

MANUAL SUPER WIZZARD SNOWMAKER

OPERATING & PARTS MANUAL

2014

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INTRODUCTION

Your Super Wizzard Snowmaker is one of the most technically advanced snowmaking machines in existence. Super Wizzard Snowmakers differ from air/water and airless snowmakers in several ways.

One Super Wizzard difference is quality snow -- large quantities of quality snow -- at very significant energy savings over other snowmaking systems. Other important features are simplicity of design, operation and maintenance. As you become more familiar with this machine and its great versatility, you will appreciate the difference your Super Wizzard can make.

Literally thousands of hours of research, testing and actual use have gone into the design and improvements to the Super Wizzard Snowmaker. At many ski areas around the world, Super Wizzard Snowmakers are operating successfully under widely varying conditions. The Super Wizzard has been continually improved over the past few years.

Snow Machines, Incorporated is dedicated to providing our customers with superior quality products for optimum trouble-free operation.

It is important that you have a full understanding of the contents of this manual. It contains information which will help you operate your Super Wizzard Snowmaker in a safe manner and obtain optimum performance from the system.

GENERAL DESCRIPTION

The SMI® Super Wizzard Snowmaker is designed for maximum performance in marginal temperatures and high humidities. The Super Wizzard was added to the Wizzard family of products for a bigger throw which improves marginal temperature performance and capacity.

The Super Wizzard utilizes five rings of 75 nozzles each to convert water into snow. These 375 heated nozzles are nucleated with a detachable periphery ring with 20 additional nozzles. SMI's unique nucleator ring is fed by a 5 HP or 10 HP on-board compressor to provide constant mixing at each nucleator nozzle. Water adjustment is easy with four heated 3-way self-draining ball valves.

The Super Wizzard chassis is galvanized and equipped with three leveling jacks. The rear axles are designed to extend to provide added stability to the machine and prevent it from tipping over on step terrain during transport. Blade lifting brackets are provided so the machine can be moved with snow grooming equipment along with an adjustable lifting extension to accommodate different blade designs. The fan enclosure is attached to the frame using a large diameter turntable bearing that enables the fan barrel to be rotated 360°. The Super Wizzard is available with an oscillator that better distributes the snow on the ski run and enables increased snow production.

The snowmaker is equipped with a 150 watt running light to provide lighting for snowmaking personnel. The strobe light is used as warning light for automatic alarm on shut down. The strobe light is activated if the alarm circuits are triggered by an electrical fault.

The aluminum spray manifold is heated with 6Kw of electric heat that is controlled by measuring the temperature of the casting so that heat is provided when needed to prevent nozzle freeze-up and unnecessary downtime. The heat operates in two modes: start-up (fan off) heating where the full 6Kw of heat is provided and run heating (fan on) where 4Kw of heat are provided. For cold temperature snowmaking a cold temperature switch is provided to enable the user to override the run heating set-up and add 2Kw of heat.

The Super Wizzard is easy to use, easy to maintain, energy efficient, quiet and an excellent value. It is another solid snowmaking product developed and supported by SMI.

TECHNICAL SPECIFICATIONS

Capacity	12 - 150 GPM (45 - 600 LPM) depending on nozzle configuration Minimum 100 psi (7 Bar) water pressure required
Throw	20 - 225 feet (7 - 70 meters)
Fan Motor	25 HP (19 Kw)
Compressor	5 HP (4 Kw) or 10 HP (7.5 Kw)
Electrical Heating (startup)	6 Kw
Electrical Heating (running)	4 Kw
Search Light	150 Watt
Water Connection	1½" or 2"
Electric Connection	Customer Choice of Plug 150 feet of Electrical Cord Included

TRAINING

The Super Wizzard Snowmaker should be operated only by personnel who have received formal training by a qualified instructor. Knowledge of the equipment and safety and operating procedures could prevent mishaps or injury and will make snowmaking more efficient. Each ski area should develop custom training programs for their ski area.

All personnel associated with snowmaking should receive the training.

They should have a thorough understanding of the SAFETY procedures as well as how to operate and handle problems that might occur.

They must know where the manual is located, how to use it for reference, and how to use the checklist prior to starting the Super Wizzard Snowmaker.

SAFETY PRECAUTIONS

BE CERTAIN the "on-hill" power service and all power switches on the machine are OFF before connecting or disconnecting the electrical plug. ELECTRICAL SHOCK CAN BE FATAL.

DO NOT open or work inside an electrical panel with the power source ON or CONNECTED. ELECTRICAL SHOCK CAN BE FATAL.

LOOSE CLOTHING SHOULD NOT BE WORN when operating the snowmaker to prevent entangling in rotating equipment.

ALWAYS STAND OUT OF THE AIRSTREAM when starting, making adjustments, or while the machine is running. This procedure is to prevent injury from possible flying ice or foreign material.

STAND BEHIND hydrant to open or close air and water valves so that in case of hose or connector failure, injury can be prevented.

ALWAYS open or close air and water valves VERY SLOWLY to slowly equalize the line and system pressure to prevent hose, connector or pressurized system failure. Rapid opening and closing of water or air valves releases a tremendous amount of energy and could cause a failure in any part of the total pressurized system or serious personal injury.

NEVER straddle a hose as serious injury could result.

DO NOT attempt to remove ice from fan or screen and DO NO mechanical or electrical servicing while the machine is in operation. NEVER run the machine without the screen and guard in place.

NEVER move the snowmaker until the power service is OFF, and the power cord and hoses are DISCONNECTED.

MAKE CERTAIN to indicate areas where snow is being made and/or close part or all of the trail to skiers. Your ski area should have a policy for machine locations, signage and/or fencing specifically for your resort. Skiers could incur injuries from the equipment and skis could damage the hoses or electrical cord.

Super Wizzard

SAFETY PRECAUTIONS (CONT)

Hoses, cords, and guns SHOULD NOT be left laying around on the hill; they could be run over by skiers with the possibility of causing injury.

Clogged nozzles cause erratic spray patterns that can promote ice formation at nozzle tip. Do Not use clogged or damaged nozzles.

Monitor the machine frequently to determine if problems are developing that could cause personal injury, machine damage or unnecessary downtime.

Be cautious of ice, snow, wet, slippery conditions and other hazards in the area.

Rules for Safe Operation

1. The manual should be read by all personnel associated with snowmaking.
2. All personnel should be familiar with the machine and be versed in your area's safety procedures.
3. Moving the machine while operating is not recommended.
4. Do Not attempt to remove ice from screen or remove the screen from the machine while operating.
5. Operators should exercise caution while operating snowmakers. Care should be taken with clothing, i.e., scarves, hats, hair, loose jackets, etc. when working with rotating equipment.
6. Be cautious of ice, snow, wet, slippery conditions and other hazards in the area.
7. Always open and close hydrants slowly. Rapid opening and closing could damage the equipment, pipes and pumps, or cause serious injury.
8. Determine if appropriate signing or fencing of machine is needed and in place.

OPERATING SPECIFICS

1. TRANSPORT AND POSITIONING

A. Towing

The Super Wizzard Snowmaker can be towed by most ski area transport equipment. When towing or transporting models with snow groomer lifting brackets on the frame, always lock the fan head and enclosure to the frame using the locking pin provided. To tow, simply attach the tow bar to the hitch on the transport equipment. The use of safety chains while towing is recommended. Before moving a machine it is recommended that:

The leveling jacks are not frozen into the ground, are cleared from deep snow and raised to prevent damage to them during transport.

The wheels are not frozen into the ground, are cleared from deep snow and free to rotate.

The tow bar is locked into the up position on models having this feature.

Before towing a machine downhill, lock the tow bar pivot with the hitch pin provided to prevent the machine from jack knifing during transport. While towing, try to move up and down the fall line to prevent side slip or jack knifing that could result in damage to the machine. If the fall line cannot be followed, auxiliary peripheral chains should be attached to prevent side slippage.

B. Anchoring

Level the machine using the level gauge on the fan enclosure and by extending the three leveling jacks into the snow. Be certain the jacks are firmly anchored to prevent machine movement. The machine must be level for the oscillator to function properly and to ensure the compressor receives proper lubrication. Remove the machine from the transport equipment once you are sure it is secured into position.

OPERATING SPECIFICS (CONT)

C. Cat Blade Lifting

The Super Wizzard has Cat blade lifting brackets on the enclosure to assist with machine transport and set up. The Super Wizzard can be transported with or without the wheels installed. The three leveling jacks can be used without the wheels. Insert the blade under the angled lifting brackets with the lower blade resting against the lower blade support member. The machine blade should rest against the lower blade support member. Note that the lower blade support member is adjustable and may need to be lengthened or shortened to match each Snowcat and blade.

Attach a towing safety chain before proceeding with transporting the Super Wizzard.

D. Frame/Leveling Jacks

The Super Wizzard is equipped with three leveling jacks that are quick and easy to adjust. The jack has three points of adjustment:

- The jack is designed with a drop leg that has five hole positions that are adjusted by pulling the pin and lower or raising the leg to the desired height.
- The jack also has five tabs welded to outside of the housing that enable height adjustment in four positions simply by pulling the attached pin and lower or raising the jack to the desired position.
- Lastly, the jack has a telescoping feature that is adjusted up or down by turning the handle located on the top of the jack.

E. Rear Axles

The rear axles are adjustable in and out. Extend to full out position for greater stability on the slopes.

OPERATING SPECIFICS (CONT)

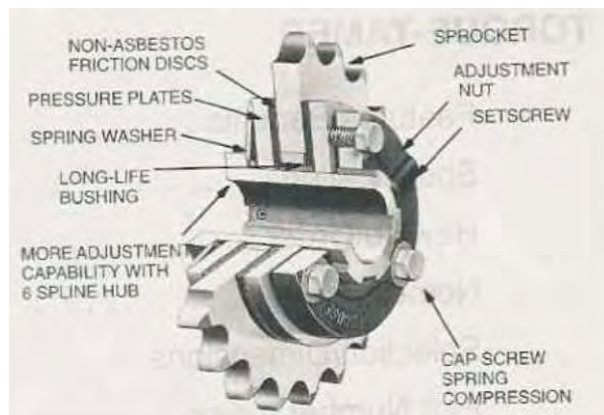
2. MACHINE PIVOTING AND HEAD ADJUSTMENT

A. Rotational Pivot and Friction Clutch Adjustment

The Super Wizzard enclosure is attached to the frame with a large diameter turntable bearing on 2000 models and newer (see assembly drawing titled “2000 oscillator assembly”) and with a spindle and bearing housing on model years 1999 and older (see assembly drawing titled “1999 center pivot & oscillator”). The Super Wizzard is equipped with a friction clutch that enables the user to adjust the location of the fan and where the snow falls while the oscillator gear motor is running. However, for the friction clutch to function correctly, it needs to be adjusted properly and the machine must be level.

The friction clutch functions by compressing two discs constructed of a fibrous brake material (“friction discs”) that apply a compressive force on a metallic drive member. The drive member is coupled to the oscillator gear motor by a tie rod and two rod ends. The rotation of the oscillator gear motor exerts a force on the tie rod assembly and drive member that is held stationary by the friction clutch, causing the enclosure and fan to rotate back and forth.

There are two types of the friction clutch used on the Super Wizzard shown below:



Type 1 on 1999 models and older:

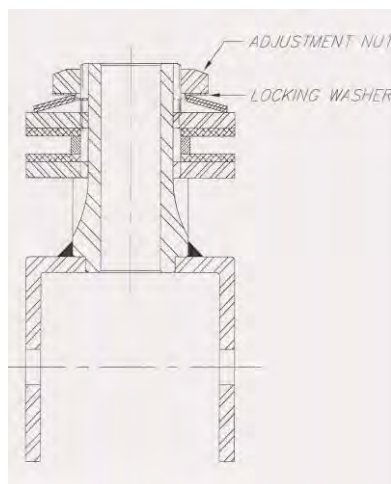
(Super Wizzard equipped with cam not a sprocket.)

The torque is adjusted by loosening the setscrew and backing off the cap screws so they are recessed inside of the adjustment nut. Fingers tighten the adjustment nut and verify that the setscrew is centered in between one of the seven spline notches. If not, using channel locks center the setscrew over one of the notches. Now finger tighten the hex screws. To apply the proper compressive force on the friction discs turn each of the three cap screws ½ turn. Depending on the wear to the friction discs and your specific conditions it may be necessary to either tighten the three cap screws more or a combination of tightening the adjustment nut and cap screw more than typical. However by over tightening the cap screws and adjustment nut, the friction clutch will not function properly and may cause damage to it.

Super Wizzard

OPERATING SPECIFICS (CONT)

Note: The ½" castle nut on the top of the spindle is used to hold the pivot assembly together and should not be adjusted (see item 19 on the assembly drawing titled "1999 center pivot and oscillator").



Type 2 on 2000 models and newer:

The torque is adjusted by bending down the ears on the locking washer and tightening the adjustment nut to ½ turn past fingers tight. Depending on the wear to the friction discs and your specific conditions it may be necessary to tighten the adjustment nut beyond ½ turn beyond fingers tight. However by over tightening adjustment nut, the friction clutch will not function properly and may cause damage to it.

Please contact SMI for further assistance with friction clutch adjustment, if necessary.

All Super Wizzard models are equipped with a transport lock to prevent the rotation or movement of the enclosure and fan during transport. The transport lock should always be used to move the machine to prevent a sudden weight shift from a rapid rotation of the enclosure and fan and to prevent damage to the friction clutch.

B. Vertical Pivot Adjustment

The Super Wizzard is equipped with an easy to use head vertical adjustment jack. Crank the handle to raise or lower the head angle. Varying the head angle can change the hang time of the plume and provide better snow production.

OPERATING SPECIFICS (CONT)

C. Optional Oscillator

The Super Wizzard may be equipped with an optional oscillator. The oscillator is used to rotate the fan head back and forth approximately 45° to allow increased snow production. The fan plume moves to freshen air and the snow produced is allowed extra cure time so production can be increased.

Note: The oscillator cannot be used effectively in swirling or changing wind conditions. Model years 1998 and older are equipped with an oscillator guard that should be in place before engaging the oscillator.

Be certain to check that the machine can swing without interference to the unit. The Super Wizzard frame must be level for the friction clutch to function properly.

During setup, the hose and cord should be looped with extra slack to allow for the movement of the enclosure and fan barrel in oscillation mode.

The oscillator is started and stopped using the buttons on the control panel.

The machine can be rotated during operation to a different direction by simply turning the enclosure. SMI's unique friction clutch allows this to occur while the oscillator gear motor is engaged.

Check to make sure the friction clutch is properly adjusted.

3. NUCLEATION

Nucleation is the small ice crystals that seed the bulk water droplets. Water is mixed with compressed air to form nucleation crystals (nuclei). The compressed air helps break the water into small droplets and cool them as the air expands. These particles freeze quickly and are frozen before mixing with the bulk water from the inner rings. These nuclei act as seeds for freezing these other droplets.

The Super Wizzard uses a 5 HP or 10 HP compressor to deliver air that is mixed with water at the 20 nucleator nozzles on the periphery of the water manifold. SMI's special nucleator is designed to be completely detachable and flushable.

The water is fed to the nucleator after leaving the water pressure regulator.

The SMI Super Wizzard nucleator is designed to have equal mixing at all 20 nucleator nozzles. The nucleator is preset at the factory and does not normally need adjustment. Please contact the SMI factory for adjustment method if nucleator setting is not correct.

Caution: For high altitude ski areas, the nucleator must be reset for your altitude.

OPERATING SPECIFICS (CONT)

4. WATER SYSTEM

The Super Wizzard water system is designed for maximum flexibility and ultimate snow production. The Super Wizzard will produce snow at water pressures below 100 psi (7 Bar), but the minimum suggested water pressure is 150 psi (10 Bar). The maximum water pressure is 500 psi (35 Bar).

Water enters the machine via a camlock fitting and then into the stainless steel valve manifold. The valve manifold is equipped with an inline filter that should be checked and cleaned regularly to prevent water pressure loss and decreased snow production. The inline filter is available in either 60 mesh for nozzle sizes 10 gph or greater and 80 mesh for nozzle sizes 7.5 gph or less. If you have extremely dirty water, pre-filtering the water at the hydrant is recommended. Pre-filter manifolds are available from SMI with either 30 or 60 mesh inline filters.

Note: If you have PoleCat Snowmakers in your fleet, be sure not to use the 30 mesh filter provided with the PoleCat in the Super Wizzard because you will experience nozzle clogging and incomplete water filtration.

To clean the inline filter, you first unscrew the valve manifold cap and hang it in an appropriate place on the machine. The filter is removed by **carefully (like a surgeon)** pulling it from the valve manifold being sure not to drag the inside surface of the filter on the threaded rod. The filter is best cleaned using a power washer but a round plastic bristle brush and flushing with tap water can be used as an alternate method. Before inserting the clean filter it is best to lightly flush out the valve manifold to remove any particulate that was deposited upon removal of the inline filter. Inspect the O-rings at each end of the inline filter and filter cap for damage and replace if necessary. Place the clean filter in the valve manifold and replace the cap. The cap only needs to be finger tight to properly seal.

Note: To simplify filter cleaning it is recommended that dirty filters are cleaned immediately or allowed to soak in water to prevent the deposits from drying making the filter very difficult to clean later.

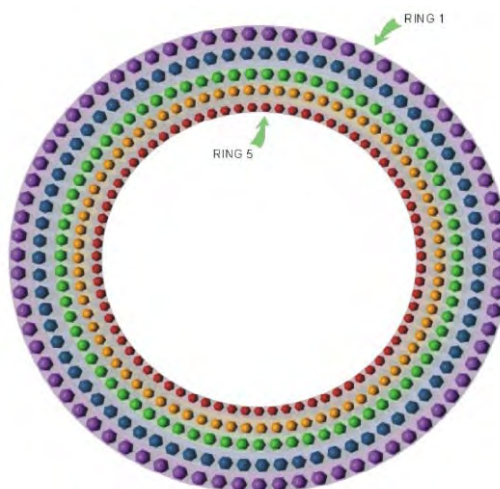
The Super Wizzard has five water rings with 75 nozzles per ring. Each ring is equipped with equal flow rate nozzles of three different sizes: 10 gallons per hour, 12 gallons per hour and 15 gallons per hour at 100 psi (7 Bar). The standard SMI nozzle configuration starting with the outside ring and moving inward is as follows: 10, 10, 12, 12 and 15. Custom nozzle configurations are available upon request.

OPERATING SPECIFICS (CONT)

4. WATER SYSTEM (cont)

Ring 1 is always on when water is supplied to the valve manifold and by converting to gpm the 10 gph nozzles with flow between 12 gpm (45 lpm) and 28 gpm (106 lpm).

Rings 2, 3, 4 and 5 can be turned on or off by the four heated 3-way ball valves on the valve manifold. Heat is automatically supplied to the ball valves when the control panel switch is on. Allow the heat to the valve to thaw them prior to operating to avoid damaging the plastic seats. The 3-way ball valves will drain upon shutdown with the valve handle in the down position. Position the angle of the fan barrel so that the water is able to drain from the spray manifold down through the valve manifold via gravity out of the valve.



Ring 2 is the next to be turned on as temperatures permit. This ring is equipped with 10 gph nozzles (standard) that flow water at the same rate as Ring 1.

Rings 3 and 4 are next to be turned on as temperatures permit. These rings are equipped with 12 gph nozzles (standard) and by converting to gpm will flow 15 gpm (57 lpm) and 34 gpm (129 lpm).

Ring 5 with 15 gph nozzles is the last to be turned on and by converting to gpm will flow 19 gpm (72 lpm) and 42 gpm (159 lpm). As the temperature rises, the water rings should be turned off in the opposite sequence.

Note: The minimum and maximum flow rates (in gpm) given above are at 100 psi (7 bar) and 500 psi (34 bar), respectively. The water flow rates given are taken for pressures at the nozzle tip.

The water pressure can be regulated at the water hydrant or pump station.

Changing the water pressure can considerably impact snow quality by varying the water flow and water particle droplet size. Increasing water pressure will increase the water flow through the nozzles and decrease the water particle droplet size. Decreasing the water pressure will decrease the water flow through the nozzles and increase the water particle droplet size.

OPERATING SPECIFICS (CONT)

5. SUPER WIZZARD PROJECTED WATER FLOW RATES

	Gallons Per Minute				
Ring #	100 PSI	200 PSI	300 PSI	400 PSI	500 PSI
1-10 gph	12	17	21	25	28
2-10 gph	12	17	21	25	28
3-12 gph	14	20	23	28	31
4-12 gph	14	20	23	28	31
5-15 gph	19	27	33	38	42
1 + 2	24	34	42	50	56
1 + 2 + 3	38	54	64	78	87
1 + 2 + 3 + 4	52	74	87	106	118
1 + 2 + 3 + 4 + 5	71	101	120	144	160

	Liters Per Minute				
Ring #	7 Bar 100 PSI	14 Bar 200 PSI	20 Bar 300 PSI	28 Bar 400 PSI	34 Bar 500 PSI
1	46	65	80	95	106
2	46	65	80	95	106
3	53	76	87	106	117
4	53	76	87	106	117
5	72	102	125	144	159
1 + 2	92	130	160	190	212
1 + 2 + 3	145	206	247	296	329
1 + 2 + 3 + 4	198	282	334	402	446
1 + 2 + 3 + 4 + 5	270	384	459	546	605

OPERATING SPECIFICS (CONT)

6. WATER SPRAY NOZZLES

It is very important to check the spray pattern of each nozzle before operation of the Super Wizzard.

Each nozzle should have a conical shaped flow of water. Clogged or plugged nozzles can greatly diminish snow production and cause icing of the spray manifold. The water filter is designed to capture all water particulate that may not pass through the nozzles, but clogging can still occur.

Each nozzle ring should be periodically checked for particulate clogging each nozzle. The outer ring can be checked easily by closing the three 3-way ball valves. To check each of the inner rings, you must remove and plug the water hose feeding the outer nozzle ring and individually open and close each inner ring.

If a nozzle is plugged, always shutdown the machine completely before removing the nozzle. Carefully remove the nozzle, clean and replace.

The Super Wizzard spray manifold is constructed from aluminum. Four of the five water rings are supplied with threaded nozzle extensions that are designed to remain in the casting. The nozzle extension is provided to reduce water wash at the nozzle and eliminate thread damage to the aluminum during maintenance. Nozzles should only be removed when the heat to the spray manifold is off and the casting has cooled down. Extreme care should be used when removing the nozzle so that the threads in the aluminum are not damaged. **Nozzles should always be removed by hand without the use of power tools.** The nozzle should be installed by carefully starting the thread in either the casting or nozzle extension thread and tightening to fingers tight. Finally tightening should be accomplished by using a palm ratchet or equivalent to firmly seat the o-ring on the machined surface on the casting or nozzle extension. **Do not over tighten.**

OPERATING SPECIFICS (CONT)

7. WATER MANIFOLD AND VALVE MANIFOLD HEATING SYSTEM

The Super Wizzard is equipped with heating on the water spray manifold and valve manifold.

The aluminum spray manifold is heated with 6Kw of electric heat that is controlled by measuring the temperature of the casting so that heat is provided when needed to prevent nozzle freeze-up and unnecessary downtime. The heat operates in two modes: start-up (fan off) heating where the full 6Kw of heat is provided and run heating (fan on) where 4Kw of heat are provided. For cold temperature snowmaking a cold temperature switch is provided to enable the user to override the run heating set-up and add 2Kw of heat.

Some Super Wizzard models are equipped with an adjustable thermostat that is preset at the factory to maintain a spray manifold temperature of 50EF (10EC). For models not equipped with a cold temperature switch it may be necessary to adjust the thermostat to a higher temperature to provide sufficient heat to the spray manifold. **Caution: Never set the thermostat above 150EF (65EC) or damage to the nozzle o-ring may occur.** An indicator light will light when the heaters are operating. The spray manifold heaters are automatically turned on when power to the machine is energized.

The 3-way ball valves are equipped with boot heaters to prevent freezing during operation and to thaw the valves prior to start-up. Heat is automatically supplied to the ball valves when the control panel switch is on and power is supplied to the panel. Allow the heat to the valve to thaw them prior to operating to avoid damaging the plastic seats. An indicator light will activate when the heaters are operating.

Operating Specifics (cont)

8. AIR COMPRESSOR

The Super Wizzard Snowmaker is equipped with a 5 HP Atlas Copco, 5 HP Hydrovane or 10 HP Hydrovane on-board compressor. The machine should be level to provide the best lubrication to the compressor. Using the level gauge on the enclosure and the three adjustable jacks at each axle the machine can be leveled.

Hydrovane specifics:

Hydrovane compressors must use Hydrovane CS100 oil.

The Hydrovane compressor can be within 15E of level and still receive proper lubrication.

The Hydrovane compressor is equipped with a pressure relief valve that automatically blows air to atmosphere when the line pressure exceeds the design pressure of the compressor.

A thermometer has been installed in the oil fill plug so that the compressor temperature can be monitored. Optimum operating range is 150-160EF (50-57EC).

To properly shutdown a Hydrovane compressor be sure the water is off and the water hose is disconnected. Then open and close the 2-way ball valve a couple of times and then leave the valve closed (failure to close the valve may result in damage to the compressor). Turn off the compressor at the panel and disconnect the air hose at the compressor.

Atlas Copco specifics:

It is recommended that PAO Atlas Copco oil is used for compressor maintenance.

The Atlas Copco compressor should always be level during operation. If the machine is not level, the compressor may not receive proper lubrication.

The Atlas Copco compressor is equipped with a safety pop-off valve to prevent system pressure from exceeding 120 psi.

Always open the Atlas Copco compressor drain valve after shutting down the compressor to allow condensation to drain out of the air hose. Close drain valve prior to start-up. Disconnecting the air hose at the compressor and allowing it to drain is also a good practice.

MACHINE OPERATION

A. Setting Up

The actual machine location will be determined by ski area personnel. The ski area should consider many factors such as slope pitch, visibility, wind direction, distance from hydrant, etc. Be certain to consider the marking of snowmaking and the determination of whether or not the trail will be open or closed. Your ski area should develop procedures for machine positioning, snow quality and signage.

1. Remove the power cord a turn at a time, laying it coil upon coil on the snow in offset fashion until the estimated length of cord required has been removed. The cord should uncoil without tangling as the end is pulled toward the power station.
2. After checking to verify that the power station is switched off, connect the plug.
NOTE: If the plug will not go into the receptacle properly, clear away any ice or snow or other debris. Try to keep the plug end out of the snow at all times. Again, be certain the POWER IS SWITCHED OFF.
3. Roll out and connect the water hose to the hydrant with the hydrant closed and lay next to the snowgun.
4. Hoses and power cord should be routed to prevent burial by newly-produced snow, and out of the way for any and all vehicles. Advise vehicle operators of cord and hose locations. Signing and/or fencing may be appropriate.
5. Flush the water hose before attaching to the gun. Open the water hydrant slowly. It is important to run enough water through the hose to wash away all ice that may be inside. There should be no ice if the hoses were well drained at shut down. For ease and safety, flush the hose off to the side of the trail to avoid ice and washouts. Failure to clear the hose may cause ice to plug the water filter. Now turn off the water and reconnect this hose to the water inlet on the machine.
6. Rotate the head so that it is pointed downwind, or quartering slightly across the wind.
7. Adjust the head to the appropriate angle for the wind and the area to be covered. Cranking the vertical adjust jack handle will change the head position.
8. Before transporting the machine, be sure to fully extend the right and left axle extensions to avoid rolling the machine on steep terrain. The axles are extended by removing the bolts and pulling the axle extension out so that the hole in the frame axle aligns with the hole located the farthest from the tire on the axle extension.

MACHINE OPERATION (CONT)

B. Pre-Start Check List

1. Machine securely anchored and jacks lowered.
2. Machine is level.
3. Check fan to see if frozen or iced (with power off at machine).
4. Water and air hoses securely connected. Make sure hose Camlock rings on coupling are in locked position (hoses and power cord out of path of snowmaking, transport or grooming vehicles).
5. Snowmaking head at appropriate angle and aimed correctly; make certain snow will not build up on wires, trees, lifts, etc.
6. The water manifold should be free of ice if drained properly. All ball valves should be in the drain position with the valve handles down to drain the spray manifold and water feed hoses.
7. Power ON at electrical station.

Before full start-up, check to be sure the electrical system is operational by turning the power on at the control panel. Push the fan start and stop button. This will indicate whether or not there is a serious fan imbalance or other operational problem within the system before full speed rotation is allowed. At this time, also check fan rotation. Before start-up, be sure no clothing, gloves, hats, etc. may be sucked up by the fan. Repeat proper rotation check for the Hydrovane compressor (Atlas Copco compressors are not rotation sensitive).

8. The main water manifold heat circuits have a thermostat that automatically cycles the heat on and off as needed. The valve manifold heaters are on all the time.

The spray manifold heater will turn on automatically when power is turned on to the machine. The thermostat will control the operating condition of the spray manifold heaters.

9. Ensure the correct water filter is installed in the valve manifold. A 60 mesh filter for 10 gph or larger nozzles or an 80 mesh filter for 7.5 gph or smaller nozzles.

MACHINE OPERATION (CONT)

C. Start-Up

Preheat the water and valve manifold to thaw any ice before starting (see manifold heating system instructions).

1. Turn on the flood light if you need the light from the machine.
2. To start the on-board Atlas Copco compressor you should first start the compressor and then close the drain valve on the compressor airline. For a Hydrovane compressor you have to first push the off button and then the on button to the control panel to start the compressor (this automatically resets the compressor). The 2-way ball valve should already be closed if properly shutdown, if not close the valve now.
3. Check air compressor pressure to assure a proper operating range.

5 HP Atlas Copco - 58 psi (4 Bar) with air flowing through nucleator nozzles and water off.

5 & 10HP Hydrovane - 87 psi (6 Bar) - air flowing through nucleator nozzles and water off.

4. Turn on the fan; be sure to be out of the fan air stream at all times in case there is any debris that may be thrown out.
5. Check the rotation of the fan and air compressor. If incorrect, have a qualified electrician change the wiring inside the panel at the main disconnect. (Be sure that the screws inside the terminal are firmly tighten onto the wires.) Be sure compressed air is existing every nucleator nozzle.
6. Turn water hydrant slowly into "Open" position (depending on water pressure, 500 PSI maximum).
7. Allow water manifold pressure to stabilize.
8. Follow Operating Adjustments to control the snow quality.
9. Give the machine a "Once-Over Walk-Around" to be sure everything is functioning properly.
10. Recheck to see if marking and/or signing and/or fencing are appropriate.
11. Check compressor oil level after letting it warm up.

MACHINE OPERATION (CONT)

D. Operation

1. Check to make sure each nucleator nozzle has a mixture of air and water exiting the nozzle in the proper consistency.
2. The only adjustment to the machine is water flow through the machine. Open and close the four heated ball valves as the temperature and snow quality dictates. See water system page for specific water flows at varying pressures.

Always be sure of the quality of snow you are trying to make before starting the machine. Once the machine is started, you vary snow quality by changing water pressures (the more the pressure, the more the flow) and by changing water quantities via the four ball valves. Always start machine with four valves in off position.

E. Daily Checks

- No ice, snow or foreign material in electric plug
- Cord and plug intact
- Air compressor oil correct level
- Fan free of ice and obstructions
- No ice build-up on machine or carriage
- Carriage not broken or cracked
- Tow bar secure and not damaged
- Hoses not iced, frozen or damaged
- Nozzles clear and undamaged
- Nucleator nozzles are free of ice build-up
- Jacks operating properly
- No loose nuts or bolts
- Wheel lug nuts secure
- Tires properly inflated
- Screen in place
- Overall "look" is normal
- Filter clean and sealing
- Pivot bearing friction adjusted properly

MACHINE OPERATION (CONT)

F. Shutdown Procedure

Trouble-free start-up of your Super Wizzard Snowmaker relies upon the observance of the proper shutdown procedure. In extreme cold conditions, it is essential that these procedures be performed as quickly as safety will permit to avoid freeze ups.

1. Turn off water at hydrant.
2. Close all 3-way ball valves, these should self drain.
3. After pressure is absent, disconnect hose and let drain downhill and off the trail edge.
4. Turn off fan.
5. Position head of machine to allow all water to drain. Tipped up as far as it can.
6. Be sure to run the compressor until all water has drained from the system.
7. Turn off on-board compressor. Open air line drain valve.
8. Turn off flood light and all heat switches.
9. Turn cold temp extra heat switch back to normal heat.
10. Turn machine disconnect switch to Off position.
11. Roll up hoses and disconnect electrical cord being certain the on-hill electric station is Off.
12. Coil cord and place machine and hoses out of the way. Before moving machine, be sure the jacks are raised and clear, and the wheels and front tow bar are free of ice and snow.

G. Gun Storage and Placement Locations

Your ski area should determine the best locations to store and operate the equipment when the machines are not operating and during actual operation. Proper marking and/or signage and/or fencing may be appropriate. Each ski area should have a policy that you clearly understand before transporting, setting up, operating or parking the snowgun.

Three-way ball valves should be in the on position (handles up) to close valve opening in drain caps to the outside elements (i.e. bugs, wasps, bees, etc.) Cover water inlet camlock.

TROUBLE SHOOTING

A. Snow Too Wet

1. Nucleator needs adjustment.
2. Close valves to rings 2, 3 4 and 5 as appropriate.
3. Water pressure too low, or inline valve manifold filter dirty.
4. Rotate head upward to allow water longer hang time.
5. Making snow into the wind will not allow the water particles ample time to freeze before hitting the ground; this will also cover the machine with snow and ice.

B. Ice-Covered Machine

Be certain machine is not running. Adjust to aim machine more downwind. Dislodge ice carefully; no hammering. Ice can be removed using a piece of rubber hose only when machine is shut off, using care.

C. Clogged Nozzles

1. Inline valve manifold filter needs cleaning.
2. Check for nozzle damage. Do Not clean nozzles while machine is operating.
3. Check for damaged inlet screen on supply pump.

D. Erratic Spray Pattern

1. Check for clogged, frozen, or iced-up nozzles.
2. Check for nozzle damage.
3. Check water pressure. Water pressure below 100 psi will prevent proper nucleation.

E. Trouble Light Flashing

If the strobe trouble light is flashing, this means there is some type of electrical fault. Electrical faults are typically caused by either the fan, compressor, oscillator or heat.

TROUBLE SHOOTING (CONT)

F. Compressor Function

This section will deal with the most common problems experienced with the Atlas Copco compressor used for snowmaking. Additional trouble shooting is contained in the Atlas Copco manual or the Hydrovane manual.

Gauges do not function:

Probably "frosted" - should thaw out as compressor warms up, caused by condensation from compressed air temperature changes.

Proper oil type:

Your compressor arrives with Atlas Copco PAO synthetic lubricant oil in its sump (for snowmaking temperatures only, see lubrication chart in Atlas Copco Manual if used under other ambient conditions). If your compressor needs make-up oil, use only PAO oil. For oil changes, as prescribed in the Atlas Copco Manual PAO oil is recommended. For more information, see the Maintenance Schedule section.

Hydrovane compressors use CS100 synthetic lubricant. Use only CS100 oil. See Hydrovane manual if used under other conditions.

G. Fan Rotation Incorrect

This should be checked before season start-up. If the fan rotates in reverse, the fan motor phasing is incorrect. **CAUTION:** Do not change any wires or open a control box or electric station with the electrical supply turned on. Disconnect power supply to be safe and disconnect cord.

H. Friction Pivot Bearing Out of Adjustment

See Operating Specifics "Horizontal Pivot Friction Brake Adjustment".

For SMI assistance, phone:

U.S. & Canada (800) 248-6600

SNOW QUALITY & CURING

A. What Is The Best Quality Snow?

According to most successful ski area operators, the best base snow is wet snow, not so wet as to discolor or bleed out, but much wetter than fresh natural snow.

Why? Natural snow will become more dense with age. So, most experienced snowmakers make snow that is like three to fifteen-day-old natural snow for base snow. It lasts longer, holds up better, is less apt to blow away, can be groomed easier, and is the most energy efficient to make. Wetter snow is more efficient because more snow can be made with the same number of people, the same pumps and the same amount of energy.

Surface snow may be wet to very dry quality. Most skiers today prefer a drier surface snow, if possible.

B. How Do You Determine Snow Quality?

Snow quality during snowmaking can be checked several ways:

- 1) Squeeze a handful and if a few drops of water come out it is OK; no drops of water, too dry; substantial water, too wet.
- 2) Kick the snow with your toe. If it comes out ball bearing size, OK; flies up as dust, too dry; golf ball size or larger, too wet.
- 3) Let the snow fall on your arm held horizontally. If it hits and bounces, OK; flutters down as dust, too dry; goes splat, too wet. These tests show snow wetter than natural snow, but good machine-made snow. The snow should appear white.
- 4) Check the snow at several locations to determine the overall quality. (Near the fan will be wetter than thirty feet away.)

The type and quality of your snow may be determined by the area being covered, skier traffic, and other factors. You have to decide what quality snow best suits your particular needs. Many areas first make a relatively heavy base snow and then a lighter snow over the base snow. Snowmaking is not a science as yet. It is an art that requires change and adaptation to many varying parameters. It is certainly challenging and confounding at times. Environmental factors influence snowmaking more than anything else. Be alert for weather changes and how they affect your machine's performance.

SNOW QUALITY & CURING (CONT)

C. Snow Curing & Grooming

Plan on grooming machine-made snow, if possible. It will last longer and ski better. Be aware of the weather conditions to follow your snowmaking operations, to determine when you should shut down to allow "curing" of your snow. Try to allow at least 48 hours for the snow to cure in piles before grooming. Also allow time to groom the snow, if appropriate, before opening the area.

MAINTENANCE SCHEDULE

At least seasonally the machine should be checked completely for unusual wear and/or damage.

Some specifics to check:

- %Wheels, tires, lug nuts and bearings
- &Carriage for weld cracks or bends
- %Tow bar for wear, cracks or bends
- &Head mounting yoke for wear, cracks or bends
- %Manifold should be flushed clean
- &Nozzles checked for damage and wear
- %Nucleator nozzles inspected
- &Fan housing and mounts inspected for cracks or wear
- %Fan visually inspected for structural cracks or nicks in blades
- &Cooling fan and vents are clear on fan motor and compressor motor
- %Electrical cord inspected for nicks and abrasions or breakage
- &Plug checked for possible problems or breakage
- %Gauges functioning
- &All nuts, bolts and other fasteners checked for tightness
- %To prevent weather checking of the tires, it may be appropriate to block the tires
- &Protect the cord from sunlight (ultraviolet rays) to assure its long life
- %3-way ball valve operating correctly and in on position for storage.
- &Filter clean and properly sealed.
- %Friction clutch is adjusted and operating satisfactorily.

MAINTENANCE SCHEDULE (CONT)

For complete compressor maintenance see Atlas Copco or Hydrovane compressor manuals. The maintenance schedule in the Atlas Copco or Hydrovane manual is a good guide; but in addition we have included the following points:

Recommended Oil

Atlas Copco PAO - Multi-viscosity oils should not be used. If the compressor will be used in the summer, the oil should be changed to coincide with the ambient operating temperature of the chart in the Atlas Copco Manual. Oil should be changed at the end of the snowmaking season to remove any moisture from compressor before storage during the off season.

Hydrovane CS100 oil. If the compressor will be used in the summer, the oil should be changed to coincide with the ambient operating temperature of the chart in the Hydrovane manual. Oil should be changed at the end of the snowmaking season to remove any moisture from compressor before storage during the off season.

Depending on operating conditions, at least seasonally, the compressor intake air filter should be changed. If the compressor is not functioning properly (especially overheating), the air filter may be restricted. To replace the filter, simply remove the air filter cover and replace the filter, much as you would in an automobile.

Electrical Motor Greasing

The electrical motors are lubricated at the factory and should not need any additional lubrication for three to five years. The following procedure should be used:

To relubricate bearings, remove the drain plug. Inspect grease drain and remove any blockage with a mechanical probe taking care not to damage bearing. **CAUTION:** Under no circumstances should a mechanical probe be used while the motor is in operation. Add one pump new grease at the grease inlet. New grease must be compatible with grease in the motor. Run the motor for 15 to 30 minutes with the drain plug removed to allow purging of any excess grease. Shut off unit and replace the drain plug. Return motor to service. **CAUTION: Over greasing can cause excessive bearing temperatures, premature lubricant breakdown and bearing failure. Care should be exercised against over greasing.**

Recommended Greases

Exxon Mobil - Polyrex EM
Chevron USA Inc. - SRI No. 2

MAINTENANCE SCHEDULE (CONT)

Recommended Spare Parts

Nozzles with O-rings

Extra Water Filter with O-Rings

Extra Electrical Plug End and Boot

Water Hose Gaskets for Couplers

Proper Oil for Compressor

Extra Air Intake Filter for Compressor

Extra Air/Oil Separator Filter for Compressor

Extra Oil Return Valve/Filter

Regulator Rebuild Kit

Water Pressure Gauge

Light Bulbs

DOS, DON'TS & REMEMBERS

DO have a training seminar before you or your crew ever start to make snow. Familiarity with the snowmaker and procedure could prevent a mishap or injury, and should make snowmaking more efficient.

DO let vehicle operators know where and how the machines are placed so they can avoid the cords, hoses, and fresh snow.

DO exercise caution and care when moving a snowmaker.

DO check the filter for cleaning and the pivot bearing for proper friction force. Always shut down the machine completely before checking filter or bearing.

REMEMBER to raise the jacks on your machines when moving.

DO check the machine frequently to determine if problems are developing that could cause an emergency.

DON'T connect or disconnect the electrical plug while the power supply is on.

DO mark areas where snow is being made and/or close part of the trail to skiers. Skis could damage the hoses or electric cord or skiers could incur injuries from the equipment.

DON'T make snow on cables, chairs, sheaves, towers, trees, signs, or buildings, etc. if avoidable. If snow does accumulate on lift parts, be certain to inform the lift operators or mountain manager of the situation before they start the lifts.

DO be sure to drain the hoses at time of shutdown, off the trail if possible.

DON'T leave hoses, cords or snowmakers unprotected on the hill. They could be run over by skiers or vehicles and damaged or skiers could be injured. Also they could be buried by snow and lost until spring.

DO remember the environment associated with snowmaking. Be prepared for cold, wet, and slippery conditions.

DO decide for yourself what constitutes the best quality snow for your area and skier traffic. You control snow quality.

DO move the snowmaker when the power source is off and the cord and hoses are disconnected.

DOS, DON'TS & REMEMBERS (CONT)

DON'T straddle hoses.

DON'T stand in front of hydrants or snowmaking equipment while opening hydrants or valves.

REMEMBER not to get in direct line of the snowmaker's air stream. Ice or debris could be thrown by the fan and cause injury.

REMEMBER not to walk or drive through fresh snow unless it will definitely be groomed; the footprints or tracks could be hazardous to skiers.

DO cure the snow as long as possible before grooming. At least 48 hours if possible.

DO keep good records of grooming and snowmaking activities. It can help you in the future. Examples include: temperature, relative humidity, water flow rate, gun location, number of guns, numbers on machines, etc.

DO plan the snowmaking activities. Having a map of the area with a preset plan of action is a good idea. Allow for changes according to various atmospheric changes and plan ahead, setting up a timetable/schedule of where, when, and how much snow you will need. Also consider how many people will be available to monitor machine operation and perform any necessary relocation.

DO move or pivot the machine to allow greater area coverage unless a mound of snow is desired. A mound takes longer to cure and groom, but lasts longer. A mound can also be a hazard.

DO keep hoses or power cord from becoming buried in the snow - it's very difficult to move a machine or shut down properly if the hose and cord are not accessible. Place them carefully at the time of start-up to minimize snow accumulation on them.

DO keep the machine's head, wheels and carriage free of ice and snow build-up. It's much easier to work with a clean machine.

DON'T beat or hammer ice and snow accumulations from the equipment, a piece of rubber hose can be used effectively.

DO follow the instructions in this booklet, especially the daily checks and safety reminders.

REMEMBER THAT SNOWMAKING IS A COLD, WET, VERY IMPORTANT JOB.

DO REMEMBER TO SHOW APPRECIATION TO A SNOWMAKING CREW THAT HAS DONE A GOOD JOB.

WET BULB CONVERSION CHART

Air Temperature °F

R.H.	38	36	34	32	30	28	26	24	22	20	18	16	14	12
100%	38.0	36.0	34.0	32.0	30.0	28.0	26.0	24.0	22.0	20.0	18.0	16.0	14.0	12.0
90%	36.9	35.0	33.0	31.0	29.1	27.2	25.0	23.2	21.3	19.4	17.3	15.3	13.5	11.5
80%	35.8	33.9	32.0	30.0	28.1	26.1	24.2	22.4	20.5	18.6	16.8	14.9	12.9	11.0
70%	34.5	32.5	30.9	28.9	27.2	25.0	23.1	21.5	19.8	18.0	16.0	14.2	12.2	10.4
60%	33.0	31.1	29.4	27.8	26.0	24.2	22.4	20.8	19.0	17.2	15.4	13.5	11.8	9.9
50%	31.5	30.0	28.2	26.6	25.0	23.1	21.5	19.9	18.1	16.3	14.6	13.0	11.0	9.2
40%	30.1	28.5	27.0	25.4	23.9	22.2	20.6	19.0	17.3	15.6	13.9	12.2	10.4	8.8
30%	28.8	27.2	25.8	24.2	22.8	21.2	19.6	18.2	16.5	14.8	13.2	11.6	9.9	8.2
20%	27.2	26.0	24.5	23.0	21.6	20.1	18.6	17.2	15.6	14.0	12.5	10.9	9.2	7.5
10%	26.0	24.5	23.2	22.0	20.5	19.0	17.6	16.2	14.8	13.2	11.8	10.1	8.5	7.0
0%	24.5	23.0	22.0	20.8	19.5	18.0	16.7	15.3	13.9	12.5	11.0	9.6	8.0	6.5

Air Temperature °C

R.H.	+3	+2	+1	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10
90%	+2.4	+1.5	+0.5	-0.6	-1.5	-2.5	-3.6	-4.5	-5.4	-6.3	-7.3	-8.4	-9.4	-10.3
80%	+1.8	+0.9	-0.1	-1.1	-2.1	-3.1	-4.0	-4.9	-5.8	-6.8	-7.7	-8.6	-9.6	-10.6
70%	+1.1	+0.1	-0.7	-1.7	-2.6	-3.7	-4.6	-5.5	-6.3	-7.2	-8.1	-9.1	-10.0	-11.0
60%	+0.3	-0.7	-1.5	-2.3	-3.2	-4.1	-5.0	-5.9	-6.7	-7.6	-8.5	-9.3	-10.4	-11.2
50%	-0.5	-1.3	-2.2	-3.0	-3.8	-4.7	-5.6	-6.4	-7.2	-8.1	-9.0	-9.9	-10.7	-11.7
40%	-1.3	-2.1	-2.9	-3.7	-4.4	-5.2	-6.1	-6.9	-7.7	-8.5	-9.4	-10.3	-11.1	-12.0
30%	-2.0	-2.8	-3.5	-4.3	-5.0	-5.8	-6.7	-7.4	-8.1	-9.0	-9.8	-10.6	-11.4	-12.3
20%	-2.9	-3.5	-4.3	-5.0	-5.7	-6.5	-7.2	-7.9	-8.7	-9.4	-10.2	-11.0	-11.8	-12.7
10%	-3.5	-4.3	-5.0	-5.6	-6.3	-7.1	-7.8	-8.5	-9.2	-9.9	-10.6	-11.4	-12.3	-13.1

WARRANTY

As set forth herein, the term "machine" shall refer to snowmaking machines as manufactured by Snow Machines, Incorporated and sold by authorized distributors. Claims for warranty shall be submitted by the authorized distributor who performs or authorizes the repairs.

- A. THE WARRANTY PERIOD SHALL BE ONE YEAR FROM THE DATE OF PURCHASE FOR ALL MODELS.
- B. DURING THE PERIOD OF WARRANTY, SNOW MACHINES GUARANTEES TO THE ORIGINAL PURCHASER OF EACH SNOW MACHINE:

Any part adjudged by the manufacturer defective by reason of faulty workmanship or material shall be replaced free of charge upon return of broken part.

- C. THE WARRANTY SHALL BE EFFECTIVE IF PURCHASER:

Gives notice to an authorized distributor of any and all apparent defects within ten (10) days after discovery and immediately makes machine available for inspection to the distributor or his authorized representative.

- D. WARRANTY SHALL NOT EXTEND TO:

1. Machines used for renting or leasing beyond the original owner.
2. Machines subjected to abnormal strain, neglect, abuse, improperly stored, or altered from factory standard.
3. Machines whose trademark, name, or identification number has been changed or removed.
4. Failures of, or failures caused by parts or accessories not manufactured by Snow Machines, Incorporated.

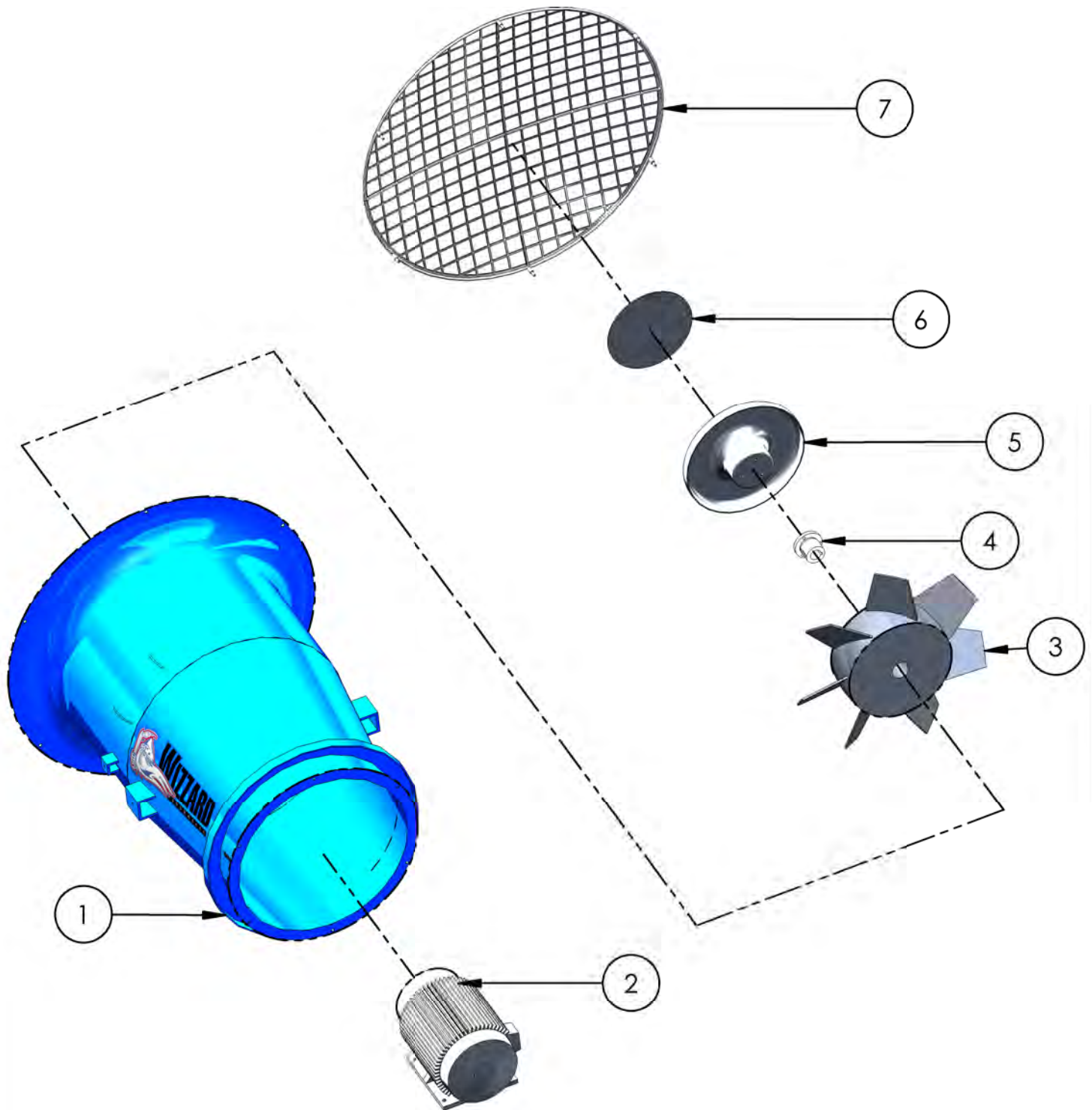
- E. WHERE PERMITTED BY LAW:

1. COMPANY'S LIABILITY SHALL BE LIMITED TO THAT SET FORTH IN THIS WARRANTY, AND COMPANY SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING INJURY TO PERSON OR PROPERTY.
2. COMPANY MAKES NO OTHER WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED; AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED THE OBLIGATION STATED IN THIS WARRANTY ARE HEREBY DISCLAIMED BY COMPANY AND EXCLUDED FROM THIS WARRANTY.

Super Wizzard Snowmaker Parts List

Last Updated Sept. 2010

SUPER WIZZARD FAN ASSEMBLY



SUPER WIZZARD FAN ASSEMBLY

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	1	38-33W7D42460A	33" Fan Assembly
		38-3W7D50460A	33" High Altitude Fan Assembly
		38-36VX45460A	36" Fan Assembly
		38-36VX50460A	36" High Altitude Fan Assembly
2	1	28-2000015	25Hp Motor 50/60Hz
3	1	38-33W042	42 Prop for 33" Fan
		38-33W050	50 Prop for 33" Fan
		38-36VX45	45 Prop for 36" Fan
		38-36VX50	50 Prop for 36" Fan
4	1	38-991163	Taperlock Bushing Q1 1 5/8"
5	1	***	Bundt Pan
6	1	***	Bundt Pan Cover
7	1	920151-1	44 ½" Screen
		845151-1	46 ½" Screen

SUPER WIZZARD SHROUD ASSEMBLY



SUPER WIZZARD SHROUD ASSEMBLY

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	1	840020-1	Shroud
2	9"	39-840021	1 ½" Continuous Hinge
3	1	840021-1	Shroud Door (Blue)
		840021-3	Shroud Door (White)
4	1	39-840020	Door Latch
5	12	134084-4	Captive Screw Clip
6	12	134084-1	Captive Screw

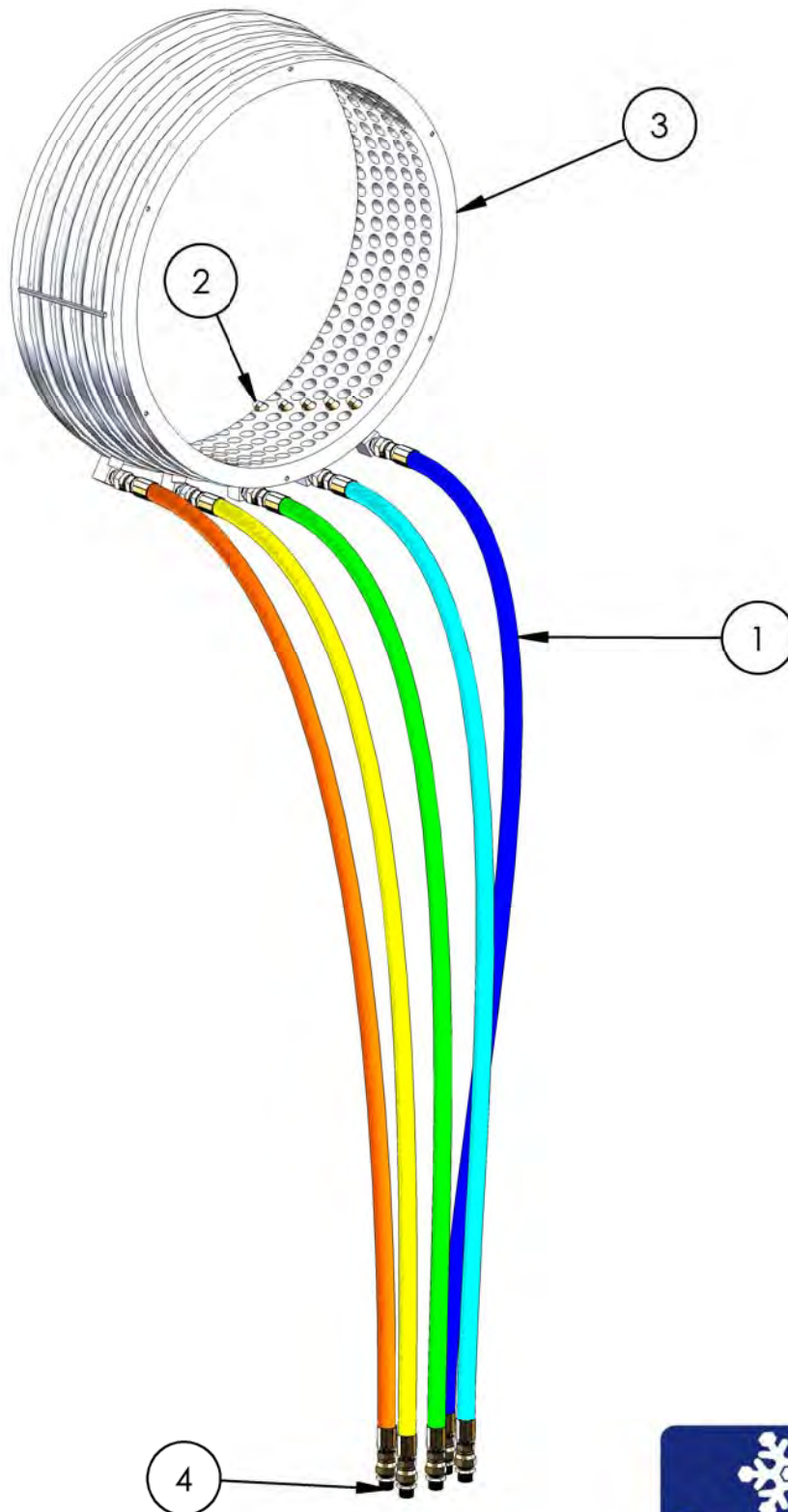
CARRIAGE SPRAY MANIFOLD



Spray Manifold

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	5	31-002090	½" to ¾" JIC
2	150	64-300085	10 GPH 45° Nozzle
	150	64-300089	12 GPH 45° Nozzle
	75	64-300093	15 GPH 45° Nozzle
3	375	64-300081	Nozzle Extension
4	750	35-840001	Spray Nozzle O-Ring
5	1	840001-1	Spray Manifold Weldment

TOWER SPRAY MANIFOLD

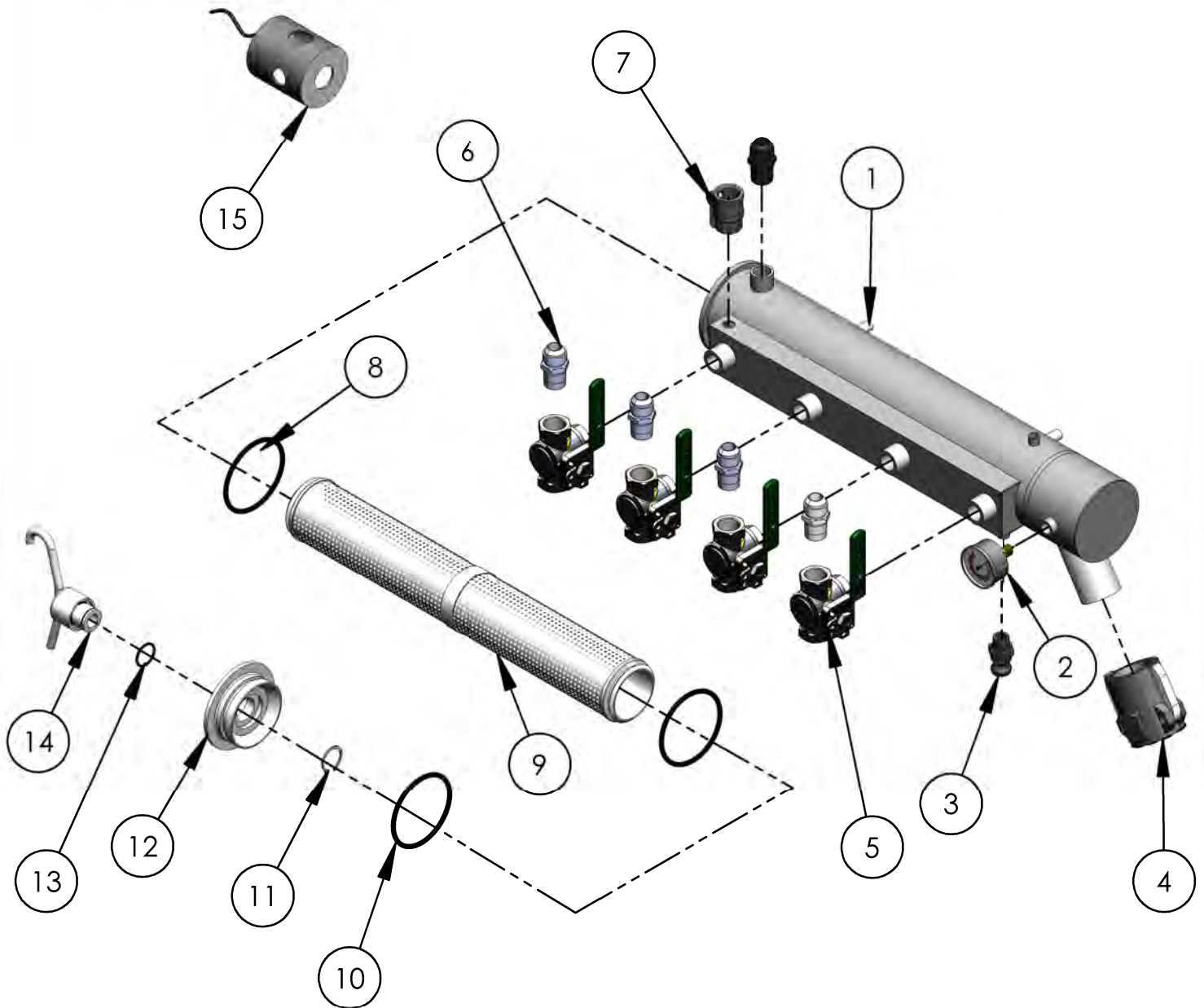


Tower Spray Manifold and Hoses

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	10	***	¾" Water Hoses (Specify Machine Type, Valve Size, Handle Color, and Length)
2	150	64-300085	10 GPH 45° Nozzle
	150	64-300089	12 GPH 45° Nozzle
	75	64-300093	15 GPH 45° Nozzle
		64-300081	7.5 GPH 45° Nozzle
	750	35-840001	Spray Nozzle O-Ring
	375	64-300080	Nozzle Extension
3	1	840001-1	Spray Manifold Weldment
4	5	31-002086	¾" Bulkhead Fitting

4 VALVE TOWER MANIFOLD

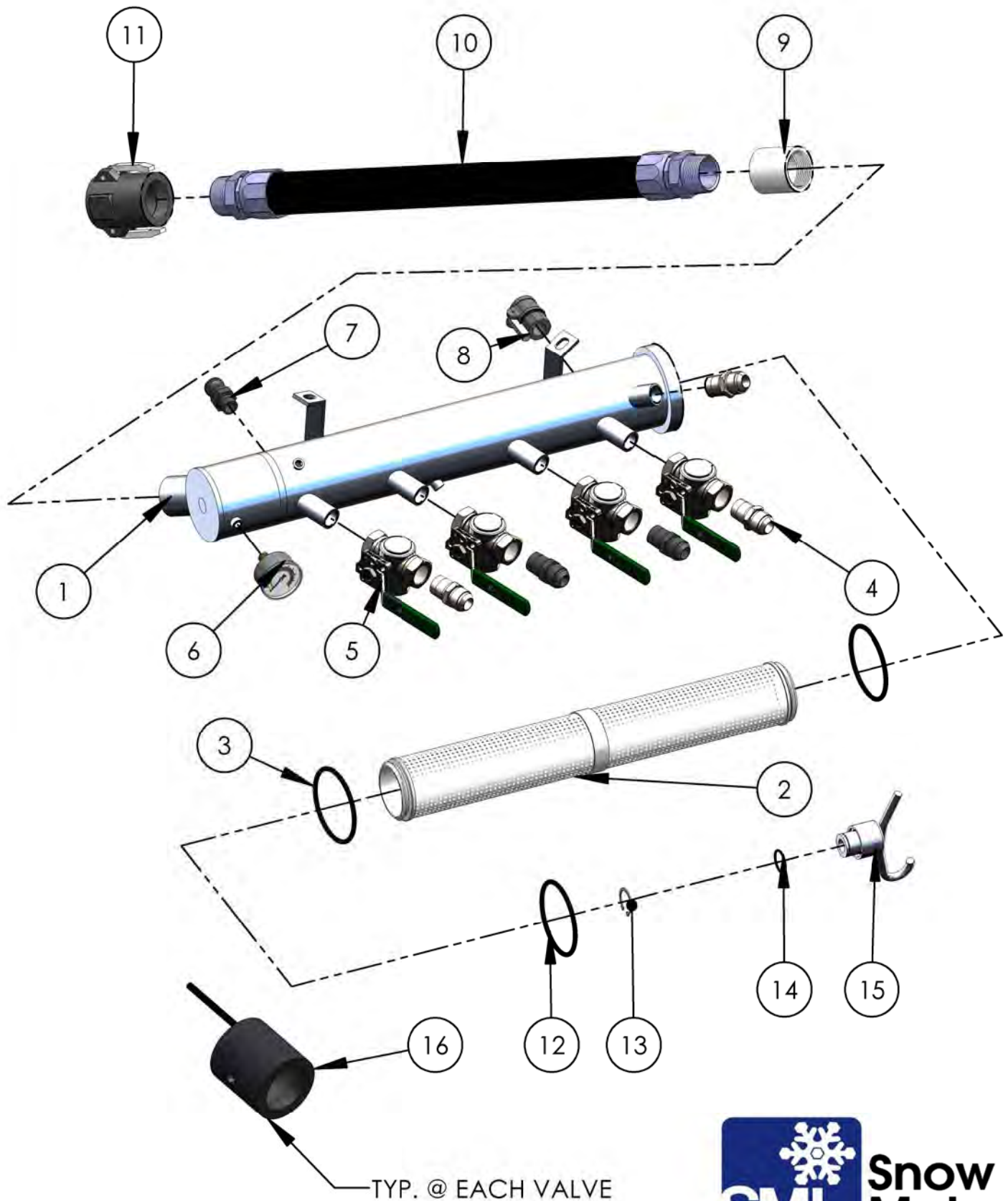
TYP @ EACH VALVE



SUPER WIZZARD TOWER MANUAL VALVE ASSEMBLY PARTS LIST

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	1	840110-1	Valve Manifold Body
2	1	06-002015-SMI	0-1000 Water Gauge
3	1	60-101050	½" Type F QD (5 HP)
		60-101076	¾" x ½" Type F QD (10 HP)
4	1	60-202151	1 ½" Type D Female QD
		60-202202	2" Type D Female QD
		60-201151	1 ½" Type A Male QD
		60-201201	2" Type A Male QD
5	4	63-000020	¾" SS 3-Way Ball Valve
		63-000020-kit	¾" Ball Valve Rebuild Kit
6	5	31-002070	¾" Male Pipe to Male JIC
7	1	60-202050	½" Type D QD (5 HP)
		60-202075	¾" Type D QD (10 Hp)
8	2	35-840004	O-Ring Strainer Element
9	1	840150-60	Filter Element 60 mesh
10	1	35-840002	O-Ring Valve Manifold Cap
11	1	39-840011	Retainer Ring
12	1	840101-1	Valve Manifold Cap
		840101-1A	Valve Manifold Cap Assem. (Includes #'s 10,11,12,13,14)
13	1	35-840003	O-Ring Valve Manifold Nut Assem.
14	1	840102-1	Valve manifold Wing Nut
15	4	29-200001	Valve Boot Heater 120v
		29-200002	Valve Boot Heater 240v

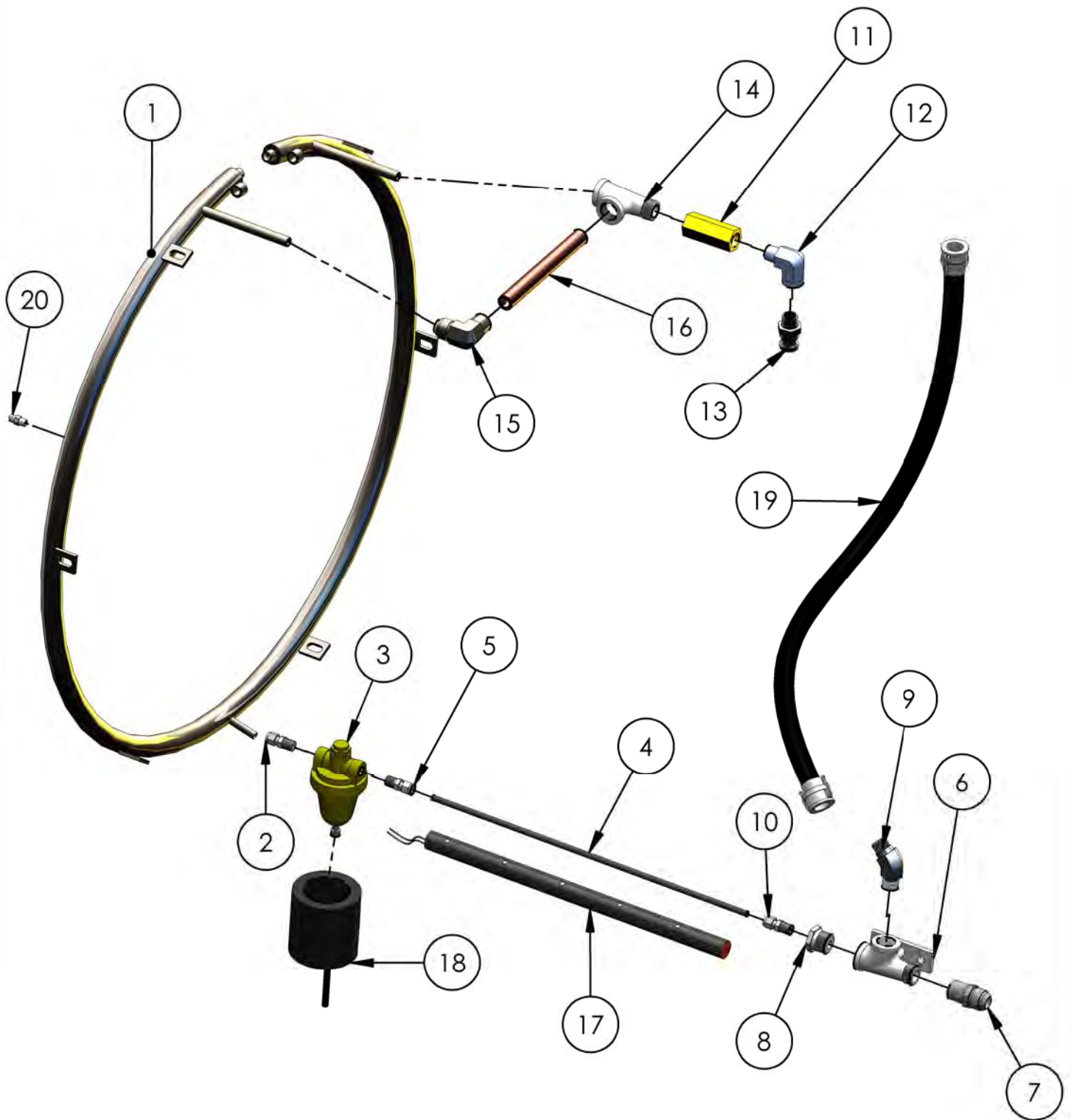
4 VALVE CARRIAGE VALVE MANIFOLD



SUPER WIZZARD CARRIAGE MANUAL VALVE ASSEMBLY PARTS LIST

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	1	845103-1	Valve Manifold Body
2	1	840150-60	Filter Element – 60 Mesh
3	2	35-840004	O-Ring Strainer Element
4	5	31-002070	¾" Male Pipe to Male JIC
5	4	63-000020	¾" SS 3-Way Ball Valve
		63-000020-kit	¾" Ball Valve Rebuild Kit
6	1	06-002015-SMI	0-1000 Water Gauge
7	1	60-101050	½" Type F QD (5 HP)
		60-101076	¾" x ½" Type F QD (10 HP)
8	1	60-202050	½" Type D QD (5 HP)
		60-202075	¾" Type D QD (10 HP)
9	1	61-002002SS	Coupling 1 ½ SS
10	1	31-002250	1 ½" x 24" Water Feed Assembly
11	1	60-202151	1 ½" Type D QD Female
		60-202202	2" Type D QD Female
		60-201151	1 1/2" Type A QD Male
		60-201201	2" Type A QD Male
12	1	35-840002	O-Ring Valve Manifold Cap
13	1	39-840011	Retainer Ring
14	1	35-840003	O-ring Valve Manifold Wing Nut
15	1	840102-1	Valve Manifold Wing Nut
16	4	29-200001	Valve Boot Heater 120V
		29-200002	Valve Boot Heater 240V

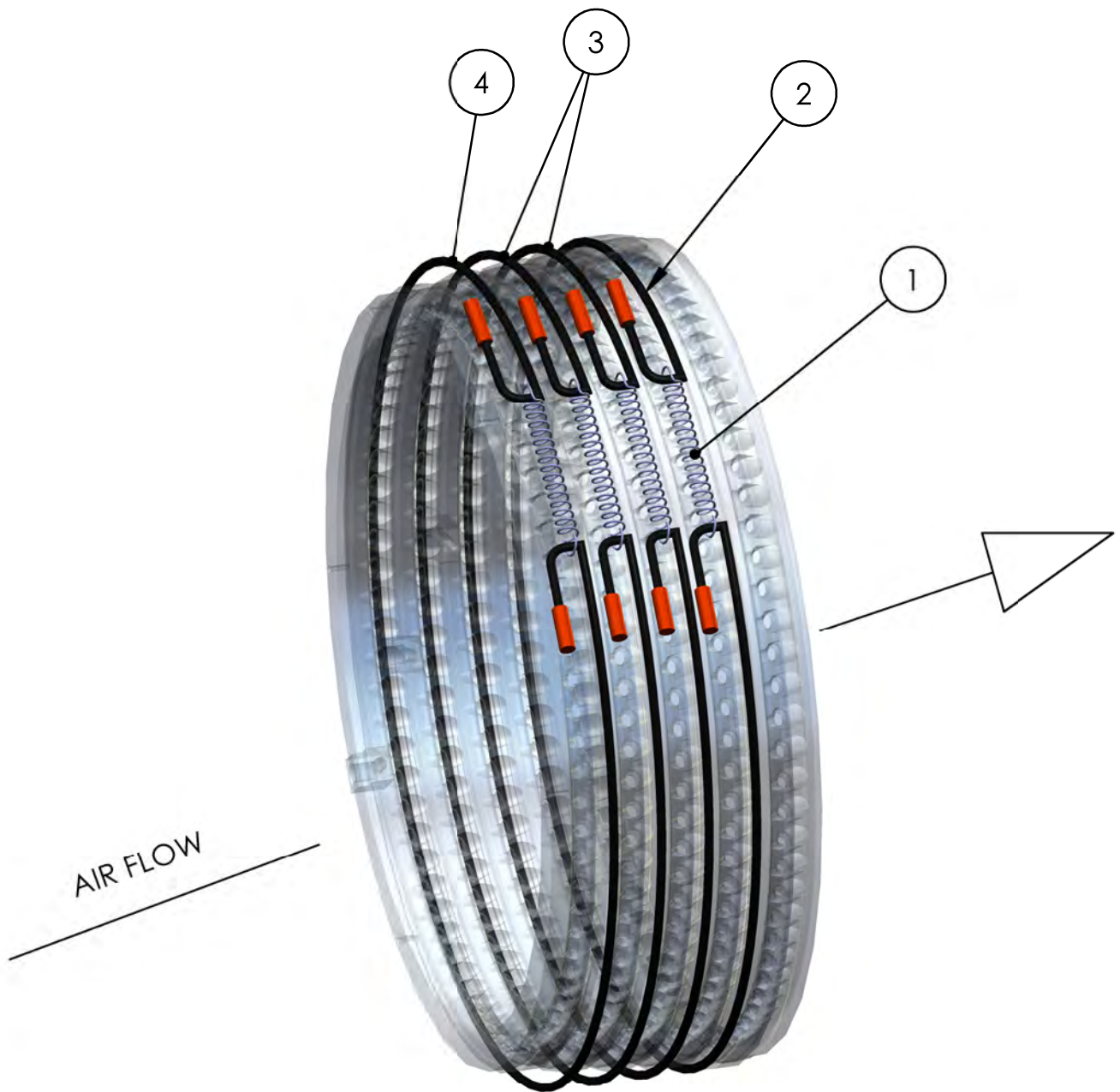
NUCLEATOR ASSEMBLY



Nucleator Assembly

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	1	840010-1	Nucleator Ring
2	1	31-002107	3/8" Tube Connector 1/4" Male NPT
3	1	63-000065	Pressure Regulator Valve
4	1.5'	40-006002	1/4" x .035w SS w Tube
5	2	31-002108	1/4" Tube Connector 1/4" Male NPT
6	1	840011-1	Wizzard Hose Tee
7	1	31-002070	3/4" Male Pipe to 37°
8	1	61-006030	3/4" x 1/4" Galv. Reducer Bushing
9	1	31-002065	3/4" 45° Elbow Male Pipe to 37° Male JIC
10	*	***	Same as number 5
11	1	61-999018	1/2" Brass Check Valve
12	1	31-002096	1/2" Street Elbow
13	1	60-101050	1/2" Type F QD (5 HP Compressor)
	1	60-101076	3/4" x 1/2" Type F QD (10 HP Compressor)
14	1	31-002120	1/2' Flare-less Tube Male Run Tee
15	1	31-002121	1/2" Flare-less Tube Union Elbow
16	7- 3/8"	86-000500	1/2" Diameter Copper Tubing
17	1	29-840034	Tube Heater 17" 120V
	1	29-840035	Tube Heater 17" 240V
18	1	29-840017	Heater Boot Pressure Regulator 120V
	1	29-840018	Heater Boot Pressure Regulator 240V
19	1	***	36" x Hose with (2) Type D QD's
20	20	64-002515	5 HP Nuc Nozzle
	20	64-000029	10 Hp Nuc Nozzle

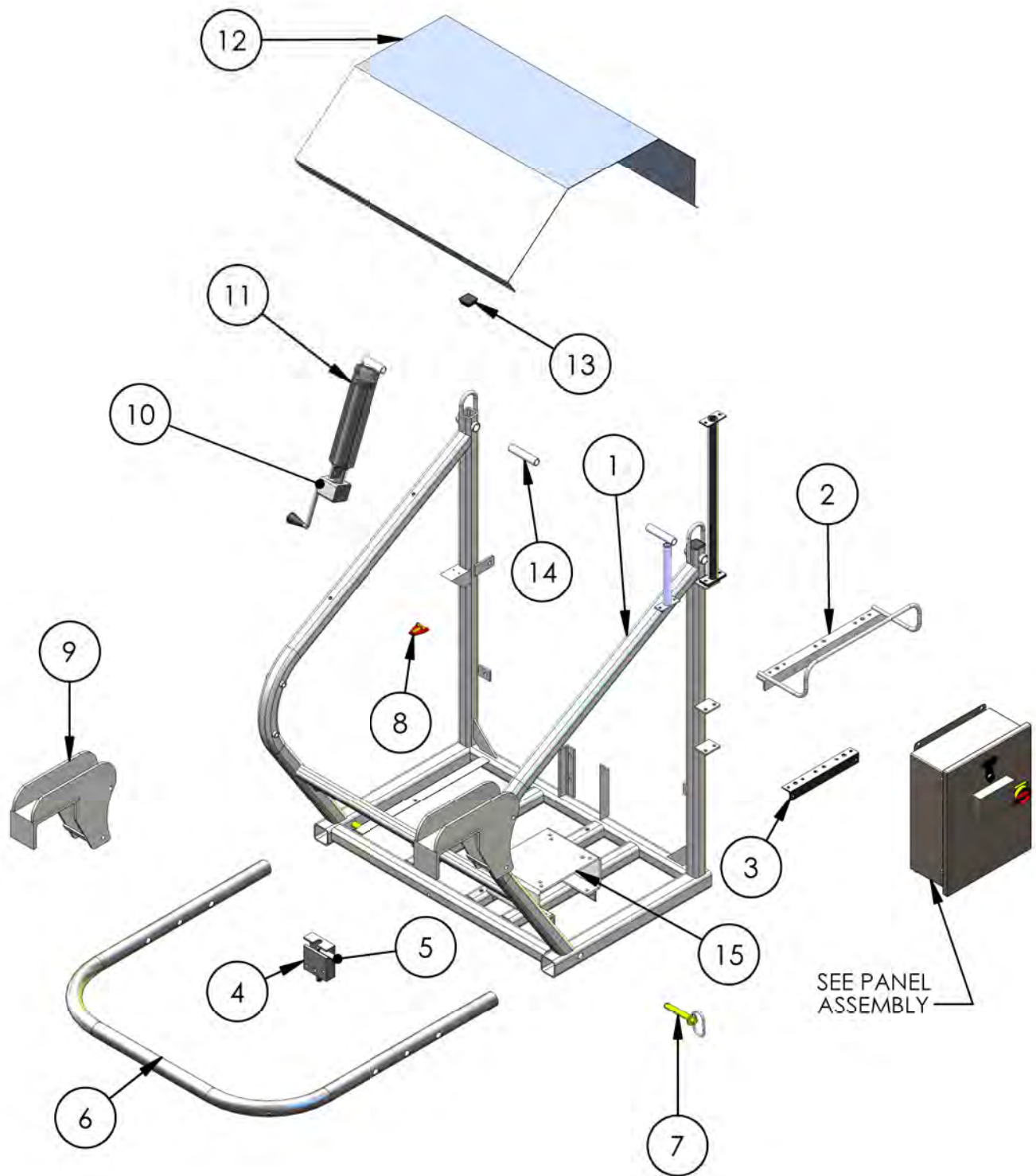
SUPER WIZZARD HEATERS



Super Wizzard Heaters

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	4	03-000008	Spring
2	1	29-840011	Wizzard Long Heater 480V/2000W
		29-840002	Wizzard Long Heater 380V/2000W
		29-840022	Wizzard Long Heater 575V/2000W
3	2	29-840010	Wizzard Manifold Heater 480V/1000W
		29-840001	Wizzard Manifold Heater 380V/1000W
		29-840021	Wizzard Manifold Heater 575V/1000W
4	1	29-840012	Wizzard Short Heater 480V/2000W
		29-840003	Wizzard Short Heater 380V/2000W
		29-840023	Wizzard Short Heater 575V/2000W

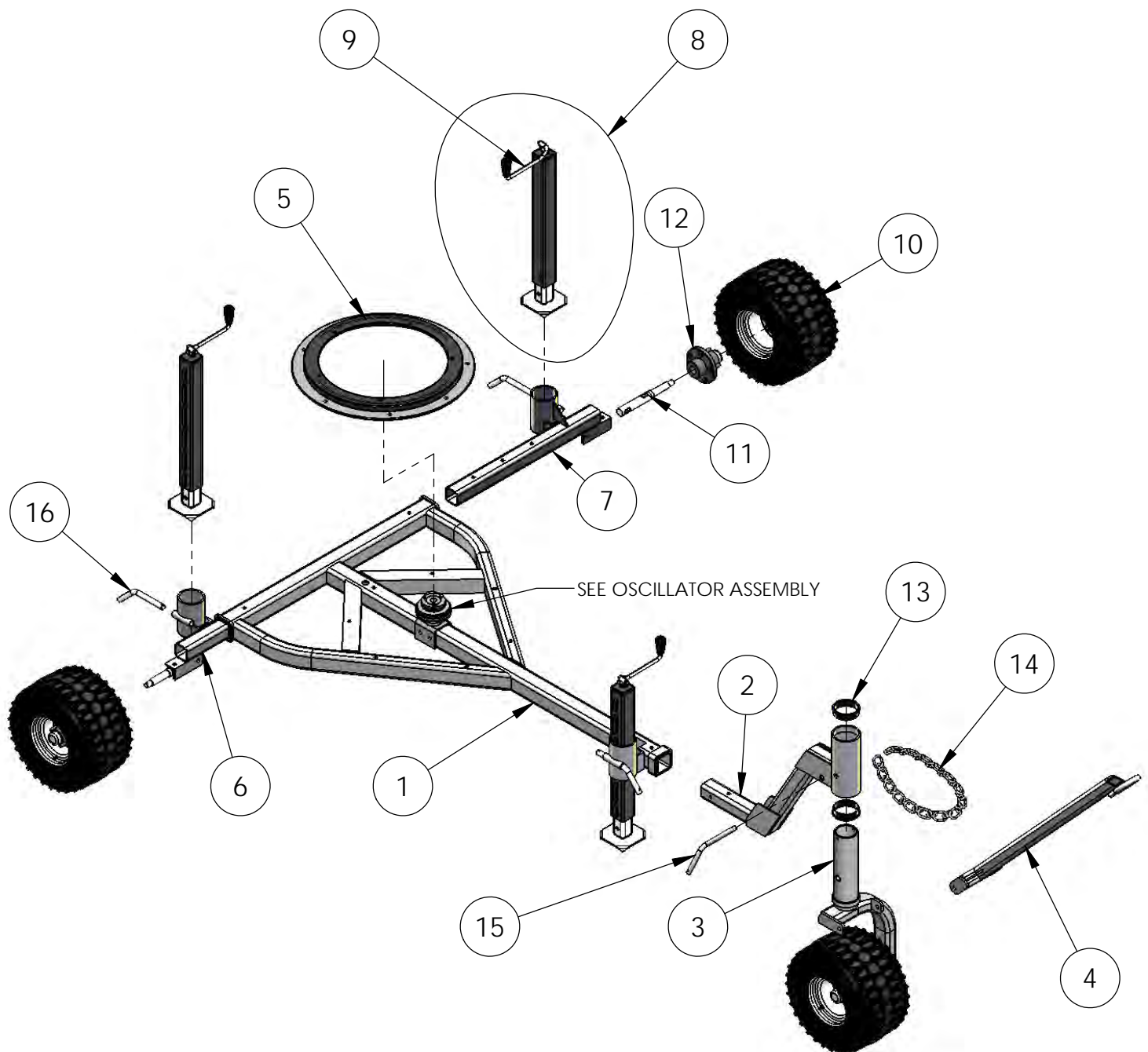
MANUAL ENCLOSURE ASSEMBLY



Manual Enclosure Assembly

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	1	845200-1	Galvanized Enclosure
2	1	840203-2	Panel Bracket and Cord Rack
3	1	840203-1	Bottom Panel Bracket
4	1	845202-3A	Travel Lock
5	1	845202-2	Travel Lock Pin
6	1	845204-1	Galvanized Lifting Extension
7	2	10-000017	¾ x 4-3/4 Hitch Pin with Lynch
8	1	06-002010	Level Gauge
9	2	845201-1	Galvanized Lifting Bracket
10	1	39-840003	Carriage Vertical Adjust Jack
11	1	39-840003-JB	Jack Boot
12	1	845220-2	Compressor Cover
13	2	39-000046	Plastic Cap
14	2	40-016012	Bolt Tube
15	1	845214-1	25/47 CK Compressor Mount Brkt.

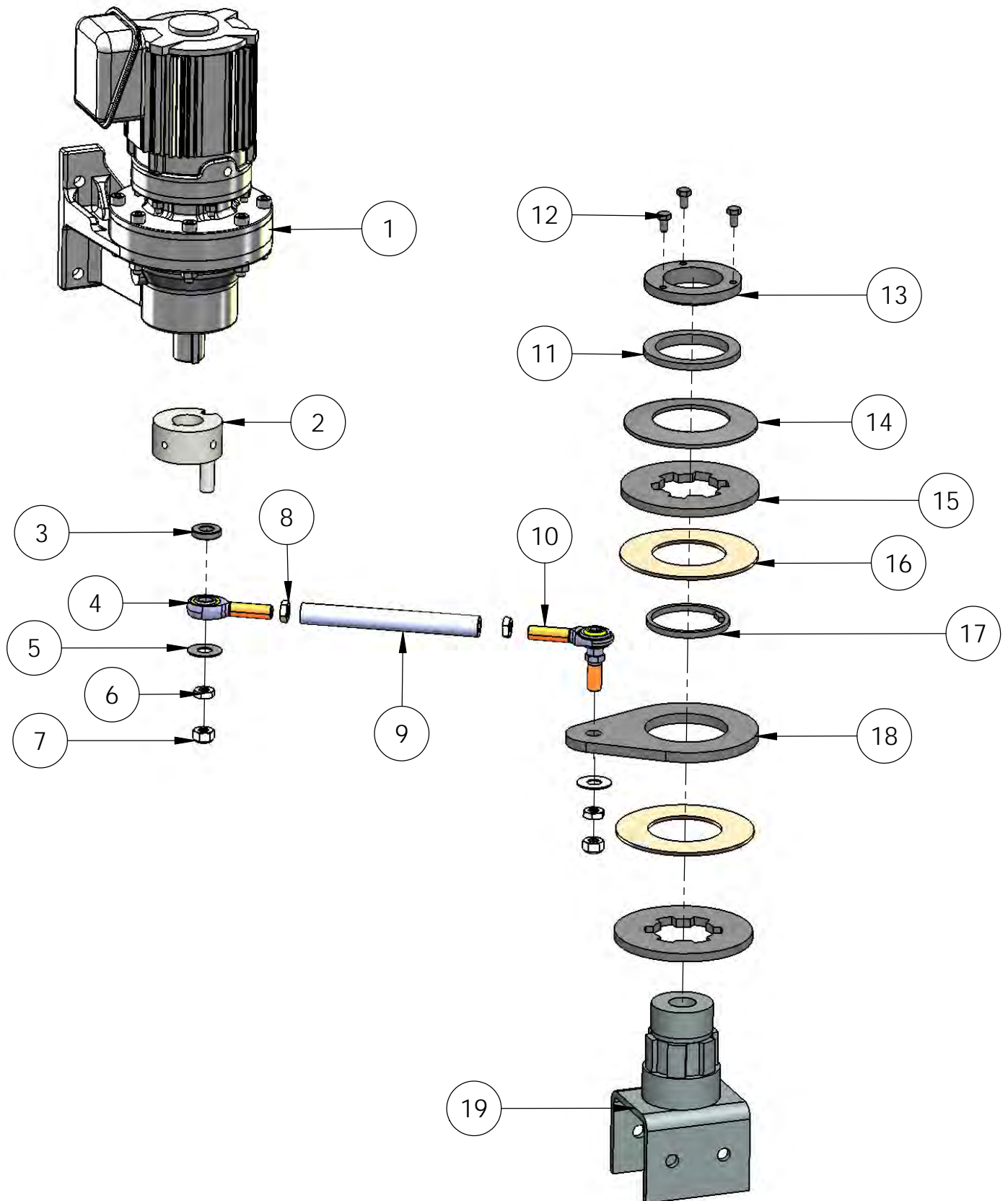
GALVANIZED FRAME ASSEMBLY



Galvanized Frame Assembly

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	1	845300-2	Frame
2	1	845301-1	Front Wheel Mount
3	1	720116-1	Single Wheel Frame
		720116-1A	Single Wheel Frame w/ Axle & Hub
4	1	720115-1	Tow Bar
5	1	845210-1	Turntable Bearing
6	1	845311-RH	Right Rear Axle Extension
7	1	845311-LH	Left Rear Axle Extension
8	3	39-840001	7000# Topwind Square Tube Jack
9	3	39-840001H	Topwind Square Tube Jack Handle
		39-890001B	7000# Jack Bearing
10	3	39-000013	22 x 12-8 Tire and Wheel
11	3	39-840305	Wheel Spindle
12	3	39-000011	5 Bolt Hub Cast Iron
13	2	320533-1	4" Bronze Bushing
14	1	33-000007	Tow Bar Chain Assembly
15	1	10-000013	Hitch Pin w/ Lynch Pin
16	3	10-000018	Hitch Pin

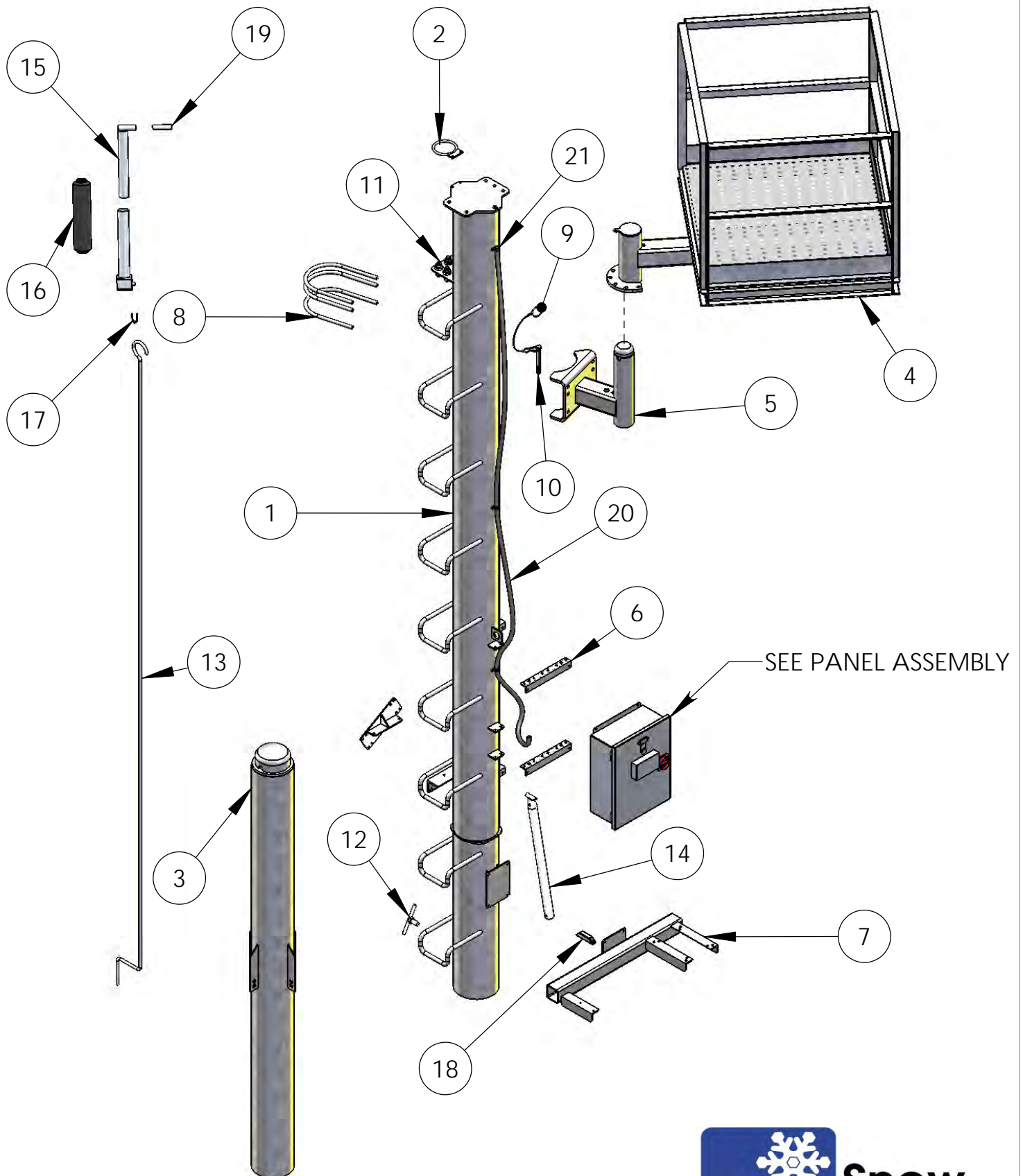
CARRIAGE OSCILLATOR ASSEMBLY



CARRIAGE OSCILLATOR ASSEMBLY

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	1	32-000100	Oscillator
2	1	840211-2Z	Oscillator Cam Hub (Zinc Plated)
3	1	400182-3	Oscillator Linkage Washer
4	1	39-000084	Rod End
5	2	***	½" Washer
6	2	***	½" Jam Nut
7	2	***	½" Nylok Jam Nut
8	2	***	½"-20 Hex Nut
9	1	400163-2	Link Tube
10	1	39-000084-STUD	Studded Rod End
11	1	32-305005	Retainer Ring
12	3	32-305007	500 TL Adjusting Nut Screws
13	1	32-305006	Adjusting Nut
14	1	32-305003	Spring Washer
15	2	32-305004	500 TL Pressure Plate
16	2	32-325146	Friction Disk Set
17	1	32-303504	Guide Ring
18	1	32-305008	Teardrop Center Member
19	1	32-305000	Complete 500TL Friction Clutch w/ Tear Drop

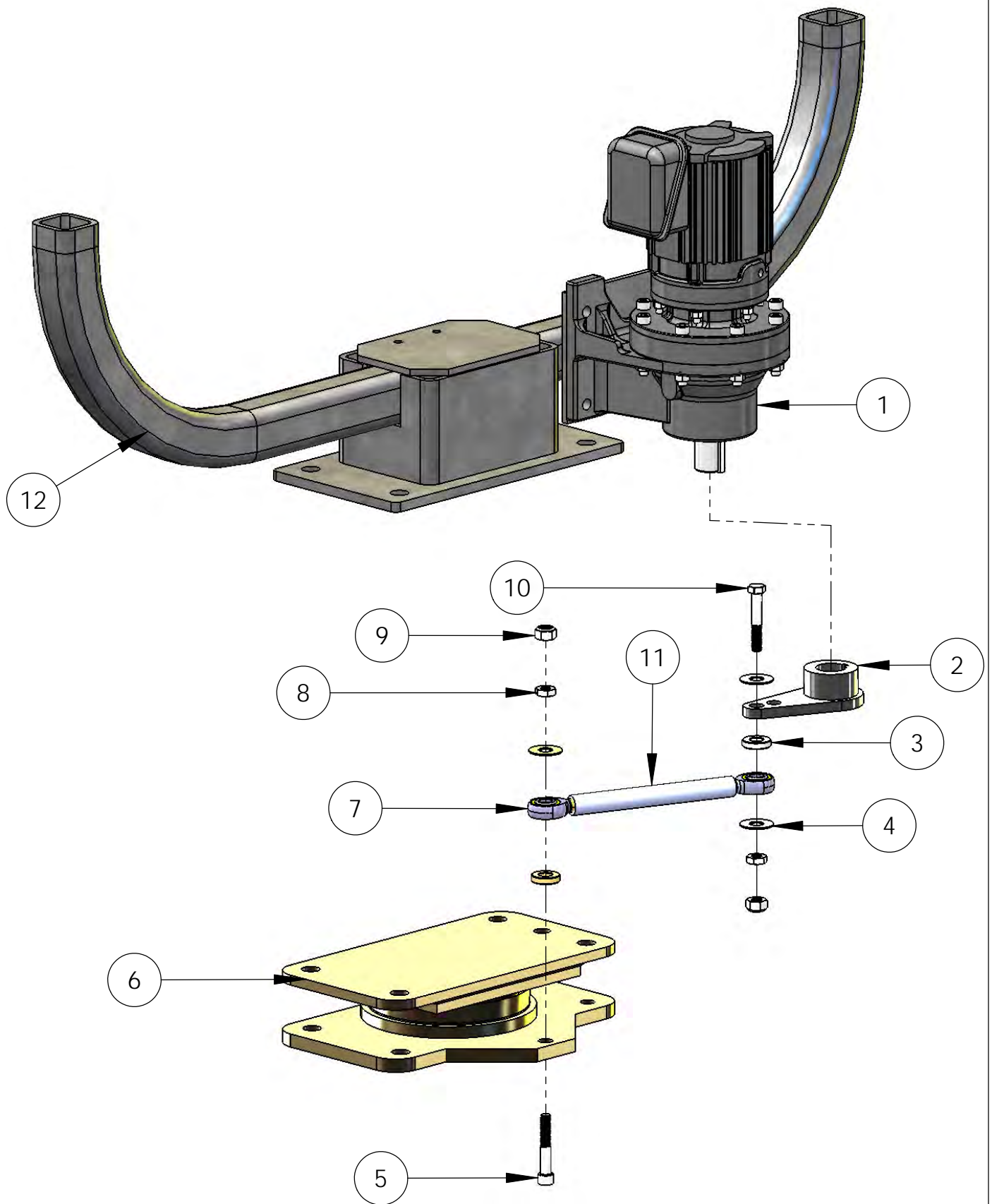
MANUAL TOWER ASSEMBLY



MANUAL TOWER ASSEMBLY PARTS LIST

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	1	400142-2	6" Oscillating Tower
		400130-8	8" Oscillating Tower
2	1	400182-2	Cord Rack
3	1	400131-1	6" Base Tube
		400131-8	8" Base Tube
4	1	400130-18	2003 Tower Platform
5	1	400130-16&20	Platform bracket
6	2	840203-1	Panel Bracket
7	1	400145-2	Atlas Copco Compressor Bracket
		400137-2	Hydrovane Compressor Bracket
8	3	400130-16	8" Tower U-Bolt
		400130-161	9" Aluminum Tower U-Bolt
		400130-15	6" Tower U-Bolt
9	1	10-000028	Lanyard Assembly for Tower Basket
10	1	101100-60	5/8-11 SS Hex Bolt
11	5	31-002086	3/4" Male Bulkhead Connector
12	1	400144-1	Polecat Service Lock Handle
13	1	400143-2	8" Vertical Adj. Crank Handle
		400143-1	6" Vertical Adj. Crank Handle
14	1	400135-1	Galv. Polecat Tower Turning Handle
15	1	39-840002	Tower Vertical Adj. Jack
16	1	39-840003-JB	Jack Boot
17	1	400126-1	Polecat Tower Jack Crank Bracket
18	1	400137-2-BRKT	47 CK Compressor Support Block
19	1	44-005080	1/2" SCH 80 SS Pipe
20	17'	25-000001	Multi Conductor Cord
21	3	23-001075	3/4" Aveco Clamp

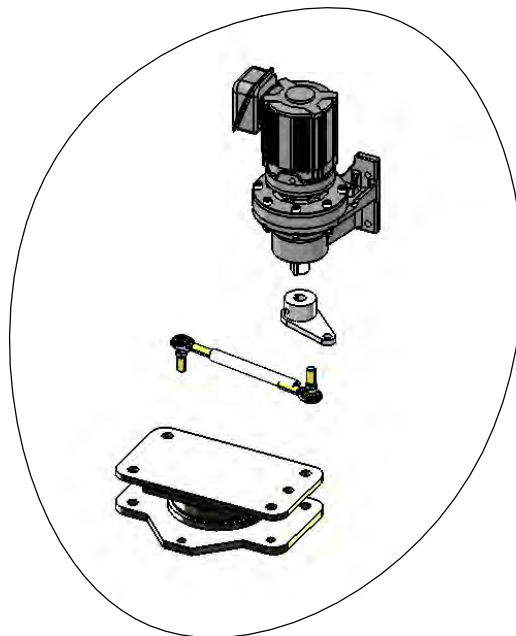
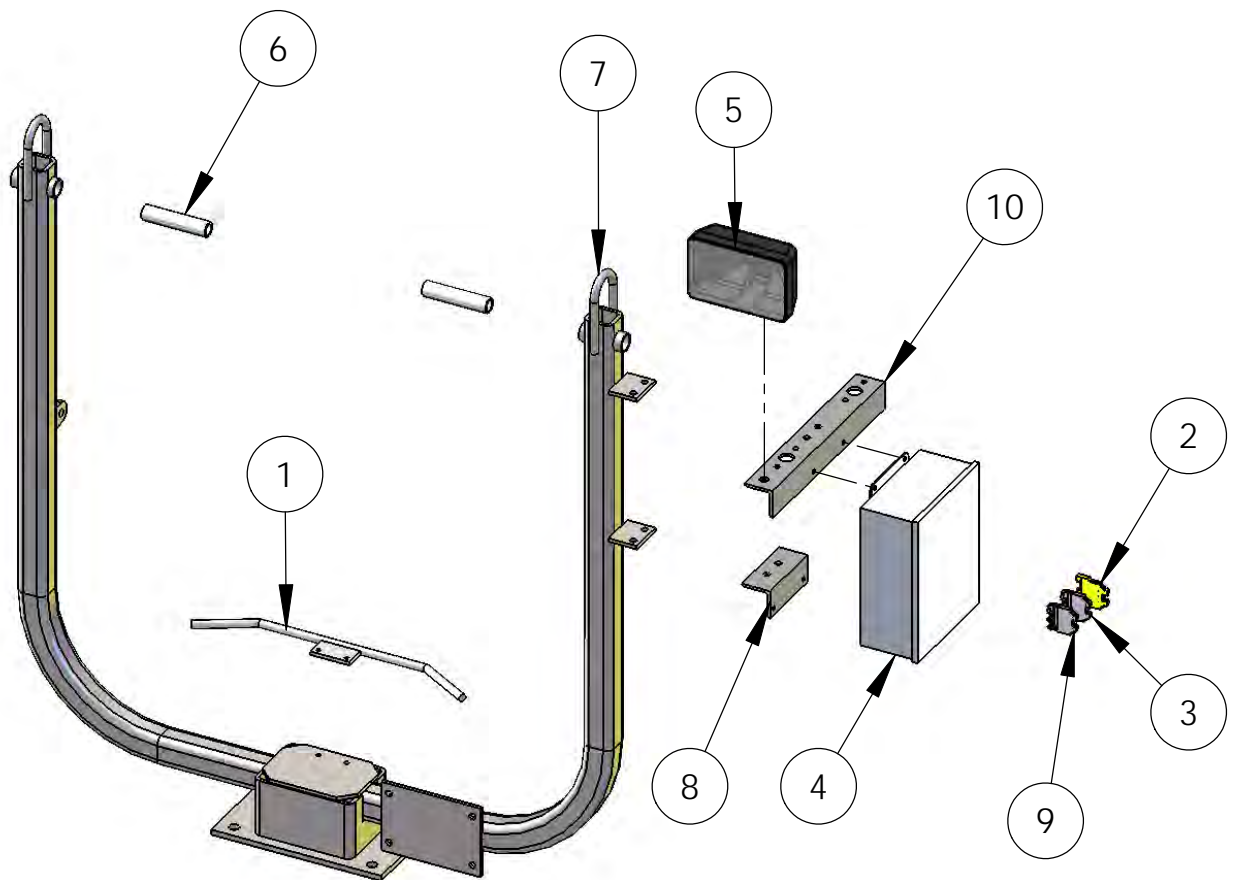
TOWER OSCILLATOR ASSEMBLY



TOWER OSCILLATOR ASSEMBLY

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	1	32-000100	Oscillator
2	1	GOLF211-2Z	Oscillator Cam
3	2	400182-3	½" Thick Washer
4	3	***	½" Washer
5	1	***	½" x 2 ¼" SHCS
6	1	400182-1	Tower Bearing
7	2	39-000084	Rod End
8	2	***	½" Jam Nut
9	2	***	½" Nylok Jam Nut
10	1	***	½" x 2 ¼" Hex Bolt
11	1	400163-2	Link Tube
12	1	400180-1	Galvanized Tower Yoke

TOWER YOKE ASSEMBLY

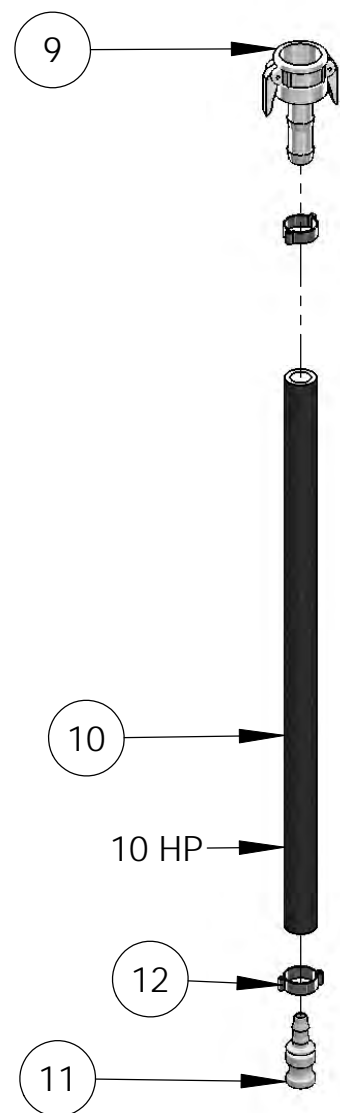
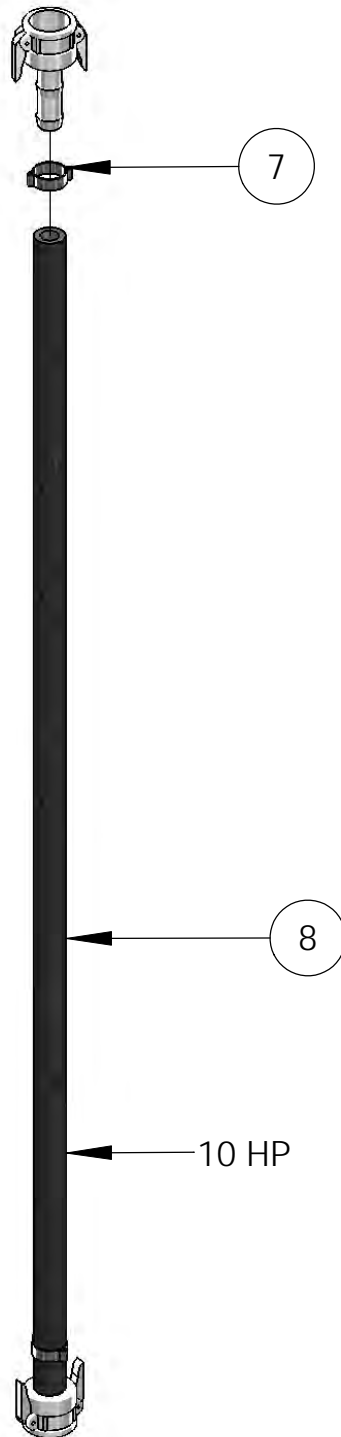
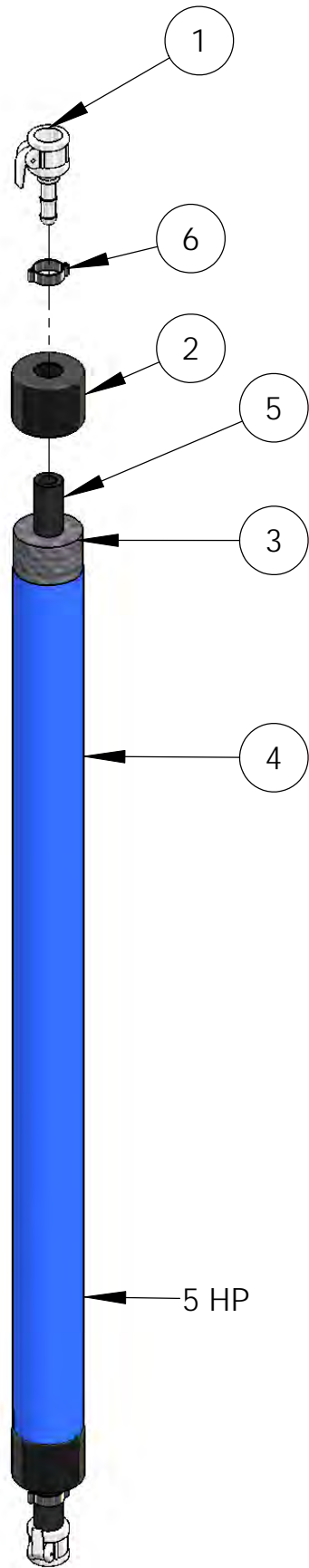


SEE TOWER OSCILLATOR
ASSEMBLY

TOWER YOKE ASSEMBLY PARTS LIST

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	1	400180-2	Hose Guard
2	2	23-004003	1492 16mm Grounding Block
3	6	23-004014	1492 J6 6mm Box Lug Block
4	1	27-000101	Electrical Junction Box
5	1	21-840100	Flood Light
6	2	40-016012	1" Dia. Pivot Tube
7	1	400180-1	Galv. Tower Yoke
8	1	400183-1	Bottom Junction Box Brkt.
9	22	23-004005	1492 J4 4mm Box Lug Block
10	1	480506-1	Upper Junction Box Brkt

TOWER AIR HOSES

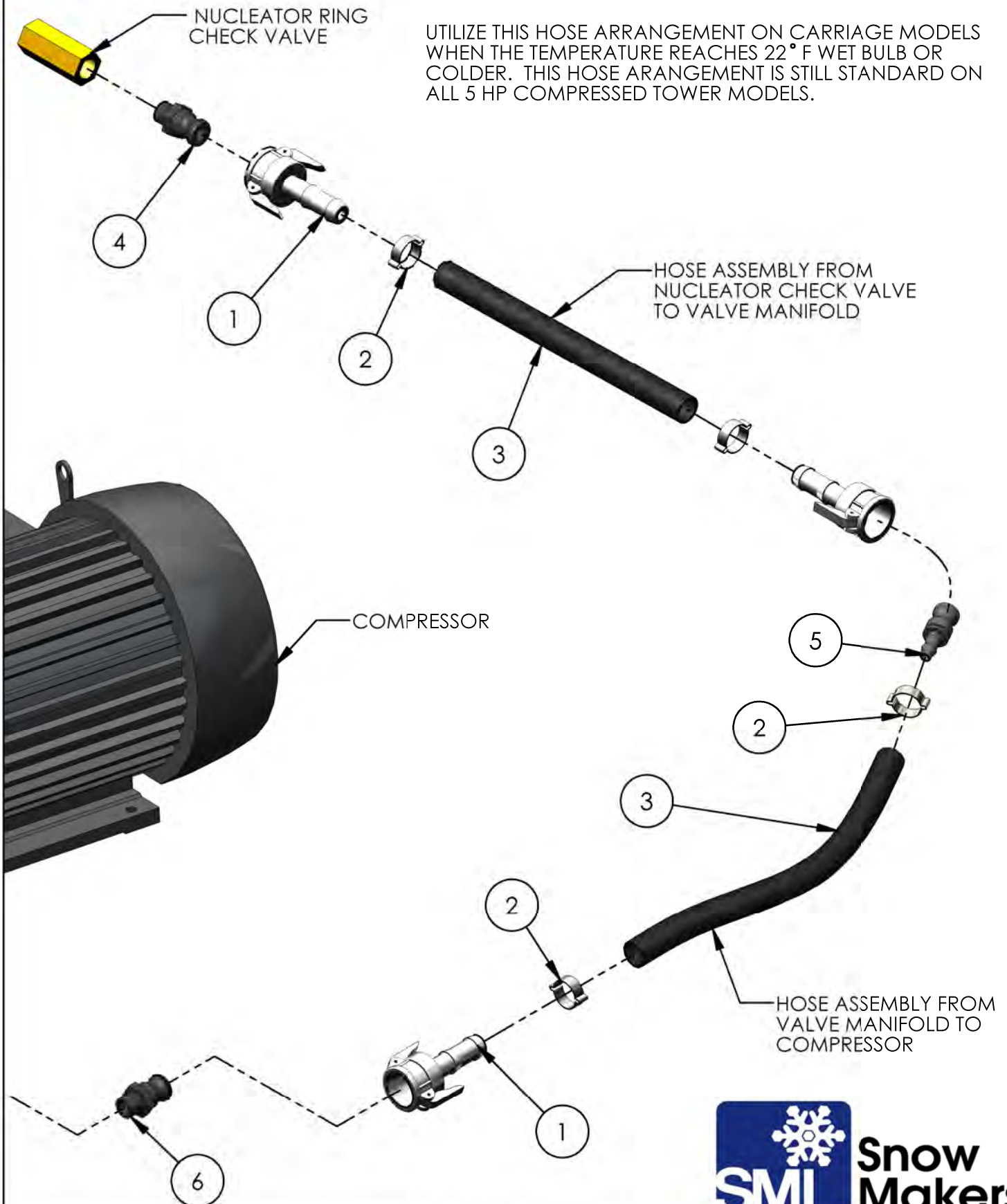


Tower Air Hose Parts List

<u>Mark</u>	<u>Qty.</u>	<u>Part Number</u>	<u>Description</u>
1	2	60-302050	½" Type C QD
2	2	65-000021	End Caps
3	21'	65-000019	Insulation
4	21'	65-000020	Blue Covering
5	21'	65-000017	½" Air Hose
6	2	39-000047	7/8" Dia Hose Clamp
7	2	39-000051	1 3/16" Hose Clamp
8	22'	65-000018	¾" Air Hose
9	2	60-302075	¾" Type C QD
10	4'	65-000018	¾" Air Hose
11	1	60-301075AL	¾" Type E QD
12	2	39-000051	1 3/16" Hose Clamp
13	1	60-301075AL	¾" Type E QD

COLD TEMPERATURE AFTERCOOLER BYPASS HOSE ARRANGEMENT

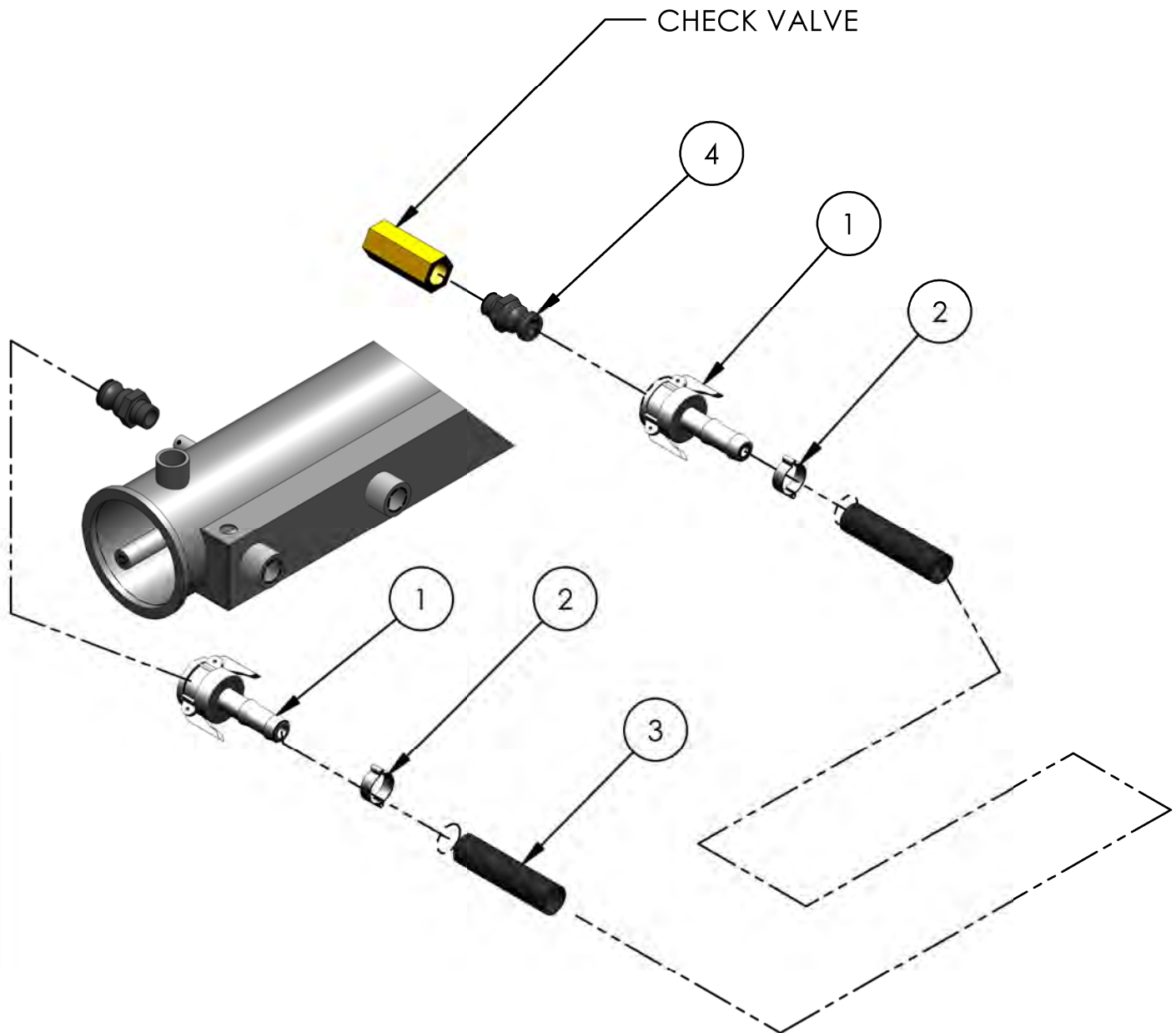
UTILIZE THIS HOSE ARRANGEMENT ON CARRIAGE MODELS WHEN THE TEMPERATURE REACHES 22° F WET BULB OR COLDER. THIS HOSE ARRANGEMENT IS STILL STANDARD ON ALL 5 HP COMPRESSED TOWER MODELS.



Cold Temperature After Cooler Bypass Hose Arrangement

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	3	60-302050	½" Type C AI QD (5 HP comp.)
		60-302075	¾" Type C AI QD (10 HP comp.)
2	4	39-000047	7/8" Dia Hose Clamp (for ½" air hose)
		39-000051	1 3/16" Dia Hose Clamp (for ¾" air hose)
3		65-000017	½" Bulk Air Hose (5 HP comp.) Spec Length
		65-000018	¾" Bulk Air Hose (10 HP comp.) Spec Length
4	1	60-101050	½" Type F AI QD (5 HP comp.)
		60-101075	¾" Type F AI QD (10 HP comp.)
5	1	60-301050	½" Type E AI QD (5 HP comp.)
		60-302075AL	¾" Type E AI QD (10 HP comp.)
6	1	60-202050	½" Type D AI QD (5 HP comp.)
		60-202075	¾" Type D AI QD (10 HP comp.)

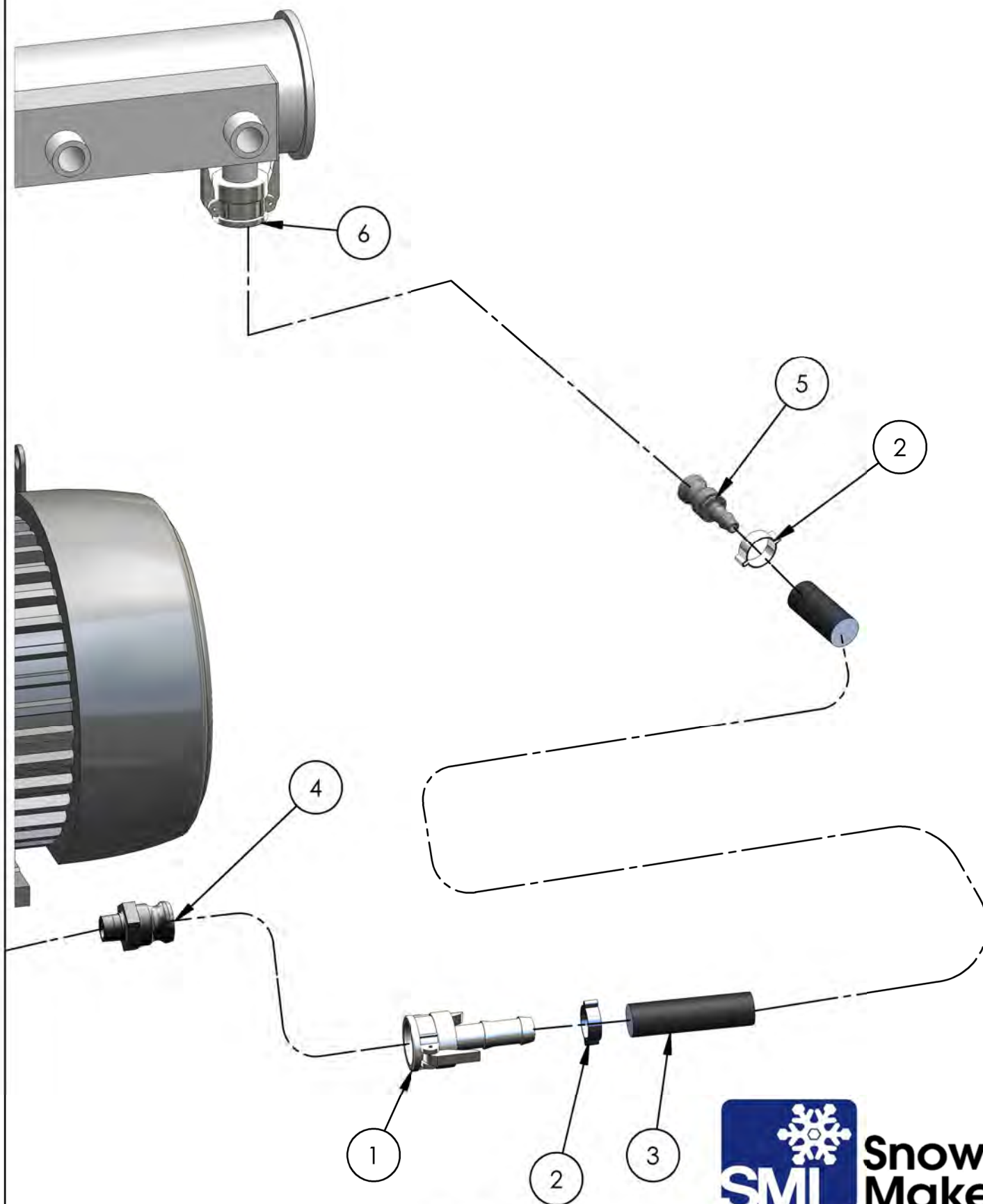
PIPING FROM VALVE MANIFOLD TO CHECK VALVE



Piping from Valve Manifold to Check Valve

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	1	60-302050	½" Type C AI QD (5 HP comp.)
		60-302075	¾" Type C AI QD (10 HP comp.)
2	2	39-000047	7/8" Dia Hose Clamp (for ½" air hose)
		39-000051	1 3/16" Dia Hose Clamp (for ¾" air hose)
3		65-000017	½" Bulk Air Hose (5 HP comp.) Spec Length
		65-000018	¾" Bulk Air Hose (10 HP comp.) Spec Length
4	1	60-101050	½" Type F AI QD (5 HP comp.)
		60-101075	¾" Type F AI QD (10 HP comp.)

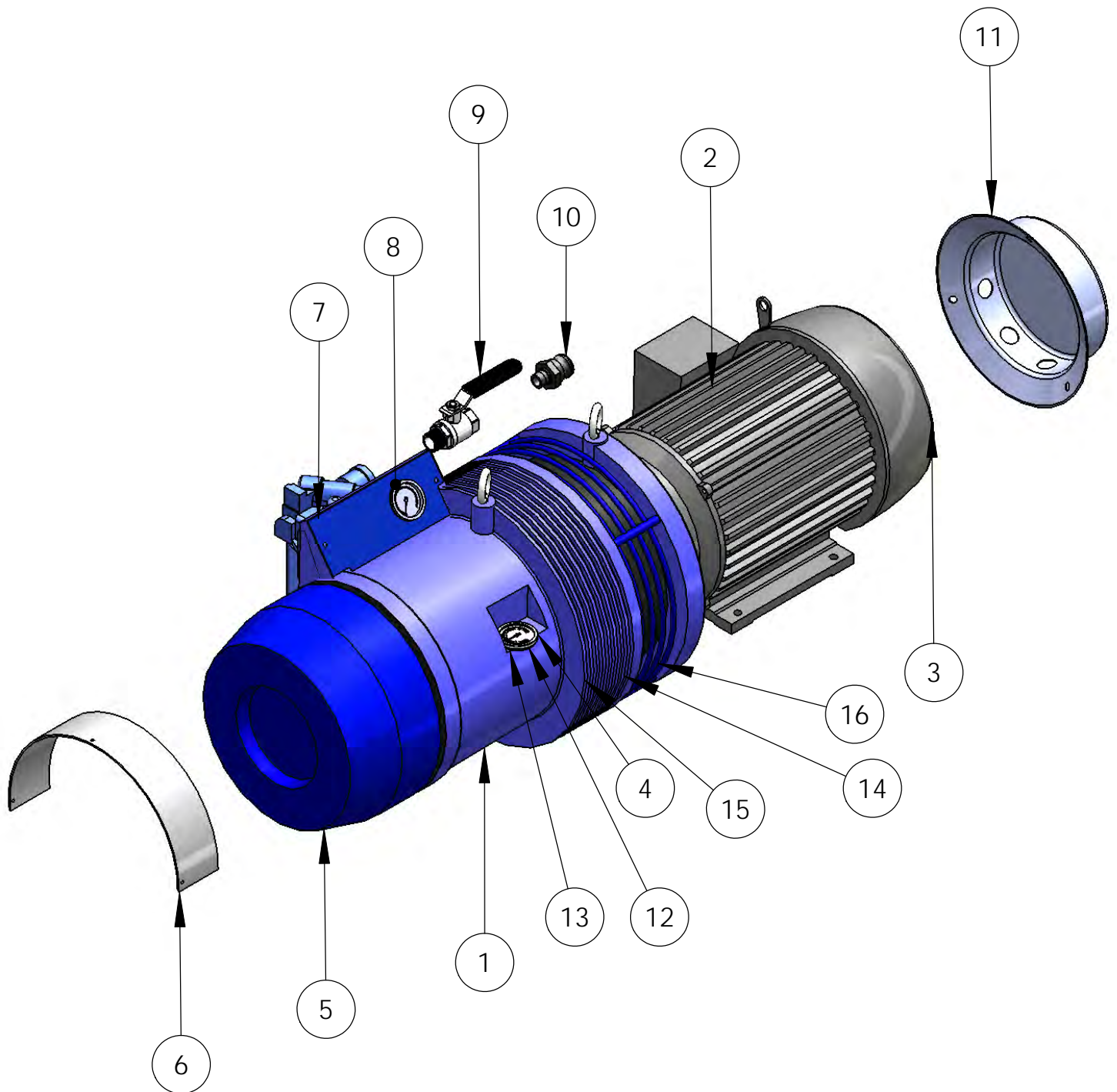
PIPING FROM COMPRESSOR TO VALVE MANIFOLD



Piping from Compressor to Valve Manifold

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	1	60-302050	½" Type C AI QD (5 HP comp.)
		60-302075	¾" Type C AI QD (10 HP comp.)
2	21	39-000047	7/8" Dia Hose Clamp (for ½" air hose)
		39-000051	1 3/16" Dia Hose Clamp (for ¾" air hose)
3		65-000017	½" Bulk Air Hose (5 HP comp.) Spec Length
		65-000018	¾" Bulk Air Hose (10 HP comp.) Spec Length
4	1	60-101050	½" Type F AI QD (5 HP comp.)
		60-101075	¾" Type F AI QD (10 HP comp.)
5	1	60-301050	½" Type E AI QD (5 HP comp.)
		60-302075AL	¾" Type E AI QD (10 HP comp.)
6	1	60-202050	½" Type D AI QD (5 HP comp.)
		60-202075	¾" Type D AI QD (10 HP comp.)

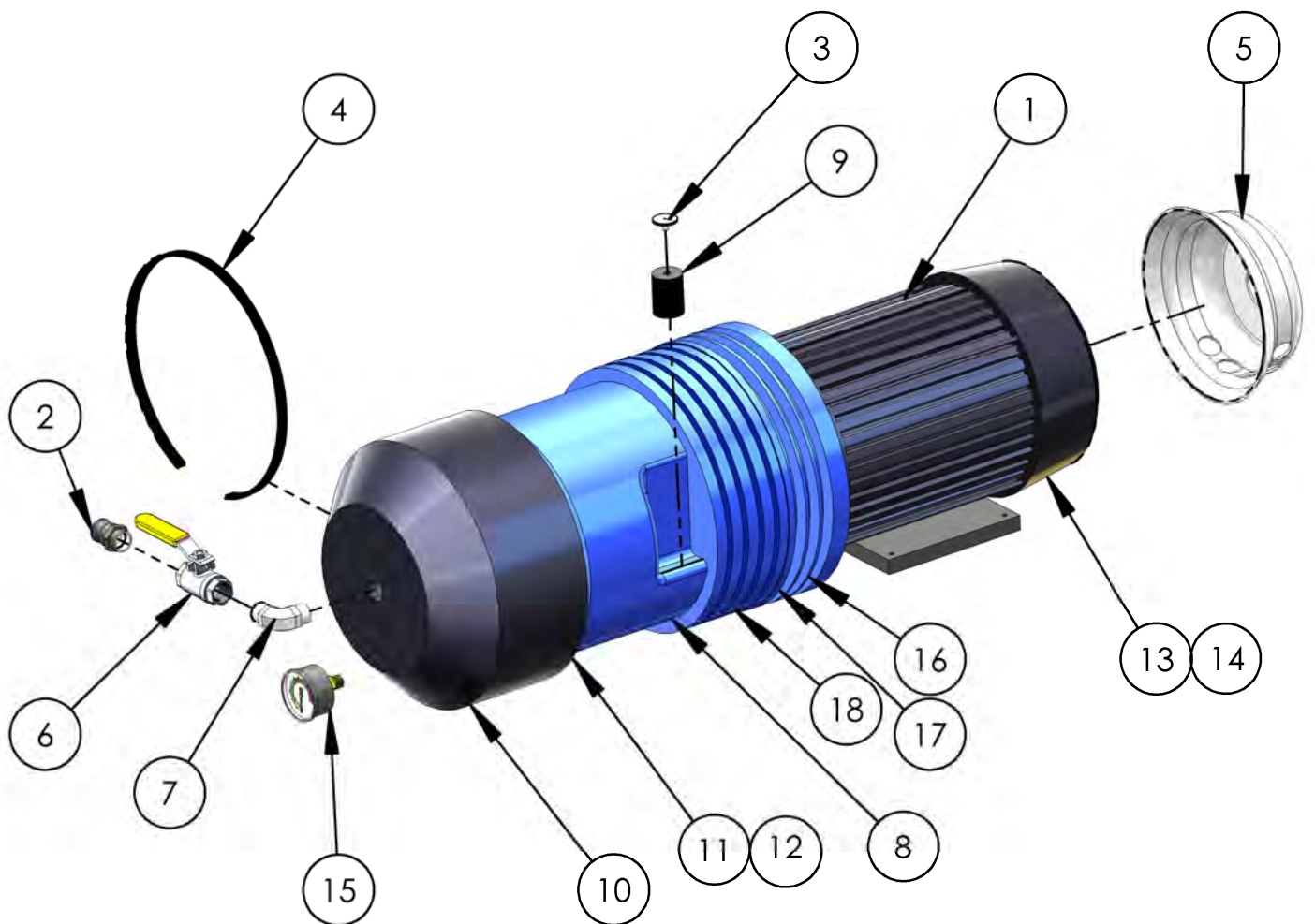
47 CK COMPRESSOR



47CK COMPRESSOR ASSEMBLY

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	1	30-000047	47CK Air End 10HP
2	1	28-000033	10HP Compressor Motor 460/60
3	1	28-000085	Cover
	1	28-000030	Fan
4	1	06-002013	Thermometer
5	1	30-470050	Cover
6	1	720506	47CK Weather Shield
7	1	05-600018	47CK Instruction Plate
8	1	06-002006	0-160 Air Gauge
9	1	63-000027	3/4" M x F Brass Ball Valve
10	1	60-101075	3/4" Type F QD
11	1	720521-1	Aluminum Motor End Cover
12	1	30-000051	Fill Plug
13	1	30-000054	Bonded Seal
14	1	30-000227	47ck Oil Cooler
15	1	30-000284	Foam Gasket
16	1	30-000288	Cork Gasket
		30-173704	Internal High Temp Switch
		30-000020	Air Filter Element
		36-000100	CS100 Oil
		30-KM71	Maintenance Kit 47CK
		30-KKS71	Separator Kit
		30-KO71	Oil Change Kit
		30-KKT71	Top-Up Kit
		30-000280	47CK Separator Gasket
		30-000015	47CK Complete Compressor

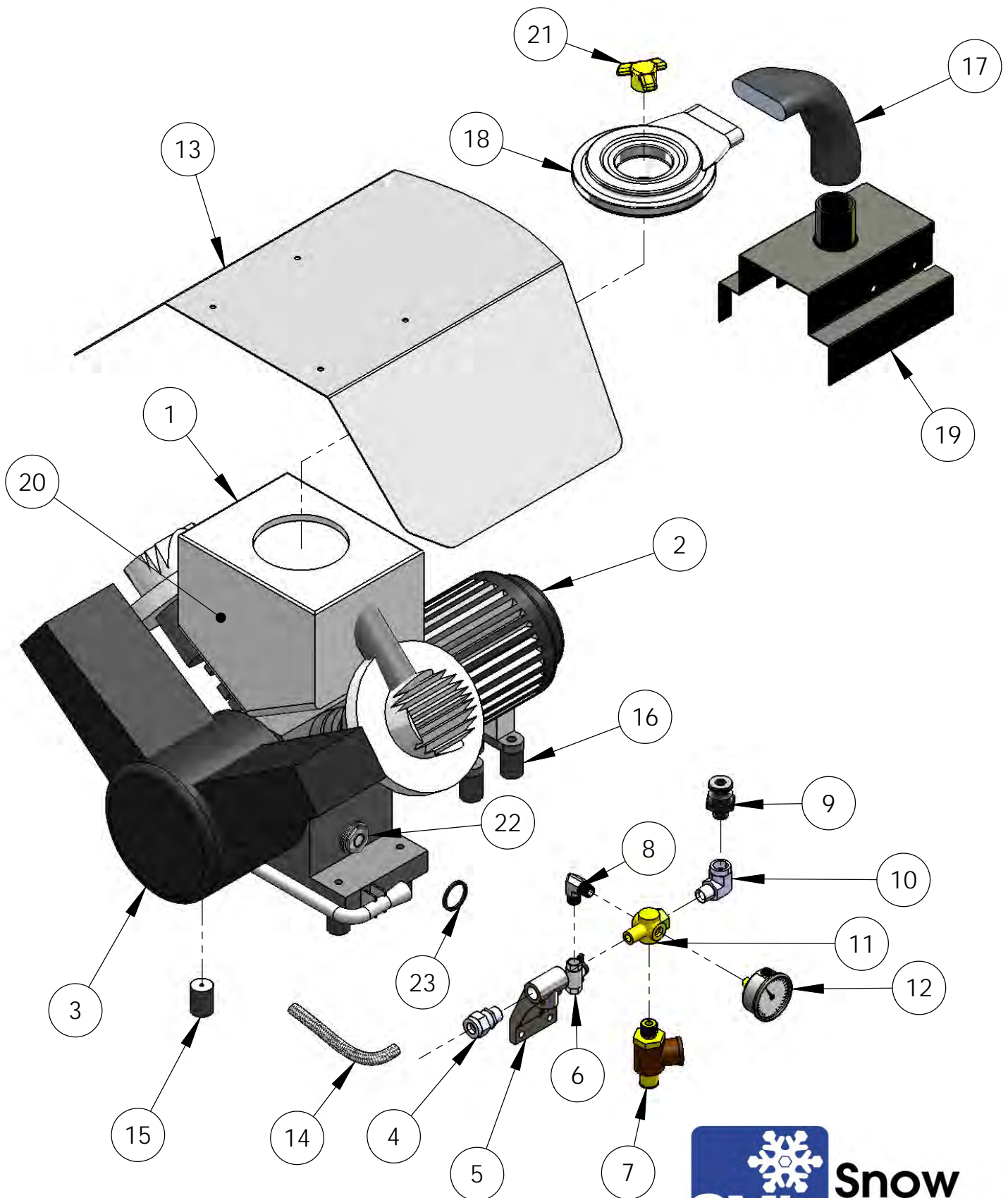
5 HP HYDROVANE COMPRESSOR



5HP HYRDROVANE COMPRESSOR ASSEMBLY PARTS LIST

<u>No.</u>	<u>Qty.</u>	<u>SMI Part #</u>	<u>Description</u>
1	1	28-200051	5HP Motor 460V
2	1	60-101050	½" Type F Aluminum QD
3	1	06-002014	1" Thermometer
4	1	35-000015-0	Rubber Edging
5	1	720520-1	184 Aluminum Motor End Cover
6	1	63-000028	½" M x F Brass Ball Valve
7	1	61-002096	½" Street Elbow
8	1	30-000022	25 CK Air End
9	1	30-250005	Fill Plug
	1	30-250014	Bonded Seal
10	1	30-250001	Cover
11	1	30-250006-ENCL	SS Enclosure
12	1	30-250006L	Snap switch
		30-250006LG	Bonded Seal
13	1	28-000048	Fan
14	1	28-000049	Cover
15	1	30-250035	Pressure Gauge
16	1	30-250013	25CK Oil Cooler
17	1	30-250029	Foam Gasket for Oil Cooler
18	1	30-250031	Cork Gasket
		30-KKM52	Maintenance Kit
		30-KKO52	Oil Change Kit
		30-KKT53	Top-Up Kit
		36-000100	CS-100 Hydrovane Oil
		30-000023	25CK Complete Compressor

5HP ATLAS COPCO COMPRESSOR



5HP ATLAS COPCO COMPRESSOR ASSEMBLY PARTS LIST

<u>No.</u>	<u>Qty.</u>	<u>SMI Part No.</u>	<u>Description</u>
1	1	30-60D5PP	Atlas Copco 5HP Compressor
2	1	28-000028	Motor End Cover
3	1	30-1503285800	Fan Housing
	1	30-1503285900	Inner Fan Housing Compressor
4	1	30-0581000076	Coupling LE40 Cooling Tube
5	1	30-1503234700	Snow Connection
6	1	30-1503253100	Valve
7	1	30-0832100110	Safety Valve 8 Bar
8	1	30-1503256541	Elbow
9	1	60-101050	½" Type F QD
10	1	31-002096	½" Street Elbow
11	1	30-1612447000	Connection Block
12	1	30-1503246800	Pressure Gauge 15 Bar
13	1	970221-1	5HP AC Compressor Cover
14	1	30-1503286100	Cooling Tube
15	2	30-1503020400	Rear Mount
16	2	30-1503296000	Front Vibration Mount
17	1	30-1503246401	Housing
18	1	30-1612406700	Cover
19	1	30-1503315500	Motor Duct
20	1	30-1503246300	Silencer
21	1	30-1503019200	Cover Nut
22	1	30-1503294800	Sight Glass
23	1	30-2801120600	Sight Glass Gasket
	1	36-000200	Alas Copco PAO Oil
	1	30-1503018900	Air Filter