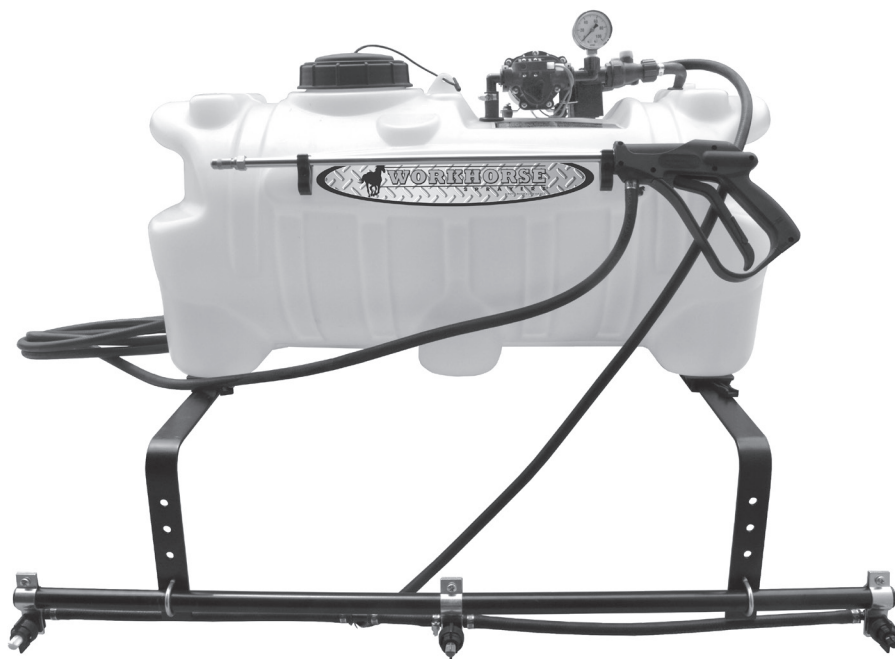


WORKHORSE

S P R A Y E R S

a Division of Green Leaf, Inc®

Assembly / Operation Instructions / Parts



ATV2503

MODEL # ATV2503

DELUXE ATV 3 NOZZLE SPRAYER

- Polyethylene Tank
- 3 Nozzle Boom Assembly
- 12 Volt Diaphragm Pump
- 2.2 G.P.M.
- Quick Attach Mounting System
- 140 inch coverage with Check Valve and Filter
- Lever Handgun
- 15 Ft. of 3/8" Hose (Handgun)
- Pressure Gauge
- Adjustable Pressure Range

— GENERAL INFORMATION

The purpose of this manual is to assist you in assembling, operating and maintaining your lawn and garden sprayer. Please read it carefully as it furnishes information which will help you achieve years of dependable trouble-free operation.

— ASSEMBLY INSTRUCTIONS

Tools required:

- 2 — 7/16" End Wrenches
- 1 — 9/16" End Wrench
- 1 — Thread Sealant
- 1 — Blade Screwdriver
- 1 — 3/16" Allen Wrench

WARNING: Some chemicals will damage the pump valves if allowed to soak untreated for a long period of time. Always flush the pump with water after use. Do not allow chemicals to sit in pump for extended times of idleness. Follow chemical manufacturers instructions on disposal of all waste water from the sprayer.

— WARRANTY / PARTS / SERVICE

Workhorse products are warranted for one year from the date of purchase against manufacture or workmanship defects for personal or homeowner usage with proof of purchase. Workhorse products are warranted for 90 days for commercial users. Any unauthorized modification of a Workhorse brand sprayer will void warranty.

Your authorized dealer is the best source of replacement parts and service. To obtain prompt, efficient service, always remember to give the following information: 1) Correct part description and part number. 2) Model number and serial number of your sprayer.

Part description and part numbers can be obtained from the illustrated parts list section of this manual.

Whenever you need parts or repair service, contact your distributor / dealer first. For warranty work always take your original sales slip, or other evidence of purchase date, to your distributor / dealer.

— OPERATION

The pumping system draws solution from the tank, through the strainer and to the pump. The pump forces the solution under pressure to the boom nozzles and spray wand.

The pump has a pressure switch which will shut the pump off when it reaches 60 PSI.

Pressure may be regulated by opening or closing the valve located on the top of the tank. See "Valve Operation" illustrated in this manual.

The nozzles on the boom will spray a 140" wide swath. Check the nozzle spray pattern by spraying water on a concrete surface.

Regularly inspect the suction supply screen on the inside of the tank. Flush with water to clear any accumulated debris.

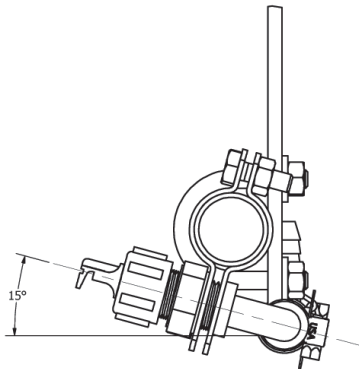
— CALIBRATION

Chemical labels may show application rates in gallons per acre, gallons per 1000 square feet or gallons per 100 square feet. You will note that the tip chart shows all three of these rating systems.

Once you know how much you are going to spray then determine (from the tip chart) the spraying pressure (PSI), and the spraying speed (MPH).

Conditions of weather and terrain must be considered when setting the sprayer. Do not spray on windy days. Protective clothing must be worn in some cases. **Be sure to read the chemical label carefully.**

For the best spray pattern coverage, the nozzles may be rotated rearward 15°.



To determine the ground speed of your sprayer, measure and mark driving distances of 100, 200, or 300 feet. Our speed chart indicates the number of seconds needed to travel these distances. Set your throttle, and with a rolling start, drive the measured distance of your choice. Adjust your throttle until you can match the number of driving seconds needed. Mark the throttle setting and note the gear range so you can use them while spraying.

Add water and chemicals in the proper amounts in the spray tank and drive to your starting point. When you are ready to spray, turn your boom control valve to the "ON" position. Once the pump is turned on, the unit will begin spraying. The system pressure will decrease slightly when you see solution flowing from the spray nozzles. This is normal, the pressure will return as before when you turn the control valve to the "OFF" position.

You will find optimal spraying in the 20 to 30 PSI range.

WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer. www.P65Warnings.ca.gov

— AFTER SPRAYING

After use, fill the sprayer part way with water. Start the sprayer and allow clear water to be pumped through the plumbing system and out through the spray nozzles.

Refill the tank about half full with plain water and use a chemical neutralizer such as Nutra-Sol® or equivalent and repeat cleaning instructions. Flush the entire sprayer with the neutralizing agent. Follow the chemical manufacturer's disposal instructions of all wash or rinsing water.

Remove tips and screens from the boom. Wash tips thoroughly with water or cleaning solution (appropriate for chemical used). Blow out orifice, clean and dry. If orifice remains clogged clean it with a fine bristle (not wire) brush, or with a toothpick. Do not damage the orifice. Water rinse and dry tips before storing.

— WINTER STORAGE

Drain all water and chemical out of sprayer, paying special attention to pump and valves. These items are especially prone to damage from chemicals and freezing weather.

The sprayer should be winterized before storage by pumping a solution of RV antifreeze through the entire plumbing. Proper care and maintenance will prolong the life of the sprayer.

— TIP CHARTS

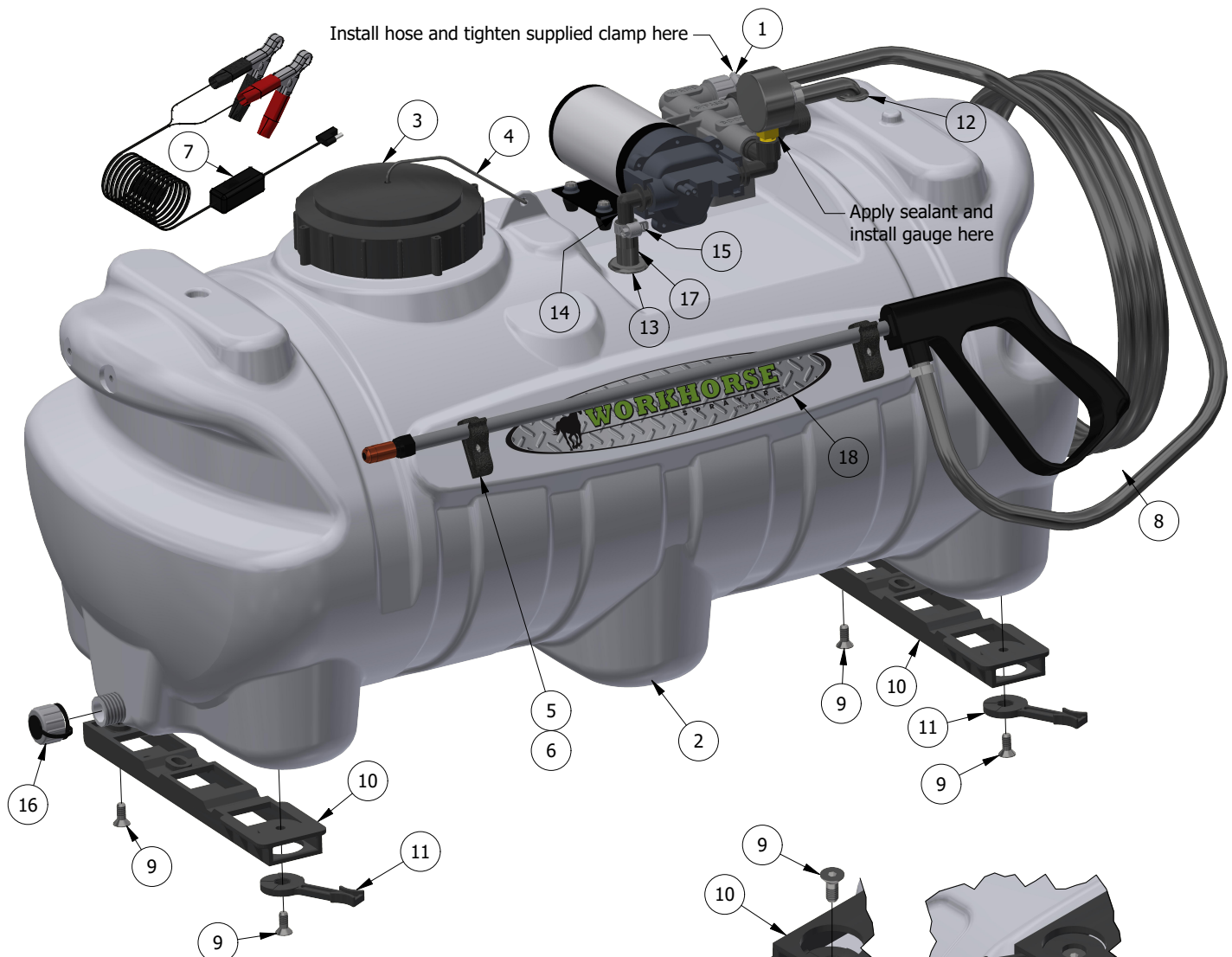
Tip No.	Spray Height	Pressure (PSI)	Capacity (GPM)	GALLONS PER ACRE - BASED ON WATER							
				1 MPH	2 MPH	3 MPH	4 MPH	5 MPH	7.5 MPH	10 MPH	
3	18"	10.0	0.30	44.0	22.0	14.9	11.1	08.9	05.9	4.50	
		20.0	0.42	63.0	31.5	20.9	15.7	12.6	08.4	6.30	
		30.0	0.52	76.0	38.0	26.0	19.3	15.4	10.3	7.70	
		40.0	0.60	90.0	45.0	30.0	22.0	17.8	11.8	8.90	
Tip No.	Spray Height	Pressure (PSI)	Capacity (GPM)	GALLONS PER 1000 SQ. FT. - BASED ON WATER							
				1 MPH	2 MPH	3 MPH	4 MPH	5 MPH	7.5 MPH	10 MPH	
3	18"	10.0	0.30	1.01	0.50	.340	.254	.204	.135	.103	
		20.0	0.42	1.40	0.72	.480	.360	.290	.190	.140	
		30.0	0.52	1.74	0.87	.596	.440	.350	.236	.176	
		40.0	0.60	2.06	1.00	.688	.500	.408	.270	.200	
Tip No.	Spray Height	Pressure (PSI)	Capacity (GPM)	GALLONS PER 100 SQ. FT. - BASED ON WATER							
				1 MPH	2 MPH	3 MPH	4 MPH	5 MPH	7.5 MPH	10 MPH	
3	18"	10.0	0.30	.100	.050	.034	.025	.020	.013	.010	
		20.0	0.42	.140	.072	.048	.036	.029	.019	.014	
		30.0	0.52	.174	.087	.059	.044	.035	.0236	.017	
		40.0	0.60	.206	.100	.068	.050	.040	.027	.020	

Tip No.	Pressure (PSI)	Capacity (GPM)	GALLONS PER ACRE BASE ON WATER-40" SPACING			
			5 MPH 440 FPM	6 MPH 528 FPM	7 MPH 616 FPM	8 MPH 704 FPM
5	10	0.50	14.9	12.4	10.6	9.3
	20	0.71	21.0	17.6	15.1	13.2
	30	0.87	26.0	22.0	18.5	16.1
	40	1.00	30.0	25.0	21.0	18.6
Most chemical labels indicate a chemical application rate in 1,000 sq. ft.; if the rate on the label is indicated as a rate per acre, divide the per acre rate by 43.56 to convert to a rate per 1,000 sq. ft.						
1 Acre = 43,560 sq. ft.						
1 gallon per 1,000 sq. ft. = 43.56 gallons per acre						
1 fl. Oz. = 2 tablespoons						
1 cup = 8 fl. Oz.						
1 pint = 2 cups = 16 fl. Oz.						
1 quart = 2 pints = 32 fl. Oz.						
1 gallon = 4 quarts = 8 pints = 128 fl. oz.						

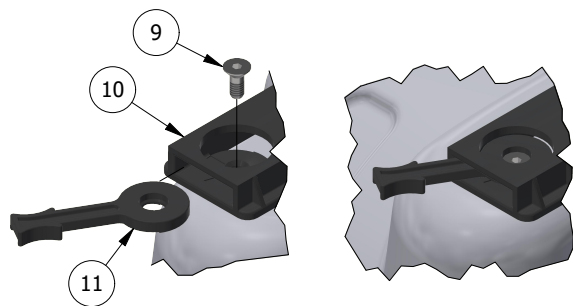
— SPEED CHART

Speed in MPH (Miles Per Hour)	Time Required in Seconds to Travel a distance of:		
	100 ft.	200 ft.	300 ft.
1.0	68.0	136	205
2.0	34.0	68	102
3.0	23.0	45	68
4.0	17.0	34	51
5.0	14.0	27	41
6.0	11.0	23	34
7.0	9.7	19	29
8.0	8.5	17	26
9.0	7.6	15	23
10.0	6.8	14	20

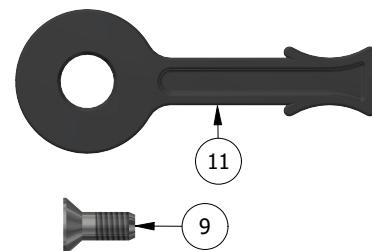
— GENERAL ASSEMBLY Instruction #1



ITEM	QTY	PART#	DESCRIPTION
1	1	600120	3/8" Hose Clamp (670001)
2	1	600132	25 Gallon Tank
3	1	600133	Tank Lid
4	1	600134	Tank Lid Tether
5	2	600151	Spray Wand Clip
6	2	600152	10-24 x 3/8" Pan Head Screw
7	1	600153	Lead Wire assy w/ Switch 96" (670001)
8	1	600156	Deluxe Wand and Hose 15'
9	4	600188	5/16-18 x 3/4 FLT SHCS (670009)
10	2	600189	ATV Boom Mount
11	2	600190	ATV Helix Lever (670009)
12	1	600207	Rubber Grommet
13	1	600284	1/2" Hose Rubber Grommet
14	1	600287	Suction Fitting
15	1	600288	1/2" Hose Clamp
16	1	600298	Drain Cap Assembly (670001)
17	1	600315	Suction Hose Assy.
18	2	630161	WH Tank Label

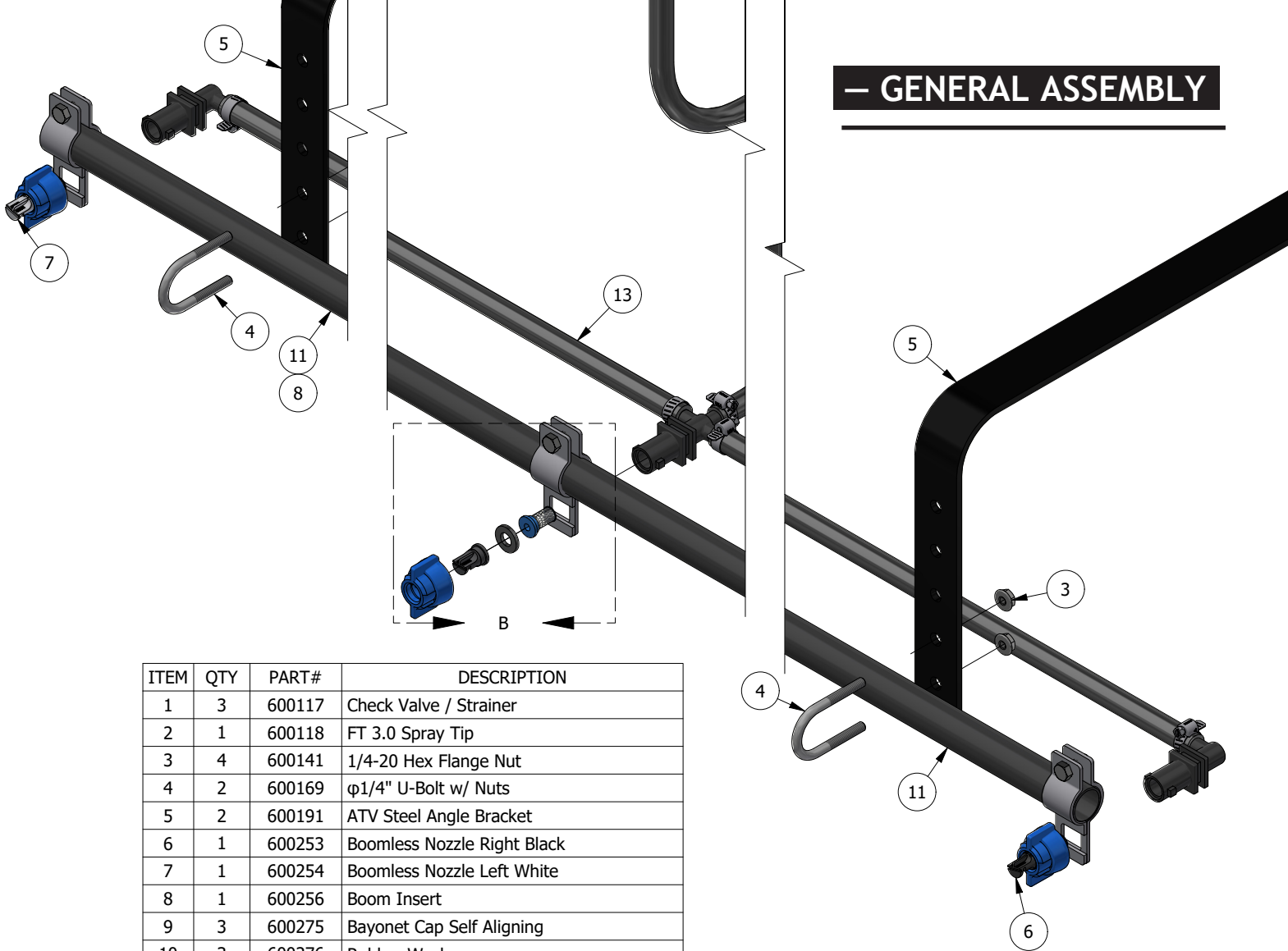


670009 Bag Assy.



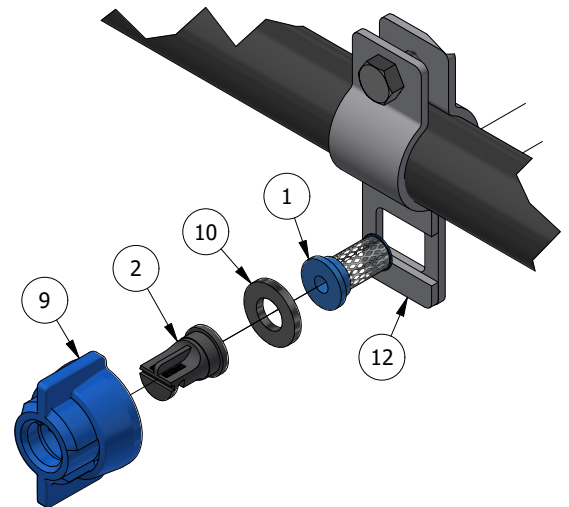
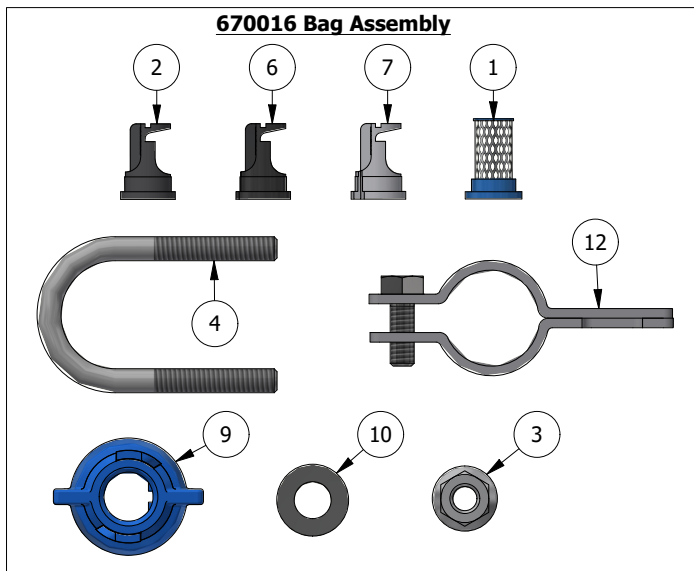
ITEM	QTY	PART#	DESCRIPTION
9	4	600188	5/16-18 x 3/4 FLT SHCS
11	2	600190	ATV Helix Lever

— GENERAL ASSEMBLY

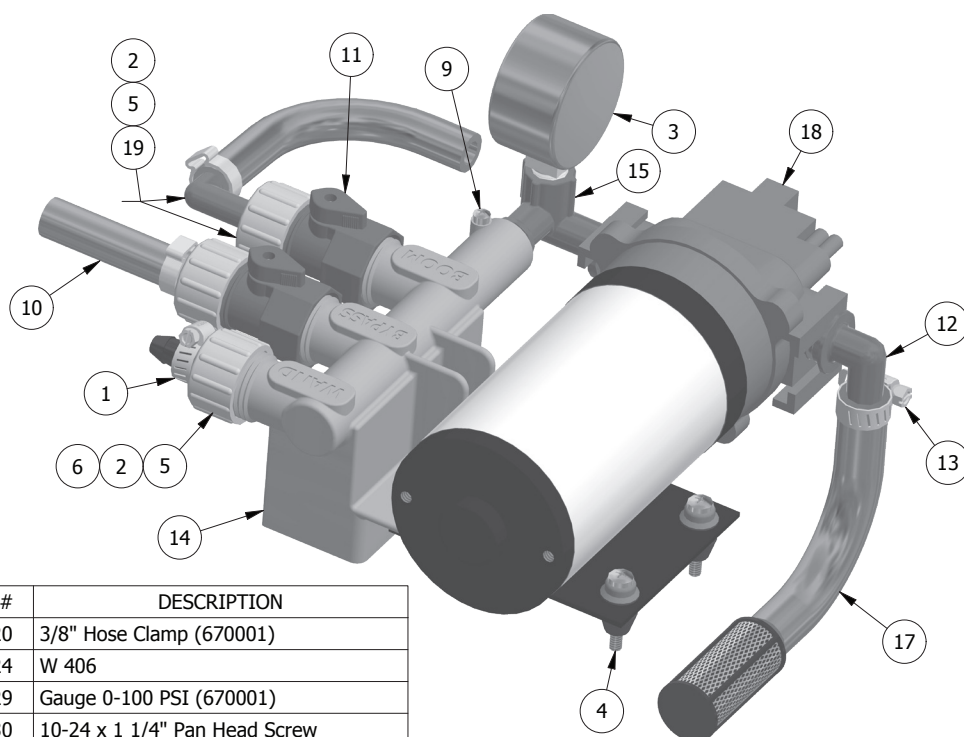


ITEM	QTY	PART#	DESCRIPTION
1	3	600117	Check Valve / Strainer
2	1	600118	FT 3.0 Spray Tip
3	4	600141	1/4-20 Hex Flange Nut
4	2	600169	φ1/4" U-Bolt w/ Nuts
5	2	600191	ATV Steel Angle Bracket
6	1	600253	Boomless Nozzle Right Black
7	1	600254	Boomless Nozzle Left White
8	1	600256	Boom Insert
9	3	600275	Bayonet Cap Self Aligning
10	3	600276	Rubber Washer
11	2	630022	2 Piece Breakdown Boom End Section
12	3	640490	BQ111R Boom Clamp
13	1	640493	ATV2503 Boom Hose

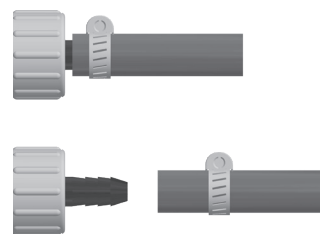
670016 Bag Assembly



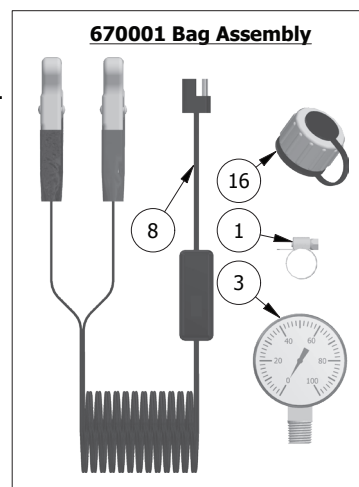
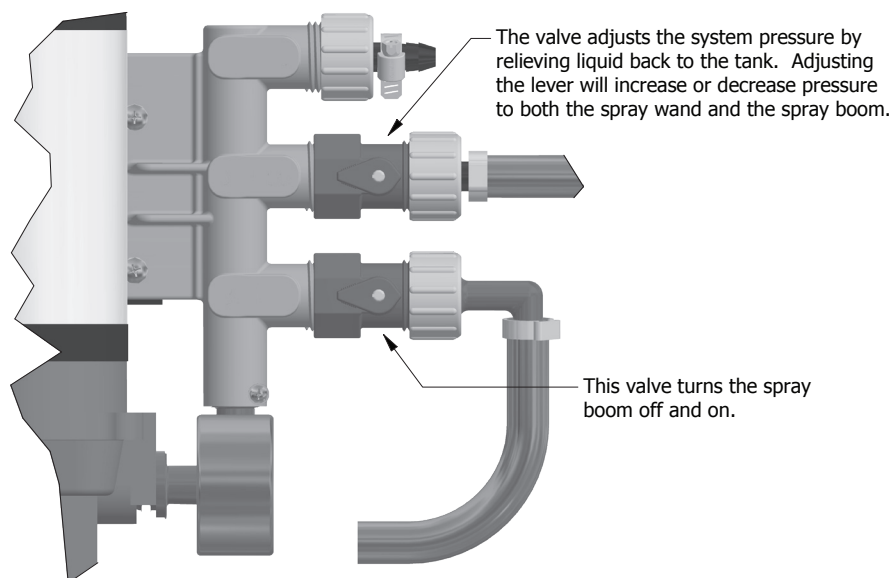
— Pump & Valve Assembly



ITEM	QTY	PART #	DESCRIPTION
1	1	600120	3/8" Hose Clamp (670001)
2	3	600124	W 406
3	1	600129	Gauge 0-100 PSI (670001)
4	4	600130	10-24 x 1 1/4" Pan Head Screw
5	3	600139	B 3400 P
6	2	600140	C3800 P Fitting
7	2	600149	18.5 mm Dia. Pinch Clamp
8	1	600153	Lead Wire Assy w/Switch (96") (670001)
9	1	600199	#8-3/4" Self Tapping Screw
10	1	600213	Relief Hose Assy.
11	2	600216	G3434V Inline Garden Hose Valve
12	1	600287	QD EL 12
13	1	600288	1/2" Hose Clamp
14	1	600289	3 Outlet Manifold Body
15	1	600291	Manifold Supply Fitting for Flex Pump
16	1	600298	Drain Cap Assy. (670001)
17	1	600315	Suction Hose Assembly
18	1	640451	2.2 GPM Flex Pump
19	1	640448	Flat Seat Swivel x 3/8" Elbow



Install Wand Hose Assembly onto Swivel Barb Assembly, by placing a Hose Clamp over the open end of the hose on the Wand Hose Assembly. Then pressing the open end of the hose onto the Swivel Barb Assembly Like shown. Secure in place by tightening the Hose Clamp as shown





3300 Series: 2.2 GPM

PUMP INFORMATION:

Type - 3 chamber diaphragm pump, self priming, capable of being run dry

Pressure Control - Demand

Liquid Temperature - 140°F (60°C) Max.

Priming Capabilities - 8 feet (2.4 m)

Max Pressure - 200 PSI (14 bar)

Inlet/Outlet Ports - 3/4" Quick Attach

Weight - 6 lbs (2.7 kg)

MOTOR INFORMATION

Leads - 14 AWG, 7" long with 2-Pin

Temperature Limits - Motor is not equipped with thermal protection. For user safety, optimal performance, and maximum motor life, the motor surface temperature should not exceed 180°F (82°C)



3200 Series: 3.2-4.0 GPM

PUMP INFORMATION:

Type - 3 chamber diaphragm pump, self priming, capable of being run dry

Pressure Control - Demand

Liquid Temperature - 140°F (60°C) Max.

Priming Capabilities - 10 feet (3 m)

Max Pressure - 100 PSI (6.9 bar)

Inlet/Outlet Ports - 3/4" Quick Attach

Weight - 5 lbs (2.3 kg)

MOTOR INFORMATION

Leads - 14 AWG, 7" long with 2-Pin

Temperature Limits - Motor is not equipped with thermal protection. For user safety, optimal performance, and maximum motor life, the motor surface temperature should not exceed 180°F (82°C)



5500 Series: 4.0-5.3GPM

PUMP INFORMATION:

Type - 5 chamber diaphragm pump, self priming, capable of being run dry

Pressure Control - Demand

Liquid Temperature - 140°F (60°C) Max.

Priming Capabilities - 14 feet (4 m)

Max Pressure Capabilities - 150 PSI (10 bar)

Inlet/Outlet Ports - 3/4" Quick Attach

Weight - 8 lbs (3.62 kg)

MOTOR INFORMATION

Leads - 14 AWG, 7" long with 2-Pin

Temperature Limits - Motor is not equipped with thermal protection. For user safety, optimal performance, and maximum motor life, the motor surface temperature should not exceed 180°F (82°C)

Installation and Operation Precautions

- The pump is equipped with a pressure sensing demand switch that controls the maximum operating pressure.
- In addition, never subject the pump to pressures above factory set/max pressure rating.
- As long as there is inlet water pressure, the pump will not stop forward flow of water even if the motor is turned off. Be sure the system has positive means of shutting off water supply.
- Do not operate pump in an explosive environment. Arcing from the motor brushes, switch or excessive heat from an improperly cycled motor may cause an explosion.
- Do not locate the pump motor near low temperature plastics or combustible material. The surface temperature of the motor may exceed 180°F (82°C).
- Do not pump gasoline or other flammable liquids. Pump head materials are designed for use with water only. Do not use with petroleum products.
- Do not assume fluid compatibility. If the fluid is improperly matched to the pumps' elastomers, a leak may occur.
- To prevent electrical shock, disconnect power before initiating any work. In the case of pump failure, the motor housing and/or pump fluid may carry high voltage to components normally considered safe. Therefore, always consider electrical shock hazard when working with and handling electrical equipment. If uncertain, consult an electrician. Electrical wiring should only be done by a qualified electrician per local and state electrical codes.

Servicing —

- Every Year: Check system against operating standards. Flush with clean water and store in warm dry place.
- Every 2-3 Years: We recommend replacing the valves and checking against operating standards.

Recommendations —

Electrical:

- The ProFlo™ series pumps are designed for intermittent duty. Make sure that "OFF" periods are sufficient. Consult the factory for particular data and design criteria.
- Be sure power supply used is adequate for the application.
- Pump and motor specifications are based on an alternator charged battery (13.6 VDC)
- Use sufficient battery supply power. UTV and lawn tractor batteries may affect pump performance due to low voltage and amp ratings
- Rapid On/Off Cycling must be limited to no more than 6 times per minute, even if the pump is operating in the Continuous Duty zone. Cycling could cause the motor to heat beyond the recommended maximum temperature, and reduce the operational life of the pump and pressure-sensing switch.

Important return safety instructions -

When returning your pump for warranty or repair, you must always do the following:

- Contact factory for RMA number.
- Flush chemical residue from the pump (best done in the field).
- Tag pump with type of chemicals having been sprayed.
- Include complete description of operation problem, such as how pump was used, symptoms of malfunction, etc. Since pumps can contain residues of toxic chemicals these steps are necessary to protect all the people who handle return shipments, and to help pinpoint the reason for the breakdown.

Troubleshooting Guide —

Problem/Causes and Remedies:

Pump will not Start

Check:

- Correct voltage ($\pm 10\%$) and electrical connections
- Fuse or breaker
- Pressure switch operation and correct voltage at switch
- Rectifier or motor for open or grounded circuit
- Locked drive assembly

Pump will not Prime (No discharge with motor running)

Check:

- Debris in strainer
- Restriction (kinks) in inlet/outlet tubes
- Debris or swelling in inlet/outlet valves

Pump will not Shut Off (Output line closed and no leaks)

Check:

- Air trapped in outlet line or pump head
- Correct voltage to pump
- Debris in pump inlet/outlet valves
- Loose drive assembly or pump head screws
- Pressure switch operations/adjustments

Leaks from Pump Head or Switch

Check:

- Loose screws at switch or pump head
- Switch diaphragm ruptured or pinched
- Punctured diaphragm if fluid is present

Spray & Pump FAQs —

--Why does the pump not run all the time?

This is a demand pump and only runs with flow; spray wand, by-pass, spray tips or leak in system

--Why does the pump surge while using the spray wand?

Low flow may cause the pump to surge (or cycle). This could happen when the spray wand is adjusted for a small or fine spray pattern. To overcome, slightly open the by-pass valve.

--How do I adjust the pressure?

Pressure should be adjusted by regulating the by-pass valve (slightly opening or closing).

--What is the optimal operating pressure?

40 PSI - This can be accomplished by turning on the pump and adjusting the bypass valve until the gauge reads 40 PSI (or slightly higher). The pump will run continuously. Ensure that the boom and/or handgun is not spraying while you set the pressure. The pressure will drop slightly when the boom and/or handgun is operated.

--What pressure should the pressure gauge read?

Please refer to the operation instructions for boom operating pressures, varying boom pressures can be achieved by regulating or adjusting the by-pass valve. Typically the spray wand will be operated between 20 and 40 PSI.

--What is the recommended PSI to inflate the tires?

30 PSI Max

--My pump quit and will not restart - what should I check?

Check all electrical connections. Ensure switch is in the on position. Check in-line fuse and/or fuse in car adapter end. Ensure correct voltage $\pm 10\%$. 12-13 volt

--Low flow or no flow at all - what should I check?

Check for a clogged suction hose and/or suction strainer. Often you will need to clean the suction strainer. Check for proper voltage.

--Is there a fuse for the sprayer?

Yes, either an in-line fuse, a fuse located in the car adapter housing or both.

--What size fuse should I use as a replacement?

7.5 amp

--What is the range of the spray wand?

35 feet max

--How should I clean the tank after use?

Tank should be cleaned with Nutrasol® or similar tank cleaning agent, and then rinsed with water.

--Is there an adjustment screw on the pump to adjust pressure?

Yes, please refer to the operation instructions, "Adjusting the Pressure Switch".

--How do I remove / replace fuse?

Unscrew in-line fuse connector, or unscrew the car adapter housing.

--Can the spray tip on the wand be replaced with a different type of tip?

Yes, however your wand comes with a #18 tip which is standard. Brass tips generally produce better spray patterns than plastic.

--Each time I turn on the pump my fuse blows.

1) Excessive voltage 2) Improper adjustment of the pressure switch 3) Damaged wiring harness.

--What is the warranty (time duration) on pump, tank, trailer pieces, and accessories?

1 year as stated in operation instructions.

--Pressure gauge reads 85 -90 psi before shutting off - should pump shut off at 60 psi?

Pump 7802 2.2 GPM comes preset from the factory to shut off at 60 PSI. Should this vary please see, "Adjusting the Pressure Switch" in the operation manual. Turn on pump and hold spray wand open, slowly adjust until the pump shuts off at 60 PSI.

--Pump continues to run and surge when not spraying.

Ensure the by-pass is completely closed and your system has no leaks. Check by-pass hose to ensure no fluid is passing through the valve while in the closed position. If so replace valve.

WARNING - Ensure the wiring harness does not become pinched or damaged in any way. This may damage the pump or cause the wiring harness to overheat, resulting in a melt down or fire.