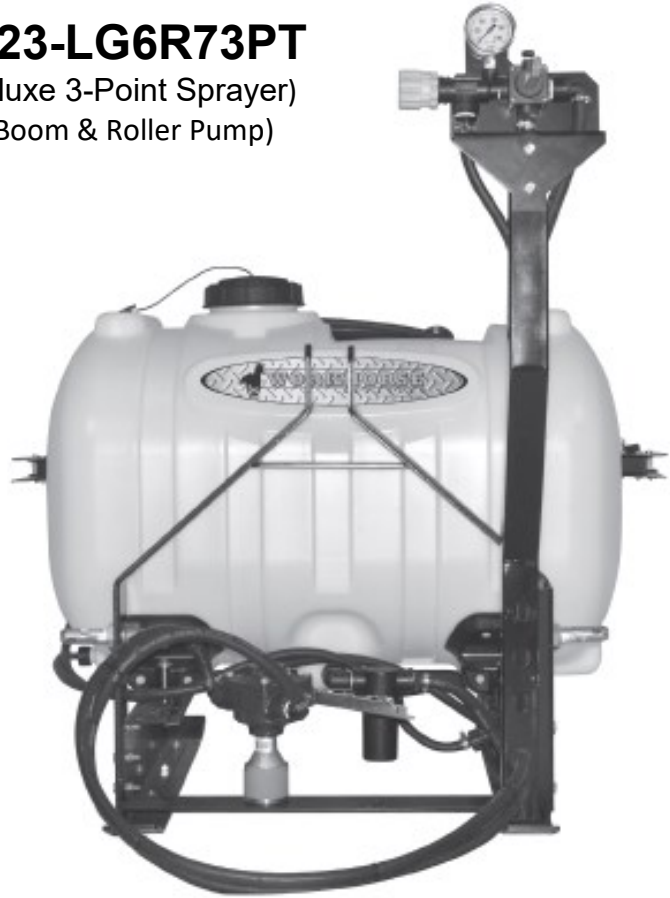


OWNER'S MANUAL

Model: G23-LG6R73PT

(60 Gallon Deluxe 3-Point Sprayer)

(W/7-Nozzle Boom & Roller Pump)



**BEFORE RETURNING THIS PRODUCT
FOR ANY REASON, PLEASE CALL**

1-888-433-6631

MONDAY-FRIDAY, 8:00 AM TO 5:00 PM CST

If you should have a question or experience a problem with your Workhorse Sprayers Product: Visit our website @ www.workhorsesprayers.com or call the Toll free number above. Our technical support representatives will be happy to help you.

In most cases a customer service rep. can resolve the problem over the phone.

To obtain prompt, efficient service, always remember to give the following information....

- Correct Part Description and/or part number
- Model number and Serial Number

Part descriptions and numbers can be obtained from the illustrated parts list section(s) of this manual.

Retain a copy of your receipt for your unit, as it will be required to validate any warranty service.

Warranted against manufacturer or workmanship defects from date of purchase with copy of receipt:

Homeowner Usage: One Year.

Commercial Usage: 90 Days.

General Information

Thank you for purchasing this product. The purpose of this manual is to assist you in operating and maintaining your lawn & garden trailer sprayer.



WARNING: To reduce the risk of injury, the user must read and understand the operator's manual before using this product.



WARNING: Cancer and Reproductive Harm.
www.P65Warnings.ca.gov



WORKHORSE
S P R A Y E R S

www.workhorsesprayers.com

Toll Free Phone: 888-433-6631

[G23-700100

(07/24)]

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Model: G23-LG6R73PT (60 Gallon Deluxe 3-Point Sprayer)

Technical Specifications

- 60 Gal. Corrosion-Resistant Polyethylene Tank
- 10.5 GPM Roller Pump (GPM dependent upon application)
- Deluxe Pistol Grip Spray Wand
- 3/8" x 25 Ft. Handgun Hose
- 7-Nozzle Boom (140" Spray Coverage)

Caution: Always check the vehicle load rating before using the sprayer.

The loaded weight of this sprayer and boom assembly is approx.: 665 lbs. when the tank is full.

~~~~~IMPORTANT~~~~~

Remove tank lid and be sure the tank is clean and free of any foreign material. Rinse tank out of any tank residue before filling with water to test.

~~~~~IMPORTANT~~~~~

It is VERY important to test this sprayer with plain water before actual spraying is attempted. This will enable you to familiarize yourself with the sprayer and check for leaks without the possibility of losing any expensive chemicals.

~~~~~WARNING~~~~~



Read and Understand the Owner's Manual before using this sprayer. Test and use in accordance to instructions.

Read and Follow chemical label instructions and wear protective gear when filling, using, cleaning and servicing the sprayer.

Exercise Caution in vehicle handling when towing/hauling a filled sprayer to avoid loss of control or overturning.

Keep Sprayer and Spray materials away from other people, children and pets.

Do Not Turn on Power to the sprayer, until ready to spray in order to avoid unintentional spray release.

Do Not Use on steep slopes. A full sprayer could cause loss of control or overturn sprayer and vehicle.

Always operate up and down a slope, never across the face of a slope.

Keep all movement on slopes slow and gradual. Do not make sudden changes in speed, directions or turning. Do not start or stop suddenly when going uphill or downhill.

Stop on level ground, set the parking brake and shut off engine before leaving the operator's position for any reason.

Keep all parts in good condition and properly installed. Fix damaged or worn parts immediately.

Caution should be taken when towing and/or using any sprayer. This sprayer combined with the weight distribution, turning radius and speed of vehicle can result in damage to vehicle and/or sprayer or severe injury or death, if not used properly.

Improper use of this sprayer or handling of chemicals could result in serious injury or illness, or could cause damage to the environment.

IMPORTANT: Remove tank lid and be sure the tank is clean and free of any foreign material. Rinse tank out of any tank residue before filling with water to test.

- Assemble sprayer per directions on pages 00, 00, 00.
- **Make sure all hose clamps are tight** before testing or spraying for the first time.

****The Sprayer should be TESTED w/plain water before actual use****

Information About the Sprayer

Roller pumps are positive displacement pumps, which means that the entire solution being pumped must go somewhere or the pump will break. In this roller pumping system, solution is drawn from the tank and forced to a planned source, such as boom nozzles or handgun. The pressure is controlled by a pressure relief valve, which is a spring-loaded device that controls the amount of fluid bypassed (recirculated) to the tank. The gray handle is to be tightened to increase pressure and loosened to decrease pressure. The 'directo-valve' is the on/off control which allows the operator to manually control the solution going to the boom.

Testing the Sprayer

Attach the sprayer to the tractor 3 point hitch. Mount the pump to the PTO and affix the torque chain.

NOTE:

It is VERY important to test this sprayer with plain water before actual spraying is attempted. This will enable you to check the sprayer for leaks without the possibility of losing any expensive chemicals.

Fill the tank about 1/2 full with plain water and drive to the starting place for spraying.

Turn the relief valve handle out to lower the line pressure. This will help prime the pump.

CAUTION:

Always be sure that the water (or solution) has reached the pump before starting your sprayer. If the pump is allowed to run dry, serious damage to the pump will result.

Always have the pressure line open to the tips so that the air which may be trapped in the line will be forced (or purged) out.

Start the tractor PTO. Check the entire system for leaks. Once the pump is primed, the pressure may be increased by turning the handle of the pressure relief valve in. Keep the pressure line open to the tips when setting the pressure. Set the pressure and then lock the relief valve handle in place. Shut off the directo-valve and check for leaks again. Pressure will increase when the pressure line valve is closed and then return to the preset pressure when the valve is opened again.

During the testing period, be sure to observe the spray pattern given by the spray nozzles. If there is any pattern distortion, it will be necessary to remove and clean the affected tips.

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(s) before application!

Operation

This sprayer is designed to be attached to a CAT I tractor with standard 540 PTO. The pumping system draws solution from the tank, through the strainer and to the pump.

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

Fill the tank part way with water and then add the desired amount of chemical to be sprayed. Finish filling tank to proper level.

Only fill the tank with what you're going to spray in a day, never leave chemicals sit in tank.

For the safest and most efficient chemical application, you will need to calibrate your sprayer using the tip and speed charts. Once you have determined the proper speed and pressure settings, you will need to consult your chemical label for the amount of chemical to be added to the tank. Read the entire label. Use only according to label directions. The performance of any agricultural chemical depends upon the proper application.

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 3 of these rating systems. Once you know how much you are going to spray, then determine the spraying pressure, and the spraying speed (MPH).

Determining the proper speed of the pulling vehicle can be done by marking off 100, 200 & 300 feet. The speed chart indicates the number of seconds it takes to travel the distances. Set the throttle and with a running start, travel the distances. Adjust the throttle until you travel the distances in the number of seconds indicated by the speed chart. Once you have reached the throttle setting needed, mark the throttle location so you can stop and go again, returning to the same speed.

Add water and proper amount of chemical to the tank and drive to the starting place for spraying.

- Speed Chart -			
Speed in MPH	Time Required in Seconds to Travel a distance of:		
	100 ft.	200 ft.	300 ft.
1.0	68.0	136.0	205.0
2.0	34.0	68.0	102.0
3.0	23.0	45.0	68.0
4.0	17.0	34.0	51.0
5.0	14.0	27.0	41.0
6.0	11.0	23.0	34.0
7.0	9.7	19.0	29.0

Rate Chart for 80/110-02 Spray Tip									
	Pressure (PSI)	Capacity (GPM)	1 MPH	2 MPH	3 MPH	4 MPH	5 MPH	7.5 MPH	10 MPH
Gallons Per Acre Base on Water	20	0.14	41.8	20.9	14.0	10.5	8.4	5.6	4.2
	30	0.17	51.2	25.6	17.2	12.9	10.3	6.9	5.1
	40	0.20	59.2	29.6	19.8	14.9	11.9	7.9	5.9
	50	0.23	66.4	33.2	22.2	16.6	13.3	8.8	6.6
Gallons Per 1000 Sq. Ft. Base on Water	20	0.14	.96	.48	.32	.24	.19	.13	.10
	30	0.17	1.18	.59	.39	.30	.24	.16	.12
	40	0.20	1.36	.68	.45	.34	.27	.18	.14
	50	0.23	1.52	.76	.51	.38	.31	.20	.15
Gallons Per 100 Sq. Ft. Base on Water	20	0.14	.096	.048	.032	.024	.019	.012	.009
	30	0.17	.117	.059	.039	.029	.024	.015	.011
	40	0.20	.135	.066	.045	.034	.027	.018	.013
	50	0.23	.152	.076	.050	.038	.030	.020	.015

Using the Boom Nozzles

Four things must be considered before spraying with the boom.

1. How much chemical must be mixed in the tank.
 2. Rate of spray (gallons per acre to be sprayed).
 3. What pressure (psi) will be used.
 4. Speed traveled (mph) while spraying.
- * Refer to the chemical label to determine chemical mixture
 - * Tip chart will show the speed used when spraying.
 - * Start the pump and open the valve to the boom nozzles.
 - * Check the spray pattern. Usually you can see the coverage better on a solid concrete surface, such as a driveway.

The tips supplied as standard with the sprayer can be used for a wide variety of spraying applications. The speed and pressure charts shown indicate the rates can be changed considerably by changing speed and pressure. The nozzles on the boom will spray a 140" wide swath.

When you are ready to spray, mix chemicals as follows. Add the proper amount of water to the tank. Run the sprayer while adding chemical to the water.

Only fill the tank with what you're going to spray in a day, never leave chemicals sit in tank.

Do NOT spray through the boom at this time. This will allow the solution to return ('bypass') to the tank. The movement of solution through the bypass will aid in mixing the water and chemicals. Once mixed, you should now be ready to spray.

When ready to spray, turn 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 the solution is spraying from the nozzles. This is normal, the pressure will return as before when the control valve is turned to the "OFF" position.

Maintenance During/After Spraying

Periodically check the strainer and clean the screen on your intake line. If sprayer becomes clogged during use, discontinue use immediately. DO NOT attempt to service while chemicals are in the sprayer and power is connected.

Proper care and maintenance will prolong the life of your sprayer.

After use, drain the tank and store or dispose of chemical properly. Fill the sprayer half way with clean water. Start the pump and allow the water to pump through the entire plumbing system and nozzles. Drain and then refill half full, add the recommended amount of a good quality tank cleaner. (If no tank cleaner is available, you may substitute dish soap for this step, about 1-2 oz. per gallon). But a neutralizer/cleaner should be used to thoroughly clean the system. Turn pump on and circulate through system for 15 minutes and then spray out through boom and handgun nozzles. Refill sprayer half way with clean water and repeat. Follow the chemical manufacturer's disposal instructions of all wash or rinsing water.

If boom or handgun nozzles need cleaning, remove them from the sprayer and soak in warm soapy water. Clean with a soft bristled brush or toothpick if necessary. Never use a metal object. Even the slightest damage can change the flow rate and spray distribution. Water rinse and dry the tips before storing.

WARNING: Some chemicals will damage the pump valves if allowed to soak untreated for a length of time! ALWAYS flush the pump as instructed after each use. DO NOT allow chemicals to sit in the pump for extended times of idleness. Follow the chemical manufacturer's instructions on disposal of all waste water from the sprayer.

Tank Care & Maintenance

Warning: Do not use the tank as a container for fuel oils, kerosene, gasoline or any other petroleum distillate product. All poly olefins are softened and permeated by such products. In an enclosed area the vaporization of these materials from the outside surface of the tank could create a dangerous condition.

The tank should not be used as a pressure vessel nor used with chemicals or solutions having a weight of more than 12 pounds per gallon.

Store the tank in a dry dark place when not in use. Storage out of sunlight will prolong the life of the tank.

Do not drop, strike or kick the tank, especially at low temperatures. Tanks become brittle and are subject to cracking at temperatures below 20° Fahrenheit.

Always flush the tank with water and a neutralizing agent at the end of each use, to prevent contamination of solutions.

Winter Storage

Drain all water out of your sprayer, paying special attention to the pump, handgun and valve(s). These items are especially prone to damage from chemicals and freezing weather.

The sprayer should be winterized before storage by pumping a solution of automotive antifreeze (containing a rust inhibitor) through the entire plumbing system. This antifreeze solution should remain in the plumbing system during the winter months.

When spring time comes and you are preparing the sprayer for the spray season, rinse the entire plumbing system out, clearing the lines of the antifreeze solution.

Proper care and maintenance will prolong the life of your sprayer.

Removing from storage: drain the antifreeze. Fill the tank with fresh water and run through the system. Dispose of antifreeze and flush water properly.



RP-600 Series 6-Roller Pump

Ace Roller Pumps are ideal for a large range of spraying, cleaning and transfer applications.

Benefits of these pumps include:

- A compact, low cost design.
- Mount directly to common tractor PTO shafts with Optional PTO coupler.



SPECIFICATIONS

Pump Specifications

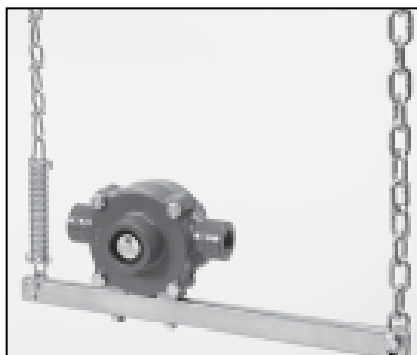
Ports	3/4" x 3/4" NPT
Max. Flow	21.8 GPM (82.5 LPM)
Max. Pressure	300 PSI (20.7 BAR)
Rotation	Counter clockwise from shaft end R model is clockwise from shaft end
Speed	540-1200 RPM
Construction	Cast Iron
Seals	FKM Lip Type
Shaft	5/8" Stainless Steel
Bearings	Sealed for long life
Rotor	Cast Iron
Rollers	Thermoplastic with metal core
Fluid Temperature	Maximum 140°F (60°C)

PERFORMANCE

Imperial	540 RPM		1000 RPM		1200 RPM	
PSI	GPM	HP	GPM	HP	GPM	HP
0	9.7	0.80	18.2	0.20	21.8	0.30
50	8.0	0.38	16.5	0.71	20.1	0.90
100	7.2	0.68	15.4	1.26	19.1	1.51
150	6.6	0.97	14.7	1.80	18.2	2.14
200	5.6	1.29	14.0	2.34	17.3	2.84
250	4.9	1.65	13.4	2.91	16.5	3.48
300	4.3	1.91	12.7	3.47	15.7	4.17

Metric	540 RPM		1000 RPM		1200 RPM	
BAR	LPM	HP	LPM	HP	LPM	HP
0	36.7	0.80	68.9	0.20	82.5	0.30
50	30.3	0.38	62.4	0.71	76.1	0.90
100	27.3	0.68	58.3	1.26	72.3	1.51
150	25.0	0.97	55.6	1.80	68.9	2.14
200	21.2	1.29	53.0	2.34	65.5	2.84
250	18.5	1.65	50.7	2.91	62.4	3.48
300	16.3	1.91	48.1	3.47	59.4	4.17

ACCESSORIES



TORQUE BAR KIT

Part #	RP-TBK
EDP #	15100
Description	Torque bar kit for 6 roller pump

PTO COUPLER

Part #	BAC-10-RP6-QC
EDP #	14880
Description	Multispeed die cast coupler for 5/8" shaft



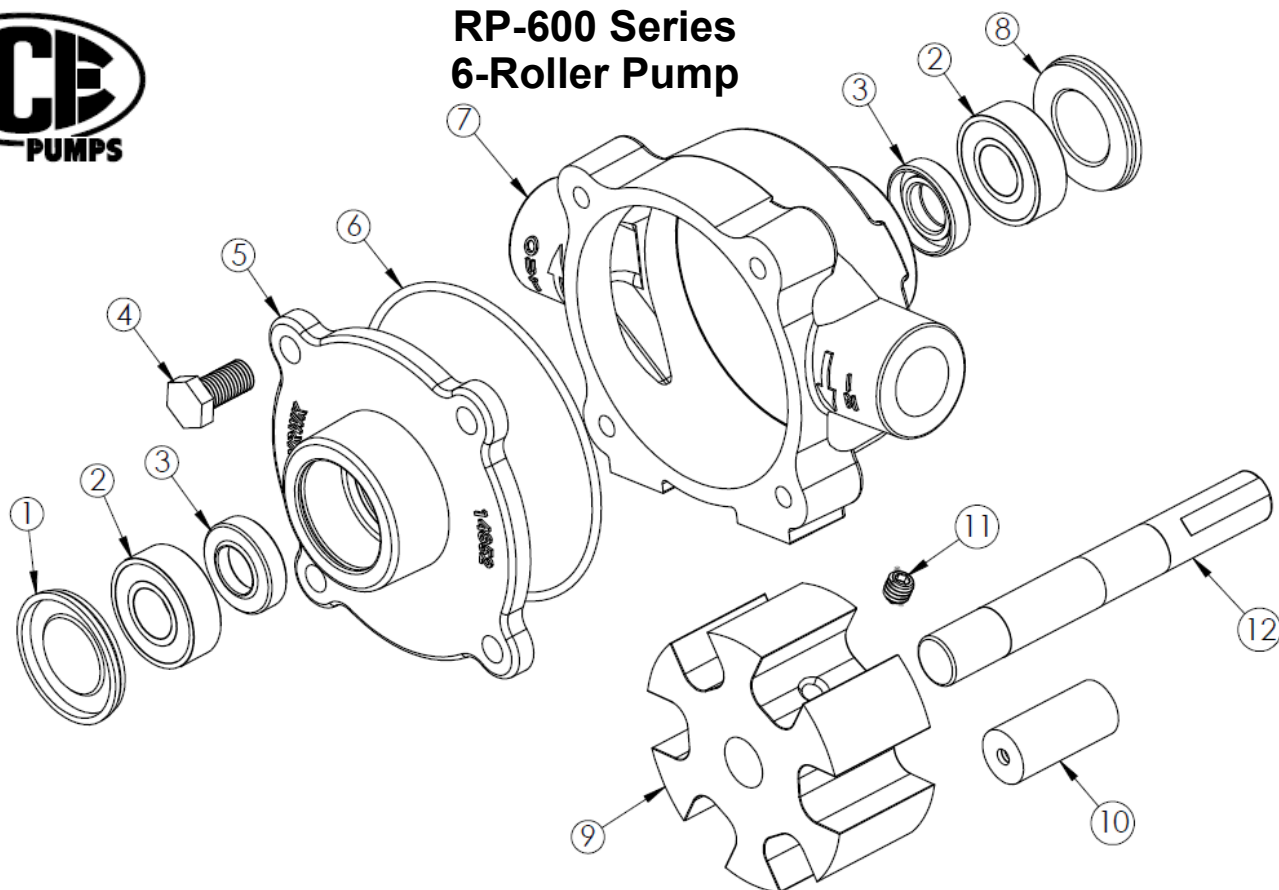
BASE PLATE

Part #	RP-BP6
EDP #	15205
Description	Base plate for gas engine mounting





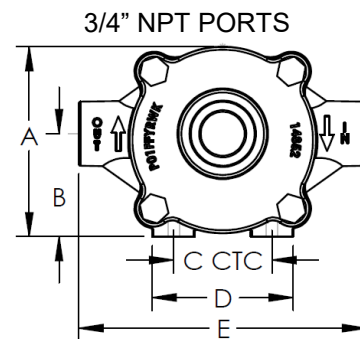
RP-600 Series 6-Roller Pump



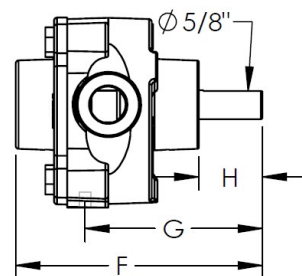
Parts List

Ref. #	Part #	EDP #	Description	Qty.
1	14863	14863	Dust Cap, Cover	1
2	14859	14859	Bearing, Sealed	2
3**	14858	14858	Seal, FKM	2
4	GE-60	42230	Cap Screw, 5/16" NF x 3/4"	4
5	14852	14852	End Plate, Cast Iron	1
6**	14861	14861	O-Ring, Body Seal	1
7	14851	14851	Body, Cast Iron	1
8	14864	14864	Dust Cap, Body	1
9	14853	14853	Rotor, Cast Iron (Includes Item 11)	1
10**	14804	14804	Roller	6
11	BAC-57	41180	Set Screw	1
12	14860	14860	Shaft, SS	1
**	RK-RP-600	14975	Repair Kit: Includes Seals, O-Ring & Rollers	-

DIMENSIONS



2 x 5/16"-18 UNC
MOUNTING HOLES



Ref.	A	B	C	D	E	F	G	H
Inches	4.10	2.22	2.12	3.04	6.20	5.32	3.82	1.37
MM	104.1	56.4	53.8	77.2	157.5	135.1	97.0	34.8

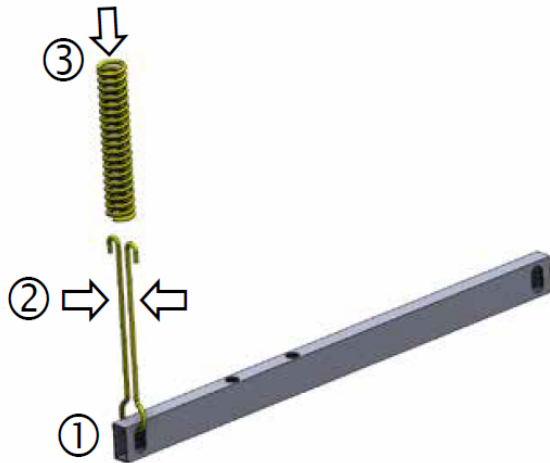
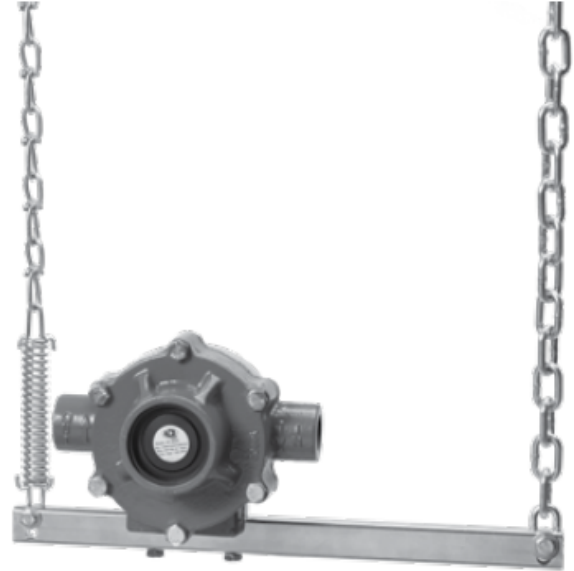
Ace Pump Corporation

www.AcePumps.com • Phone: 901-948-8514



Torque Bar Kit for Roller Pumps Model RP-TBK

Ace Pump's Torque Bar Kit is designed for use with Roller Pumps when connected to a tractor's PTO shaft. This kit may be used with any RP-600 or RP-800 pump. Ace's unique design provides safe operation by supporting the pump and carrying the PTO torque load. All steel construction ensures strength and durability.



1. Connect spring to bar:
 - a. Insert attachment clip through end slot closest to pump mounting holes.
 - b. Squeeze attachment clip ends together and hold.
 - c. Push clip completely through spring and release.
2. Repeat step 1 to connect light weight tensioning chain to opposite end of spring using the second attachment clip.
3. Attach heavy torque chain to opposite end of bar:
 - a. Place cap screw through attachment slot.
 - b. Then place heavy chain end, flat washer and lock nut on Bolt (in this order).
 - c. Tighten the lock nut to securely fasten chain to bar.
4. Attach pump to bar using two cap screws. Orient pump with outlet port facing spring and tighten to 15 ft-lbs. (20Nm).

INSTALLATION INSTRUCTIONS

Preferred installation: Mount the torque bar and pump assembly to the tractor with the chains going up providing support for the pump. The chains should be attached to the tractor vertically to avoid side loading or bending forces on the pump.

Mount the pump and torque bar assembly to the PTO shaft using an Ace Pump quick coupler BAC-10-RP6-QC or BAC-10-RP8-QC.

1. Attach the heavy torque chain to the tractor's frame with arm in horizontal position.
2. Attach the tensioning chain to the tractor's frame while applying tension to the spring.

Alternate installation: It is possible to mount the torque bar with the chain in the down position. For this orientation, Rotate the pump mounting 180°. Do not use the tension spring and double loop chain. Follow all other instructions.

1. Mount the pump and torque bar assembly to the PTO shaft using an Ace Pump quick coupler BAC-10-RP6-QC or BAC-10-RP8-QC.
2. Attach the torque chain to the tractor's frame with arm in horizontal position.

Warning:

Do not attach chains to movable linkages.

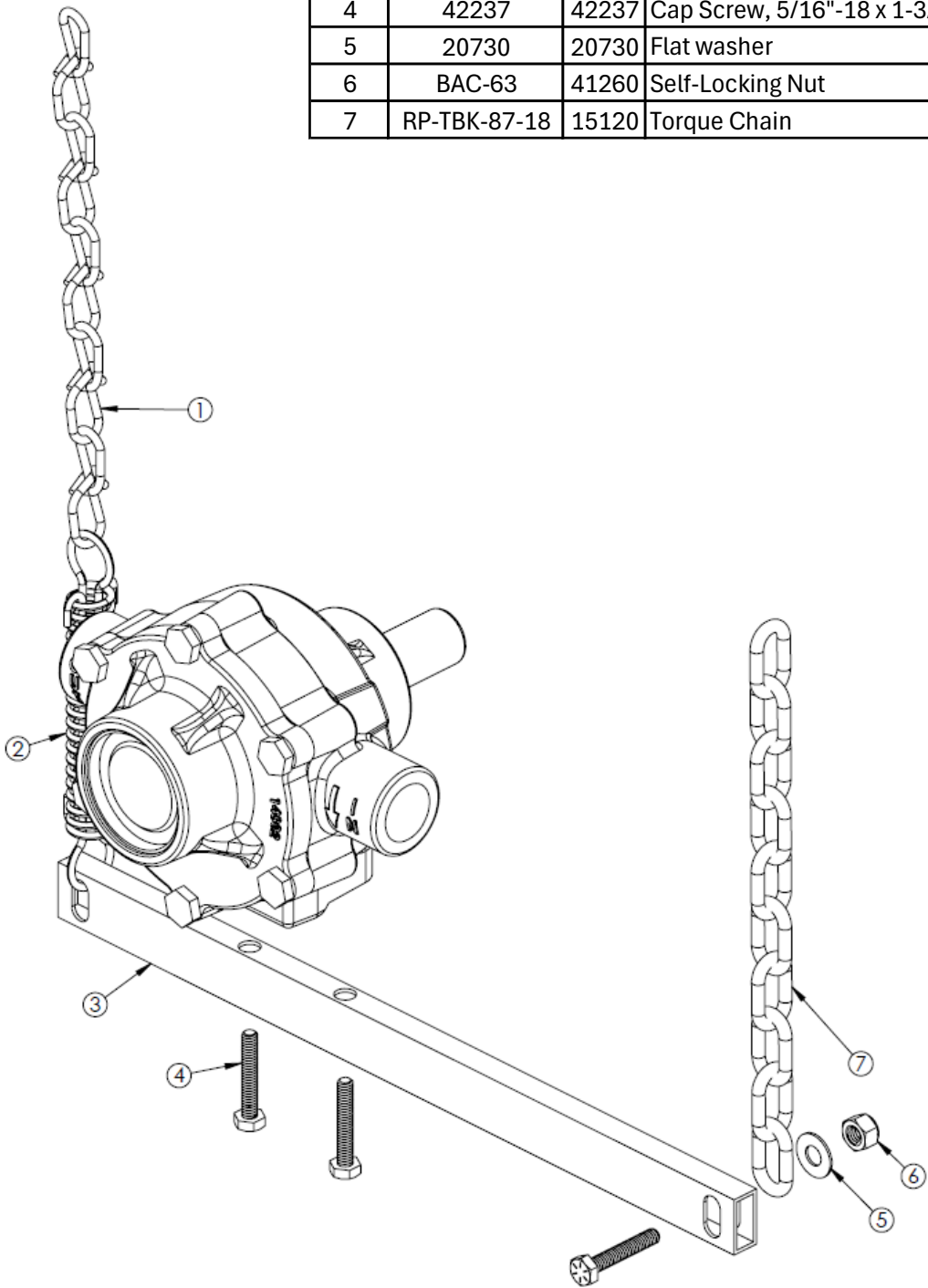
Never modify the tractor's PTO safety shield(s).

Do not operate the pump without the tractor's PTO safety shield(s) in place.



Parts List

Ref. #	Part #	EDP #	Description	Qty.
1	RP-TBK-87-20	15115	Chain, tensioning, double link	1
2	RP-TBK-5	15110	Drawbar Spring	1
3	RP-TPK-1	15105	Torque Bar	1
4	42237	42237	Cap Screw, 5/16"-18 x 1-3/8"	3
5	20730	20730	Flat washer	1
6	BAC-63	41260	Self-Locking Nut	1
7	RP-TBK-87-18	15120	Torque Chain	1





PTO Coupler for Roller Pumps Model BAC-10-RP

Ace Pump's PTO couplers are designed for use with Roller Pumps for connection to a tractor's PTO shaft. Die cast coupler is designed for use on standard 6 spline (540 RPM) and 21 spline (1000 RPM) tractor PTO shafts. The spring loaded design provides for quick connection and removal from the tractor.



Part #	BAC-10-RP6-QC
EDP #	14880
Description	For 6 Roller Pump

INSTALLATION INSTRUCTIONS

6 Roller Installation:

1. Slide the coupler over the pump shaft aligning the set screw with the flat on the shaft.
2. Lock the coupler in place with the set screw using an allen wrench.

OPERATION INSTRUCTIONS

The tractor should be parked with the engine off and parking brake engaged prior to installing the pump-coupler assembly.

NOTE: a torque bar and chain (Ace # RP-TBK) is also recommended to prevent rotation of the pump during operation.

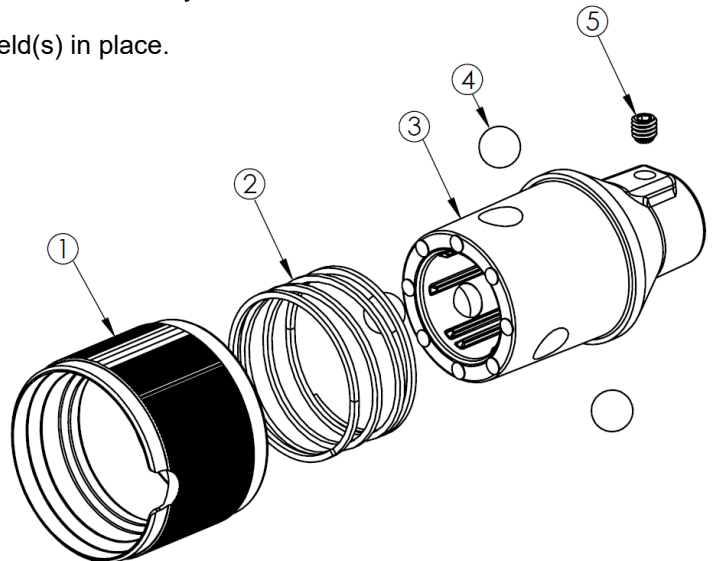
1. Align the pump-coupler assembly with the tractor PTO shaft.
2. Pull the orange collar back and start pushing the coupler on to the PTO shaft.
3. After the balls pass the shaft end, release the collar and continue pushing on to the shaft until balls engage the PTO shaft groove.
4. Ensure the balls are seated in the groove and the collar has returned to the original position by pulling on the assembly.
5. Ensure that all guards are in place prior to starting the tractor and pump.

Warning:

Ensure the coupler fits the shaft snugly and that the balls/sleeve lock it firmly to the shaft.
Never modify the tractor's PTO safety shield(s).
Do not operate the pump without the tractor's PTO safety shield(s) in place.

Parts List

Ref. #	Part #	EDP #	Description	Qty.
1	14902	14902	Ball Retainer Sleeve	1
2	14903	14903	Spring	1
3	14901	14901	Coupler Body, 5/8" Shaft	1
4	14904	14904	Ball, Quick Coupler	3
5	14905	14905	Set Screw, 5/16"-16	1



Roller Pump Operation & Maintenance

WARNING: Never pump corrosive or abrasive liquids as these will cause rapid wear or deterioration of the body, rotor, shaft and seals in the pump. The pump should be used on with liquids compatible with pump component materials. Never exceed maximum specified rpm and pressure. Never run pump dry. Failure to follow this warning will void the product warranty.

Priming the Pump:

To help prime the pump, keep the inlet or suction line as short as possible with a minimum of bends, elbows and kinks. Make sure all connections are tight and do not leak air. Make sure line strainer is free of debris. If pump does not self-prime, disconnect suction hose, fill with water and reconnect to liquid source. Often a squirt of oil into the ports of the pump will seal clearance and help priming.

Care of the Pump:

Proper care and maintenance will keep your pump wear at a minimum and will keep it running smoothly and trouble-free for a long time.

Flush the Pump After Each Use

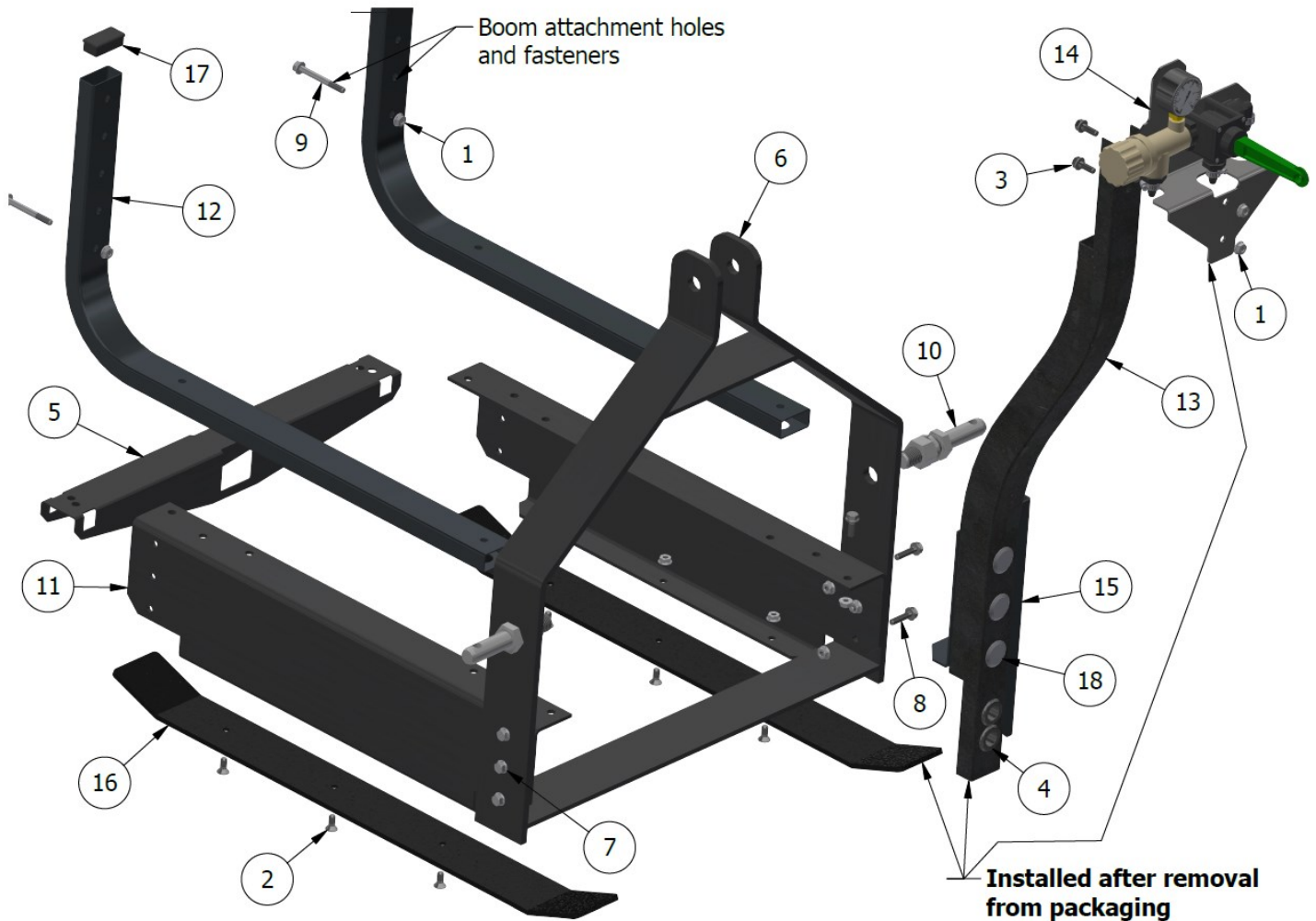
One of the common causes of faulty pump performance is “gumming” or corrosion inside the pump. This prevents rollers from moving freely in their rotor slots. Flush the pump with a solution that will neutralize liquid pumped, mix according to manufacturer’s directions.

To Prevent Corrosion:

After cleaning pump as above, flush it with a 50-50 solution of permanent-type automotive antifreeze (containing a rust inhibitor) and water. A rust inhibitor can also be squirted into the ports of the pump. Turn shaft several times to draw protective liquid through pump and coat entire inner surface. Drain pump and plug ports to keep out air during storage. For short periods of idleness, noncorrosive liquids may be left in the pump, but air must be kept out. Plug ports or seal port connections.

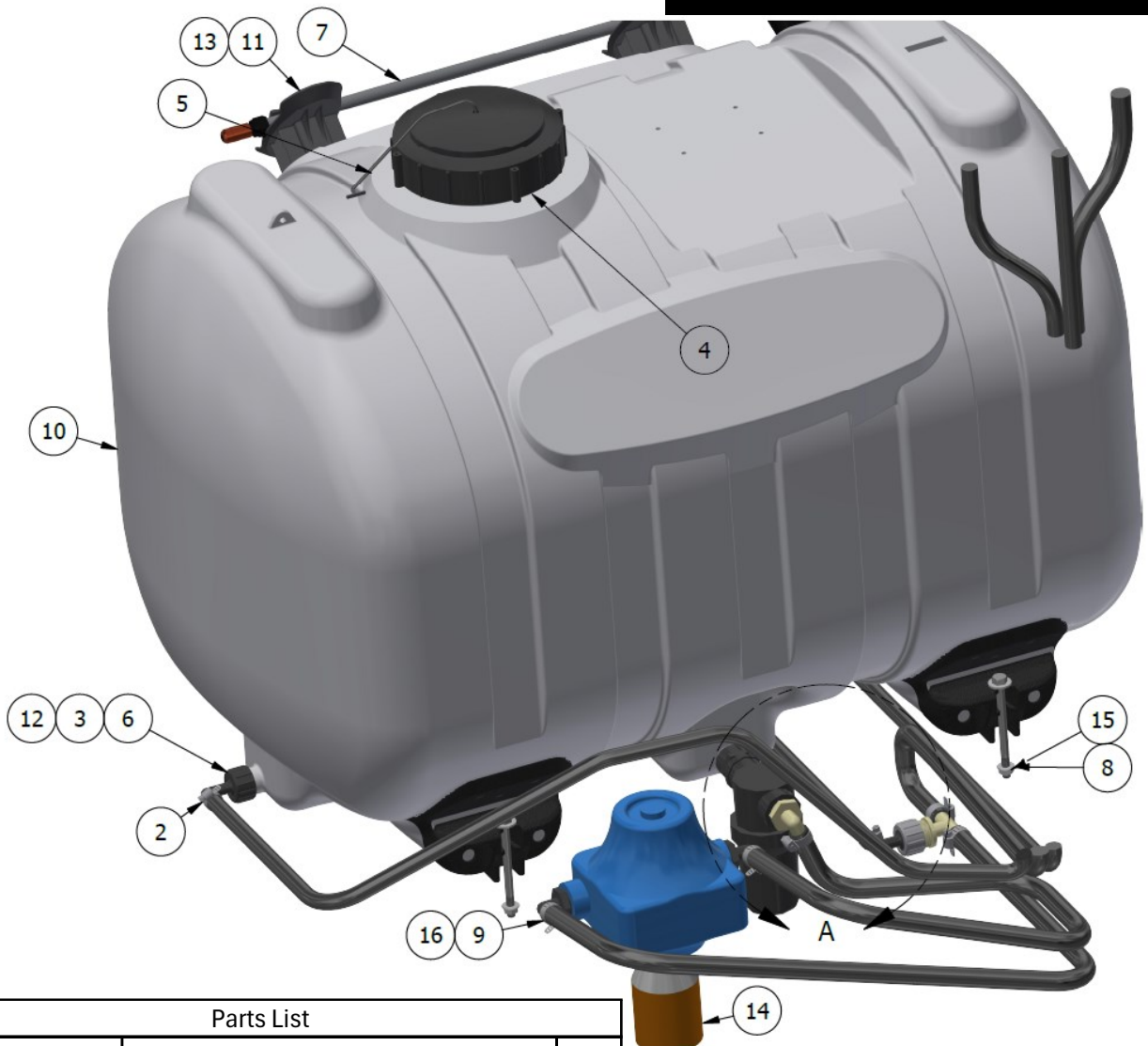
Troubleshooting		
Symptom	Probable Cause(s)	Corrective Action
Pump Does Not Prime	Leak in suction line	Check hose and fittings for leaks and correct
	Obstruction in suction line	Inspect hose for debris or loose inner liner in hose
	Suction strainer clogged	Clean strainer
	Suction hose sucked to bottom or side of tank	Cut a notch or "V" in end of suction hose
	Air lock in pump	Run pump with discharge hose removed to clear air lock
	Pump worn	Replace or repair pump
	Rollers stuck in pump	Disassemble pump and inspect rollers
	Pump seals worn, leaking air	Replace seals
Loss of Pressure	Clogged suction strainer	Check strainer and clean it regularly
	Kinked or blocked suction hose	Inspect suction hose and repair as necessary
	Air leak in inlet side plumbing	Check hose and connections for leaks Use pipe joint sealant and retighten connections
	Relief valve setting too low or weakened spring	Check relief valve and correct setting
	Faulty Gauge	Replace gauge
	Pump seals leak air	Replace seals
	Nozzle orifices worn	Replace nozzles
	Pump worn	Repair pump
Erratic Pressure Gauge Fluctuates Excessively	Suction line has air leak	Tighten all fittings and hoses between pump and tank
	Debris in valve or gauge	Remove and clean parts
	Kinked or blocked suction hose	Remove suction line and clean-check tank and strainer
	Air leak in suction hose	Tighten all fittings - replace hose if necessary
	Suction hose collapsed	Replace hose
	Pump is sucking air or air has not been evacuated from strainer	Make sure suction hose is tightly secured. Run pump with discharge hose removed to remove air lock from pump
Pump will not turn	Corrosion (rust), scale or residue	Loosen endplate bolts. Squirt oil into ports to help free rotor. Retighten bolts.
	Solid object lodged in pump.	Disassemble pump and remove objects
Pump Leaks	Worn out seal	Replace seal
Excessive Vibration or Noisy Pump	Loose coupler or damaged shaft	Inspect shaft and tighten coupler
	Excessive PTO or engine speed	Reduce PTO or engine speed
	Rotor or internal problem	Replace rotor or pump
	Partially clogged strainer	Clean strainer
	Air leak in suction hose	Inspect suction hose - replace if necessary
Pump Runs, but Low Pressure	Debris in suction line	Clear debris
	Hose kinked	Straighten or replace hose if necessary
	Worn rollers	Replace rollers
	Strainer clogged	Clean strainer
Pump Pressure Good, but Low Output Through Nozzles	Nozzle size may be too small or clogged	Clean nozzles - replace nozzles if necessary
	Inlet line too small or blocked	Clear blockage and if necessary replace hose
	By-pass open too much	Close slightly

3PT Frame Parts List



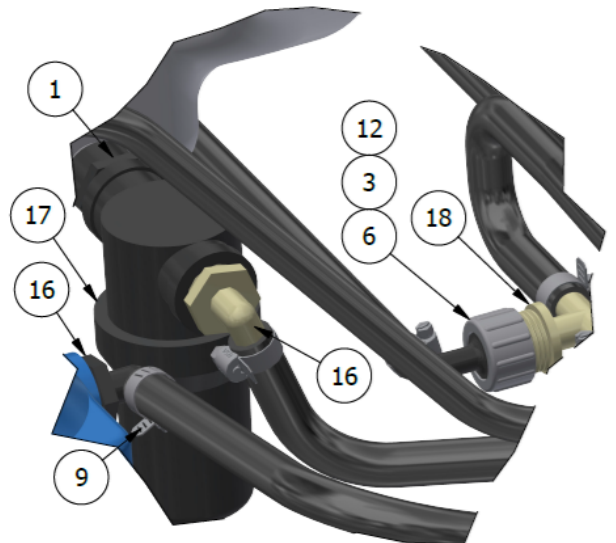
Parts List			
Item	Part #	Description	Qty.
1	G23-600172	5/16-18 Hex Flange Nut	24
2	G23-600188	5/16"-18 x 3/4 Flat HD Cap Screw	6
3	G23-600269	5/16-18 X 7/8" Flng Bolt	6
4	G23-600284	1/2" Hose Rubber Grommet	2
5	G23-640400	Front Support	1
6	G23-640518	Frame 2024	1
7	G23-640420	5/16"-18 x 1" Flng Bolt	4
8	G23-640421	5/16-18 x 1-1/4" Flng Cap Screw	2
9	G23-640423	5/16-18 x 2-3/4" Flng Cap Screw	2
10	G23-640425	CAT I Lower Link Pins	2
11	G23-640438	Side Panel	2
12	G23-640463	Boom Mount Tube	2
13	G23-640476	Valve Stand Tube	1
14	G23-640477	Valve Plate	1
15	G23-640478	Valve Stand Mounting Bracket	1
16	G23-640479	Skid Pad	2
17	G23-640485	Snap In Rect Plug, 2" x 1"	4
18	G23-640487	Snap In Round Plug, 1" Dia.	3

Tank & Pump Assembly & Parts List

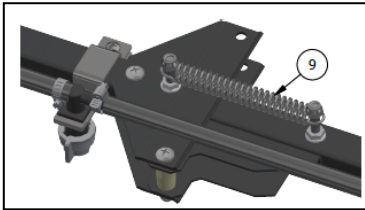


Parts List

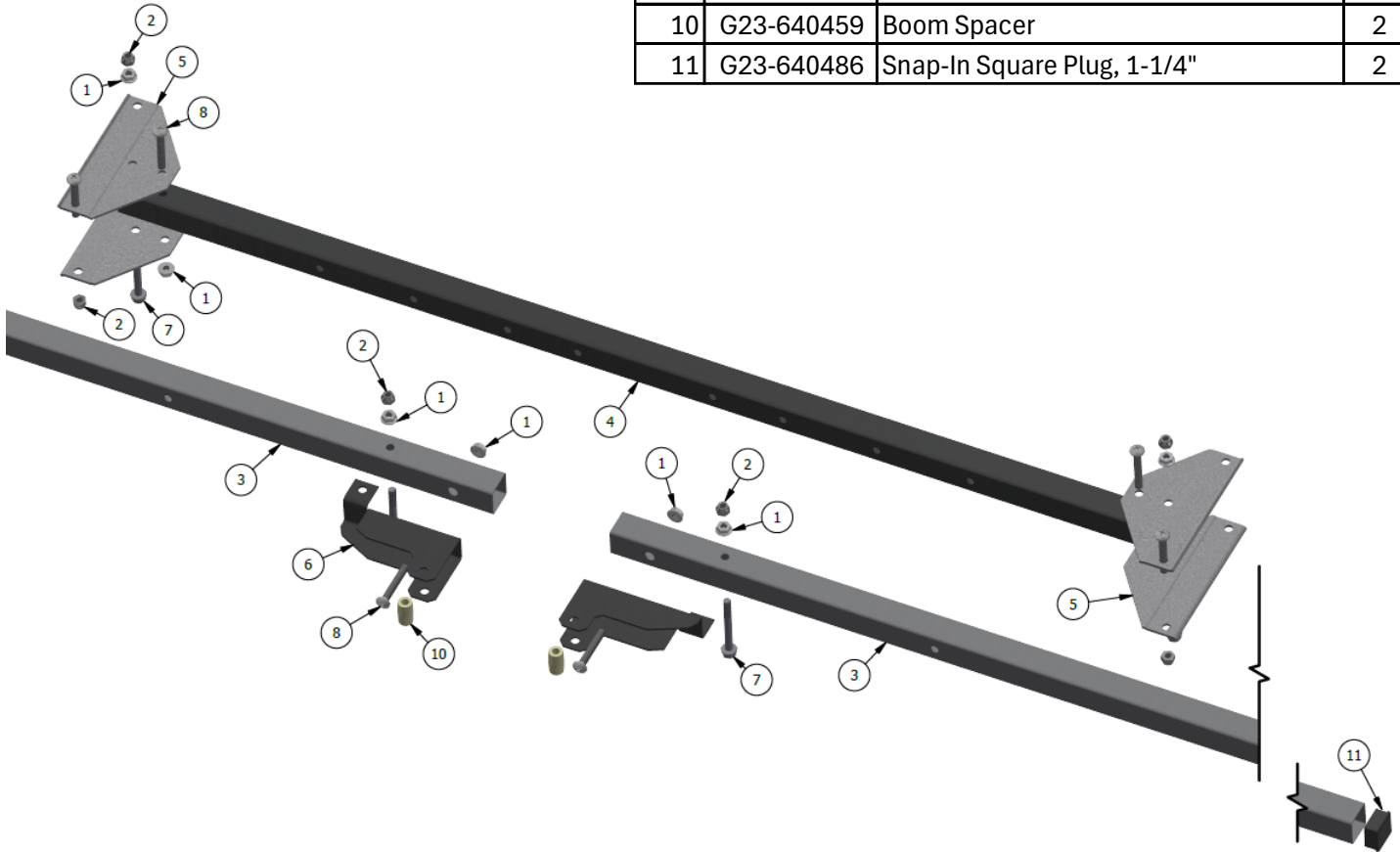
Item	Part #	Description	Qty.
1	G23-H3434P	Adapter, 3/4" NPT x 3/4" FGHT	1
2	5051144	Hose Clamp, 3/8"	2
3	G23-600124	Garden Hose Washer	3
4	G23-600133	Tank Lid	1
5	G23-600134	Tank Lid Tether	1
6	G23-600139	Swivel Nut, 3/4" FGHT	2
7	G23-600147	Deluxe Hand Wand, 18"	1
8	G23-600172	5/16-18 Hex Flange Nut	24
9	5051114	Hose Clamp, 1/2"	5
10	G23-640000	60 Gallon Tank	1
11	G23-640105	Plastic Hose Wrap	2
12	G23-640448	Flat Seat Swivel, 3/8" Elbow HB	2
13	G23-640458	10-24 x 1/2" PH Screw	6
14	G23-640484	Roller Pump Kit	1
15	G23-640488	5/16-18 x 4" Hex Bolt	4
16	G23-EL3412P	Threaded Elbow, 3/4" x 1/2"	3
17	LS07540	Y Line Strainer	1
18	MT3412G	Tee Adapter, 3/4" MGHT x 1/2" HB	1



Boom Assembly & Parts List



Parts List			
Item	Part #	Description	Qty.
1	G23-600172	5/16-18 Hex Flange Nut	10
2	G23-620106	5/16-18 Hex Lock Nut	6
3	G23-640413	7-Nozzle Boom Arm	2
4	G23-640414	45" Center Boom Section	1
5	G23-640416	Boom Center Bracket	4
6	G23-640417	Boom Arm Bracket	2
7	G23-640423	5/16-18 x 2-3/4" Flng Cap Screw	6
8	G23-640426	5/16-18 x 2" PH Screw	6
9	G23-640428	Spring	2
10	G23-640459	Boom Spacer	2
11	G23-640486	Snap-In Square Plug, 1-1/4"	2

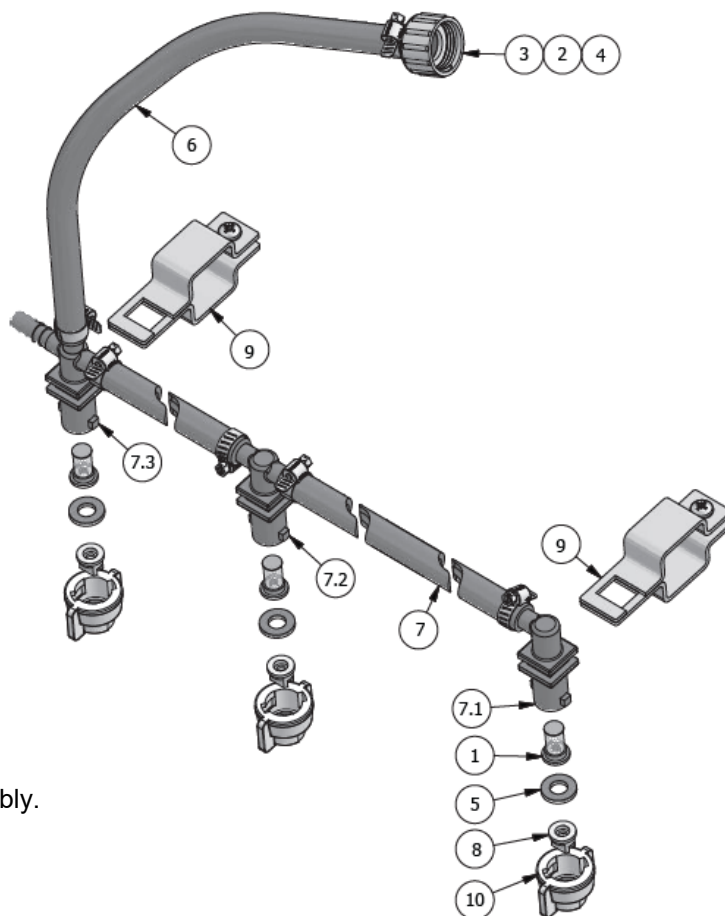


Assembly Instructions

- 1.0 Install Boom Arm Brackets to Boom End Sections using hex bolts, screws and nuts, as shown. Note the orientation and position of these parts as it is essential for proper assembly.
- 1.1 Install (2) Boom Center Brackets to each end of the Center Boom Section using screws as shown.
- 1.2 Install the Boom Hinge Bolts through the Boom Center Brackets and the Boom End Brackets, as shown in the close up detailed view. Secure in place with the Lock Nuts. Making sure not to overtighten, so boom can rotate freely.
- 1.3 Install the Boom Springs over the (2) bolts as shown in the detailed view.
- 1.4 Install the Lock Nuts onto the bolts to secure the Boom Springs in place, as shown in the detailed view.
- 1.5 Install (2) Boom Adapter Brackets to Center Boom Section, as illustrated with bolts and nuts.
- 1.6 Install completed boom assembly to Hitch Mount Brackets in desired location.

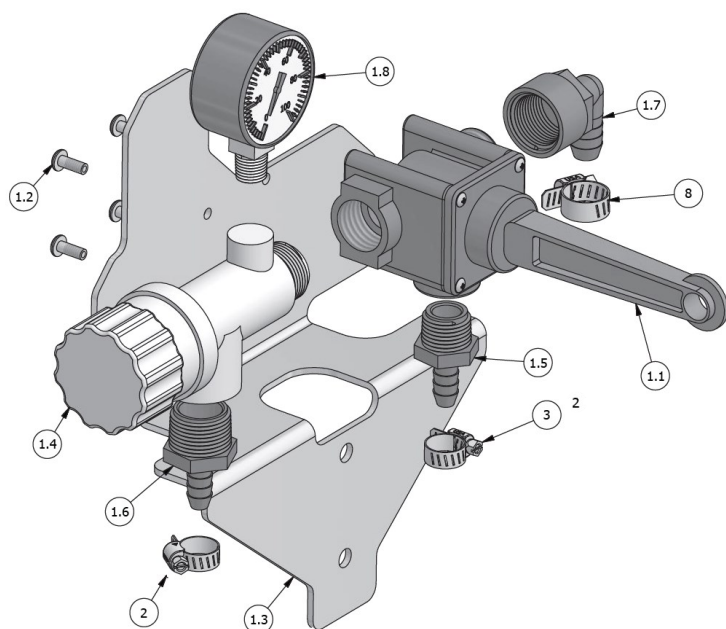
Nozzle Harness Assembly & Parts List

Parts List			
Item	Part #	Description	Qty.
1	G23-600117	Tip Strainer, 50 Mesh Screen	7
2	G23-600124	Garden Hose Washer	1
3	G23-600139	Swivel Nut, 3/4" FGHT	1
4	G23-640448	Flat Seat Swivel, 3/8" Elbow HB	1
5	G23-600276	Rubber Washer	7
6	G23-600302	3/8" x 60" Feeder Hose	1
7	G23-640494	7-Nozzle Harness Assembly	1
7.1	G23-640491	3/8" Nozzle Body Elbow	2
7.2	G23-640492	3/8" Nozzle Body Tee	4
7.3	G23-640498	3/8" Nozzle Body Cross	1
7.4	5051144	Hose Clamp, 3/8"	12
7.5	5020531	Hose, 3/8" - 1Brd x 19-3/8"	6
8	G23-640432	Flat Fan Spray Tip	7
9	G23-640496	Boom Clamp, 1-1/4"	7
10	G23-640497	Bayonet Cap	7



Boom Hose Assembly Instructions

- 2.0 Install Boom Clamps on to the Spray Boom Assembly.
(Note: Clamps should be spaced 20" a part).
- 2.1 Install Nozzle Body Fittings in Boom Clamps.
- 2.2 Insert Check Valves into the Nozzle Body Fittings.
- 2.3 Insert Spray Tip into Bonnet Caps, then install rubber washer and install on to Nozzle Body Fittings.
- 2.4 Install Hose Assembly on to valve assembly.



Valve Assembly Detail & Parts List

Parts List			
Item	Part #	Description	Qty.
1	G23-640500	Roller Valve Sub-Assembly	1
1.1	G23-2750	Shut Off Valve	1
1.2	G23-640458	10-24 x 1/2" PH Screw	4
1.3	G23-640477	Valve Plate	1
1.4	G23-640483	Pressure Relief Valve, 3/4"	1
1.5	G23-A1238P	P Fitting	1
1.6	G23-A3438P	Adapter, 3/4" NPT x 3/8" HB	1
1.7	G23-EL3412FP	90° Elbow, 3/4" FNPT x 1/2" HB	1
1.8	G23-LG100	Liquid Filled Gauge	1
2	G23-600120	Hose Clamp, 3/8"	14
3	G23-600288	Hose Clamp, 1/2"	1

Warranty

LIMITED WARRANTY FOR NEW WORKHORSE SPRAYERS EQUIPMENT

WHO MAY USE THIS LIMITED WARRANTY. This limited warranty (the "Limited Warranty") is provided by Workhorse Sprayers to the original purchaser ("you") of the Equipment (as defined below) from Workhorse Sprayers or one of Workhorse Sprayers' authorized dealers. This Limited Warranty does not apply to any subsequent owner or other transferee of the Equipment. THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

WHAT THIS LIMITED WARRANTY COVERS AND FOR HOW LONG. Workhorse Sprayers warrants that any new Equipment will be free from defects in material and workmanship for a period of **one (1) year** for homeowner and **90 days** commercial user, after delivery of the Equipment to you (the "Warranty Period"). The Warranty Period is not extended if Workhorse Sprayers repairs or replaces the Equipment.

WHAT IS NOT COVERED BY THIS LIMITED WARRANTY. This Limited Warranty does not apply to: (1) used Equipment; (2) any Equipment that has been altered, changed, repaired or treated since its delivery to you, other than by Workhorse Sprayers or its authorized dealers; (3) damage or depreciation due to normal wear and tear; (4) defects or damage due to failure to follow Workhorse Sprayers' operator's manual, specifications or other written instructions, or improper storage, operation, maintenance, application or installation of parts; (5) defects or damage due to misuse, accident or neglect, "acts of God" or other events beyond Workhorse Sprayers' reasonable control; (6) accessories, attachments, tools or parts that were not manufactured by Workhorse Sprayers, whether or not sold or operated with the Equipment; or (7) rubber parts, such as tires, hoses and grommets.

HOW TO OBTAIN WARRANTY SERVICE. To obtain warranty service under this Limited Warranty, you must (1) provide written notice to Workhorse Sprayers of the defect during the Warranty Period and within **thirty (30)** days after the defect becomes apparent or the repair becomes necessary, at the following address: Workhorse Sprayers, PO Box 1700, North Sioux City, SD 57049; and (2) make the Equipment available to Workhorse Sprayers or an authorized dealer within a reasonable period of time.

For more information about this Limited Warranty, please call: **888-433-6631**.

WHAT REMEDIES ARE AVAILABLE UNDER THIS LIMITED WARRANTY. If the conditions set forth above are fulfilled and the Equipment or any part thereof is found to be defective, Workhorse Sprayers shall, at its own cost, and at its option, either repair or replace the defective Equipment or part. Workhorse Sprayers will pay for shipping and handling fees to return the repaired or replacement Equipment or part to you.

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