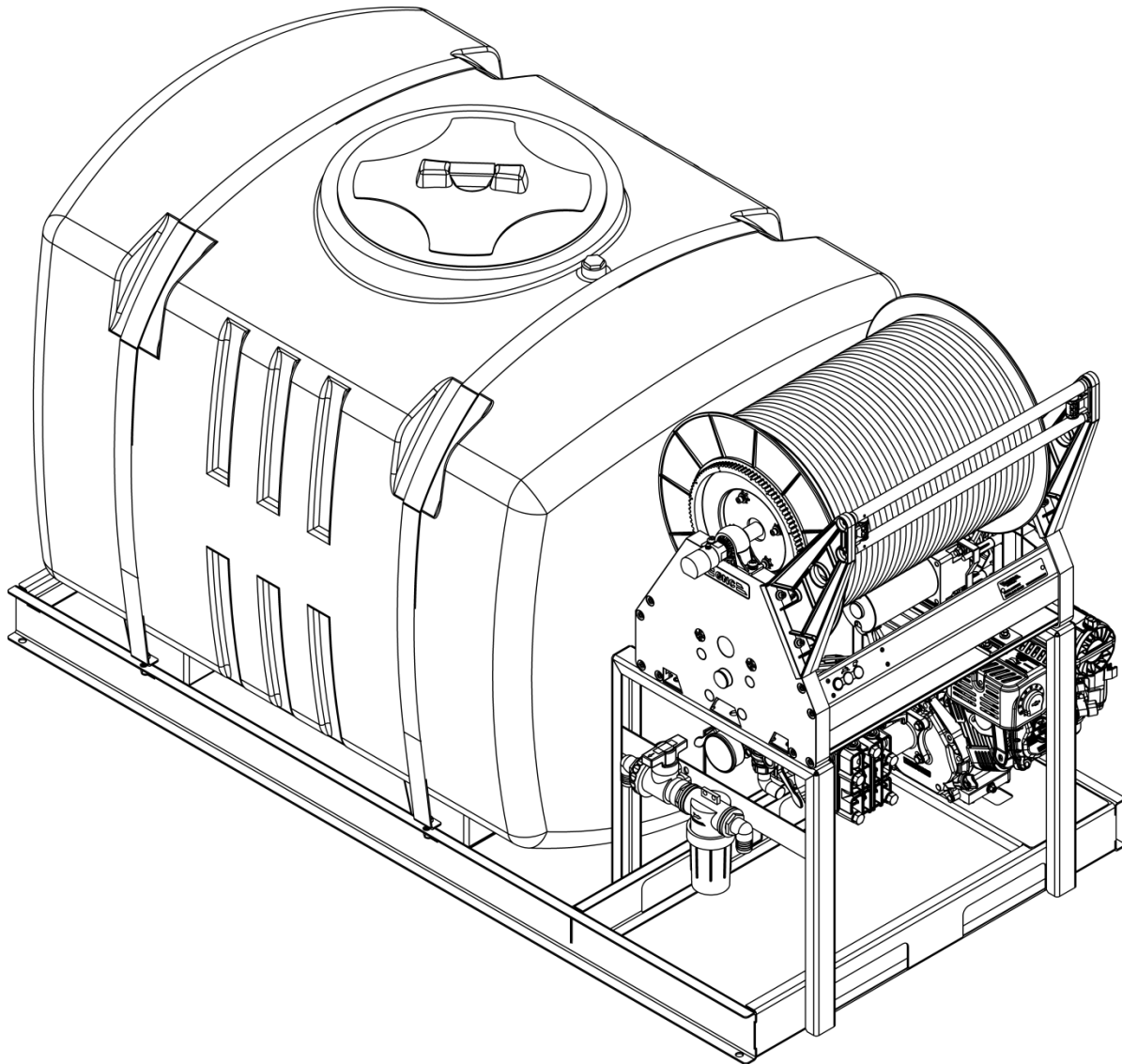


ELSPRAYERS

100 and 200



Owner's Manual
Revision Date: 9/8/2021
Serial #: ≤18104

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FORWARD

ELS sprayers are reliable spray equipment designed for the entry level professional pest, lawn & turf grass managers. This manual provides the operating and maintenance instructions necessary to keep your sprayer operating efficiency. If properly operated and maintained, your sprayer can provide years of dependable service.

NOTE: The engine and reel manufacturers are responsible for issues with regarding their performance, power rating, specifications, warranty and service. Please refer to the appropriate manufacturer's owners/operator's manual, packed separately with your unit, for more information.

SAFETY PRECAUTIONS

A. General

1. No one should operate or maintain this sprayer who has not read this manual.
2. Keep adults, children and pets away from the sprayer and the area to be sprayed.
3. If truck or trailer mounted, make certain the sprayer is properly secured.
4. When spraying chemicals:
 - a. ALWAYS FOLLOW THE DIRECTIONS ON THE LABEL.
 - b. Avoid breathing vapors.
 - c. Avoid contact with the skin, eyes and clothing.
 - d. Wear rubber boots or rubberized shoes.
 - e. Wear work clothes with long-sleeved shirts and long-legged pants.
 - f. Change to clean clothing daily.
 - g. Wash hands and face before eating or smoking.
 - h. Bathe thoroughly as soon after spraying as possible.
5. Wear a face shield and rubber gloves when handling concentrates.
6. Do NOT remove any shields, guards or safety devices from the sprayer. If a shield, guard or safety device is damaged or does not function, repair or replace it before operating the sprayer.
9. To prevent hand or arm injury, always pull engine starter cord rapidly to avoid kickback.
10. Never run a gasoline engine indoors without adequate ventilation. Exhaust fumes are deadly.
11. To avoid serious burns, do NOT touch a gasoline engine, the exhaust pipe or muffler while the engine is running or until it has cooled after it has been shut off.

C. Related to Batteries

1. The electrolyte in a lead-acid battery is dilute sulfuric acid which is a very dangerous and corrosive liquid. Always wear safety glasses or goggles and rubber gloves when working on a lead-acid battery.
2. Do not overfill a lead-acid battery when filling the cells with distilled water.
3. Lead-acid batteries generate hydrogen and oxygen gases which form an explosive mixture. Keep sparks and flames away at all times.

B. Related to Gasoline or Engines

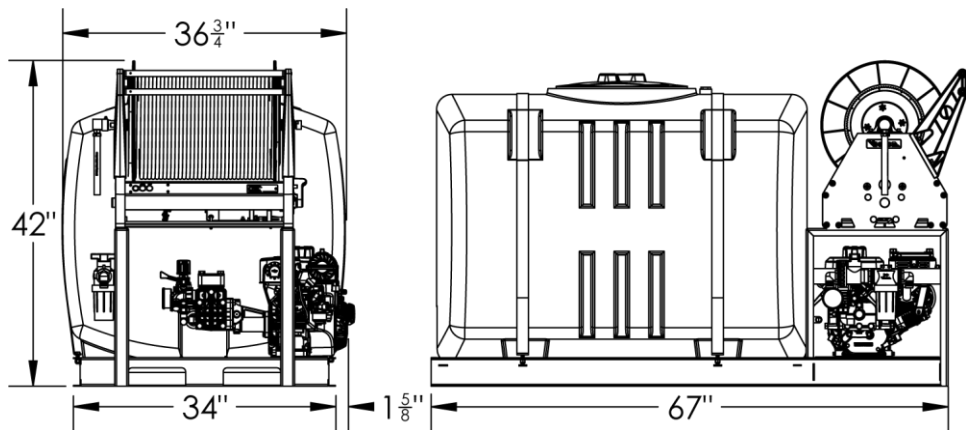
1. GASOLINE IS HIGHLY FLAMMABLE -RESPECT IT!
2. Do NOT smoke or permit others to smoke while handling gasoline.
3. Always use approved containers for gasoline.
4. Always shut off a gasoline engine and permit it to cool before removing the cap of the fuel tank.
5. Always fill the fuel tank outdoors.
6. If the fuel container spout will not fit INSIDE the fuel tank opening, use a funnel.
7. When filling the fuel tank, stop when the gasoline reaches ½" from the top. This space must be left for expansion. DO NOT OVERFILL!
8. Wipe up any spilled gasoline.

SPECIFICATIONS

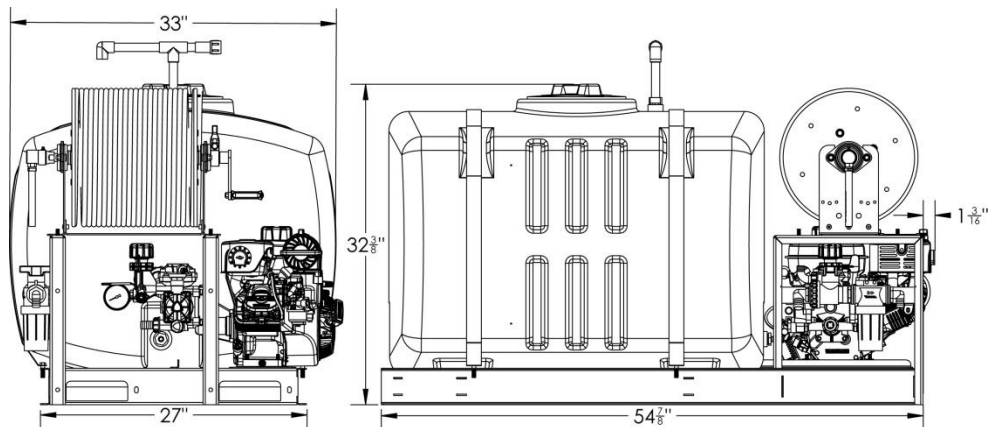
	100 Gallon	200 Gallon
Frame	Stainless Steel	Stainless Steel
Engine	Vanguard 160	Vanguard 160
Pump Model #/Mfr	AR 252/Annovi Reverberi	Kappa 25/Udor
Max GPM	5	7.0
Max psi	362	350
Hose Reel #/Mfr	HA-1020-14-16/Hannay	52-180-E00/GNC Industries
Pump Oil Amount/Type	13oz/SAE 30W Non-Detergent	12oz/SAE 30W Non-Detergent
Pump Gear Box Oil Type	90W Gear Lube	90W Gear Lube
Hose Size	200'x $\frac{3}{8}$ "	300'x $\frac{1}{2}$ "
Agitation	Jet	Jet
Strainer Mesh	20	20

DIMENSIONS

200 Gallon



100 Gallon



OPERATING INSTRUCTIONS

A. SET-UP

1. General

Check all the bolts on the sprayer for tightness. Make certain all hose clamps are tight. Check that the tank straps are tight. Check all fluid levels. If applicable, check that electrical connections are sound on electric sprayers and electric reels.

NOTE: If using an electric reel and connecting it to the truck battery, a good/clean ground is required from the sprayer to the truck frame.

2. Install Spray Gun

A commercial Mag-1 spray-gun is installed on your sprayer. The end of your hose is equipped with a ½” male NPT fitting. If changing out the spray gun, use a sealant tape and make 2-3 rounds on the fitting threads. Install the gun grip on the hose fitting by turning the gun clockwise until it is secure. Do not over tighten.

3. Installation in Vehicle

Once the sprayer is in the desired position in your van or pickup truck, it should be securely bolted through the truck bed to the vehicle's frame. Bolts should be used at each corner of the sprayer's frame and should have cap screws placed through the holes punched in the frame for this purpose. Bolts of at least ¾” diameter should be used. Mounting hardware is not supplied for the sprayer because the installation will vary.

4. Wiring Electric Hose Reel (200 Gallon)

The following instructions are for providing electrical power to electrical hose reel if your sprayer is so equipped. The vehicle's or sprayer's battery should be a 12-Volt DC automotive-type.

- Using the provided wiring harness, connect the red wire to a +12V power source. If it is necessary to shorten this wiring harness, a 40 amp fuse must be installed at the battery connection.
- Connect ground wire to the common ground of the source. This is typically the vehicle frame or negative battery terminal.
- Connect wiring harness to microcontroller plug.



B. Operation


1. Sprayer Start Up

- Check the level of the oil in the pump. (See pump manual for specifications)
- Clean the in-line suction strainer, if it is dirty.
- Fill the tank one third full with clean water.
- Set pressure regulator to pressure release.

e. Start Engine

- Pull the throttle and choke levelers fully back as seen in the picture above. Please note a warm engine may not require choking.



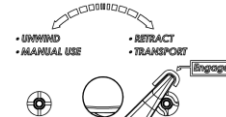
- Grasp the recoil grip and pull until the starter engages. If it is hard to pull, confirm pressure regulator is in the pressure release position.
- Once engine starts slowly move choke lever to the off position 

NOTES: Sprayers are NOT shipped with gas in the engine. Refer engine owner's manual for further engine information and maintenance.

- Engage the spray gun and spray back into the tank for approximately one minute to remove any air from the system.
- Check the flow rate out of the application device with a calibrated container. (See Calibration)
- Adjust the flow rate by adjusting the pressure regulator. When the flow rate is correct, it should stay set until something in the system is changed.
- A slight increase in pressure is normal when the application device is turned off. This will vary according to the length and diameter of the hose used.

2. Operating GNC Hose Reel

Prior to pulling hose out, set side lever to "UNWIND". Pull out the hose as needed. When it is time to power wind the hose, switch lever to "RETRACT". Turn hose reel on and press either slow or fast rewind operation. Once hose has been rewound **TURN HOSE REEL OFF!**



3. Calibration

Hand Spraying

There are two steps to properly calibration your sprayer. First is knowing the current flow rate out the spray gun nozzle. Secondly is knowing your walking/spraying pace. That is the time it consistently takes you to spray an even application of product on each 1000 sq. ft. area.

Our example is based on the most common 2 gallon per minute (GPM) flow rate.

Step 1, set up your sprayer to spray two gallons per minute (GPM) out the nozzle. To do this, you need a graduated container. Fill the sprayer tank one third full with clean water and start it up. Engage the spray gun and spray into the graduated container for one minute. Check how much water you collected. To adjust the flow rate, use your pressure regulator, until you can collect two gallons in one minute. (Make sure nozzle is rated within your pump spec) If you do not have a graduated container, use the weight base system. First weigh your bucket. Next, spray in to a bucket until you have collected ≈ 16.5 pounds.

The next step is to determine how long it takes you to evenly spray 1000 sq. ft.. Measure an area 20 ft. x 50 ft. on a paved surface. Spray the area evenly with clean water. Time your application. After the water evaporates, spray the area again. Repeat this several times until you are constantly walking the area in one minute. Spraying on asphalts or concrete will permit you to see the pattern you are applying and will give you a better conception of even application.

Once you have trained your applicator to walk 1,000 square feet per minute and your truck is calibrated to spray two gallons per minute, your spray volume is two gallons per 1,000 square feet based on walking speed and nozzle output.

*****READ YOUR CHEMICAL LABEL*****

Example: the herbicide label says to apply two ounces of product per 1,000 square feet. It is important to notice that the label does not state the amount of product to add per gallon of water. Therefore, before adding anything to the tank we must first determine how many square feet we can spray with our tank. Assume that you have a truck with a 100-gallon tank and an output of two gallons per 1000 square feet. How many square feet will the tank cover if the pump is calibrated to deliver two gallons of water per 1000 sq. ft. feet? The answer is 50,000 square feet:

$$\text{Total ft}^2 \text{ covered by spray tank} = \frac{100 \text{ gal tank}}{2 \text{ gallon}} \times 1,000 \text{ sq. ft.}$$

Adding product to the tank:

Because the chemical label requires X ounces of product to be applied per 1,000 square feet, you'll need to figure out just how many 1,000 square-foot areas exist within your larger 50,000-square-foot area. The answer is 50 (50,000 square feet divided by 1,000 square feet). For our example, two ounces of product are needed per 1000 square-foot area. Since you have 50 of those 1000-square-foot areas, you will need to mix 100 ounces of product (multiply 50 by two ounces) with your 100 gallons of water.

In case you think you'll get tired measuring all 100 ounces by hand, just divide those 100 ounces by 128 ounces (there are 128 ounces in 1 gallon), and you'll come up with about ¾ of a gallons of chemical as the proper mix for 100 gallons of water. Understanding how we arrived at the final number allows us to use this formula to calculate how many gallons of product are needed based on tank size, gallons of water per thousand square feet, and labeled rate.

$$\text{Ounces of Product} = \frac{\text{Tank Size(gal)}}{\text{Calibration rate (GPM)}} \times \text{Labe rate (per 1,000ft}^2\text{)}$$

In reading the instructions for application rates on most chemical containers, you'll note that suggested rates vary significantly. Experience and professional recommendations will help you determine the proper rate for your situation.

CAUTION: AVOID ACCIDENTS!

FOR SAFETY, READ THE ENTIRE PRODUCT LABEL INCLUDING PRECAUTIONARY STATEMENTS, USE ALL PRODUCTS ONLY AS DIRECTED.

4. Stop Sprayer

- Stop Engine by pushing the throttle lever forward to the stop position. This will also shut off the fuel.



- Turn the pressure release knob to release the pressure

5. Clean Sprayer

After use, flush the sprayer tank, and the entire system, pump, plumbing, hose and gun, wand or boom with Nutra-Sol or some comparable cleaner to neutralize chemicals and reduce pump problems. Follow the instructions on the label. Extra cleaning care should be taken after spraying herbicides to prevent possible damage to turf or plants when next spraying insecticides or fungicides. After the sprayer has been flushed, clean the in-line strainer. Hose off the outside of the sprayer to wash off dust and dirt. Do NOT spray water on the motor if it is hot.

Maintenance

A. Engine Maintenance Schedule

See Operating and Maintenance Instructions furnished with the sprayer for full details.

Daily: Check the gasoline level. Check the engine oil level.

After the First 5 Hours: Change the engine oil

Every 50 Hours: Change the engine oil.

Note: Change the oil every 25 hours if the engine is operated under heavy load or in high ambient temperatures.

B. Pump

The procedures that are required are listed in the pump Installation/Operation Instructions furnished with the sprayer.

		1 st Use	Each Use	1 st month or 40hrs	Every 3 month or 500hrs	Every 6 month or 1000hrs
Crankcase Oil	Check Level	X	X			
	Replace			X	X	
Gearbox Oil	Check Level	X	X			
	Replace			X	X	
Pulsation Dampener	Set of 20% of work psi	X				
	Check			X	X	
Diaphragms	Replace				X	
	Check				X	
Valves	Replace					X
	Check				X	
O-rings	Check				X	
	Replace					X

C. Tank

The sprayer tank requires no scheduled maintenance. The inside of the tank should be flushed out after each use as described in the section on cleaning the Sprayer. The outside of the tank should be hosed off after use and scrubbed occasionally with soapy water to remove ground-in dirt.

D. In-Line Strainer

The in-line strainer should be cleaned each day after the sprayer has been flushed.



1. Clean Strainer:

- a. Place an empty container under the strainer bowl to catch the liquid and unscrew the bowl.
- b. Turn off ball valve
- c. Unscrew strainer bowl. **NOTE:** There is a gasket seal between the top lip of the bowl and the strainer body. **DO NOT LOSE THIS GASKET!**
- d. Check the gasket for any damage. A damaged gasket will keep the pump from priming. Note: The gasket must be reinstalled or you will NOT be able to operate your sprayer.
- e. Dump contents of bowl and rinse with fresh water
- f. Remove and rinse metal strainer with fresh water

- g. Place gasket back in the grove of the bottom bowl and coat with a very thin layer of petroleum jelly.
- h. Reinstall strainer in bowl & screw bowl to the strainer top and hand tighten..
- i. Turn valve on

E. Hose

If the hose on your sprayer is treated carefully, it will give long and trouble free service. When you have finished spraying, carry the application device and drag the hose back to the sprayer. This protects the application device from being damaged. It eases the load on your reel because the hose will be rewound from only half the distance. The hose should be flushed out daily as described in the section on Cleaning the Sprayer. Weekly clean the outside cover of the hose by rewinding it onto the reel while gripping lightly with a rag dipped in soapy water.

F. Storage And Winterizing

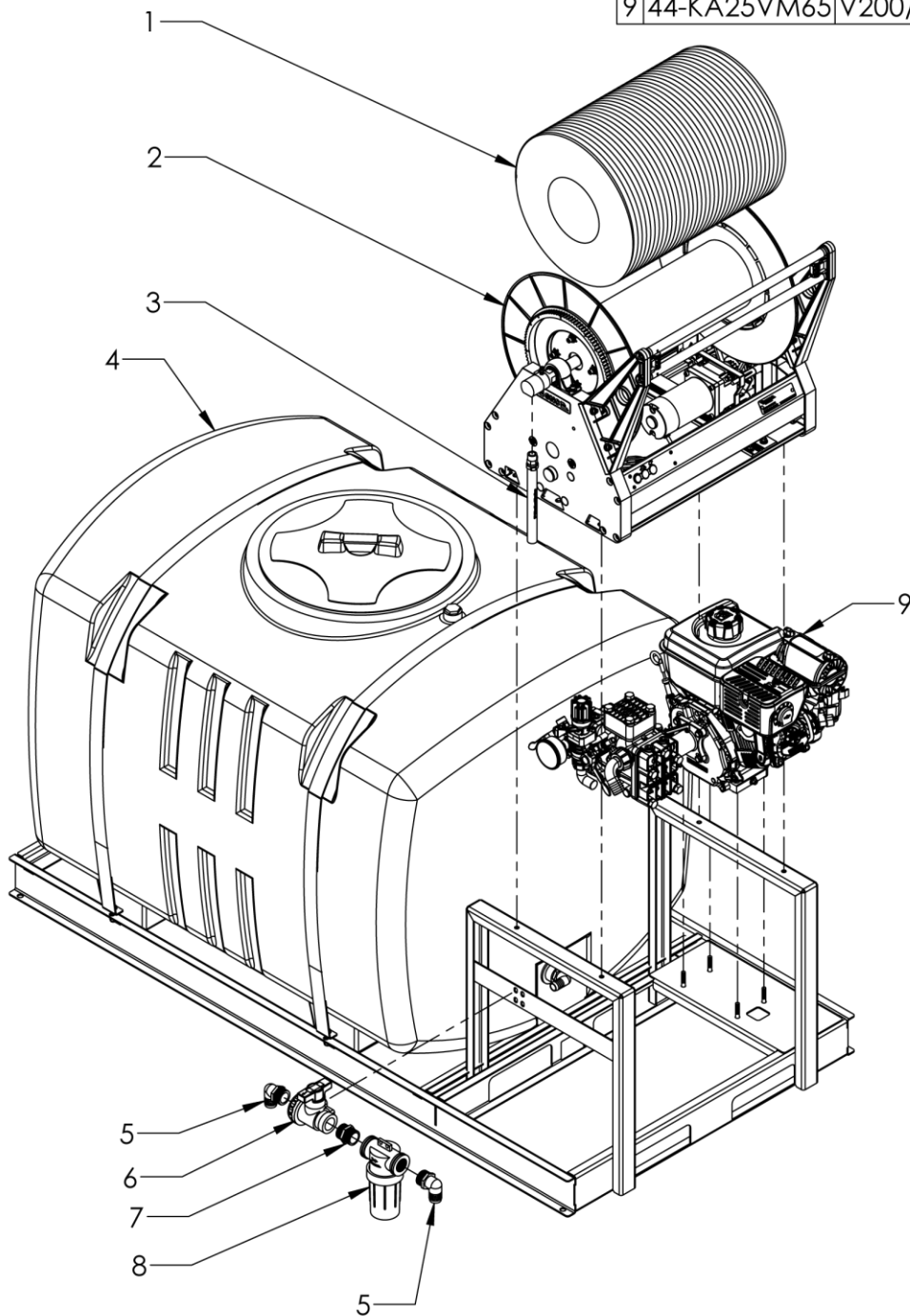
If the sprayer will not be used for 30 days or more, it should be thoroughly flushed out and cleaned as described in the section on Cleaning the Sprayer. The engine should be drained of fuel to prevent gum deposits from forming. First, the fuel tank should be drained and then the engine should be started and allowed to run until it stops from lack of fuel. While the engine is still warm, the oil should be drained from the crankcase and then refilled with new oil. The spark plug should be removed, a teaspoon of oil poured into the cylinder, the engine cranked slowly to distribute the oil and the spark plug replaced. The blower housing should be removed and any dirt should be cleaned from the engine's cooling fins. Please see your pump and engine manual for full maintenance requirements. The sprayer should be stored in a clean, dry area. If you are located where freezing weather occurs, the unit should be stored in a climate controlled area. If storing in a climate controlled area is not possible, fully winterize the sprayer. Pour a gallon of RV antifreeze and a gallon of clean water into the sprayer. Start the engine and agitate the mixture. Then pump the RV antifreeze mixture through hose and discharge it from the spray gun back into the one gallon container. Remove spray gun and store the 50/50 antifreeze mixture for future use. *If temperatures are expected to be below 0°F, check the freeze chart of the anti-freeze and add antifreeze to recommended ratio for expected temperatures.*

Prior to the next use, make sure to clean tank thoroughly. Fill the tank with clear water and one bottle of ammonia-based cleaning liquid (approx. 1 QT to 100 Gal). After cleaning solution has been run through, fill tank with fresh water and flush thoroughly.

Exploded Views

	DWG#	DESCRIPTION	REV. DATE
	21-52ELG0-KA25	200 EL Sprayer	11/12/2019

#	PART #	DESCRIPTION	QTY.
1	73-6000500	1/2"x 300' 600psi Hose Yellow	1
2	51-180-E00	18" Electric Reel	1
3	73-600050H	1/2" Reel Lead Hose 10' w/Fitting	1
4	34-EL20010	200Gal PCO 10GPM	1
5	FT-3EL100	1"MNPT x 1"HB 90° Poly Fitting	2
6	BV-2-100P	3-Way Ball Valve	1
7	FT-3M100	3/4" MNPT x 3/4" MNPT Nipple	1
8	LS-110100	GNC Filter	1
9	44-KA25VM65	V200/KA25 Module	1



Exploded Views



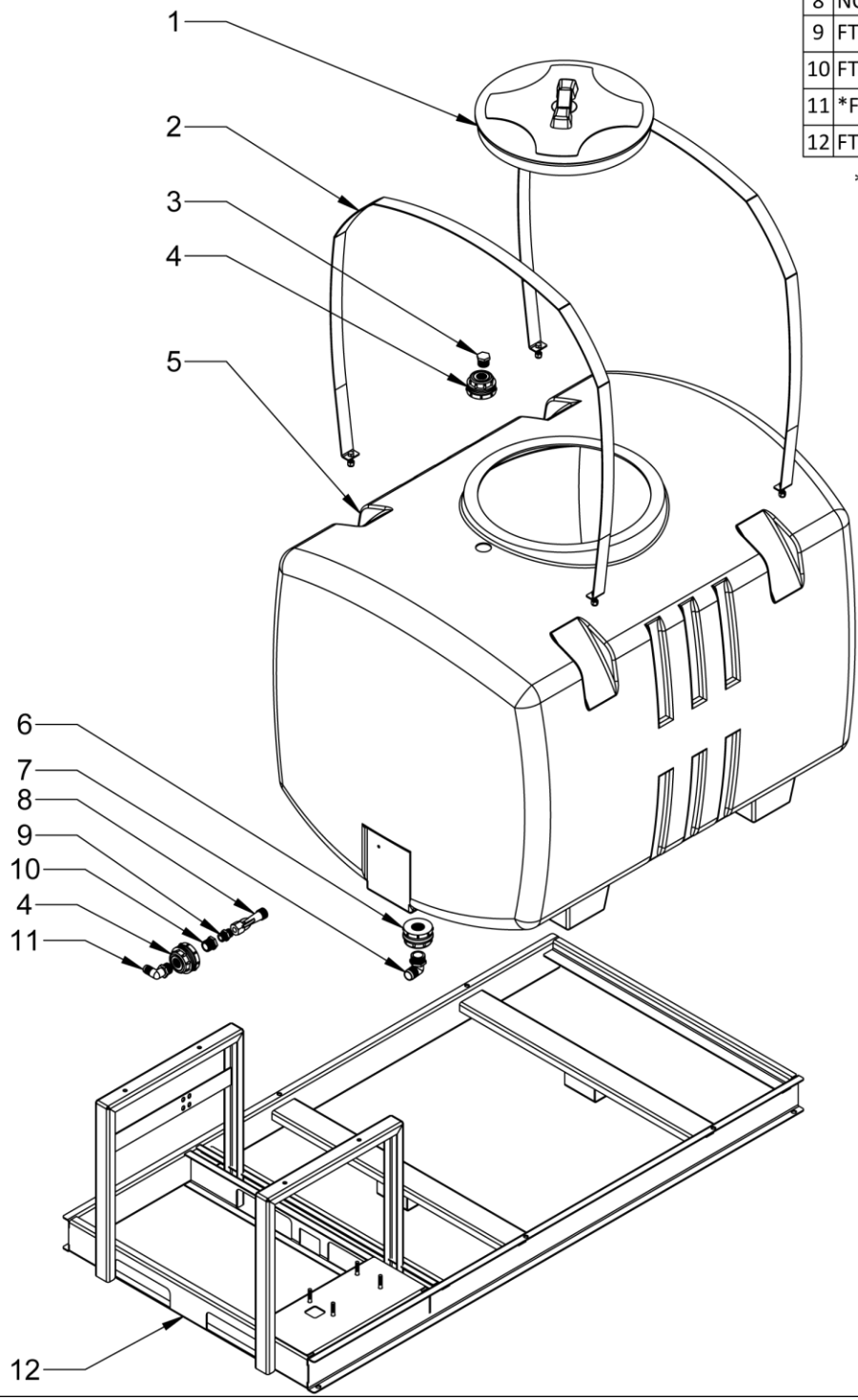
DWG# 34-EL20010

DESCRIPTION: 200 Gallon ELS Module

REV. DATE 11/12/2019

#	PART #	DESCRIPTION	QTY.
1	NO-200	200 Gallon PCOw/Lid	1
2	FR-1200EL	200 ELS Frame	1
3	FT-3F34	3/4" MNPT Hex Plug Poly	1
4	FT-3RB3412	3/4" MNPT X 1/2" FNPT Reducer	1
5	FT-3M12	1/2" MNPT x 1/2" MNPT Nipple	1
6	HY-3371	Jet Agitator ≤10 GPM	1
7	*FT-BHF-034P	3/4" Poly Bulk Head Fitting	2
8	NO-60011	16" Lid with Breather	1
9	FT-20270	200 ELS Strap	2
10	FT-3EL100	1" MNPT x 1" HB 90° Poly Fitting	1
11	*FT-BHF-100	1" Poly Bulk Head Fitting	1
12	FT-3EL34	3/4" MNPT x 3/4" 90° Hose Barb	1

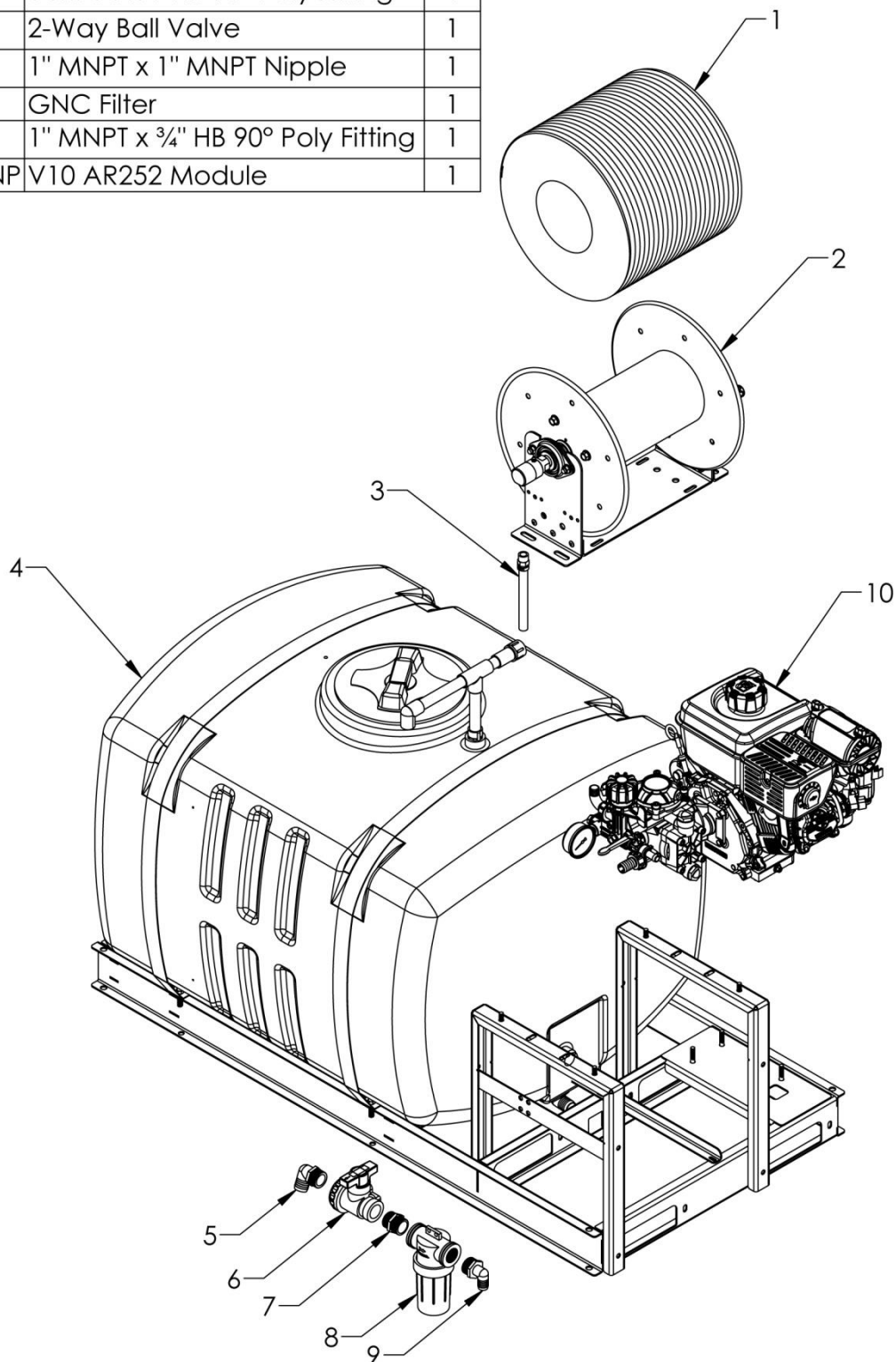
* Used to replace factory spinweld



Exploded Views

		DWG# 21-51ELB2-D252	DESCRIPTION: 100 Gallon ELS Sprayer	REV. DATE 9/8/2021
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#	PART NUMBER	DESCRIPTION	QTY
1	73-6000372	3/8"x 200' 600psi Hoses Yellow	1
2	HA-1020-14-16	Hannay 12" ECO Manual Reel	1
3	73-600037H	1/2" Reel Lead Hose 10' w/Fitting	1
4	34-EL10005	100 Gallon ELS Tank Module	1
5	FT-3EL100	1"MNPT x 1"HB 90° Poly Fitting	1
6	BV-2-100P	2-Way Ball Valve	1
7	FT-3M100	1" MNPT x 1" MNPT Nipple	1
8	LS-110100	GNC Filter	1
9	FT-3EL10034	1" MNPT x 3/4" HB 90° Poly Fitting	1
10	44-AR252VM50-NP	V10 AR252 Module	1



Exploded Views



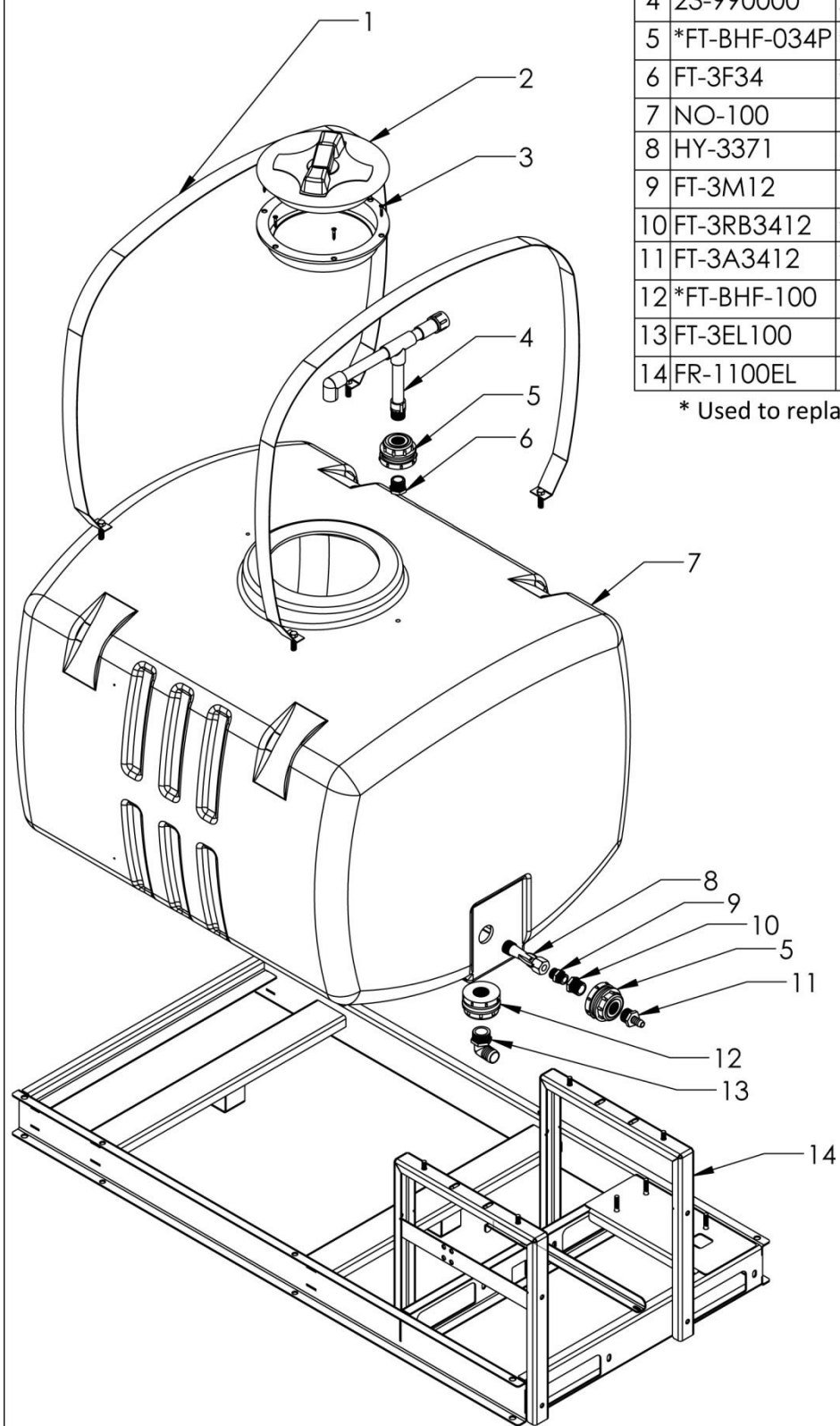
DWG# 34-EL10005

DESCRIPTION: 100 Gallon ELS Tank Module

REV. DATE 9/8/2021

#	PART #	DESCRIPTION	QTY
1	FR-20333	100 PCO Strap	2
2	32-110006	8" Lid with Breather	1
3	HW-990002	#8-15x1" Phillips Screw	6
4	23-990000	Airgap Backflow Prevention	1
5	*FT-BHF-034P	3/4" Poly Bulk Head Fitting	2
6	FT-3F34	3/4" MNPT Hex Plug Poly	1
7	NO-100	100 Gallon PCO w/Lid	1
8	HY-3371	Jet Agitator ≤10 GPM	1
9	FT-3M12	1/2" MNPT x 1/2" MNPT Nipple	1
10	FT-3RB3412	3/4" MNPT X 1/2" FNPT Reducer	1
11	FT-3A3412	3/4" MNPT x 1/2" HB Poly Fitting	1
12	*FT-BHF-100	1" Poly Bulk Head Fitting	1
13	FT-3EL100	1" MNPT x 1" HB 90° Poly Fitting	1
14	FR-1100EL	100 ECO Frame	1

* Used to replace factory spinweld



Troubleshooting Guide

Problem	Cause	Solution
Pump does not draw water.	The in-line strainer is clogged.	Clean the in-line strainer.
	The suction line is plugged or collapsed.	Examine the suction line.
	Valve in suction line closed.	Open Gate Valve.
	One or more valves are sealing improperly.	Examine the valve seating and clean them or replace if scored or worn
	Suction line or strainer is not sealed.	Check suction filter for cracks, missing gasket or screen clogged.
The pressure gauge fluctuates excessively.	The pump is sucking in air somewhere in the suction line.	Examine the suction line and make certain all parts are firmly secured.
	Air has not been entirely evacuated from the pump.	Run pump with the outlet hose open to evacuate air from the pump.
The liquid flow is irregular.	Incorrect charge in the pulsation damper.	Check the charge in the pulsation damper. (10% of working pressure)
	One or more valves are seating improperly.	Examine the valve seating and clean them or replace them if scored or worn.
The output drops and the pump is noisy.	The oil level is too low.	Add oil to the correct level for the pump.
	Suction has a leak and is sucking air.	Make sure filter bowl is tight and O-ring is present. Check for loose or damaged hoses and fittings.
	Suction valves are worn.	Replace valves
No agitation	If no agitation when spraying the nozzle is too large	Replace nozzle.



Support Page

Warranty

- A. **GENERAL PROVISIONS** — The warranties described below are provided to the original purchaser of new ELS equipment from an authorized dealers. Under these warranties, the authorized ELS brand servicing dealer will repair or replace any covered part which is found to be defective in material or workmanship during the applicable warranty term. Warranty service must be performed by an authorized dealer or service center authorized by to sell and/or service the type of product involved, which will only use new or remanufactured parts or components furnished by authorized dealer. The purchaser will be responsible, for any service call and/or transportation of product to and from the authorized ELS Dealer's place of business, for any premium charged for overtime labor requested by the purchaser, and for any service and/or maintenance not directly related to any defect covered under the warranties below.
- B. **WHAT IS WARRANTED** —Pumps, parts and accessories are warranted for the number of months as set forth below. All other branded products, such as engines, pumps, parts, reels and accessories are warranted by their respective manufacturers as specified in the original manufacturer's manual.

ELS Sprayers carry a 1yr Limited, 90 Day Commercial Warranty

Warranty statements required by law covering engine emission-related parts and components are found in the Operator's Manual.

- C. **WHAT IS NOT WARRANTED** — WE ARE NOT RESPONSIBLE FOR THE FOLLOWING:
1. Used Products. Warranty applies to original purchaser only.
 2. All branded products, such as engine, pump, hose reel are warranted by respective manufacturers;
 3. Any product that has been altered or modified in ways NOT approved by manufacturer;
 4. Depreciation or damage caused by normal wear, lack of reasonable and proper maintenance, failure to follow operation procedures, misuse, lack of proper protection during storage or accident;
 5. Normal maintenance parts and service;
 6. Loss of profits or any other consequential damages.
- D. **SECURING WARRANTY SERVICE** — To accrue warranty service, the purchaser must:
1. Return completed warranty card to manufacturer.
 2. Report the product defect to an authorized ELS dealer and request repair within the applicable warranty; **and**
 3. Present evidence of the warranty start date; **and**
 4. Make the product available to authorized ELS service dealer within a reasonable period of time.
- NOTE:** All warranty claims must be pre-approved by manufacture.

LIMITATION OF IMPLIED WARRANTIES AND OTHER REMEDIES — COMMERCIAL EQUIPMENT- To the extent permitted by law, neither the manufacturer (nor any company affiliated with it) makes any warranties, representations or promises as to the quality, performance or freedom from defect of the equipment coved by this warranty.

- E. **IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, TO THE EXTENT APPLICABLE, SHALL BE LIMITED IN DURATION TO THE APPLICABLE PERIOD OF WARRANTY SET FORTH ON THIS PAGE. THE PURCHASER'S ONLY REMEDIES IN CONNECTION WITH THE BREACH OR PERFORMANCE OF ANY WARRANTY ON EQUIPMENT ARE THOSE SET FORTH ON THIS PAGE. IN NO EVENT WILL THE BRAND RETAILER OR ANY COMPANY AFFILIATED WITH THE BRAND BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.** (Note: some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages so the above limitations and exclusions may not apply to you.). This limited warranty gives you specific legal rights, and you many also have other rights which vary from state to state.)
- F. **NO RETAILER WARRANTY** — The selling retailer makes no warranty of its own and the retailer has no authority to make any representation or promise on behalf of manufacturer or to modify the terms or limitations of this warranty in any way.
- G. **IF** further information is desired, contact your selling brand Retailer.