



PROVEN ELECTRIC POWER AND PERFORMANCE

OLYMPIA ICEBEAR

Ice Resurfacers

Operating Manual

Keep for future use

Operating Manual
Ice Resurfacers OLYMPIA ICEBAR

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Foreword

Dear User!

Before you put your OLYMPIA ICEBEAR Ice Resurfacer into operation, please take the time to carefully read this operating manual.

Pay particular attention to the safety instructions given throughout the manual and to Chapter 1, Safety.

This is a prerequisite for...

Safe handling and operation of the ice resurfacer,

Trouble-free operation of the machine.

Always keep the operating manual in the vicinity of the ice resurfacer

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1. Safety

1.1. Pictograms Used

Throughout the texts in this manual and in part, on the ice resurfacer itself, you will find, among other things, the following pictograms:



Imminent danger that can result in death, serious bodily injury, or major material damage.



Warning about dangerous electrical voltage.



Warning about hazardous movements that can result in hand injuries.



Warning about blades, sharp edges and similar, that can result in cutting injuries.



Warning about potential explosion.



Application tips and other useful information.

1.2. Generally Applicable Safety Instructions

- Please study the operating manual with due attention before starting the first resurfacing operation. Always remember that you are responsible for an ice resurfacer that weights several tons.
- The ice resurfacer has been built and designed in compliance with European and international safety standards, so that it can be used without risk.
- To operate the ice resurfacer safely, you must follow the safety instructions.
- The OLYMPIA ICEBEAR may only be operated when there are no people on the ice and no objects on the ice surface.
- Sound the horn when you drive through areas in which pedestrians may be present, where your view is restricted, and when you drive onto the ice surface or leave the ice surface again.
- No passengers are allowed on the ice resurfacer at any time.
- Operating conditions vary greatly and ICEBEAR ELECTRIC GmbH cannot predict them. Therefore, it is the User's responsibility to select the appropriate settings for operation of the OLYMPIA ICEBEAR.
- Wherever necessary, safety circuits and safety devices are installed and are active. Therefore, no modifications and conversions may be undertaken on the ice resurfacer, nor must the safety circuits and devices be modified in any way, or rendered inoperable.
- The OLYMPIA ICEBEAR must be inspected at least once a day for visible signs of damage! Any changes, including changes in the operating behaviour must be reported to the responsible department or person immediately!



1 Safety

The ice resurfacers must be switched off and secured immediately if necessary (e.g. push the emergency stop button and turn the key-operated switch to the off position and remove the key)!

- Do not perform any procedures that are not described in this manual!
- No liability will be accepted for any material damage or personal injury caused by failure to comply with the above directives, or failure to follow the instructions given in this operating manual. This also applies for damage caused.

1.3. Proper Use

The OLYMPIA ICEBEAR ice resurfacers has been manufactured exclusively for the resurfacing of ice surfaces. Do not use the OLYMPIA ICEBEAR for any other purpose.

Only duly authorized and trained drivers may operate the OLYMPIA ICEBEAR.

All information and instructions given in this documentation must be adhered to without fail.

1.4. Improper Use

The following are deemed to be improper use:

- Operation without the safety devices.
- Failure to comply with the on-site directive posted by the User.
- Driving on surfaces that have more than a 15 % incline (or 13.5°).
- Carrying of passengers.
- Operation without the duly trained driver.
- Operation in inadequate light conditions.
- Failure to comply with the instructions given in this documentation.

1.5. Organizational Measures

- The operating manual must be kept in a place where it is readily accessible to the operators and maintenance personnel!
- The personnel employed to work with and on the ice resurfacer must have read the operating manual before starting any work. This applies in particular for personnel who only work occasionally on the machinery, e.g. for setup or maintenance purposes.
- Maintenance personnel must tie back long hair, and must not wear loose clothing or jewellery, including rings, when working on the machine. There is a risk of injury, e.g. by getting caught on or pulled into the machinery.
- The prescribed schedules, or those specified in the operating manual for periodic checks/inspections must be adhered to!
- Local safety standards must be adhered to as well as recommendations in this document.



1.6. Personnel Qualifications

- Every OLYMPIA ICEBEAR has a variety of built-in safety functions. To prevent accidents from occurring, everyone that deals with the operation and maintenance of the machine must carefully read the instruction manuals provided by ICEBEAR electric GmbH before they operate or service the OLYMPIA ICEBEAR.
- Only the specially trained ice resurfacers may have access to the starter key and they must keep it under lock and key. The necessary training and instruction will be given by ICEBEAR electric GmbH or one of their authorized dealers upon delivery of the machine.
- All operators must be trained by a qualified instructor.
- All safety instructions must be strictly followed when operating, maintaining and shutting down the ice resurfacers. Failure to adhere to the instructions can lead to accidents resulting in personal injury and material damage.
- The personnel are instructed both verbally and in writing, the emergency shut off switch must be switched off before disconnecting the battery connector (to avoid sparking). The emergency shut off switch must be switched on after connecting the battery charger.
- The driver is instructed both verbally and in writing, that he must wear the seatbelt at all times when operating OLYMPIA ICEBEAR.
- ICEBEAR electric GmbH recommends that the user holds regular training courses, in which special emphasis must be placed on the hazards and safety measures. The service personnel must be instructed about the specific hazards in association with the maintenance and repair of the ice resurfacers. This instruction must be repeated at regular intervals, at least once a year.



1 Safety

- The employees must wear protective gloves when doing maintenance and repair work. The hazards in association with the sharp components are pointed out in regularly held training courses. The hazard avoidance measures must be explained.
- The responsibilities of the personnel for operation, setup and maintenance of the ice resurfer must be clearly defined. Make sure that only duly authorized personnel are allowed to work on and with the ice resurfer!
- The maintenance personnel must be duly certified in accordance with the following charts:

Job \ Person	Instructed persons	Qualified technicians	Qualified electricians	Authorized Service personnel
Operation	X			
Trouble_shooting			X	X
Mechanical fault rectification		X		
Electrical fault rectification			X	
Maintenance		X	X	
Repair				X



1.7. Obligations of the User

The User must ensure that...

- The ice resurfacers are only used in the proper manner,
- The ice resurfacers are only operated when they are in perfect working order,
- The integrated safety devices are regularly maintained and checked for proper function,
- The operating manual is supplemented with all generally applicable, statutory and other binding accident prevention and environmental protection regulations, and that these are complied with!
- Personal protection gear/clothing is provided and is worn (e.g. protective gloves, warm clothing, safety helmet and, if necessary, ear muffs, and also non-slip footwear (for walking on the ice surface), spikes or similar for the shoes).
- The operating manual is supplemented with facility-internal instructions, e.g. supervision and reporting duties to take account of facility-specific particulars, such as work organisation, operational procedures, employed personnel, etc.
- It is checked, regularly, that the personnel are working in a safety- and hazard-conscious manner and are adhering to the instructions given in the operating manual!

1.8. Operator's Workplace

Operation of the ice resurfer is done solely from the driver's seat on the driver's platform.



Before doing any jobs of „longer duration“ on moving parts, switch off the power and depressurise the systems at the vehicle and take suitable measures to prevent it from being switched back on again (after switching off the emergency shut off switch, pull the battery plug, turn the key-switch to the Off position and remove the key).

1.9. Safety Devices and Guards

Limit switch at the driver's seat

There is a limit switch at the driver's seat on the OLYMPIA ICEBEAR that must not be bypassed. When the driver leaves the seat, the ice resurfer is stopped after a delay of 8 seconds, so that the OLYMPIA ICEBEAR cannot be driven without the driver.

EMERGENCY STOP

The EMERGENCY shut off button can be used to shut down the whole ice resurfer in an emergency. The EMERGENCY shut off button is located at the front left, in front of the steering wheel.

Switch-Off: Depress the knob on the switch to shut off the power (disconnect the circuit).

Switch-On: To switch the ice resurfer back on again, pull out the knob until it locks into place. The normal switch-on procedure must then be executed from the beginning. (Chapter 7.1.1)



Fig. 1.1: Emergency Shut off switch on the OLYMPIA ICEBEAR



The Emergency Shut off switch turns off the whole ice resurfer, except for the BiCAT. The BiCAT is mounted on the battery to save the stored data. When the battery connector is disconnected, the whole ice resurfer is switched off too, with the exception of the BiCAT.

Limitation: The (+) contact of the EMERGENCY STOP switch still carries the potential of the (+)Ub port of the battery!



Charging of the battery is also interrupted when the Emergency shut off switch is pressed. If the charger is not working, please first check whether the Emergency shut off switch has been pressed.

**Caution!**

Do not attempt to operate the ice resurfacer until the reason for the shut down has been discovered and corrected.

If the EMERGENCY STOP circuit is activated, all power to the OLYMPIA ICEBEAR is switched off. The brake accumulator remains under pressure, but can be depressurised by simply pressing the brake pedal several times.



The removal of guards or safety devices or rendering them inoperable while the ice resurfacer is in operation is prohibited.

Guards and safety devices may only be removed or put out of operation for repair or maintenance purposes after the main switch has been turned off and measures taken to prevent it from being switched back on again, and after the ice resurfacer has been depressurised.

Tools are needed to open all covers and panels.

1 Safety

Horn Button

The horn button is located below the left display on the upper dash. The horn sounds as soon as you press this button.



Fig. 1.2: Horn button on the OLYMPIA ICEBEAR

Warning Signals

- Warning lamp indicating that there is not enough water in the water tank
- Warning signal indicating that the battery is low (accumeter flashes)



1.10. Maintenance and Repair Regulations

In terms of this manual, maintenance work means all ...

- maintenance jobs that have to be done periodically,
- lubrication on the ice resurfacer,
- cleaning jobs,
- setup and retooling jobs, changing of components / sub-assemblies, and
- Adjustments/setting of the electrical equipment, mechanical parts and hydraulic systems.
-
- Never open the control cabinet and/or any electrical components while power is being supplied to the machinery.
- The battery connector must be disconnected before doing any work on the ice resurfacer (including changing the blades). The proper way to do this is to remove the starter key. Depress the emergency shut off switch, open the panel door on the right side of the ice resurfacer, disconnect the battery and close the panel door. Carry the key on your person. Put up a notice on the ice resurfacer that says, DO NOT START.
- Before starting the work, cordon off the area in which the maintenance work is to be done with a red/white safety chain and put up notices that read MAINTENANCE WORK IN PROGRESS! UNAUTHORIZED ACCESS PROHIBITED. RISK OF INJURY.



1 Safety

After completing the maintenance jobs and before switching on the ice resurfacers, make sure that:

- There is nobody in the danger zone
- There are no more tools or other parts in the vehicle, and
- All safety devices/guards have been duly re-installed and are in proper working order.

Also adhere to the safety regulations that are specified in the descriptions of the individual maintenance jobs.

1.11. Waste Disposal

Hazardous waste must not be disposed of with general household waste. Each local community generally has drop-off locations for the proper disposal of hazardous waste.

The battery must be disposed of in the proper manner (refer to the regulations in Directive 91/157/EEC or to your local battery disposal regulations).



For more information, please contact your local waste disposal authorities.

1.12. Remaining Hazards



Risk of Injury!

The ice resurfacers operator must be in possession of all his mental and physical faculties to ensure that nobody gets run over (i.e. he must not have consumed alcohol, taken pills or other medication, or taken drugs)..



Risk of Falling and Risk of Injury!

The carrying of passengers on the ice resurfacers is strictly prohibited, as they could fall off the machine and sustain injury.



Risk of Injury!

Before starting any maintenance job, make sure that you secure the snow bin lid with the safety bolts to prevent it from dropping down, because despite the installed hose- break safety valves, there is still a considerable hazard potential here.



Risk of Sustaining Cutting Injuries!

Always wear protective gloves when handling the blade. Because the blade is extremely sharp, for your own safety and to protect the sharp edge of the blade, always use the magnetic guard.



NEVER leave the OLYMPIA ICEBEAR unattended when filling it with water, because hot water could leak out and injure someone.



Risk of Injury!

Make sure that there are no people or objects in the work and driving area.



Danger!

Do not spray the machine with a water hose to clean it, because this can lead to electrical faults.



Risk of Explosion!

Open the battery compartment covers on both sides of the OLYMPIA ICEBEAR with the key to provide sufficient ventilation during the battery charging process. Escaping hydrogen gas could lead to an explosion.



Risk of Short Circuiting!

The batteries must not come into contact with water, otherwise short-circuiting could occur.



Risk of Injury!

If your ice resurfer is parked on an incline, before releasing the handbrake turn the start key to the ON position. Make sure the gear selector is in neutral. Depress and release the accelerator pedal. Now you can depress the brake pedal, release the handbrake and the ice resurfer will not move.

Failure to follow this procedure will result in the ice resurfer rolling down the incline when the handbrake is released.

**Risk of Injury!**

Before switching on the OLYMPIA ICEBEAR, it is necessary to make a complete circle check of the ice resurfacer.

Always use extreme caution when driving the OLYMPIA ICEBEAR from the service area onto the ice surface (and vice-versa), as there could be people on the connecting routes.

Proceed with extreme caution when driving the ICEBEAR from the service area onto the ice surface (and vice-versa), as there could be people on the connecting routes.

The OLYMPIA ICEBEAR may only be operated on the ice surface when it is completely clear of persons and debris.

The ice resurfacer operator must stop the ice resurfacer and secure it to prevent it from rolling away before he leaves his seat on the ice resurfacer's platform. This is done by setting the key-operated switch (starter switch) to the STOP position and applying the parking brake.

The ice resurfacer's driver's safety seat has a timed limit switch that stops all movements eight seconds after the driver leaves the seat.

Caution:

In a hazardous situation, depress the palm-type emergency shut off switch immediately, if any other controls fail for any reason.

**Risk of Getting Crushed!**

There must not be any people in the vicinity of the OLYMPIA ICEBEAR when snow is being unloaded.



Risk of Getting Crushed!

If other people enter the area during the unloading process, the ice resurfacer movements must be stopped and may only be resumed after these people have left the area again.



Risk of Falling!

Proceed with extreme caution when moving the ice resurfacer around or near the stationary snow dump area. Risk of falling!



Risk of Getting Crushed!

When doing maintenance or repair work in the area of the snow bin cover, the latter must be secured with safety bolts, if the work is to be done with the cover open.



Risk of Injury!

When driving the OLYMPIA ICEBEAR always proceed with caution.

Drive with a greatly reduced speed. Especially when driving in areas with a restricted view or in narrow spaces.

When driving off-ice, the general vehicle lighting must be switched on.

The OLYMPIA ICEBEAR must not be driven on public roads, as it is not licensed for use on public roads and highways.



Risk of Getting Crushed!

There is an increased risk of accident when doing maintenance and repair work, because electrical safety devices may have to be put out of action.

2. On-Site Conditions

2.1. Ground Conditions

Level, solid floor covering, preferably with spike-friendly overlay.



Maximum permitted incline: 15 %

2.2. Room Ventilation

In accordance with VDE and local codes, the battery rooms should be designed such that natural ventilation is adequate (see VDE 510).

2.3. Water Connections

- Ice making water on the left hand side of the ice resurfacer.
- Wash water on the right hand side of the ice resurfacer.

The intake can be controlled with a solenoid valve. The solenoid valve is controlled by the ice resurfacer. Valve size is 1”.

2.4. Water Quality

- Clean water with low lime content
- Ice making water temperature approx. 40°C (104°F) - 70°C (158°F)
- Wash water: cold only

2 On-Site Conditions

2.5. Charger

Main connection:

Wall socket Europe: 400 V/3~+N+PE 32 A 5-pol. CEE-Norm.

Charger cable:

6 m long, battery connection plug at the back right of the ice resurfacers, behind the battery compartment cover.



It is not possible to simply remove the charger switch from the charger, in order to place it at a seemingly better location by using a longer cable.

Please ask the battery manufacturer or contact us for a more suitable solution.

2.6. Garage Temperature

Preferably above 15°C (59°F), never below 0°C (32°F)



Charging can take considerably longer at temperatures below 15° (59°F). Freezing of a partially discharged battery can damage the battery. The same applies for freezing of the water system.

2.7. Snow Dump

When the snow bin is opened, the snow slides out to the front. A threshold at the snow dump must not be any higher than 80 mm (3,2 inches).

3. Design and Function

3.1. Ice Resurfer Design and Chassis

3.1.1. Front View

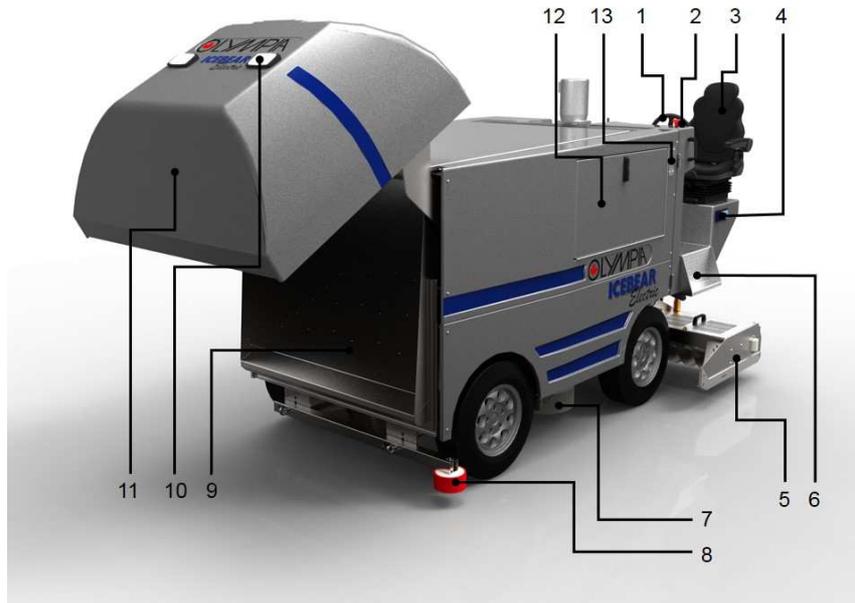


Fig. 3.1: Front View

- Item 1: Steering Wheel.....
- Item 2: EMERGENCY-SHUT-OFF switch.....
- Item 3: Driver's seat.....
- Item 4: Ice Making Water Control Panel.....
- Item 5: Conditioner.....
- Item 6: Step for climbing up to the driver's seat.....
- Item 7: Board Brush.....
- Item 8: Front Bumper Wheel.....
- Item 9: Snow Bin.....
- Item 10: Front Headlights.....
- Item 11: Snow Bin Hood.....
- Item 12: Battery Cover left.....
- Item 13: Ice Making Water Filler Pipe.....

3 Design and Function

3.1.2. Rear View

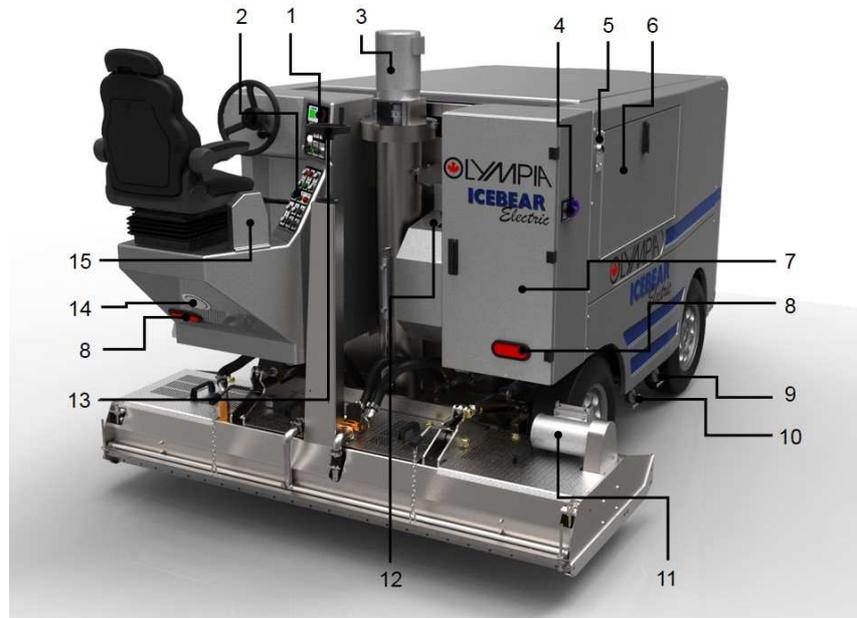


Abb. 3.2: Rear View

- Item 1: Top Control Panel
- Item 2: Bottom Control Panel
- Item 3: Vertical Motor
- Item 4: Wash Water Control Panel.....
- Item 5: Wash Water Filler Pipe.....
- Item 6: Battery Cover right
- Item 7 Electrical Control Cabinet Door
- Item 8: Tail Lights.....
- Item 9: Ice Making Water Drain Valve.....
- Item 10: Wash Water Drain Valve
- Item 11: Horizontal Motor
- Item 12: Emergency hand pump
- Item 13: Hand crank for adjusting the depth of cut.....
- Item 14: Reverse Light
- Item 15: Parking Brake.....



3 Design an Function

The OLYMPIA ICEBEAR is mainly made of stainless steel. This applies to the self-supporting chassis, the conditioner, the snow bin, the frame of the snow tank cover, the steel structure of the driver's platform and all metal parts that, for technical reasons, should not be manufactured from any other material.

For static reasons, the front and rear axle, the mounting arm for the front bumper wheel, the lift arms, the steel structure of the brush and of the edger are made of hot-dip galvanized, or electro-galvanized steel. The electrical control cabinet is made of aluminium.

3.1.3. Self-supporting chassis

The chassis consists of a 3 mm (1/8 inches) thick, stainless steel plate. It is supported on the front and rear axles. The front axle is bolted rigidly to the chassis, while the rear axle is designed as a floating axle.

The battery holders, the driver's seat and the mountings for the conditioner, the brush and other parts are part of the chassis.

The control cabinet, the snow bin cover, all parts of the hydraulic system, power supply, water supply and panelling are bolted to the chassis.

3.1.4. The front axle

The front axle is a rigid, all-steel construction, made of 10mm (0,4 inches) thick, hot-dip galvanised sheet steel. It holds the front drive units (gear with motor), the hydraulic steering and the front bumper wheel.

The drive units are supported in sliding bushings by two well dimensioned, hard chrome plated steel bolts in each case. They absorb all radial forces. The vertical forces are absorbed by a bearing ring. This extends the serviceable life of the bearing assembly.



3 Design and Function

Coupling of the front drives consists of two solid, adjustable steering links, which are connected to the gears via link fittings.

Steering is controlled by a hydraulic cylinder that is mounted between the steering links of the front wheels at the axle. In conjunction with a hydraulic orbit control and the hydraulic pump, this arrangement ensures smooth and low-maintenance steering.

3.1.5. Panelling

All panels are made of glass fibre-reinforced plastic (GRP) and are easy to remove.

3.2. Snow Conveyor (Auger)

The horizontal auger in the conditioner transports the snow that has been scraped off the ice by the blade to the centre of the conditioner, where it is picked up by a vertical auger and is transported into the OLYMPIA ICEBEAR'S snow bin. To switch on the horizontal and vertical augers, press the button ELEVATOR ON on the dashboard.

3.2.1. Directional Control Switch for the elevator:

- This switch has three possible positions
- Turning the switch to the left turns the elevator FORWARD (self- locking)
- The middle position is OFF
- Turning the switch to the right turns the elevator REVERSE (turn and hold switch)

3.3. Edger



There shall no other persons on the ice when you are using the edger.

Before running the edger, close all doors onto the ice surface. Inspect the dasher boards and ice surface immediately beside the boards for any loose or protruding screws and plastic or debris in the ice.

If you do not know how the edger will react in certain situations, do a dry run first, without the edger running.



Never drive backwards when the edger is down.

3.4. Hydraulic Components

A hydraulic pump supplies the hydraulic system with oil. Control valves supply the ice resurfer with oil for the operation of a series of non-return and control valves, and valves for movement control, which control the flow of hydraulic fluid to the various components as needed. The pump must only be serviced by qualified personnel.

4. Controls

4.1. EMERGENCY SHUT OFF Switch



Fig. 4.1: EMERGENCY SHUT OFF Switch

The ice resurfer is equipped with an EMERGENCY SHUT OFF SWITCH that is installed above the steering wheel, at the left.

- To get power from the batteries to the ice resurfer, pull the red knob up.
- To disconnect the batteries from the ice resurfer, depress the red knob.

4.2. Top Control Panel



Fig. 4.2: Top Control Panel

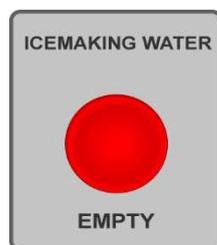


Item 1 : BDI Display

The BDI Display is equipped with a digital LCD display. This will display the charging status, the operating temperature and low electrolyte level.



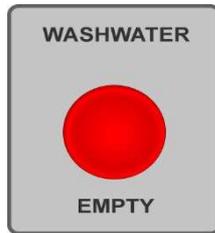
For more information, please refer to the documentation provided by the manufacturer, Abertax.



Item 2: Ice Making Water Indicator

The red light will come on when the ice making water tank is empty. Simultaneously it will turn off the speed related water pump. When the red light first comes on there is approximately 100 litres of water in the tank.

4 Controls



Item 3: Wash Water Indicator

The red light will come on when the wash water tank is empty. Simultaneously turning off the wash water pump and valve.



Item 4: Gear Shift Lever

Unless moving the ice resurfacer, always make sure the gear shift selector is in the neutral position. To move the ice resurfacer forward move the gear shift selector to the forward position. To reverse the ice resurfacer, move the gear shift selector to the reverse position.

F = Forwards

N = Neutral

R = Reverse



Always move the gearshift selector to the centre position (neutral position) before you leave the driver's platform.



If the lever is not in the neutral position when the ignition key is turned on, the drive control will be disabled until the gear shift selector is switched back to the centre position.

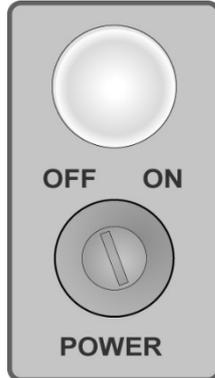


Make sure the ice resurfacer comes to a complete stop before changing gears.



Item 5: Light

This switch turns the headlights and tail lights on and off



Item 6: Ignition Key and Power On Light

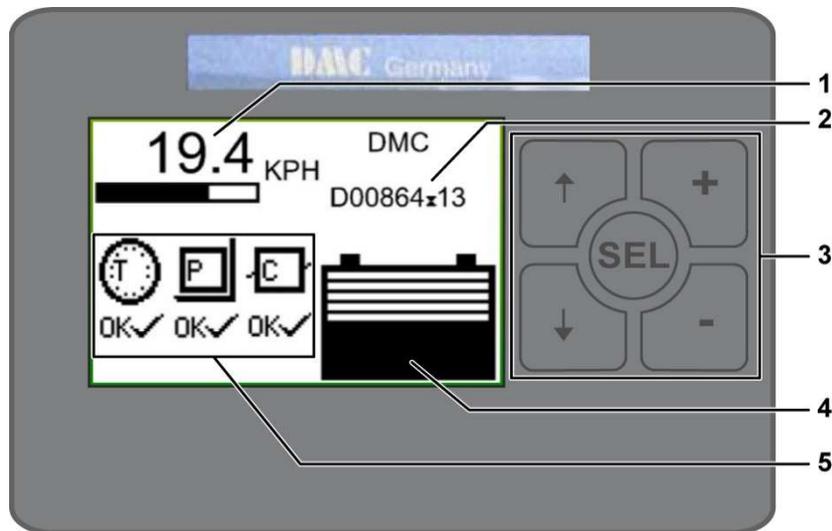
Turn the key to the right to switch on the ice resurfer and put it into operation. Turn it to the left to switch it off again. The key can be removed in the centre position at any time – even when the machine is switched on. It can be switched off with the EMERGENCY SHUT OFF (Fig. 4.1) at any time. A white pilot lamp above the switch indicates the state of the switch. When the ice resurfer is switched off, all functions are shut down, except for the automatic water stop and the pump for the distilled water.



Item 7: Horn

Press this button to sound the horn.

Item 8: Dashboard Display



- 1) Display field with switching function for display of the speed, motor voltage, acceleration and steering
- 2) **Operating hours counter:** can be activated using the display buttons.
- 3) Membrane keys to set functions such as service intervals, operating hours counter and the customer information field.
- 4) Battery discharge status indicator
- 5) **Fault indicator:**
Indicates the status of the drive and pump controllers. If there is a fault, the relevant fault message appears instead of OK.



For more information, please refer to the documentation provided by the manufacturer, DMC.

4.3. Bottom Control Panel

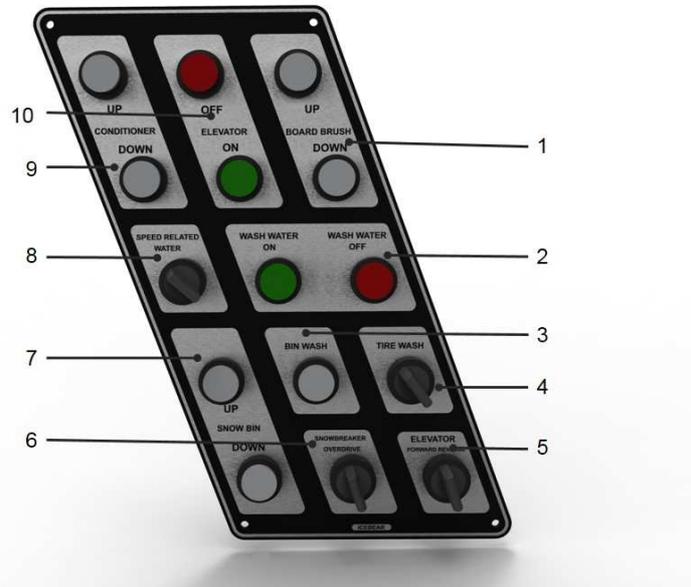
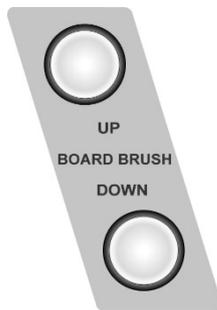


Fig. 4.3: Bottom Control Panel



Item 1 : Board Brush

Raises and lowers the board brush.

When the brush is lowered, it will automatically start to rotate. When the board brush is raised, it will automatically stop rotating.



Item 2: Wash Water On/Off

Switches the wash water system on and off. When switched on the water from the tank will flow for approximately 8 seconds before the wash water pump turns on. When switched off both the pump and the water flow stop at the same time.



Item 3: Bin Wash

When this button is pressed, water is sprayed on the sides of the snow bin via a pipe system, to facilitate emptying of the snow bin.

4 Controls



Item 4: Tire Wash

Right switch position:

Activate the tire washing system

Left switch position:

Deactivate the tire washing system



Item 5: Elevator Forward/Reverse

Left switch position: Snow is transported from the conditioner into the snow bin by the snow transport system

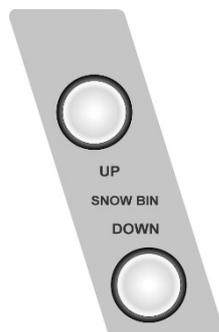
Right switch position: The augers reverse

Centre position: Neither auger turns



Item 6: Snowbreaker Override

Is a backup system which allows for the manual operation of the snowbreaker. Turning the switch to the right will make the breaker go down. Letting go of the switch brings the breaker back to the up position. (Only on "Auger Conditioner")



Item 7: Snow Bin Up/Down

Opens and closes the snow bin hood

To open the bin hood push and hold the UP button until the hood is fully open.



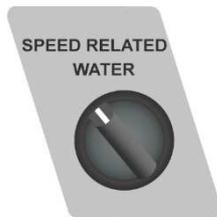
Before opening the hood make sure there is sufficient clearance as the hood will move forward and up.

To close the bin hood push and hold down the down button until the hood is completely closed.



Before closing the hood make absolutely sure that there are no obstructions of any type that could get crushed between the hood and the chassis of the ice resurfacer.

It is recommended that the hood should be left slightly open after each two ice cleaning operations, so that any residual snow in the snow bin can melt and so that the hood seal can recover.



Item 8: Speed Related Water

Water is pumped out in direct relation to the speed of the ice resurfacer.

Left switch position is OFF. No water will flow.

Right switch position is ON. Ice making water will flow in accordance to how fast the ice resurfacer is going.

4.4. Ice Making Water Control Panel



Fig. 4.4: Ice Making Water Control Panel

- Item 1: Indicator lamp for water tank level HALF FULL .
- Item 2: Selector switch.....
- Item 3: Indicator lamp for water tank level FULL.....

This panel controls how much hot water can be put into the ice resurfacer.

The ice resurfacer is supplied with an electric water valve, to be mounted onto the water supply line in the building. Power for this valve is supplied from the ice resurfacer. Once mounted and wired.



The water hose behind the solenoid valve should not be too big in relation to the water pressure and pipe size, because a pressure difference of 0,5 bar (7 psi) is needed to close the solenoid valve.

The solenoid valve plug of the water supply pipe is connected at the Ice Making Water Control Panel and the water level for the water tank is set there. At the left of the selector switch there is a green indicator lamp (Fig. 4.4, Item 1) for half filling the water tank. At the right there is a blue indicator lamp (Fig. 4.4, Item 3) for completely filling the water tank. To select the desired fill level, turn the selector switch (Fig. 4.4, Item 2) in the appropriate direction.

The filling process can be interrupted or stopped at any time by turning the selector switch to the centre position.



The control panel function can be used even when the ignition key is turned off, provided the battery connector is plugged in.

Connection of the Ice Making Water Line

First connect the water line to the water-filling inlet and then connect the solenoid valve to the supply socket on the panel. Turn the fill level selector switch to the desired setting (full or half-full). When the preselected water level is reached, the solenoid valve closes.



Always be sure to insert the fill hose into the ice resurfacers first.

4 Controls

Disconnection of the Ice Making Water Line

Proceed in the following order to disconnect the water hose from the ice resurfacer:

1. Turn the selector switch to the neutral position.
2. Pull the plug out of the socket.
3. Disconnect the hose from the ice resurfacer.



This procedure prevents the solenoid valve from opening before the water hose is connected to the ice resurfacer when the next fill takes place, thus preventing water from pouring out in an uncontrolled manner.



When the green or blue mark is reached, the solenoid valve shuts off the supply of water.



When the solenoid valve is open, a pressure difference of at least 0.5 bar (7 psi) must prevail at the valve to ensure safe and speedy switching of the pilot-controlled solenoid. A smaller valve on a low-pressure supply pipe with a bigger cross-section therefore works better than a large valve in a small pipe at low pressure!

4.5. Wash Water Control Panel



Fig. 4.5: Wash Water Control Panel

Item 1: Selector switch (illuminated)

This panel controls how much cold water can be put into the ice resurfacer.

The ice resurfacer is supplied with an electric water valve, to be mounted onto the water supply line in the building. Power for this valve is supplied from the ice resurfacer. Once mounted and wired.



The water hose behind the solenoid valve should not be too big in relation to the water pressure and pipe size, because a pressure difference of 0,5 bar (7 psi) is needed to close the solenoid valve.

4 Controls

The solenoid valve of the cold water supply line is connected at the Wash Water panel. To switch the wash water supply ON or OFF, turn the switch (Fig. 4.5, Item 1) in the appropriate direction.

The filling procedure can be interrupted or stopped at any time by turning the selector switch to the OFF position.



The control panel function can be used even when the ignition key is turned off, provided the battery connector is plugged in.

Connection of the Wash Water Line

First connect the water line to the water-filling inlet and then connect the solenoid valve to the supply socket on the panel. When the water tank is full, the solenoid valve closes.



Always be sure to insert the fill hose into the ice resurfacers first.

Disconnection of the Wash Water Line

Proceed in the following order to disconnect the water hose from the ice resurfacers:

4. Turn the selector switch to the OFF position.
5. Pull the plug out of the socket.
6. Disconnect the hose from the ice resurface.



This procedure prevents the solenoid valve from opening before the water hose is connected to the machine when the next fill takes place, thus preventing water from pouring out in an uncontrolled manner.



When the tank is full, the solenoid valve shuts off the supply of water.



When the solenoid valve is open, a pressure difference of at least 0.5 bar must prevail at the valve to ensure safe and speedy switching of the pilot-controlled solenoid. A smaller valve on a low-pressure supply pipe with a bigger cross-section therefore works better than a large valve in a small pipe at low pressure!

4.6. Edger Control Panel

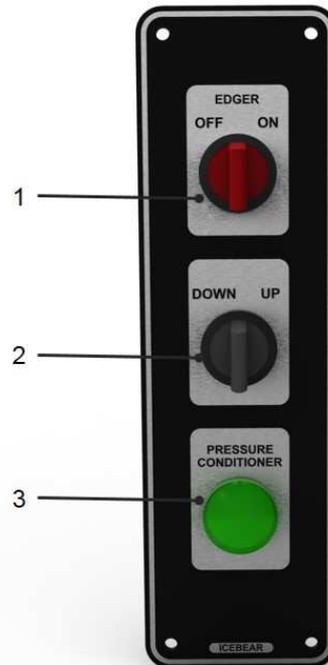


Fig. 4.6: Edger Control Panel

Item 1:Edger OFF/ON

Item 2:Edger DOWN/UP

Item 3:Indicator Lamp CONDITIONER PRESSURE.

The edger is turned on and off by turning the switch (Fig. 4.6, Item 1) to the left or to the right accordingly. The illuminated switch indicates the status.



Two conditions must be met in order to start the edger:

- The edger must be in the DOWN position, and
- The conditioner must be pressed down onto the ice until the green CONDITIONER PRESSURE indicator lamp (Fig. 4.6, Item 3) lights up.

As soon as the edger is moved to the UP position, or the conditioner is hydraulically raised, the edger is turned off immediately, even if the machine is switched off with the ignition key or the EMERGENCY SHUT OFF switch.

Conditioner Pressure Indicator (Fig. 4.6, Item 3)

The lamp lights up when the contact pressure of the conditioner on the ice is reached.

4.7. Foot Pedals and Parking Brake

Another three controls that you will work with a lot are located in the foot well area of the ice resurfacers:

4.7.1. Accelerator Pedal

The right foot pedal is the accelerator pedal and is used to control the driving speed of the machine.

Initially press the foot pedal just a little to switch on the hydraulic motor for the power steering. The more you press down on the pedal, the faster the OLYMPIA ICEBEAR accelerates.



The accelerator pedal must not be pressed when you turn on the ice resurfacers, otherwise the controller will assume there is a fault and will not turn on.



Before pressing the accelerator pedal, it is essential that you first turn on the ignition with the key and select the direction in which you want to travel.

4.7.2. Brake Pedal

The left foot pedal is the main brake pedal. The foot brake acts simultaneously on all four drive wheels. ABS is not installed. The OLYMPIA ICEBEAR braking system has a pressure accumulator, so that the brakes can be applied at least another two times after the hydraulic system has been switched off.



4.7.3. Parking Brake Lever

The parking brake lever (hand brake) is located at the right of the driver's seat. It acts on the two rear wheels. If movement of the ice resurfer is started while the parking brake is applied, the controller switches to CREEP MODE (very low speed) to facilitate starting on slopes.

4.8. Controls for the Water

All possible combinations are possible when setting the water valves.

4.8.1. Ice Making Water

The flow of flood water is controlled either by the speed-related pump, or by the ball valve at the base of the conditioner (Manual Water Valve). For the best resurfacing results, the ice making water should have a temperature of at least 60°C (140°F). The hot water melts some of the surface of the ice, thus achieving the best possible bond with the existing ice. Hot water also holds less oxygen than cold water and therefore produces a denser, harder ice.

Hard ice does not get damaged as easily and therefore needs resurfacing less often and to a lesser depth, which in turn, results in minimal ice build-up.

This means less time spent on ice maintenance and less wear and tear on the resurfacing equipment.

4 Controls



Speed Related Water

The automatic flow of water depends primarily on the speed at which the ice resurfer is being driven, and secondarily on the water valve setting. The lowest quantity of water flows when the ice resurfer is at a standstill, the highest quantity when the ice resurfer is driving at full speed and the water valve is fully open. This automatic function reduces the flow of water in the curves to an adjustable minimum.

Manual Ice Making Water Flow

The manual water function allows water to be applied to the ice at a constant rate, regardless of the speed at which the ice resurfer is travelling. It can also be used to supplement the speed related water.

4.8.2. Wash Water



There must always be enough wash water available to be vacuumed up. The pump must not be allowed to run dry, because the shaft bearing assembly is water-lubricated.

The wash water is sprayed directly out of the water tank onto the ice by a spray pipe in the back wall of the conditioner. When the wash water system is started, cold water is distributed in the conditioner over the whole width of the conditioner, creating slush. The squeegee then forces the slush into the cuts on the ice. Any excess water and debris is vacuumed back into the wash water tank.



4.9. Controls for the Hydraulic System

Switching the Hydraulic Motor On and Off

There are two ways of switching on the hydraulic motor:

- 1) By pressing the accelerator pedal.
- 2) By pressing the appropriate pushbutton.

However, the ice resurfer must be turned on at the main switch before the motor can be started up.

The hydraulic motor is switched off either by turning off the main switch, or automatically approx. 20 seconds after the accelerator pedal was last pressed, or as soon as you let go of a pushbutton.

4 Controls

4.10. Blade Level Adjustment

The blade adjustment crank, located on the tower to the right of the operator, raises and lowers the blade. The adjustment crank is turned until the indicator arm completely fills the sight hole at the side of the conditioner as shown below.

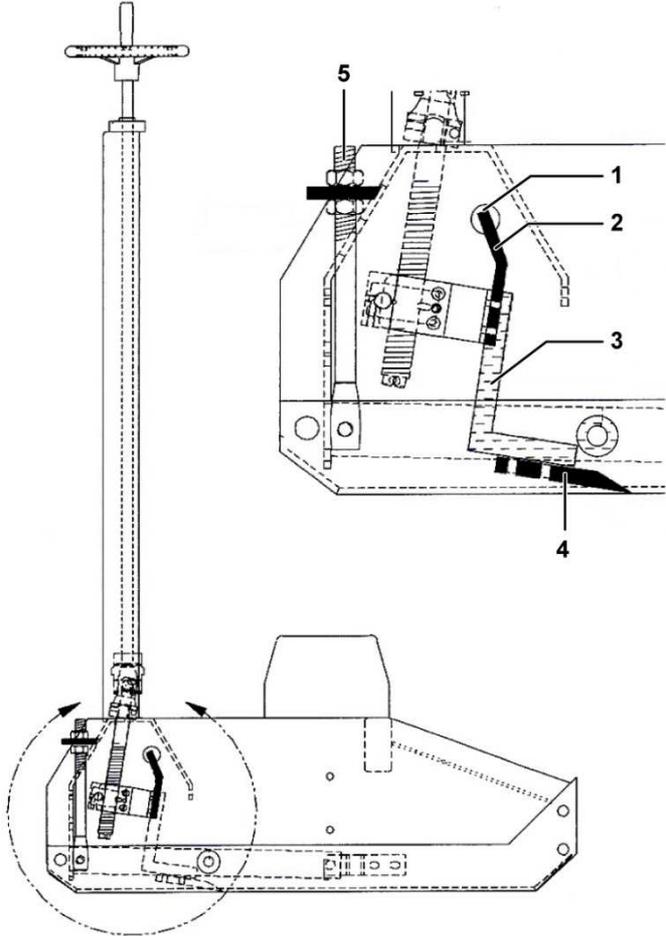


Fig. 4.7: Blade Level Adjustment

Item 1: Sight hole

Item 2: Indicator arm

Item 3: Blade holder

Item 4: Blade

Item 5: Blade level adjuster

If the sight hole is filled, but the blade is too low or high, go to the rear of the conditioner and using a 1 1/8" wrench (metric version 27mm), first loosen the top nut of the blade level adjusters located on each side of the rear of the conditioner shown below.

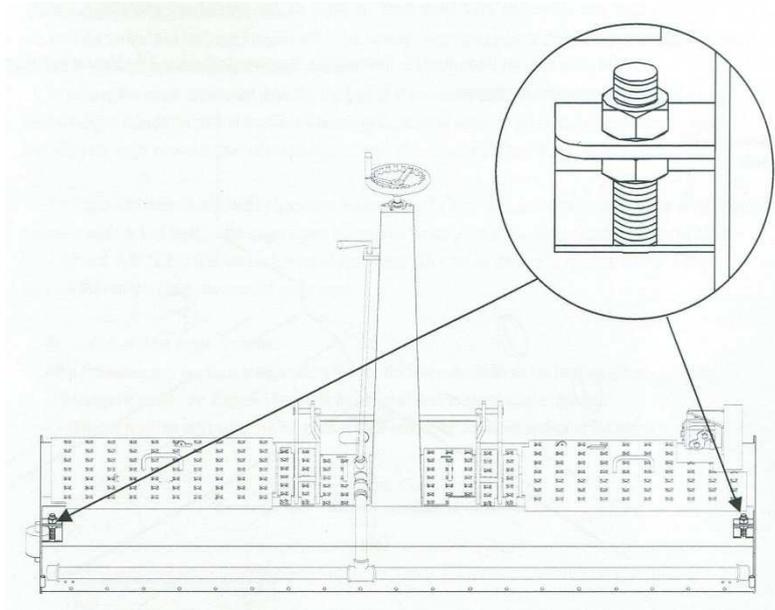


Fig. 4.8: Blade Level Adjuster

Then turn the nuts to raise or lower the blade into the proper position, which is exactly level with the bottom of the runner. Once the blade is at the proper level tighten the nuts on the blade level adjuster.

When the ends of the blade are flush with the runners, the majority of the blade will extend 1/16" (1,6mm) below the runners, which is an excessive amount unless the intent is ice maintenance. The blade is now set for a specific blade width.

To check the level of the blade see on the blade/coin check (refer Chapter 5.3.2).



Be careful when doing the coin check. Make sure you are wearing gloves and that you move the coin from back to front as the blades are extremely sharp.

5. Start Up of the OLYMPIA ICEBEAR

5.1. Charge the Batteries

Before you can start work with the OLYMPIA ICEBEAR, you must charge the battery. A battery charger is supplied with the ice resurfacer for this purpose. This charger is designed to fully recharge a battery that has been drained up to 80%.

1. First turn off the battery charger (OFF).



2. Open the battery access doors on both sides of the OLYMPIA ICEBEAR with the key, to ensure proper ventilation during the charging procedure. (Battery gassing does occur in the final stages of charging. Gassing emits dangerous hydrogen gas).

3. Press the EMERGENCY SHUT OFF switch.
4. Carefully disconnect the power supply coupling at the right hand side of the ice resurfacer, behind the battery access door. Now plug the cable from the battery charger into the vehicle's power supply connection.
5. Pull up the EMERGENCY SHUT OFF switch.



The EMERGENCY SHUT OFF switch must be pulled (released), otherwise charging cannot be done.

6. Turn on the battery charger (ON).



The battery charger switches off automatically when the battery is fully charged

7. When recharging is complete, depress the EMERGENCY SHUT OFF switch, disconnect and store the charger cable from the ice resurfacer's power supply connection.



If the charging operation has to be interrupted for any reason, turn off the charger before pulling out the charger plug.

8. Reconnect the OLYMPIA ICEBEAR'S internal power supply cables.
9. Close and lock the battery access doors.
10. Pull the EMERGENCY SHUT OFF switch



The batteries must not come into contact with water, as this could cause them to short out.



When working with acid batteries, avoid all contact of the acid with the skin or clothing.

5 Start Up



Always wear a rubber safety apron, a facemask, suitable protective gloves and safety footwear when you open the battery access door.



Always use only distilled water to fill batteries.



Check the electrolyte level in the batteries once a week immediately after recharging. Top it up, if necessary.



The battery water level is correct when all of the cell floats are visible. Periodically check the specific gravity with a hydrometer. In the log supplied, record water filling and specific gravity reading.

In Europe:

A mobile battery watering canister with hose coupling and immersion pump is supplied with the ice resurfacer.

11. Connect the hose coupling to the respective battery trays (two on the left, two on the right)
12. On the right hand side of the ice resurfacer, connect the plug from the canister to the wash water fill station; on the left hand side connect the plug to the ice making water fill station.
13. The batteries are automatically filled with distilled water until the float valves at the individual battery cells stop the filling process. The water flow indicator in the hose will stop spinning when the tray is full. This process must be repeated on each of the four battery trays.

In North America:

A battery watering cart is supplied with each ice resurfacer.

14. Connect the hose coupling to the respective battery trays (two on the left, two on the right).
15. Turn on the pump in the cart.
16. The batteries are automatically filled with distilled water until the float valve at the individual battery cells stop the filling process. The water flow indicator in the hose will stop spinning when the tray is full. This process must be repeated on each of the four battery trays



The optimal charging cycle for a maximum life expectancy of the battery is as follows:

1. Discharge until the battery is as close to 0% on the accumulator charge indicator as possible.
 2. Recharge uninterrupted for 7-8 hours.
17. If at all possible do not attempt to charge the battery between resurfacings (opportunity charge).



Opportunity charging, although sometimes may be necessary should be avoided as it decreases the overall life of the battery.

5.2. Installation of the Squeegee

Mount the squeegee on the inside of the conditioner with the bolts and nuts provided. However these bolts and nuts are stainless steel and it is recommend to coat the threads with a lubricant before installing.

If not already trimmed, carefully trim the ends of the squeegee so that it fits tightly against the runners of the conditioner, as in the picture:



Snow that is pushed by the squeegee must stay within the area between the squeegee and the runners, and must not be pushed out from there, as this would cause ridges to be produced on the ice.

5.3. Installation and Removal of the Blade



Always wear approved safety gloves when handling the blade. For operator safety and to protect the edge of the blade, always use the magnetic blade protector when handling the blade, as it is extremely sharp.



For shipping and storage, blades should be bolted into wooden sheaths.



Before installing a blade, make sure that the surface of the blade holder is clean and has been lightly coated with oil to prevent rust. The blade should also be clean where it attaches to the blade holder and coated with oil.

5 Start Up

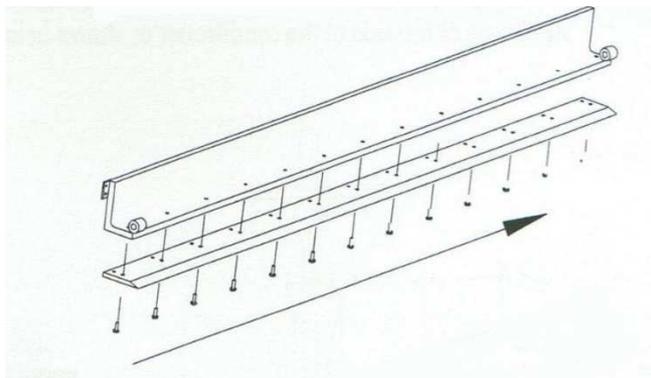
5.3.1. Blade Installation

1. Place the blade on blocks at the rear of the conditioner.
2. Drive the conditioner in a upper position.
3. Press the EMERGENCY SHUT OFF switch and pull out the battery plug.
4. Unlock and take out the blade wedge
5. Grease the blade bolts lightly
6. Using the blade hook lift and slide the blade underneath the conditioner until the attachment holes line up.
7. Install the blade bolts and finger tighten remembering to utilize the row of holes closest to the cutting edge. The second row of holes should be used when the blade has been ground down to 4 inch (approx. 10 cm) overall width.



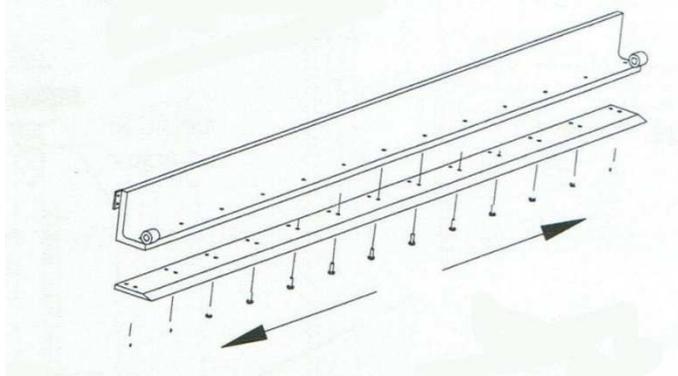
Following the diagrams below, begin to install the blade bolts. DO NOT use lock washers as they will damage the blade holder.

Blade Bolt Sequence “A”:



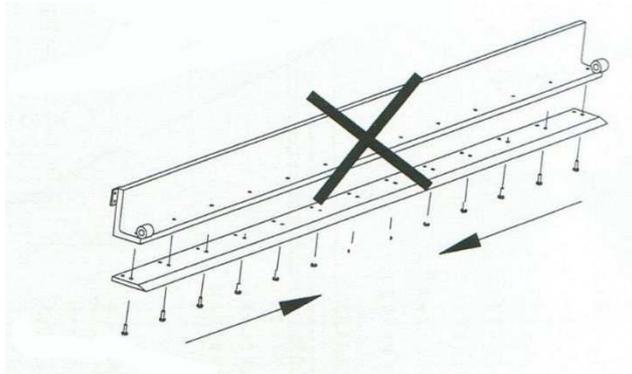
- Starting at one end of the blade, tighten the bolts consecutively across the blade to the opposite end.
- Remove the blade hooks and insert the remaining two blade bolts and tighten.

Blade Bolt Sequence “B”:



- Starting in the middle tighten the bolts from the centre to one end then return to the centre and tighten the bolts to the other end in order.
- Remove the blade hooks and insert the remaining two blade bolts and tighten.

Wrong Sequence:



Please note: Tighten the bolts in any other order, such as from the end to the middle or at random will result in a warped blade and uneven ice.



The blade holder is feathered by 1/16“ (approx 1,6 mm) over the last 7" (17.78 cm) at each end. This prevents ridges from forming on the ice.



5 Start Up

8. Lock the used blade in the blade wedge.
9. Adjuste the blade.
10. Plug in the battery plug and pull out the EMERGENCY SHUT OFF switch
11. The machine is now ready to use.



Removal of the blade is done in reverse order to that in which it was installed!

5.3.2. Blade/ Coin check

The sharp tip of the blade should be flush with the runners on both sides. If the blade is flush the coin will slide smoothly over the blade edge.



Safety Note: Be careful when doing the coin check. Make sure you are wearing gloves and that you move the coin from back to front as the blades are extremely sharp.

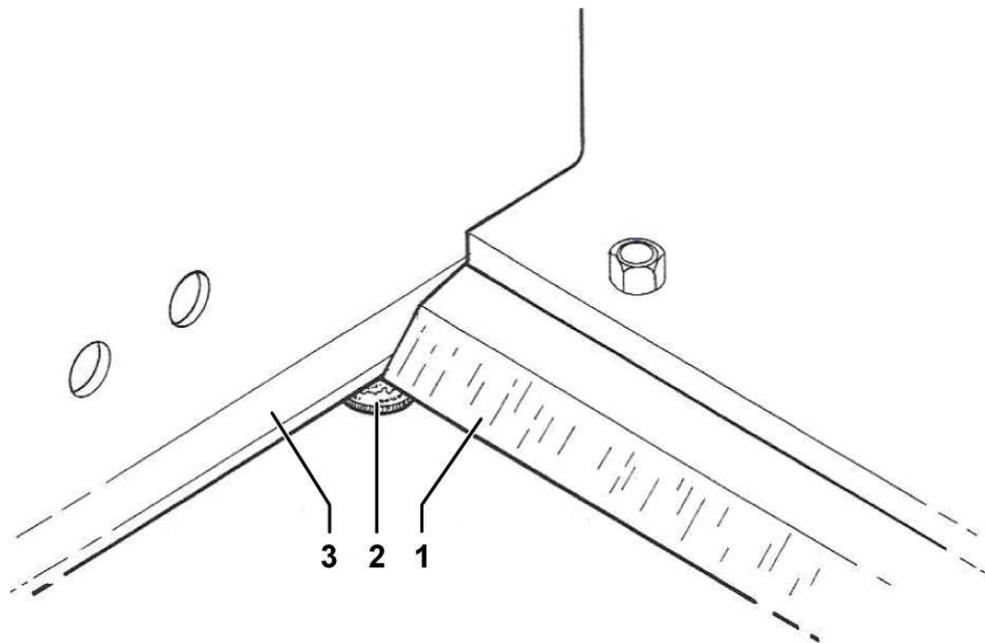


Fig. 5.1: Blade/ Coin check

Item 1: Blade

Item 2: Coin

Item 3: Runner



It is important that the blade holder and the blade surface be free of foreign material and lightly coated with oil to prevent rust.



5 Start Up

Test drive the OLYMPIA ICEBEAR doing a dry cut. If the blade is properly set up you will see a feathered edge on the ice surface on both sides of the conditioner. If the cut is on one side or the other then the blade needs to be raised or lowered, on the drivers side, to bring it precisely level with the runner.

After the blade angle and level are set, any change in the cutting depth will alter the indicator arm position in the sight hole, but blade angle tolerances will accommodate such adjustment and further adjustment of the blade angle will not be necessary.

5.4. Horizontal und vertical Augers

The horizontal auger in the conditioner carries the snow scraped off the ice by the blade into the centre of the conditioner where a vertical auger picks it up and transports it to the snow bin in the front of the OLYMPIA ICEBEAR.

The horizontal auger should be barely above the ice level to maximise snow pick up while at the same time preventing any marking of the ice surface.

5.4.1. Horizontal Auger Adjustment

The horizontal auger is adjusted by loosening the four outer bolts on the bearing adjustment plate on each end of the auger and the four bolts for the auger motor mount. The lowest point of the auger should be between 1/16" (1,6mm) and 1/8" (3,2mm) above the bottom of the runners. This can be checked by running a piece of string between the runners at the lowest point of the auger.

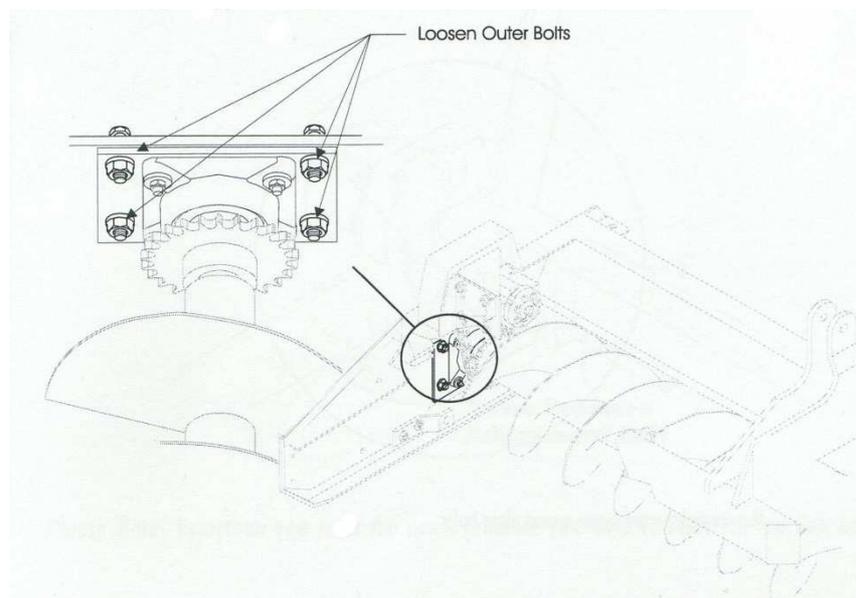
Auger Height Adjustment:

Pry the auger to the proper position.

After the adjustment has been completed, re-tighten the four outer bolts on the bearing adjustment plate.

If the auger is set too low, diagonal lines may be found where the auger touches the ice.

If the auger is set too high, excessive amounts of snow will be left on the ice surface at the end of the flood.

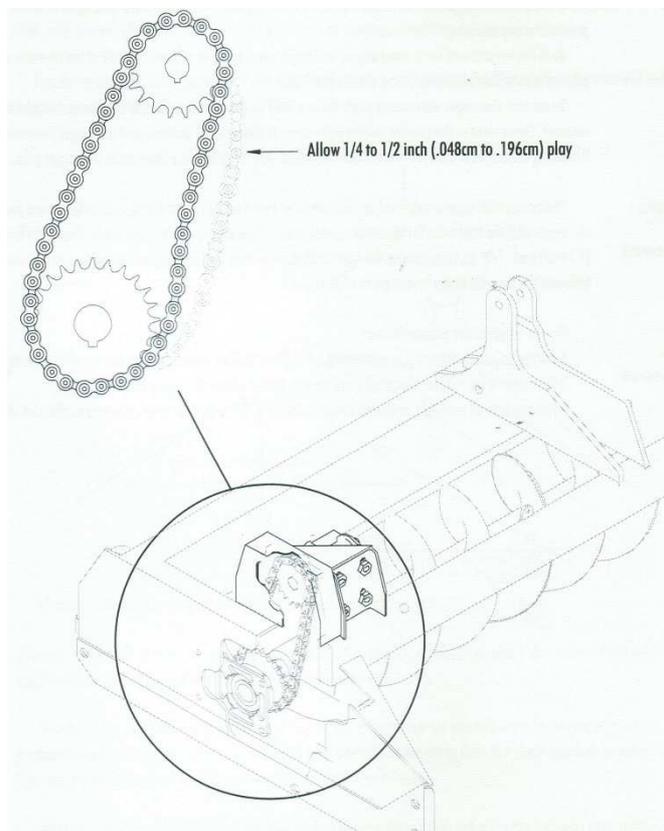


5 Start Up

5.4.2. Auger Drive Chain Adjustment

The horizontal auger drive chain should be kept at a reasonable tension at all times. If too loose, the sprockets chain will wear out prematurely. If too tight, the sprockets, chain and auger bearings will also wear out prematurely.

To adjust the chain tension, loosen the motor mount plate bolts and adjust the motor mount until you get the proper tension (allow $\frac{1}{4}$ to $\frac{1}{2}$ inch/6 to 12 mm play).



5.4.3. Down Pressure Adjustment

To adjust the down pressure stop the OLYMPIA ICEBEAR, place it in park and lower the conditioner until it is almost touching the ice surface.

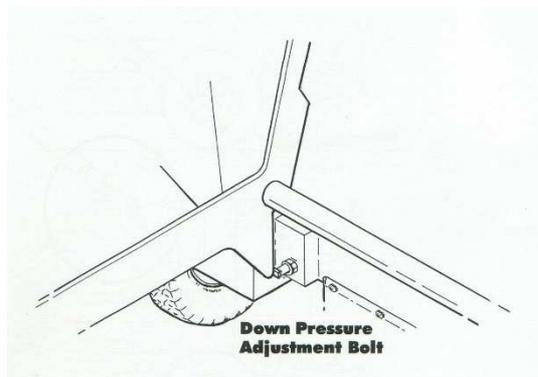
Properly dismount and turn the down pressure stop bolts in (clockwise) 5 full turns.

Remount the OLYMPIA ICEBEAR lower the conditioner until you have three tire lugs touching the ice. Shut off the OLYMPIA ICEBEAR and dismount. Turn the down pressure stop bolts until they are tight against the down stops under the conditioner arms.

Now tighten the jam nuts.

Too much down pressure will lift the rear wheels off the ice resulting in a loss of control.

Too little down pressure will result in rippled ice and gouging in the corners.



Every time you reset the down pressure you have to reset the top link adjustment.

5 Start Up

5.4.4. Top Link Adjustment

Check to make sure the front of the runners are still on the ice surface.

Drive the OLYMPIA ICEBEAR once around the rink.

When the top link is adjusted properly the rear tires should leave a full tread pattern on the ice.



It is essential for proper operation that rear tire pressure be maintained at 101,5 psi (7 bar) and the front at 75 psi (5 bar).

To test the top linkage, first loosen the lock nuts on both top links.

Now loosen both top links by turning them counter clockwise until there is no tension.

Remount the OLYMPIA ICEBEAR and drive forward six feet (2 meters), stop, turn off the OLYMPIA ICEBEAR and dismount.

Now simultaneously re-tighten the top links by turning them clockwise making sure to extend the top link to hand tight only.

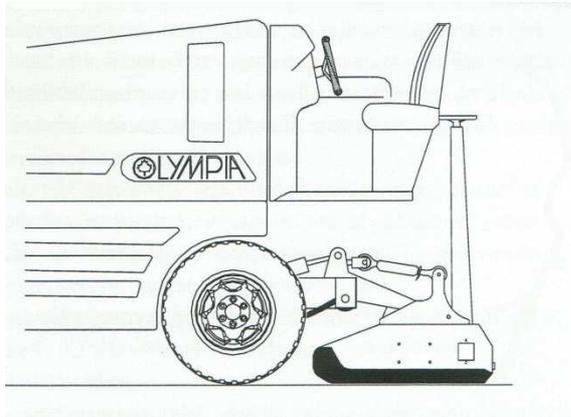
Secure the top links by tightening the lock nuts.

Check to make sure the front of the runners are still on the ice surface. When properly adjusted the runners will not leave any marks on the ice surface.

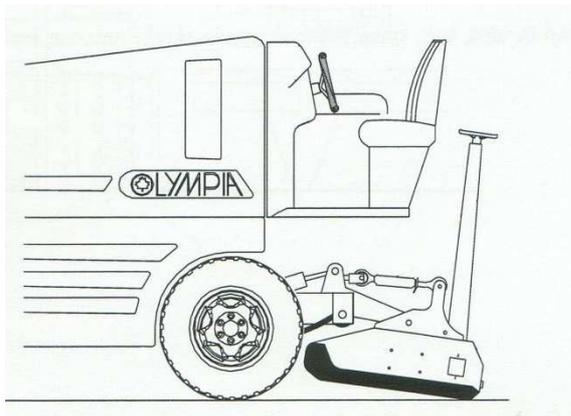


It is essential that you adjust both top links at the same time.

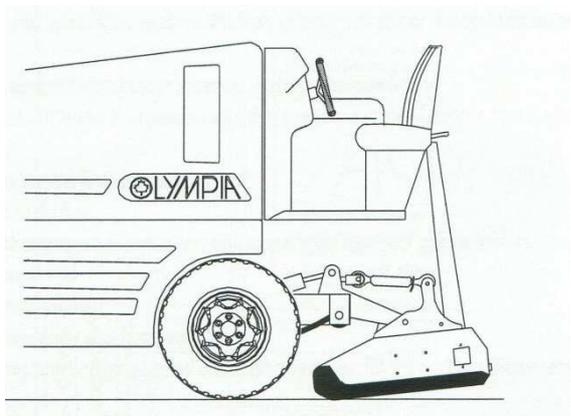
Proper Top Link Adjustment



Top Link too long



Top Link too short



5.5. Spreader Cloth Installation

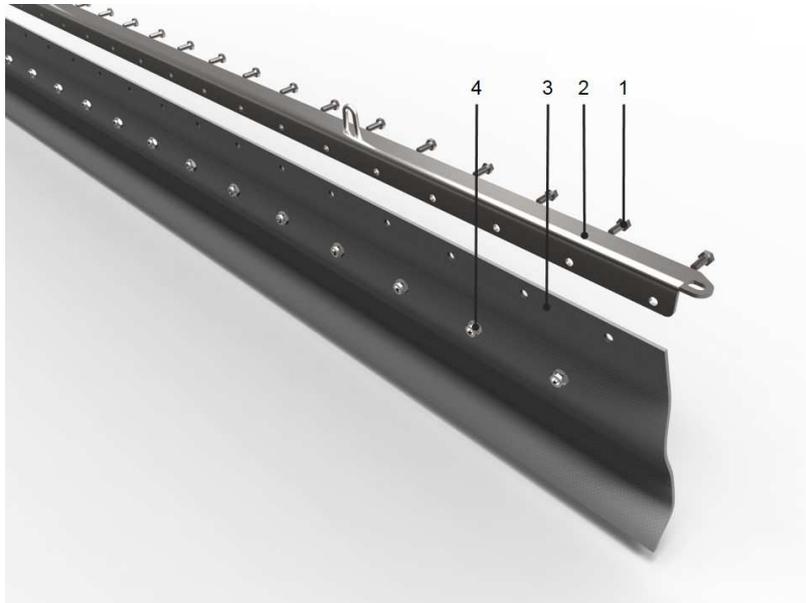


Fig. 5.2: Spreader Cloth

- Item 1: Hex Head Bolt.....
- Item 2: Towel Bar.....
- Item 3: Spreader Cloth.....
- Item 4: Locknut.....

1. Install the towel on the backside of the towel bar with M10x25mm hex head bolts and locknuts, making sure the nuts are on the towel side of the towel bar. However these bolts and nuts are stainless steel and it is recommend to coat the threads with a lubricant before installing.
2. Place the towel bar assembly onto the towel lift guides.
3. Attach towel lift chains between the towel bar and towel lift arm

5.6. Water Filling Procedure



Always fill the ice making water tank with hot water, always fill the wash water tank with cold water.



Never leave the OLYMPIA ICEBEAR unattended during the water filling procedure.



During the ice resurfacing procedure, both tanks vent into the snow bin.

5 Start Up

5.6.1. Ice Making Water Filling Procedure



Fig. 5.3: Ice Making Water Filling Procedure

1. To fill the ice making water tank, insert the hot water hose into the filling inlet (Item 1) on the left hand side of the OLYMPIA ICEBEAR.
2. Plug the solenoid valve plug into the socket on the Ice making water fill station (Item 2).
3. Select whether you want to half-fill or completely fill the tank.
4. When the switch is turned, the water begins to flow until the previously selected water level is reached and the system shuts itself off automatically.
5. Return the switch to the OFF position, pull out the solenoid valve plug and remove the hose from the filling inlet.

5.6.2. Wash Water Filling Procedure



Always fill the wash water tank with cold water only.



Fig. 5.4: Wash Water Filling Procedure

1. Insert the cold water hose into the filling inlet (Item 1) on the right side of the ice resurfacer.
2. Plug the solenoid valve plug into the socket on the Wash water fill station (Item 2) on the exterior right hand side of the OLYMPIA ICEBEAR` s control cabinet.
3. Turn the switch to the ON position, the water then begins to flow.
4. The filling procedure ends automatically when the tank is full.
5. Turn the switch to the OFF position, pull out the solenoid valve plug and remove the hose from the filling inlet.



5 Start Up

5.7. Safety Circle Check

- Do a smell check
- Turn on the lights
- Be sure battery charge is complete. Check to make sure battery charger is turned off.
- Depress Emergency Shut Off switch.
- Disconnect the battery cables and store.
- Reconnect the internal power supply cables.
- Close and lock the battery access doors.
- Make sure the front bumper wheel spins freely.
- Check lug nuts and tire pressure and general condition of tire and studs on left front wheel.
- At front of ice resurfacer check the body for damage
- Look under ice resurfacer for any leaking fluids, debris and make sure no one is working under the ice resurfacer.
- Check lug nuts and tire pressure and general condition of tire and studs on right front wheel.
- Make sure both tank drains are closed.
- Check lug nuts and tire pressure and general condition of tire and studs on right rear wheel.
- Check the conditioner of the blade, in relationship to the runners. To avoid being cut by the blade, always start at the rear of the conditioner and slide your hand towards the front of the conditioner.
- Check the runners for burrs that would leave scratches on the ice surface. Make sure you go the full length of the runner. The runner should have no nicks or scratches on it and the blade should be flush or slightly above the bottom of the runner.



5 Start Up

- Remove the conditioner cover on the right hand side and check that the horizontal auger turns freely in both directions.
- Make sure there is no up, down or side to side movement.
- Check the tension on the conditioner chain. There should be between a quarter and half- inch play (6 - 12 mm).
- Check electrical connection for conditioner (horizontal auger) motor.
- Check the squeegee making sure it fits tightly from end to end and there are no nicks or cuts.
- Examine the bottom side of the towel. Make sure it is clean, debris free and that the terri loops are in good condition.
- Check the auger for up and down and side to side movement.
- Check the bottom of the runners again for burrs or nicks.
- If your OLYMPIA ICEBEAR is equipped with the optional electric Edger on the conditioner, check the cutting tips for damage and make sure the plate is securely attached.
- Check all the hydraulic hoses connections on the Edger and make sure there are no fluid leaks.
- Check the electrical connections.
- Check lug nuts and tire pressure and general condition of tire and studs on left rear wheel.
- Check the board brush. Make sure that no debris is caught in the brush and that there is no free play.
- If the snow dump door was left open return both safety support pins back into their storage place.
- Using a three point mount, step onto the ice resurfacers and sit down.



5 Start Up

- Turn the start key to the ON position.
- Check the horn and the lights.
- Make sure the conditioner is all the way up by pushing and holding the conditioner UP button on the dash.
- Test the elevator system. First, make sure the toggle switch is in the ON position, then push the ON button for the elevator. While it is still running turn the toggle switch to the reverse position. The augers should come to a stop and then reverse direction. Then switch back to the forward position and shut off.
- If the wash water tank is full turn on the wash water only long enough to make sure the wash water valve opens and you have an unobstructed water flow on both sides of the conditioner.
- Check the board brush by pushing the lower half of the board brush button, to lower the board brush and then the upper half to raise the board brush.
- Depress the brake pedal to check the brake lights.
- Check the blade adjustment hand crank wheel. Make sure it turns freely.
- Turn on the tire wash to make sure the pump works.
- At least once a month check the Emergency hand pump for the conditioner cylinders (refer chapter 8.6).
- Remove all hoses and cables from the ice resurfacer.
- You have now completed the safety check and are ready to proceed onto the ice surface and begin the resurfacing process. Make sure you use the horn when crossing any pedestrian areas.

6. Working with the OLYMPIA ICEBEAR

6.1. Driving

6.1.1. Starting

To start the OLYMPIA ICEBEAR you must be seated in the driver's seat. The red EMERGENCY SHUT OFF switch must be in the UP or ON position. Turn the ignition key to the right and you will hear the switches turn on inside the electrical panel.

6.1.2. To move the ice resurfacers

Release the parking brake and select forward or reverse gear. Press down the accelerator pedal and carefully start driving. When you are on the ice surface, carefully check the distance to the boards.



If the ice resurfacers are not sitting on a level floor, you must first depress the accelerator pedal to start the hydraulic pump, before releasing the parking brake.



In the event of electrical drive faults depress the EMERGENCY SHUT OFF switch on the dashboard. Wait for approximately 10 seconds and lift up the EMERGENCY SHUT OFF switch. This will reset all the electrical motor controllers. Restart the ice resurfacers. If a fault code persists a pictogram will appear showing the fault code on the lower left hand corner of the DMC gauge on the dashboard (Fig. 4.2 Item 8).

6 Working with

6.1.3. Brakes

To stop the OLYMPIA ICEBEAR, take your foot off the accelerator pedal and carefully press the brake pedal.



Always apply the hand brake (parking brake), set the gear lever to neutral and turn off the controller before turning off the OLYMPIA ICEBEAR.

6.1.4. Shifting from Forward to Reverse

Always come to a complete stop before changing the direction of travel.

Never drive in reverse when the brush is out or the edger is down.



When lowering the conditioner, make sure that the OLYMPIA ICEBEAR continuously moves forwards!

6.2. Ice Resurfacing



Only lower the conditioner while the Icebear is moving, otherwise it will sustain damage.



When working with the OLYMPIA ICEBEAR, there must not be any other person on the ice.



Operation and start-up must only take place from the driver's seat!



Before driving onto the ice surface make sure pedestrian doors in the dasher boards are closed.

6.2.1. Working with the Edger



There must not be any foreign objects on or in the ice.

Check for any protruding screws in the dasher boards before edging. Pay particular attention to the edges of the dasher board gates. Make sure to close the ice resurfacers entry gate before using the edger.

6 Working with



If you are not sure how the edger will behave in certain situations (e.g. at openings in the board, at the edges of the ice, etc.), first do a dry run, without the edger running



Danger!

Never drive backwards when the edger is down, otherwise the edger may sustain damage.



Danger!

Before edging, always check the edger for damage and make sure that all parts are secure.

Starting the Edging Operation

1. Drive onto the ice close to the point at which you want to start edging.
2. Turn OFF the ice resurfacer. Using a three point system dismount the ice resurfacer. Close and lock all ice entry gates.
3. The towel should already be removed from the conditioner. If not, remove it.
4. If the ice resurfacer is equipped with a manual raise and lower system, release the edger catch and slowly lower the edger. The edger should be approx. 40" (one meter) away from the boards.
5. Using a three point system mount the ice resurfacer and sit in the driver`s seat.
6. Turn ON the ice resurfacer.
7. If the ice resurfacer is equipped with a hydraulic raise and lower system, turn the switch on the dash to lower the edger.

8. Raise the blade to the point where it no longer cuts.
9. Lower the conditioner all the way to the ice surface.
10. Slowly drive along side the board until the conditioner is approx. 4" (10cm) from the boards.
11. When the edger touches the boards, switch it on. Do not switch it on before that! When driving with the edger, keep the board guide roller at a uniform distance of approx. 4" (10cm) away from the boards. In the curves, reduce the distance to ½" (1,2cm). At the end of the curve, increase the distance again to approx. 4" (10cm).
12. Drive at a comfortable walking pace. The quality of the cut depends on the speed, the distance of the conditioner to the boards and correct setting of the edger.
13. Turn the blade down until it starts to cut.
14. Drive the ice resurfacers along side the boards.
15. Turn on the board brush and continue with lap.
16. Upon completion of the first lap retract the board brush and drive the second lap half of conditioner width away from the boards.
17. Drive a third lap a full conditioner width away from the boards.
18. Drive the fourth lap against the boards again.
19. You have now completed the edging process.



Before leaving the driver's seat, always turn off all functions!

After Completion of the Edging Operation

20. Turn off the edger.
21. Drive away from the board.
22. Raise the edger and lock it into place.

6 Working with

6.2.2. Driving with the Board Brush

Normally the brush is used for the first lap around the boards at the beginning of each ice cleaning process.

This produces a clean, snow-free board area, right up to the edges. In connection with the edger and the automatic water function, the use of the brush reliably prevents a build-up of ice at the boards.



Drive with the brush in the same way as you would without the brush, but always travel in a clockwise direction around the boards.



Never drive backwards while the brush is extended. The brush can yield to the boards in the forward direction of travel, however, when driving in reverse, the brush could swing into an opening and catch the boards, causing severe damage.



It is easy to adjust the brush to any angle to suit the local conditions.

6.2.3. Water Application

Ice Making Water Procedure

- 1) Fill the tank with hot water through the fill pipe located on the driver`s side.
- 2) Note: A ½ full tank is more than sufficient for a single resurfacing.
- 3) 2. Water flow can be turned on and off two ways.
A: Gravity flow regulates the flow of water by opening or closing the water tap mounted just in front of the blade adjustment hand wheel on the conditioner.
B: Turn on the speed related water on the bottom control panel. Ice making water will then be pumped out according to how fast or slow you are driving.



For the best results, ice making water should always be at least 60 C (140 F).



After each resurfacing it is recommended to drain any excess water left in the tank. This will reduce the cooling the next tank of water before using and reduce scale build up inside the ice making water tank.

6 Working with

Wash Water Procedure

The wash water system sprays water from both sides of the conditioner into the centre, in front of the squeegee, thus creating slush. Excess water and slush are then vacuumed up, taking with it any dirt and debris from the ice surface. In addition, any snow left behind by the blade is turned into slush by the wash water and is pushed into any cracks in the ice by the squeegee. The water is filtered and then returned to the wash water tank.



Always use cold water in the wash water system.

To turn on the wash water system during the resurfacing operation, press the button Wash Water ON (Fig. 4.3, Item 2). The water begins to flow. After 10 seconds, the wash water pump begins to vacuum up the water.

$\frac{3}{4}$ of the lap prior to completion of resurfacing, turn off the wash water, press the button Wash Water Off (Fig. 4.2, Item 2). Both the water flow and the pump turn off at the same time.



By turning the wash water off $\frac{3}{4}$ of the lap before completion, any water trapped between the blade, squeegee and runners will be used up and this will prevent pooling of any water once the conditioner is raised.

The filter basket for the wash water is located in the snow bin, directly in front of the driver and can be accessed by lifting the snow bin lid.

Fill the water tanks with enough water to do a complete resurfacing job. Any water still remaining in the tanks after the job has been completed should be drained completely, to prevent a build- up of scale.

6.3. Resurfacing Procedure

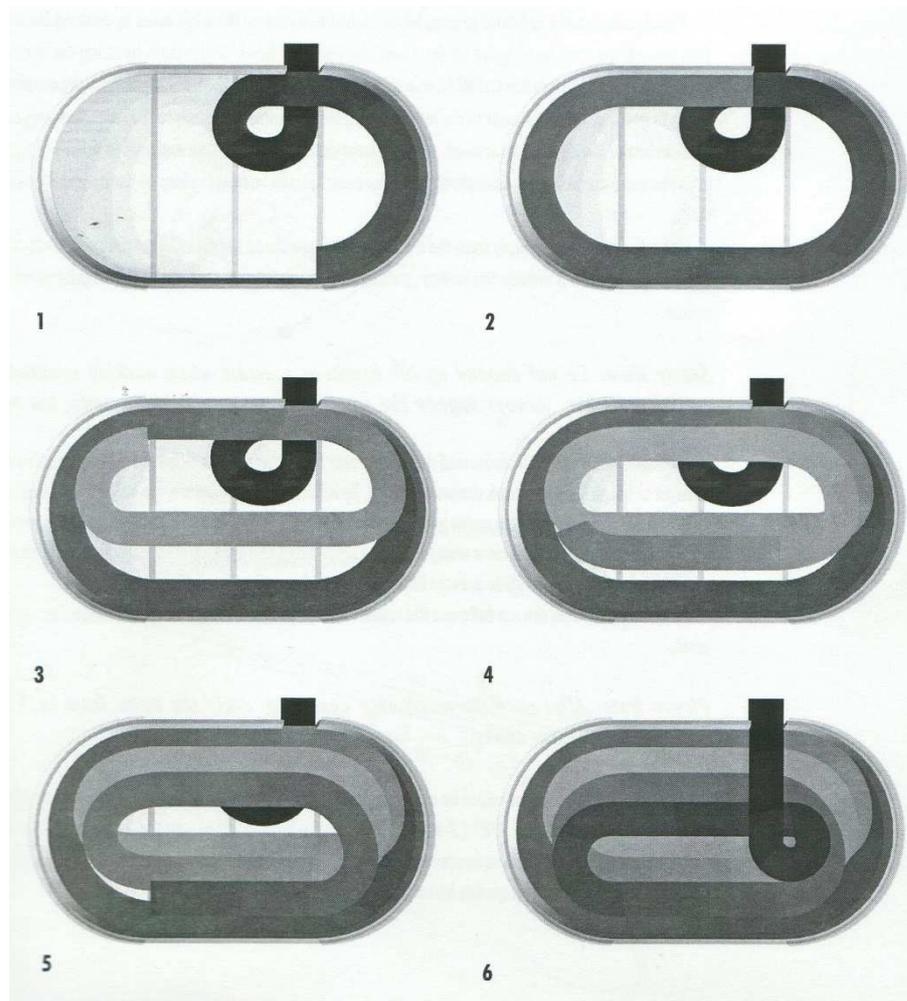
Once you have taken on sufficient water, before driving onto the ice surface, turn on the tire wash to rinse the tires of any debris. Now carefully drive onto the ice surface and carry out the normal ice making procedure as follows:

- Lower the conditioner to the ice surface by pressing the bottom of the conditioner button until the conditioner arms are against the stops.
- Engage the horizontal augers by pushing the top of the elevator on button.
- Turn on the ice making water with either the Speed Related Water button or the manually operated water valve.
- Turn on the Wash Water button.
- Now engage the board brush by pushing the Board Brush button down.
- Drive slowly ahead keeping the board brush close to the boards. (This will clean the snow on the kick plate and edges of the ice surface into the conditioner)
- Upon completion of a full circuit of the rink, retract the board brush and follow the pattern shown below.



Use extreme caution with the board brush when passing open gates as the board brush could swing into the opening, causing damage to both the boards and/ or the ice resurfacer.

6 Working with



- $\frac{3}{4}$ of a lap prior to completion of the resurfacing, turn off the wash water by pushing the Wash Water Off button. Just prior to finishing the resurfacing, turn off the ice making water. Bring the OLYMPIA ICEBEAR to a complete stop while the rear wheels are still on the ice surface.
- Turn off the augers by pushing the Elevator Off button.
- Lift the conditioner by pushing the Conditioner Up button. Do not move the ice resurfacer until the conditioner is in the fully raised position.
- Proceed carefully to the snow dumping area. Prior to dumping check to ensure there is sufficient head and foot clearance. Push and hold the Snow Dump Up button until the snow bin door is completely opened.

If needed push and hold the Bin Wash button to remove any snow that might be left in the snow bin.

- Back away from the snow dumping area approximately 1 meter (40"), then push and hold the Snow Bin Down button until the snow bin door is completely closed.
- Proceed to the parking area.
- Engage the parking brake and turn off the ice resurfacers.
- After stepping down from the ice resurfacers, be sure to drain both water tanks, then remove cover plates and wash out the conditioner.



In order to maintain the recommended ice thickness of 2,5- 4 cm (1-1/4 inches), it is important that you cut the ice at a rate equal to the water you put down. Usually between $\frac{1}{2}$ and $\frac{3}{4}$ a bin of snow will equal $\frac{1}{2}$ a tank of water.



Proceed with extreme caution when driving up to the snow dumping area!



The snow dumping area should meet the following safety requirements:

- **Red/white cordons at the left and right of the unloading area, with pictograms.**
- **Yellow/black threshold on the floor that is high enough to prevent the OLYMPIA ICEBEAR from falling into the dump.**
- **Guard at the front of the snow dump to prevent people from falling in.**

6 Working with

6.3.1. Cleaning after an Ice Resurfacing Operation

The conditioner should be rinsed out after each use. Do not hose down the whole ice resurfacers unnecessarily. The control cabinet, the hydraulic station, the battery panels and the driver`s platform may only be cleaned with a damp cloth, never with a direct jet of water.



Keep the humidity in the storage area as low as possible!

7. Cleaning and Maintenance

7.1. Cleaning an Maintenance Safety Instructions



To perform the maintenance program, park the OLYMPIA ICEBEAR with the conditioner in the fully UP position and shift the gear lever to the neutral position (N).

Open the snow bin door.

Turn off the ice resurfacer.



Before starting any maintenance jobs, remove the ignition key from the lock and keep it on your person. Put up a notice at the dashboard that says:

DO NOT SWITCH ON! WORK IN PROGRESS IN THE DANGER ZONE!

Dismount using the three-point procedure and insert the safety bolts into the snow bin door.



When working on any of the other hydraulically operated components of the OLYMPIA ICEBEAR, also secure them with safety bolts or props, so that a hazardous situation does not arise in the event that a component failure. The hydraulic cylinders at the conditioner are additionally equipped with hose-break safety valves, however, whenever working on the conditioner it is recommended that blocks be placed under it to prevent any possible injuries.

7 Cleaning and Maintenance



Maintenance and repair work must only be done by duly trained personnel. Specialists are needed for some jobs (e.g. electricians, hydraulics technicians, etc.).



Before doing such jobs, the whole ice resurfacer must be switched off. To do this, pull out the main battery connector in the right side battery component. Put up a warning notice there that says:

**DO NOT PLUG IN BATTERY CONNECTOR!
WORK IN PROGRESS IN THE DANGER
ZONE!**



Before starting the work, the OLYMPIA ICEBEAR must also be secured with chocks to prevent it from rolling away. The red/white plastic chains must be clearly visible at the sides of the machine. It is imperative that the chocks are removed again before putting the OLYMPIA ICEBEAR back into operation (the red/white plastic chains serve as a reminder).



Only after the OLYMPIA ICEBEAR has been secured in the described manner may the isolating guards be removed (if necessary).



Only duly authorized personnel are permitted to be in the vicinity of the machine when maintenance and repair work is being performed.



If mechanically driven movements are necessary on the OLYMPIA ICEBEAR in the course of maintenance and repair work, these may only be executed on the instruction of the facility supervisor, and at a safe, reduced speed.



Before starting the work, the employee responsible for doing the work must first ensure that this can be done without endangering people or facility equipment. Only after he has done so may he switch the power back on.



Mechanically driven ice resurfacer movements can only be started in jog mode during maintenance and repair work by holding the respective controls accordingly.



After completing the maintenance and repair jobs, the responsible employee must ensure that the isolating guards are remounted and that there are no people in the danger zone. After it has been ascertained that the ice resurfacer can be put back into operation without endangering people or facility equipment, the responsible employee can restore the power to the ice resurfacer by plugging the battery connector back in again. The people working on the ice resurfacer must be informed in advance.

7 Cleaning and Maintenance



In an emergency, press the **EMERGENCY SHUT OFF** switch. Before reengaging the ice resurfacer, make sure that this can be done without endangering people or facility equipment.



Employees must wear protective gloves when doing maintenance and repair work. The hazards associated with the sharp components should be pointed out in regular training courses.



Any failure of, or damage to the safety devices or guards must be reported to the facility supervisor without delay. He will then decide how to proceed.

7.2. Maintenance Checks



Failure to carry out the basic maintenance checks can lead to damage and downtimes.

7.2.1. Daily

- Carry out circle check as described in chapter 5.7
- Recharge the battery (if necessary)
- Inspect all safety switches
- If your ice resurfacers is equipped with an edger, inspect all the components

7.2.2. Every Time the Blade is changed or Weekly

The procedure for changing the blade is described in chapter 5.3.

- Re- grease the blade bolts
- Lightly oil bottom side of blade holder system
- Grease blade holder pivots
- Grease horizontal auger bearings
- Grease conditioner lift arms
- Grease conditioner mounting pins
- Clean the entire ice resurfacers thoroughly with a damp cloth



Never spray an open jet of water into the ice resurfacers, as electrical components will be damaged.



7 Cleaning and Maintenance

7.2.3. After 5 Hours

- Tighten the lug nuts (140 Nm).

7.2.4. After 50 Hours

- Check all drive belts (vee-belts) and re- tension them, if necessary
- First oil change on the wheel drive gear boxes (using Dexron III)
- First oil change on the board brush gear box

7.2.5. Monthly

- Check the battery voltage, measure and note down the battery acid density. Add distilled water, if necessary.
- Check whether the battery box is dry
- Check the air gap at the edger brake and re- adjust it, if necessary (approx. 1/64 inch (0,4mm))
- Inspect the hydraulic system for any sign of leaks
- Check the belt tension at all drive belts
- Check the tire pressure (Front tires: 72,5 psi/5 bar, rear tires: 101,5 psi/7 bar)
- Check that all lug nuts are tight (140 Nm)
- Check all traction drives for leaks
- Check that the parking brake cable runs smoothly, re-lubricate it with penetrating oil, if necessary
- Check the hydraulic oil level in the hydraulic tank
- Check the sealing on the snow bin lid
- Check that the board guide roller runs smoothly
- Check the surface of the blade holder in the conditioner and lightly oil it



7 Cleaning and Maintenance

- Briefly test all functions
- Check the tension of the conditioner drive chain, it should not have more than ½ inch (1,27 cm) of play
- Spray lubricant onto the conditioner drive chain

7.2.6. Annually or Before Storage

- Spray all metal surfaces of the conditioner with a thin coating of penetrating oil
- Lubricate all lube points on the OLYMPIA ICEBEAR to eliminate moisture
- The horizontal and the vertical auger and all moving parts of the conditioner must be coated with a thin coating of penetrating oil
- Open the drains
- To avoid corrosion in the water system, remove the inspection cover on the bottom of the ice making water tank and clean and remove any debris
- Remove the screen basket from the wash water tank. Using a wet vac, vacuum out any debris left in the tank
- Remove the blade and properly store it
- Oil the blade holder on the conditioner
- Clean the ice resurfer: Wash the OLYMPIA ICEBEAR with luke- warm water and a mild soap. Make sure that you rinse off the soap with cold water before it dries and causes streaking on the surface of the OLYMPIA ICEBEAR



Never spray an open jet of water into the ice resurfer, as electrical components will be damaged.



7 Cleaning and Maintenance

- Use a high- quality automotive wax to preserve the high- gloss finish of the OLYMPIA ICEBEAR
- Change the electrical contact brushes inside the electric motor on the board brush
- Disconnect the battery charger and leave the batteries unplugged. If storing for more than one month charge the batteries each month
- Tighten all connections in the control cabinet
- Check the brake lines for leaks and rusting
- Grease the entire ice resurfacers, making sure to get all twenty- seven grease nipples

7.2.7. Lubrication to be Done Whenever Necessary

- The lube points are shown on the separate lubrication chart in the appendix

7.2.8. Every 3 Years

- Change the wheel drive gear box oil (Dexron III)
- Change the board brush gear oil
- Change the hydraulic oil and filter



To put the OLYMPIA ICEBEAR back into operation at the beginning of the season, perform the weekly maintenance procedure 7.2.2.

8. Self-Help and Troubleshooting

8.1. Check the Carbon Brushes at the Motors



Only the drive motor for the Board Brush and Edger has carbon brushes.



Never change individual brushes. When changing the brushes, check the armature. It must be smooth and straight. Scored armatures must be machined by a qualified technician to straighten them out again.

Clean the interior of the motor to remove the carbon dust and carefully seal the motor again so that it is watertight.

8 Self-Help and Troubleshooting

8.2. Edger Adjustment

The edger has been configured and set in the factory so that the grinding edge of the housing butts exactly against the board when the guide roller is approx. 12 inches (30 cm) away from the board. The blade plate is set so that the blades cut minimally deeper at this point than the level formed by the runners.

The basic cutting depth is set using the M 10 height adjustment setscrew at the arm. It is secured by a locknut.

The tilt of the blade plate is set with four screws at the edger housing. For adjustment purposes, the locknuts at all four screws must be loosened first.

In order to be able to raise the outer edge of the blade plate, the bottom screws must be loosened. The outer edge can then be raised by screwing in the top screws.

To lower the outer edge of the blade plate, the bottom screws must be loosened. The outer edge can then be lowered by screwing out the top screws.



Before trying out the new setting, all four screws must be tightened.

After the correct setting has been attained, tighten all locknuts again, hand-tight.



8 Self-Help and Troubleshooting

8.2.1. Edger Brake Adjustment

The air gap between the pole piece and the back plate of the edger brake is adjusted by means of three adjusting bushings in the pole piece. This air gap should be between 0.4 mm and 0.5 mm (a postcard is approx. 0.25 mm thick).

When looking onto the brake from above, the air gap is increased by unscrewing the adjusting bushings clockwise, i.e. screwing them out of the pole piece. Conversely, the gap is decreased by screwing in the screws counter-clockwise.

The smell of hot brake pads, the tripping of fuses, increased current consumption and overheating of the edger motor are all indications that the brake air gap is too small.

Adjustment of the edger is done as follows:

1. Loosen three Allen head screws on the pole piece of the brake by 3-4 turns with a size 4 Allen key.
2. Using a size 12 open-ended spanner, consecutively turn each of the three adjusting bushings 1/6 of a turn (one spanner flat) (1/6 of a turn corresponds to 0.17 mm for a lead of 1 mm/turn).
3. Tighten the Allen head screws.
4. Check the adjustment with a feeler gauge in the vicinity of all three fastening screws; re-adjust if necessary.

8.3. Squeegee Replacement

If the squeegee needs to be replaced, it should be mounted on the back of the conditioner with the Squeegee Bar and locknuts. Install the squeegee such that the ends fit tightly against the sides of the conditioner.

Snow that is pushed by the squeegee is trapped between the squeegee and the runners and must not be able to escape to the outside, as it would form a ridge on the ice.

8.4. Towel Replacement

Inspect the towel and replace it if necessary. Attach the towel to the front of the towel holder with hex bolts (M8x25 mm) and the towel bar.

8.5. Blade Replacement



Refer to Chapter 5.3, „Installation and Removal of the Blade“.

8.6. Emergency Hand Pump

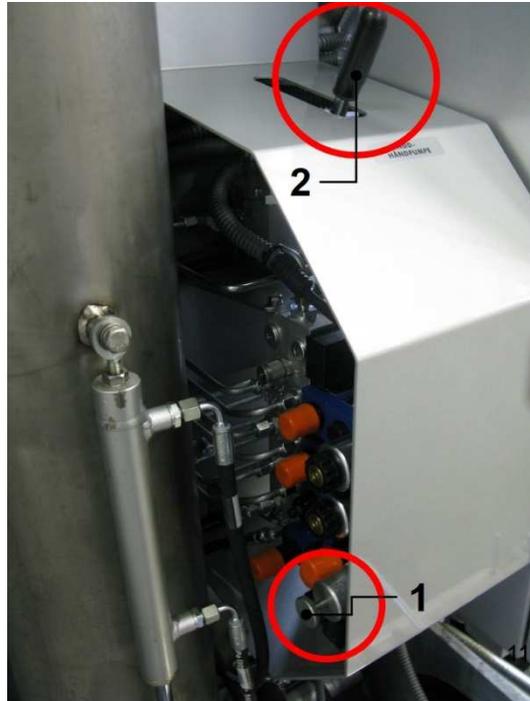


Fig. 8.1: Emergency Hand Pump

- Insert the manual conditioner by- pass bolt located in the electrical cabinet, into the conditioner valve on the manifold block. Turn it all the way in (Item 1).
- Now pump up the conditioner (Item 2).

If the emergency hand pump is no longer needed, remove the manual conditioner by- pass and restore into the electrical cabinet.



9 Technical Data

9. Technical Data

9.1. Dimensions

With snow bin closed:

Width Machine only	200 cm / 79 inch
Width with 84 inch Conditioner	224 cm / 88 inch
Width with 96 inch Conditioner	254 cm / 100 inch
Length	387 cm / 153 inch
Height	218 cm / 86 inch

With snow bin opened:

Length	438 cm / 173 inch
Height	264 cm / 104 inch

General Dimensions:

Blade width (84 inch Conditioner)	213 cm / 83,9 inch
Blade width (96 inch Conditioner)	243 cm / 95,7 inch
Turning radius	390 cm / 153,5 inch
Wheelbase	167 cm / 65,75 inch
Ground Clearance (Auger Conditioner)	150 mm / 59 inch



9.2. Weights

Net weight total

(incl. 660 Ah batteries) 4.140 kg / 9108 lbs
Front axle 1.190 kg / 2618 lbs
Rear axle..... 2.950 kg / 6490 lbs

Gross weight (incl. 660 Ah batteries and full water tanks)

..... 5.530 kg / 12166 lbs
Front axle 1.740 kg / 3828 lbs
Rear axle..... 3.810 kg / 6490 lbs

9.3. Noise Emission

Standind noise (hydraulic pump only) 63 dB (A)
Driving noise without Conditioner..... 73 dB (A)
Driving noise with Conditioner..... 75 dB (A)
At a distance of 25m away
(with elevator turned off) 65 dB (A)
At a distance of 50m away
(with elevator turned on) 56 dB (A)

9.4. Filling Capacities

Capacity of snow bin 3,3 m³ / 119 ft³
Capacity of wash water tank 359 l / 95 US gal
Capacity of flood water tank..... 873 l / 213 US gal
Hydraulic oil quantity 10 l / 3 US gal



9 Technical Data

9.5. Electrical System

Battery voltage	80 V
Battery capacity	up to 770 Ah
Total power	16 KW
Traction Motor	4 Pcs each.....2,5KW
Hydraulic Motor	1 Pc.....1,9KW
Horizontal Auger Motor	1 Pc.....1,9KW
Vertical Auger Motor	1 Pc.....2,0KW
Board Brush Motor	1 Pc.....0,8KW

9.6. Brake Systeme

Operating principle: Gearbox multi-disk brake at each wheel

Application:

Main brake	hydraulic
Parking brake	mechanical

9.7. Hydraulic System

Hydraulic fluid:.....	ATF 55 F-30589
Oil change interval:	Approx. every 3 years
Oil filter:	Exchangeable fine filter, 20 Micro
Oil cooling:	Convection cooling at the oil tank
Oil temperature:	Max: 80°C, normal: approx. 30°C
Oil pump, motor-driven:.....	Single gear pump 4 cm ³ /rev
Emergency hand pump:	Piston pump 2.5 cm ³ /stroke
Steering:.....	Load sensing hydraulic



9.8. Water System

Water Pumps:

Flood water: Impeller pump
..... 123 L/min (32,4 US gal/min) at 2,450 rpm
Tire and tank wash pumps: Impeller pumps
..... 40 L/min (10,5 US gal/min)
Wash water: Impeller pump
..... 234 L/min (61,7 US gal/min) at 1,750 rpm

9.9. Conditioner

9.9.1. Blades

Ice shaver blade: **inlaid** steel
Length: 199,5 – 244,0 cm / 78,5 inch – 96 inch
Width: 12,8 cm / 5 inch
Cutting angle: 8,5 degrees
Blade grind angle: 27 degrees

9.10. Tires

Tire size:

Tubeless: 205/75 R16 C TL
Tire pressure Front: 5 bar / 72,5 psi
..... Back: 7 bar / 101,5 psi



9 Technical Data

9.11. Edger

Rated power output: 1,900 W
Rated current consumption: 28 A
Braking time: approx. 2.5 sec.
Braking torque: approx. 32 Nm
Speed: Idling:
..... approx. 1,850 rpm.
Cutting width: 45 cm / 17,7 inches
Edger blades: top: 2
..... bottom: 4
Magnetic brake air gap: approx. 0.5 mm
Pneumatic spring pressure: 1000 N ~ 100 kg

Edger Blades: **Custom Made**

Edger brake:

Operating principle: Full disk brake
Application: Spring-loaded, applied in idle state.
Release: electromagnetic. 24 V coil.
Brake disk thickness: 10 mm
Maximum braking torque: 32 Nm
Air gap: 0.4–0.5 mm



9.12. Materials Used

Stainless Steel:	W1.4301, W1.4305
Aluminium:	AlMg
.....	AlCuMgPb
Steel:	hot-dip galvanized
.....	electrogalvanized
.....	hard-chrome plated
.....	painted
Plastics:	Glass fibre-reinforced plastic
.....	Polyamide
.....	Polyurethane
.....	Polyoxymethylen



10. Appendix

- 10.1. Control Panel Overview**
- 10.2. Documentation by Company DMC
(Electric Drawings)**
- 10.3. Documentation by Company DMC
(Fault-Codes)**
- 10.4. Documentation by Company Abertax
(BMU)**
- 10.5. Hydraulic Drawings by Company
Niehues**
- 10.6. Grease Plan**
- 10.7. Battery Informations**
- 10.8. Machine Dimensions Data Sheet**
- 10.9. On-site directive**