



# MILLENNIUM *H*



Owner's Manual





## Welcome to the OLYMPIA Advantage

The OLYMPIA MILLENNIUM - H has been designed and built to deliver trouble free performance. Like all mechanical equipment however, trouble free operation is based on complete and ongoing maintenance procedures being adhered to in order to validate your Resurface Corp. warranty.

We have included a maintenance log form at the back of this manual to assist you in maintaining a permanent record of your maintenance program. Please copy this form to provide additional pages as needed.

The operational and maintenance procedures outline a step by step process that should be followed precisely. A variety of safety and performance- enhancing options are available and may be ordered on any model.

The illustrations and product information contained in this manual were current at the time of publication. In order to continue Resurface Corp.'s development of its ice resurfacing technology, Resurface Corp. reserves the right to change designs, models and specifications without notice and without liability for such changes. Resurface Corp. will not be liable for any errors or omissions in this manual.

The components in your OLYMPIA ice resurfacing machine are warranted against defects in material and workmanship by Resurface Corp., for two full years from the date of delivery. The terms of Resurface Corp.'s limited warranty are outlined in the warranty letter that accompanies your product, a copy of which is attached as an Appendix to this manual.

For continued safe, economic operation and to validate the Resurface Corp. warranty, the balance of your OLYMPIA ice resurfacing machine should be strictly maintained under the guidelines outlined in this manual.

**ALL WARRANTY REPAIRS MUST FIRST BE AUTHORIZED BY RESURFICE CORP. OR AN AUTHORIZED DEALER**

**To obtain warranty service you must first contact us so we can determine the problem and the most appropriate solution.**

**No warranty on this machine will be honoured by Resurface Corp. other than that stated in the warranty letter.**





## LIMITED WARRANTY

Thank you for your recent purchase of your OLYMPIA ice resurfacing machine.

The components in your OLYMPIA ice resurfacing machine are warranted against defects in material and workmanship by Resurfice Corp. for two full years from the date of delivery. During the warranty period, Resurfice Corp. will repair and replace, at no charge, products or parts of products that are defective because of improper material and workmanship, under normal use and maintenance. Transportation and labour charges to install replacement parts are included in this warranty. Resurfice Corp. will also provide a replacement machine on loan free of charge if the machine needs to be returned to the factory for repairs.

This warranty does not cover any problem that is caused by conditions, malfunctions or damage that does not result from defects in material and workmanship. In particular, repairs and service adjustments that are necessary as a result of negligence, misuse, collision, alteration or lack of reasonable and proper maintenance are not covered by this warranty. A failure to follow all maintenance and other instructions in the Owner's Manual may void the warranty.

No warranty on this machine will be honoured by Resurfice Corp. other than stated above. In no circumstance will Resurfice Corp. be responsible or liable for any indirect, incidental, consequential or special damages (including lost profits) of any form incurred by any person, whether or not foreseeable, including without limitation, loss of time and revenue, inconvenience, loss of use of the machine and any other matters not specifically or expressly covered under this warranty.

**ALL WARRANTY REPAIRS MUST FIRST BE AUTHORIZED BY RESURFICE CORP.**

To obtain warranty service, you must first contact Resurfice Corp. so we can determine the problem and the most appropriate solution. All inquiries in relation to warranty service should be directed to:





## Power Train Information

Owner's Name: .....

Address: .....

.....

.....

Serial Number: .....

Frame Number: .....

Type of Engine: .....

Engine Serial Number: .....

ECM Engine Serial Number:.....

ECM Transmission Serial Number: .....

Wheel Drives FL: ..... FR: .....

RL: ..... RR: .....

Fuel System: .....

Trans Drive: ..... Aux Pump:.....

Drive Block: ..... Aux Block:.....

Catalytic Converter Serial Number:.....



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## Dear User!

Before you use the OLYMPIA Millennium H Ice Resurfer, 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 resurfer,
- Trouble-free operation of the machine.

Always keep the operating manual in the vicinity of the ice resurfer.

## Note:

We reserve the right to make changes in content. Resurface Corp. accepts no liability for any errors, omissions and or misinterpretations of the material in this documentation. Liability for indirect damages arising from the supply and use of this documentation is excluded, unless required by law.

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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 weighs several tons.
- The ice resurfacer has been built and designed in compliance with Canadian 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 Millennium H 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 Resurface Corp. cannot predict them. Therefore, it is the User's responsibility to select the appropriate settings for operation of the OLYMPIA Millennium H.
- 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 Millennium H 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! The ice resurfacer 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 as a result of improper or unauthorized use of the machine.

### 1.3 Proper Use

The OLYMPIA Millennium H resurfacer has been manufactured exclusively for the resurfacing of ice surfaces. Do not use the OLYMPIA Millennium H for any other purpose.

Only duly authorized and trained drivers may operate the OLYMPIA Millennium H.

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 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 Resurface Corp. before they operate or service the OLYMPIA Millennium H.
- Only the specially trained ice resurfacers operators may have access to the ignition key and they must keep it under lock and key. The necessary training and instruction will be given by Resurface Corp. or one of their authorized distributors 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 driver is instructed both verbally and in writing, that he must wear the seatbelt if equipped at all times when operating OLYMPIA.

- Resurface Corp. 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 resurfacer. This instruction must be repeated at regular intervals, at least once a year.
- 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 resurfacer must be clearly defined. Make sure that only duly authorized personnel are allowed to work on and with the ice resurfacer!
- The maintenance personnel must be duly certified in accordance with the following charts.

| Job \ Person                   | Qualified Operators | Qualified technicians | Authorized Service personnel |
|--------------------------------|---------------------|-----------------------|------------------------------|
| Operation                      | X                   |                       |                              |
| Troubleshooting                |                     |                       | X                            |
| Mechanical fault rectification |                     | X                     | X                            |
| Electrical fault rectification |                     |                       | X                            |
| Maintenance                    |                     | X                     | X                            |
| Repair                         |                     | X                     | X                            |



## 1.7 Obligations of the User

The User must ensure that...

- The ice resurfacer is only used in the proper manner,
- The ice resurfacer is only operated when it is 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, steel toed safety boots, and also non-slip footwear (for walking on the ice surface).
- 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 organization, operational procedures, employed personnel, etc.
- It is checked, regularly, that the personnel are working in a safe and hazard-conscious manner and are adhering to the instructions given in this operating manual!

## 1.8 Operator's Workplace

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



**Before doing any jobs 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.**

**Turn the key switch to the OFF position and remove the key; switch off the battery disconnect switch if equipped.**

## 1.9 Safety Devices and Guards

Operator Present Switch (OPS)



**There is a limit OPS switch at the driver's seat on the OLYMPIA Millennium H that must not be bypassed. When the driver leaves the seat, the ice resurfacer is stopped after a delay of 8 seconds, so that the OLYMPIA Millennium H cannot be operated without the driver in the seat.**



## EMERGENCY STOP

In the case of an emergency remove your foot from the accelerator and shift gear into the Neutral position and then into the Park position. Turn off the water valves and lift conditioner if safe to do so, then turn off the ignition key.





**Caution!**

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



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.





## Horn Button

The horn button is located in the center of the steering wheel hub and will sound when pressed down.



*Fig. 1.2: Horn button on the OLYMPIA*

## 1.10 Maintenance and Repair Regulations

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

- maintenance jobs that have to be done periodically on the OLYMPIA.
- lubrication.
- cleaning.
- setup and retooling, changing of components / sub-assemblies.
- Adjustments/setting of the electrical equipment, mechanical parts and hydraulic systems.
- 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.

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 tools or other parts in the vehicle or on the floor.
- All safety devices/guards have been duly re-installed and are in proper working order.
- Adhere to the safety regulations that are specified in the descriptions of the individual maintenance jobs.



## 1.11 Fuel Safety

If your OLYMPIA H is powered by LPG (propane) ensure you take the proper precautions when changing the tanks.

Always use all of the required PPE (personal protective equipment), neoprene gloves, safety goggles, long sleeve shirt, long pants, and steel toed work boots.

Always change the tanks outside or in a well ventilated area.

Always lift the tank with your knees, aluminium tanks weight approximately 53 lbs. when full of fuel.

Before removing the tank coupler from the tank turn off the service valve, then start the engine and run the OLYMPIA H completely out of fuel, this will ensure the supply line is empty and minimize the chance of fuel leaking out of the tank coupler during the removal process.

Once the engine has run out of fuel, turn off the engine ignition switch, get down from the OLYMPIA H using the three point contact dismount procedure.

While wearing your PPE, disconnect the empty fuel cylinder by removing the supply line (turn the tank coupler counter clockwise), then unfasten the two tank straps, carefully lift the empty tank off of the OLYMPIA H and place it in the secured propane tank storage compartment at your arena.



Perform a visual check of the full tank you want to install on the OLYMPIA H for any damage or distortion, check to make sure both o rings are in place inside the service valve, visually inspect the tank coupler checking for any foreign material, ie, o rings or dirt.

Safety note: Never push the check valve pins on the tank coupler as any residual propane could be released from the propane hose and possibly cause injury.

Install full propane tank on the OLYMPIA H, turn tank to proper position, and securely fasten tank straps.

Attach tank coupler to the tank service valve by turning the coupler in a clockwise rotation, tighten all the way.



**CAUTION: Tighten only hand tight, the tank couplers are made of thin brass and designed to distort if over tightened by using a pliers or pipe wrench.**

Once the tank coupler is tight slowly open the service valve until it is fully open. NOTE: the service valve has a stem seal for both open and closed position and may leak if not seated internally in either position.

Using a spray bottle containing a mixture of 50% liquid hand soap and 50% water spray around all connections and look for any bubbling. If the spray bubbles you have a leak or loose connection, this must be addressed immediately.

Next move back to the operators platform using the three point contact mount procedure, then slowly turn the tank selector switch to the position of the new tank, start the engine to make sure the propane is flowing.

At this point if no problems are detected you are ready to use the OLYMPIA.



**SAFETY NOTE: We recommend performing at least one ice making procedure on every full tank that has been changed immediately after changing the tank to accommodate for internal tank pressure increase due to temperature change, and possible over filling by the propane supplier.**



*INFORMATION: The propane system used on your OLYMPIA H is a liquid with drawl system, meaning the propane in the lines is in a liquid state until it reaches the convertor mounted on the engine.*

Liquid propane turns from a liquid to a vapor whenever it escapes to the atmosphere, when this happens, the liquid multiplies in volume 270 times, as well changes in temperature to minus 40 degrees, as well propane is 2 ½ times heavier than air, it is considered an asphyxiate, it is a flammable gas, and colorless and odourless in it's natural state, it has an odorant added to it.

Never park the OLYMPIA H directly in the vicinity of a heat source or an open flame!



## **ALWAYS USE EXTREME CAUTION WHEN HANDLING OR WORKING NEAR PROPANE!**

For more safety information contact your governing safety authority.

If your OLYMPIA H is powered by CNG (natural gas), to fill the fuel tanks, remove the dust cover from the fill receptacle, connect the natural gas fill line into the fill receptacle mounted between the tanks at the rear of the OLYMPIA H. Then turn on the fill pump, when the OLYMPIA H is full the fill pump will automatically turn off. If it is necessary to stop the fill procedure before the tanks are full and the pump station turns itself off, first, manually turn off the fill pump at the control station, wait for approximately 1 minute for the pressure to be relieved from the fill pump, then disconnect the fill hose from the OLYMPIA H. Next make sure you reinstall the dust cover on the fill receptacle.



*INFORMATION: CNG is in a gaseous state, it is under high pressure, when released into the atmosphere it becomes a refrigerant, it is considered an asphyxiate, it is lighter than air, it is a flammable gas, and colorless and odourless in it's natural state, it has an odorant added to it.*

Never park the OLYMPIA H directly in the vicinity of a heat source or an open flame!

## **ALWAYS USE EXTREME CAUTION WHEN HANDLING OR WORKING NEAR COMPRESSED NATURAL GAS!**

For more information contact your governing safety authority.

If your OLYMPIA H is powered by GASOLINE (petrol) or DIESEL, always use caution when refilling the fuel tank. Always refuel outside or in a well ventilated area.

Never completely fill the fuel tank, 85% maximum, this will allow for expansion as the fuel warms to room temperature, never refill near an ignition source.



*INFORMATION: Gasoline and Diesel must be stored outside in a regulation container and in a secured location. Gasoline and Diesel is in a liquid state however gives off noxious flammable fumes when open to the atmosphere, gasoline vapors are heavier than air, if you get gasoline on your skin immediately wash with soap and water, do not smoke or expose to open flame, or electrical spark. If a spill occurs wipe up immediately and properly dispose of the wipe cloth. Never breath in Gasoline or Diesel fumes as they are considered a carcinogen.*



**ALWAYS USE EXTREME CAUTION WHEN HANDLING OR WORKING NEAR GASOLINE OR DIESEL FUEL!**

For more information contact your governing authority.

## **1.12 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. Contact your battery supplier for proper disposal of your batteries. (refer to the regulations in your O.S.H.A. manual or Directive 91/157/EEC or to your local battery disposal regulations).

Similarly all oils and hydraulic fluid must be disposed of according to local regulations.

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



## 1.13 Remaining Hazards



### Risk of Injury!

The ice resurfacer operator must be in possession of all his mental and physical faculties to ensure that no one gets injured (i.e. the operator 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 resurfacer 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 dump tank with the safety supports to prevent it from dropping down, because there is a considerable hazard potential here.



### Risk of Injury!

Always place blocks under the conditioner when performing maintenance work and blade changes.



### Risk of Sustaining Cutting Injuries!

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



**NEVER** leave the OLYMPIA Millennium H 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 Injury!**

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

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

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

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

The driver's seat has a timed operator presence switch that stops all movements eight seconds after the driver leaves the seat.



**Risk of Getting Crushed!**

There must not be any people in the vicinity of the OLYMPIA Millennium H when the ice shavings are 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 Getting Crushed!

When doing maintenance or repair work in the area under the snow dump tank, the safety supports must be secured, if the work is to be done with the tank open.



## Risk of Injury!

When driving the OLYMPIA Millennium H always proceed with caution.

When driving in areas with a restricted view or in narrow spaces, use horn and drive with a reduced speed.

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

The OLYMPIA Millennium H 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 safety devices may have to be put out of action, while performing any diagnostics or repairs. Always ensure that the wheels, safety bars and or necessary blocking are in place before starting any repair, diagnostics or adjustments.

## 2 TECHNICAL DATA

### 2.1 Brake Systems

Computer Controlled Dynamic Braking System:

Operating principle: ..... full disk brake on each wheel  
 Dynamic Braking .....Hydraulic  
 Parking brake:.....Mechanical

### 2.2 Hydraulic System

Hydraulic fluid: ..... Dexron III Oil change interval: Approx. every 3 years  
 Oil filter: .....Exchangeable filter, 20 Micron  
 Oil filter change interval ..... every year at start of season  
 Oil cooling: ..... Inline fan assisted oil cooler  
 Oil temperature:..... Max: 80°C, normal: approx. 30°C / 86 F  
 Emergency hand pump:..... Piston pump: 0.15 in<sup>3</sup> / 2.5 cm<sup>3</sup>/stroke  
 Steering: ..... Load sensing hydraulic  
 Bosch Rexroth Load Sensing Piston Drive Pump..... Output, up to 120 lpm total  
 Bosch Rexroth Load Sensing Piston Auxiliary Pump..... Output up to 99 lpm total

### 2.3 Water System

Water Pumps:

Tire wash pump: ..... Impeller pump  
 8.7 Imp gal/min (40 L/min)  
 Wash water: ..... Impeller pump  
 51.3 Imp gal/min (234 L/min) at 1,750 rpm



## 2.4 Tires

Tire size:

Tubeless: ..... HANKOOK DYNAPRO M/T  
LT225/75R16 10 ply  
Tungsten tip studs  
Aluminium alloy wheels

Tire pressure: ..... Front: 65 psi / 448.16 bar  
Back 65 psi / 448.16 bar

## 2.5 Conditioner

### 2.5.1 Blades

Ice shaver blade: .....inlaid steel  
Length: ..... 80-96” / 203.2 - 243.8cm  
Width: ..... 5” / 12.8cm  
Cutting angle: ..... 8,5 degrees  
Blade grind angle: ..... 27 degrees

### 2.5.2 Conveyor System

Auger:

Vertical: .....8” / 20.3 cm  
Horizontal:..... 12” / 30.5 cm

## 2.6 Materials Used

Stainless Steel:..... AISI 304L-316

Aluminium: ..... 5052H32

Steel: ..... Hot-dip galvanized  
Electro zinc plating  
Hard-chrome plating  
painted

Plastics: ..... Glass fibre-reinforced plastic  
Polyamide  
Polyurethane



## 3 ON-SITE CONDITIONS

### 3.1 Ground Conditions



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

Maximum permitted incline: 15 %

### 3.2 Room Ventilation

Adhere to local standards.

### 3.3 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.

### 3.4 Water Quality

- Clean water with low total grains of hardness.
- Ice making water temperature as hot as local codes will allow.
- Wash water: cold only.

### **3.5 Garage Temperature**

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

### **3.6 Snow Dump Pit Threshold**

A threshold at the snow dump pit must adhere to local standards and not exceed 23" (58.5cm) in height.



## 4 DESIGN AND FUNCTION

### 4.1 Ice Resurfacer Design and Chassis



Fig. 4.1: Front view with open hood

- Item 1 Auxilliary Hydraulic Drive Reservoir
- Item 2 Wash Water Fill
- Item 3 Steering wheel
- Item 4 Driver's seat
- Item 5 Mounting handles
- Item 6 Ice Making Water Fill
- Item 7 Step for climbing up to the driver's seat
- Item 8 Conditioner
- Item 9 Board brush
- Item 10 Front bumper wheel
- Item 11 Front headlights
- Item 12 Hydraulic Drive Reservoir
- Item 13 Snow bin
- Item 14 Snow bin hood



Fig. 4.2: Rear view of the OLYMPIA Millennium H

- Item 1 Handle for mounting the driver's seat
- Item 2 Steering wheel with horn button
- Item 3 Top gauge panel
- Item 4 Manual Ice Making Water tap handle
- Item 5 Wash water tap
- Item 6 Vertical auger drive motor
- Item 7 Tail lights
- Item 8 Horizontal auger drive motor
- Item 9 Wash Water pump motor
- Item 10 Spreader cloth
- Item 11 Conditioner bumper wheel
- Item 12 Automatic towel lift
- Item 13 Emergency hand pumps for the Brakes and the conditioner inside seat box





The OLYMPIA Millennium H has a Mig welded structural chassis. This applies to the chassis, the conditioner, the snow dump tank, 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.

## Self-supporting chassis

The chassis consists of 5/6" wall carbon steel. It is supported on the front and rear axles. The front axle is designed as a floating axle. The rear axle is designed as part of the chassis which is welded directly to the mainframe rails. As well as the the driver's platform and the mountings for the conditioner, the brush and other parts are part of the chassis.

The snowbin cover, all parts of the hydraulic systems, engine, transmission, water supply and paneling are bolted to the chassis.

## The front axle

The front axle is of structural tube steel construction. It holds the front drive units, and the hydraulic steering components.

The drive units are supported in spindles attached via upper and lower king pins. They absorb all radial forces. The vertical forces are absorbed by a bearing ring. This extends the serviceable life of the bearing assembly.

Steering is controlled by a hydraulic cylinder that is mounted between the spindles 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.

## **Body Panels**

All panels are made of glass fibre-reinforced plastic (GRP).

## **4.2 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 resurfacers snow dump tank.

## **4.3 Hydraulic Components**

A variable flow piston pump supplies the hydraulic system with oil. Control valves supply the resurfacers with oil to a series of control valves which control the flow of oil to various components. The hydraulic system must only be serviced by qualified personnel.



## 5 CONTROLS



## 5.2 Top Control Panel

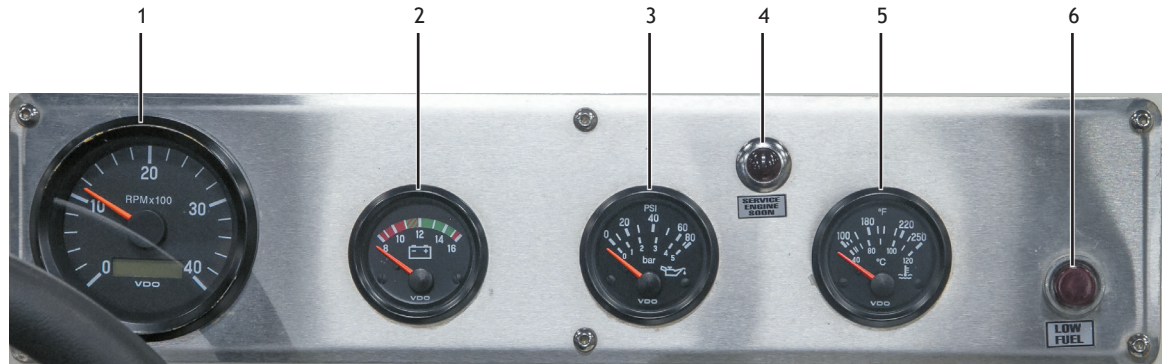


Fig. 5.2: Top control panel

Item 1

Tachomete/Hour meter



Item 2

Battery Gauge





Item 3

Oil Gauge



Item 4

Service Engine Soon Indicator



Item 5

Temperature Gauge



Item 6

Low Fuel Indicator



### 5.3 Bottom Control Panel

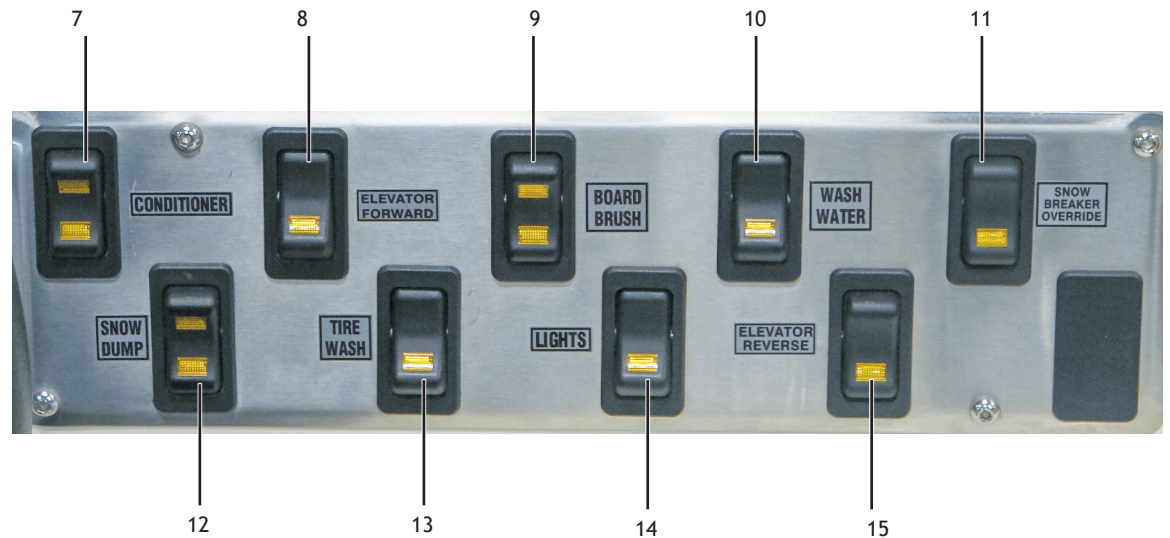


Fig. 5.3: Bottom control panel



The bottom control panel has been configured that the top row of switches is on ice and in a specific order to maintain the proper sequence of engagement. From Left to right.

#### Item 7

#### Conditioner Up/Down



Raises and lowers the conditioner

To raise the conditioner, push and hold the switch UP until the conditioner is in the full up position.

To lower the conditioner, push and hold the switch DOWN until the conditioner is in the full down position.

#### Item 8

#### Elevator Forward



To turn the Elevator forward, push the elevator forward switch down.



## Item 9

### Board Brush



Raises and lowers the board brush.

To lower the board brush push the switch down.

When the brush is lowered, it will automatically start to rotate.

To raise the board brush lift and hold the switch in the up position until the board brush is fully raised.

When the board brush is raised, it will automatically stop rotating.

## Item 10

### Wash Water On/Off



To turn the wash water system on push the bottom of the switch to the down position.

To turn the wash water off push the top of the switch to the off position.

## Item 11

### Snowbreaker Override



The snow breaker Override is a backup system which allows for the manual operation of the snow breaker.

Pushing the switch will move the snow breaker down, releasing the switch will raise the snow breaker.



#### Item 12

#### Snow Bin Up/Down



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

To open the snow dump push and hold the switch up until the snow dump tank is fully open.

Before closing the snow dump tank make absolutely sure that there are no obstructions of any type that could get crushed between the tank and the chassis of the ice resurfer.

To close the snow dump tank push the switch down and hold until the snow dump tank is completely closed.

#### Item 13

#### Tire Wash



Push the switch down and hold to activate the tire washing system.  
Release the switch to deactivate the tire washing system.





## Item 14

### Lights



This button turns the headlights and tail lights on and off.

Push the bottom of the switch to turn on, push the top of the switch to turn off.

## Item 15

### Elevator Reverse



To turn the Elevator in reverse, push and hold the elevator reverse switch down.

## Item 16

### Engine RPM Control



To adjust the engine RPMs turn the RPM control knob left to decrease or right to increase the engine's RPM.

Item 17

Gear Shift Lever



Unless moving the ice resurfacer, always make sure the gear shift selector is in the PARK 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

P = Parking Brake

R = Reverse



Always move the gearshift lever to the Park position before you leave the driver's platform.



*Prior to starting the OLYMPIA make sure the gear shift lever is in the park position.*



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

Item 18

Ignition Key



To start the ice resurfacer turn the key to the right (clockwise) to accessory and then continue to the ON position until the engine starts.

To turn off the ice resurfacer, first make sure the gear shift is in the PARK position, then turn the key to the left (counter clockwise) to the OFF position and remove the key from the ignition.



## 5.4 Accelerator Foot Pedal and Parking Brake

Applying pressure on the accelerator foot pedal instantly engages the hydrostatic Dynamic Drive system. The more you press down on the pedal the faster the OLYMPIA Millennium H will go.

DO NOT press down on the accelerator pedal when starting the engine.

The hydrostatic drive system automatically stops the 4 drive wheels when pressure on the accelerator pedal is removed. This eliminates the need for a brake pedal. The parking brake is engaged when you move the gear shift into the Park position thus engaging the spring applied disk brakes on the rear wheels as a safety measure.

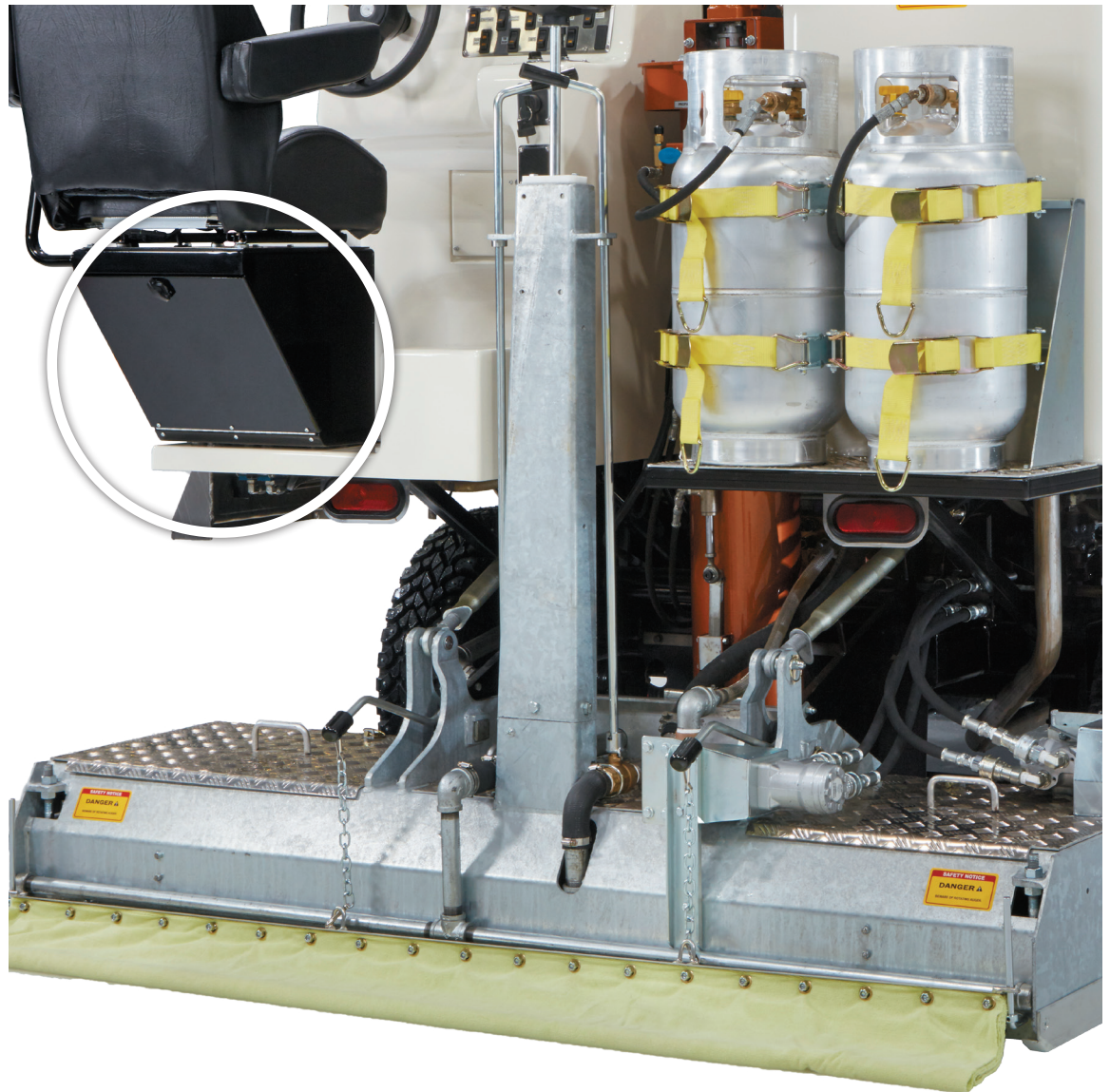


## 5.5 Emergency Hand Pump Operation

The OLYMPIA H is equipped with two hand pumps and a hand pump switch mounted under the drivers seat.

The hand pump on the left enables the raising of the conditioner and snow dump in the case that the engine will not start.

The hand pump on the right enables the release of the hydraulic spring brakes in the case that the engine will not start and the OLYMPIA H needs to be moved.





To operate these hand pumps, first open the seat box, push the top of the emergency hand pump switch to shift it from the drive position to the hand pump position. This engages the electrical circuits that will enable the hydraulic fluid to flow to the necessary controls to either raise the conditioner and snow dump, and or release the rear wheel spring brakes.

Insert the hand pump handle into the conditioner hand pump and commence pumping to raise the conditioner.



*NOTE: Once the conditioner is fully raised, if you keep pumping you will raise the snow dump. Also the hand pump only raises the conditioner and snow dump, so the engine will have to be started to lower these two parts of the OLYMPIA H.*

To release the rear wheel spring brakes, first place the emergency hand pump switch into the hand pump position, next move the gear selector into the N (neutral) position, then insert the hand pump handle into the hand pump labelled brakes, and commence pumping that hand pump until you feel a slight resistance on the pump. At this point you will be able to push or pull the OLYMPIA H to the service area. Once the OLYMPIA H is in a place where it can be serviced place the gear selector back into the P(park) position the reengage the spring brakes. Then switch the emergency hand pump switch back to the drive position.



*NOTE: Over pressurizing the brake circuit could cause damage to the brakes. As well the brakes will reengage after approximately five minutes, or when the gear selector is placed back into P(park).*



*NOTE: If the battery is below 11 volts the emergency hand pumps will not work, and it may be necessary to use a booster pack to increase the battery voltage to the point that the electrical circuits have enough voltage to open the solenoids.*



*INFORMATION: When you are finished using the emergency hand pumps make sure you place the emergency hand pump switch back in the drive position or the battery could go flat.*

## 5.6 Controls for the Water



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

### 5.6.1 Wash Water

The wash water is sprayed directly out of the water tank onto the ice by a spray pipe on the back inside 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 skate cuts on the ice. Any excess water and debris is vacuumed back into the wash water tank.

### 5.6.2 Ice Making Water

The flow of flood water is controlled 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 NO HIGHER than local codes will allow. 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.



Harder ice does not get damaged as easily and therefore needs less depth of cut to achieve a smooth surface. 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.

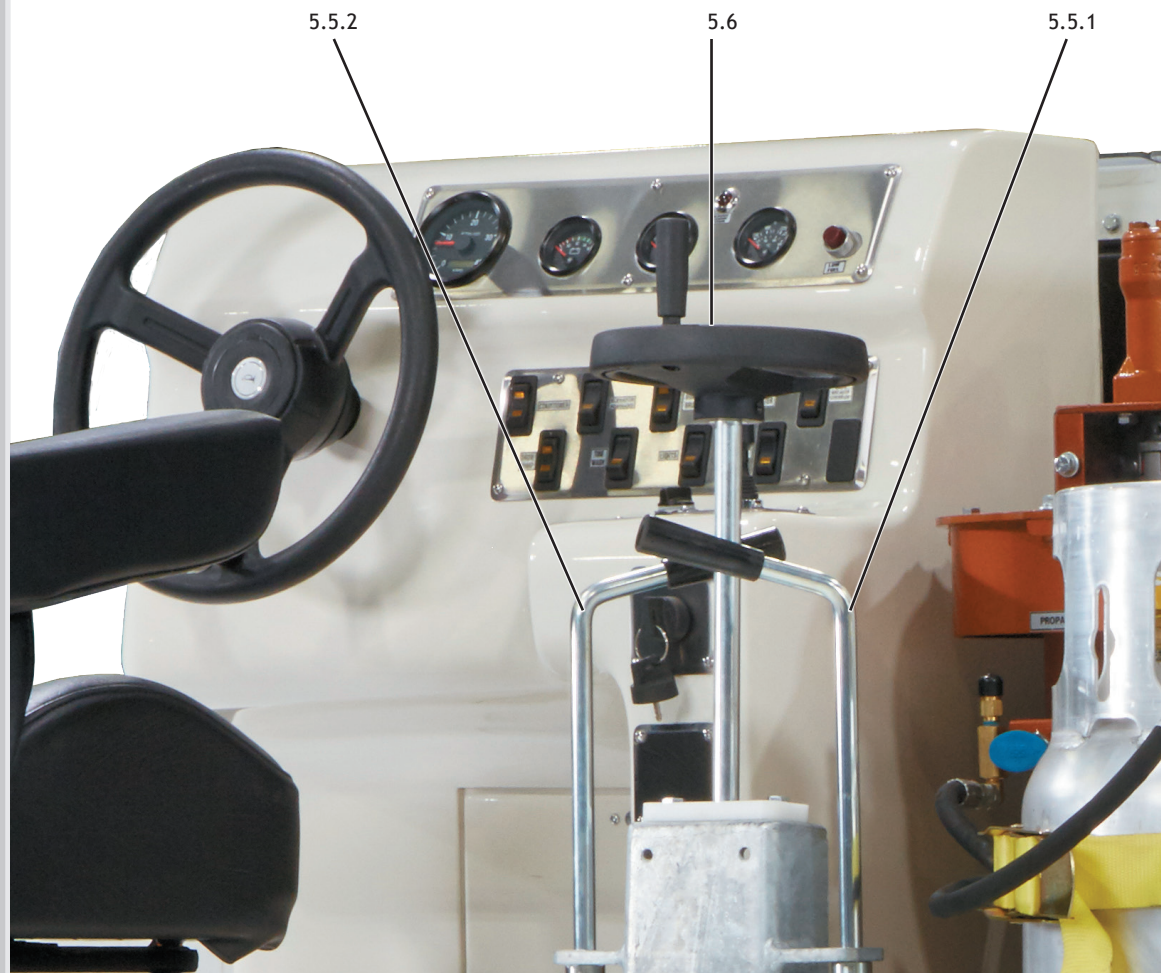


## Manual Ice Making Water Flow

The manual flood water function is controlled by the operator turning the hand lever to the right of the operator's seat either right or left to either decrease or increase the flow of flood water.

## 5.7 Blade Level Adjustment

The blade adjustment hand wheel, located on the tower to the right of the operator, raises and lowers the blade. Turn clockwise to lower the blade onto the ice, counter clockwise raises the blade.

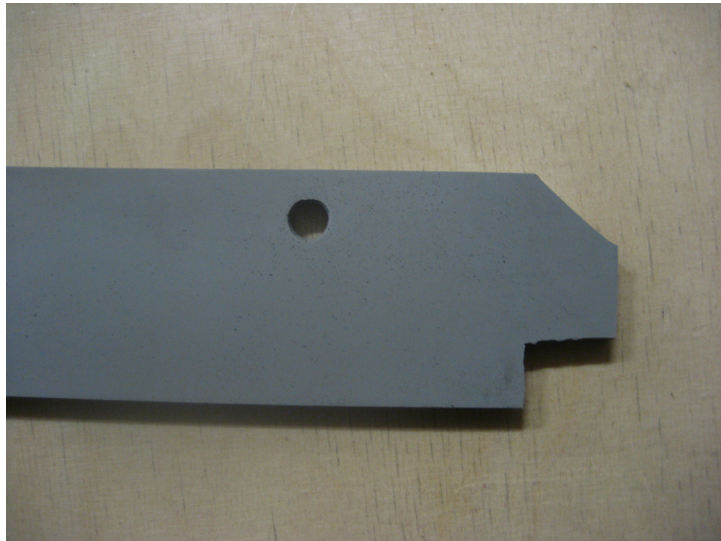


## 6 START UP OF THE OLYMPIA MILLENNIUM H

### 6.1 Installation of the Squeegee

Mount the squeegee on the inside of the conditioner with the bolts and nuts provided. .

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:



#### *Squeegee Trimming*

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.



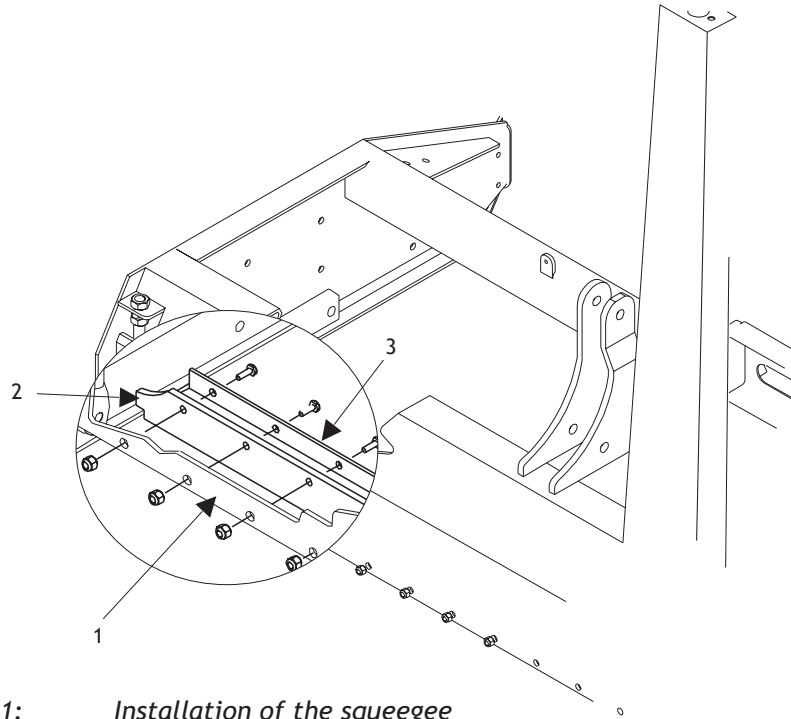


Fig. 6.1: Installation of the squeegee

- Item 1 Conditioner
- Item 2 Squeegee
- Item 3 Squeegee clamp bar

## 6.2 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.



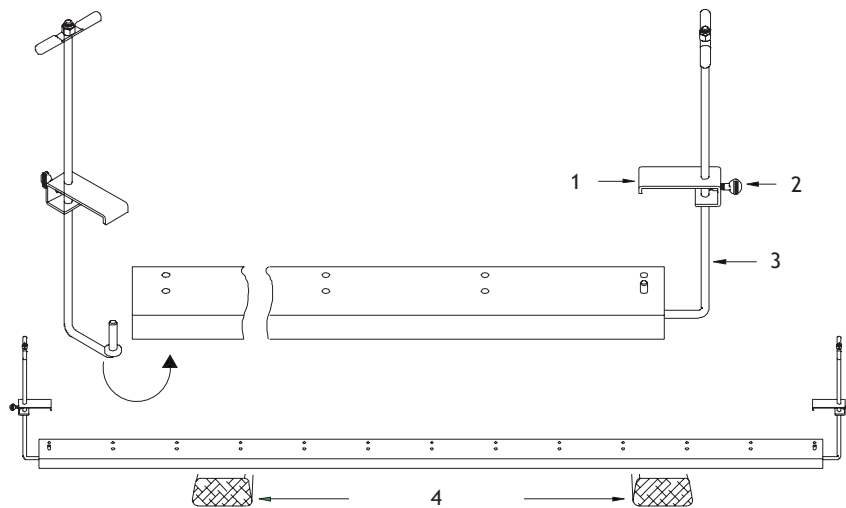
For shipping and storage, blades should be bolted into wooden sheaths.



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.

## 6.2 Blade Installation

1. Insert safety blocks under the conditioner before attempting to work under it.
2. Place the blade on small wood blocks(4) at the rear of the conditioner, remove it from the wood sheath and install the magnetic protector supplied with the tool kit.
3. Using the blade hook, lift and slide the blade underneath the conditioner and lift against the bladeholder until the attachment holes line up.
4. Tighten the blade hook thumb screws(2) so that the slide bracket(1) sits on top of the conditioner.



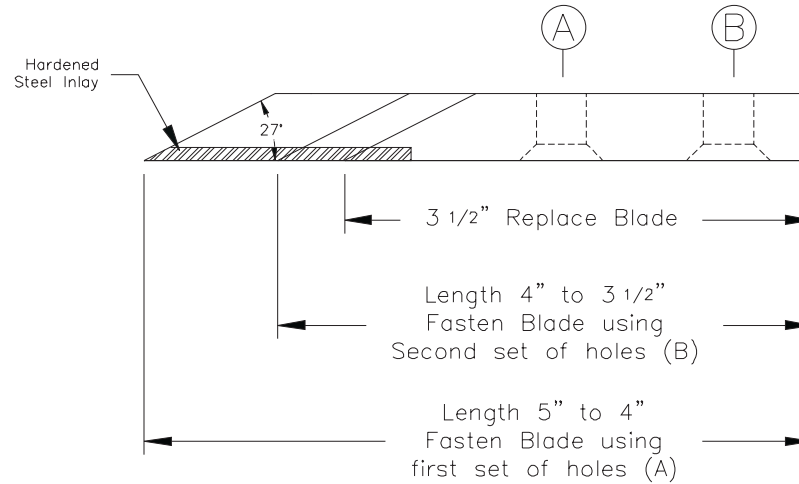
*Fig. 6.2: Installing the blade*

|        |               |
|--------|---------------|
| Item 1 | Bracket       |
| Item 2 | Thumb screw   |
| Item 3 | Blade hook    |
| Item 4 | Wooden blocks |



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. 10.16 cm) overall width.

Remove the blade hooks and insert the remaining two blade bolts and tighten.



## The Order is Important



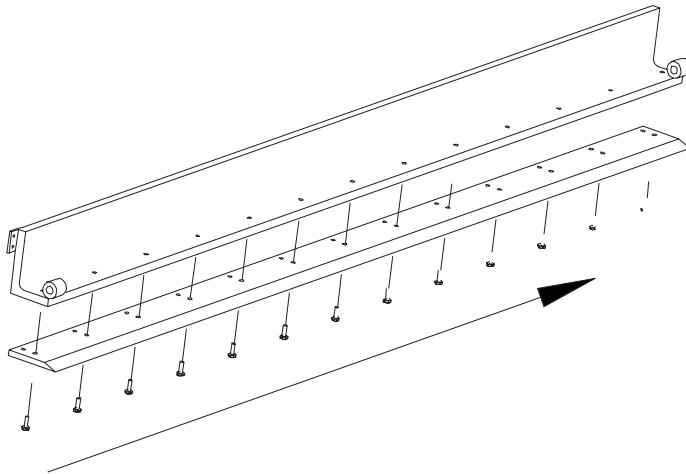
Install the blade bolts according to the following diagrams. Finger tighten the bolts. **DO NOT** use lock washers as they will damage the blade holder.

There are two ways of properly tightening the blade bolts:

### Blade Bolt Sequence “A”

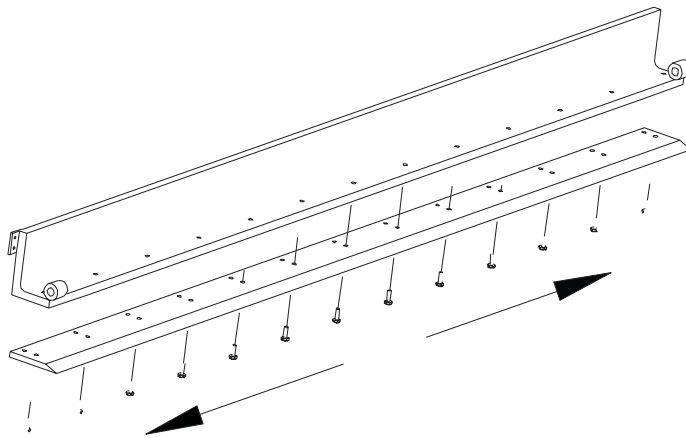
Sequence A - starting at one end of the blade, tighten the bolts consecutively across the blade to the opposite end.

Remove the blade hooks and insert the remaining two blade bolts and tighten.



### Blade Bolt Sequence “B”

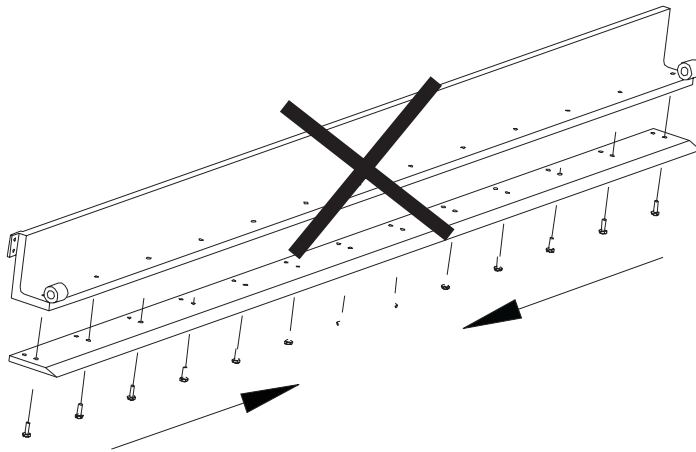
Sequence B - starting in the middle tighten the bolts from the centre to one end then return to the centre and tighten the bolts to the other end in order. Remove the blade hooks and insert the remaining two blade bolts and tighten.



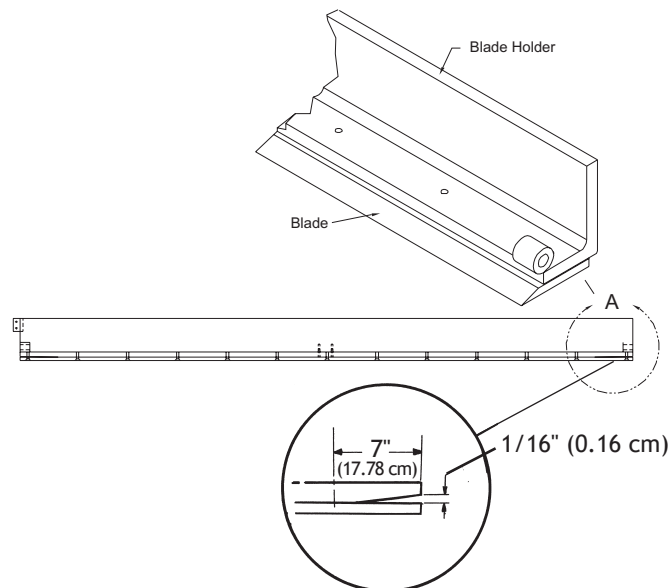


## Wrong Sequence

Please note: Tightening 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.



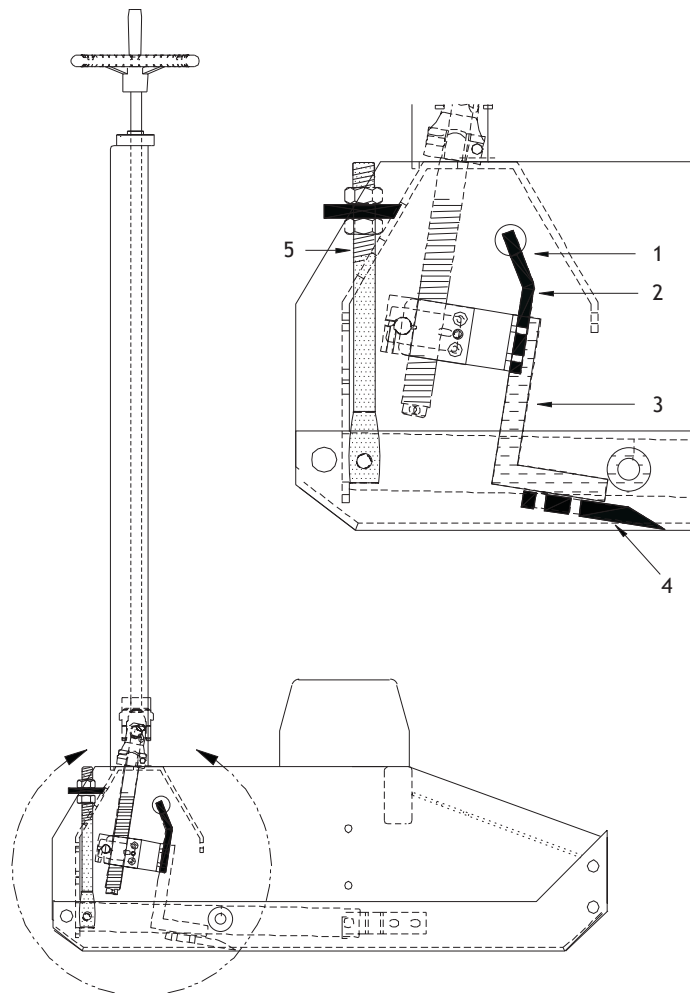
The blade holder is feathered by 1/16" (approx 1,6 mm) over the last 6" to 7" (15.2 to 17.78 cm) at each end. This prevents ridges from forming on the ice.



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

## 6.2.1 Blade Level Adjustment

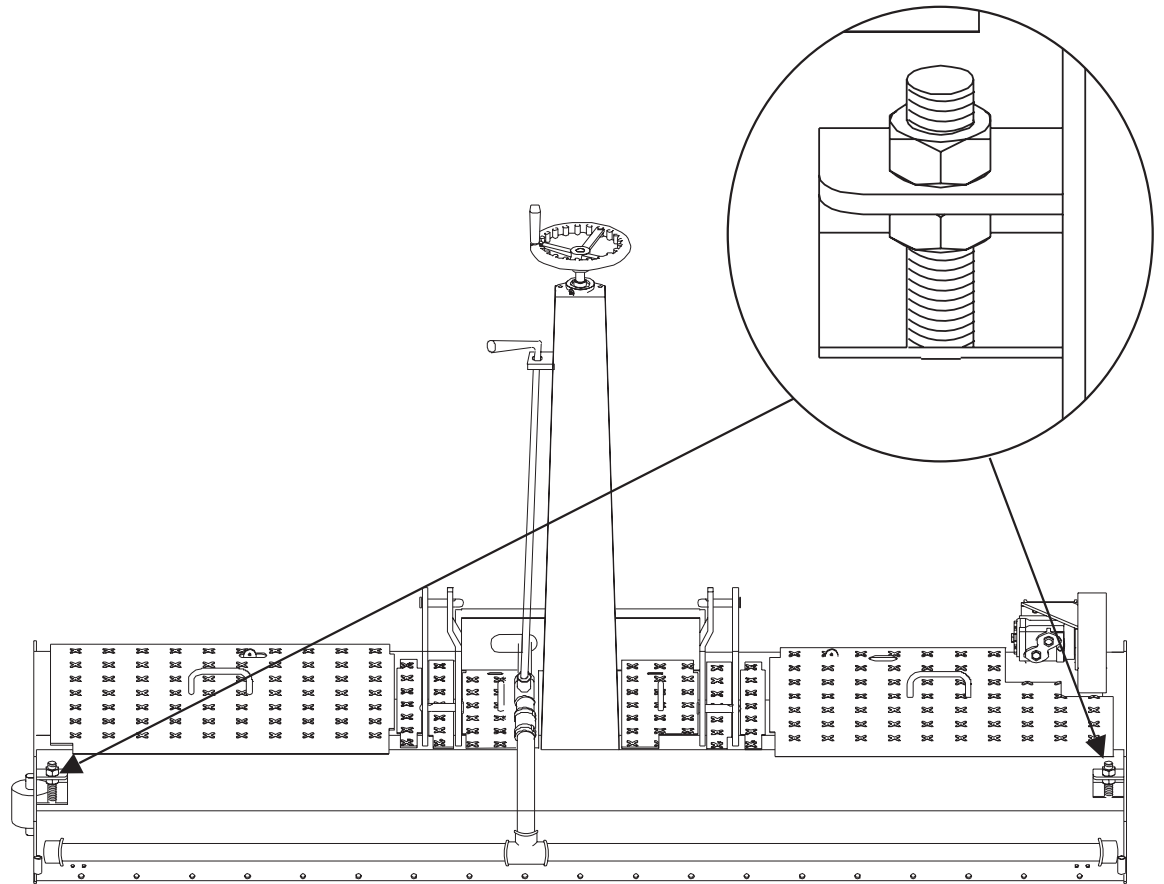
The next step is to adjust the angle of the blade. The blade adjustment hand wheel, located on the tower to the right of the operator, raises and lowers the blade. The adjustment hand wheel is turned until the indicator arm completely fills the sight hole on the right side of the conditioner as shown below.



- |        |                      |
|--------|----------------------|
| Item 1 | Sight hole           |
| Item 2 | Indicator arm        |
| Item 3 | Blade holder         |
| Item 4 | Blade                |
| Item 5 | Blade level adjuster |

*Fig. 6.3: Blade height adjustment*

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, first loosen the top nut of the blade level adjusters located on each side of the rear of the conditioner shown below.



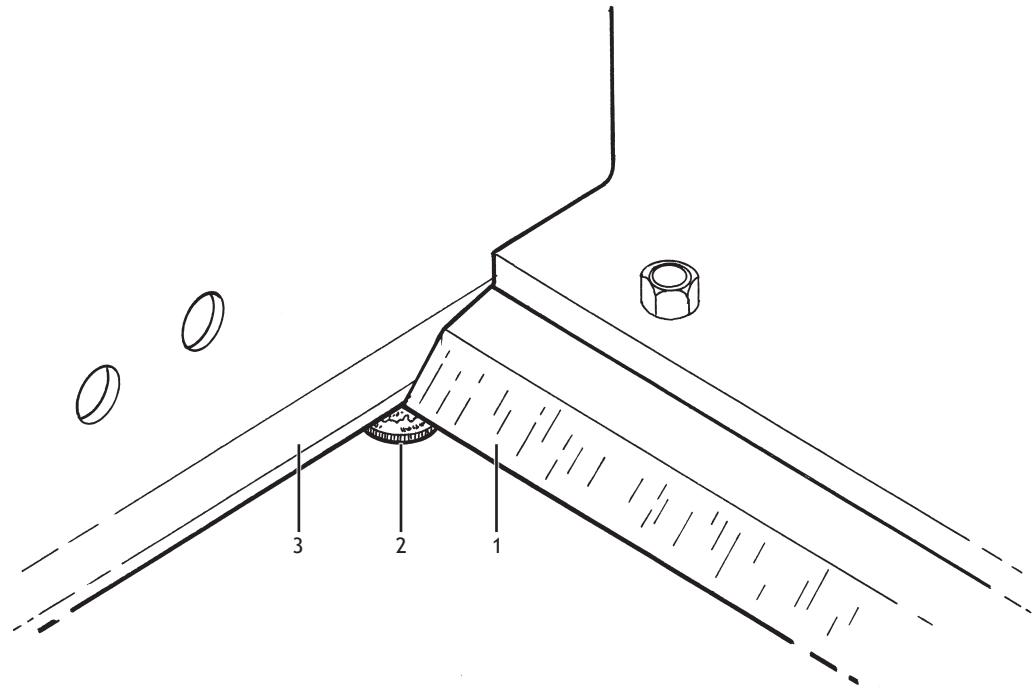
Then turn the nuts to raise or lower the blade into the proper position, which is exactly level with the bottom of the runner. Once the blade is at the proper level tighten the nuts on the blade level adjusters.



**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.

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.

**Blade/ Coin check**



*Fig. 6.4: Place a coin underneath*

- Item 1     Blade
- Item 2     Coin
- Item 3     Runner

At this point go back to the blade adjustment crank and turn it counter clockwise 2 turns to raise the blade.



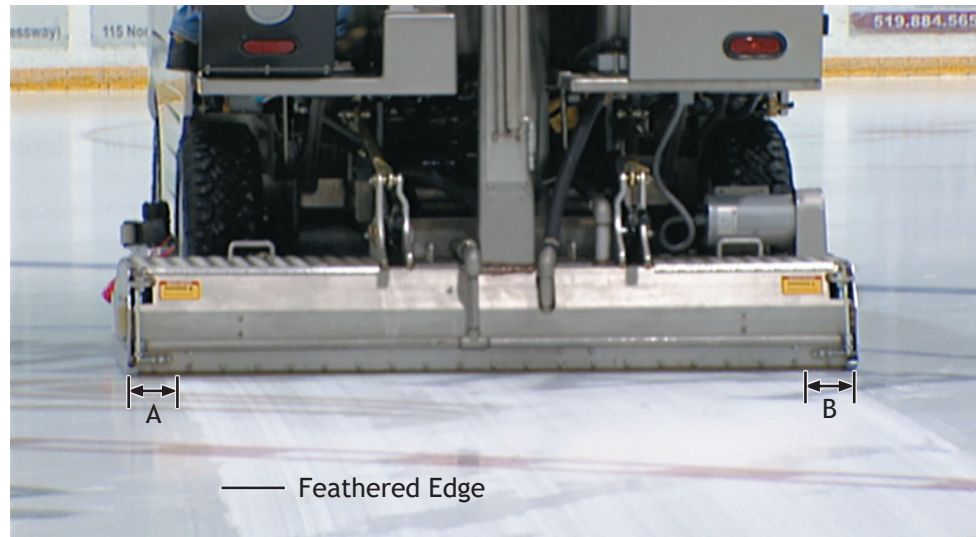
*Please Note: It is important that the blade holder and the blade surface be free of foreign material and lightly coated with oil to prevent rust before attaching the blade.*





Test drive the OLYMPIA H 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 feathered edge on both sides of the conditioner is not an equal distance from the runners on both sides, stop, dismount, and adjust the driver's side , up or down, until the feathered edge is equal distance from the runners on both sides of the conditioner.

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.



*Distance A & B should be equal*

## 6.3 Horizontal and 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 Millennium H.

### 6.3.1 Horizontal Auger Adjustment

The horizontal auger should be approximately 1/8th" (3mm) above the bottom of the runners to maximize snow pick up while at the same time preventing any marking of the ice surface.

## Auger Height Adjustment

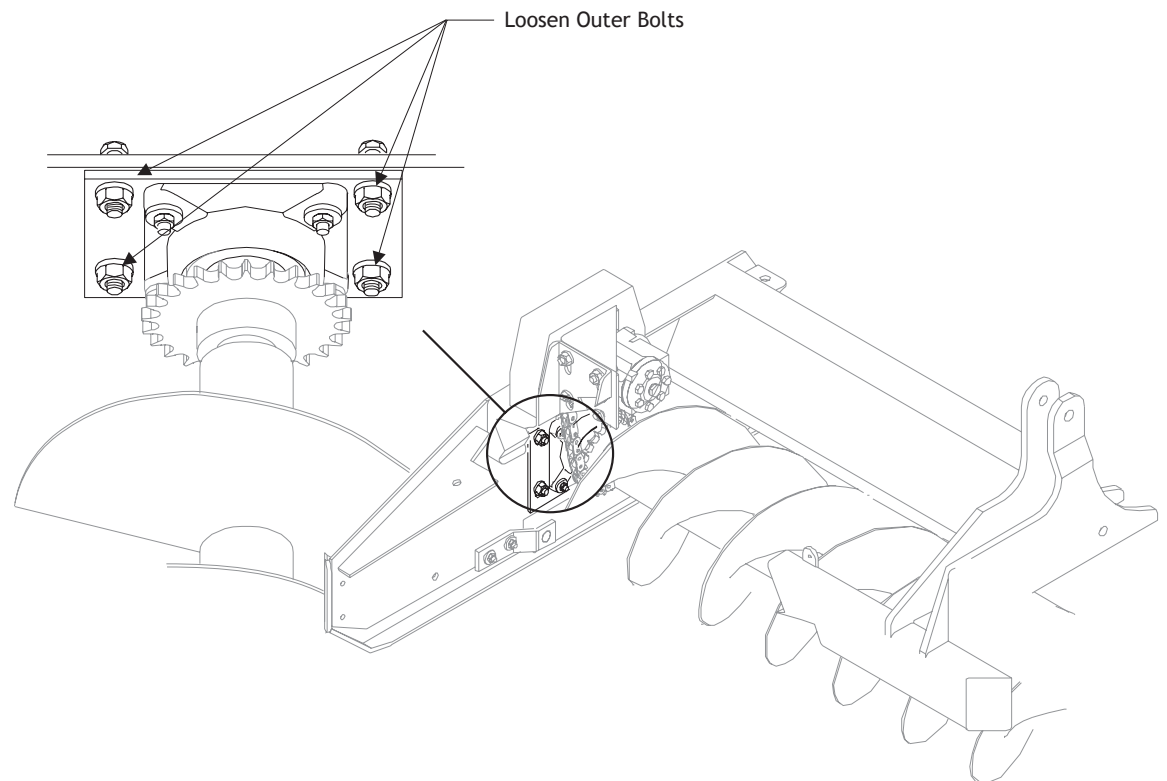
The horizontal auger is adjusted by loosening the four outer bolts on the bearing adjustment plate on each end of the auger and the four bolts for the auger motor mount. This can be checked by running a piece of string between the runners and observing the distance between the string and the auger.

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.

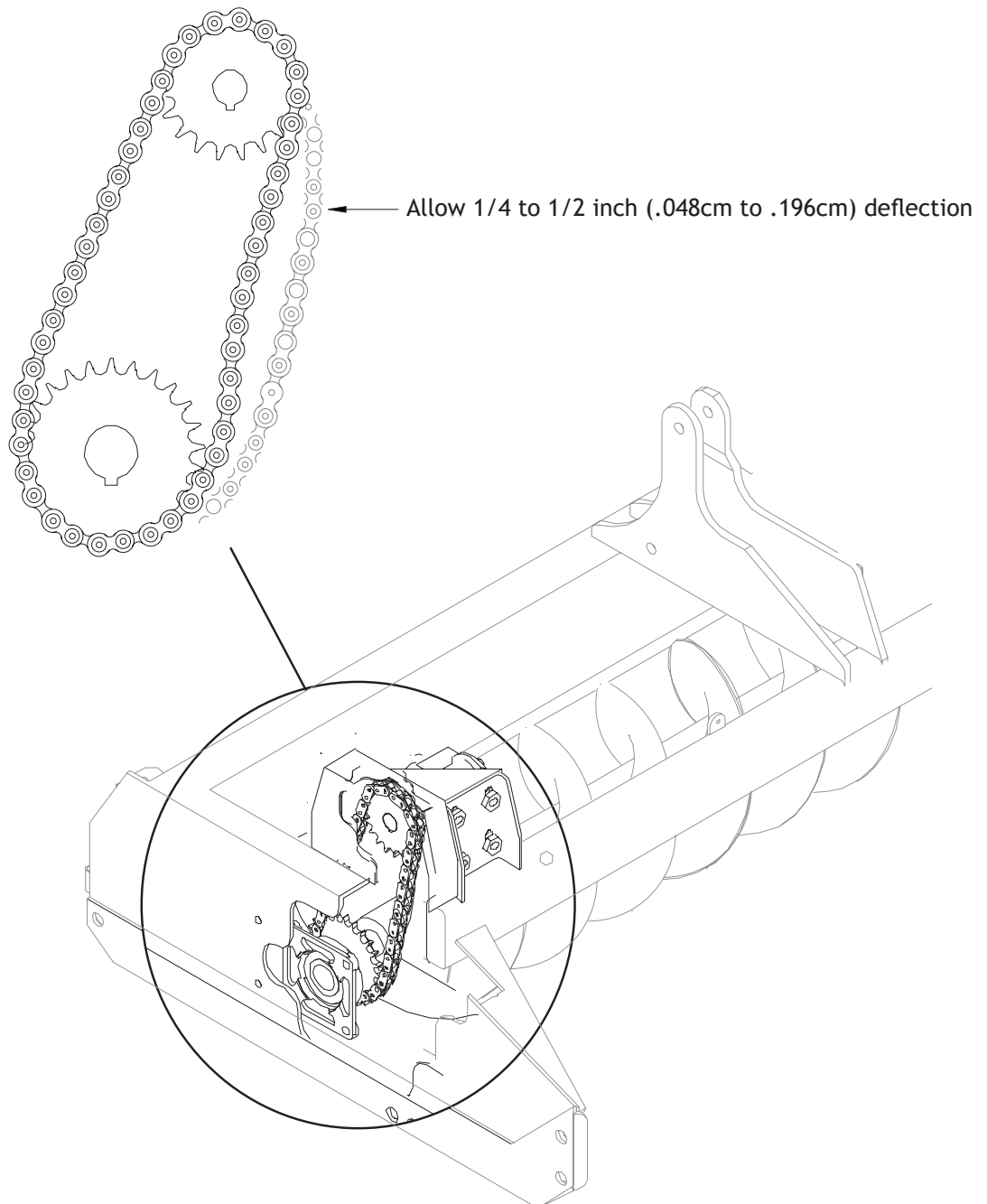
If the auger is set too high, excessive amounts of snow will be left on the ice surface at the end of the resurfacing.





## 6.3.2 Auger Drive Chain Adjustment

The horizontal auger drive chain should be kept at a reasonable tension at all times. If too loose, the sprockets and 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.



### Vertical Auger

There is only one adjustment to be made on the vertical auger, look into the inspection plate where the auger connects to the motor, the space between the coupling halves should be no more than 1/6th" (1.5mm).

Generally if the space is more than that it might be necessary to replace the bushing in the bottom of the vertical auger.

### 6.3.3 Down Pressure Check

Raise the blade to above the runners by turning the adjustment hand wheel counter clockwise.

With the conditioner in the UP position, drive the OLYMPIA Millennium H onto the ice surface.

Lower the conditioner to the ice surface by pushing and holding the CONDITIONER UP DOWN switch down until the lift arms are against the down pressure stops. Before operating the OLYMPIA, you should check to see if the runners are sitting level on the ice surface.

We recommend that you drive around the ice surface with the conditioner down for 2 or 3 laps to cool the runners.

To do this, the conditioner should be lowered so the runners are sitting on the ice surface and the conditioner lift arms are against the down pressure stops.

For proper traction and control the rear tires of the OLYMPIA Millennium H should be in full contact with the ice surface, the entire width and 5" (12.7cm) of the circumference of the tire should be flat on the ice.

It is important to have the correct tire pressure 65 psi (4.9bar) in the tires prior to checking and adjusting the conditioner down pressure.



## 6.3.4 Down Pressure Adjustment

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

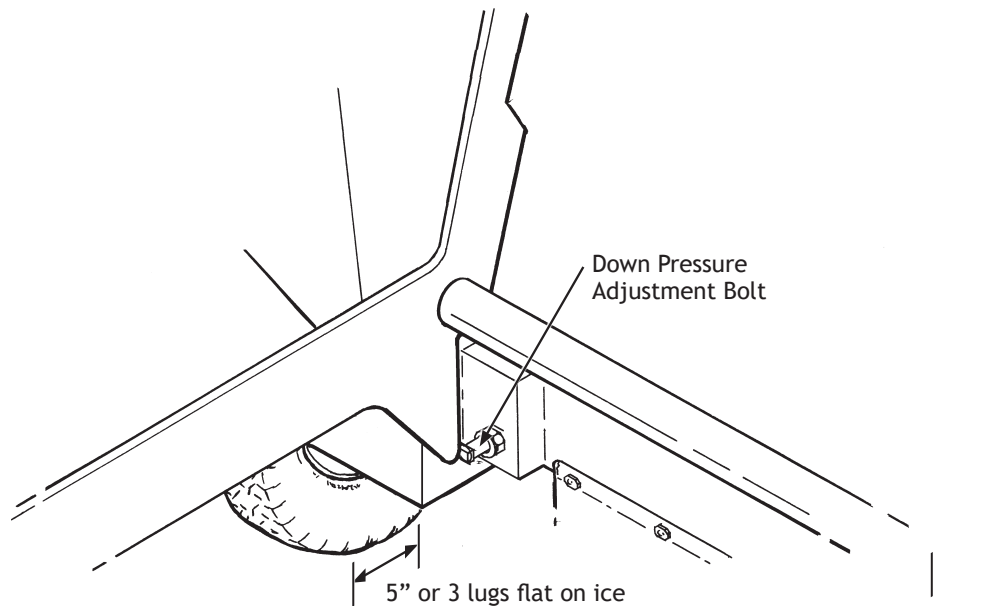
Properly dismount and turn the down pressure stop bolts in (clockwise) 5 full turns.

Remount the OLYMPIA, lower the conditioner until you have three tire lugs or 5" (12.7mm) of the tire touching the ice. Shut off the OLYMPIA, 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.



*Please Note: Every time you reset the down pressure you have to reset the top link adjustment.*

### 6.3.5 Top Link Adjustment

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

Drive the OLYMPIA Millennium H once around the rink.

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



*Please note: It is essential for proper adjustment that the rear tire pressure be maintained at 65psi / 4.9bar.*

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 Millennium H and drive forward six feet (2 meters), stop, turn off the OLYMPIA Millennium H 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.

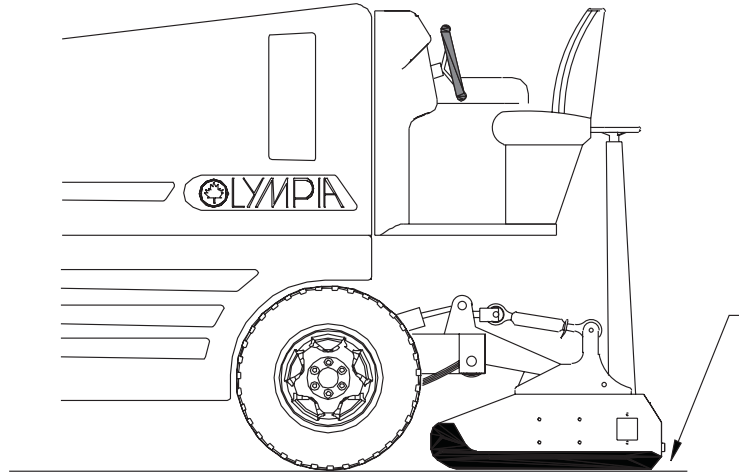
Check to make sure the front of the runners are still on the ice surface. When properly adjusted the runners will not leave any marks on the ice surface.



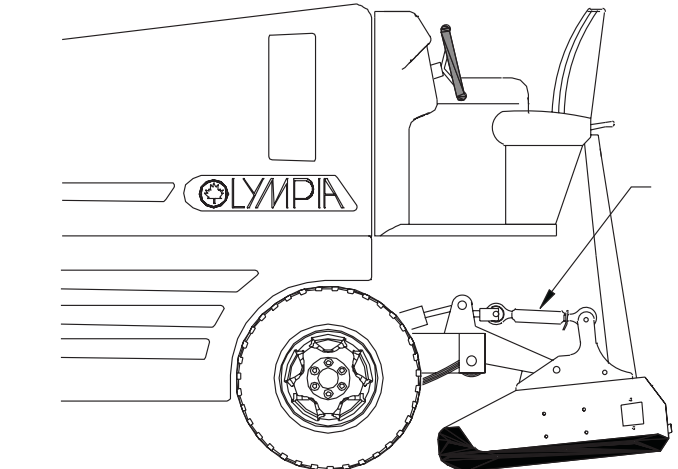
*Please Note: It is essential that you adjust both top links at the same time, and in the same direction.*



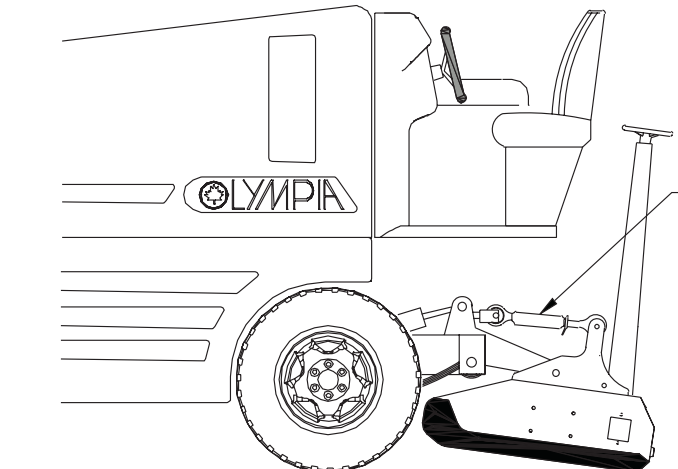
## Proper Top Link Adjustment



## Top Link too short

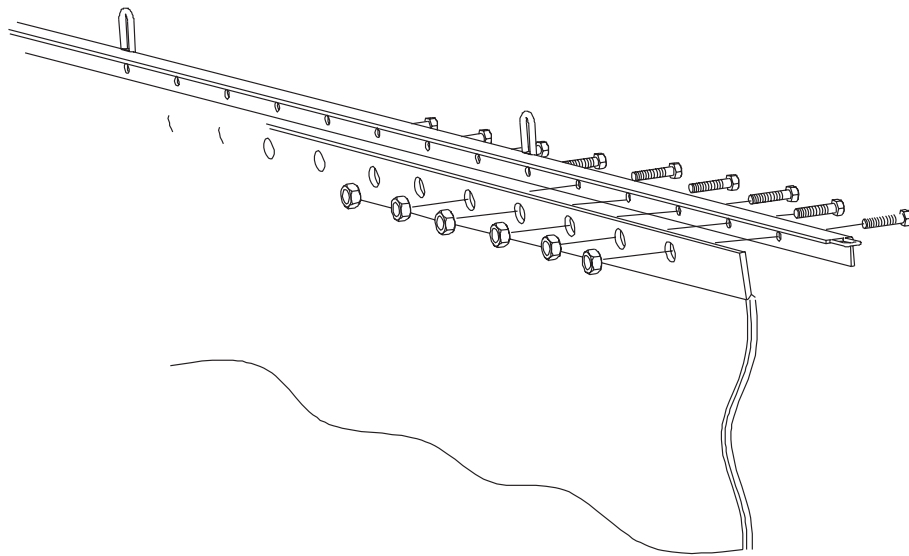


## Top Link too long



## 6.4 Spreader Cloth Installation

1. Install the towel on the backside of the towel bar with the 3/8" hex head bolts and locknuts, making sure the nuts are on the towel side of the towel bar or use plastic ties.
2. Place the towel bar assembly onto the towel lift guides.
3. Attach towel lift chains between the towel bar and towel lift arm.



## 6.5 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 Millennium H unattended during the water filling procedure.





## 6.5.1 Ice Making Water Filling Procedure

1. To fill the ice making water tank, insert the hot water hose into the fill pipe on the left side of the OLYMPIA Millennium H and turn on the hot water.



**Warning! NEVER leave the resurfacer unattended during the hot water filling procedure.**

Once the water level gauge on the left side of the resurfacer reaches the half way point for a single surfacing, turn off the hot water and remove and store the fill hose to its proper storage position.



*Note: Over filling will over flow the tank through the overflow tubes and waste treated and hot water.*



## 6.5.2 Wash Water Filling Procedure

Always fill the wash water tank with cold water only.

1. Insert the cold water hose into the filling inlet (Item 1) on the right side of the ice resurfacer.
2. Turn on the cold water and fill until the gauge reaches the fill mark on the gauge on the right side of the resurfacer.



**Warning! NEVER** leave the resurfacer unattended during the wash water filling procedure.





## 6.6 Safety Circle Check

Always check the following before proceeding into the OLYMPIA room. Check the door for heat with the back of your hand. If it is hot, evacuate the building and call the fire department. If there is no heat open the door a crack and smell for fuel leaks. If you smell something, close the door, evacuate the building and call the fire department. If no smell is present, proceed into the OLYMPIA room. Automatic lights should never be installed in the OLYMPIA room.

Check your log book for any remarks made by the last shift as to condition of the OLYMPIA Place keys for the OLYMPIA in your pocket for the duration of the circle check. The OLYMPIA should be stored over night with the snow bin in the up position with the snow bin safety supports engaged and all water tanks drained.

Starting at the left rear wheel, inspect the tire and rim for damage. Inspect the studs to make sure they are tight and secure in the tire. Inspect the lug nuts to ensure tightness and check the tire pressure for proper inflation.

1. Inspect the valve block area for leaks Inspect all valve block wiring connections Inspect all hydraulic hoses for wear and leaks
2. Inspect the left side body panels for any new damage.
3. Inspect the board brush making sure to check for any dirt or debris stuck in the brush Inspect the roller for free movement Physically grab the board brush arm, making sure it is secure and has no play.
4. Looking behind the left front wheel inspect the hoses in the area for leaks and or damage.
5. Inspect the left front tire and rim for damage.
6. Inspect the studs to make sure they are tight and secure in the tire.
7. Inspect the lug nuts to ensure tightness and tire pressure for correct inflation.
8. Inspect the bumper wheel for free movement.
9. Inspect the hydraulic tank sight gauge for proper level and colour of fluid, (2/3 - 3/4 full and bright red in colour).
10. Inspect all of the engines electrical connections on the left hand side.
11. Inspect the engine for any oil or coolant leaks.

12. Inspect the steering linkage.
13. Properly secure the left hand side snow bin support in the upright position.
14. Moving around the front of the OLYMPIA check inside the bin before walking in front for anything in the snow tank.
15. Inspect under the OLYMPIA for any leaks or debris that may be there.
16. Inspect the headlights for proper placement.
17. Inspect the front right tire and rim for damage.
18. Inspect the studs to make sure they are tight and secure in the tire.
19. Inspect the lug nuts to ensure tightness and tire pressure for correct inflation.
20. Looking behind the left front wheel inspect the hoses in the area for leaks and or damage.
21. Inspect the condition of the serpentine belt for proper placement and damage.
22. Inspect the hydraulic tank sight gauge on the right hand side for proper level and colour of liquid, ( 2/3 - 3/4 full and bright red in colour).
23. Inspect the engine oil for proper level using the dipstick.
24. Inspect the radiator fluid for proper fill level.
25. Inspect all radiator coolant lines for leaks and wear.
26. Inspect all of the engines electrical connections on the right hand side.
27. Inspect the engine for any oil or coolant leaks.
28. Inspect the steering linkage Properly secure the right hand side snow bin support in the upright position.
29. Inspect the flood water tank over-flow hoses to ensure proper placement.
30. Inspect all 4 of the flood water tanks clamps to ensure proper placement.
31. Inspect the flood water tank drain valve, making sure it opens and closes freely.
32. Close the flood water tank drain valve.
33. Inspect the right hand side of the body for damage.



34. Inspect the right hand side of the valve block for leaks. All adjuster nuts on the valve block must be tight.
35. Inspect all hoses in the area for leaks, damage and wear
36. Inspect the rear right tire and rim for damage.
37. Inspect the studs to make sure they are tight and secure in the tire.
38. Inspect the lug nuts to ensure tightness and tire pressure for correct inflation.
39. Inspect the wash water tank drain valve, making sure it opens and closes freely.
40. Close the wash water drain valve.
41. Remove and inspect the wash water basket and make sure it is free of dirt and debris .
42. Moving to back of the OLYMPIA, unstrap and inspect the LPG tanks for fuel.
43. Always make sure you have one full tank on board.
44. When replacing a tank, inspect the tank for damage as well as the o-ring in the tank connection for proper placement. **ALWAYS WEAR YOUR PPE WHEN CHANGING A LPG TANK!**
45. Dress the straps of the tanks to ensure the tanks are secure
46. Turn on both LPG tanks.
47. Check all LPG connections for leaks using soapy water.
48. When turning on LPG tanks make sure to turn them on slowly as to not trip the excess flow valve.
49. Run your hand on the bottom of the right hand side runner of the conditioner from **BACK TO FRONT**, check for burrs on the runner and note the blade position. If there are burrs present use a flat file to remove them.
50. The blade must be above the runner to prevent damage to the ice. **NEVER RUN YOUR HAND FROM FRONT TO BACK ON THE RUNNER!!!**
51. Inspect the chain for proper deflection,( 1/4"-1/2").
52. Rotate the auger until you see the master link and make sure the retaining clip is present and secure.
53. Inspect the quick couplers for leaks and proper connection Inspect the right hand side auger bearing for proper operation.

54. Taking hold of the centre of the auger shaft check for movement north, south, east and west. The bearing should have no play.
55. Inspect the squeegee for proper installation and damage. A damaged squeegee or improper instalment will effects the wash waters ability to work and the life of the impeller.
56. Flip the flood towel over and inspect for dirt, debris and wear. The towel is the last thing to touch the ice, it must be clean and in good report.
57. Inspect both flood water and wash water valve handles for ease of operation and close both valves.
58. Inspect the hand wheel for free movement, turning the blade both up and down 2 turns returning it to the original location.
59. Inspect the right hand side auger bearing for proper operation.
60. Take hold of the centre of the auger shaft and move it to check for movement north, south, east and west. The bearing should have no play.
61. Run your hand on the bottom of the left hand side runner of the conditioner from BACK TO FRONT, check for burrs on the runner and note the blade position. If there are burrs present use a flat file to remove them. The blade must be above the runner to prevent damage to the ice. NEVER RUN YOUR HAND FROM FRONT TO BACK ON THE RUNNER!!!
62. Inspect the conditioner bumper wheel making sure it spins freely.
63. Replace all conditioner cover plates and retaining pins
64. Open the compartment under the seat, flip the switch to hand pump mode and operate the system. You can lower the conditioner slightly for this procedure. When pumping the conditioner should fully rise and then the snow bin should start to rise. Flip the hand pump switch back to drive.
65. Removing the key from your pocket place it in the ignition
66. Using the 3 points of contact, safely mount the OLYMPIA. Never use the arm rest as a grab handle!
67. Start the OLYMPIA and make sure the OIL PRESSURE gauge is operating and you have oil pressure. If you do not, shut off the OLYMPIA immediately.



68. Using the RPM controller, bring the OLYMPIA up to 1500RPM.
69. Inspect the tachometer for proper function.
70. Inspect the engine temperature gauge for proper function.
71. Inspect the voltmeter for proper function.
72. Test the horn.
73. Turn on the headlights and check for the reflection of both the headlights and tail lights.
74. Lower and raise the conditioner.
75. Turn on your elevators for at least one full cycle of the automatic snow breaker system.
76. Lower the snow bin Cycle the snow breaker using the snow breaker bypass button to ensure proper operation.
77. Operate the LPG cross over and run the OLYMPIA off each tank for a few minutes to ensure proper operation.
78. When operating the LPG crossover make sure to turn it slowly as to not trip the excess flow valve.
79. Dial back the RPM Controller until the OLYMPIA is at an idle and turn the OLYMPIA off.
80. Fill the flood making water with hot water. Never leave the hose unsupervised while filling and beware of the danger that the hot water can cause.
81. Fill the wash water tank with COLD water only. Never leave the hose unsupervised while filling.
82. Test both the wash water and flood water to make sure both systems have unrestricted flow.
83. Using your log book, log any concerns of the circle-check. Make sure to log in the date and your name.

You have now completed the circle-check and are ready to proceed onto the ice surface and begin the resurfacing process. Make sure to always use the horn when crossing any pedestrian areas. pedestrian areas.

## 7 WORKING WITH THE OLYMPIA MILLENNIUM H

### 7.1 Driving

#### 7.1.1 Starting

Make sure the gear selector is in the P (park) position. Insert the ignition key and turn to the start position. Once the engine is running release the key and it will automatically return to the run position.

Check the engine gauges starting with the oil pressure gauge. If the oil pressure does not start to increase immediately shut down the engine by turning the ignition key to the off position and report the problem to management to arrange for servicing.

#### 7.1.2 To move the ice resurfacers

To move the OLYMPIA Millennium H first adjust the engine rpm knob on the top right corner of the dash until the rpm gauge reads between 1500 to 1700 rpm. To move the OLYMPIA Millennium H push the gear selector into the (F)forward position or (R) reverse position and depress the accelerator pedal. The more you depress the accelerator pedal the faster the OLYMPIA Millennium H will move. To stop ease off the accelerator pedal. The hydraulic oil will stop flowing to the wheel motors and the machine will stop.



**NOTE:** When not driving on the ice surface it is advisable to set the rpm level at approximately 11-1200 rpm for the optimum control in maneuvering in tight spaces.





## 7.1.3 Brakes



To stop the OLYMPIA Millennium H take your foot off the accelerator. The hydrostatic drive system will stop the wheels from turning.

Always apply the park brake, set the gear lever to park position and turn the ignition switch to the off position before dismounting the OLYMPIA Millennium H.

## 7.1.4 Shifting from Forward to Reverse

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

Never drive in reverse when the board brush is out.

When lowering the conditioner, make sure that the OLYMPIA Millennium H continuously moves forward.

## 7.2 Starting and Driving

The OLYMPIA H, has many built in safe guards to keep it safe. Therefore there is a proper sequence to start the OLYMPIA that must be adhered to.

After mounting the drivers platform using the three point contact procedure. Insert the key into the ignition switch, make sure the gear selector is in the park position, turn the key to the start position and hold until the engine starts.



*NOTE: If the key is released before the engine starts you must return it to the off position before trying to start the engine a second time. As well if the accelerator pedal is pushed down the engine will stop cranking.*

Once the engine is started, before selecting which ever direction you wish to move, visually check for any persons or objects that may be in the way, and clear the area before moving.

Next adjust the engines RPM by turning the RPM control clockwise until the engine reaches approximately 1200 RPM.

Sound the horn to let anyone in the area know you are about to move the OLYMPIA H.

Now slowly push down on the accelerator pedal, the OLYMPIA will start to move, the further you push on the accelerator pedal the faster the OLYMPIA move.



**SAFETY NOTE:** The OLYMPIA H is designed with computer controlled hydraulic dynamic braking, this means that once the OLYMPIA H is in motion, by releasing pressure from the accelerator pedal the OLYMPIA H will automatically at a controlled rate slow to a stop if the pedal is completely released.

To change direction in movement, first come to a complete stop then shift the gear selector to N (neutral) and then into the other direction, then slowly depress the accelerator pedal to start the OLYMPIA H moving in the desired direction.

Once you are on the ice surface, adjust the engine RPM control up to between 1600 and 1800 RPM. And commence with resurfacing the ice.



*NOTE: Regardless of where you set the engine RPM above 1800, when you turn on the Elevator Forward switch the engine will automatically slow to a maximum of 1800 RPM. The OLYMPIA H is programmed this way to enable it to operate at maximum efficiency both in fuel consumption and hydraulic function, as well as a safe operational speed.*

After completion of resurfacing and snow dumping procedure move the OLYMPIA H to the desired parking place in your building, IDLE down the engine, place the gear selector in the P (park) position, and turn off the engine.

Be sure to remove the ignition key and return it to the key storage container to safe guard against any undesired starting of the OLYMPIA H.



**SAFETY NOTE:** When the OLYMPIA H's engine is off the spring brakes on the rear wheels automatically engage, as well if the OLYMPIA H's engine is running, at all times when it is in the P (park) position the rear wheel spring brakes are engaged.

The P (park) position on the gear selector switch acts as the emergency or parking brake.

## 7.3 Ice Resurfacing



Only lower the conditioner while the OLYMPIA Millennium H is moving forward, otherwise it could sustain damage.



When operating the OLYMPIA Millennium H, make sure there is no one 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.



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

### 7.3.1 Driving with the Board Brush

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



*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.



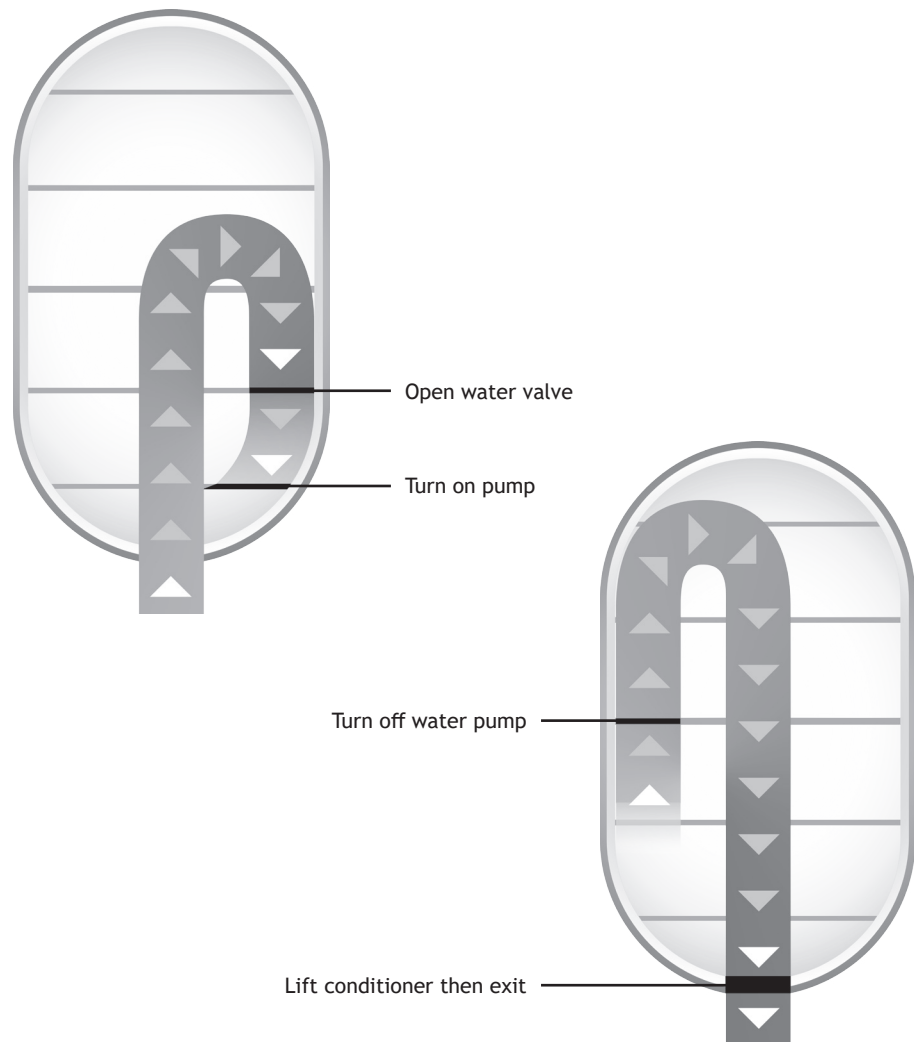
Retract the board brush when approaching any ice level opening.



## 7.3.2 Water Application

To turn on the wash water, first open the wash water valve located to the right of the operator all the way to the right. Drive the distance from blue line to blue line or from the Blue line to the goal line. Next turn on the wash water pump by pressing down the wash water switch on the dash.

To properly turn off the wash water, 3/4 of the way from the end of the last lap at the center line turn off the wash water lever all the way to the left and immediately turn off the wash water pump by pushing the wash water switch up.



The wash water system sprays cold water onto the ice from the sides of the conditioner behind the cutting blade in front of the squeegee and between the runners.

The cold water flushes the snow and debris out of the skate cuts in the ice. The debris is floated up to the top of the slush while the snow is compacted into the skate cuts by the squeegee. The remaining slush snow and debris is augured into the center of the conditioner and then lifted by the elevator auger upward into the filter basket and then into the snow bin.

### Ice Making Procedure

1. Fill the tank with hot water through the fill pipe located on the driver's side.

With the Ice Making Water tank filled with enough hot water to do a complete resurfacing plus 10%. Now drive onto the ice surface and lower the conditioner all the way to the ice surface. Turn on the ice making water by opening the ice making water valve located at the right of the operator. Adjust the ice making water valve to match the speed you are driving the OLYMPIA Millennium H. Usually half open for the first lap and then increased to full open once you have moved away from the boards.

We recommend you maintain a constant wheel speed throughout the resurfacing to ensure an even amount of water dispersed onto the ice thus preventing ice buildup particularly in the corners.



*After each resurfacing it is recommended to drain any excess water left in the tank. This will reduce scale build up inside the ice making water tank.*



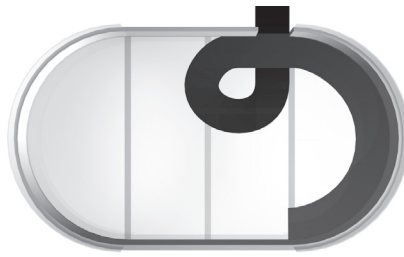
## 7.4 Resurfacing Procedure

Once you have taken on sufficient water (10 % more than needed to do a single resurfacing), before driving onto the ice surface, turn on the tire wash to rinse the tires of any debris. With the tire wash water turned off, carefully drive onto the ice surface and carry out the normal ice making procedure as follows:

- Lower the conditioner to the ice surface by pushing the bottom of the conditioner switch until the conditioner lift arms are all the way down.
- Engage both the vertical and the horizontal augers by pushing the bottom of the elevator on switch.
- Turn on the ice making water with the manually operated water valve.
- Turn on the Wash Water following the previous instructions (first the wash water hand valve and then the wash water pump).
- Now engage the board brush by pushing the bottom of the board brush switch.
- Drive slowly ahead keeping the board brush against 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 by pushing and holding the board brush switch and follow the pattern shown below.

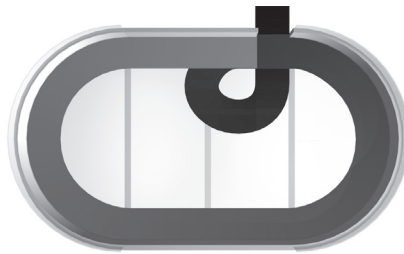


*Use extreme caution with the board brush when passing open gates as the board brush could swing into the opening, causing damage to both the boards and/or the ice resurfacer.*

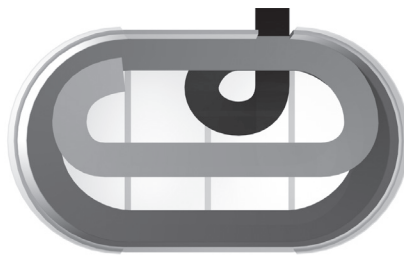


1. Lower the conditioner, turn on elevator, adjust blade (3" feathered edge), turn on wash water valve, turn on wash water pump, turn on ice making water, turn on board brush.

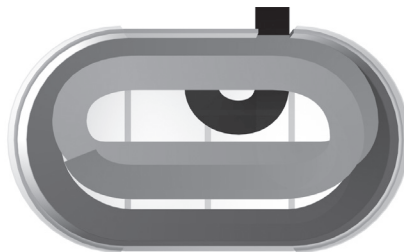
**Note:** When driving past an opening level with the ice you must retract the board brush until you are all the way past the opening.



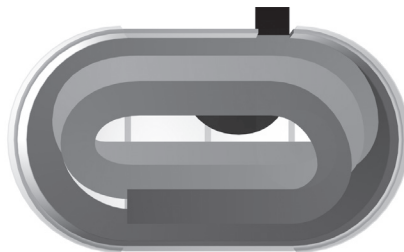
2. Retract board brush by pushing and holding the board brush switch until it is fully retracted to the side of the OLYMPIA.



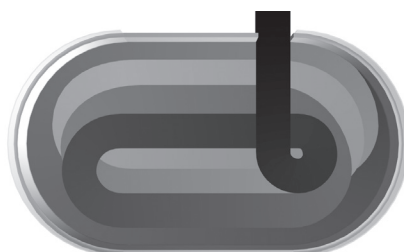
3. Proceed along the path.



4. Proceed along the path.



5. Turn off wash water by simultaneously pushing the wash water switch to the off position and immediately turn off the wash water valve.



6. Turn off ice making water, sound horn, completely stop at threshold, turn off elevator, lift conditioner.





- $\frac{3}{4}$  of a lap prior to completion of the resurfacing, turn off the wash water. Just prior to finishing the resurfacing, turn off the ice making water. Bring the OLYMPIA Millennium H to a complete stop while the rear wheels are still on the ice surface.
- Turn off the horizontal and vertical augers.
- Lift the conditioner. 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 overhead clearance. Raise the snow dump tank button until it is completely opened.
- After dumping the snow lower the snow dump tank of after dismounting install the snow dump safety supports.
- Engage the parking brake and turn off the ice resurfacer.
- After stepping down from the ice resurfacer, be sure to remove cover plates and wash out the conditioner.



*In order to maintain the recommended ice thickness of 1.5" (38mm), 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 the amount of water put down on an 8 to 10 minute resurfacing.*



**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 from falling into the snow dump pit.
- Guard at the front of the snow dump to prevent people from falling in.

### 7.4.1 Cleaning the Ice Resurfacers after an ice resurfacing

The conditioner should be rinsed out after each use. Do not hose down the whole ice resurfacers unnecessarily. The control 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!**

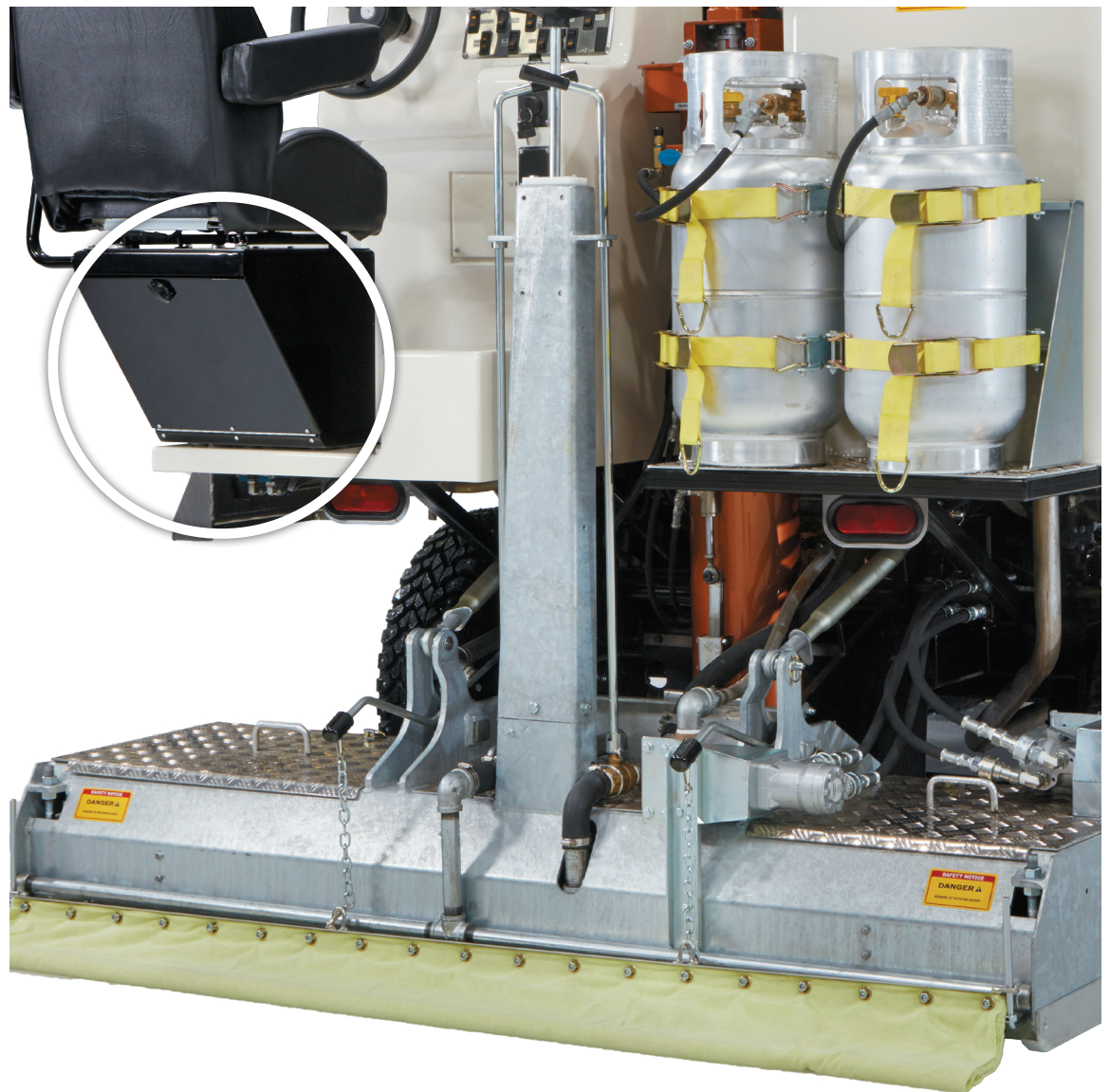


## 7.5 Emergency Hand Pump Operation

The OLYMPIA H is equipped with two hand pumps and a hand pump switch mounted under the drivers seat.

The hand pump on the left enables the raising of the conditioner and snow dump in the case that the engine will not start.

The hand pump on the right enables the release of the hydraulic spring brakes in the case that the engine will not start and the OLYMPIA H needs to be moved.



To operate these hand pumps, first open the seat box, push the top of the emergency hand pump switch to shift it from the drive position to the hand pump position. This engages the electrical circuits that will enable the hydraulic fluid to flow to the necessary controls to either raise the conditioner and snow dump, and or release the rear wheel spring brakes.

Insert the hand pump handle into the conditioner hand pump and commence pumping to raise the conditioner.



*NOTE: Once the conditioner is fully raised, if you keep pumping you will raise the snow dump. Also the hand pump only raises the conditioner and snow dump, so the engine will have to be started to lower these two parts of the OLYMPIA H.*

To release the rear wheel spring brakes, first place the emergency hand pump switch into the hand pump position, next move the gear selector into the N (neutral) position, then insert the hand pump handle into the hand pump labelled brakes, and commence pumping that hand pump until you feel a slight resistance on the pump. At this point you will be able to push or pull the OLYMPIA H to the service area. Once the OLYMPIA H is in a place where it can be serviced place the gear selector back into the P(park) position the reengage the spring brakes. Then switch the emergency hand pump switch back to the drive position.



*NOTE: Over pressurizing the brake circuit could cause damage to the brakes. As well the brakes will reengage after approximately five minutes, or when the gear selector is placed back into P(park).*



*NOTE: If the battery is below 11 volts the emergency hand pumps will not work, and it may be necessary to use a booster pack to increase the battery voltage to the point that the electrical circuits have enough voltage to open the solenoids.*



*INFORMATION: When you are finished using the emergency hand pumps make sure you place the emergency hand pump switch back in the drive position or the battery could go flat.*



## 8 CLEANING AND MAINTENANCE

### 8.1 Cleaning and Maintenance Safety Instructions



To perform the maintenance program, park the OLYMPIA Millennium H in an area that the snow dump can safely be fully raised with the conditioner in the fully UP position and shift the gear lever to the park position (P).

Fully raise the snow dump tank and install the safety support bars.

Turn off the ice resurfacers.



Before starting any maintenance jobs, remove the ignition key 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.



When working on any of the other hydraulically operated components of the OLYMPIA, also secure them with safety bolts or props, so that a hazardous situation does not arise in the event of a component failure. Whenever working on the conditioner it is recommended that blocks be placed under it to prevent any possible injuries.



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 starting the work, the OLYMPIA Millennium H must also be secured with wheel 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 wheel chocks are removed again before putting the OLYMPIA back into operation (the red/white plastic chains serve as a reminder).



Only after the OLYMPIA Millennium H has been secured in the described manner may any 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 Millennium H 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.



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.



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. The supervisor will then decide how to proceed.



## 8.2 Maintenance Checks

Failure to carry out the basic maintenance checks can lead to damage and downtime as well as possible personal injury.

### 8.2.1 Daily

- Carry out circle check as described in section 6.6.
- Check that safety guards are in place.
- If your ice resurfacer is equipped with an edger, inspect all the components.

### 8.2.2 Every Time the Blade is changed or Weekly



*The procedure for changing the blade is described in Chapter 6.3.*

- Re- grease the blade bolts.
- Lubricate the horizontal auger drive chain.
- Lightly oil bottom side of blade holder system.
- Grease blade holder pivots.
- Grease horizontal auger bearings.
- Grease conditioner lift arms.
- Grease conditioner mounting pins.
- Water the batteries using only distilled or RO. treated water.



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

### 8.2.3 After 5 Hours

- Check and torque the lug nuts to 140 (Nm) 100 ft·lb.

### 8.2.4 After 50 Hours

- Check all drive belts (vee-belts) and re-tension them, if necessary (Refer to Chapter 9.1).
- Change the oil and oil filter on the engine.





## 8.2.5 Monthly or Every 100 hours

- Change engine oil and filter.
- Inspect the hydraulic system for any sign of leaks.
- Check the belt tension at all drive belts.
- Check the tire pressure 65 psi (4.9 bar).
- Check that all lug nuts are tight 100 ft·lb (140 Nm).
- Check the hydraulic oil level in both hydraulic tank.
- Check that all the board guide rollers run smoothly.
- Check the surface of the blade holder in the conditioner and lightly oil it.
- 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.
- Check battery terminals for tightness and corrosion. Tighten and clean as required.
- Grease the entire machine as per section 8.2.7

### 8.2.6 Annually or Before Storage

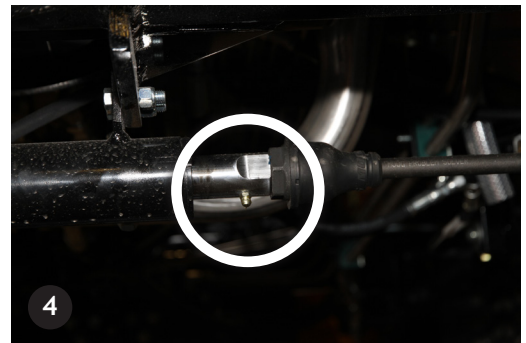
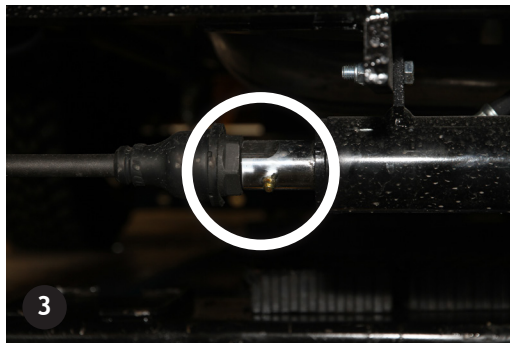
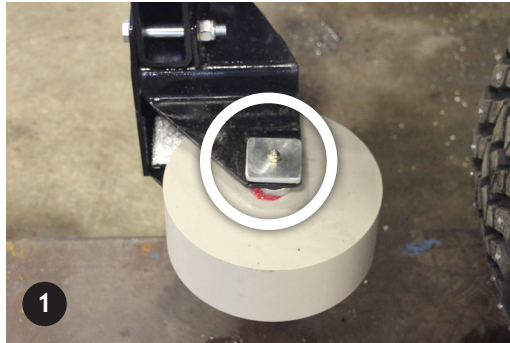
- Spray all metal surfaces of the conditioner with a thin coating of penetrating oil.
- Lubricate all lube points on the **OLYMPIA Millennium H** to eliminate moisture.
- The horizontal and the vertical auger and all moving parts of the conditioner must be coated with a thin coating of penetrating oil.
- Open the drains.
- Remove the filter 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.
- Change the hydraulic filters
- Clean the ice resurfacers: Wash the **OLYMPIA Millennium H** 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 Millennium H**.
- After parking the **OLYMPIA Millennium H** disconnect the battery.
- Every two(2) years change the hydraulic oil and filters on both drive and auxiliary systems.

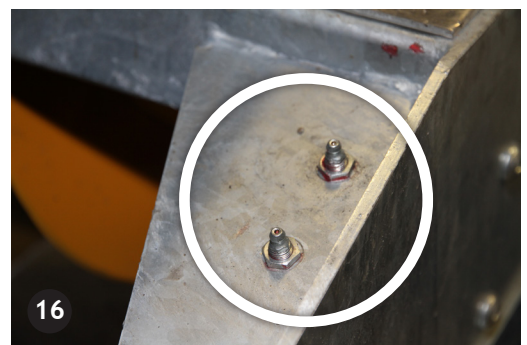
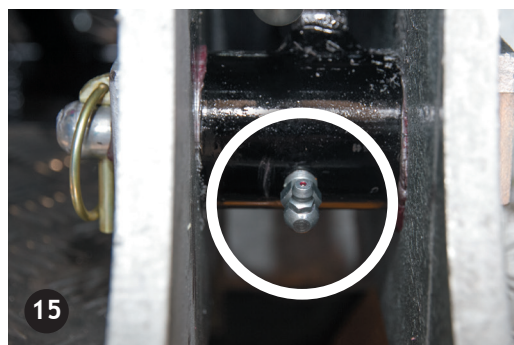
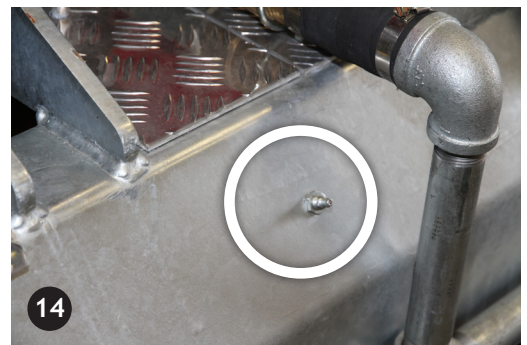
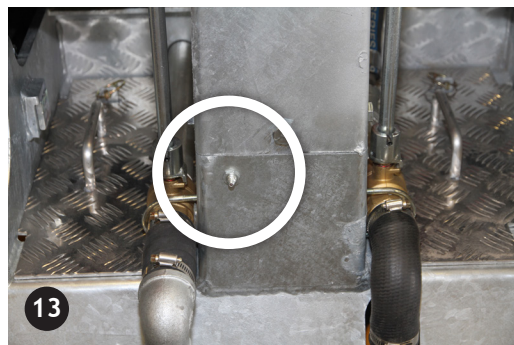
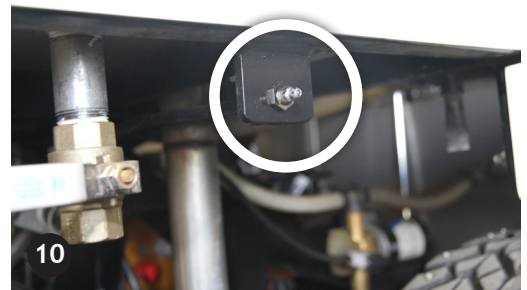
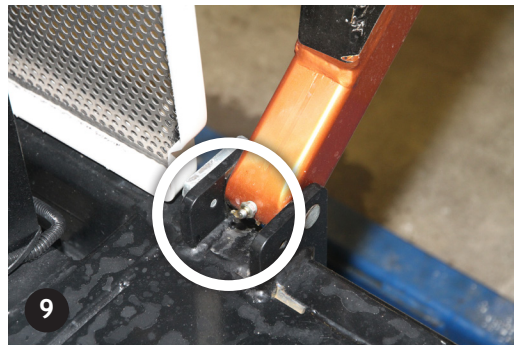


## 8.2.7 Lubrication to be Done Weekly and Before Long Term Storage



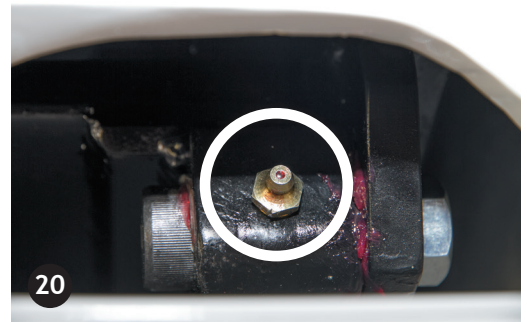
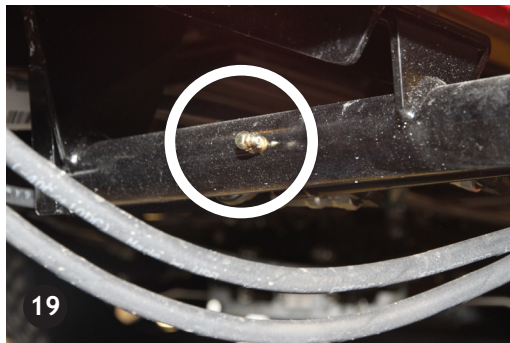
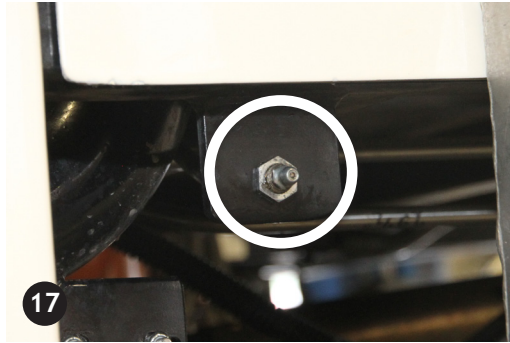
The lube points are shown on the separate lubrication chart in the appendix







# MILLENNIUM 7



- Picture 1: Bumper Wheel
- Picture 2: Snow Bin Pivot Left Side
- Picture 3: Inner Tie Rod End Left Side
- Picture 4: Inner Tie Rod End Right Side
- Picture 5: Left Side Upper King Pin
- Picture 6: Left Side Lower King Pin
- Picture 7: Right Side Upper King Pin
- Picture 8: Right Side Lower King Pin
- Picture 9: Right Side Snow Bin Pivot
- Picture 10: Right Side Conditioner Lift Arm Pivot
- Picture 11: Right Side Horizontal Auger Bearing and Blade Holder Pivot
- Picture 12: Right Side Conditioner Mount Pin
- Picture 13: Blade Adjustment Screw Bearing
- Picture 14: Blade Adjustment Nut Bearing
- Picture 15: Left Side Conditioner Mount Pin
- Picture 16: Left Side Horizontal Auger Bearing and Blade Holder Pivot
- Picture 17: Right Side Conditioner Lift Arm Pivot
- Picture 18: Board Brush Swing Arm Pivot
- Picture 19: Board brush Swing Arm Pivot
- Picture 20: Right Side Snow Bin Cover Pivot
- Picture 21: Left Side Snow Bin Cover Pivot

### **8.2.8 Every 3 Years**

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



To put the OLYMPIA Millennium H back into operation at the beginning of the season, perform the weekly maintenance procedure



## 9 SELF- HELP AND TROUBLESHOOTING

### 9.1 Squeegee Replacement

If the squeegee needs to be replaced, it should be mounted on the inside of the conditioner with hex head bolts (3/8" x 1-1/4") 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.

### 9.2 Towel Replacement

Inspect the towel and replace it if necessary. Attach the towel to the back of the towel holder with hex head bolts (3/8" x 1") and locknuts; make sure that the nuts are on the towel side of the towel holder or with plastic cable ties.

### 9.3 Blade Replacement



*Refer to Chapter 6.3, "Installation and Removal of the Blade".*

## 9.4 Hydraulic oil integrity is Critical

The new OLYMPIA Millennium H is a genuine hydrostatic drive machine relying on hydraulic fluid as the key element in power transfer rather than conventional mechanical means with a transmission & differential. Consequently the performance and longevity of the system relies on the integrity of the fluid.

Not only does the hydraulic fluid drive the wheels it also lubricates and cools each of the precision components within the drive system. The quality and quantity of the hydraulic fluid is critical. It must be maintained and kept free of contaminants and within designed operating parameters to provide the longest possible life for the pumps & motors.

### Beware of Hydraulic Oil Contamination

Oil contamination can be in three forms; solid, liquid, or gas which generally relates to dirt, water or air. A high concentration of any of these contaminants can degrade machine performance and reduce component lifespan resulting in premature failure. The onboard filters remove solid particulate only and are designed to primarily “maintain” a clean system, not to “clean-up” a system. It is up to you to eliminate contamination during any service work that involves the addition or changing of the hydraulic oil.

## 9.5 System Temperature

Hydraulic oil will break down and lose lubrication qualities in high temperature conditions. It is important to monitor temperatures regularly in the system as a proactive measure to identifying a potential problem before it results in a premature or even catastrophic failure.

In addition to the on-board temperature monitors, we suggest you use an infrared temperature gun to first establish a baseline by measuring and tracking the reservoir temperature and each motor on a weekly basis. The machine should be pulled from service if the reservoir temperature reaches 60 degrees Celsius as there will be insufficient lubrication for the bearings.





## 9.6 Periodic Checks

In addition to temperature it is also important to keep an eye on fluid levels, filter bypass indicators and unusual noise development. Low fluid levels would not only indicate fluid loss but would also increase the risk of pulling harmful air into the system. If the bypass indicators on the filter are indicating bypass, much of the fluid is being circulated without being filtered. Immediate action to change out the filters is mandatory.

## 9.7 Maintenance

- Generally speaking, axial piston transmissions are maintenance-free. As stated earlier, the service life of the hydrostatic pump motors depends on the quality of the hydraulic fluid. For this reason Rexroth recommends that the hydraulic fluid has to be changed at least every 2 years or every 2000 operating hours or that it has to be analyzed by a laboratory.
- Periodically check operation of the park brake release circuit with the hand pump to open the free-wheel valves in the traction manifold and disengage the park brake.

## 9.8 Troubleshooting

**If the OLYMPIA Millennium H does not move in either direction with engine running and the accelerator is depressed.**

Check fluid level

Determine the presence of charge pressure of 20-25 bar at G port on drive manifold.

If the charge pressure is below 10 bar, shut the machine down and check electrical connections at pump & foot pedal and all influencing devices in the circuit (ie. selector, seat interlock, park brake release solenoid). If the engine is loading, check to make sure the park brakes are releasing by checking the operation of the brake release valve.

#### **If OLYMPIA Millennium H will move in one direction only**

Check to see if the pump coils are both functioning. This can be done by switching the connections over to see if the machine changes the direction it is operating. If the problem follows a specific coil, change that coil immediately.

Alternatively, you can install gauges at X1, X2 on the pump and with the brakes left engaged, give the foot pedal partial half stroke in forward and reverse and record the readings.

If no pressure at X1, X2 and you are certain of an input signal, the control valve should be changed by a qualified technician.

#### **Machine driving slow or with reduced power**

Confirm the charge pressure, temperatures, sound levels and hours of service and communicate these and any other abnormalities to the machine manufacturer

#### **If the OLYMPIA Millennium H is not driving straight**

The OLYMPIA Millennium H utilizes a single pump that divides flow evenly between left side and right side during straight line driving and self-adjusts when cornering. A problem with any one of the motors would likely result in a tendency to drift offline with a simultaneous rise in operating temperature at the suspect motor and the oil reservoir.

Check the temperatures and compare them to your baseline measurements. The most probable issue will be on whichever side the machine is drifting toward. (i.e. if the machine drifts right, check the right side motors first.

Also check the function of each of the bypass valves in the traction block



## 10 APPENDIX

Hydraulic Schematics

1.0 Drive Systems

2.0 Auxiliary System

2.1 Auxiliary System Millennium HD

Documentation provided by the company DMC (Controllers)

Documentation provided by the company Victron

Documentation provided by the company Siemens

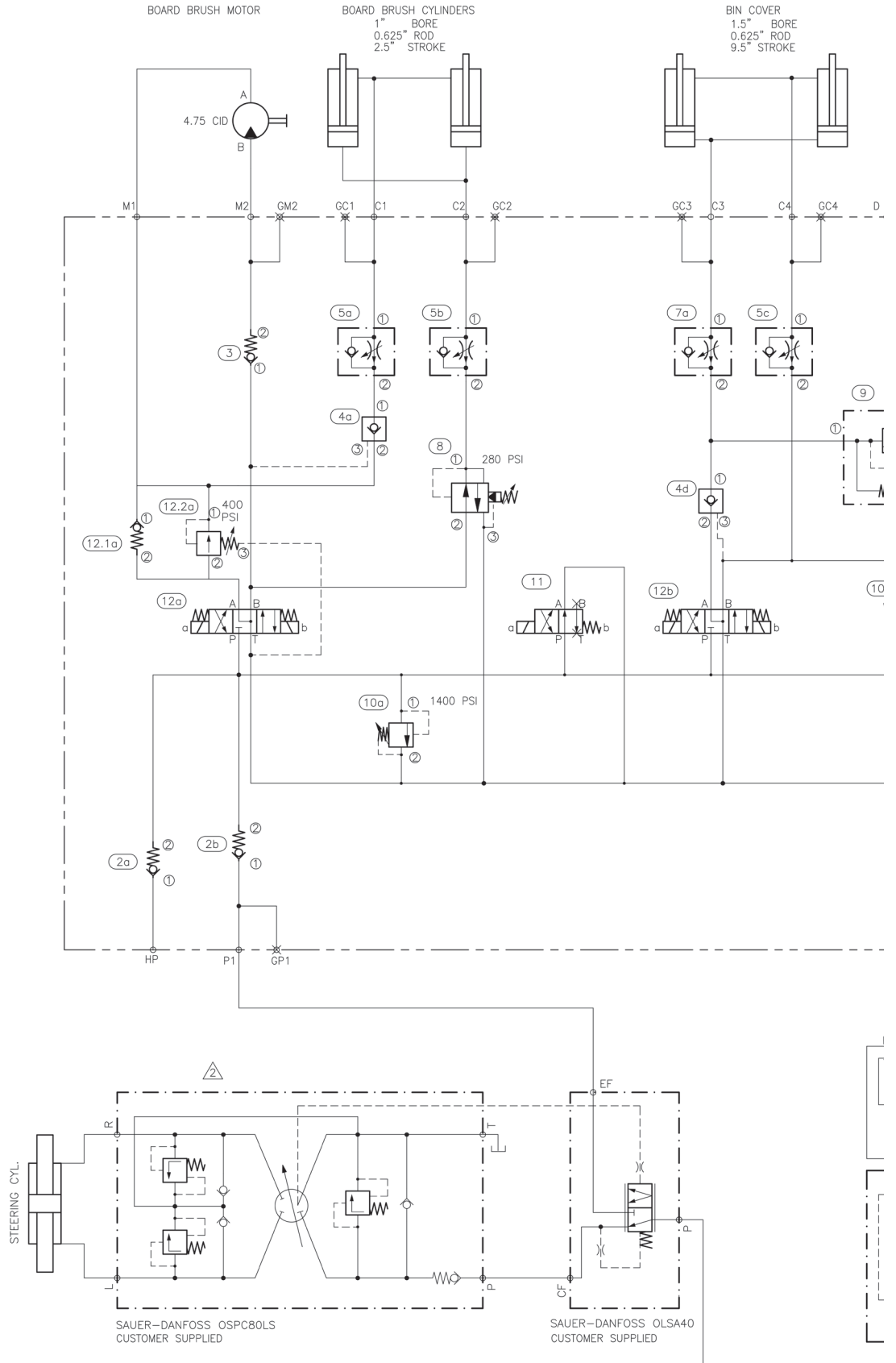
Documentation provided by the company Safe T Alert

Documentation provided by the company DMC (Converter)

Electric Drawings

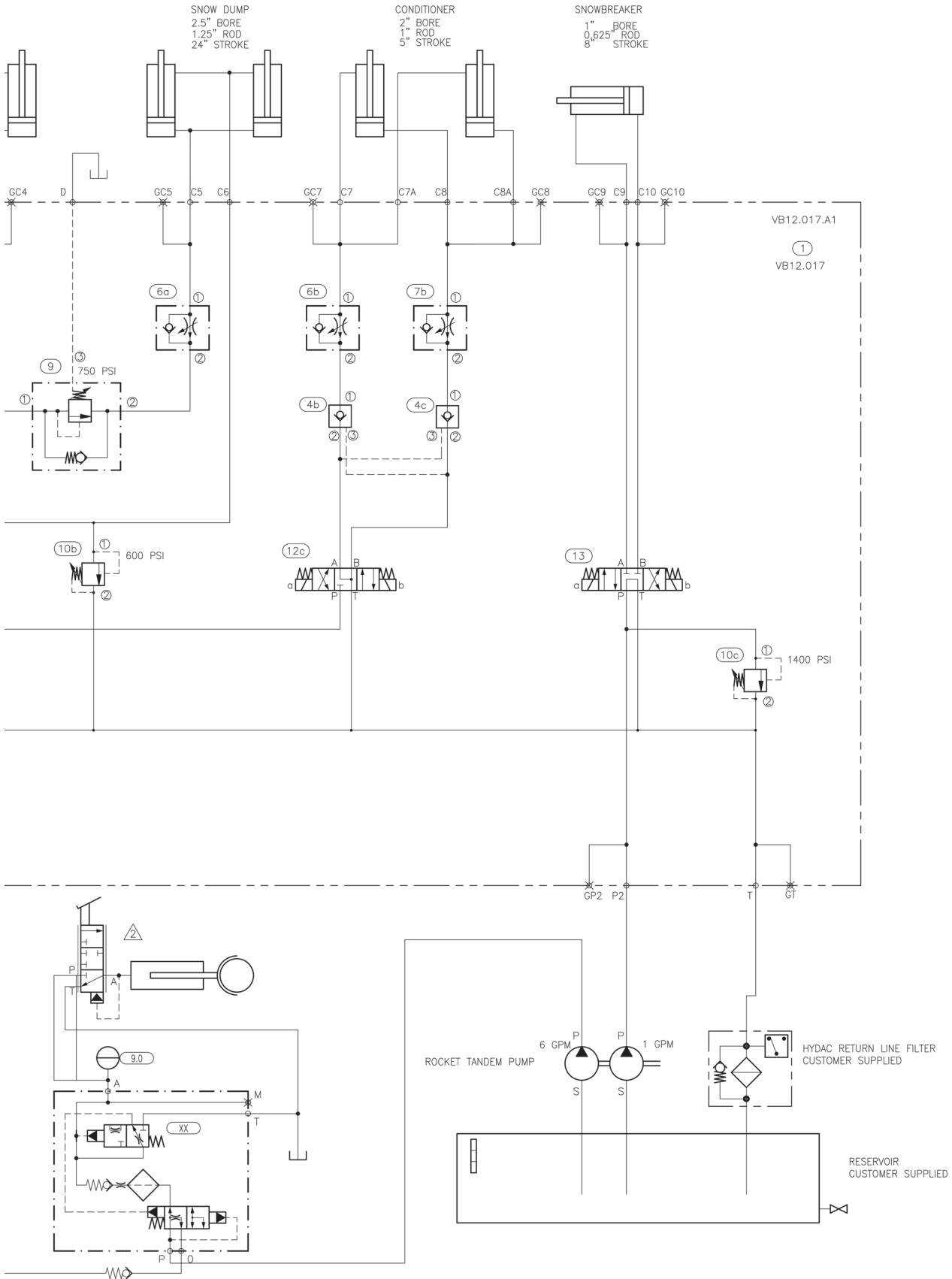
Grease Plan

Battery Information





# MILLENNIUM 7





## 6.6 Safety Circle Check

Always check the following before proceeding into the OLYMPIA room. Check the door for heat with the back of your hand. If it is hot, evacuate the building and call the fire department. If there is no heat open the door a crack and smell for fuel leaks. If you smell something, close the door, evacuate the building and call the fire department. If no smell is present, proceed into the OLYMPIA room. Automatic lights should never be installed in the OLYMPIA room.

Check your log book for any remarks made by the last shift as to condition of the OLYMPIA Place keys for the OLYMPIA in your pocket for the duration of the circle check. The OLYMPIA should be stored over night with the snow bin in the up position with the snow bin safety supports engaged and all water tanks drained.

Starting at the left rear wheel, inspect the tire and rim for damage. Inspect the studs to make sure they are tight and secure in the tire. Inspect the lug nuts to ensure tightness and check the tire pressure for proper inflation.

- Inspect the valve block area for leaks Inspect all valve block wiring connections Inspect all hydraulic hoses for wear and leaks
- Inspect the left side body panels for any new damage.
- Inspect the board brush making sure to check for any dirt or debris stuck in the brush Inspect the roller for free movement Physically grab the board brush arm, making sure it is secure and has no play.
- Looking behind the left front wheel inspect the hoses in the area for leaks and or damage.
- Inspect the left front tire and rim for damage.
- Inspect the studs to make sure they are tight and secure in the tire.
- Inspect the lug nuts to ensure tightness and tire pressure for correct inflation.
- Inspect the bumper wheel for free movement.
- Inspect the hydraulic tank sight gauge for proper level and colour of fluid, (2/3 - 3/4 full and bright red in colour).
- Inspect all of the engines electrical connections on the left hand side.
- Inspect the engine for any oil or coolant leaks.
- Inspect the steering linkage.
- Properly secure the left hand side snow bin support in the upright position.
- Moving around the front of the OLYMPIA check inside the bin before walking in front for anything in the snow tank.
- Inspect under the OLYMPIA for any leaks or debris that may be there.
- Inspect the headlights for proper placement.
- Inspect the front right tire and rim for damage.
- Inspect the studs to make sure they are tight and secure in the tire.
- Inspect the lug nuts to ensure tightness and tire pressure for correct inflation.
- Looking behind the left front wheel inspect the hoses in the area for leaks and or damage.



- Inspect the condition of the serpentine belt for proper placement and damage.
- Inspect the hydraulic tank sight gauge on the right hand side for proper level and colour of liquid,( 2/3 - 3/4 full and bright red in colour).
- Inspect the engine oil for proper level using the dipstick.
- Inspect the radiator fluid for proper fill level.
- Inspect all radiator coolant lines for leaks and wear.
- Inspect all of the engines electrical connections on the right hand side.
- Inspect the engine for any oil or coolant leaks.
- Inspect the steering linkage Properly secure the right hand side snow bin support in the upright position.
- Inspect the flood water tank over-flow hoses to ensure proper placement.
- Inspect all 4 of the flood water tanks clamps to ensure proper placement.
- Inspect the flood water tank drain valve, making sure it opens and closes freely.
- Close the flood water tank drain valve.
- Inspect the right hand side of the body for damage.
- Inspect the right hand side of the valve block for leaks. All adjuster nuts on the valve block must be tight.
- Inspect all hoses in the area for leaks, damage and wear
- inspect the rear right tire and rim for damage.
- inspect the studs to make sure they are tight and secure in the tire.
- Inspect the lug nuts to ensure tightness and tire pressure for correct inflation.
- Inspect the wash water tank drain valve, making sure it opens and closes freely.
- Close the wash water drain valve.
- Remove and inspect the wash water basket and make sure it is free of dirt and debris .
- Moving to back of the OLYMPIA, unstrap and inspect the LPG tanks for fuel.
- Always make sure you have one full tank on board.
- When replacing a tank, inspect the tank for damage as well as the o-ring in the tank connection for proper placement.  
ALWAYS WEAR YOUR PPE WHEN CHANGING A LPG TANK!
- Dress the straps of the tanks to ensure the tanks are secure
- Turn on both LPG tanks.
- Check all LPG connections for leaks using soapy water.
- When turning on LPG tanks make sure to turn them on slowly as to not trip the excess flow valve.
- Run your hand on the bottom of the right hand side runner of the conditioner from BACK TO FRONT, check for burrs on the runner and note the blade position. If there are burrs present use a flat file to remove them.



- The blade must be above the runner to prevent damage to the ice. NEVER RUN YOUR HAND FROM FRONT TO BACK ON THE RUNNER!!!
- Inspect the chain for proper deflection,( 1/4"-1/2").
- Rotate the auger until you see the master link and make sure the retaining clip is present and secure.
- Inspect the quick couplers for leaks and proper connection Inspect the right hand side auger bearing for proper operation.
- Taking hold of the centre of the auger shaft check for movement north, south, east and west. The bearing should have no play.
- Inspect the squeegee for proper installation and damage. A damaged squeegee or improper instalment will effects the wash waters ability to work and the life of the impeller.
- Flip the flood towel over and inspect for dirt, debris and wear. The towel is the last thing to touch the ice, it must be clean and in good report.
- Inspect both flood water and wash water valve handles for ease of operation and close both valves.
- Inspect the hand wheel for free movement, turning the blade both up and down 2 turns returning it to the original location.
- Inspect the right hand side auger bearing for proper operation.
- Take hold of the centre of the auger shaft and move it to check for movement north, south, east and west. The bearing should have no play.
- Run your hand on the bottom of the left hand side runner of the conditioner from BACK TO FRONT, check for burrs on the runner and note the blade position. If there are burrs present use a flat file to remove them. The blade must be above the runner to prevent damage to the ice. NEVER RUN YOUR HAND FROM FRONT TO BACK ON THE RUNNER!!!
- Inspect the conditioner bumper wheel making sure it spins freely.
- Replace all conditioner cover plates and retaining pins
- Open the compartment under the seat, flip the switch to hand pump mode and operate the system. You can lower the conditioner slightly for this procedure. When pumping the conditioner should fully rise and then the snow bin should start to rise. Flip the hand pump switch back to drive.
- Removing the key from your pocket place it in the ignition
- Using the 3 points of contact, safely mount the OLYMPIA. Never use the arm rest as a grab handle!
- Start the OLYMPIA and make sure the OIL PRESSURE gauge is operating and you have oil pressure. If you do not, shut off the OLYMPIA immediately.
- Using the RPM controller, bring the OLYMPIA up to 1500RPM.
- Inspect the tachometer for proper function.





- Inspect the engine temperature gauge for proper function.
- Inspect the voltmeter for proper function.
- Test the horn.
- Turn on the headlights and check for the reflection of both the headlights and tail lights.
- Lower and raise the conditioner.
- Turn on your elevators for at least one full cycle of the automatic snow breaker system.
- Lower the snow bin Cycle the snow breaker using the snow breaker bypass button to ensure proper operation.
- Operate the LPG cross over and run the OLYMPIA off each tank for a few minutes to ensure proper operation.
- When operating the LPG crossover make sure to turn it slowly as to not trip the excess flow valve.
- Dial back the RPM Controller until the OLYMPIA is at an idle and turn the OLYMPIA off.
- Fill the flood making water with hot water. Never leave the hose unsupervised while filling and beware of the danger that the hot water can cause.
- Fill the wash water tank with COLD water only. Never leave the hose unsupervised while filling.
- Test both the wash water and flood water to make sure both systems have unrestricted flow.
- Using your log book, log any concerns of the circle-check. Make sure to log in the date and your name.

You have now completed the circle-check and are ready to proceed onto the ice surface and begin the resurfacing process. Make sure to always use the horn when crossing any pedestrian areas.