



## SX AIRLESS SPRAY PUMPS SERIES

OPERATING INSTRUCTIONS  
& SERVICE MANUAL



### Important Safety Instructions

Read all warnings and instructions in this manual.  
Save these instructions.

**Storm Machinery**

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# Contents

<b>Models</b> .....	3	<b>Technical Data</b> .....	24
<b>Warnings</b> .....	4	Application Information .....	25
<b>Component Identification - Trolley Mount</b> .....	6	<b>Storm Machinery Standard Warranty</b> .....	27
System Components .....	7	<b>Storm Machinery Information</b> .....	27
<b>Grounding</b> .....	8		
<b>Setup</b> .....	8		
<b>Pressure Relief Procedure</b> .....	9		
Trigger Lock .....	9		
<b>Prime/Flush</b> .....	10		
<b>Spray</b> .....	12		
<b>Shutdown</b> .....	13		
<b>Maintenance</b> .....	14		
Preventive Maintenance Schedule .....	14		
Daily Maintenance .....	14		
Corrosion Protection .....	14		
Trolley Maintenance .....	14		
<b>Troubleshooting</b> .....	15		
<b>Pump Lower Removal &amp; Fitment</b> .....	16		
Disconnect and Reconnect Lower .....	16		
<b>Air Motor Parts</b> .....	17		
<b>Pump Lower with 145cc lower (95:1 ratio)</b> .....	19		
<b>Pump Lower with 180cc lower (75:1 ratio)</b> .....	20		
<b>Pump Lower with 220cc lower (63:1 ratio)</b> .....	21		
<b>Pump Lower with 250cc lower (55:1 ratio)</b> .....	22		
<b>Pump Lower with 290cc lower (47:1 ratio)</b> .....	23		
<b>Dimensions</b> .....	24		
Weights .....	24		

# **N270 type Air Motor & X- type Displacement Sprayer**

## **Part No. SX290-000, (290cc)**

*4090 psi (282 bar) Maximum Fluid Working Pressure*

## **Part No. SX250-000, (250cc)**

*4786 psi (330 bar) Maximum Fluid Working Pressure  
(Only Available on Request)*

## **Part No. SX220-000, (220cc)**

*5483 psi (378 bar) Maximum Fluid Working Pressure*

## **Part No. SX180-000, (180cc)**

*6527 psi (450 bar) Maximum Fluid Working Pressure*

## **Part No. SX145-000, (145cc)**

*8267 psi (570 bar) Maximum Fluid Working Pressure*

### **Pump Packages**

*When ordering replacement parts, please ensure you check your pump identification plate. (This is located on the base of the Air Motor)*

*Refer to the correct section of this manual, to obtain the correct reference numbers and part number for the package.*

*Please contact your nearest agent or Customer Services department should you require any assistance or additional information when ordering replacement parts. We cannot accept any liability for financial losses incurred by customers who have ordered parts incorrectly.*

# Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. Refer back to these Warnings. Additional, product-specific warnings may be found throughout the body of this manual where applicable.

 <b>WARNING</b>	
	<b>FIRE AND EXPLOSION HAZARD</b> <p>Flammable fumes, such as solvent and paint fumes, in <b>work area</b> can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"><li>• Use equipment only in well ventilated area.</li><li>• Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).</li><li>• Keep work area free of debris, including solvent, rags and gasoline.</li><li>• Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.</li><li>• Ground all equipment in the work area. See <b>Grounding</b> instructions.</li><li>• Use only grounded hoses.</li><li>• Hold gun firmly to side of grounded pail when triggering into pail.</li><li>• If there is static sparking or you feel a shock, <b>stop operation immediately</b>. Do not use equipment until you identify and correct the problem.</li><li>• Keep a working fire extinguisher in the work area.</li></ul>
	<b>SKIN INJECTION HAZARD</b> <p>High-pressure fluid from gun, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. <b>Get immediate surgical treatment.</b></p> <ul style="list-style-type: none"><li>• Do not point gun at anyone or at any part of the body.</li><li>• Do not put your hand over the spray tip.</li><li>• Do not stop or deflect leaks with your hand, body, glove, or rag.</li><li>• Do not spray without tip guard and trigger guard installed.</li><li>• Engage trigger lock when not spraying.</li><li>• Follow <b>Pressure Relief Procedure</b> in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.</li></ul>

## **WARNING**

	<p><b>EQUIPMENT MISUSE HAZARD</b></p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"><li>• Do not operate the unit when fatigued or under the influence of drugs or alcohol.</li><li>• Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See <b>Technical Data</b> in all equipment manuals.</li><li>• Use fluids and solvents that are compatible with equipment wetted parts. See <b>Technical Data</b> in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS forms from distributor or retailer.</li><li>• Check equipment daily. Repair or replace worn or damaged parts immediately with genuine Storm Machinery replacement parts only.</li><li>• Do not alter or modify equipment.</li><li>• Use equipment only for its intended purpose. Call your Storm Machinery distributor for information.</li><li>• Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.</li><li>• Do not kink or over bend hoses or use hoses to pull equipment.</li><li>• Keep children and animals away from work area.</li><li>• Comply with all applicable safety regulations.</li></ul>
  MPa bar PSI	<p><b>MOVING PARTS HAZARD</b></p> <p>Moving parts can pinch or amputate fingers and other body parts.</p> <ul style="list-style-type: none"><li>• Keep clear of moving parts.</li><li>• Do not operate equipment with protective guards or covers removed.</li><li>• Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the <b>Pressure Relief Procedure</b> in this manual. Disconnect power or air supply.</li></ul>
	<p><b>TOXIC FLUID OR FUMES HAZARD</b></p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"><li>• Read MSDS's to know the specific hazards of the fluids you are using.</li><li>• Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.</li></ul>
	<p><b>PERSONAL PROTECTIVE EQUIPMENT</b></p> <p>You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to:</p> <ul style="list-style-type: none"><li>• Protective eyewear</li><li>• Clothing and respirator as recommended by the fluid and solvent manufacturer</li><li>• Gloves</li><li>• Hearing protection</li></ul>

# Component Identification - Cart Mount

A Air Motor  
B Air Inlet (3/4 npt) F  
C Air Regulator & Gauge  
D Silencer  
E Air Pressure Gauge  
F Air Regulator Adjustment Knob  
G Surge Chamber  
J Fluid Drain/Purge Valve (required)

K Fluid Outlet  
L Optional Fluid Outlet, for second gun (hidden)  
M Lower  
N Suction Hose and Tube  
O Trolley & Frame  
P Packing Nut (hidden)  
Q Master Air Inlet Valve (Ball Valve)  
R Ground Wire (Required - not shown)

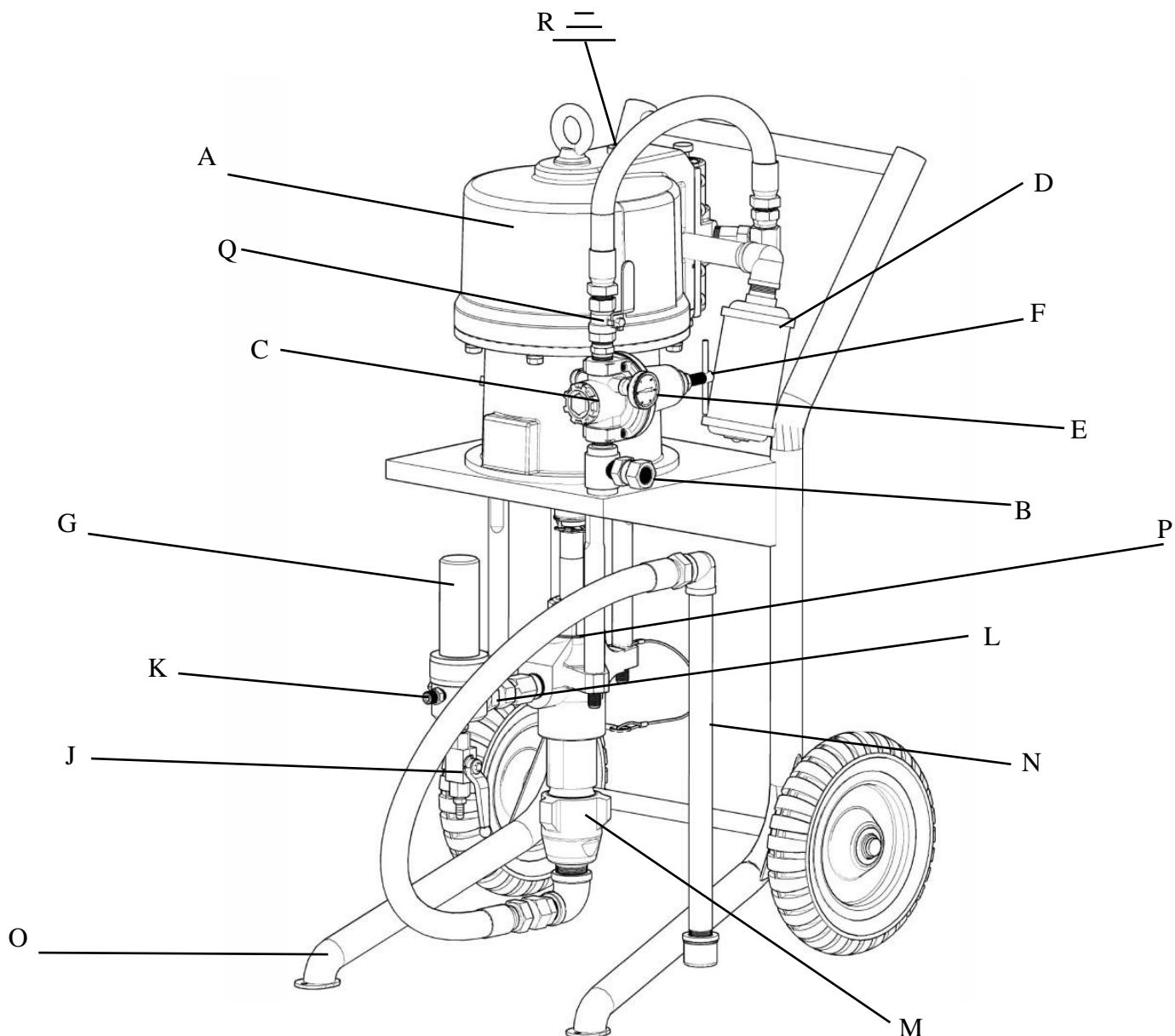
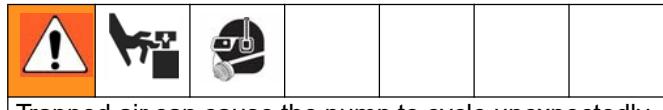


FIG. 1: Airless Sprayer

# System Components

## \* Master Air Valve (Q)



Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury from splashing or moving parts.

- Be sure the valve is easily accessible from the pump and located downstream from the air regulator.
- Required in your system to relieve air trapped between it and the air motor when the valve is closed.
  - Open to supply air to the motor.
  - Close to shut off air to the motor, and bleed any trapped air from the motor.

## Air Regulator Adjustment (F)

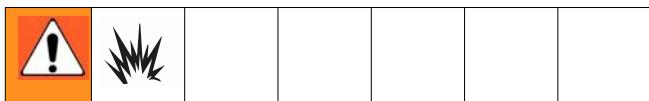
Adjusts air pressure to the motor and fluid outlet pressure of pump. Locate it close to the pump. Read air pressure on gauge (E).

## \* Fluid Drain/Purge Valve (J)

Open valve to relieve pressure and when flushing or priming pump. Close valve when spraying.

*\* Required system components.*

# Grounding

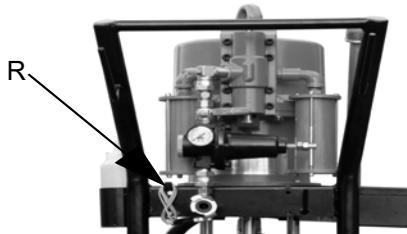


The equipment must be grounded. Grounding reduces the risk of static and electric shock by providing an escape wire for the electrical current due to static build up or in the event of a short circuit.

**Table 1: Tools Required**

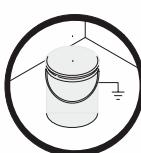
- Grounding wires and clamps for pails
- Two 5 gal. (19 litre) metal pails

1. Connect the ground wire (R) to the ground stud on the air motor.

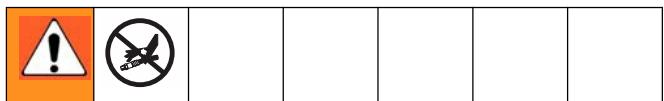


**FIG. 2**

2. Connect the other end of the ground wire to a true earth ground.
3. Ground the object being sprayed, fluid supply container, and all other equipment in the work area. Follow your local code. Use only electrically conductive air and fluid hoses.
4. Ground all solvent pails. Use only metal pails, which are conductive, placed on a grounded surface. Do not place pail on a nonconductive surface, such as paper or cardboard, which interrupts grounding continuity.



# Setup

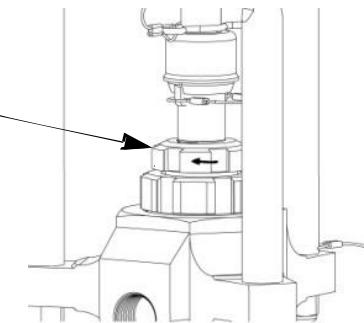


To avoid tip over, ensure cart is on a flat and level surface. Failure to do so could result in injury or equipment damage.

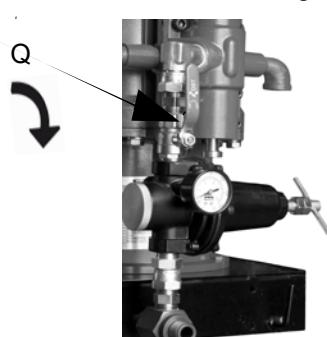
**Table 2: Tools Required**

- Two adjustable wrenches
- Non-sparking hammer or plastic mallet
- Torque wrench

1. Ground sprayer.
2. Check packing nut (P). Fill with Throat Lubricant (DOP). Torque to 34-41 N.m. (25-30 ft-lb).



3. Attach electrically conductive fluid hose to pump Outlet (K) and tighten.
4. Attach electrically conductive fluid hose (and air hose if using an AA gun) to gun and tighten.
5. Close bleed type master air valve (Q). Connect air supply hose to 3/4 npt(f) air inlet (B).
6. Flush before using. See page 10.
7. Prime before using. See page 10.



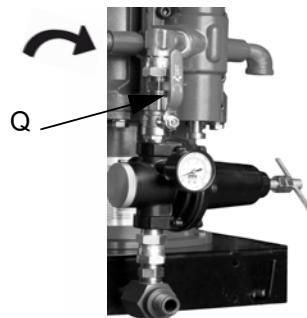
# Pressure Relief Procedure



- Engage gun trigger lock.



- Close bleed type master air valve (Q).



- Disengage gun trigger lock.

If using an AA gun, turn gun air regulator counter-clockwise to relieve pressure.



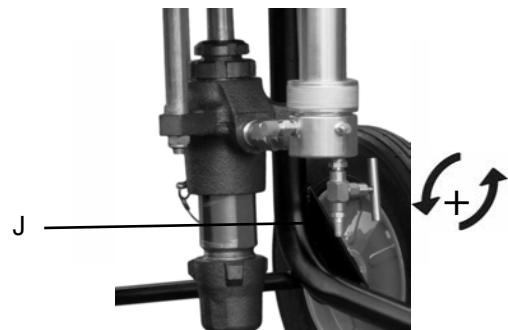
- Hold gun firmly against a grounded metal pail. Pull the trigger on the gun.



- Engage gun trigger lock.



- Drain fluid. To drain fluid, slowly open all fluid drain valves, including drain/purge valve (J), in system into a waste pail. If there is a return tube, open return line ball valve.



- If you suspect the spray tip or hose is completely clogged, or that pressure has not been fully relieved after following the previous steps, very slowly loosen the tip guard retaining nut or hose end coupling and relieve pressure gradually; then loosen completely. With tip removed, trigger gun into bucket.

## Trigger Lock

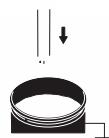


Always engage gun trigger lock when you stop spraying to prevent gun from being triggered accidentally by hand or if dropped or bumped.

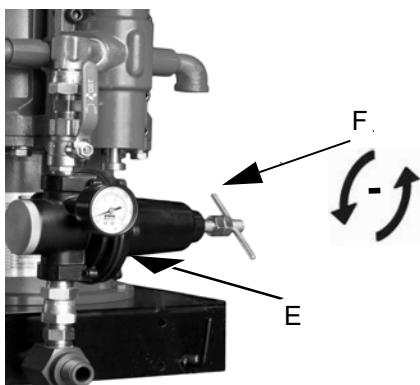
# Prime/Flush



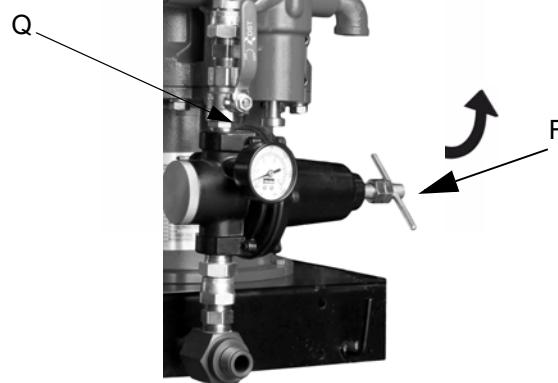
1. Follow **Pressure Relief Procedure**, page 9.
2. Remove tip and tip guard from gun.
3. *Flushing only:* If desired, remove built-in fluid filter (present on some models). Reinstall filter cap after removing fluid filter.
4. Place suction tube in a compatible fluid (if priming) or solvent (if flushing).



5. Turn regulator adjustment knob (F) counterclockwise until it stops, or gauge (E) reads zero.



6. Open bleed type master air valve (Q). Turn Regulator adjustment Knob (F), clockwise until the pump starts to stroke.



7. Prime or flush hose and gun:

- a. Disengage gun trigger lock.



- b. Trigger gun into grounded pail until a steady stream comes from gun. **If flushing**, trigger gun for 10-15 seconds.



If using an AA gun, increase air pressure by turning gun regulator clockwise.

- c. Engage trigger lock.
- d. Turn Regulator adjustment knob (F) counter clockwise, until it stops and Gauge (E) reads zero.
8. If priming, equipment is now ready to spray; go to **Spray**, page 12.

If flushing, proceed with step 9 overleaf.

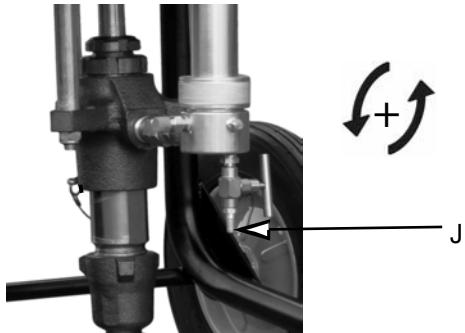


The remaining steps are for flushing only.

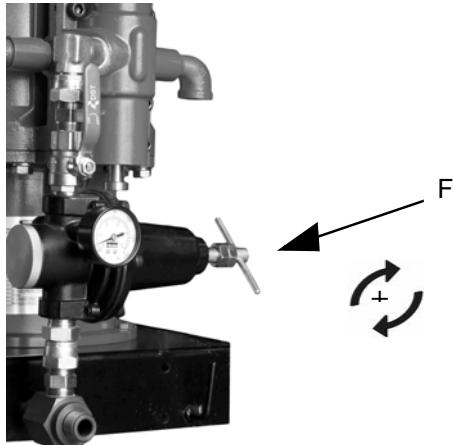
<b>CAUTION</b>
Do not prime pump through drain/purge valve using two component materials. Mixed two-component materials will harden in valve and result in clogging.

9. Place drain tube in a grounded waste pail.

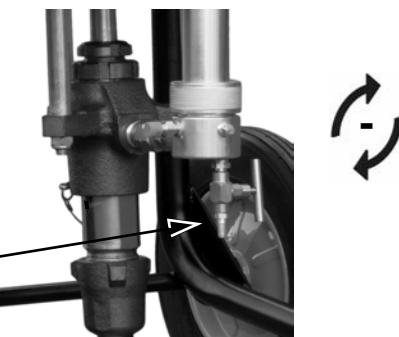
Open drain/purge valve (J) slightly by rotating counterclockwise.



10. Start the pump by rotating the air regulator adjustment knob (F) clockwise until pump begins to move.



11. When clean solvent flows from drain tube close drain/purge valve (J) by rotating clockwise. Pump will stall.



12. Follow **Pressure Relief Procedure**, page 9. Leave solvent in and store sprayer.

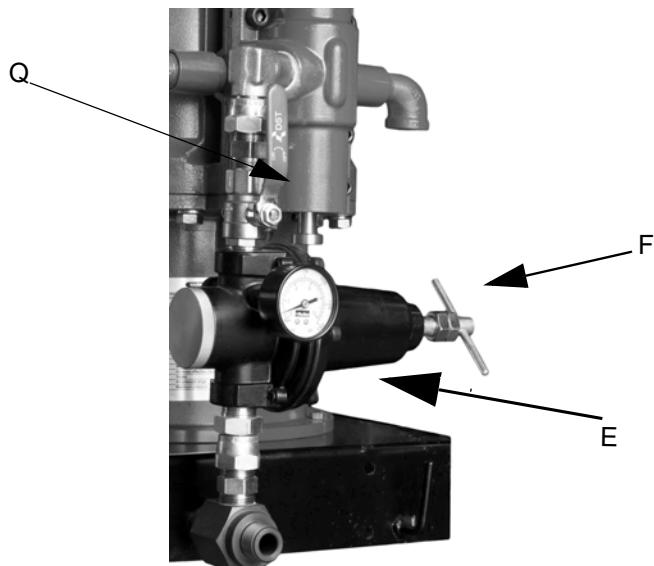
# Spray



## CAUTION

Do not allow pump to run dry. It will quickly accelerate to a high speed causing damage.

1. Prime. See **Prime/Flush**, page 10.
2. Follow **Pressure Relief Procedure**, page 9.
3. Install tip and tip guard on gun.
4. Open bleed type master air valve (Q).

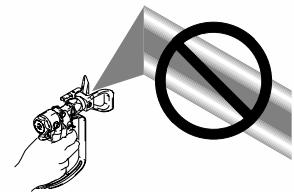
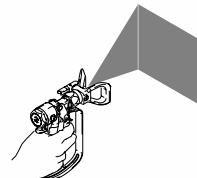


5. Turn regulator adjustment knob (F) until gauge (E) reads desired pressure. Turn clockwise to increase pressure, counterclockwise to decrease pressure.

6. Disengage gun trigger lock.



7. Spray a test pattern. Read fluid manufacturer's recommendations. Adjust as necessary. If using an AA gun, increase gun air pressure while testing spray pattern.



8. Flush when done spraying. See **Prime/Flush**, page 10.
9. Follow **Pressure Relief Procedure**, page 9.

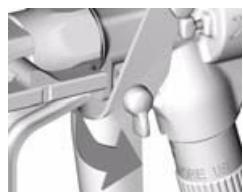
# Shutdown



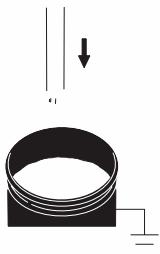
## CAUTION

Never leave water or water-base fluid in pump overnight. If you are pumping water-base fluid, flush with water first, then with a rust inhibitor, such as mineral spirits. Relieve pressure, but leave rust inhibitor in pump to protect parts from corrosion.

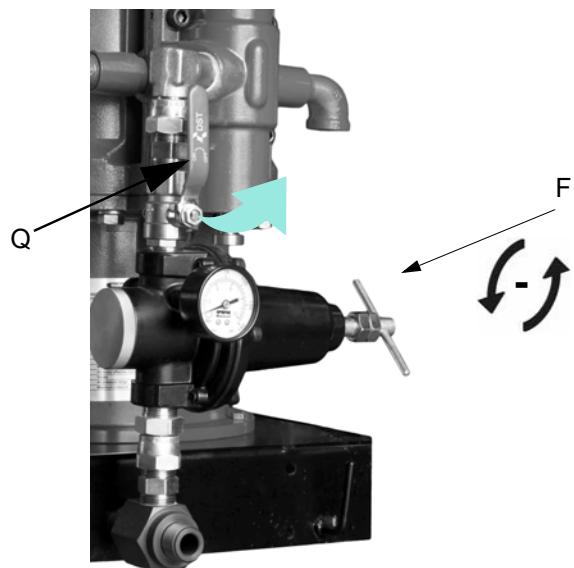
1. Follow **Pressure Relief Procedure**, page 9.
2. Remove tip and tip guard from gun.
3. Engage gun trigger lock.



4. Place siphon tube in grounded metal pail containing cleaning fluid.



5. Turn regulator adjustment knob (F) counterclockwise to lowest possible fluid pressure. Then open master air valve (Q).



6. Hold a metal part of the gun firmly to a grounded metal pail. Trigger the gun until clean solvent dispenses.



7. Follow **Pressure Relief Procedure**, page 9.

# Maintenance

## Preventive Maintenance Schedule

The operating conditions of your particular system determine how often maintenance is required. Establish a preventive maintenance schedule by recording when and what kind of maintenance is needed, and then determine a regular schedule for checking your system.

## Daily Maintenance



 For overnight shutdown, stop pump at bottom of its stroke to prevent fluid from drying on exposed displacement rod and damaging throat packings. Follow **Pressure Relief Procedure**, page 9.

1. Flush. See **Prime/Flush**, page 10.
2. Relieve pressure. See **Pressure Relief Procedure**, page 9.
3. Check packing nut (P, FIG. 1). Adjust packings and replace DOP as necessary. Torque to 34-41 N.m (25-30 ft-lb).
4. Drain water from air filter (if fitted)
5. Clean suction tube using a compatible solvent. It is recommended that you clean the outside of the sprayer using a cloth and compatible solvent.
6. Check hoses, tubes, and couplings. Tighten all fluid connections before each use.
7. Clean fluid line filter.

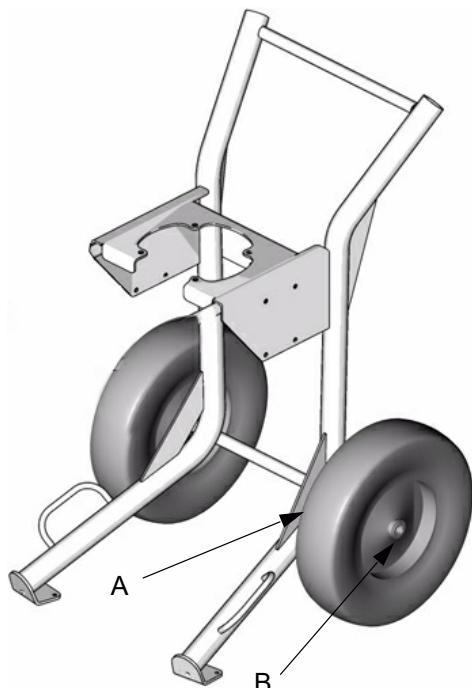
## Corrosion Protection

Always flush the pump before the fluid dries on the displacement rod. Never leave water or water-based fluid in the pump overnight. First, flush with water or a compatible solvent, then with mineral spirits. Relieve the pressure, but leave the mineral spirits in the pump to protect the parts from corrosion.

## Cart Maintenance

Periodically lubricate the axle between points A and B with lightweight oil. See FIG. 4 below.

Keep the cart clean by wiping up spills daily, using a compatible solvent.



**FIG. 4: Trolley Assembly (not to scale)**

# Troubleshooting



1. Follow **Pressure Relief Procedure**, page 9.
2. Check all possible causes and problems before disassembling pump.

Problem	Cause	Solution
Pump does not operate	Air Valve and/or hose closed or clogged  Damaged Air Regulator  Hose and/or Gun obstructed with product (paint)  Cured/dried fluid(paint) seizure of displacement rod  Air motor stopped on change over  Air motor parts, dirty, worn or damaged.	Check that all valves are open and in good working order. Clean and clear air Line. Increase air supply  Replace Air Regulator  Clean/flush hose and/or gun (replace if necessary)  Clean displacement rod; Clean H.P. Filter Manifold; Always stop pump at bottom of stroke and keep wet-cup filled with compatible solvent; check and replace lower packings if necessary  Push override plunger  Clean or repair Air motor
Output low on both strokes	Inadequate air supply or Restricted Air line, Valves closed or clogged  Obstructed H.P.Filter manifold and/or hose and gun  Fluid hose ID too small.	Clear airline; Increase air supply Check all valves are open  Clean and clear obstruction in Filter/Hose/Gun.  Use larger ID fluid hose for application
Output low on down stroke	Intake valve obstructed/dirty or worn(damaged)  Worn Packings  High viscosity product	Clean or replace intake valve if necessary  Replace Packings  Adjust intake spacers
Output low on up stroke	Piston Valve obstructed/dirty or worn(damaged)  Worn packings	Clean or replace piston valve if necessary  Replace packings

\* To determine if fluid hose or gun is obstructed, follow **Pressure Relief Procedure**, page 9.

## Disconnect fluid

hose and place a container at pump fluid outlet to catch any fluid. Turn on air power just enough to start pump. If pump starts, the obstruction is in fluid hose or gun.

## Troubleshooting contd.

Problem	Cause	Solution
Erratic Pump Acceleration (run away)	Exhausted product supply, clogged suction hose  High Viscosity product  Obstructed or worn piston valve  Obstructed or worn intake valve or lower packings	Refill supply and prime pump. Clean suction tube  Adjust intake spacers  Clean or replace piston valve if necessary  Clean or replace intake valve if necessary Replace lower packings
Pump cycles or fails to hold pressure at stall	Worn Check Valves or Seals	Service Lower : See Pump Lower Removal page 17
Air bubbles in product	Loose or damaged suction tube	Tighten using compatible thread sealant or PTFE on connectors.  Replace suction tube if necessary
Poor Finish, Irregular spray pattern.	Incorrect fluid pressure at the gun  Fluid too thick or too thin (incorrect viscosity)  Spray gun dirty, damaged or worn.  Spray tip dirty, damaged or worn. Incorrect Tip Size for application	See gun manual; Increase pump pressure  Adjust fluid viscosity (See note Below)  Service or Replace spray gun if necessary.  Clean or Replace spray tip if necessary.  <b>N.B. ALWAYS Read fluid manufacturer's data sheet for recommendations.</b>

# Removal & Fitment of the Pump Lower

<b>CAUTION</b>					
Use caution when disconnecting lower; they can weigh up to 25 kg (55 lbs). Take appropriate precautions.					
Do not lift the pump by the lift ring when the total weight exceeds 250 kg (550 lb)					

## Required Tools

- Set of adjustable wrenches
- Torque wrench
- Rubber mallet
- Thread lubricant
- Anti-seize lubricant
- Loctite® 2760™ or equivalent

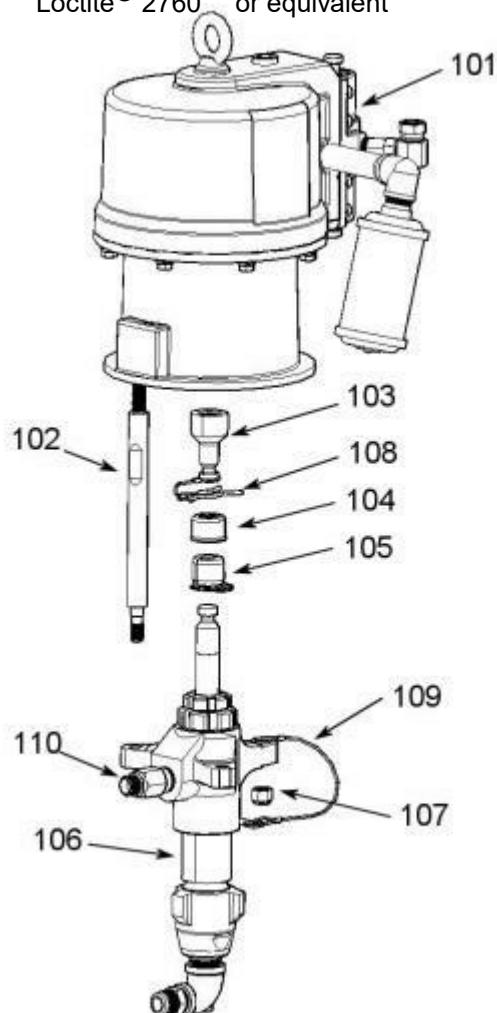


FIG. 4: Exploded View of Pump (not to scale)

NO.	Storm-code	G-code	Description	Qty
101	N270-100		AIR MOTOR	1
102	K254-001	197-329	ROD, Tie	3
103	K254-102	197-341	ADAPTER	1
104	K254-103	197-340	COVER	1
105	K254-104	244-819	COUPLING	
106	Nxxx-100		DIS. PUMP	1
107	K254-105	101-712	NUT	1
108	K254-106	244-820	CLIP, HAIRPIN	1

## DISCONNECTING THE PUMP LOWER

1. Flush the pump if possible; see Prime/Flush, page 10. Stop the pump at the bottom of its stroke. Follow, **Pressure Relief Procedure, page 9.**
2. Disconnect all the hoses. Air supply (see B fig 1), fluid delivery hoses from 110 (see Fig 4) and Paint Suction hose from the pump lower (see N Fig .1 on page 6.)

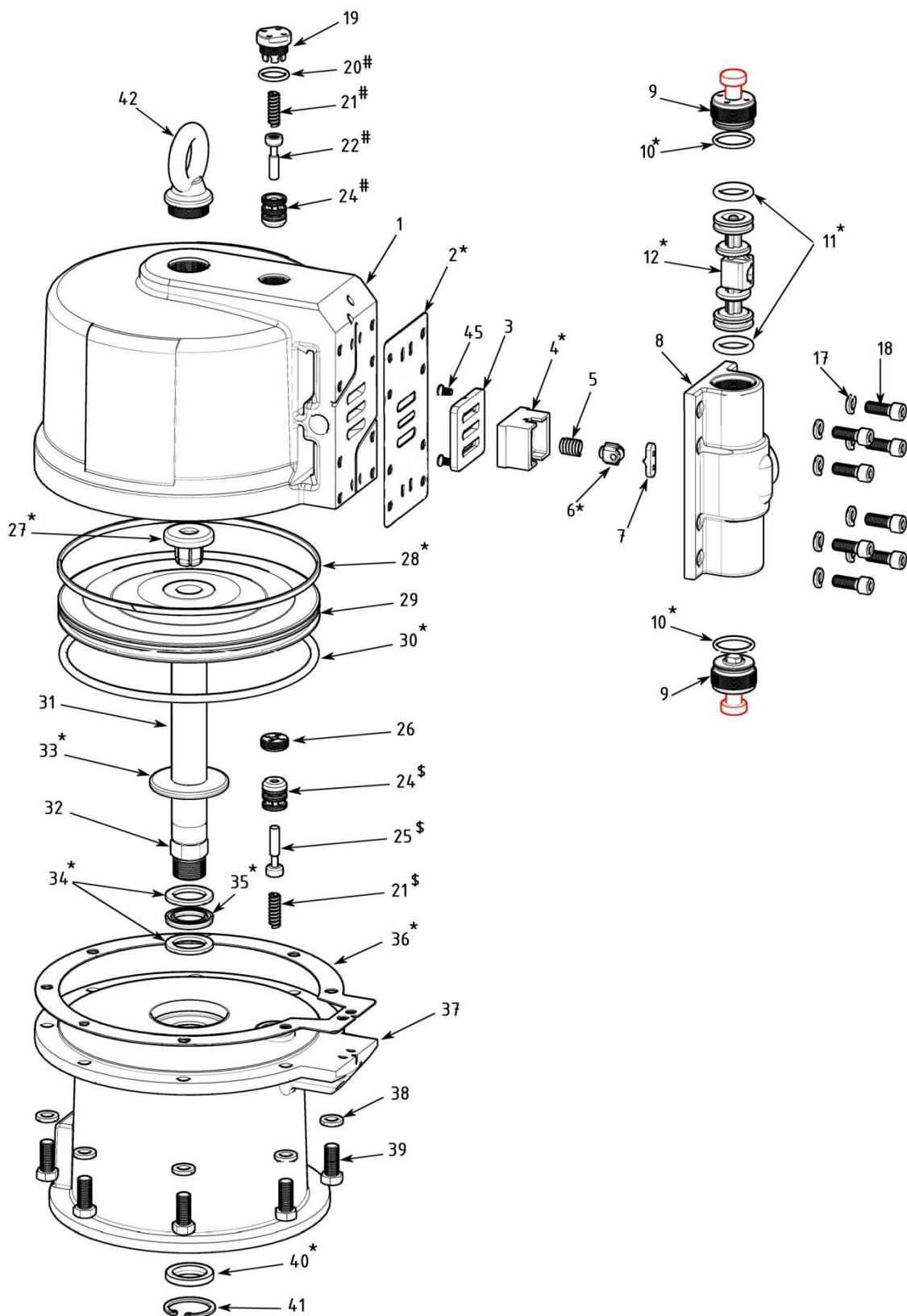
Continue to remove the pump from its mounting by;

3. Remove hairpin clip (108) and lift Cover (104) from coupling (105). Be Carefully not to loose the two couplers as you remove the cover (104). Unscrew the tie rod locknuts from the tie rods. Carefully pull the displacement pump away from the air motor.
4. To service the displacement pump, refer to displacement pump service.

## RECONNECTING THE PUMP LOWER

1. Align the pump's fluid outlet to the optional fluid outlet of the air motor. Position the displacement pump on the tie rod.
2. Ensure displacement rod is positioned against the Air motor piston boss . Fit the couplings (105) and slide the cover (104) over the couplings (105). Replace the hairpin clip (108) .
3. Mount the pump and reconnect all hoses. Reconnect the ground wire if it was disconnected during repair.
4. Tighten the tie rod locknuts evenly, and torque to 54-68 N.m (40-50ft-lb).
5. Start the pump and run it slowly, at about 2.8 bar/ 40 psi (280 kPa,) air pressure, to check the tie rods for signs of binding. Adjust the tie rods as necessary to eliminate binding. Tighten the packing nut/wet-cup with the wrench supplied. Fill the wet-cup half full with DOP liquid or compatible solvent.

## N270-100 Parts



## Parts

No	Part No	Description	Qty	No	D Part No	Description	Qty
1	N270-001	CYLINDER	1	26	N270-026	STEM SCREW	1
2	N270-002	GASKET, piston housing	1	27	N270-027	PISTON PAD	1
3	N270-003	VALVE PLATE	1	28	N270-028	WEAR RING	1
4	N270-004	PISTON VALVE	1	29	N270-029	PISTON PLATE	1
5	N270-005	Compression SPRING	1	30	N270-030	SEAL O-RING	1
6	N270-006	ROLLER ASS'Y	1	31	N270-031	PISTON PIPE	1
7	N270-007	BLOCK	1	32	N270-032	STUD	1
8	N270-008	PISTON VALVE HOUSING	1	33	N270-033	PAD, base	1
9	N270-009	HOUSING PLUG ASS'Y	2	34	N270-034	GASKET	2
10	N270-010	O-RING	2	35	N270-035	U-PACKING	1
11	N270-011	O-RING, piston	2	36	N270-036	Motor GASKET	1
12	N270-012	PISTON VALVE	1	37	N270-037	BASE	1
17	N270-017	SPRING WASHER	8	38	N270-038	SPRING WASHER	8
18	N270-018	S.H.C.S	8	39	N270-039	BOLT	8
19	N270-019	VALVE CAP	1	40	N270-040	SEAL	1
20	N270-020	VALVE CAP O-RING	1	41	N270-041	SNAP RING	1
21	N270-021	Compression SPRING	2	42	N270-042	HOOK	1
22	N270-022	STEM, valve ASS'Y	1	43	N270-043	Name PLATE	2
24	N270-024	VALVE HOUSING ASS'Y	2	44	N270-044	SCREW	10
25	N270-025	STEM, valve LOW ASS'Y	1	45	N270-045	SCREW	2

Note : part marked in colour are the spare parts

PART NO 2, 4, 6, 10, 11, 12, 27, 28, 30, 33, 34, 35, 36, 40,

Included in AIR MOTOR Repair KIT No N270-500

PART NO 20, 21, 22, 24

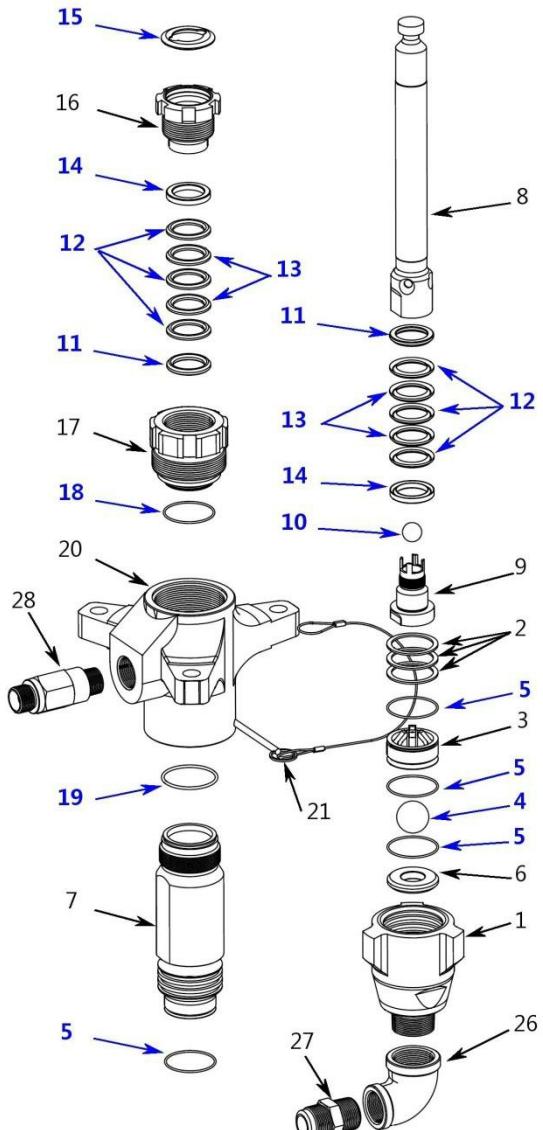
Included in UPPER CHECK VALVE Repair KIT No N270-501

PART NO 21, 24, 25

Included in LOWER CHECK VALVE Repair KIT No N270-502

## Parts drawing and Parts List

### N951-100 PUMP (145cc)



Note : parts marked in colour are in the Repair Kit

No	D Code	G Code	Description	Qty
1	N951-001	197-303	HOUSING , Inlet	1
2	N951-002	244-855	SHIM	3
3	N951-003	197-307	BALL GUIDE	1
4	N951-004	253-031	BALL(1 1/4")	1
5	N951-005	244-890	PACKING ,O-RING	4
6	N951-006	196-358	SEAT	1
7	N951-007	197-315	CYLINDER	1
8	N951-008	197-320	DISPLACEMENT ROD	1
9	N951-009	197-309	PISTON VALVE	1
10	N951-010	253-029	BALL(3/4")	1
11	N951-011	244-881	GLAND-M	2
12	N951-012	244-863	PACKING-V(UHMWPE)	6
13	N951-013	244-869	PACKING-V(Leather)	4
14	N951-014	244-875	GLAND-F	2
15	N951-015	244-996	SEAL	1
16	N951-016	197-330	PACKING NUT	1
17	N951-017	197-325	CARTRIDGE	1
18	N951-018	244-890	PACKING, O-RING	1
19	N951-019	244-892	PACKING, O-RING	1
20	N951-020	197-334	HOUSING	1
21	N951-021	244-826	PIN	1
26	N951-026		TUBE	1
27	N951-027		NIPPLE	1
28	N951-028		JOINT NIPPLE	1

REPAIR KIT No: N951-500 (244-850)

With 4, 5, 10, 11, 12, 13, 14, 15, 18, 19

REPAIR KIT No: N951-501 (244-900)

With 4, 5, 10, 11, 12, 14, 15, 18, 19

No #12UHMWPE v-packing 10 EA

REPAIR KIT No: N951-502 (246-833)

With 4, 5, 10, 11, 12, 13, 14, 15, 18, 19

No #12 UHMWPE v-packing 2 EA

#13 LEATHER v-packing 8 EA

## Parts drawing and Parts List

Note : parts marked in colour are in the Repair Kit				
No	D Code	G Code	Description	Qty
1	N751-001	197-303	HOUSING , Inlet	1
2	N751-002	244-855	SHIM	3
3	N751-003	197-307	BALL GUIDE	1
4	N751-004	253-031	BALL(1 1/4")	1
5	N751-005	244-890	PACKING ,O-RING	4
6	N751-006	196-358	SEAT	1
7	N751-007	197-316	CYLINDER	1
8	N751-008	197-321	DISPLACEMENT ROD	1
9	N751-009	197-310	PISTON VALVE	1
10	N751-010	253-029	BALL(3/4")	1
11	N751-011	244-882	GLAND-M	2
12	N751-012	244-864	PACKING-V(UHMWPE)	6
13	N751-013	244-870	PACKING-V(Leather)	4
14	N751-014	244-876	GLAND-F	2
15	N751-015	244-996	SEAL	1
16	N751-016	197-330	PACKING NUT	1
17	N751-017	197-326	CARTRIDGE	1
18	N751-018	244-890	PACKING, O-RING	1
19	N751-019	244-892	PACKING, O-RING	1
20	N751-020	197-334	HOUSING	1
21	N751-021	244-826	PIN	1
26	N751-026		TUBE	1
27	N751-027		NIPPLE	1
28	N751-028		JOINT NIPPLE	1

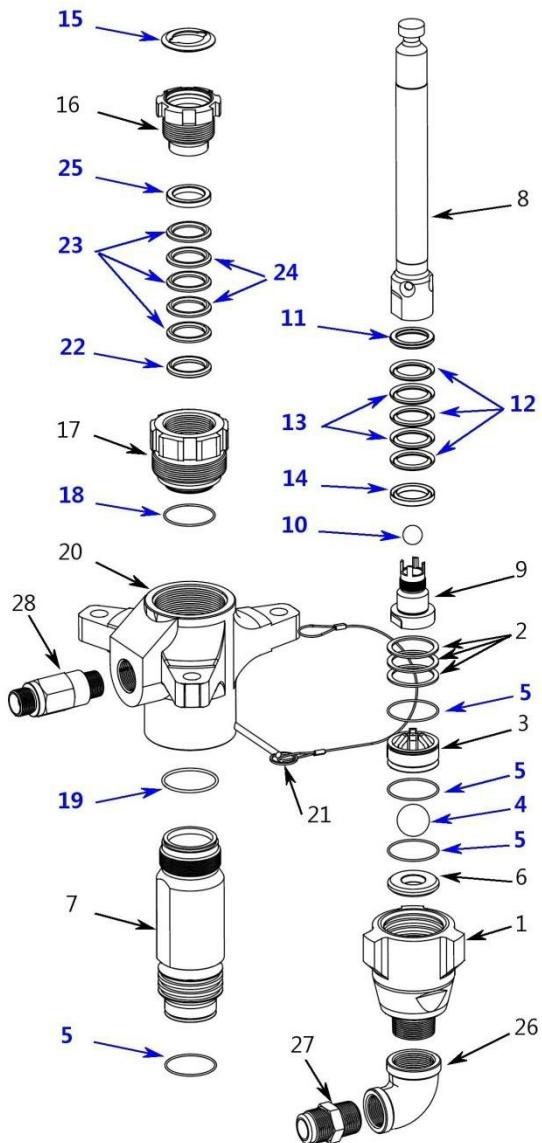
**REPAIR KIT No: N751-500 (244-851)**  
With 4, 5, 10, 11, 12, 13, 14, 15, 18, 19

**REPAIR KIT No: N751-501 (244-901)**  
With 4, 5, 10, 11, 13, 14, 15, 18, 19  
No #13 LEATHER v-packing 10 EA

**REPAIR KIT No: N751-502 (246-834)**  
With  
No #12 UHMWPE v-packing 2 EA  
#13 LEATHER v-packing 8 EA

## Parts drawing and Parts List

### N631-100 PUMP (220cc)



Note : parts marked in colour are in the Repair Kit

No	D CODE	G CODE	Description	Qty
1	N631-001	197-304	HOUSING , Inlet	1
2	N631-002	244-856	SHIM	3
3	N631-003	197-308	BALL GUIDE	1
4	N631-004	253-030	BALL(1 1/2")	1
5	N631-005	244-894	PACKING ,O-RING	4
6	N631-006	197-344	SEAT	1
7	N631-007	197-317	CYLINDER	1
8	N631-008	197-322	DISPLACEMENT ROD	1
9	N631-009	197-311	PISTON VALVE	1
10	N631-010	244-898	BALL (7/8")	1
11	N631-011	244-884	GLAND-M	1
12	N631-012	244-860	PACKING-V (UHMWPE)	3
13	N631-013	244-872	PACKING-V(Leather)	2
14	N631-014	244-878	GLAND-F	1
15	N631-015	244-999	SEAL	1
16	N631-016	197-331	PACKING NUT	1
17	N631-017	197-327	CARTRIDGE	1
18	N631-018	244-891	PACKING, O-RING	1
19	N631-019	244-893	PACKING, O-RING	1
20	N631-020	197-335	HOUSING	1
21	N631-021	244-826	PIN	1
22	N631-022	244-883	GLAND-M	1
23	N631-023	244-859	PACKING-V (UHMWPE)	3
24	N631-024	244-871	PACKING-V(Leather)	2
25	N631-025	244-877	GLAND-F	1
26	N631-026		TUBE	1
27	N631-027		NIPPLE	1
28	N631-028		JOINT NIPPLE	1

**REPAIR KIT No : N631-500 (244-852)**

With 4,5,10,11,12,13,14,15,18,19,22,23,24,25

No #13 LEATHER v-packing 5 EA

**REPAIR KIT No : N631-501 (244-902)**

With 4,5,10,11,13,14,15,18,19,22,24,25

No #12 UHMWPE v-packing 1 EA

#13 LEATHER v-packing 4 EA

#23 UHMWPE v-packing 1 EA

#24 LEATHER v-packing 4 EA

**REPAIR KIT No : N631-502 (246-835)**

With 4,5,10,11,12,13,14,15,18,19,22,23,24,25

No #12 UHMWPE v-packing 1 EA

#13 LEATHER v-packing 4 EA

#23 UHMWPE v-packing 1 EA

#24 LEATHER v-packing 4 EA

## Parts drawing and Parts List

Note : parts marked in colour are in the Repair Kit				
No	D CODE	G CODE	Description	Qty
1	N551-001	197-304	HOUSING , Inlet	1
2	N551-002	244-856	SHIM	3
3	N551-003	197-308	BALL GUIDE	1
4	N551-004	253-030	BALL(1 1/2")	1
5	N551-005	244-894	PACKING ,O-RING	4
6	N551-006	197-344	SEAT	1
7	N551-007	197-318	CYLINDER	1
8	N551-008	197-323	DISPLACEMENT ROD	1
9	N551-009	197-312	PISTON VALVE	1
10	N551-010	244-898	BALL(7/8")	1
11	N551-011	245-232	GLAND-M	2
12	N551-012	245-229	PACKING-V (UHMWPE)	6
13	N551-013	245-230	PACKING-V(Leather)	4
14	N551-014	245-233	GLAND-F	2
15	N551-015	244-999	SEAL	1
16	N551-016	197-331	PACKING NUT	1
17	N551-017	197-328	CARTRIDGE	1
18	N551-018	244-891	PACKING, O-RING	1
19	N551-019	244-893	PACKING, O-RING	1
20	N551-020	197-335	HOUSING	1
21	N551-021	244-826	PIN	1
26	N551-026		TUBE	1
27	N551-027		NIPPLE	1
28	N551-028		JOINT NIPPLE	1

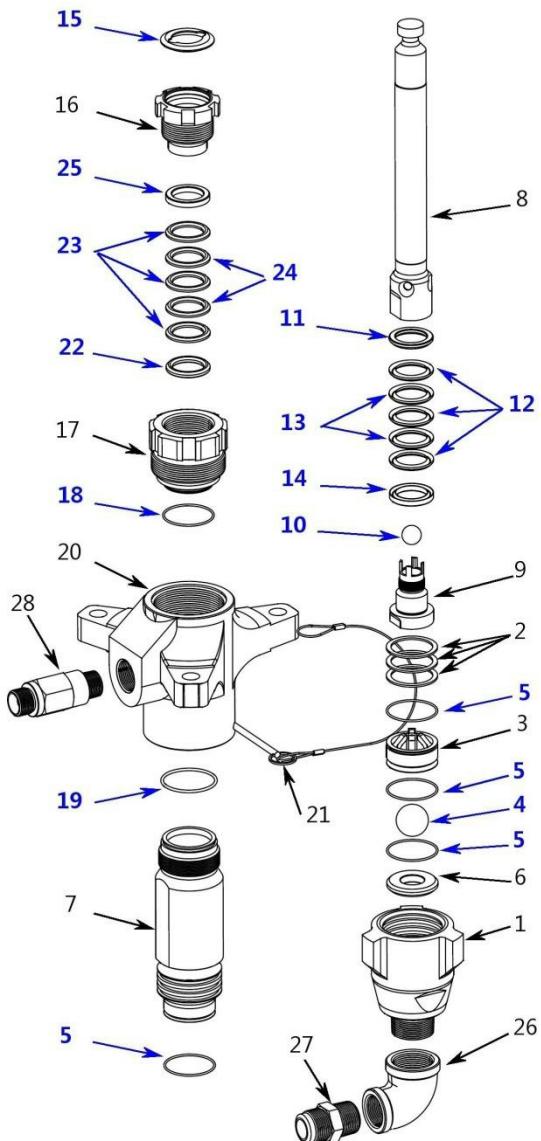
**REPAIR KIT No : N551-500 (244-853)**  
With 4,5,10,11,12,13,14,15,18,19

**REPAIR KIT No : N551-501 (244-903)**  
With 4,5,10,11,13,14,15,18,19  
No #13 LEATHER v-packing 10 EA

**REPAIR KIT No : N551-502 (244-836)**  
With 4,5,10,11,12,13,14,15,18,19  
No #12 UHMWPE v-packing 2 EA  
#13 LEATHER v-packing 8 EA

## Parts drawing and Parts List

### N471-100 PUMP (290cc)



Note : parts marked in colour are in the Repair Kit

No	D CODE	G CODE	Description	Qty
1	N471-001	197-304	HOUSING , Inlet	1
2	N471-002	244-856	SHIM	3
3	N471-003	197-308	BALL GUIDE	1
4	N471-004	253-030	BALL(1 1/2")	1
5	N471-005	244-894	PACKING ,O-RING	4
6	N471-006	197-344	SEAT	1
7	N471-007	197-319	CYLINDER	1
8	N471-008	197-324	DISPLACEMENT ROD	1
9	N471-009	197-313	PISTON VALVE	1
10	N471-010	244-899	BALL (1")	1
11	N471-011	244-886	GLAND-M	1
12	N471-012	244-868	PACKING-V (UHMWPE)	3
13	N471-013	244-874	PACKING-V(Leather)	2
14	N471-014	244-880	GLAND-F	1
15	N471-015	244-999	SEAL	1
16	N471-016	197-331	PACKING NUT	1
17	N471-017	197-327	CARTRIDGE	1
18	N471-018	244-891	PACKING, O-RING	1
19	N471-019	244-893	PACKING, O-RING	1
20	N471-020	197-335	HOUSING	1
21	N471-021	244-826	PIN	1
22	N471-022	244-885	GLAND-M	1
23	N471-023	244-867	PACKING-V (UHMWPE)	3
24	N471-024	244-873	PACKING-V(Leather)	2
25	N471-025	244-879	GLAND-F	1
26	N471-026		TUBE	1
27	N471-027		NIPPLE	1
28	N471-028		JOINT NIPPLE	1

REPAIR KIT No : N471-500 (244-854)

With 4,5,10,11,12,13,14,15,18,19,21,22,23,24,25

REPAIR KIT No : N471-501 (244-904)

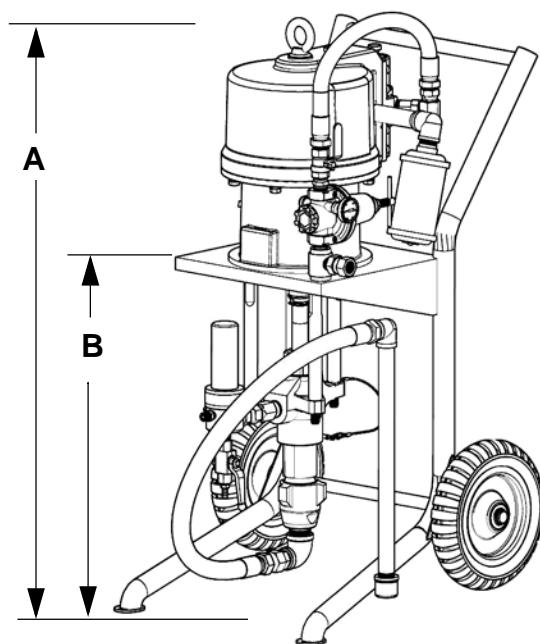
With 4,5,10,11,13,14,15,18,19,22,24,25

No #13 LEATHER v-packing 5 EA  
 #24 LEATHER v-packing 5 EA

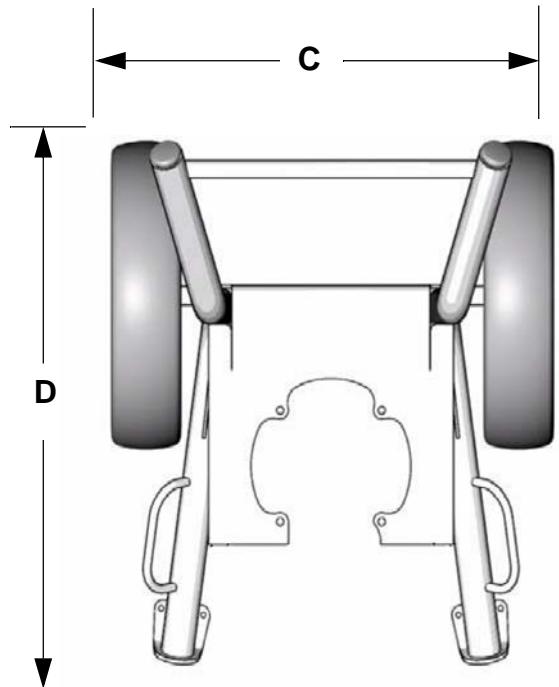
# Dimensions

## Sprayer (Cart Mounted) Packages

Profile View - Complete Pump Shown



Top View - Trolley Shown



Key :

	A	B	C	D	Nett Weight
	1250 mm	725mm	675mm	860mm	105 Kg

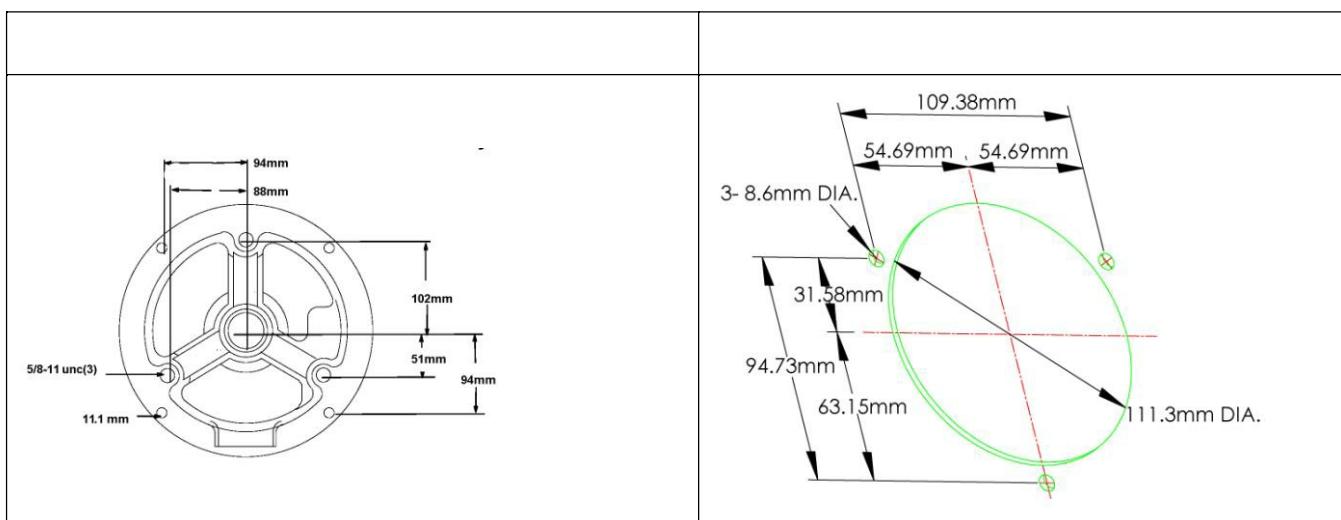


Weight is approximate and does not include hoses

# Technical Data

## Air Motor

Category	Data
Maximum incoming pressure	100 psi (.68 MPa, 6.89 bar)
Effective piston area	729 cm <sup>2</sup>
Piston diameter	270 mm
Stroke length	120 mm
Valve housing	Balanced, opposing seals and detent rollers
Seals and packings	Nitrile rubber
Recommended maximum speed	50 cycles per minute
Air Inlet	3/4 pf
Air Consumption	approx 60 CFM



## Pump Lower

Category	Data				
	SX290-000 (290CC)	SX250-000 (250CC)	SX220-000 (220CC)	SX180-000 (180CC)	SX145-000 (145CC)
Maximum fluid working pressure	33.0MPa 330 bar	38.0MPa 380 bar	44.0MPa 440 bar	53.0MPa 530 bar	66.0MPa 660 bar
Maximum air input pressure page			0.7 MPa 7 bar		
Ratio	47:1	55:1	63:1	75:1	95:1
Air inlet size			3/4 in. npt(f)		
Fluid inlet size			1 -1/4 in npt		
Displacement per cycle	311cc	270cc	233cc	195cc	155cc
Fluid flow at 60 cycles per minute	18.7 / Ltr.	16.2 / Ltr.	14 / Ltr.	11.7 / Ltr.	9.3 / Ltr
Maximum operating temperature			82_C (180_F)		
Air motor effective			10.6 inch (270mm)		
Wetted parts	Carbon Steel; Alloy Steel; 304, 440 and 17-4 PH Grades of Stainless Steel; Zinc and Nickel Plating; Ductile Iron; Tungsten Carbide; PTFE; Leather				

# Application Information

## Tip Orifice Sizes & Consumption

Inch	007	009	011	013	015	017	019	021
Millimetre	0.178	0.229	0.279	0.330	0.381	0.432	0.483	0.533
Flow rate (Gpm)	0.05	0.09	0.12	0.18	0.24	0.31	0.38	0.47
Flow Rate (Lpm)	0.2	0.33	0.49	0.69	0.91	1.17	1.47	1.79
Inch	023	025	027	029	031	033	035	037
Millimetre	0.584	0.635	0.686	0.737	0.787	0.838	0.889	0.940
Flow rate (Gpm)	0.57	0.67	0.77	0.9	1.03	1.17	1.31	1.47
Flow Rate (Lpm)	2.15	2.54	2.96	3.42	3.9	4.42	4.98	5.56
Inch	039	041	045	047	049	051	053	
Millimetre	0.991	1.04	1.14	1.19	1.24	1.30	1.35	
Flow rate (Gpm)	1.63	1.8	2.17	2.37	2.58	2.79	4.26	
Flow Rate (Lpm)	6.18	6.83	8.23	8.98	9.76	10.57	16.13	

(Based on tests performed using water @ 2000 psi, 13,8MPa, 138 bar)

**Proper tip sizing.**

Same fan width - difference orifice sizes: The example below demonstrates the difference between tips with the same fan width, but increasing orifice sizes. The larger the orifice, the more coating you apply using the same spray pressure and hand-speed as you spray.

Different fan width - same orifice sizes: The example below demonstrates the difference between tips with the same orifice size, but increasing fan sizes. The same amount of coatings is applied over a larger area - or less coating per square inch using the same pressure and hand-speed as you spray. When necessary, remember to size up or down your orifice as you size up or down your fan width if you want to apply the same amount of coating per square inch.

**Signs of tip wear.**

# Storm Machinery Standard Warranty

Storm Machinery warrants all equipment referenced in this document which is manufactured by Storm Machinery and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Storm Machinery, Storm Machinery will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Storm Machinery to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Storm Machinery's written recommendations.

This warranty does not cover, and Storm Machinery shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Storm Machinery component parts. Nor shall Storm Machinery be liable for malfunction, damage or wear caused by the incompatibility of Storm Machinery equipment with structures, accessories, equipment or materials not supplied by Storm Machinery, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Storm Machinery.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Storm Machinery distributor for verification of the claimed defect. If the claimed defect is verified, Storm Machinery will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labour, and transportation.

**THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.**

Storm Machinery's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

**Storm Machinery MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY Storm Machinery.**

**MANUFACTURED BY Storm Machinery.**  
These items sold, but not manufactured by Storm Machinery (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Storm Machinery will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Storm Machinery be liable for indirect, incidental, special or consequential damages resulting from Storm Machinery supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Storm Machinery, or otherwise.

#### **FOR NON-ENGLISH SPEAKING CUSTOMERS**

**FOR NON-ENGLISH SPEAKING CUSTOMERS**  
The Parties acknowledge that they have required that the present document, as well as all documents, notices and legal proceedings entered into, given or instituted pursuant hereto or relating directly or indirectly hereto, be drawn up in English.

FRENCH

**FRENCH**  
Les parties reconnaissent avoir convenu que la rédaction du présent document sera en Anglais, ainsi que tous documents, avis et procédures judiciaires exécutés, donnés ou intentés, à la suite de ou en rapport, directement ou indirectement, avec les procédures concernées.

## SPANISH

Las partes reconocen haber convenido en que la redacción de este documento será en Inglés, así como todos los documentos, notificaciones y procedimientos judiciales emprendidos, dados o incoados como consecuencia de o en relación directa o indirectamente con los procedimientos pertinentes.

## PORTUGUESE

As partes reconhecem que eles concordaram que a elaboração deste documento será em Inglês, bem como todos os documentos, notas e processos legais inseridos, atribuídos ou instituídos, como resultado de ou em conexão direta ou indiretamente com os procedimentos pertinentes.

## ARABIC

يُنون أقلياً تاءِ راجلَى او قَى اشْتَوْلَا عِيمَجْ كُلْذَكْوَى، يُزِيلْ جِنَّا ئَغْلَلَابْ نُوكْتَ فُوسْ بَقِيْشُولْا مَذْءَغَيْصِنْ نَأْيَلْ عَوْقَفْتَ اِمْنَأْ نَأْفَرْ طَلَانْ فَرْتَعْيَى بَلْصَلْ اَلَادْ اَمَارْ جِلَّا عَمْ قَرْشَابْ مَرِيَغْ وَفَرْشَابْ مَرِوصَبْ قَلْعَتْيَى اِمِيَفْ وَفَجِيَتْنَ تَعْضَوْ وَانْيَعَمْ، هَتْمَرْ بَأْيِيْتَلْا.

**TO PLACE AN ORDER**, please contact your nearest Storm Machinery distributor.

[www.stormmachinery.com.au](http://www.stormmachinery.com.au)  
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