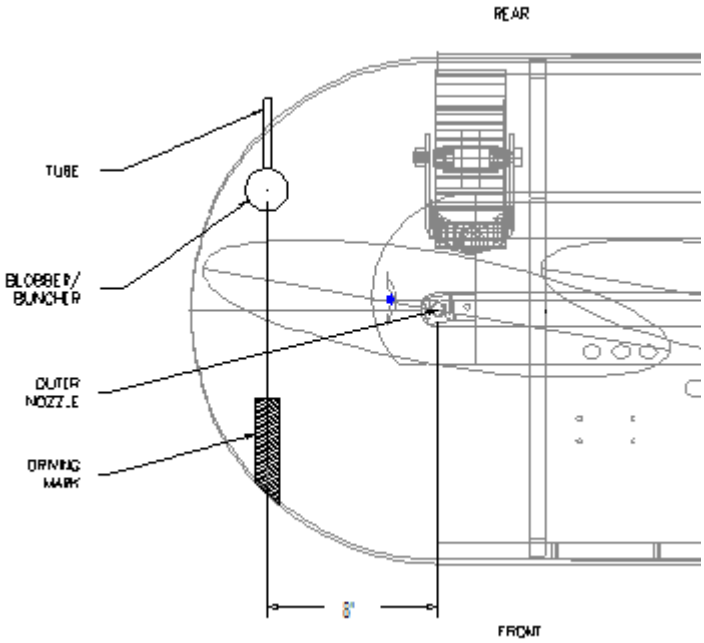
Table 1: American Application Rates at 16” Nozzle Spacing – 110 Degree Tips

Rogers Part #	Tip Number	Tip Mfg	Liquid Press psi	Liquid Press bars	Cap. /noz. gpm	U. S. GALLONS PER ACRE					U. S. GALLONS PER 1000 SQ. FT.				
						2.5 mph	3 mph	4 mph	5 mph	7 mph	2.5 mph	3 mph	4 mph	5 mph	7 mph
05862	11001VS (100 mesh)	Teejet	30	2.07	0.087	12.9	10.7	8.0	6.4	4.6	0.29	0.25	0.18	0.15	0.11
			40	2.76	0.100	14.9	12.4	9.3	7.4	5.3	0.34	0.28	0.21	0.17	0.12
			50	3.45	0.112	16.6	13.8	10.4	8.3	5.9	0.38	0.32	0.24	0.19	0.14
			60	4.14	0.122	18.2	15.2	11.4	9.1	6.5	0.42	0.35	0.26	0.21	0.15
01713	110015VS (100 mesh)	Teejet	30	2.07	0.130	19.3	16.1	12.1	9.6	6.9	0.44	0.37	0.28	0.22	0.16
			40	2.76	0.150	22.3	18.6	13.9	11.1	8.0	0.51	0.43	0.32	0.26	0.18
			50	3.45	0.168	24.9	20.8	15.6	12.5	8.9	0.57	0.48	0.36	0.29	0.20
			60	4.14	0.184	27.3	22.7	17.1	13.6	9.7	0.62	0.52	0.39	0.31	0.22
14670	XR11002VK or AXI-11002 (50 mesh)	Teejet Albuz	30	2.07	0.173	25.7	21.4	16.1	12.9	9.2	0.59	0.49	0.37	0.29	0.21
14384			40	2.76	0.200	29.7	24.8	18.6	14.9	10.6	0.68	0.57	0.43	0.34	0.24
			50	3.45	0.224	33.2	27.7	20.8	16.6	11.9	0.76	0.63	0.48	0.38	0.27
			60	4.14	0.245	36.4	30.3	22.7	18.2	13.0	0.83	0.69	0.52	0.42	0.30
14671	XR11003VK or 11003VS (50 mesh)	Teejet Teejet	30	2.07	0.260	38.6	32.2	24.1	19.3	13.8	0.88	0.74	0.55	0.44	0.32
05864			40	2.76	0.300	44.6	37.1	27.8	22.3	15.9	1.02	0.85	0.64	0.51	0.36
			50	3.45	0.335	49.8	41.5	31.1	24.9	17.8	1.14	0.95	0.71	0.57	0.41
			60	4.14	0.367	54.6	45.5	34.1	27.3	19.5	1.25	1.04	0.78	0.62	0.45
14672	XR11004VK or AXI-11004 (50 mesh)	Teejet Albuz	30	2.07	0.346	51.4	42.9	32.2	25.7	18.4	1.18	0.98	0.74	0.59	0.42
14056			40	2.76	0.400	59.4	49.5	37.1	29.7	21.2	1.36	1.13	0.85	0.68	0.49
			50	3.45	0.447	66.4	55.3	41.5	33.2	23.7	1.52	1.27	0.95	0.76	0.54
			60	4.14	0.490	72.7	60.6	45.5	36.4	26.0	1.67	1.39	1.04	0.83	0.59
14673	XR11005VK or 11005VS (50 mesh)	Teejet Teejet	30	2.07	0.433	64.3	53.6	40.2	32.2	23.0	1.47	1.23	0.92	0.74	0.53
14060			40	2.76	0.500	74.3	61.9	46.4	37.1	26.5	1.70	1.42	1.06	0.85	0.61
			50	3.45	0.559	83.0	69.2	51.9	41.5	29.6	1.90	1.58	1.19	0.95	0.68
			60	4.14	0.612	90.9	75.8	56.8	45.5	32.5	2.08	1.74	1.30	1.04	0.74
14674	XR11006VK or AXI-11006 (50 mesh)	Teejet Albuz	30	2.07	0.520	77.2	64.3	48.2	38.6	27.6	1.77	1.47	1.10	0.88	0.63
14482			40	2.76	0.600	89.1	74.3	55.7	44.6	31.8	2.04	1.70	1.28	1.02	0.73
			50	3.45	0.671	99.6	83.0	62.3	49.8	35.6	2.28	1.90	1.43	1.14	0.81
			60	4.14	0.735	109.1	90.9	68.2	54.6	39.0	2.50	2.08	1.56	1.25	0.89
14675	XR11008VK (50 mesh)	Teejet	30	2.07	0.693	102.9	85.7	64.3	51.4	36.7	2.36	1.96	1.47	1.18	0.84
			40	2.76	0.800	118.8	99.0	74.3	59.4	42.4	2.72	2.27	1.70	1.36	0.97
			50	3.45	0.894	132.8	110.7	83.0	66.4	47.4	3.04	2.53	1.90	1.52	1.09
			60	4.14	0.980	145.5	121.2	90.9	72.7	52.0	3.33	2.78	2.08	1.67	1.19

Table 2: Metric Application Rates at 16” Nozzle Spacing (0.4 meters) – 110 Degree Tips

Rogers Part #	Tip Number	Tip Mfg	Liquid Press psi	Liquid Press bars	Cap /noz. gpm	U. S. GALLONS PER ACRE					Liters/Hectare				
						2.5 mph	3 mph	4 mph	5 mph	7 mph	4 kph	4.8 kph	6.4 kph	8 kph	11.2 kph
05862	11001VS (100 mesh)	Teejet	30	2.07	0.087	12.9	10.7	8.0	6.4	4.6	120	100	75	60	43
			40	2.76	0.100	14.9	12.4	9.3	7.4	5.3	139	116	87	69	50
			50	3.45	0.112	16.6	13.8	10.4	8.3	5.9	155	129	97	78	55
			60	4.14	0.122	18.2	15.2	11.4	9.1	6.5	170	142	106	85	61
01713	110015VS	Teejet	30	2.07	0.130	19.3	16.1	12.1	9.6	6.9	180	150	113	90	64
			40	2.76	0.150	22.3	18.6	13.9	11.1	8.0	208	174	130	104	74
			50	3.45	0.168	24.9	20.8	15.6	12.5	8.9	233	194	146	116	83
			60	4.14	0.184	27.3	22.7	17.1	13.6	9.7	255	213	159	128	91
14670	XR11002VK	Teejet	30	2.07	0.173	25.7	21.4	16.1	12.9	9.2	240	200	150	120	86
	or		40	2.76	0.200	29.7	24.8	18.6	14.9	10.6	278	231	174	139	99
14384	AXI-11002	Albuz	50	3.45	0.224	33.2	27.7	20.8	16.6	11.9	310	259	194	155	111
	(50 mesh)		60	4.14	0.245	36.4	30.3	22.7	18.2	13.0	340	283	213	170	121
14671	XR11003VK	Teejet	30	2.07	0.260	38.6	32.2	24.1	19.3	13.8	361	301	225	180	129
	or		40	2.76	0.300	44.6	37.1	27.8	22.3	15.9	417	347	260	208	149
05864	11003VS	Teejet	50	3.45	0.335	49.8	41.5	31.1	24.9	17.8	466	388	291	233	166
	(50 mesh)		60	4.14	0.367	54.6	45.5	34.1	27.3	19.5	510	425	319	255	182
14672	XR11004VK	Teejet	30	2.07	0.346	51.4	42.9	32.2	25.7	18.4	481	401	301	240	172
	or		40	2.76	0.400	59.4	49.5	37.1	29.7	21.2	555	463	347	278	198
14056	AXI-11004	Albuz	50	3.45	0.447	66.4	55.3	41.5	33.2	23.7	621	517	388	310	222
	(50 mesh)		60	4.14	0.490	72.7	60.6	45.5	36.4	26.0	680	567	425	340	243
14673	XR11005VK	Teejet	30	2.07	0.433	64.3	53.6	40.2	32.2	23.0	601	501	376	301	215
	or		40	2.76	0.500	74.3	61.9	46.4	37.1	26.5	694	579	434	347	248
14060	11005VS	Teejet	50	3.45	0.559	83.0	69.2	51.9	41.5	29.6	776	647	485	388	277
	(50 mesh)		60	4.14	0.612	90.9	75.8	56.8	45.5	32.5	850	709	531	425	304
14674	XR11006VK	Teejet	30	2.07	0.520	77.2	64.3	48.2	38.6	27.6	721	601	451	361	258
	or		40	2.76	0.600	89.1	74.3	55.7	44.6	31.8	833	694	521	417	298
14482	AXI-11006	Albuz	50	3.45	0.671	99.6	83.0	62.3	49.8	35.6	931	776	582	466	333
	(50 mesh)		60	4.14	0.735	109.1	90.9	68.2	54.6	39.0	1020	850	638	510	364
14675	XR11008VK	Teejet	30	2.07	0.693	102.9	85.7	64.3	51.4	36.7	962	802	601	481	344
	(50 mesh)		40	2.76	0.800	118.8	99.0	74.3	59.4	42.4	1111	926	694	555	397
			50	3.45	0.894	132.8	110.7	83.0	66.4	47.4	1242	1035	776	621	444
			60	4.14	0.980	145.5	121.2	90.9	72.7	52.0	1360	1134	850	680	486

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 8in (20cm) 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, boom mount assembly, 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	WGF11	FGF11
Wing weights (lbs/kg)	54/25	54/25
Boom Mount Assembly (lbs/kg)	50/23	50/23
Center weight (lbs/kg)	126/58	126/58

Center Frame Section

The initial step to setting up your new Windfoil covered boom is to install the mounting kit to the rear of sprayer frame (see applicable instructions with mounting hardware). The next step is to attach the boom mount assembly to the mounting kit. The boom mount assembly is attached to the mounting kit with u-bolts (ensure the boom mount assembly is centered on the back of the sprayer. The top of the lower tube should be approximately 20.5 inches (52 cm) from the ground. (see mounting instructions in mount kit for recommended tube heights)

Figure 1



Mounting Kit Install

Figure 2



Boom Mount Tubes

Once the boom mount assembly is secured, wheels can be attached to the center section. With the center section on the floor and the front elevated insert the wheel labeled center section (these wheels have a rim with 8 fins). The wheels labeled wing section will have a rim with 4 fins and an additional 3/4" flat washer on the shaft.

Figure 3



Inserting castor Wheel

Figure 4



Castor Wheel and Boom Height Spacers

Note: wheels must castor freely when pin is inserted in top of castor fork. If wheel doesn't castor freely, remove one of the spacers or top machine washer.

Next attach the float arm assembly to the center frame. The top two bolts should have the nuts towards the outside of the frame and the wing stop rubber towards the outside of the frame. (see figures below) Use a square to ensure the pivot plates being bolted to the center frame are perpendicular with the mounting tube.

Figure 5



Float Arm Assembly

Figure 6



Bolt and Wing Stop Orientation

Figure 7



Squaring Float Arm Assembly

With the help of an assistant, roll unit along side of boom mount assembly, as shown below in figure 8. When attaching the boom mount assembly to the float arm assemblies, make sure that the bolts run from the inside out (i.e. nuts should be facing outward).

Figure 8



To adjust the tilt of the center section, loosen the two locked 5/8 jam nuts next to the actuator on the adjustment assembly (note the locked 5/8 jam nuts must be loosened on both float arm assemblies before adjustment is made). Now adjust the 5/8 nylon lock nut on the end of the adjustment assemblies until level.

Figure 9



Center Section Adjustment

Figure 10



Center Section Adjustment

Wing Sections: With the wing sections on the ground, lift the tip of the wing and insert the wing wheels.

Figure 11



Wing Castor Wheel

Figure 12



Wing Castor Wheel

Place the wing in the broke away position and attach the break away tube to the center section. Note wing actuator must be extended before inserting wing into breakaway catch.

Figure 13



Attaching Break Away Tube

Figure 14



Extend Wing Actuator

Figure 15



Insert Wing into Break Away Catch

Install the wing support arms on the front of the boom mount assembly. The part of the arm facing outward from the sprayer should be approximately level. Once installed the wing actuators can be adjusted as well as the wing stops. The wing should slightly compress the rubber on the wing stop so the wing is held firm. Do not extend wing stop excessively outward as this will put excessive stress on the center frame. The wing actuator rubber damper should be slightly compressed when the actuator is retracted.

Figure 16



Wing Support Arm

Figure 17



Wing Actuator Adjustment

Figure 18



Wing Stop Adjustment

Figure 19



Wing Alignment for Transport

The center flow monitor can now be installed on the front side of the boom mount assembly. Usually it is installed on the right side of the boom mount assembly but will also work on the left.

Figure 20



Center Flow Monitor

TORO 1250 Control box and wiring

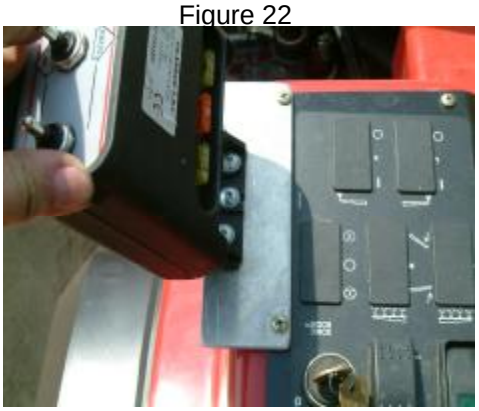
Remove screws from existing panel, mount aluminum bracket and control box as shown in figure 23 & 24. Use screws provided to mount control box to plate.

Figure 21



Control Box Mount

Figure 22



Mounting To Panel

Bundle wires together and run them along the right side of the unit removing the power wire from the bundle to connect to the battery see figure 25. Plug the split kit into the center wire feed and run it to both actuators on the fixed arms. Leave enough slack in the wire to accommodate float arm movement, (approx. 8 inches (20 cm)) figure 26.
NOTE- Be sure to take care in routing wiring along the unit to avoid sharp objects, pivot points or excessive heat sources. Replace terminal and battery covers.

Figure 23



Power Wire Installation

Figure 24



Center Actuator Wiring

Run the remaining two wires for the left and right wings over the upper boom mount tube and leave slack for boom travel, (approx 12 inches (30.5 cm)) figure 27. Cable tie wires securely to upper boom mount tube. It is recommended that you have someone watch for clearances as you test the electric lift operation.

Figure 25



Wing Actuator Wiring

TORO 5700 control box and wiring

Loosen screw directly below hour meter on dash, using the center slot on the mounting bracket attach to dash as shown below in figure 28. Extra screws are provided, if required, to attach the control box to the dash using the other two slots on the mounting bracket, (drilling holes in the dash will be required). Run the appropriate ends up through the existing hole in floor and connect to corresponding feeds, see figure 29.

Figure 26



Mounting Box to Dash

Figure 27



Feeding Wires to Control

Run bundled wires under unit, try to follow existing wires towards battery securing the bundle with cable ties. Bring bundle out beside battery to make terminal connections. Positive will be connected to the battery terminal, ground will be connected to the connection on battery mount as shown in figure 27.

NOTE. Be sure to avoid running wires against sharp objects, possible pivot points and excessive heat sources.

Figure 28



Positive Battery Connection

Figure 29



Negative Battery Connection

Continue with remaining bundle along the tank support bracket using cable ties as shown in figure 28.

Figure 30



Wire Harness Install

Connect provided split kit to center actuator feed and cable tie wires along upper boom mount tube to the actuators on the float arms. Leave approx 8 inches (20cm) slack in the wire. Connect right and left wing actuators running the wires over top of the upper boom mount tube to avoid a pinch point, leave approximately 12 inches (30.5 cm) of slack.

Figure 31



Center Split Kit

Figure 32



Secure Split Kit to Upper Tube

Secure wires to boom mount tubes. It is recommended to have someone watch the initial testing of the wiring routings to watch for potential stressing of the connections and wires.

TORO Workman 200 Gallon Skid control box and wiring

Find suitable location on Dash of Workman and using nuts and bolts provided attach control box to dash as shown below in figure 31. Feed wires back with other wires as shown in Figure 32.

Figure 33



Mount Control Box to Dash

Figure 34



Feed Wires with existing wires.

Route new wiring harness along side existing wiring harness from front of Workman to back of unit, tie harness to existing framework or harness if needed, see Figure 33. Attach power wires to battery as shown in Figure 34.

Figure 35



Feed Wires Along Frame

Figure 36



Battery connections

Continue feeding actuator wires to back of unit. Attach wires to side frame as shown below in Figure 35, split loom is installed on actuator wires just past the power wires to protect wires as they pass the exhaust area. (Be sure wires are clear of exhaust parts) Mount remainder of wiring harness on Boom Mount tubes and to actuators as described earlier in 5700 & 1250 assembly sections.

Figure 37



Attach Wires to Frame, Avoid Exhaust

Final Assembly Checklist

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 90º 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®, 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.

Operating Instructions

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.

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 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 110º spray tips. If any other tips have been installed, spray pattern will be incorrect.

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 adjustment bolts and the wing stopper on the center section to allow the wing to sit vertical. This should allow the wings to hit lockup brackets.

DCSS Breaks Away Too Easily
Adjust the bolt on the top of the spring, tightening the bolt adds tension making it more difficult to breakaway.

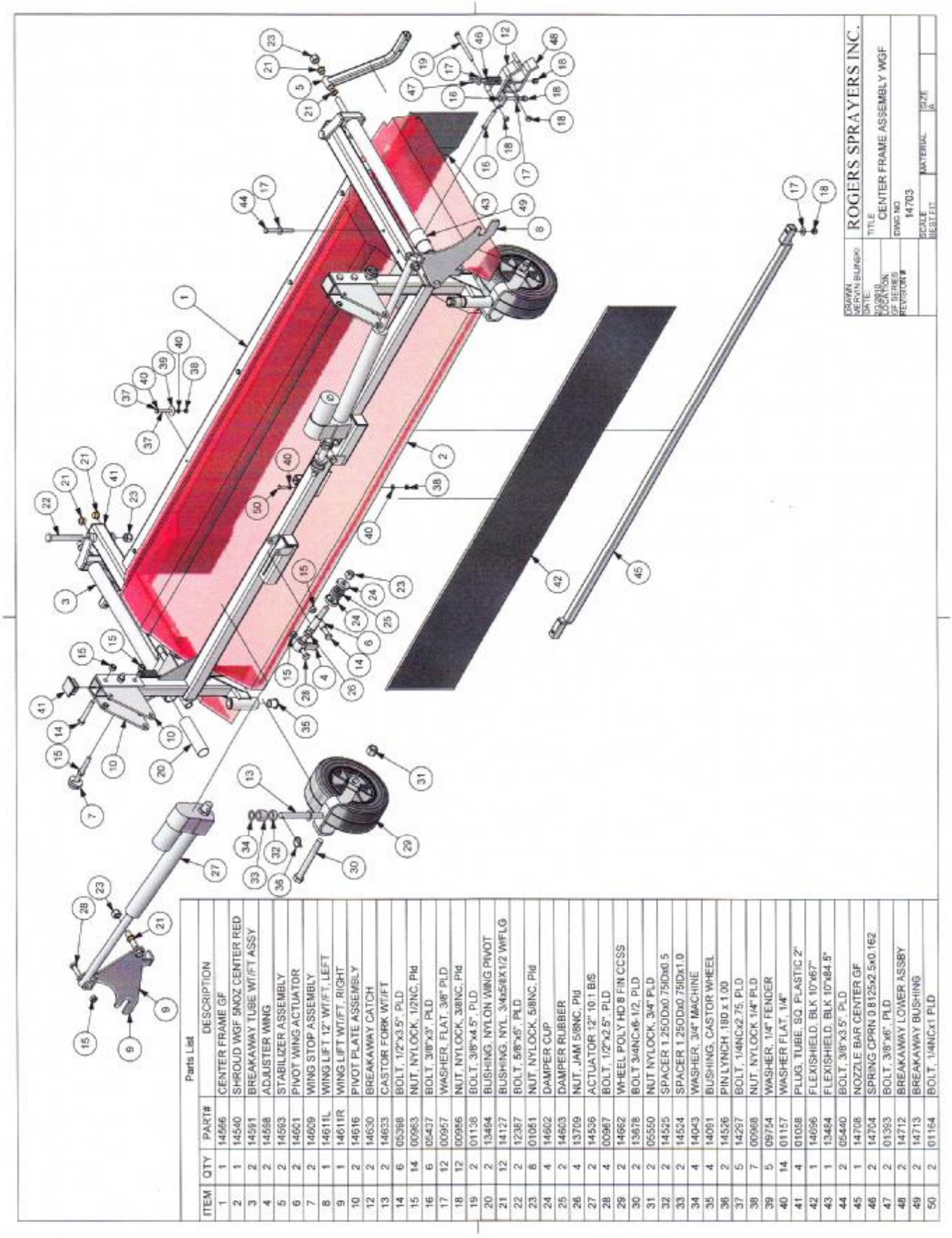
Tracking
The wheels have been placed in front so they do not run over the spray. However the weight of the prime mover and in extreme situations, the boom wheels, will modify the turf and cause it to absorb more fertilizer or chemical. Some fertilizers and fungicides are very susceptible while others 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 110º.
⇒ 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).

Center Boom Assembly Part # 14703



Parts List

ITEM	QTY	PART#	DESCRIPTION
1	1	14566	CENTER FRAME GF
2	1	14540	SHROUD WGF SNOZ CENTER RED
3	2	14591	BREAKAWAY TUBE W/IFT ASSY
4	2	14598	ADJUSTER WING
5	2	14583	STABILIZER ASSEMBLY
6	2	14601	PIVOT WING ACTUATOR
7	2	14609	WING STOP ASSEMBLY
8	1	14611L	WING LIFT 12" W/IFT, LEFT
9	1	14611R	WING LIFT W/IFT, RIGHT
10	2	14616	PIVOT PLATE ASSEMBLY
12	2	14630	BREAKAWAY CATCH
13	2	14633	CASTOR FORK W/IFT
14	6	05398	BOLT, 1/2"x3.5", PLD
15	14	00963	NUT, NYLOCK, 1/2NC, Pld
16	6	05437	BOLT, 3/8"x3", PLD
17	12	00957	WASHER, FLAT, 3/8" PLD
18	12	00966	NUT, NYLOCK, 3/8NC, Pld
19	2	01138	BOLT, 3/8"x4.5", PLD
20	2	13464	BUSHING, NYLON W/ING PIVOT
21	12	14127	BUSHING, NYL, 3/4x5/8X1/2 WFLG
22	2	12387	BOLT, 5/8"x5", PLD
23	8	01061	NUT, NYLOCK, 5/8NC, Pld
24	4	14602	DAMPER CUP
25	2	14603	DAMPER RUBBER
26	4	13709	NUT, JAM 5/8NC, Pld
27	2	14536	ACTUATOR 12" 10:1 B/S
28	4	00967	BOLT, 1/2"x2.5", PLD
29	2	14662	WHEEL POLY HD 8 F/N CCSS
30	2	13678	BOLT 3/4NCx6-1/2, PLD
31	2	05560	NUT NYLOCK, 3/4" PLD
32	2	14525	SPACER 1.250Dx0.75IDx0.5
33	2	14524	SPACER 1.250Dx0.75IDx1.0
34	4	14043	WASHER, 3/4" MACHINE
35	4	14091	BUSHING, CASTOR WHEEL
36	2	14526	PIN LYNCH .180 x 1.00
37	5	14297	BOLT, 1/4NCx2.75, PLD
38	7	00968	NUT, NYLOCK 1/4" PLD
39	5	09754	WASHER, 1/4" FENDER
40	14	01157	WASHER FLAT, 1/4"
41	4	01058	PLUG, TUBE, SQ. PLASTIC 2"
42	1	14096	FLEXISHIELD, BLK 10"x67"
43	1	13464	FLEXISHIELD, BLK 10"x84.5"
44	2	05440	BOLT, 3/8"x3.5", PLD
45	1	14708	NOZZLE BAR CENTER GF
46	2	14704	SPRING CPRN 0.8125x2.5x0.162
47	2	01363	BOLT, 3/8"x6", PLD
48	2	14712	BREAKAWAY LOWER ASSBY
49	2	14713	BREAKAWAY BUSHING
50	2	01164	BOLT, 1/4NCx1 PLD

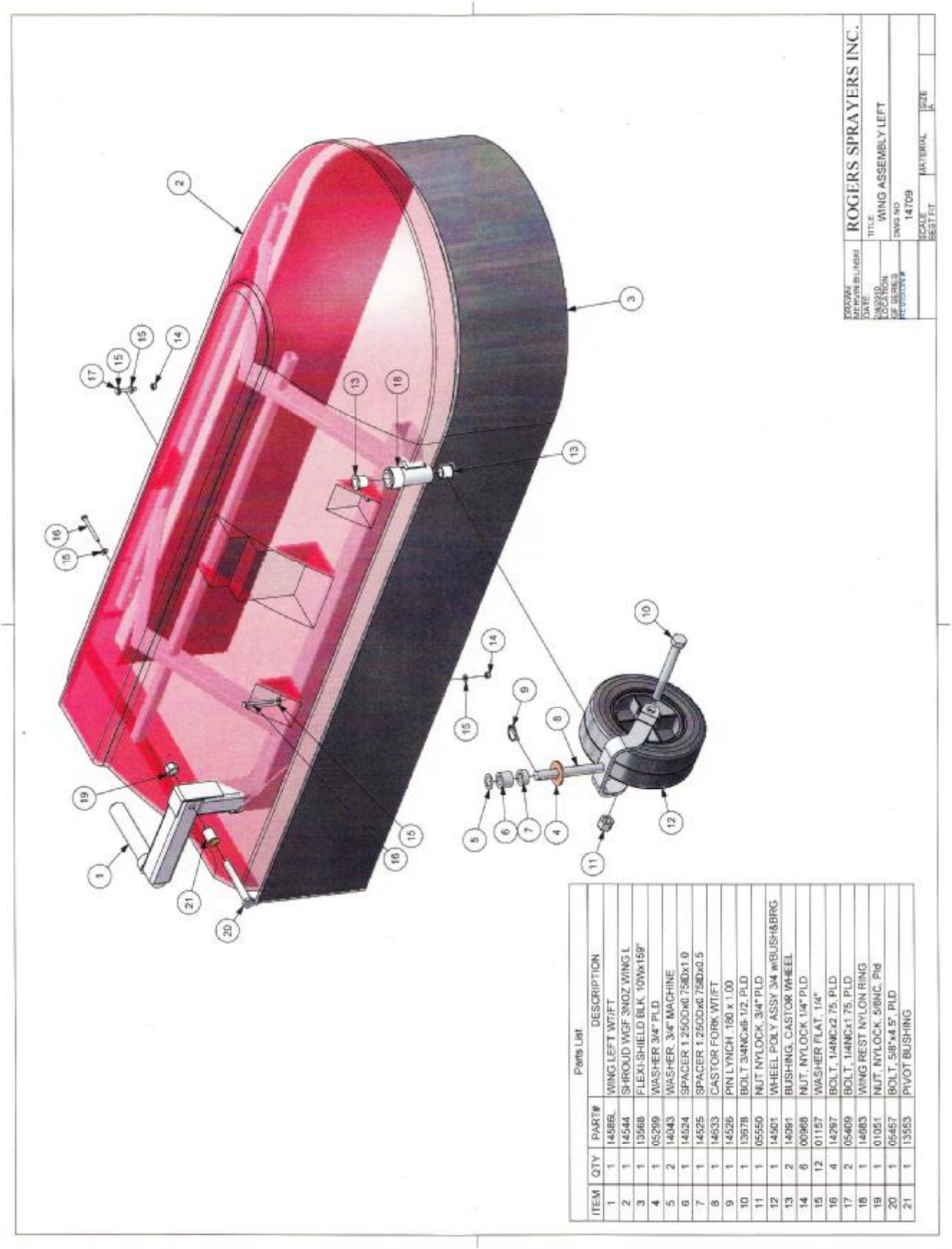
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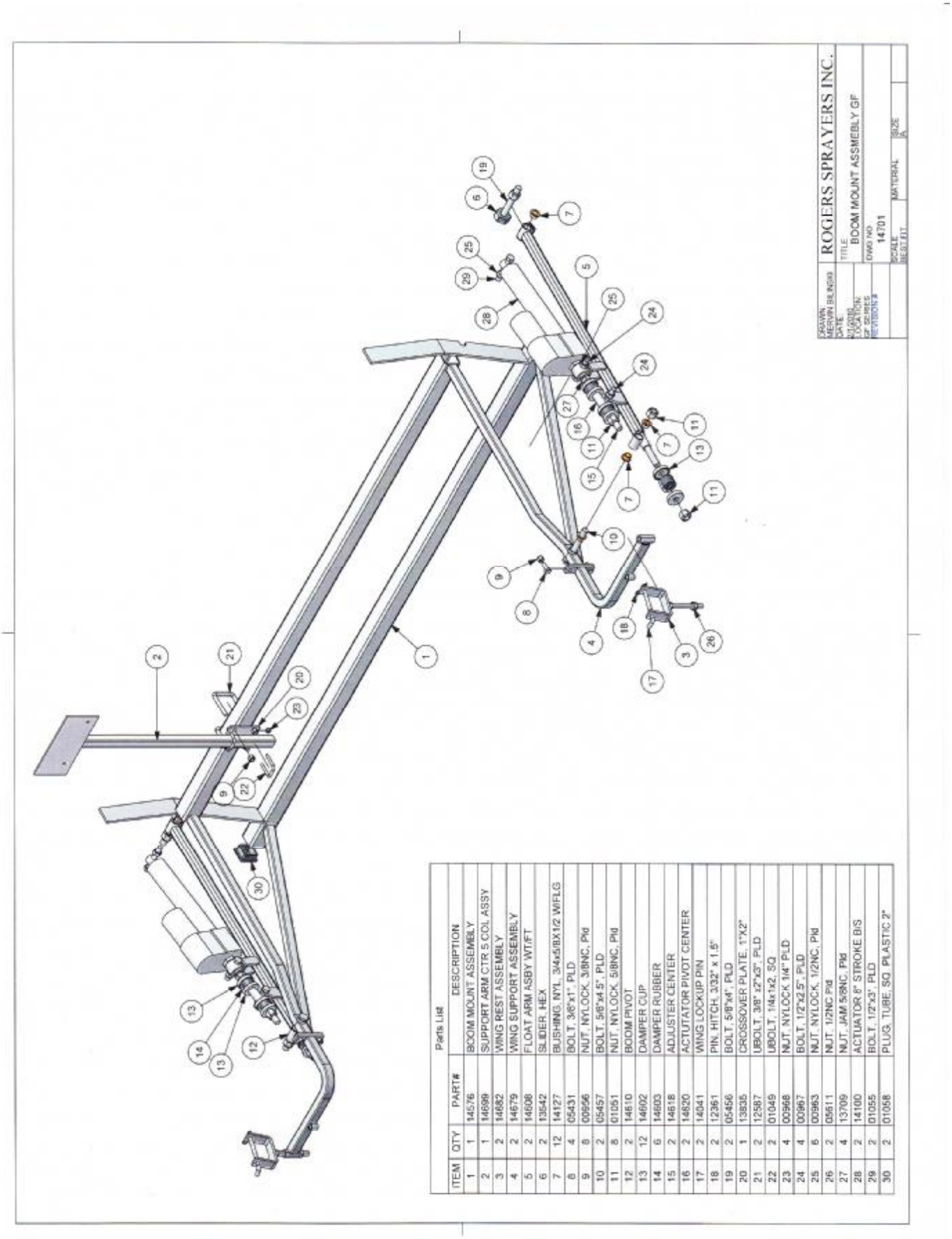
Wing Frame Assembly Part # 14709



Parts List

ITEM	QTY	PART#	DESCRIPTION
1	1	14586L	WING LEFT W/FT
2	1	14544	SHROUD WGF 3NOZ WING L
3	1	13568	FLEXI-SHIELD BLK, 10Wx159"
4	1	05289	WASHER 3/4" PLD
5	2	14043	WASHER, 3/4" MACHINE
6	1	14524	SPACER 1.250OD x0.758D x1.0
7	1	14525	SPACER 1.250OD x0.758D x0.5
8	1	14533	CASTOR FORK W/FT
9	1	14526	PIN LYNCH .180 x 1.00
10	1	13578	BOLT 3/4NCx6 1/2, PLD
11	1	05550	NUT NYLOCK, 3/4" PLD
12	1	14501	WHEEL POLY ASSY 3/4 wBUSH&BRG
13	2	14091	BUSHING, CASTOR WHEEL
14	6	00968	NUT, NYLOCK 1/4" PLD
15	12	01157	WASHER FLAT, 1/4"
16	4	14297	BOLT, 1/4NCx2.75, PLD
17	2	05409	BOLT, 1/4NCx1.75, PLD
18	1	14683	WING REST NYLON RING
19	1	01051	NUT, NYLOCK, 5/8NC, Pld
20	1	05457	BOLT, 5/8"x4.5", PLD
21	1	13553	PIVOT BUSHING

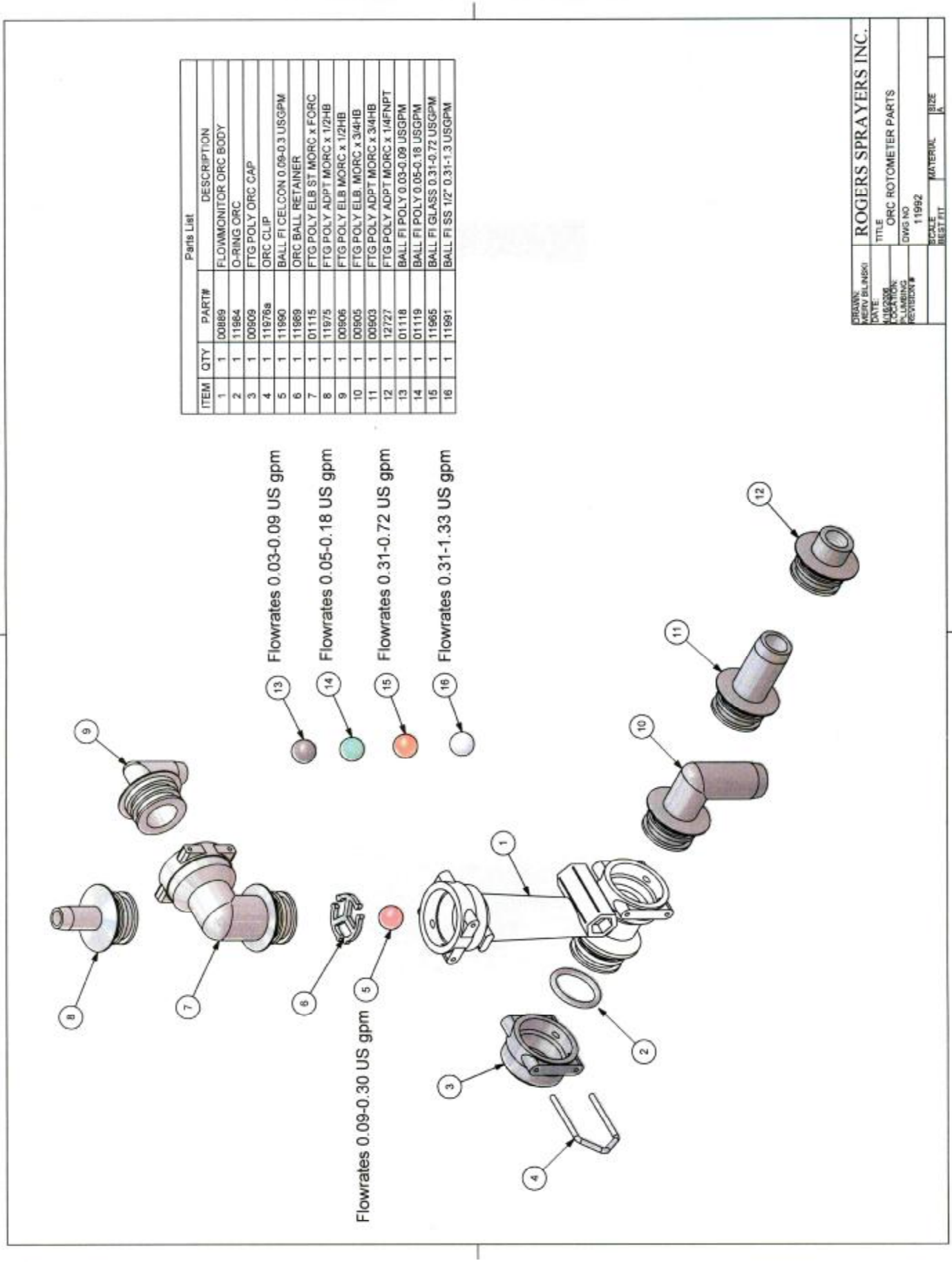
Boom Mount Assembly Part # 14701



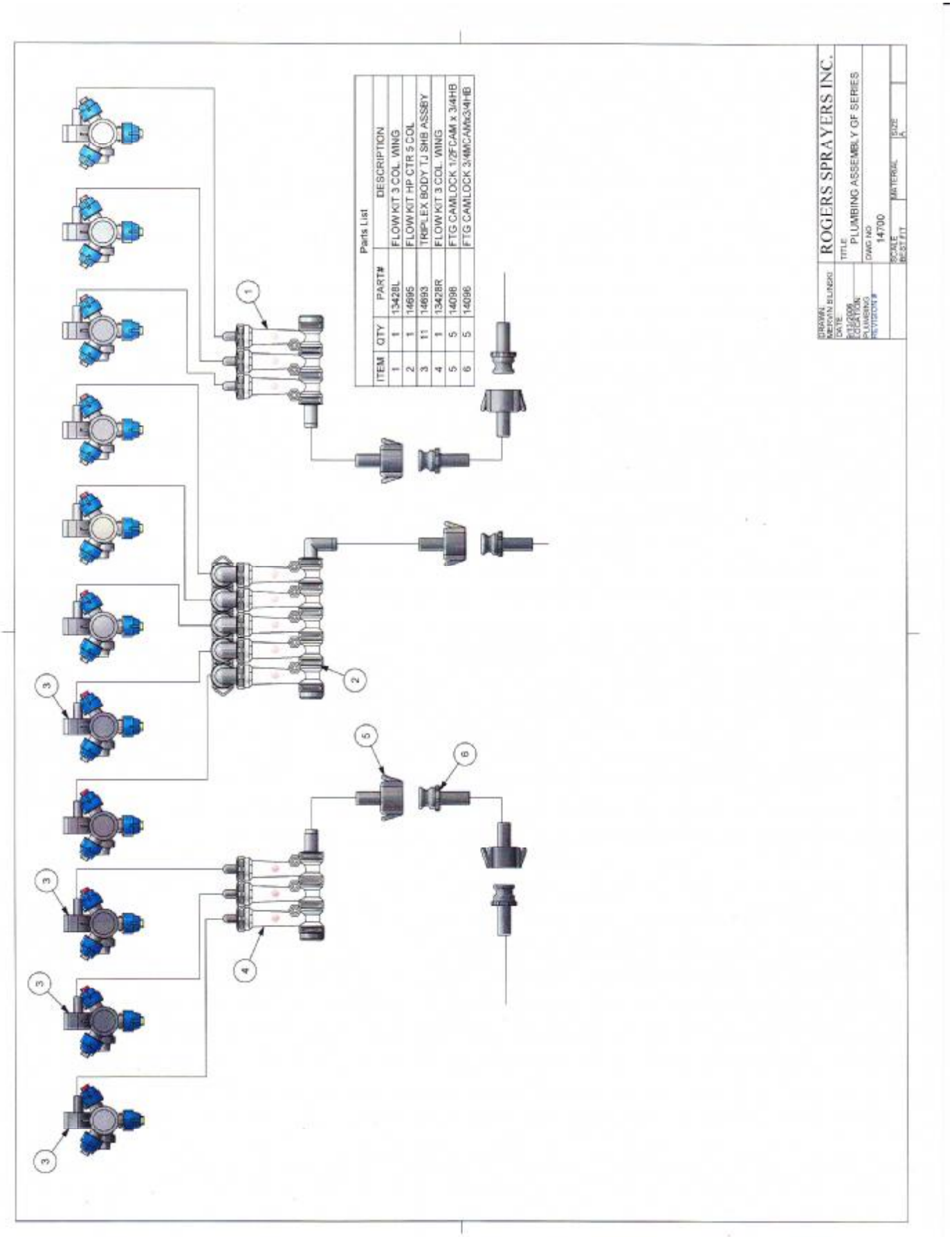
Parts List

ITEM	QTY	PART#	DESCRIPTION
1	1	14576	BOOM MOUNT ASSEMBLY
2	1	14699	SUPPORT ARM CTR 5 COIL ASSY
3	2	14682	WING REST ASSEMBLY
4	2	14679	WING SUPPORT ASSEMBLY
5	2	14608	FLOAT ARM ASBY WT/FT
6	2	13542	SLIDER, HEX
7	12	14127	BUSHING, NYL, 3/4x5/8X1/2 W/FLG
8	4	05431	BOLT, 3/8"x1", PLD
9	8	00996	NUT, NYLOCK, 3/8NC, Pld
10	2	05457	BOLT, 5/8"x4.5", PLD
11	8	01061	NUT, NYLOCK, 5/8NC, Pld
12	2	14610	BOOM PIVOT
13	12	14602	DAMPER CUP
14	6	14603	DAMPER RUBBER
15	2	14618	ADJUSTER CENTER
16	2	14620	ACTUATOR PIVOT CENTER
17	2	14041	WING LOCKUP PIN
18	2	12361	PIN, HITCH, 3/32" x 1.5"
19	2	05456	BOLT, 5/8"x4", PLD
20	1	13835	CROSSOVER PLATE, 1"X2"
21	2	12587	UBOLT, 3/8" x2"x3", PLD
22	2	01049	UBOLT, 1/4x1x2, SQ
23	4	00968	NUT, NYLOCK 1/4" PLD
24	4	00967	BOLT, 1/2"x2.5", PLD
25	6	00963	NUT, NYLOCK, 1/2NC, Pld
26	2	00611	NUT, 1/2NC Pld
27	4	13709	NUT, JAM 5/8NC, Pld
28	2	14100	ACTUATOR 8" STROKE B/S
29	2	01055	BOLT, 1/2"x3", PLD
30	2	01058	PLUG, TUBE, SQ PLASTIC 2"

ORC Rotometer Parts Part # 11992



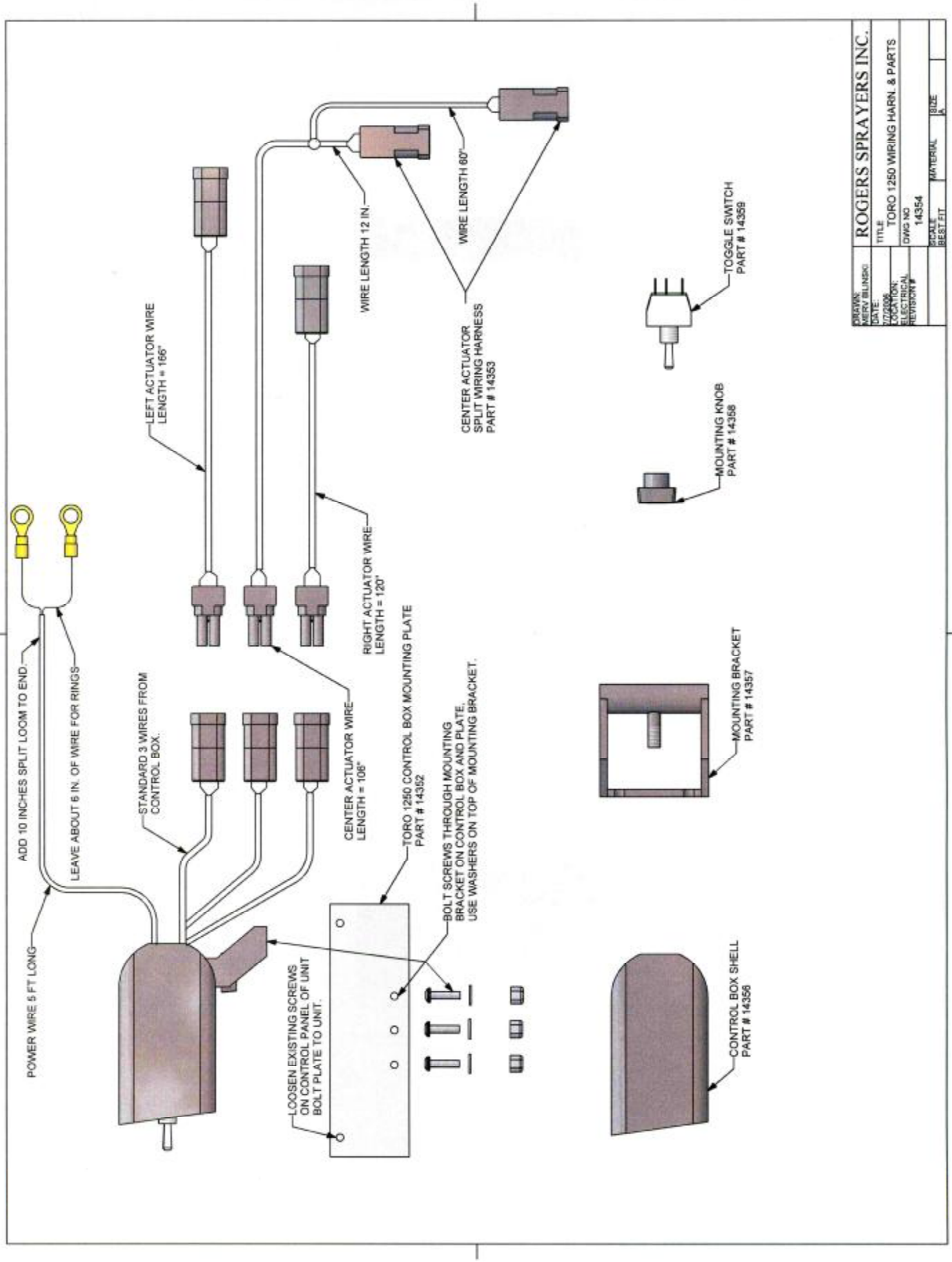
Plumbing Assembly Part # 14700



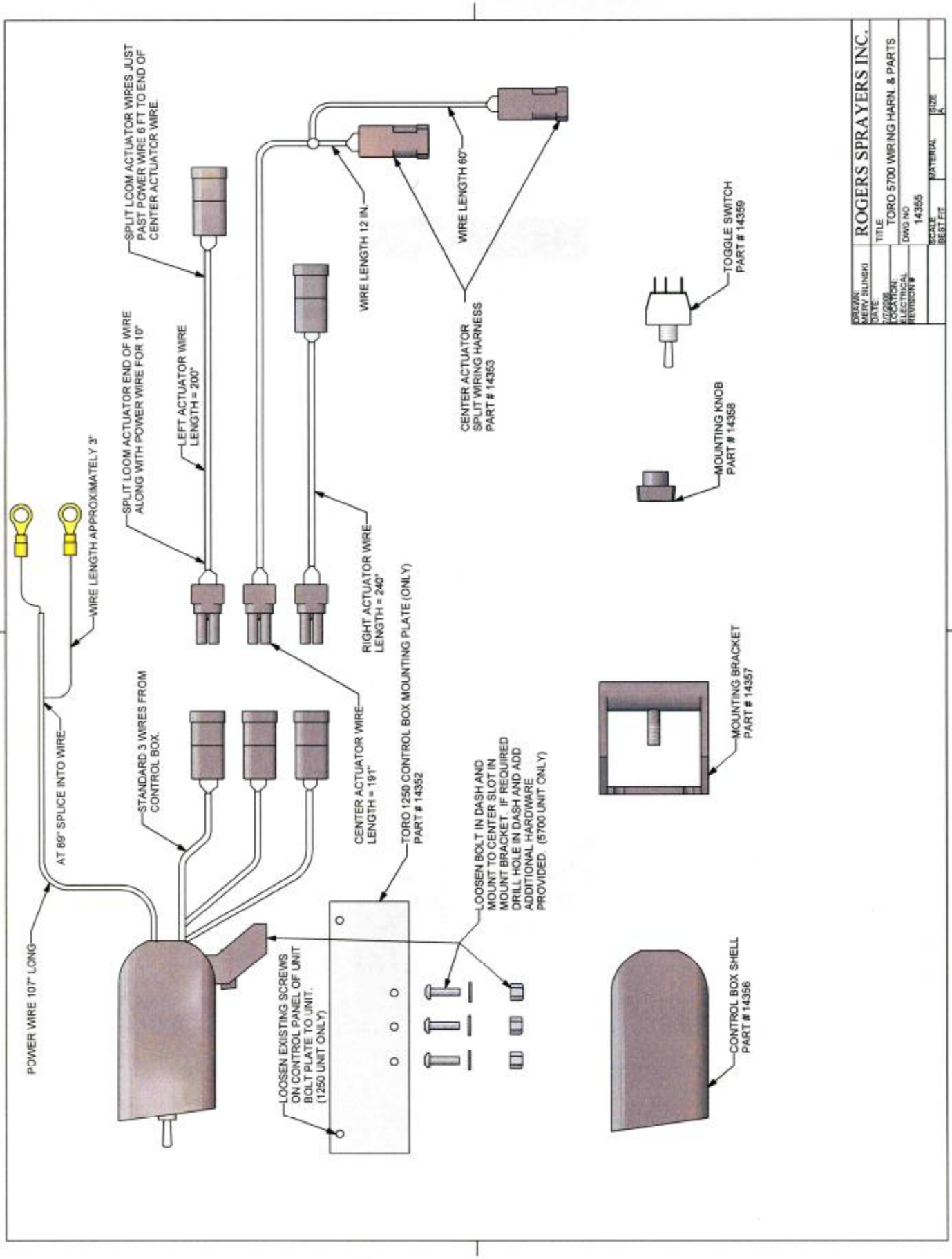
Tire Assemblies



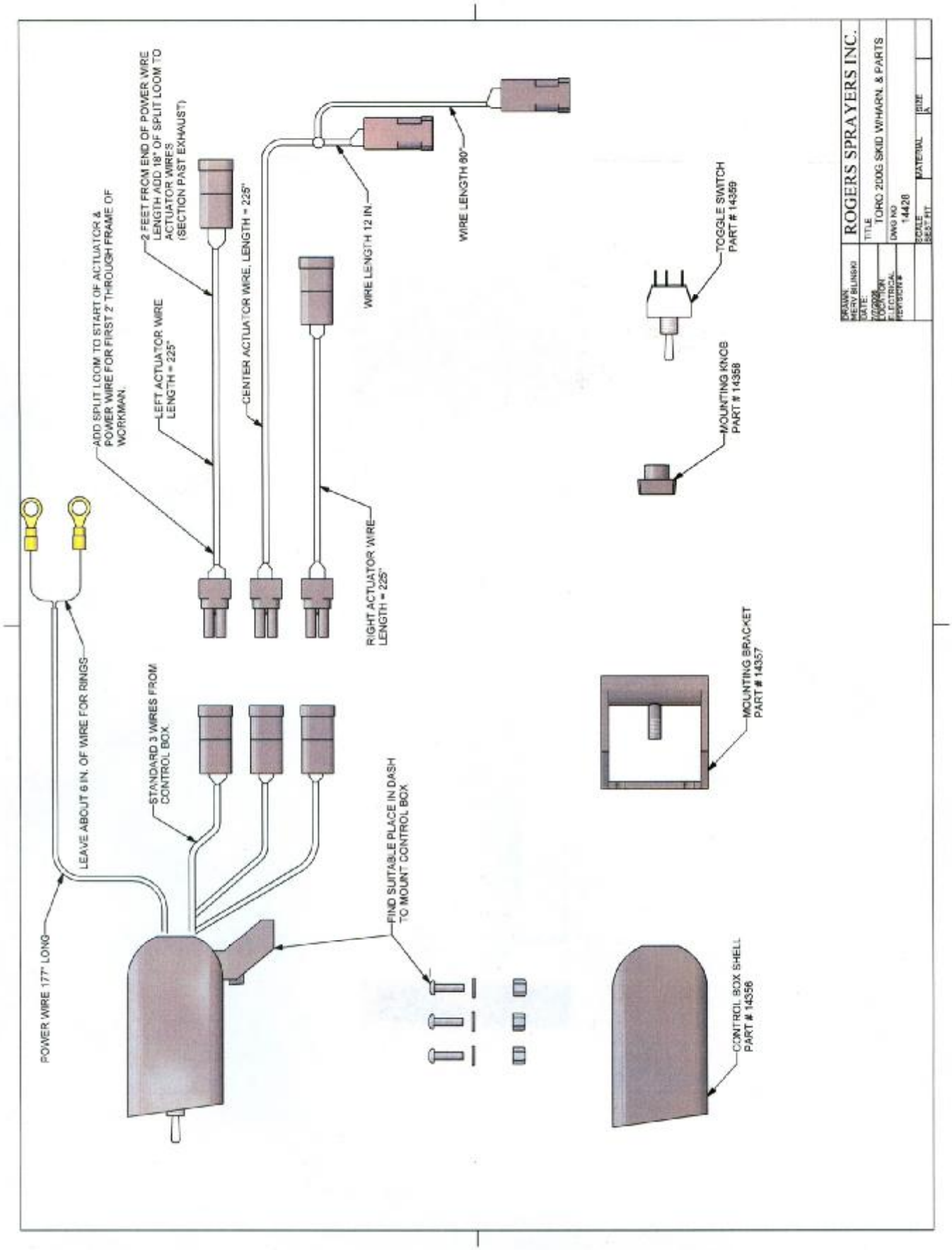
Toro 1250 Wiring Harness Part # 14354



Toro 5700 Wiring Harness Part # 14355



Toro Workman 200 Gal. Wiring Harness Part # 14428



Installation of #14494 Wiring Harness Toro Workman w/switch

- Take off the front panel of main control box. Remove rubber grommet from bottom of control box.
- Remove a blank insert from the control box front panel. Insert the toggle switch into the blank spot. Connect the toggle switch to the plastic connector. (Do not put the actual rocker switch lever on the body until proper up down orientation of the switch body has been determined)
- Run the wires in the split loom of the existing wiring harness from the control box to the back of the cab.
- Attach connector rings of power wire to battery and run wire to harness connections behind the cab.
- Attach split kit for center section actuators to the unit. The wiring can be run back along the left hand side of the unit by the tank mounts.
- Connect power wire and split kit to wiring harness from the control box installed earlier.
- Test center actuators by partially inserting rocker switch lever into the rocker switch body. If the up down motion is correct push rocker switch lever into switch body until it clicks into place. Otherwise rotate the rocker switch body.
- Install actuator extensions to existing wiring harness for the wing actuators. These actuators will be controlled by the standard rocker switches in the control panel for lifting the wings.

Installation of #14535 Wiring Harness Toro 1250 w/switches

- Lift seat to access engine compartment and take off console cover panel to access wiring components.
- Remove the blank toggle switch inserts for lifting the wings and the sonic boom control. Use the sonic boom slot in the console for the switch that folds the boom into transport. During proper functioning of the Rogers Spray boom the sonic boom option on the Toro Multipro is not needed.
- The power wire runs with the existing harness from the battery up to the front console. Note that the main wiring harness runs very close to the drive for the pump, therefore care must be taken to ensure the wiring is kept secured.
- Insert the toggle switches into the blank slots. There is existing wiring harness for lifting the left and right wings. Connect the toggle switch to the plastic connectors. (Do not put the actual rocker switch lever on the body until proper up down orientation of the switch body has been determined**)
- Run wire for split kit on the outside of the frame along the tank to the rear of the unit.
- Install actuator extensions to existing wiring harness for the wing actuators.
- Attach connector rings of power wire to battery and test the movement of the actuators.

**Test actuators by partially inserting rocker switch lever into the rocker switch body. If the up down motion is correct push rocker switch lever into switch body until it clicks into place. Otherwise rotate the rocker switch body.

EC Declaration of Conformity

WE,

Rogers Sprayers Inc.
141 - 105th St East
Saskatoon, Saskatchewan, S7N 1Z2
Canada

declare that the following products

Machine Type: Rear mounted spray boom

Model: WGF11, FGF11, WA5000F, WA5000, FA5000F, FA5000

Machine Type: Pedestrian Boom

Model: WG3, WG4, WG6, FG3, FG4, FG5

Machine Type: Pedestrian Spray Boom

Model: WE3, WE4, WE6, FE3, FE4, FE6

is in conformity with the provisions of the following European Directive(s)

Directive	Number	Certification Method
Machinery Directive	98/37/EC	Self-Certification
Machinery Directive	2006/42/EC	Self-Certification

And the following Standard:

SS-EN 907
EN ISO 4254-1:2009
EN ISO 4254-6:2009

The original copy of this document is kept at Rogers Sprayers Inc. with copies of the relevant test data and certificates, which constitute the required technical file for self declaration.

Place of declaration: Saskatoon, Saskatchewan, Canada
Date of declaration: May 3, 2011

Name: Mervin Bilinski, P. Eng.
Title: President
Rogers Sprayers Inc.



ROGERS SPRAYERS INC.

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