

INSTALLATION AND INSTRUCTIONAL MANUAL
ANTI-ICING SERIES

ANTI-ICING INSTALLATION AND OPERATIONAL INSTRUCTION MANUAL



SPACE SAVING
DESIGN SERIES

Contents

INSTALLATION AND INSTRUCTIONAL MANUAL

ANTI- ICING SERIES

SAFETY PRECAUTIONS

The best safety device is a careful operator!



This symbol means **ATTENTION!**

Become Alert!

Your safety is involved!

Please read and understand completely before doing!

BEFORE PERFORMING MAINTENANCE OPERATIONS, PARK VEHICLE ON LEVEL GROUND. SET PARKING BRAKE, SHUT OFF ALL POWER, AND MAKE SURE ALL MOVEMENT HAS STOPPED. IF BODY IS RAISED, IT MUST BE SECURELY BLOCKED SO IT CANNOT COME DOWN. SUPPORT BLOCKS MUST NOT BE REMOVED UNTIL THERE IS NO DANGER OF ANYONE BEING UNDER BED WHEN BED IS LOWERED.



Improper use of this equipment can result in serious injury. To reduce this possibility, give complete and undivided attention to the job at hand, and follow these safety precautions.

PREPERATION:

Know your controls. Read this instruction manual. Learn how to stop the equipment quickly in an emergency.

Do not allow children to operate machine; nor adults to operate it without proper instructions.

Keep all individuals not involved in the use of the equipment a safe distance away.

A copy of this manual should be available in the cab at all times. A copy may be obtained from your local dealer or download from www.swensonspreader.com.

OPERATION:

Do not exceed rated capacities of chassis or hoist.

Observe and shut off all equipment controls before starting engine so equipment will not unintentionally operate when engine is started.

Always check area around machine before engaging or operating controls.

Vehicle should be on a flat surface prior to raising bed. Operation on slippery uneven terrain may result in equipment damage or personal injury.

Know the material you are hauling and plan your haul to avoid "set up" or freezing of the load in the dump bed. In the event that a load becomes stuck or frozen in the bed, do not abuse, overload, or damage the truck, hoist, or bed in efforts to quickly free the load. It may be necessary to thaw indoors to safely remove such a load.

In the event that shoveling or mechanical means are used to free the stuck load, be sure the load is NOT hoisted and the tailgate, if opened, is secured properly before starting this effort. If hoisted, a stuck load, or portion, could release unexpectedly and cause injury to personnel or damage to the body, truck, or surroundings.

Some materials such as mud, or sludge, may shift easily when wet, resulting in increased tendency to overturn the truck on curves, unstable ground, or side slope situations. Reduce load size, speeds, and side slopes, and use care and planning to avoid this potential occurrence.

Unload the bed and securely prop and block a raised bed before any service, inspection, or repair work is started.

Be sure the electric cable is disconnected before traveling. Failure to disconnect the electrical cable when bed is in transit may allow the dump bed to rise unintentionally. This may lead to loss of vehicle control, accidental injury and/or property damage.

Use of lift points are recommended to safely lift body assembly. Never lift or handle loaded bed, empty material prior to handling the bed.

Always wear relatively tight and belted clothing when operating equipment. Loose jackets, shirts sleeves or other loose clothing should not be worn because of the danger of catching them in moving parts or controls.

Stop and inspect equipment if unusual movement, sounds, or noises are observed. Repair damage before restarting and operating the equipment.

Disengage power to all operating equipment: (1) before leaving operator's position, (2) before making any repairs or adjustments, or (3) when not in use.

Take all possible precautions when leaving the equipment unattended; such as disengaging the hydraulic system, shifting vehicle out of gear, setting parking brake, shutting off engine and removing key. Never leave raised bed unattended.

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THE BEST SAFETY DEVICE IS A CAREFUL OPERATOR SAFETY ALERT SYMBOL



THIS SYMBOL MEANS ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!
PLEASE READ AND UNDERSTAND COMPLETELY BEFORE DO-
ING!

SAFE EQUIPMENT INSTALLERS and OPERATORS:



TURN OFF ALL POWER BEFORE PERFORMING ANY SERVICE OPERATIONS

- FOLLOW RECOMMENDED OPERATING PROCEDURES.
- KEEP EQUIPMENT IN SAFE OPERATING CONDITION AT ALL TIMES.
- RECOGNIZE AND AVOID HAZARDS WHILE OPERATING, SERVICING AND MAINTAINING EQUIPMENT.



NOTICE: INSTRUCTIONAL MATERIAL AND PARTS LISTS INCLUDED IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE.

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SAFETY PRECAUTIONS

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operating!**

Prevent Malfunction Engine



**Close gas shut off valve
during transport**

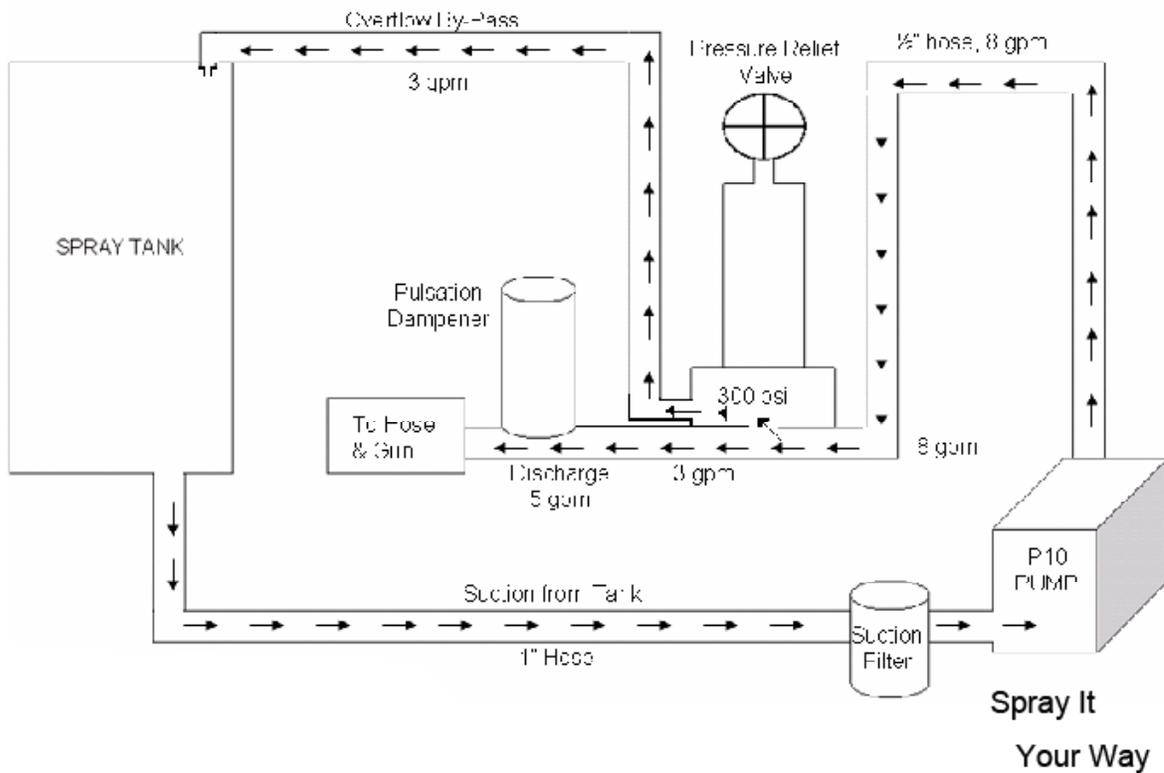
Sprayer **Components**

- **Tank**
 - The storage compartment for the water and chemical.
- **Pump**
 - Delivers the water and chemical from the tank to the spray gun or boom.
- **Engine or Motor**
 - Power Source
- **Pressure Regulator**
- **Suction Filter**



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Journey Through A Sprayer System



Pressure Regulator

- When the regulator is fully open and the spray gun is closed, all liquid is returned to the tank through the return line.
- As the regulator valve spring tension is increased, an increase of pressure occurs.
 - The greater the spring tension in the regulator, the greater the output pressure

Pressure Gauge



Without a pressure gauge, it is impossible to calibrate your sprayer and keep it calibrated.



Jet Agitation

- When the spray gun is turned **off**, the full amount of solution being pumped is returned through the jet agitator.
- When the spray gun is turned **on**, there is still sufficient solution being returned through the jet agitator to keep the chemical in solution.
- ***If there is no return when the spray gun or boom is turned on, the system is NOT properly calibrated.***

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Suction Filters

The purpose of the suction filter (line strainer) is to remove un-dissolved particles and debris from the solution before it enters the pump. This is to prevent clogging or damage to the equipment.



Filter Selection for Best Performance

1-4 GPM Pump – ½” Filter
5 GPM Pump – ¾” Filter
5-10 GPM Pump – 1” Filter
15-20 GPM Pump – 1 ¼” Filter
25-30 GPM Pump – 1 ½” Filter

Suction Filter

Maintenance

- The strainer is installed on the inlet side of the pump.
- The strainer can be cleaned without removing it from the line.
 - Unscrew the bowl from the cap and remove the screen.
 - Flush the sediment from the screen
 - Turn the bowl hand-tight. This provides a sufficient seal against the cap.
 - Make sure the rubber gasket is properly installed in the bowl. If it is not, there could be a suction leak and the pump will not function properly.

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TROUBLESHOOTING GUIDE

LOW OR LOST PRESSURE

- SUCTION FILTER

MUST BE CLEAN AND UNCLOGGED
DAMAGED OR MISSING GASKET
CRACKED HOUSING

- SUCTION LINE

LOOSE HOSE CONNECTIONS
FOREIGN OBJECTS IN THE SUCTION LINE
SUCTION LINE VALVE CLOSED

- PRESSURE REGULATOR

BY-PASS VALVE OPEN

- SPRAY GUN TIP TOO LARGE OR WORN

(THE PROPER TIP MUST BE INSTALLED TO MAINTAIN PRESSURE)

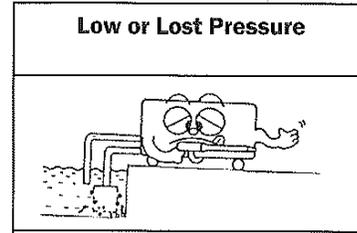
- PULLEY

DRIVE PULLEY SPINNING ON PUMP OR ENGINE (PULLEY KEY MISSING)
BELTS LOOSE

- MALFUNCTIONING PRESSURE REGULATOR

- WORN PUMP SUCTION AND DISCHARGE VALVES

- WORN PUMP VALVE CHAMBER



ABNORMAL SUCTION

- SUCTION FILTER

MUST BE CLEAN AND UNCLOGGED
MISSING OR DAMAGED GASKET
CRACKED HOUSING

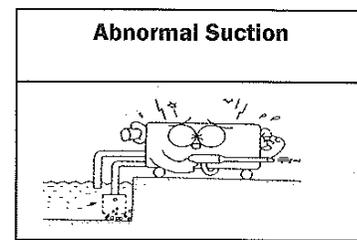
- SUCTION LINE

LOOSE HOSE CONNECTIONS
FOREIGN OBJECTS IN THE SUCTION LINE
SUCTION LINE VALVE CLOSED

- WORN PUMP SUCTION AND DISCHARGE VALVES

- PULLEY

DRIVE PULLEY SPINNING ON PUMP OR ENGINE (PULLEY KEY MISSING)
BELTS LOOSE

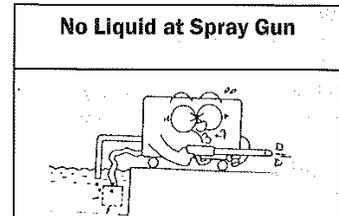


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TROUBLESHOOTING GUIDE

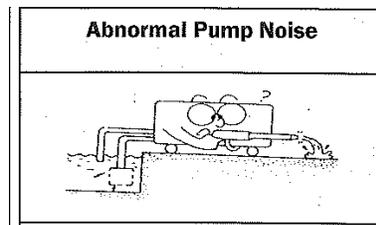
NO LIQUID AT SPRAY GUN

- **SUCTION LINE**
 - FILTER CLOGGED
 - FOREIGN OBJECTS IN THE SUCTION LINE
 - SUCTION LINE VALVE CLOSED
- **PRESSURE REGULATOR**
 - BY-PASS VALVE OPEN
- **PULLEY**
 - DRIVE PULLEY SPINNING ON PUMP OR ENGINE (PULLEY KEY MISSING)
 - BELTS LOOSE
- **WORN PUMP SUCTION AND DISCHARGE VALVES**
- **TRASH IN SUCTION OR DISCHARGE VALVE**



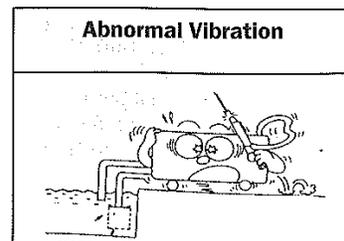
ABNORMAL PUMP NOISE

- **SUCTION FILTER**
 - MUST BE CLEAN AND UNCLOGGED
 - MISSING OR DAMAGED GASKET
 - CRACKED HOUSING OR FILLINGS
- **SUCTION LINE**
 - LOOSE HOSE CONNECTIONS
 - FOREIGN OBJECTS IN THE SUCTION LINE
 - SUCTION LINE VALVE CLOSED
 - SUCTION LINE TOO SMALL
- **WORN PUMP SUCTION AND DISCHARGE VALVES**
- **OVER SPEEDING PUMP**



ABNORMAL VIBRATION

- **PULSATION DAMPENER/
AIR CHAMBER FULL OF WATER**



Pressure Drop Through Hose

Flow In GPM	Pressure Drop in PSI (In 10ft. Length - Without Couplings)									
	1/4" I.D.	3/8" I.D.	7/16" I.D.	1/2" I.D.	5/8" I.D.	3/4" I.D.	1" I.D.	1 1/4" I.D.	1 1/2" I.D.	1 3/2" I.D.
0.2	.3									
0.3	.6									
0.4	1.0									
0.5	1.4	.2								
0.6	2.0	.3								
0.8	3.3	.5	.2							
1.0		.7	.3							
1.5		1.4	.6	.4						
2.0		2.4	1.1	.6						
2.5		3.4	1.9	.9						
3.0			2.4	1.2	.4					
4.0				2.0	.7					
5.0				2.9	1.0	.4				
6.0				4.0	1.4	.6				
8.0					2.6	.9	.3			
10.0					3.6	1.4	.4			
15.0						3.0	.8			
20.0							1.4			
25.0							2.0			
30.0							2.8			
40.0								1.6		.2
50.0								2.5		.3
60.0								3.4		.4
70.0									1.6	.6
80.0									2.0	.8
90.0									2.6	1.2
100.0									3.0	1.6

Maintenance Guide

Daily

- ◆ Clean Suction Filter – Be Careful with the Filter Gasket
- ◆ Check Oil
Pump- Usually SAE 30
Engine- Usually 10w30

Weekly

- ◆ Low cost pumps procured from a Taiwanese supplier
- ◆ Advanced IT enables cost savings in internal data sharing among distant sites
- ◆ Decreasing machinery maintenance expense over the past 5 years

Monthly

- ◆ Florida facility delivers prompt parts service demands
- ◆ Provide 2-year warranty on sprayer units to demonstrate quality products
- ◆ Effective differentiation by providing professional sprayers

Yearly

- ◆ Streamlined and standardized assembly process
- ◆ In-house variety manufacturing capabilities
- ◆ Speedy product development to meet changing demands

INSTALLATION AND INSTRUCTIONAL MANUAL ANTI- ICING SERIES

ELECTRIC WIRING KIT FOR GAS OR ELECTRIC SPRAYERS



WARNING: FAILURE TO FOLLOW INSTRUCTIONS could result in personal injury and/or damage to unit.

Read, understand, and follow all safety practices in Owner/Operator Manual before beginning.

Package Contents

Check contents of your kit for the parts listed (Figure 1):

Item	Qty	Description	Lesco P/N
1	6	Cable Tie, 8.5"	012470
2	25 ft.	Wire, 8 Ga. Insulated Black	010795
3	1	Circuit Breaker, 12V: 40 AMP	010847
4	2	1/4" Stud Ring Terminal, 8 Ga.	005788
5	2	3/8" Stud Ring Terminal, 8 Ga.	010628

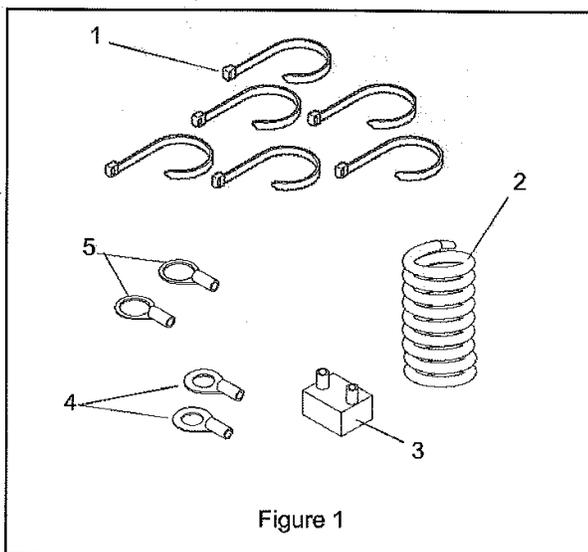


Figure 1

INSTALLATION

NOTE: The following instructions are for providing electric power from your vehicle's battery to the electric hose reel on your sprayer. The vehicle's battery must be a 12-volt automotive type. The vehicle can have either a positive or negative ground system and therefore polarity is not shown on the diagram.

WIRING

1. Disconnect the ground cable from the vehicle's battery.
2. Install the circuit breaker inside the vehicle's engine compartment near the vehicle battery but away from sources of heat and humidity.
3. Cut a length of #8 wire (item 2) required to reach from the ungrounded terminal (in most cases, this will be positive terminal) on the battery to the terminal marked "BAT" on the circuit breaker.
4. Attach a 3/8" ring terminal (item 5) to one end of the wire cut in step 3 and a 1/4" ring terminal (item 4) to the other.
5. Connect the 3/8" ring terminal (item 5) to the ungrounded terminal (in most cases, this will be positive terminal) on the battery and the 1/4" ring terminal (item 4) to the "BAT" terminal on the circuit breaker.
6. Attach a 1/4" ring terminal (item 4) to the remaining #8 wire (item 2) and connect it to the "AUX" terminal on the circuit breaker.
7. Route the remaining #8 wire (item 2) under the vehicle or through the fire wall (depending on your vehicle) to reach the sprayer. Use existing cable ties and the cable ties (item 1) provided in the kit to support the wire away from moving parts, heat sources or pinch points.
8. Route the #8 wire (item 2) to the solenoid mounted on the hose reel frame. If hose reel is manual, attach to engine solenoid. Cut away excess wire.
9. Attach a 3/8" ring terminal (item 5) to the #8 wire (item 2) and connect it to the solenoid terminal.

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NOTE: If the sprayer has been properly bolted to the frame of the vehicle with bolts passing through or over the sprayer's frame and the vehicle's frame, the sprayer is grounded and you can skip to step 11.

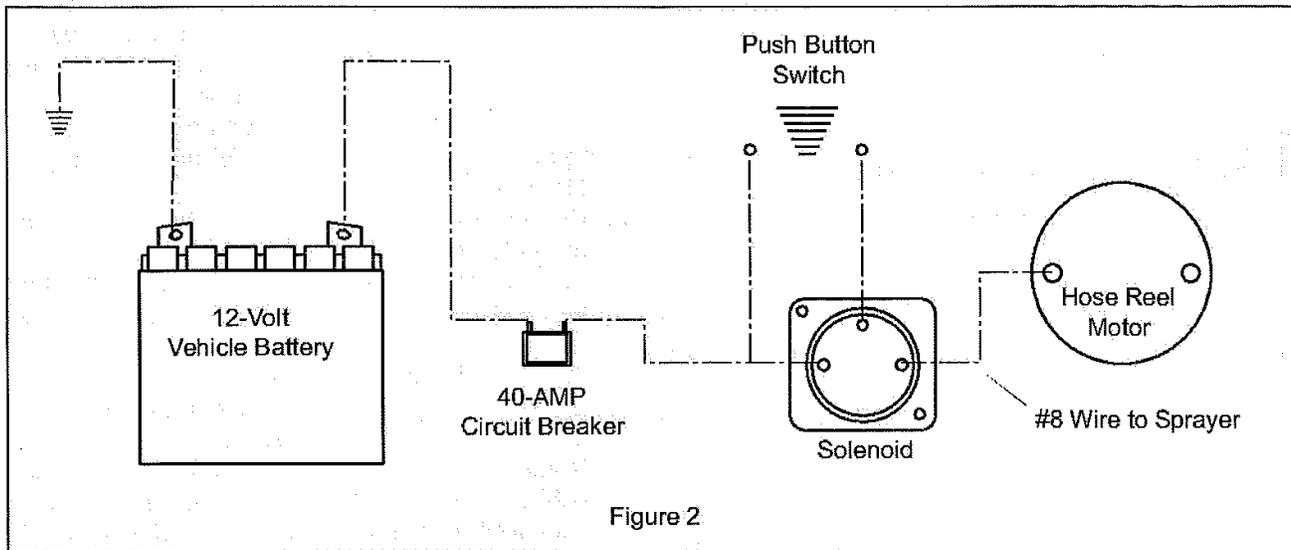
10. Ground the sprayer frame to the vehicle body:

- A. Locate a bolt on the vehicle's body near or under the sprayer's frame that can be easily removed and replaced.
- B. Place a bolt through the nearest hole punched in the sprayer's frame.
- C. Cut a length of #8 wire (item 2) to reach between these two bolts.
- D. Strip approximately 1 in. (2.54 cm) of insulation from each end of the wire.
- E. Remove the bolts or nuts and scrape away any paint that will prevent good metal to metal contact.
- F. Wrap the stripped ends of the wire around each bolt and replace the bolts and/or nuts. Make sure the nuts and bolts are secure.

11. Connect the ground cable disconnected in step 1 to the battery.

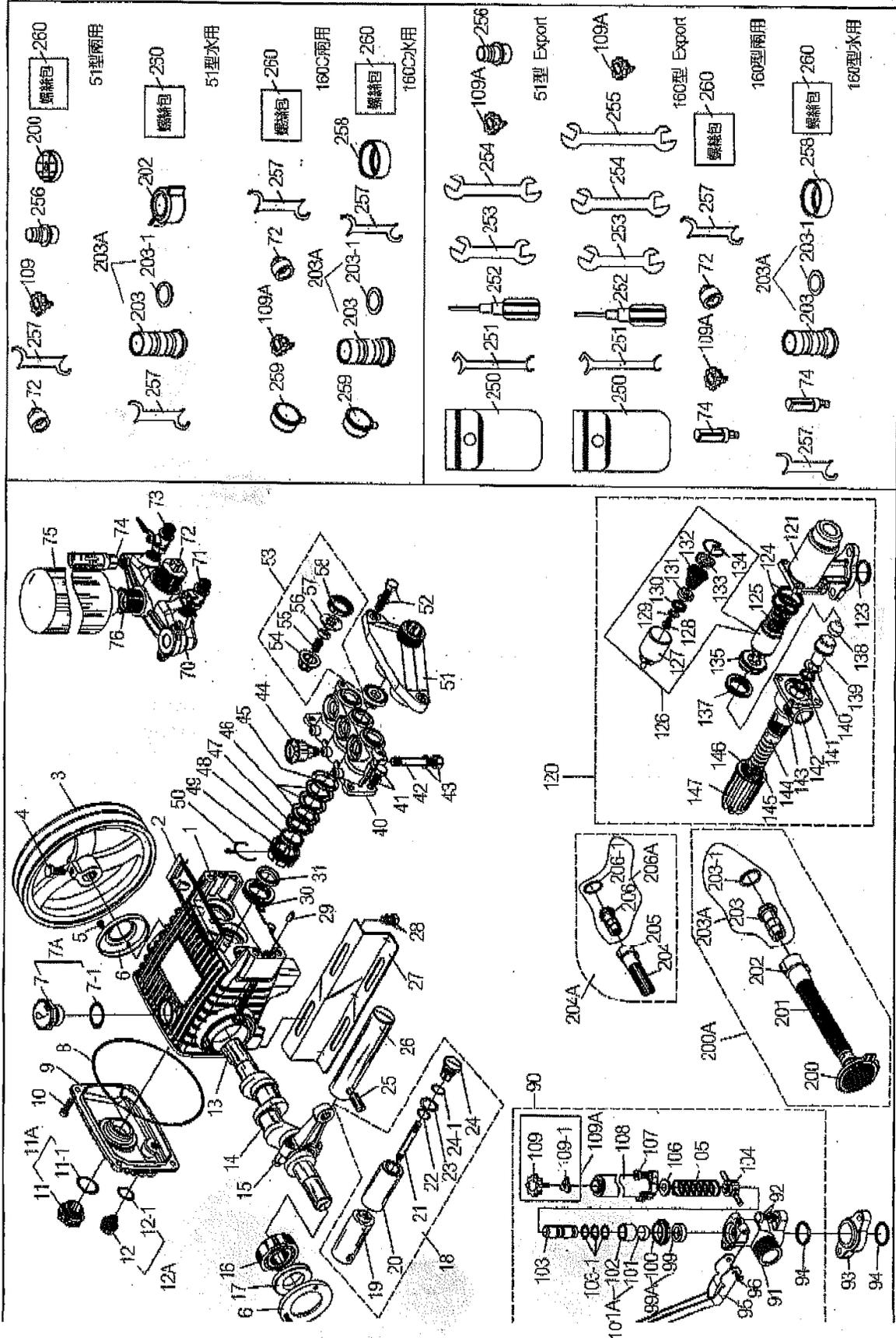
12. Test the circuit. Pull some hose from the reel and then push the reel switch on the reel mount frame. The reel should retrieve the hose and the engine electric start should work.

13. If your vehicle is equipped with a positive ground system, the reel will run in reverse and spill out some hose. To make the reel run properly, reverse the reel motor leads on the reel solenoid. Take the main lead that goes to the solenoid and interchange it with the lead that is grounded to the motor mounting.



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41-815W-000—P15 PUMP



INSTALLATION AND INSTRUCTIONAL MANUAL ANTI-ICING SERIES

41-815W-000—P15 PUMP PARTS LIST

NO.	DESCRIPTION
1	Crankcase
2	Dustproof Cap
3	Pulley
4	Set Bolt
5	Set Bolt
6	Crankshaft Oil Seal Cover
7A	Oil Inlet Cover Assy.
7	Oil Inlet Cover
7-1	O-Ring
8	Rear Cover Packing
9	Rear Cover
10	Set Bolt
11A	Oil Window Assy.
11	Oil Window
11-1	O-Ring
12A	Drainage Screw Assy.
12	Drainage Screw
12-1	O-Ring
13	Crankshaft Key
14	Crankshaft
15	Connecting Rod Assy.
16	Bearing
17	Crankshaft Oil Seal
18	Piston Assy.
19	Piston Rod
20	Ceramic Piston Sleeve
21	Double-End Screw
22	O-Ring
23	Gasket
24	Set Nut

NO.	DESCRIPTION
24-1	Back-Up Ring
25	Piston Ring
26	Piston (S.S.)
27	Crankcase Stand
28	Set Bolt, Washer
29	Set Pin
30	Piston Oil Seal
31	Waterproof Ring
40	Cylinder (CEDP) Cylinder (Cast Iron)
41	Set Bolt, Washer
42	Double End Screw
43	Set Bolt, Washer
44	Grease Cup (Brass) Grease Cup (Zinc)
45	V-Packing Seat
46	V-Packing (UCL) V-Packing (FPM) V-Packing (NBR) V-Packing (A120)
47	Grease Ring
48	V-Type O-Ring
49	Adjusting Ring
50	Set Clip
51	Suction Chamber (CEDP) Suction Chamber (Cast Iron)
52	Set Bolt, Washer
53	Valve Assy.
54	Valve Cage
55	Valve Spring

INSTALLATION AND INSTRUCTIONAL MANUAL ANTI- ICING SERIES

41-815W-000—P15 PUMP PARTS LIST

NO.	DESCRIPTION
56	Valve Plug
57	Valve Seat
58	Valve Packing
70	Outlet Chamber (Cast Iron) Outlet Chamber (CEDP)
71	Ball Valve
72	Plug
73	Ball Valve
74	Pressure Gauge
75	Air Chamber
76	O-Ring
90	Safety Valve Assy.
91	Overflow Chamber (Cast Iron) Overflow Chamber (CEDP)
92	Set Bolt, Washer
93	Overflow Rod Seat
94	Square Ring
95	Pressure Regulating Handle
96	Set Bolt
98	Square Ring
99A	Valve Seat Assy.
99	Valve Seat
100	Valve Seat Sleeve
101A	Pressure Valve Assy.
101	Pressure Valve
102	Pressure Valve Sleeve
103	Valve Rod
103-1	O-Ring
104	Spring Seat
105	Pressure Regulating Spring

NO.	DESCRIPTION
106	Spring Seat
107	Screw, Washer
108	Pressure Regulating Pipe
109A	Pressure Regulating Screw Assy.
109	Pressure Regulating Screw
109-1	Set Plate
120	Unloading Valve Assy.
121	Unloading Valve Cylinder
123	Square Ring
124	O-Ring
125	Auxiliary Spring
126	Piston Valve Assy.
127	Piston Valve Body
128	Screw, Washer
129	Valve Plug
130	O-Ring
131	Valve Plug Seat
132	Spring
133	Spring Seat
134	C-Type Ring
135	Valve Seat
137	Square Ring
138	Pressure Valve
139	Valve Rod
140	Damper Plate
141	O-Ring
142	Overflow Chamber
143	Screw, Washer
144	Spring Seat
145	Pressure Regulating Spring

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41-815W-000—P15 PUMP PARTS LIST

NO.	DESCRIPTION
146	Spring Seat
147	Pressure Regulating Nut
200A	Suction Hose Assy.
200	Filter
201	Suction Hose
202	Suction Hose Wing Nut
203A	Suction Hose Socket Assy.
203	Suction Hose Socket
203-1	Square Ring
204A	Overflow Hose Assy.
204	Overflow Hose
205	Overflow Hose Wing Nut
206A	Overflow Hose Socket Assy.
206	Overflow Hose Socket
206-1	Square Ring
250	Tool Kit
251	Adjusting Ring Spanner
252	Cross-Screw Kit
253	Open Spanner
254	Open Spanner
255	Open Spanner
256	Filter Socket
257	Adjusting-Ring Spanner
258	Suction Nut
259	Pressure Gauge
260	Spare Parts Kit

ATTENTION!

1. Check every fastener to make sure that the sprayer and engine are installed firmly onto the frame.
2. Set both pulleys in a straight line and set the belt to an appropriate tightness.
3. Check whether there is sufficient oil and use the appropriate fuel.
4. Before starting the engine, check both ON/OFF switches on the engine and the carburetor.
5. Connect the suction hose to the inlet of the sprayer. Leave the suction hose filter 20 cm above the bottom of the water tank in order to prolong the life of the sprayer.
6. Make sure the water supply is sufficient to allow the pump to reach its working pressure.
7. Connect the spray hose to the spray gun.
8. Open the exhaust cock before starting the engine in order to release air from the pump. Before using the spray gun for spraying, confirm the circulation of water in the pump is flowing properly.
9. To extend the life of the pump, always operate the machine according to its specific pressure. Adjust the pressure by turning the adjusting valve clockwise
10. In order to avoid damage to the packings and the pump, shut off the engine when not operating the pump for periods of 5 minutes or more.
11. Replace the oil in the pump after the first 10 to 15 hours of use. After this, the oil should be changed after every 70 hours of use. Make sure the oil is in good condition before each use.
12. Drain any sludge before changing the oil.
13. Replace and tighten the nut before refilling with #30-40 oil, then refill the oil level up to 2/3 of the oil window.
14. Always keep the grease cup filled with grease. Twist the grease cup twice for every 2 hours of spraying.
15. After finishing spraying, loosen the pressure regulator handle and operate the sprayer with fresh water to clean out any remaining chemicals.
16. Never aim the sprayer output directly at people or animals
17. Operate carefully, as the engine's working temperature is very hot.
18. Do not touch the Pulleys or belts when the sprayer is running.

TROUBLESHOOTING

1. Instability of working pressure and water supply:
 - A. Check whether the suction hose leaks or sticks.
 - B. Open the ball cock to flush any air from the system.
 - C. Remove the water inlet cover to check if the valve assemblies are stuck or damaged.
 - D. Check whether the suction filter is obstructed.
2. Insufficient pressure:
 - A. Check whether the pressure is property adjusted.
 - B. Check whether the belt is too loose.
 - C. Check whether the spray hose and the couplings are damaged.
 - D. Check whether the valve or valve sheath is worn.
3. Cylinder leakage:
 - A. Remove the dust-proof ring, then fasten the adjusting ring.
 - B. If the problem persists, replace the y-packing in the cylinder.
 - C. Check whether the plunger is damaged. A scraped plunger can lead to sprayer leakage and low pressure.

INSTALLATION AND INSTRUCTIONAL MANUAL ANTI- ICING SERIES

P10 PUMP

Operations and Parts Manual

SPRAYER START UP

1. Fill the engine with oil according to the engine manufacturer's specifications. (SAE 30).
2. Fill the pump with 30-weight oil, until the oil level is at the full mark on the pump oil sight gauge or dip stick.
3. Check the grease cups (ref # 50) to ensure they are full of grease.
4. Make sure all hoses are properly secured.
5. Make sure there is liquid in the tank.
6. Position the pressure bypass lever (ref # 108) on the pressure regulator in the fully clockwise (up) position. This relieves all pressure and bypasses all the liquid being pumped, back into the tank.
7. Start the engine and set the engine speed at approximately 3200-3400 RPM. *These use air cooled engines and should be run at full throttle during use.*
8. Close all the discharge valves allowing only the return line into the tank to remain open.
9. Check inside the tank to be sure there is liquid being pumped back into the tank through the return agitator.
10. Unscrew the threaded regulator handle (ref # 101) until it comes out of the regulator. Then put it back and screw it inward four (4) turns only.
11. Place the lever on the pressure regulator (ref # 108) in the fully counter-clockwise (down) position. A slight pressure should register on the pressure gauge.
12. Screw the regulator handle (ref # 101) inward until the desired operating pressure is obtained on the pressure gauge. Then, open all valves to the hose reel and place the spray gun in the open position, spraying back into the tank through the lid. The pressure may drop slightly, but this is normal. If the pressure drops below the desired pressure, adjust the regulator handle (ref #101) inward one (1) turn. If the pressure increases, continue to adjust inward until desired pressure is obtained with the spray gun in the "on" position. When the desired pressure is obtained, you are ready to go to work. !!! NEVER EXCEED 600 PSI !!! If the pressure will not go up to the desired operating pressure, do not continue to adjust the regulator screw handle inward.
13. **!! LEAVE THE SPRAY GUN IN THE ON POSITION AND GO TO STEP 15.**
14. Adjust the pressure regulator screw handle in the reverse direction until the pressure starts to drop, and place the pressure regulator bypass lever (ref #108) in the full (up) clockwise position. Then place the spray gun in the off position.
15. Re-check the engine RPM to make sure it is at 3200-3400 RPM.

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16. If you had to make any adjustments in step 15 or 16, repeat steps 10 thru 15
17. If you still cannot get the desired operating pressure, change the spray gun tip to the next smaller size, and repeat steps I thru K.
17. If you still cannot get the desired operating pressure, go to the trouble shooting guide (SECTION V.) or call Swenson Spreaders at 888-825-7323

SPRAYER SHUT DOWN AND STORAGE

1. Run the pump until all liquid is pumped out of the system. **Do not run the pump dry for more than 30 seconds.** Then shut the engine off and fill the tank with clean, clear water. Pump the tank empty. If the sprayer is going to be stored for several days, the following procedure is recommended:
2. Put 1 gallon of anti-freeze and 1 gallon of water or equivalent in the tank if temperatures are expected to be below 0° F. Check the freeze chart of the anti-freeze and add anti-freeze to recommended rating for expected temperatures.
3. Start the engine and allow the pump to operate just long enough to fill the system with the anti-freeze solution. This is accomplished when only anti-freeze mixture is coming out of the spray gun. Close the spray gun and allow the pump to operate for 1 minute.
4. Shut the system off and place in storage. This procedure keeps all the valves and other moving parts protected during storage.
5. When you are ready to use the system again, start the engine and allow the pump to operate until all anti-freeze has been pumped out of the system. Fill the tank with clear water and one bottle of ammonia-based cleaning liquid. Run the pump until this solution has been pumped out. Refill the system with clear water and pump the system dry once more. The spray system is now ready to go to work.

NOTE: The above procedure is highly recommended for sprayers in cold climates as a prevention of freezing and breaking the pump.

STANDARD MAINTENANCE CHECKS

FILLING AND CHANGING LUBRICATION OIL

Take off the oil cap (ref # 4) and fill with 30-weight oil to the full line on the indicator window or dip-stick. It is recommended to change oil every one

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hundred (100) hours of operation.

GREASE THE CYLINDERS

Each cylinder is equipped with a grease cup to prevent premature plunger and packing wear. Each cup must be filled with grease on the initial starting of the sprayer unit and filled weekly if necessary.

PUMP REPAIR

TO REPLACE PUMP PISTON PACKING

1. Unscrew the nuts located underneath the cylinder (ref # 49) and remove the discharge metal/manifold (item #71).
2. Unscrew the bolts (ref # 62) and remove the suction metal/manifold (ref # 60).
3. Unscrew the nuts (ref # 52) that hold the cylinder (ref # 49) on, and then the cylinder (ref # 49) should slide off the pistons.
NOTE: The cylinder (item #49) may require tapping with a non-metallic object to remove. The piston packing is inside the housing.
4. Unscrew the crown nut (ref # 44) with the special wrench supplied with the pump. With your fingers, you can now remove the grease ring (ref # 46) and also the V packing (ref # 47). Make sure to observe the direction of the v-shaped portion of the V packing. Install the new V packing in the same direction. Re-assembly may be accomplished by reversing the procedures.
5. After the pump is re-assembled, tighten the crown nut (ref # 44) with the same special tool used to remove them.
CAUTION: DO NOT OVER TIGHTEN!!
6. After the pump is back in operation, if there is any leakage, a slight tightening of the crown nut (ref # 44) may be necessary.
NOTE: Make sure to repack the grease cups (ref # 50) with grease before placing the pump back in operation.

REPLACING THE SUCTION AND DISCHARGE VALVE ASSEMBLIES

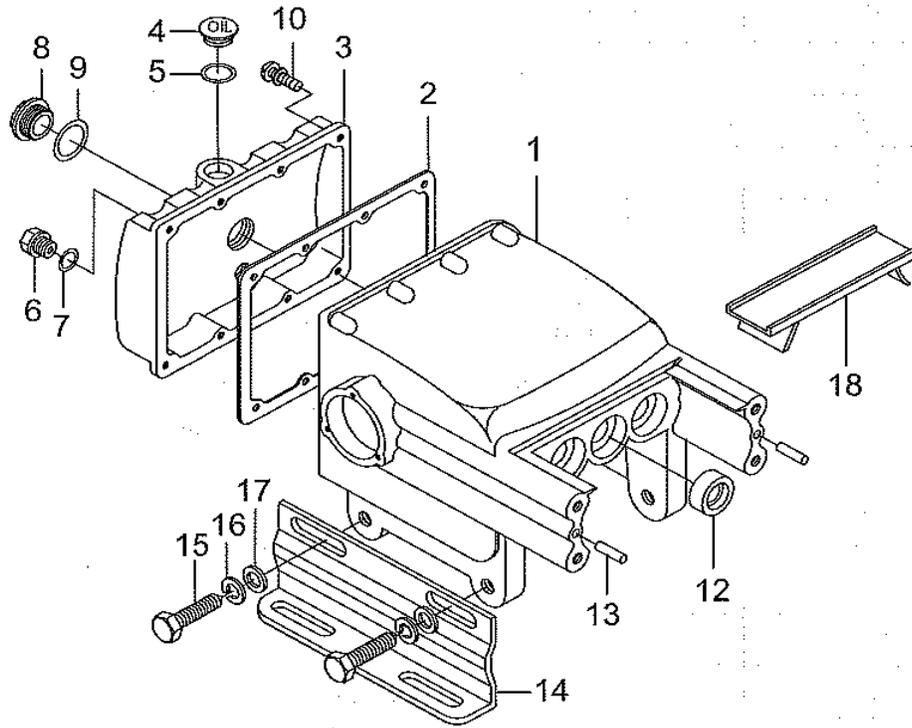
1. Unscrew the nuts located underneath the cylinder (ref # 49) and remove the discharge metal/manifold (ref # 71). Then the valve ass'y (ref # 53) may be removed with a screwdriver.
CAUTION: Careful not to damage the plunger (ref # 26)
2. Unscrew the bolts (ref # 62) and remove the suction metal/manifold (item #60). Then the valve ass'y (ref # 53) may be removed with a screwdriver.
3. Clean the insets where the valves sit to make the new valves seat properly.
4. Reassembly may be accomplished by reversing the disassembly procedure.

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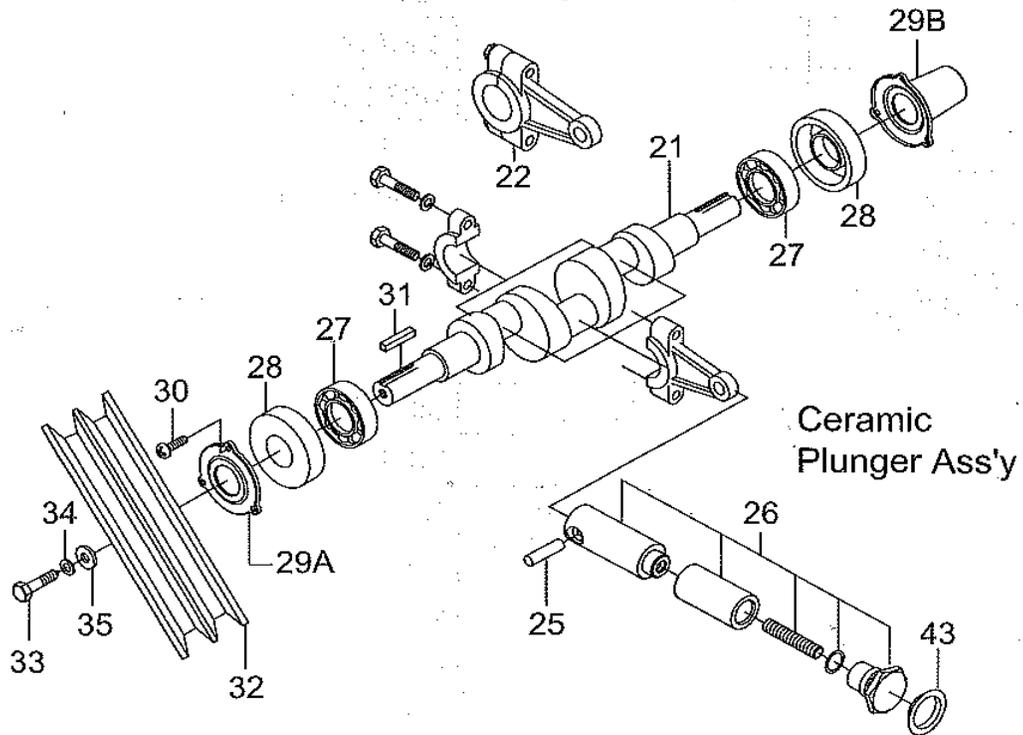
REPAIR KITS

PART #	DESCRIPTION
43-810-200	PRESSURE REGULATOR ASSEMBLY Complete pressure regulator (unassembled)
43-810-250	PRESSURE REGULATOR REBUILD KIT: Upper Metal, Spring, Under Metal, Packing, Spindle Guide, Oil Seal
43-810-325	PACKING REPAIR KIT: 9 Packings, 3 Crown Nuts, 3 Grease Rings, 3 V-Packing, 3 Water Stopping Rings, 3 Grease Packings
43-810-350	VALVE REPAIR KIT: 6 Valves, 6 Seals(Valve Box, Spring Valve, Valve Flat, Valve Seat, Valve Ring, Valve Seal)
43-810-375	PUMP PACKING KIT: 9 packings. Enough for all three cylinders
43-810-380	PUMP REBUILD KIT: 3 Crown Nuts, 3 Grease Rings, 3 V-Packing, 3 Water Stopping Rings, 3 Grease Packing, 9 Packing, 6 Valves, 6 Seals

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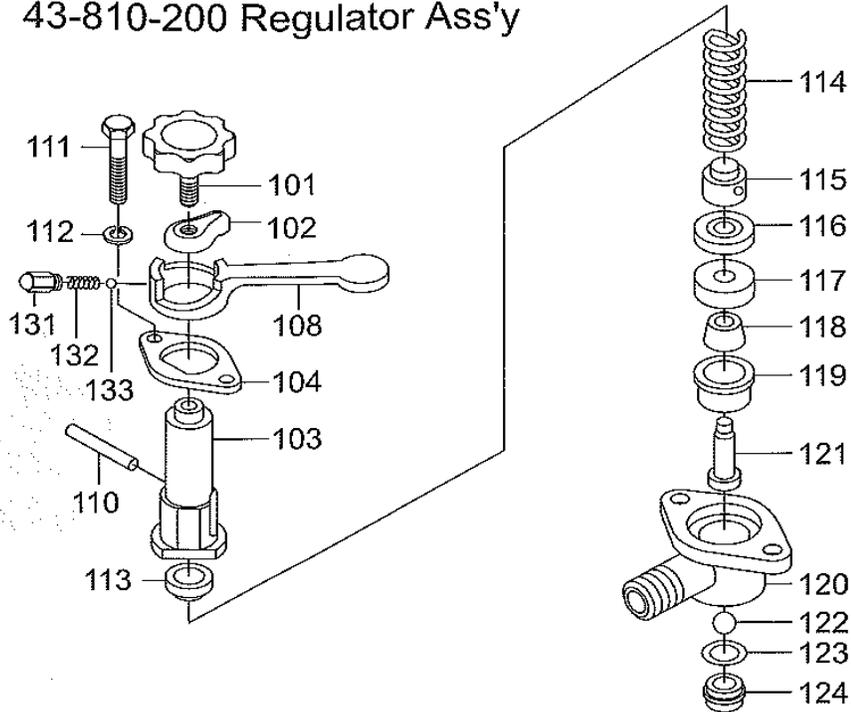


Connecting Rod Ass'y

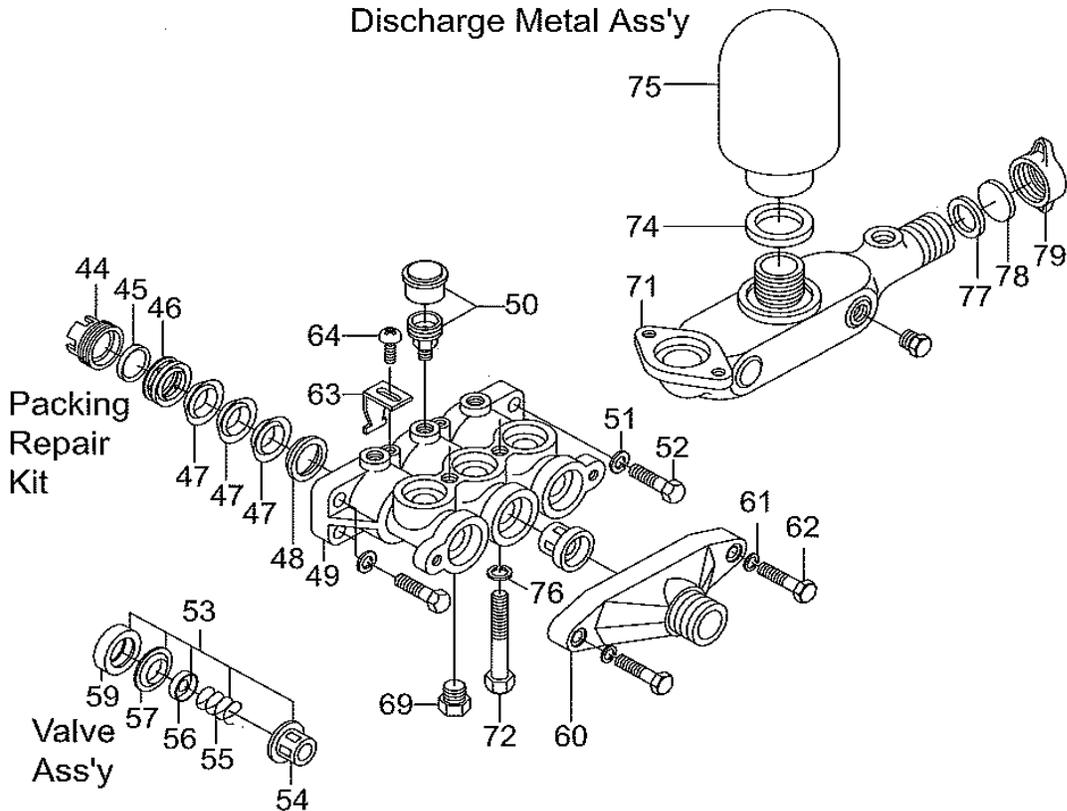


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43-810-200 Regulator Ass'y



42-810-80 Discharge Metal Ass'y



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REF #	PART #	DESCRIPTION
1	42-810-01	CRANK CASE
2	42-810-02	GASKET, CRANK CASE
3	42-810-03	COVER, CRANK CASE
8 & 9	42-810-04	OIL GAUGE & O-RING
6	42-810-05	PLUG, FUEL DRAIN
7	42-810-06	O-RING
10	42-810-07	SCREW
18	42-810-09	PLUNGER COVER
4	42-810-10	OIL CAP
5	42-810-11	O-RING
13	42-810-12	PIN
14	42-810-13	BED, CRANK CASE
15	42-810-14	BOLT
16	42-810-15	WASHER, SPRING
17	42-810-16	WASHER
21	42-810-21	CRANK SHAFT
22	42-810-22	CONNECTING ROD ASS'Y
25	42-810-25	PLUNGER PIN
26	42-810-26	CERAMIC PLUNGER ASS'Y
27	42-810-27	BEARING
28	42-810-28	OIL SEAL, CRANK SHAFT
29A	42-810-29A	COVER, OIL SEAL - A
29B	42-810-29B	COVER, OIL SEAL - B
30	42-810-30	SCREW
31	42-810-31	KEY
32	42-810-32	PULLEY
33	42-810-33	BOLT
34	42-810-34	WASHER, SPRING
35	42-810-35	WASHER
12	42-810-41	OIL SEAL, PLUNGER

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REF #	PART #	DESCRIPTION
43	42-810-43	STOPPING RING, WATER
44	42-810-44	GRAND
45	42-810-45	GREASE PACKING
46	42-810-46	GREASE RING
47	42-810-47	V-PACKING
48	42-810-48	V-PACKING SEAT
49	42-810-49	CYLINDER
50	42-810-50	GREASE CUP
51	42-810-51	WASHER, SPRING
52	42-810-52	BOLT
53	42-810-53	VALVE ASSY
54	42-810-54	BOX, VALVE
55	42-810-55	SPRING, VALVE
56	42-810-56	FLAT, VALVE
57	42-810-57	SEAT, VALVE
59	42-810-59	SEAL, VALVE
60	42-810-60	SUCTION METAL
61	42-810-61	WASHER, SPRING
62	42-810-62	BOLT
63	42-810-63	STOPPER, GRAND
64	42-810-64	SCREW
44-50	42-810-65	CYLINDER ASS'Y
69	42-810-69	PLUG, WATER DRAIN
71	42-810-71	DISCHARGE METAL
72	42-810-72	BOLT
74	42-810-74	PACKING
75	42-810-75	AIR CHAMBER
76	42-810-76	WASHER, SPRING
77	42-810-77	PACKING
78	42-810-78	WASHER
79	42-810-79	COUPLING
71,74,75,77-79	42-810-80	DISCHARGE METAL ASS'Y

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Dealers have the responsibility of calling to the attention of their customers the following warranty prior to acceptance of an order from that customer for any SWENSON® product.

WARRANTY

WHAT THIS WARRANTY COVERS

Swenson Spreader LLC (hereinafter "Swenson") is committed to assuring Customer satisfaction with the Spreader (hereinafter "Product"). Swenson warrants to the original owner (hereinafter "Purchaser") of the Product to be free from defects in material and workmanship for the following term: Swenson warrants ALL PARTS AND ASSEMBLIES to be free from defects in material and workmanship for a period of one year from the date of purchase. Installation of the Product must be in accordance with Swenson's instructions. This warranty extends to the Purchaser and may not be assigned without the prior written approval of Swenson; except a distributor may assign this warranty to the first titled owner of the Product.

If a Product has a defect in material or workmanship covered by the warranty, Swenson will (at our option) either replace or repair said part. Swenson's has sole discretion as to repair of defects covered by this warranty, or replacement of the Product. Swenson's responsibilities as described herein shall not exceed the amount of the purchase of the Product.

WHAT THIS WARRANTY DOES NOT COVER

Swenson's warranty does not extend to Product which have been misused, abused, improperly installed, repaired with non-genuine Swenson parts, improperly cared for, if materials such as lava rock or cinders are used, or for which payment has not been made. The warranty is void if repairs or alterations to the Product are made by unauthorized persons, or the Product serial numbers have been altered or defaced.

All gasoline engines and hydraulic pumps are warranted by their manufacturer and not by Swenson Spreader LLC. Electrical or hydraulic components are not to be disassembled without the express written permission of Swenson Spreader LLC.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. THERE IS NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SWENSON'S MAXIMUM OBLIGATION AND LIABILITY UNDER THIS WARRANTY SHALL BE LIMITED TO AN AMOUNT EQUAL TO THE PRESENT PURCHASE PRICE FOR THE SWENSON PRODUCT. SWENSON SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE, WHETHER DIRECT OR INDIRECT, INCIDENTAL, CONSEQUENTIAL OR OTHERWISE ARISING OUT OF BREACH OF THIS WRITTEN WARRANTY OR ANY IMPLIED WARRANTY. Some states do not allow limitations on how long an implied warranty will last or the exclusion or limitation of incidental or consequential damages.

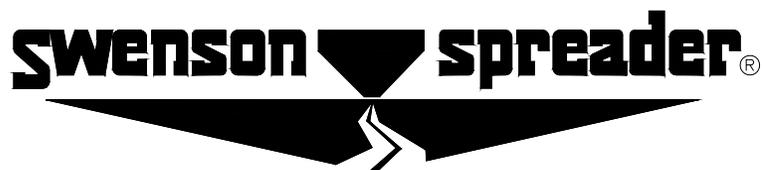
Defective parts returned to Swenson Spreader LLC must be accompanied by the following information:

RGA # _____
Spreader Model _____
Serial Number _____
Date Installed _____
Where Purchased _____

Purchaser accepts these terms and warranty limitations unless product is returned within fifteen days for full refund of purchase price.

Effective 4/15/05

**INSTALLATION AND INSTRUCTIONAL MANUAL
ANTI- ICING SERIES**



**SWENSON SPREADER LLC
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**IMPORTANT
INFORMATION
ENCLOSED**