

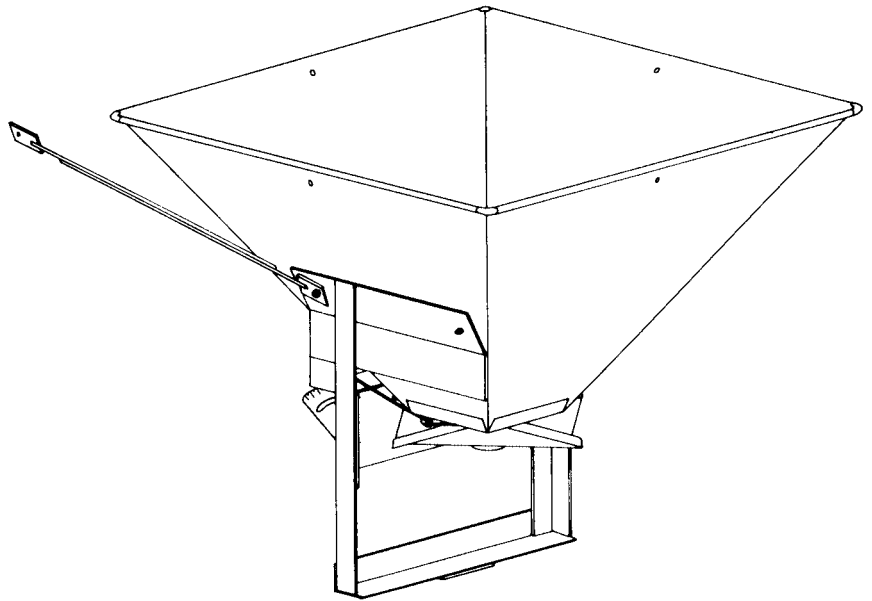
**OWNER'S/
OPERATOR'S
MANUAL**

**MODEL NO.'s
ES-1.5
ES-1.5 PKP
ES-33**

⚠ CAUTION

For Safe Operation
Read Rules And
Instructions Carefully

SINO LEEINGLES, PIDA AYUDA
A AIGUIEN QUE SI LO LEA
PARA QUE LE TRADUZCA LAS
MEDIDAS DE SEGURIDAD.



ELECTRIC SEEDER

**Safety Instructions
Tractor Preparation
Operating Instructions**

**Assembly & Mounting
Maintenance
Repair Parts**

⚠ ATTENTION! SAFETY RULES

1. Read instruction manual and make sure all operators are knowledgeable on correct operation of equipment and familiar with the Safety Rules of Operation.
2. Never allow riders on equipment.
3. When operating on rough or uneven terrain, use extreme caution and a safe operating speed.
4. When spreading seed or fertilizer, always use safety goggles.
5. Never operate equipment when anyone is within 50 feet of seeder/spreader.

Before operating equipment – If you have any questions regarding the proper assembly or operation, contact your dealer or representative.

To the Owner/Operator/Dealer

All implements with moving parts are potentially hazardous. There is no substitute for a cautious, safe-minded operator who recognizes the potential hazards and follows reasonable safety practices. The manufacturer has designed this implement to be used with all its safety equipment properly attached to minimize the chance of accidents.

BEFORE YOU START!!

**Read the safety messages on the implement and shown in your manual.
Observe the rules of safety and common sense!**



THIS SYMBOL MEANS

– **ATTENTION!**

– **BECOME ALERT!**

– **YOUR SAFETY IS INVOLVED!**

THIS SAFETY ALERT SYMBOL IDENTIFIES IMPORTANT SAFETY WARNING MESSAGES. CAREFULLY READ EACH WARNING MESSAGE THAT FOLLOWS. FAILURE TO UNDERSTAND AND OBEY A SAFETY WARNING, OR RECOGNIZE A SAFETY HAZARD, COULD RESULT IN AN INJURY OR DEATH TO YOU OR OTHERS AROUND YOU. THE OPERATOR IS ULTIMATELY RESPONSIBLE FOR THE SAFETY OF HIMSELF, AS WELL AS OTHERS, IN THE OPERATING AREA OF THE TRACTOR AND EQUIPMENT.

UNDERSTAND SIGNAL WORDS

Note the use of the signal words **DANGER**, **WARNING** and **CAUTION** with the safety messages. The appropriate signal word for each has been selected using the following guidelines:

DANGER: Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations typically for machine components which, for functional purposes, cannot be guarded.

WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION: Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

IMPORTANT SAFETY INFORMATION!

Working with unfamiliar equipment can lead to careless injuries. Read this manual, and the manual for your tractor, before assembly or operating, to acquaint yourself with the machine. It is the equipment owner's responsibility, if this equipment is used by any person other than yourself, is loaned or rented, to make certain that the operator, prior to operating:

1. Reads and understands the operator's manuals.
2. Is instructed in safe and proper use.



The use of this equipment is subject to certain hazards which cannot be protected against by mechanical means or product design. All operators of this equipment must read and understand this entire manual, paying particular attention to safety and operating instructions, prior to using. If there is something in this manual you do not understand, ask your supervisor, or your dealer, to explain it to you.



Most accidents occur because of neglect or carelessness. Keep all helpers and bystanders fifty feet (50') from operating equipment. Only properly trained people should operate this tractor and attached implement. It is recommended the tractor be equipped with a Roll-Over Protection System (ROPS) and a seat belt that is used. Always stop the tractor, set brake, shut off the tractor engine, remove the tractor key, and lower implement to the ground before dismounting tractor. Never leave equipment unattended with the tractor running.

SAFETY INFORMATION (continued)



All equipment is potentially hazardous. There is no substitute for a cautious, safe-minded operator who recognizes potential hazards and follows reasonable safety practices.



When the use of hand tools is required to perform any part of assembly, installation, adjustment, maintaining, repairing, removal, or moving the implement, be sure the tools used are designed and recommended by the tool manufacturer for that specific task.



Personal protection equipment including safety glasses, safety shoes, and gloves are recommended during assembly, installation, operation, adjustment, maintaining, repairing, removal, or moving of the spreader.



Always use two people to handle heavy, unwieldy components during assembly, installation, removal, or moving of the implement.



Never place any part of your body where it would be in danger if movement should occur during assembly, installation, operation, maintaining, repairing, removal, or moving the implement.



Train all new personnel and review instructions frequently with existing workers. A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.



A heavy load can cause instability of the tractor. Use extreme care during travel. Slow down on turns and watch out for bumps. The tractor may need front counter-weights to counter-balance the weight of the implement. An unstable tractor could steer badly and possibly tip over, causing injury or death.



Never use alcoholic beverages or drugs which can hinder alertness or coordination while operating equipment. Consult your doctor about operating tractor and implement while taking prescription medications.



Do not allow others to ride on the tractor with an operator. Riders are subject to injury such as being struck by foreign objects or being thrown off. Riders obstruct the operator's view resulting in unsafe operation. **Never allow anyone to ride on the implement!**



Before you operate any implement, check over all pins, bolts and connections to be sure all are securely in place. Replace any damaged or worn parts immediately.



Do not allow anyone who is not familiar with the safety rules and operation instructions to use this equipment.



Never allow children to operate or be around equipment.



Do not exceed lift capacity of the tractor hitch.

















Keep alert and watch the front as well as the rear when working with the attached implements.



Never operate broadcast spreader if anyone is within 50 ft. of tractor and spreader.

SAFETY INFORMATION (continued)

-  When maneuvering close to buildings or passing through narrow areas, be sure to allow sufficient clearance for the implement.
-  Use extreme care and maintain minimum ground speed when transporting on hillside, over rough ground and when operating close to ditches or fences. Be careful when turning sharp corners.
-  Never use your hand or fingers to clear a jam of material in the feed gate. Use a clean stick or rod.
-  When spreading any material, always use safety goggles or safety glasses with side shields.
-  When spreading, always be aware of the wind direction and that it may carry the material further than normal spread width.
-  Do not allow tools to cause sparks when working on a battery. **BATTERIES PRODUCE EXPLOSIVE HYDROGEN GAS.** A spark could cause an explosion if hydrogen gas is present.
-  Observe correct polarity (+ and –) on batteries.
-  Disconnect negative (–) cable first and connect it last.
-  Avoid excessive speed during operation. Use lower gear to slow forward travel. Use care when working on slopes.
-  Comply with state and local laws governing highway safety and movement of farm machinery on public roads.
-  The use of flashing amber lights is acceptable in most localities. However, some localities prohibit their use. Local laws should be checked for all highway lighting and marking requirements.
-  Always be sure the implement is in the proper position and secure for transport.
-  Always shut off tractor or pickup and shift to “Park” or set brakes when leaving tractor or pickup. Remove key when leaving tractor or pickup unattended.
-  Before operating equipment: if you have any questions regarding the proper assembly or operation, contact your dealer or representative.

SAFETY SIGNS



This SAFETY SIGN is located on the seeder.

OBEY ALL SAFETY WARNINGS!

NOTE: If Safety Sign is missing or damaged, replace immediately.

INSTRUCTIONS

TRACTOR OR VEHICLE PREPARATION

The 12 volt electric seeder can be mounted on farm or lawn tractors, pickup trucks, jeeps, wagons or on some farm implements.

The tractor (or other vehicle) must have a 12 volt electrical system or you need to supply a separate 12 volt battery to power the spreader fan motor.

The seeder should be positioned so that spreader fan is at least 30-34 inches above the ground. This will provide the best spreading performance. It is also best if the seeder unit is tilted slightly forward so that the spreader fan throws slightly upward. Use the brace rods to make this adjustment.

Be sure tires and rims are in good condition. Inflate tires to the proper recommended air pressure.

It is recommended that a ROPS (Roll-Over Protection Structure) be installed on all tractors. Contact your local dealer for ROPS for your tractor.



Be sure your tractor or vehicle is in good condition and properly equipped with counterweights if required. Read all the safety precautions and make sure all vehicle operators are familiar with the safety rules of vehicle operation.

PACKING

Seeders are usually shipped in individual cartons. Sometimes the extension sides (3 bu. model only) are in the main seeder carton if ordered together.

ASSEMBLY & MOUNTING

Preview the assembly instructions and the exploded views of the seeder in your operator's manual and become familiar as to how the parts or assemblies go together.

ES-1.5

Assemble the drawbar mount bracket (#480317) to the main frame (#480301) with the $\frac{3}{8}$ " bolts provided.

Set the seeder in the center of the drawbar on your tractor, or on the bumper of your truck and bolt it down securely with the bolt, washers, and nut provided.

Assemble the brace rods on the seeder by placing one end of each one to the sides of the seeder and bolt them in place. Loosen the clamps on the brace rods, leaving one end attached to the seeder and secure the other end

to the tractor fender or some other convenient place. If you are using a truck, the flat surface on the upper edge of the bed can be used. Adjust the braces so seeder sets level or slightly tilted forward, then tighten the clamps.

ES-1.5 PKP PICKUP RECEIVER HITCH MOUNT

Remove the ball mount from your receiver hitch. Clean the 2 inch square socket. Check the receiver hitch mounting bolts and braces.

Slide the formed 90° 2" seeder mounting tube into the receiver hitch and install the lock pin.

Review the "exploded" parts drawing of the ES-1.5 PKP to become familiar with the parts and their relationship.

NOTE: If the optional ES-1.5 PKP rope control package is used, refer to those instructions in this manual as it is fastened with the same bolts that mount the seeder.

Position the seeder on the 2" seeder mounting tube and install the two $\frac{1}{2}$ " x $3\frac{1}{2}$ " hex head bolts. **NOTE:** The two special square washers (Ref. #5) are to reinforce the channel bracket on the seeder. Install the lock washers and nuts and tighten the bolts.

Refer to the instructions for all units, wiring and operation.

ES-33

The scale plate and lever assembly is folded and bolted to the seeder frame to prevent shipping damage. Unbolt and unfold the lever and control rod. Bolt the scale plate and control rod assembly on the front of the main frame, using the $\frac{1}{4}$ " - 20 x $\frac{1}{2}$ " bolts provided. Swing the upper half of the lever up into position (as shown in parts drawing). Replace the bolts and tighten securely.

Insert the control rod through the hole in the seed gate control plate (middle plate) and secure with the $\frac{3}{32}$ " x $\frac{1}{2}$ " cotter pin provided.

The openings in the hopper bottom (seed gate) are regulated by the control rod and the scale plate lever. Put the seed gate middle plate into the closed position. Loosen the control rod adjustment bolt (this bolt connects the lever to the control rod and screws into an adjustment button). The adjustment button should now be able to slide on the control rod. Then follow brace rod instructions as in last two paragraphs for ES-1.5.

EXTENSION HOPPER

Position the hopper extension sides as in figure "B". As you position each side, insert the corner angle rod in each pocket as shown in figure "C". After these are in place, insert all the bolts and tighten. Remove the cap plugs in the seeder hopper. (**NOTE:** If there is a possibility of using seeder as a 3 bushel, then cap plugs should be saved.) Position the extension hopper in the seeder hopper and bolt it in place.

INSTRUCTIONS (continued)

ALL UNITS

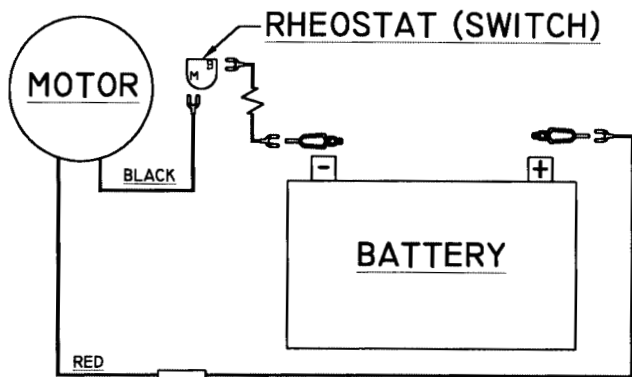
NOTE: If the paint on the control rod does not allow the button to slide on the control rod, it may be necessary to sand some of the paint off with emery paper.

With the seed gate (middle plate) in the closed position, place the scale plate lever in the closed position. Retighten the adjustment bolt so that the adjustment button is tight on the control rod.

Move the lever and check to see that the seed gate (middle plate) is moving with the lever.

Place the lever at the desired setting on the scale plate and locate the stop bolt so that each time the lever is pulled to the open position it will be at the same position. Tighten the stop bolt.

WIRING



Refer to the electrical schematic above. Strip approximately 1/2" of insulation from the ends of the wires and crimp on the terminals as shown. For best results, solder the connections using electrical grade solder. Attach the wires to the rheostat switch and battery as shown.



Always disconnect negative (-) cable first and connect it last.



Always stop engine before disconnecting or connecting battery cables or servicing battery.

When properly connected, the fan should rotate in a clockwise direction, looking down on the fan. The first position on the rheostat switch is full speed, which will be used for most seeding applications. The second position is variable speed, which can be used to reduce the spread width.

The fan motor is for use on 12 volt electrical systems. The motor will draw approximately 3 amps full load.

Mount the rheostat switch within easy reach of the driver. To prevent polarity problems, run both wires to the battery, rather than grounding through the chassis frame.

PREPARATION

- Know your controls and how to stop tractor, engine, or pickup quickly in an emergency. **READ THIS MANUAL AND THE ONE PROVIDED WITH YOUR TRACTOR.**
- Any person who operates this equipment must be instructed in and be capable of the safe operation of the tractor, implement and all controls.
- Ensure implement is properly mounted, adjusted and in good operating condition.
- Ensure that all safety shielding and safety signs are properly installed and in good condition.

OPERATION

1. Check the register of the control lever with the seed gate (material gate). With the seed gate closed, the control lever indicator should so indicate. If it does not, you can adjust the adjustment button on the control rod.
2. **DO NOT FILL HOPPER** (especially with fertilizer) and transport over long distances, as it may result in packing, causing poor or erratic discharge.
3. **FOR BEST RESULTS** use pelletized fertilizer, as it has little tendency to lump and cause little or no dust.
4. Be sure to sift or break up lumps found in some types of granular fertilizer before filling hopper.
5. Do not use on windy days, especially when spreading fine grass seed.
6. Be extremely careful if you are spreading herbicides, as there is the possibility of wind drift or overthrow into area that serious crop/shrub damage could occur. Follow precautions on package.
7. The spreader will **not work with rock salt**. It will spread granular calcium chloride if dry and free-flowing.
8. When broadcasting fertilizer, always start vehicle in motion before opening feed gate. (Do not allow vehicle to sit stationary with feed gate open.) If fertilizer is accidentally deposited too heavily in a small area, soak down thoroughly with garden hose or sprinkler to prevent burning.

INSTRUCTIONS (continued)

OPERATION (continued)



A heavy load can cause instability in driving a tractor. Make sure the front of the tractor is properly counter-balanced with weights. Always drive slowly – especially around turns. An unstable tractor could steer badly and possibly tip over, causing injury or death.



Do not attempt to use your fingers to clear a jam. Accidental closing of the feed gate could pinch or amputate a finger. Be sure that the electric motor is shut off and the power is disconnected before doing any adjustment or repair.



KEEP ALL PERSONS AWAY FROM THE ROTATING SPREADERS FAN! NEVER OPERATE WHEN ANYONE IS WITHIN 50 FEET OF SEEDER/SPREADER.

SPREADING INSTRUCTIONS

1. The opening in the hopper bottom is regulated by the control lever. The size of the opening is determined by the calibrated scale. Place the control lever at the desired setting and adjust the stop bolt.
2. Check rate chart for suggested setting for material type to be spread.
3. Width of spread depends upon the tractor PTO speed and the weight of the material. The heavier the material, the wider the spread. The table shows width of spread at full fan rpm, so the width will vary according to the speed of your motor. The rheostat switch can be used to slow the speed of the fan in order to obtain a narrow spread width.

For accurate spreading, calibrate your tractor to operate at the desired speed. A calibrated speedometer is the best and most accurate. If your tractor or vehicle does not have a speedometer or its accuracy is questionable, then you may calibrate in the following manner:

Set out two markers 88 feet apart. Select proper gear and adjust throttle speed to give the following travel time as shown between the markers.

- 1 MPH will travel 88 feet in 60 seconds
- 4 MPH will travel 88 feet in 15 seconds
- 6 MPH will travel 88 feet in 11.2 seconds
- 8 MPH will travel 88 feet in 7.5 seconds

After adjusting throttle setting to give speed as desired, mark throttle position in some convenient manner to indicate selected speed. NOTE: After selecting speed, be sure vehicle engine is running fast enough for generator to properly charge battery. On some vehicles it may be necessary to operate in a lower gear to maintain an adequate engine speed for charging battery.

4. You are now ready to make a trial turn to assure accurate results. Close the hopper and put in a pre-determined amount of the material to be spread. Spread this and check the results. Make final adjustments to obtain desired results.

MAINTENANCE

This seeder will give long service with proper care. Keep all of the bolts tightened well. Clean the seeder thoroughly before storing it, especially when corrosive materials are used. For best results, after using corrosive material clean the seeder after each use. Wash it with clear water or ammonia solution, then wipe it down completely with an oily rag. Put a few drops of oil on the seed plate and work it back and forth to protect these parts.

Always store seeder/spreader in a clean, dry place.

Before using, check to make sure all nuts and bolts are tight.

Paint any bare metal or rusty spots for longer life.

WARNING!! When washing the seeder, completely cover the motor to protect it from water or corrosive solutions. If the motor is not protected, damage may occur.

INSTRUCTIONS (continued)

OPTIONAL ES-1.5 PKP ROPE CONTROL PACKAGE INSTRUCTIONS

This optional package allows operators to open or close the seed gate of the ES-1.5 PKP seeder from the cab of the pickup truck.

One rope will open the seed gate when pulled and the other will close it.

Refer to figure "A" to see the relationship of the rope control frame to the seeder.

The rope control frame mounts on the front side of the 2" seeder mount tube with the same 1/2" x 3 1/2" hex bolts that hold the seeder.

NOTE: Make sure the rope control lower pivot arm is on the same side as the scale plate assembly of the seeder before bolting in place.

NOTE: The rope control bracket may come up against the forward top edge of the seed hopper. There should be a slight space between these parts. If necessary, remove the rope control bracket and install two or three 1/2" flat washers between the backside of the rope control bracket and the 2" mounting tube.

Extra 1/2" flat washers are included with the rope control bracket in case they are needed.



Fig. A

Install the 1/4" rod connecting link between the scale plate lever (use the unused hole in the lever) the lower pivot arm of the rope control pivot. Install the 3/32" cotter pins in each end of the connecting link and spread the cotter pins.

Order part number 480040 for the optional rope pull bracket assembly.

Tie one end of the rope to one end of the upper pivot arm and the other rope to the other end of the pivot arm.

Separately run the ropes to the cab of the pickup. If the pickup has a sliding rear window, the rope can be run through the window.

The ropes can also be run along the left side of the pickup and looped around the side mirror bracket. This will allow operator control by reaching through the open side window.

NOTE: If the ropes are located to the side mirror, a simple loop with some slack in the rope will allow the operator to easily remove the loop from the side mirror bracket for easy access in and out of the left door.

NOTE: Cut off any additional length of rope not required and make sure no ends of the loop can catch in brush or tree limbs. Damage to the seeder and rope control could occur.

OPTIONAL USX-3 3 BU. EXTENSION KIT REPAIR PARTS

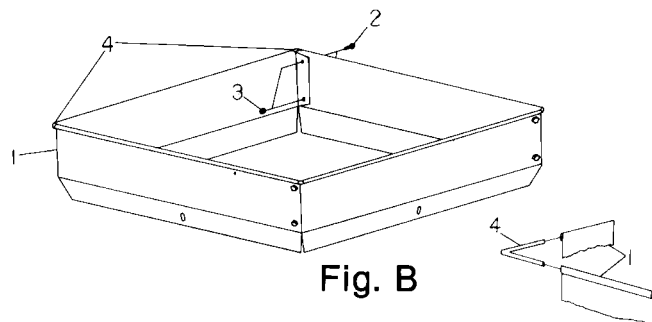


Fig. B

REF. NO.	PART NO.	DESCRIPTION	NO. REQ'D.
1	420101	Extension Hopper Side (3 bushel)	4
2	2503008	Bolt 1/4" - 20 NC x 1/2" Round Head	12
3	2500008	Nut 1/4" - 20 NC Hex Whiz Flange	12
4	420102	Corner Angle Rod	4

INSTRUCTIONS (continued)

OPERATIONAL SPREADING CHART

(Calibrated at 4 MPH ground speed)

Material	Spread Width In Feet	Approx. Pounds Per Acre For Setting As Indicated					
		1/4	3/8	1/2	3/4	1	1-1/2
Alfalfa, Red Clover	30	8	12	16	24	32	48
Barley, Wheat, Rye	35	30	45	60	90	120	180
Sweet or Crimson Clover	30	8	12	16	24	32	48
Kentucky Blue or Bermuda Grass ★	15	7	11	14	21	28	
Lespedeza	30		15	20	30	40	60
Oats ★	35		19	25	37	50	75
Timothy	20	10	15	20	30	40	60
Sudan Grass ★	30		15	20	30	40	60
Fertilizer: Pellet or Granule	38	25	37½	50	75	100	150

The spread width indicated on this chart is possible if spinner is operated 30 inches above the ground. Seeder should be level or tilted forward slightly.

NOTE:

Spread Chart settings are approximate – always make trial run to check actual application rate.

The amount of seed or fertilizer broadcast depends on the size of the hopper opening and the speed of the tractor. The table shown is an approximate guide based on a tractor speed of 4 MPH, so adjust for different speeds.

NOTE:

Since there is no agitator in the seed hopper, these materials will bridge at narrow seed gate settings and cause erratic seeding rates. If bridging occurs at wider seed gate settings, cleaning the seed or blending with a small dense seed such as clover may help. A mix of dry sand with the seed (50/50 mix) can sometimes solve the problem.

HELPFUL TROUBLE-SHOOTING TIPS

1. Not feeding even –

- A. Seed gate opening may be set too close for the material being spread. To overcome, set the opening larger and driver faster to obtain same spread rate.
- B. Check material for foreign matter or lumps.

D. Set screw loose or missing on fan hub.

E. Too windy for material being spread.

F. Agitator problems – check tips above, under “Not feeding even.”

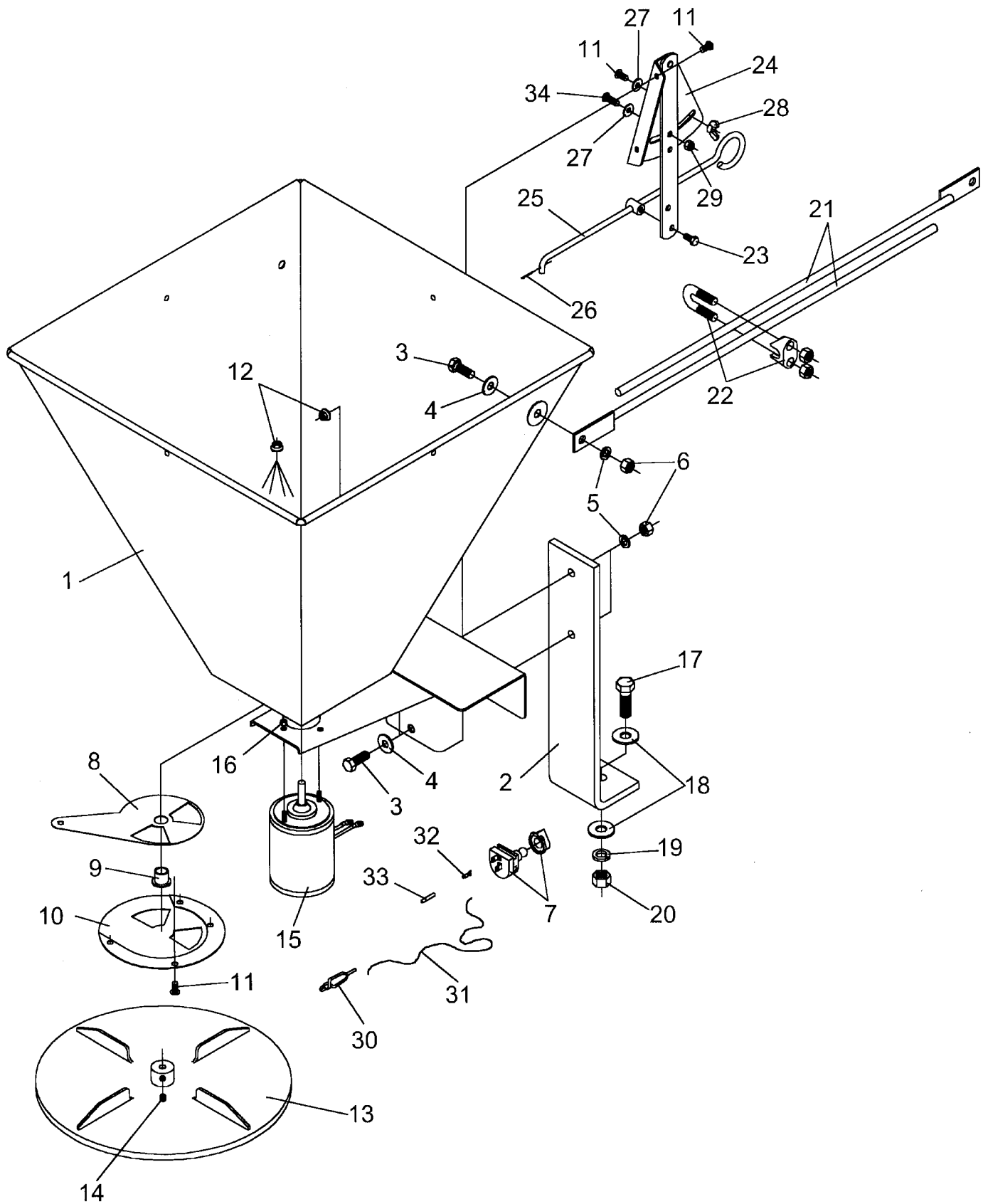
G. Operator not spacing spread runs properly for correct overlap.

2. Poor spread –

- A. Too much speed (over 560 PTO rpm) can cause uneven spread.
- B. Spreader fan speed too slow (under 520 rpm) will result in a narrow spread.
- C. Bent or broken fan blades.

For best results, cover area twice over at one-half recommended material usage rate, the second time over to run halfway between first spreading width or in a criss-cross pattern. This method allows the most complete and even coverage, as well as to give operator a chance to adjust gate setting to compensate for too thin or too heavy a covering the first time over.

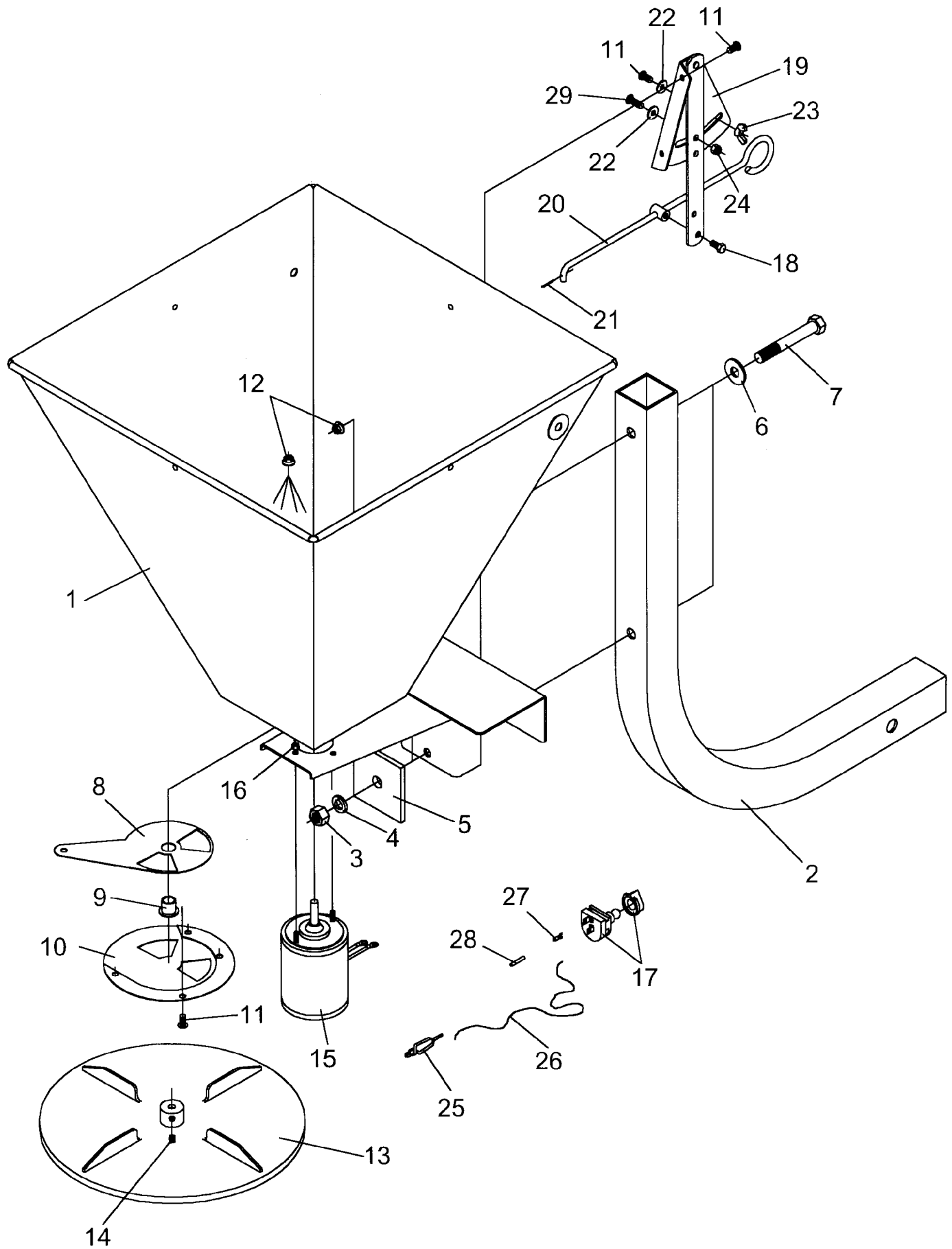
ES-1.5 SEEDER PARTS DRAWING



ES-1.5 SEEDER PARTS LIST

Ref. No.	Part No.	Description	No. Req'd.
1	480301	Hopper & Mount Weldment	1
2	480317	Bracket, Drawbar Mount	1
3	2503011	Bolt 3/8"-16NC x 1" Hex Head Gr. 2	6
4	2501004	Washer 3/8" Flat	4
5	2502008	Washer 3/8" Spring Lock	6
6	2500004	Nut 3/8"-16NC Full Hex	6
7	2401014	Switch, Rheostat 12V	1
8	3450008	Middle Seed Plate	1
9	2505003	Bearing, Flanged Bronze	1
10	420510	Lower Seed Plate	1
11	2503008	Bolt 1/4"-20NC x 1/2" Round Head	7
12	2500008	Nut 1/4"-20NC Whiz Flange Hex	6
13	403421	Fan, Plastic	1
14	2503042	Set Screw 5/16"-18NC x 5/16" Allen	2
15	2401026	Motor 12V DC	1
16	2500034	Nut #10-32NF Hex	2
17	2503007	Bolt 1/2"-13NC x 2" Hex Head Gr. 2	1
18	2501003	Washer 1/2" Flat	2
19	2502002	Washer 1/2" Spring Lock	1
20	2500003	Nut 1/2"-13NC Full Hex	1
21	3450002	Brace Rod Weldment	4
22	2504018	Cable Clamp 3/8"	2
23	2503027	Bolt 1/4"-28NF x 1/2" Hex Head Gr. 2	1
24	480017	Scale Plate & Lever Assembly	1
25	480005	Control Rod & Pin Assembly	1
26	2504010	Cotter Pin 3/32" x 1/2"	1
27	2501006	Washer 1/4" Flat	2
28	2500007	Nut 1/4"-20NC Wing	1
29	2500006	Nut 1/4"-20NC Nylock Hex	1
30	2401011	Battery Clamp (Alligator Type)	1
31	480320	Wire, Electrical 14 Ga. x 10 Ft.	1
32	2401006	Connector, #14 Spade Type	1
33	2401010	Connector, #14 Butt	1
34	2503014	Bolt 1/4"-20NC x 3/4" Round Head	1

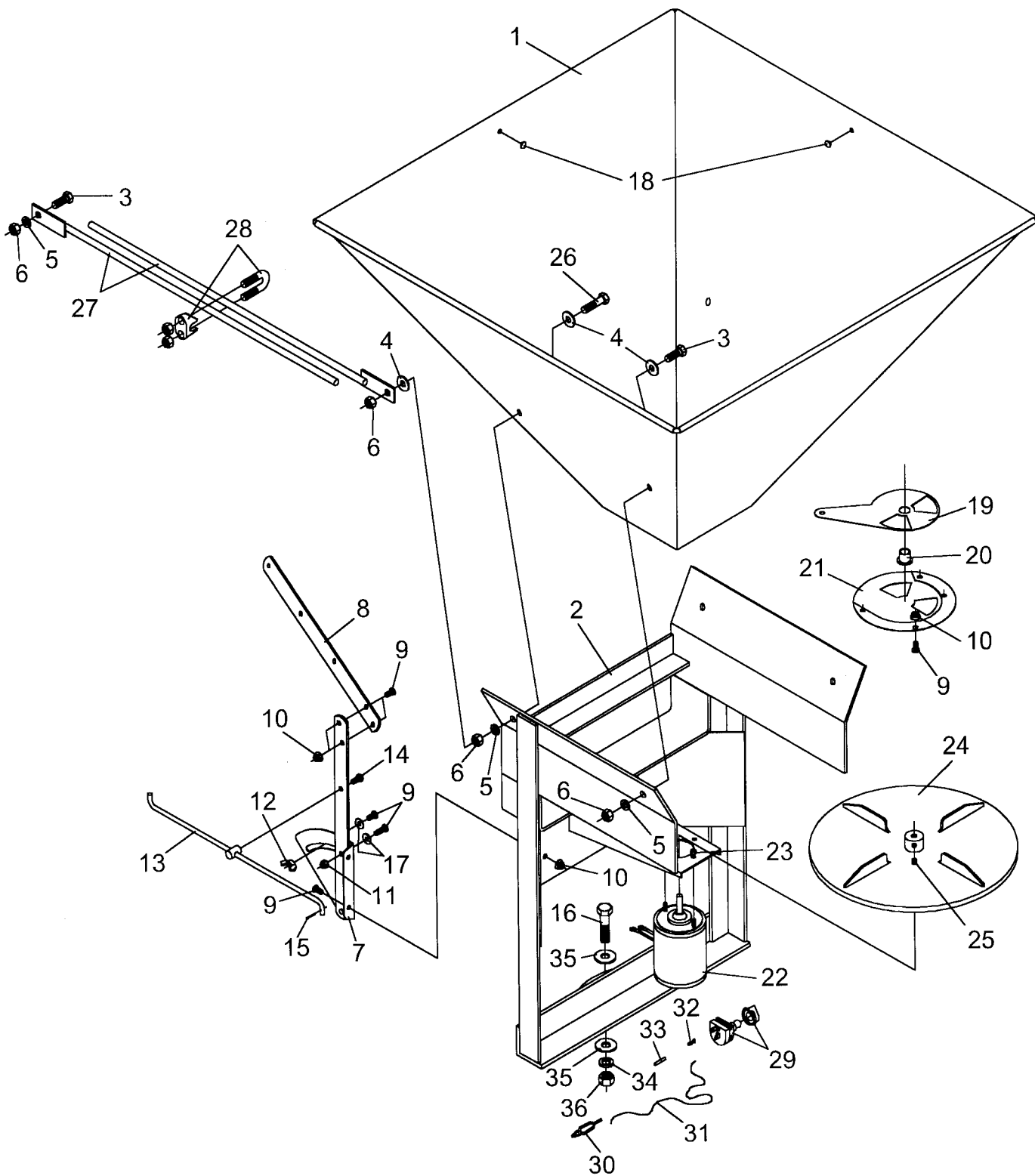
ES-1.5 PKP SEEDER PARTS DRAWING



ES-1.5 PKP SEEDER PARTS LIST

Ref. No.	Part No.	Description	No. Req'd.
1	480301	Hopper & Mount Weldment	1
2	480036	Tube, Seeder Mounting (2")	1
3	2500003	Nut 1/2"-13NC Full Hex	2
4	2502002	Washer 1/2" Spring Lock	2
5	480037	Washer, Special	2
6	2501003	Washer 1/2" Flat	2
7	2503109	Bolt 1/2"-13NC x 3 1/2" Hex Head Gr. 2	2
8	3450008	Middle Seed Plate	1
9	2505003	Bearing, Flanged Bronze	1
10	420510	Lower Seed Plate	1
11	2503008	Bolt 1/4"-20NC x 1/2" Round Head	7
12	2500008	Nut 1/4"-20NC Whiz Flange Hex	6
13	403421	Fan, Plastic	1
14	2503042	Set Screw 5/16"-18NC x 5/16" Allen	2
15	2401026	Motor 12V DC	1
16	2500034	Nut #10-32NF Hex	2
17	2401014	Switch, Rheostat 12V	1
18	2503027	Bolt 1/4"-28NF x 1/2" Hex Head Gr. 2	1
19	480017	Scale Plate & Lever Assembly	1
20	480005	Control Rod & Pin Assembly	1
21	2504010	Cotter Pin 3/32" x 1/2"	1
22	2501006	Washer 1/4" Flat	2
23	2500007	Nut 1/4"-20NC Wing	1
24	2500006	Nut 1/4"-20NC Nylock Hex	1
25	2401011	Battery Clamp (Alligator Type)	1
26	480320	Wire, Electrical 14 Ga. x 10 Ft.	1
27	2401006	Connector, #14 Spade Type	1
28	2401010	Connector, #14 Butt	1
29	2503014	Bolt 1/4"-20NC x 3/4" Round Head	1

ES-33 SEEDER PARTS DRAWING



ES-33 SEEDER PARTS LIST

Ref. No.	Part No.	Description	No. Req'd.
1	420001	Hopper Weldment	1
2	420502	Main Frame Weldment	1
3	2503011	Bolt 3/8"-16NC x 1" Hex Head Gr. 2	4
4	2501011	Washer 3/8" Fender	6
5	2502008	Washer 3/8" Spring Lock	6
6	2500004	Nut 3/8"-16NC Full Hex	8
7	430322	Scale Plate & Lever Assembly	1
8	420010	Lever, Scale Plate	1
9	2503008	Bolt 1/4"-20NC x 1/2" Round Head	10
10	2500008	Nut 1/4"-20NC Whiz Flange Hex	8
11	2500006	Nut 1/4"-20NC Nylock Hex	1
12	2500007	Nut 1/4"-20NC Wing	1
13	3404016	Control Rod & Pin Assembly	1
14	2503027	Bolt 1/4"-28NF x 1/2" Hex Head Gr. 2	1
15	2504010	Cotter Pin 3/32" x 1/2"	1
16	2503007	Bolt 1/2"-13NC x 2" Hex Head Gr. 2	1
17	2501006	Washer 1/4" Flat	2
18	2400027	Cap Plug	4
19	3450008	Middle Seed Plate	1
20	2505003	Bearing, Flanged Bronze	1
21	420510	Lower Seed Plate	1
22	2401026	Motor 12V DC	1
23	2500034	Nut #10-32NF Hex	2
24	403421	Fan, Plastic	1
25	2503042	Set Screw 5/16"-18NC x 5/16" Allen	2
26	2503006	Bolt 3/8"-16NC x 1 1/2" Hex Head Gr. 2	2
27	3450002	Brace Rod Weldment	4
28	2504018	Cable Clamp 3/8"	2
29	2401014	Switch, Rheostat 12V	1
30	2401011	Battery Clamp (Alligator Type)	2
31	480320	Wire, Electrical 14 Ga. x 10 Ft.	1
32	2401006	Connector, #14 Spade Type	1
33	2401010	Connector, #14 Butt	1
34	2502002	Washer 1/2" Spring Lock	1
35	2501003	Washer 1/2" Flat	2
36	2500003	Nut 1/2"-13NC Full Hex	1

SAFETY PRECAUTIONS

**MOST ACCIDENTS OCCUR BECAUSE OF NEGLIGENCE OR CARELESSNESS.
AVOID NEEDLESS ACCIDENTS BY FOLLOWING ALL OF THE SAFETY PRECAUTIONS LISTED BELOW.**

- Machinery should be operated only by those who are responsible and are authorized to do so.
- Stop the engine, lower all equipment, lock the brakes, and remove the ignition key before dismounting from the tractor.
- Never stand between tractor and implement while tractor is being backed to hitch.
- Loose fitting clothing should not be worn, to avoid catching on various parts.
- Detach implement in area where children normally do not play.
- When performing adjustments or maintenance on an implement, first lower it to the ground or block it securely at a workable height.
- Only a qualified operator should be permitted on tractor when in operation; no riders allowed.
- Make certain everyone is in the clear before starting tractor or raising or lowering equipment.
- Operate the tractor and implement only while seated in the driver's seat.
- Reduce speed when transporting mounted implements to avoid bouncing and momentary loss of steering control.
- A heavy load can cause instability of the tractor. Use extreme care during road travel. Slow down on turns and watch out for bumps. Tractor may need front counterweights to counter-balance the weight of the implement.
- Reduce speed on hillsides or curves so there is no danger of tipping.
- Avoid driving too close to the edge of ditches or creeks.
- Do not transport implement on public roads without reflectors and slow moving vehicle emblem in daylight and with approved warning lights at night and other periods of poor visibility.
- Due to the width of some implements, use extra caution on highways, farm roads, and when approaching gates.
- Always be sure the implement is in the proper position for transport.
- Keep alert and watch the front as well as the rear when working with the implement.

OWNER'S/ OPERATOR'S MANUAL

**MODEL NO.'s
ES-1.5
ES-1.5 PKP
ES-33**

**WHEN ORDERING
REPAIR PARTS,
ALWAYS GIVE
THE FOLLOWING
INFORMATION:**

1. PART NUMBER
2. PART DESCRIPTION
3. MODEL NUMBER
4. NAME OF ITEM

MARCH 2002

STATEMENT OF POLICY

It is the policy of Worksaver to improve its products where it is possible and practical to do so. Worksaver reserves the right to make changes or improvements in design and construction at any time, without incurring the obligation to make these changes on previously manufactured units.

ELECTRIC SEEDER

LIMITED WARRANTY

Worksaver warrants its implements, parts and accessories to be free from defects in materials and workmanship for a period of six (6) months from date of purchase. Upon written approval, Worksaver will repair or exchange without charge any part, which upon examination by Worksaver or its authorized agent, shall disclose to be defective.

This does not apply to (1) parts that have worn out in normal use, (2) parts broken because of improper assembly or operation by the customer, (3) parts accidentally damaged, (4) failure of parts traceable to improper care, (5) parts failing through use of implement for purposes other than those for which it was designed.

The obligations assumed by Worksaver and the limitations expressed herein are in lieu of all other warranties expressed or implied.

Worksaver, Inc.

P.O. BOX 100 LITCHFIELD, IL 62056-0100 (217) 324-5973

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