Electronic Service Manuals

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Phone (517) 484-9312 or (800) 331-3339
2011 N. High St. -- Lansing, Michigan -- 48906
Fax: (517) 484-9836
Email: CustServe@Michco.com
Web site: www.Michco.Com
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Serving the Cleaning Industry Since 1922

Nilfisk Cyclone

INSTRUCTIONS FOR USE
ORIGINAL INSTRUCTIONS

MODEL: 56380676

10/09
FORM NO. 56041819

English

Printed in USA

Nilfisk
setting standards

TABLE OF CONTENTS

READ ALL INSTRUCTIONS BEFORE USING

CAUTION AND WARNING SYMBOLS

Nilfisk uses the symbols below to signal potentially dangerous conditions. Always read this information carefully and take the necessary steps to protect personnel and property.

GENERAL SAFETY INSTRUCTIONS

Specific Cautions and Warnings are included to warn you of potential danger of machine damage or bodily harm.

⚠ DANGER!

THIS SYMBOL IS USED TO WARN OF IMMEDIATE HAZARDS THAT WILL CAUSE SEVERE PERSONAL INJURY OR DEATH.

* This machine emits exhaust gases (carbon monoxide) that can cause serious injury or death; always provide adequate ventilation when using machine.

⚠ WARNING!

THIS SYMBOL IS USED TO CALL ATTENTION TO A SITUATION THAT COULD CAUSE SEVERE PERSONAL INJURY.

* This machine shall be used only by properly trained and authorized persons.
* While on ramps or inclines, avoid sudden stops when loaded. Avoid abrupt sharp turns. Use low speed down hills.

High speed operation is designed only for use on level surfaces.

* To avoid hydraulic oil injection or injury always wear appropriate clothing and eye protection when working with or near hydraulic system.
* Turn the key switch off (O) and disconnect the batteries before servicing electrical components.
* Never work under a machine without safety blocks or stands to support the machine.
* Do not dispense flammable cleaning agents, operate the machine on or near these agents, or operate in areas where flammable liquids exist.
* Ear plugs or other hearing protection devices are mandatory. The engines, pumps, and Cyclone Cleaning Head all produce decibel levels high enough to cause hearing loss.

⚠ CAUTION!

THIS SYMBOL IS USED TO CALL ATTENTION TO A SITUTION THAT COULD CAUSE MINOR PERSONAL INJURY OR DAMAGE TO THE MACHINE OR OTHER PROPERTY.

* This machine is only approved for hard surface use.
* This machine is not suitable for picking up hazardous dust.
* When operating this machine, ensure that third parties (particularly children) are not endangered.
* Before performing any service function, carefully read all instructions pertaining to that function.
* Do not leave the machine unattended without first turning the key switch off (O), removing the key and applying the parking brake.
* Turn the key switch off (O) and remove the key before opening any access panels.
* Take precautions to prevent hair, jewelry, or loose clothing from becoming caught in moving parts.
* Before use, all doors and hoods should be properly latched.
* Do not use on surfaces having a gradient exceeding that marked on the machine.

NOTES:

- Pay attention to the yellow decals on this machine.
- If you have any questions, contact your supervisor or your local Nilfisk Industrial Dealer.
- Should your machine malfunction, do not attempt to correct the problem.
- Only a trained company mechanic or an authorized Nilfisk Dealer Service person shall make repairs to this equipment.
- The maximum rated incline during operation in 24".
- Reference the separately supplied engine manufacturer's maintenance and operator manuals for more detailed engine specification and service data

SAVE THESE INSTRUCTIONS

SAFETY RECOMMENDATIONS

Before Operating Equipment

Equipment and Clothing

Standard Practice & Procedures

This information was prepared to aid in the identification of potentially unsafe conditions when using high-pressure waterblast equipment. These practices describe how to use high-pressure waterjets for cleaning hard surfaces. These practices do NOT replace the training necessary to operate and maintain high-pressure waterjet systems. It should be noted that other potential hazards might exist which have not been mentioned in this manual.

BEFORE OPERATING EQUIPMENT:

Before operation of this equipment, it is important that you read the Owner's Manual for each of the component parts installed in your machine. It is especially important to read and understand all of the safety information included in the manuals. Failure to do so could result in damage to the equipment, serious injury or death to the operator and may void any and all warranties associated with this equipment.

⚠ WARNING!

This equipment has:
MOVING PARTS at HIGH RATES OF SPEED
VERY HOT WATER
HIGH PRESSURE WATER
DIESEL FUEL

In all cases, Nilfisk products are sold with the understanding that the purchaser agrees to **THOROUGHLY TRAIN ALL OPERATING AND MAINTENANCE PERSONNEL IN THE CORRECT AND SAFE OPERATION AND MAINTENANCE OF THE CYCLONE SYSTEM.**

⚠ WARNING!

Do NOT attempt to change Original Equipment Manufacturer (OEM) parts or equipment. Use of non-OEM parts could result in damage to the equipment, serious injury or death to the operator and may void any and all warranties associated with this equipment.

EQUIPMENT & CLOTHING

1 Ear plugs or other hearing protection devices are mandatory. The engines, pumps, and Cyclone Cleaning Head all produce decibel levels high enough to cause hearing loss.

2 Leather gloves should be worn at all times. The Cyclone SYSTEM uses 160°F water. High-pressure and return hoses and couplings get hot enough to burn you.
3 Safety glasses are recommended when operating the Cyclone System.
4 Long pants are recommended when operating the Cyclone System.

STANDARD PRACTICE & PROCEDURES

1 After the NILFISK CYCLONE has come to a complete stop, turn off the engine and apply parking brake. Never leave the NILFISK CYCLONE engine running unattended.
2 A strong vacuum is formed from the rotation of the Cyclone cleaning head. Therefore, all surface plates such as manhole covers, utility access covers and large debris must be secured, removed or avoided during the cleaning process.
3 All surfaces should be swept prior to operating the Nilfisk Cyclone, hard surface cleaner.
4 The Nilfisk Cyclone is not designed to pick up particulate matter such as sand.

⚠ WARNING!

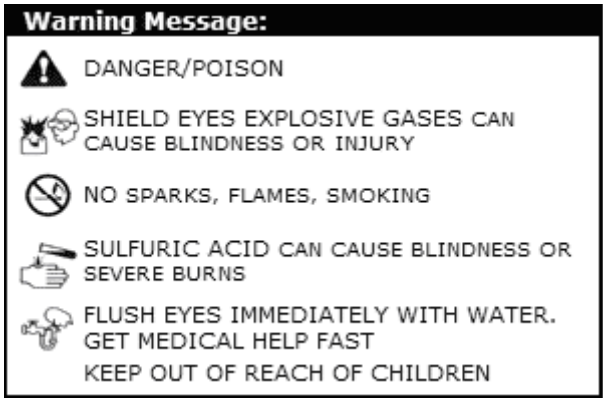
These items could cause extensive and costly damage to the blades and spray bars and serious injury or death to the operator.

1 Always turn off the engine before fueling.
2 Never point the hand-held spray gun at yourself or another person. Water coming out of the gun is at a high enough pressure to cause injury or death.
3 This equipment should not be used without consulting all applicable standards, guidelines, or recommendations of the United States Occupational Safety and Health Administration (OSHA), the American Society of Testing Materials (ATSM), the National Standards Institute (ANSI), and the instructions, recommendations and standards of Nilfisk. Nilfisk does not guarantee that the practices described and the recommendations contained in this manual will prevent harm or injury, even when such equipment is properly used in conformity with the recommended practices. In the event of bodily injury, nothing in this manual should substitute for proper medical care.

BATTERY SAFE HANDLING GUIDELINES

FIGURE 1

- Always wear proper eye, face and hand protection when working with battery
- Never lean over battery while boosting, testing, or charging
- Exercise caution when working with metallic tools or conductors to prevent short circuits and arcing
- Keep terminals protected to prevent accidental shorting
- Replace any battery that has signs of damage to the terminals, case, or cover
- Install battery in a ventilated area for operation and during charging
- **DO NOT ADD WATER TO THE OPTIMA BATTERY**



Battery Maintenance

The OPTIMA battery is truly maintenance free. When charged properly you will not have to worry about leaking, corrosion, or gassing. Periodically inspect your battery terminal connections to ensure they are clean, snug, and protected from the elements.

Open circuit voltage (OCV) and storage:

OCV: 34 >12.8 volts
(for a fully charged battery)
D34 >13.0 volts
(for a fully charged battery)

Battery Storage

Because of the high purity lead grid in the OPTIMA battery, it has a self-discharge rate much lower than conventional flat-plate batteries. This means the OPTIMA can sit for longer periods retaining enough charge to start your vehicle. Depending on storage temperature, the OPTIMA can usually sit for 8 to 12 months and start most vehicles.

When possible, store your battery in a cool, dry location. Check the battery voltage every 6 months and charge if it falls below 12.6 volts.

Remember, newer vehicles with on-board electronics such as computers, LCD screens, game systems, GPS units, clocks, etc., require battery power to retain system memory while the vehicle is parked. If the vehicle is to be stored for long periods you should use a maintenance charger to compensate for this drain. This charger should be voltage regulated between 13.2 - 13.8 volts, 1 amp maximum. On older vehicles, without electronics, disconnect the battery cables when the vehicle is not being used for extended periods.

INTRODUCTION

This manual will help you get the most from your **Nilfisk Cyclone**. Read it thoroughly before operating the machine.
This product is intended for commercial use only.

PARTS AND SERVICE

Repairs should be performed by Nilfisk service personnel using Nilfisk original replacement parts and accessories.
Call Nilfisk for repair parts or service. Please specify the model and serial number when discussing your machine.

NAME PLATE

The model and serial number of your machine are shown on the nameplate on the machine. This information is needed when ordering repair parts for the machine. Use the space below to note the model and serial number for future reference.

MODEL _____

SERIAL NUMBER _____

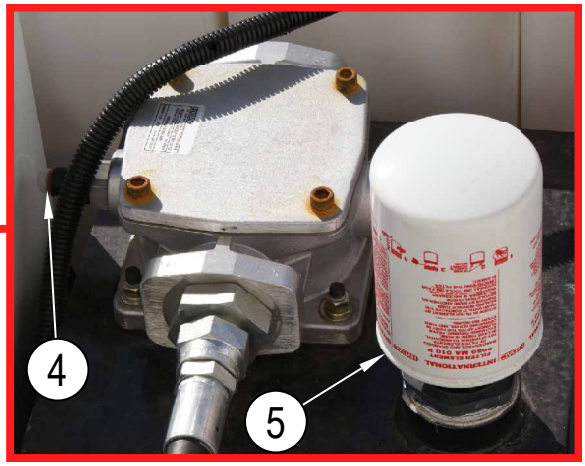
UNCRATING THE MACHINE

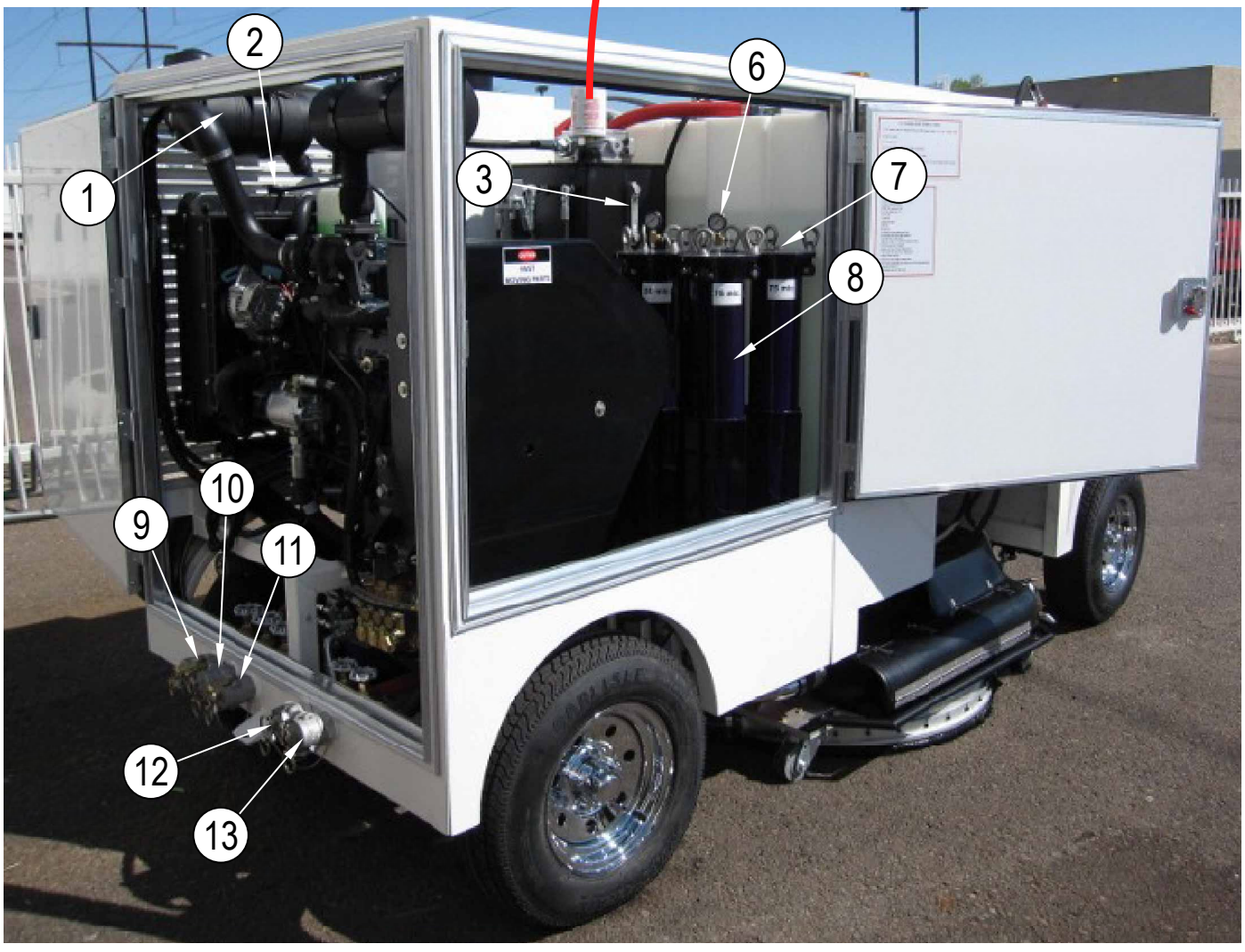
1 Upon delivery, carefully inspect the machine for damage. If damage is evident, contact the trucking company immediately to file a freight damage claim.
2 Read the instructions in the “Preparing the Machine For Use” section of this manual. Read the instructions in the “Operating Controls” and “Operating the Machine” sections of this manual before starting the engine.
3 Remove the binding straps.
4 Verify the engine oil level, engine coolant level, hydraulic oil level and the high pressure pump oil level.
5 Verify sufficient diesel fuel is in the fuel tank for transporting the machine out of the shipping container.
6 Keep your foot lightly on the brake pedal until the machine is out of the container. Slowly drive the NILFISK CYCLONE out of the shipping container.

KNOW YOUR MACHINE

As you read this manual, you will occasionally run across a bold number or letter in parentheses, i.e., **(2).** These numbers refer to an item shown on these pages unless otherwise noted. Refer back to these pages whenever necessary to pinpoint the location of an item mentioned in the text.
NOTE: Refer to the service manual for detailed explanations of each item illustrated on these pages.

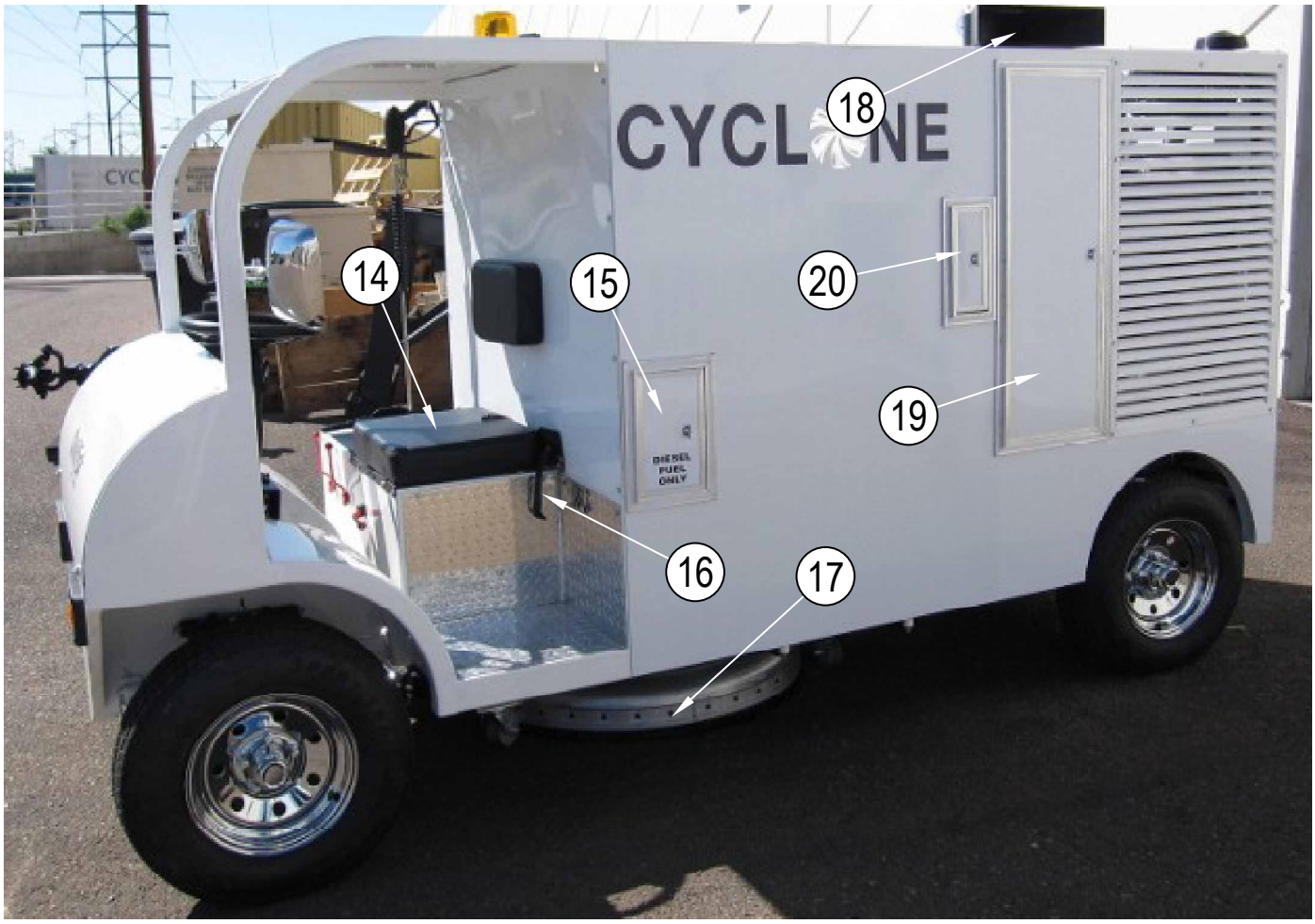
1 **Engine Air Filter**
2 **Radiator Cap**
3 **Hydraulic Level Gauge**
4 **Hydraulic Filter Pop-Out**
5 **Hydraulic Breather Filter**
6 **Water Filter Pressure Gauges**
7 **Bleed Valves**
8 **Water Filters**
9 **Reclaim #1 Drain**
10 **Reclaim #2 Drain**
11 **Reclaim #3 Drain**
12 **Filter Drain**
13 **Fresh Water Drain**





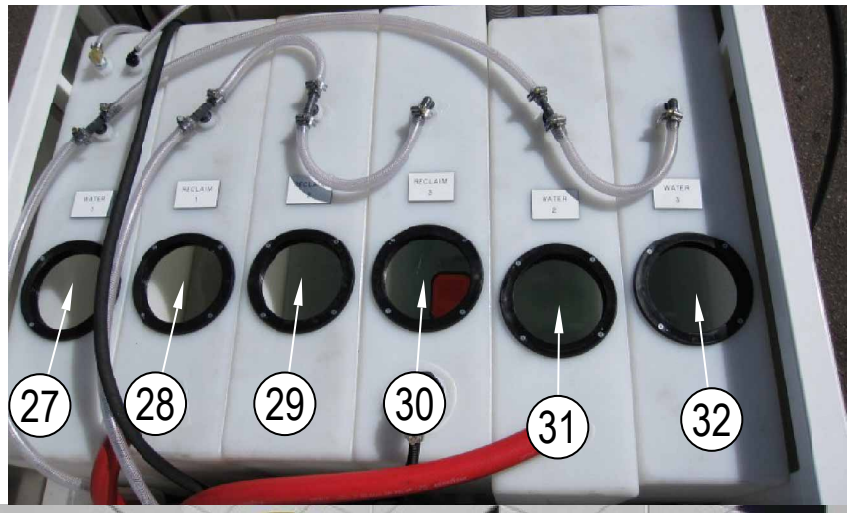
KNOW YOUR MACHINE

14 Operator Seat
15 Fuel Access Door
16 Seat Belt
17 Cyclone Cleaning Head
18 Burner Exhaust
19 Hot Water Coil, Burner, Fuel Filter Access Door
20 Remote Water Fill Connection



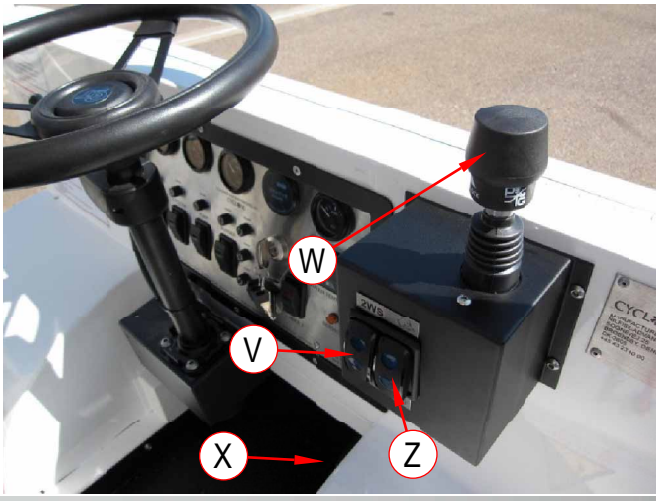
KNOW YOUR MACHINE

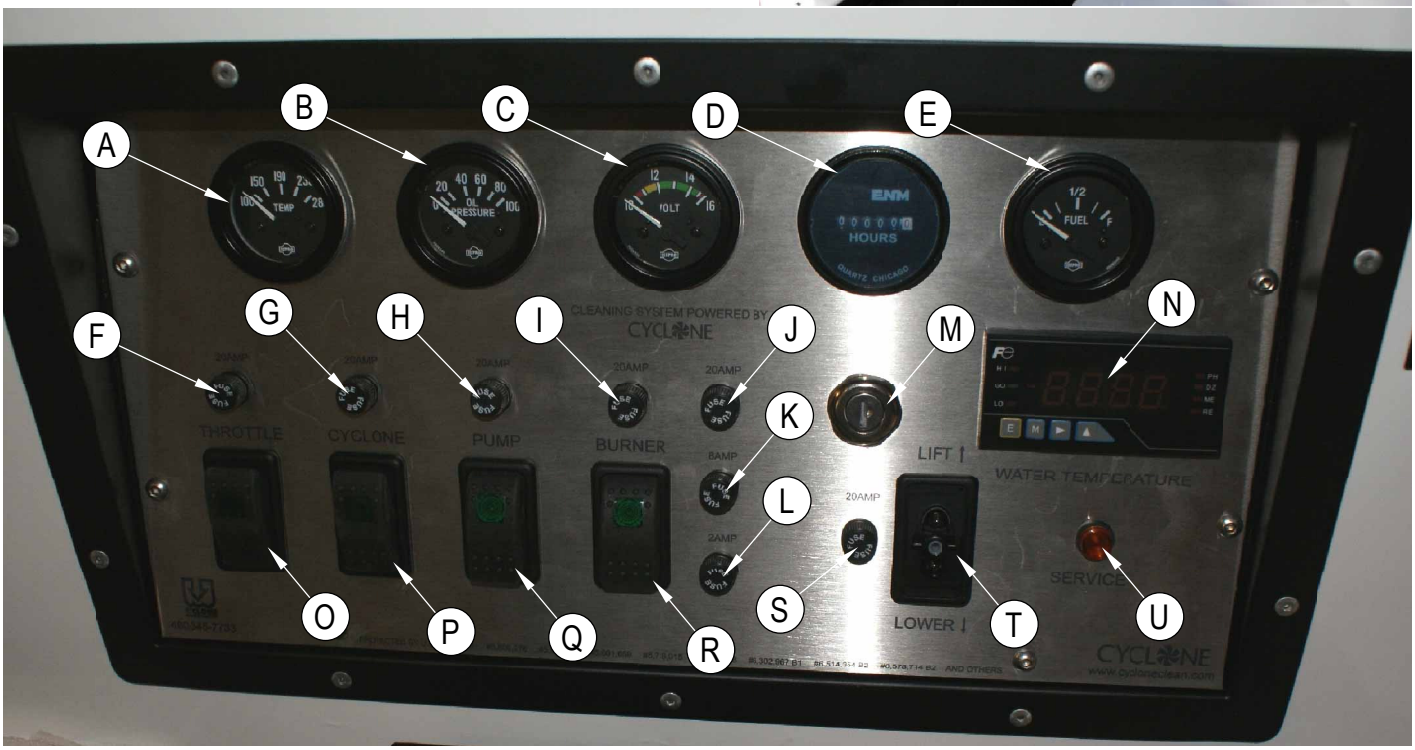
21 Cyclone Breather Tubes
22 Cleaning Wand
23 Parking Brake
24 Wand Control Lever
25 Curb Cleaner Lever
26 Recovery Tank / Debris Tray
27 Fresh Water Tank #1
28 Reclaim Tank #1
29 Reclaim Tank #2
30 Reclaim Tank #3
31 Fresh Water Tank #2
32 Fresh Water Tank #3
33 Cyclone Pressure Control Lever



KNOW YOUR MACHINE

A Engine Coolant Temp Gauge
B Engine Oil Pressure Gauge
C Electrical System Volt Meter
D Hour Meter
E Fuel Gauge
F 20 Amp Fuse (throttle)
G 20 Amp Fuse (cyclone)
H 20 Amp Fuse (pump)
I 20 Amp Fuse (burner)
J 20 Amp Fuse
K 8 Amp Fuse
L 2 Amp Fuse
M Ignition Switch
N Water Temperature Controller
O Throttle Switch
P Cyclone Switch
Q Pump Switch
R Burner Switch
S 20 Amp Fuse
T Deck Raise/Lower Switch
U Hi/Lo Water Level Indicator Light
V 2 Wheel / 4 Wheel Steer Switch
W Directional Control Lever
X Brake Pedal
Z high/low speed switch





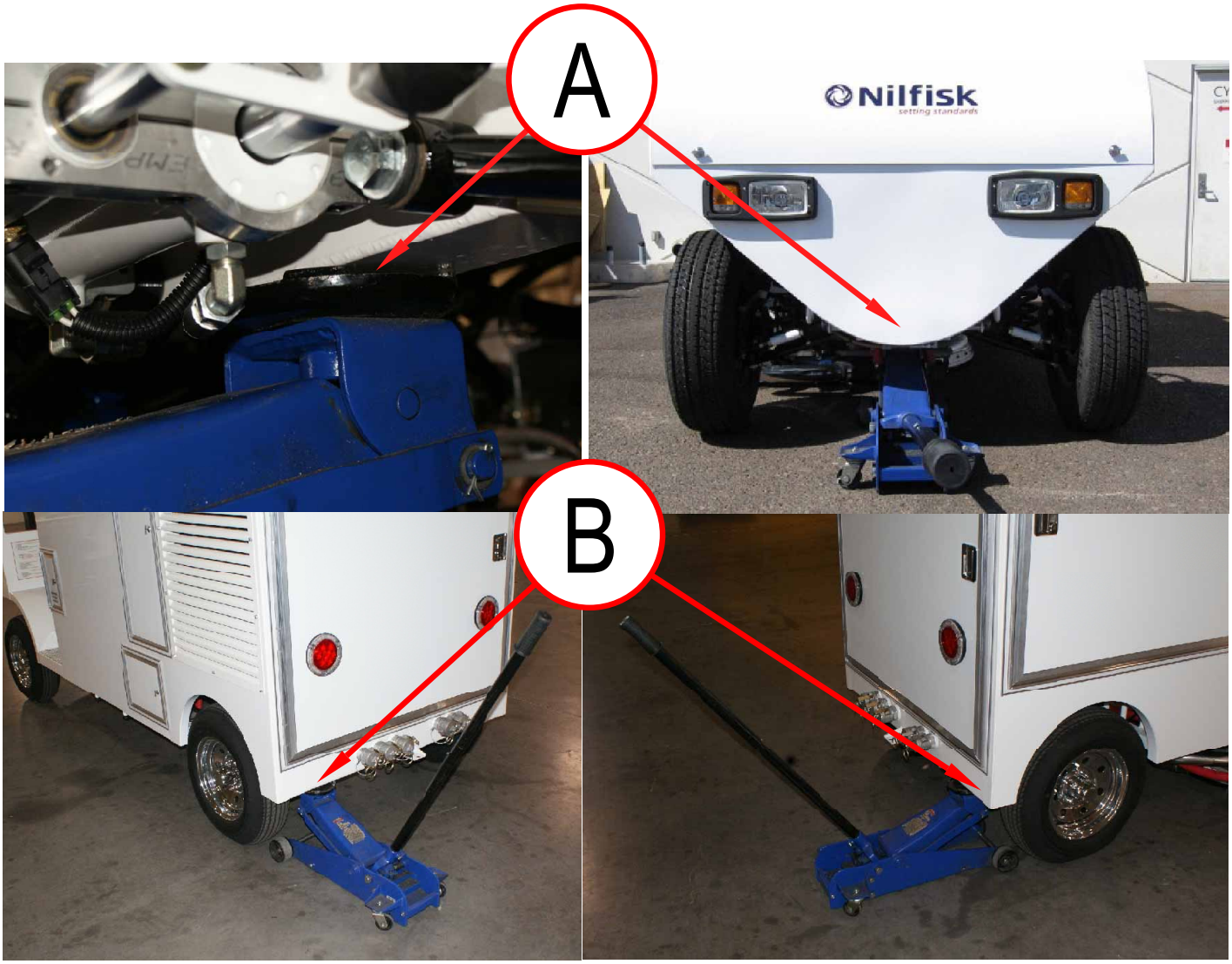
JACKING THE MACHINE

⚠ CAUTION!

Never work under a machine without safety stands or blocks to support the machine.

- When jacking the machine, do so at three designated locations: The front cross-member between the two front tires, and at each side of the rear of the chassis.
- When positioning the jack, take care to avoid hitting the hydraulic cylinders or sense switch!

FIGURE 2



TOWING OR PUSHING THE MACHINE

⚠ CAUTION!

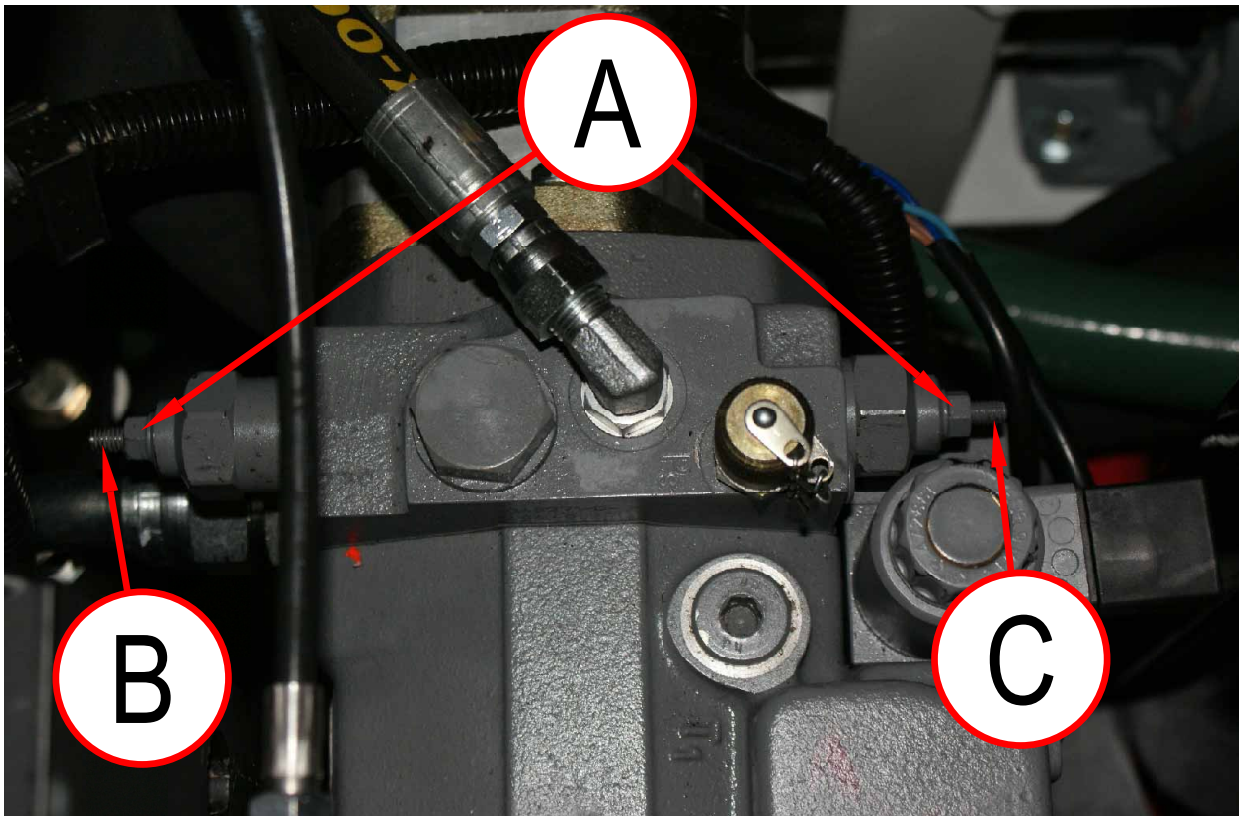
IF THE TOW VALVES ARE NOT PROPERLY ADJUSTED, DAMAGE TO THE HYDRAULIC SYSTEM WILL RESULT.
DO NOT TOW THE MACHINE FASTER THAN A WALKING PACE.
TOW OPTIONS ARE MEANT TO BE USED FOR A SHORT TIME ONLY. DO NOT USE FOR AN EXTENDED PERIOD OF TIME.

Tools Required
13 MM box end wrench
4 mm Allen Wrench

TOW VALVE SETTING
1) To actuate the tow valves, loosen the two lock nuts **(A)**.
2) Turn the two Allen screws **(B & C)** six turns clockwise. Be accurate, as the secondary function of these valves is the high pressure regulation.
3) To disengage, turn the screws counter-clockwise until the exact position of the screws are reset. Torque the locknut to 5ft.lb. (7 Nm)
4) Recheck the high pressure relief settings after tow valves have been repositioned!

A - 13MM Lock Nut
B - 4mm Allen Tow Valve / High Pressure Relief A
C - 4mm Allen Tow Valve / High Pressure Relief B

FIGURE 3



PREP FOR TRANSIT

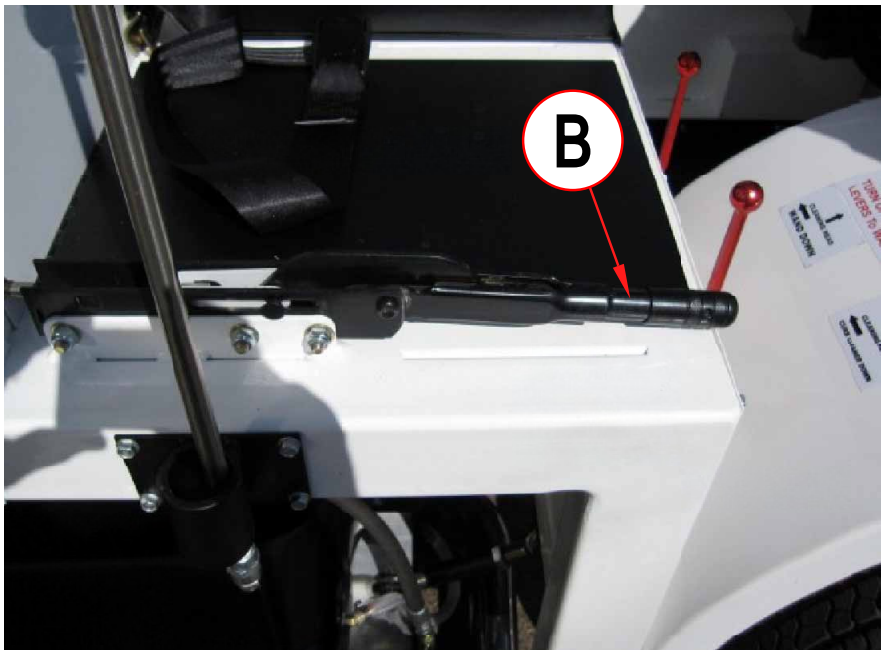
⚠ CAUTION!

NEVER USE CHAINS OR LOAD BINDERS TO SECURE THIS MACHINE. When tying down this machine, only cloth ratchet straps with a minimum capacity of 10,000 lbs are recommended (see picture at right). Be sure to note the proper load rating and tensile strength of the straps to be used. The Nilfisk Cyclone weighs around 4000lbs. dry, and around 6000lbs. full of water. All four corners of the machine shall be secured.

1 Carefully load the machine into the desired position on the trailer.
2 Lower the cleaning head **(A)** (figure 4), and apply the parking brake **(B)** (figure 5).

FIGURE 4

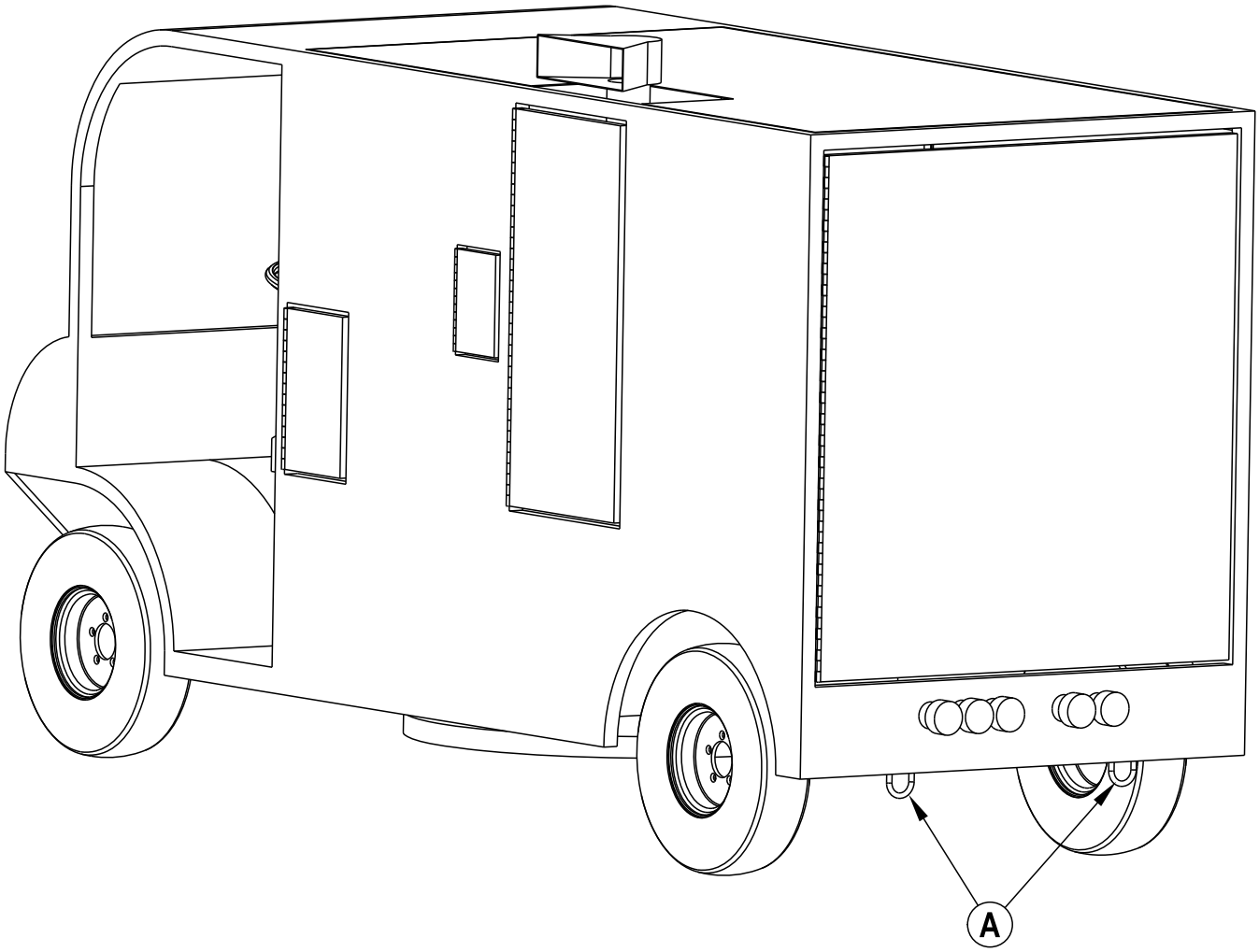
FIGURE 5



PREP FOR TRANSIT

3 Locate the tie down rings **(A)** at the rear of the machine. Use tie down straps hooked into these rings and then hooked to a secure position on the trailer to the rear of the machine and tighten the straps.

FIGURE 6



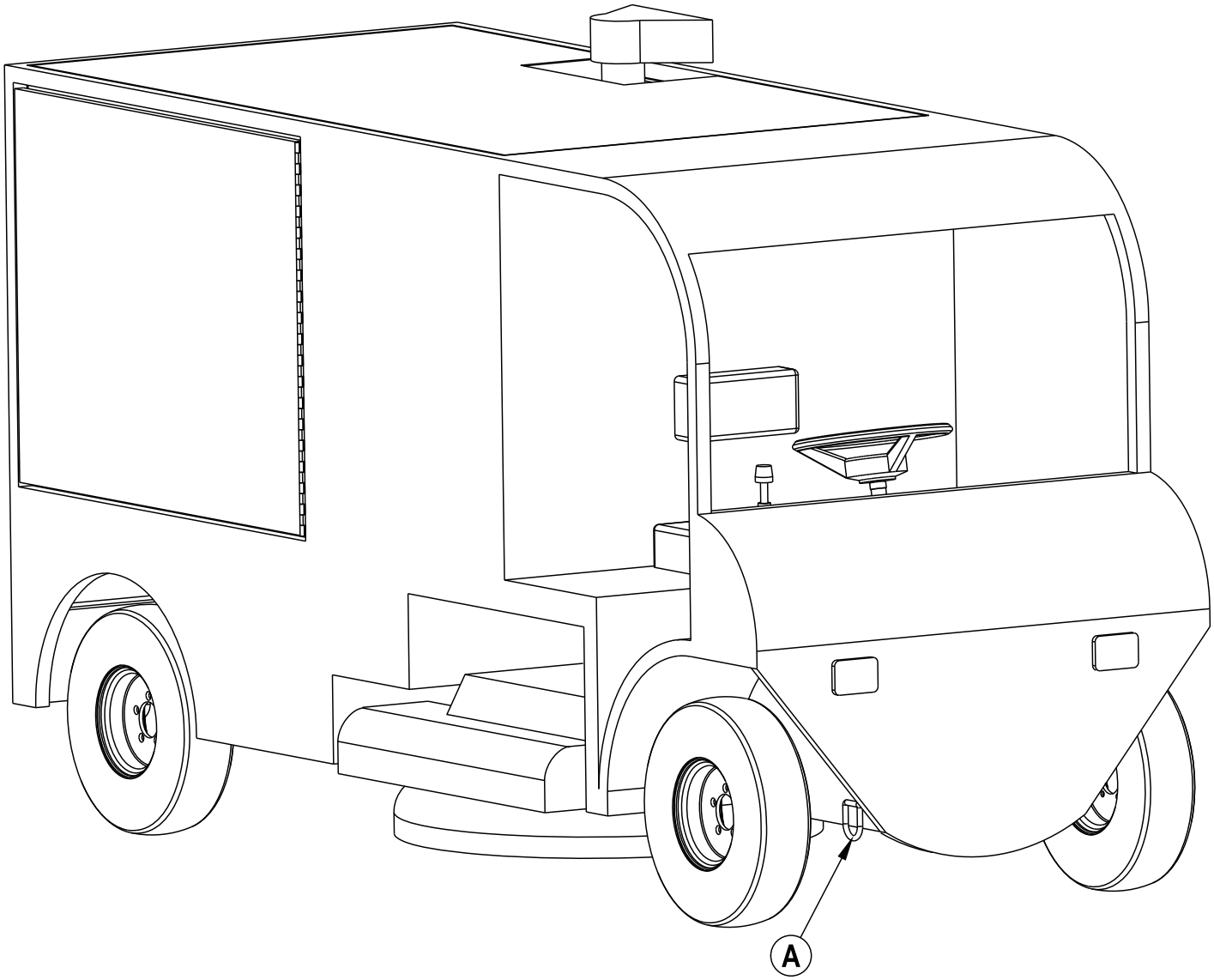
⚠ WARNING!!

DO NOT allow ANY strap to make contact with the body or doors of the machine!!

PREP FOR TRANSIT

4 At the right front corner of the machine, locate the tie down ring **(A)** (figure 7).

FIGURE 7



5 Hook a tie down strap into the ring. Hook the strap to a tie down point on the trailer forward of the machine, and tighten the strap.

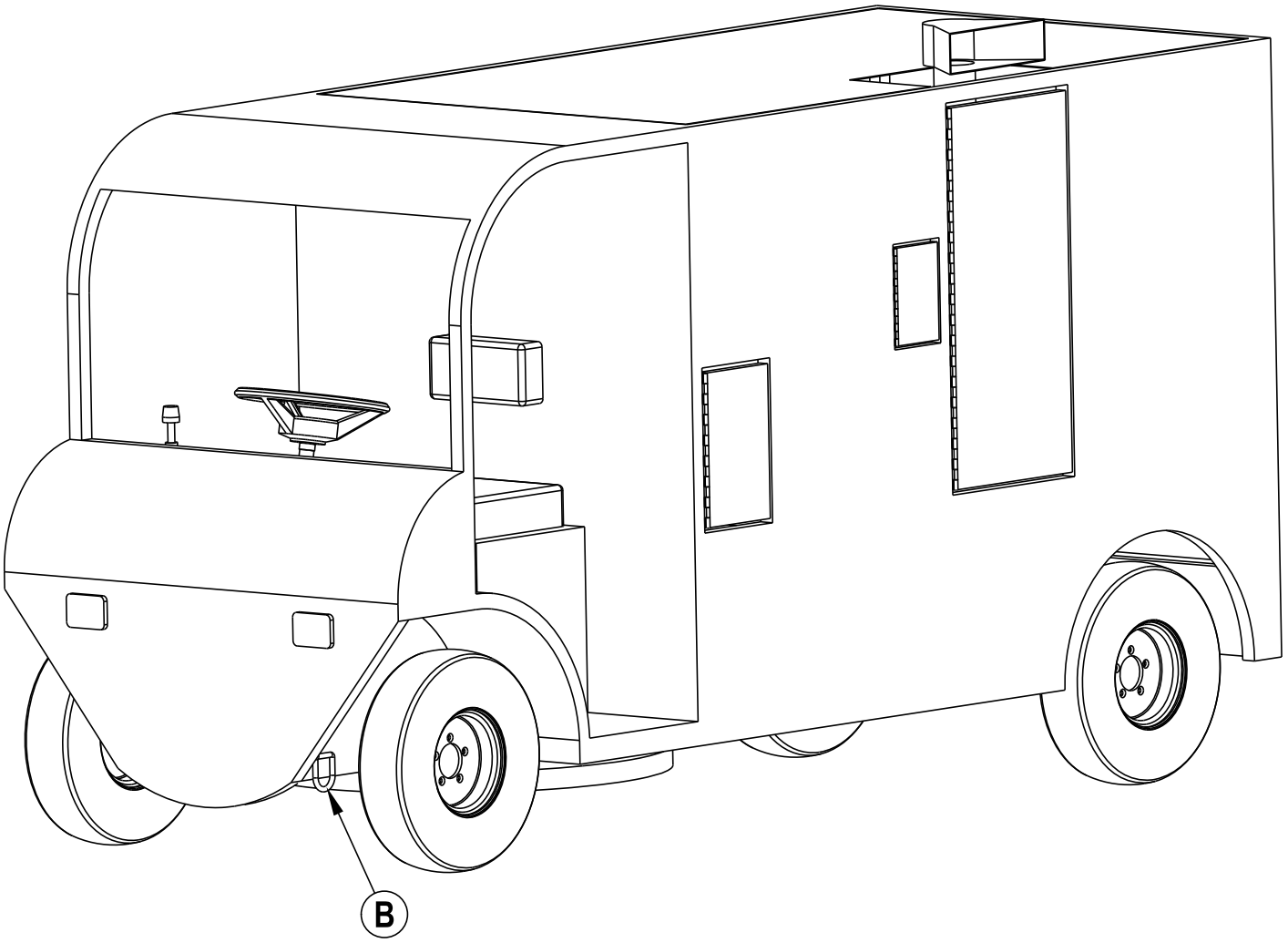
⚠ WARNING!!

DO NOT allow ANY strap to make contact with the body or doors of the machine!!

PREP FOR TRANSIT

6 At the left front corner of the machine, locate the tie down ring **(B)** (figure 8).

FIGURE 8



7 Hook a tie down strap into the ring. Hook the strap to a tie down point on the trailer forward of the machine, and tighten the strap.

⚠ WARNING!!

DO NOT allow ANY strap to make contact with the body or doors of the machine!!

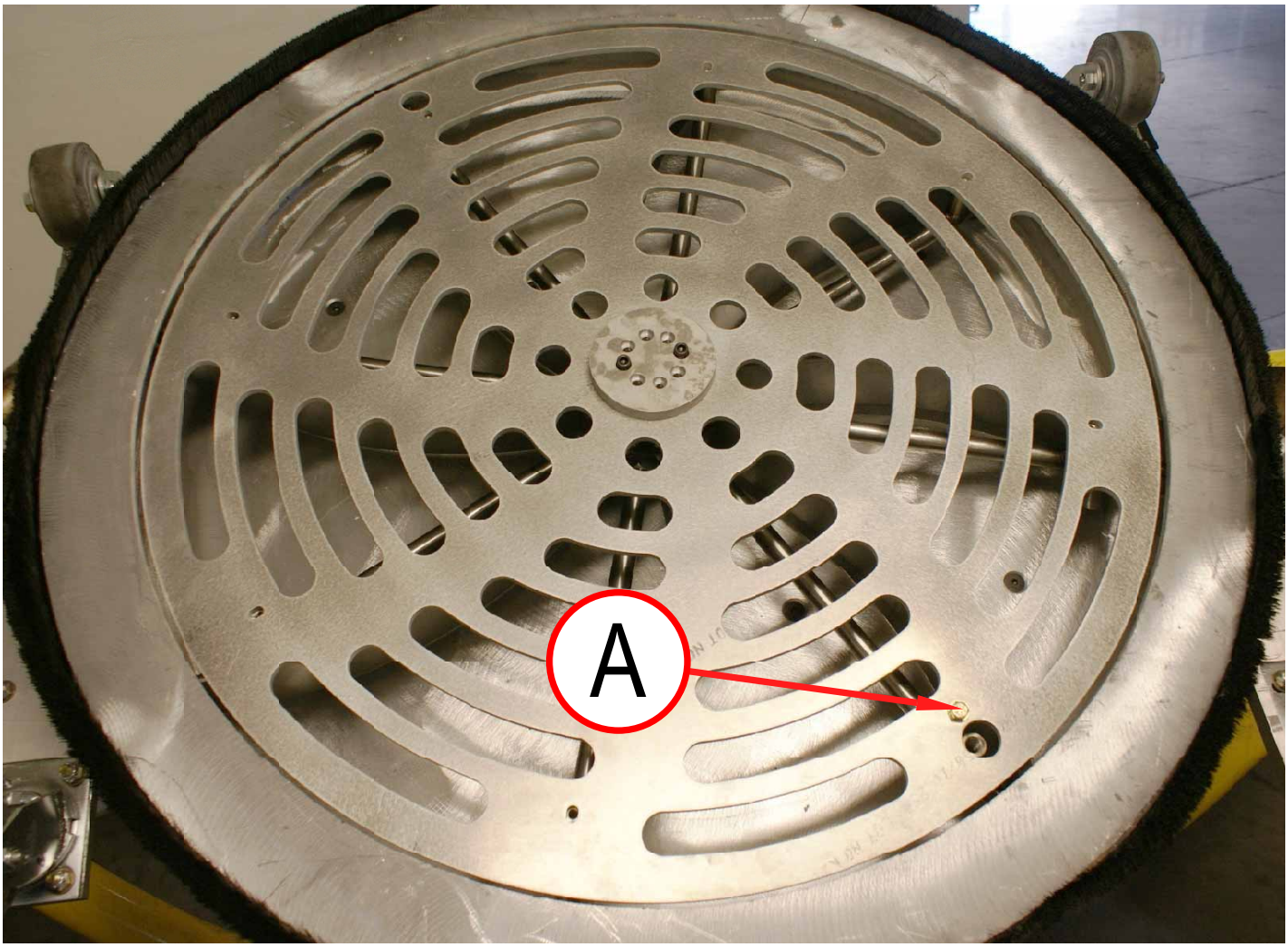
PREPARING THE MACHINE FOR USE

1 Check the tires for pressure, abnormal wear patterns, and any foreign objects.
2 Make sure the parking brake is functioning correctly
3 Check the lights
4 Check fluid levels on engine and pumps
5 Check belts and hoses on engines and pumps.
6 Verify seat belt latch is functional

PRIOR TO START-UP

1 **See Figure 9.** Prior to start up, check the cleaning head. Check the outer 8 bolts **(A)** on the protective shield for excessive wear. Any wear requires a bolt change. Also, make sure all bolts are securely tightened before operating.
2 Check pressure tips and replace as necessary.

FIGURE 9



Failure to check the Cyclone shield bolts and pressure tips can result in damage to the blades, spray bars and possible operator injury.

⚠ WARNING!

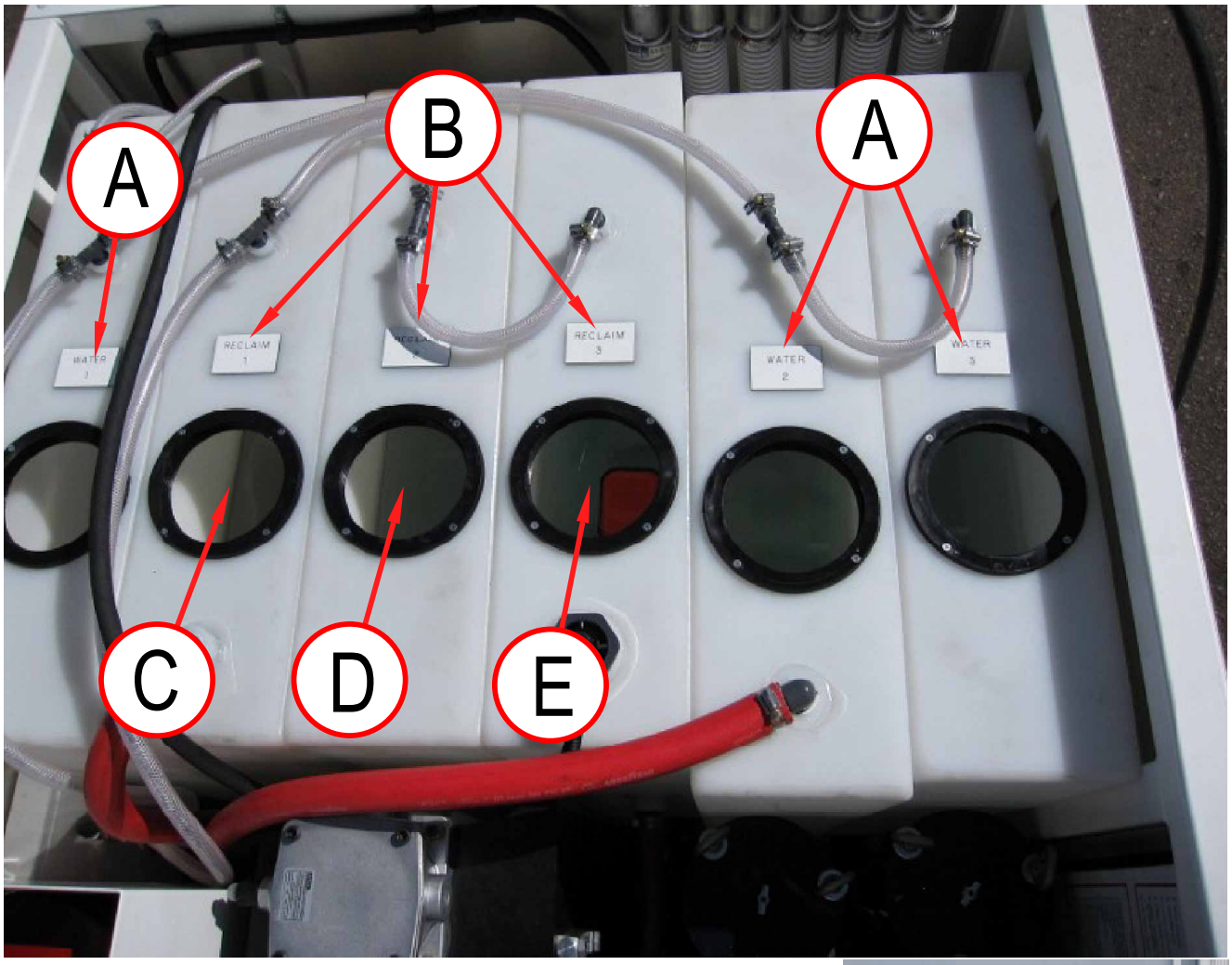
MAKE SURE CLEANING HEAD IS SUPPORTED BEFORE CHANGING SPRAY TIPS

PREPARING THE MACHINE FOR USE

FILLING WATER/RECLAIM TANKS

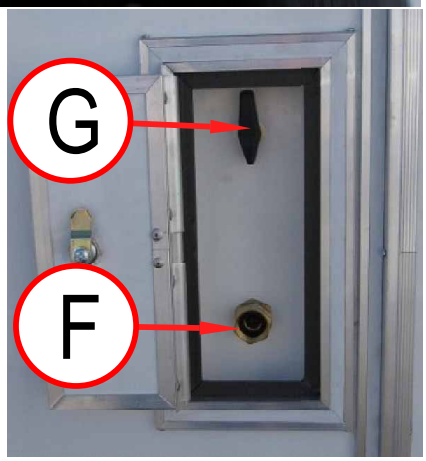
1 **See Figure 10.** Put the water hose in Reclaim Tank #2 **(D)** and fill Reclaim Tanks #1, #2 & #3 **(B)** to 1" from the top. NOTE: Once tank #2 fills water will automatically flow into Reclaim #1 **(C)** and Reclaim #3 **(E)**.
2 Start the engine and set Throttle Switch **(O)** to the ON position.
3 Open the valves on top of each filter housing. After the water begins to flow close the valves.
4 Keep the Throttle Switch **(O)** ON until the filter pump turns OFF or until water stops flowing into the clean water tanks **(A)**.
5 Fill the Clean Water Tanks to 6" from the top.

FIGURE 10



FILLING WATER/RECLAIM TANKS WITH REMOTE FILL

1 **See Figure 10.** Connect garden hose to Remote Fill Connection **(F)** and rotate Remote Water Fill Valve **(G)** to the UP position for reclaim tanks.
2 Turn on garden hose and fill reclaim tanks to 1" from the top then turn hose off. Start the engine and set Throttle Switch **(O)** to the ON position.
3 Open the valves on top of each filter housing. After the water begins to flow close the valves.
4 Keep the Throttle Switch **(O)** ON until the filter pump turns OFF or until water stops flowing into the clean water tanks **(A)**.
5 Rotate Remote Water Fill Valve **(G)** to the DOWN position, turn garden hose ON and fill the Clean Water Tanks to 6" from the top. Turn garden hose OFF.

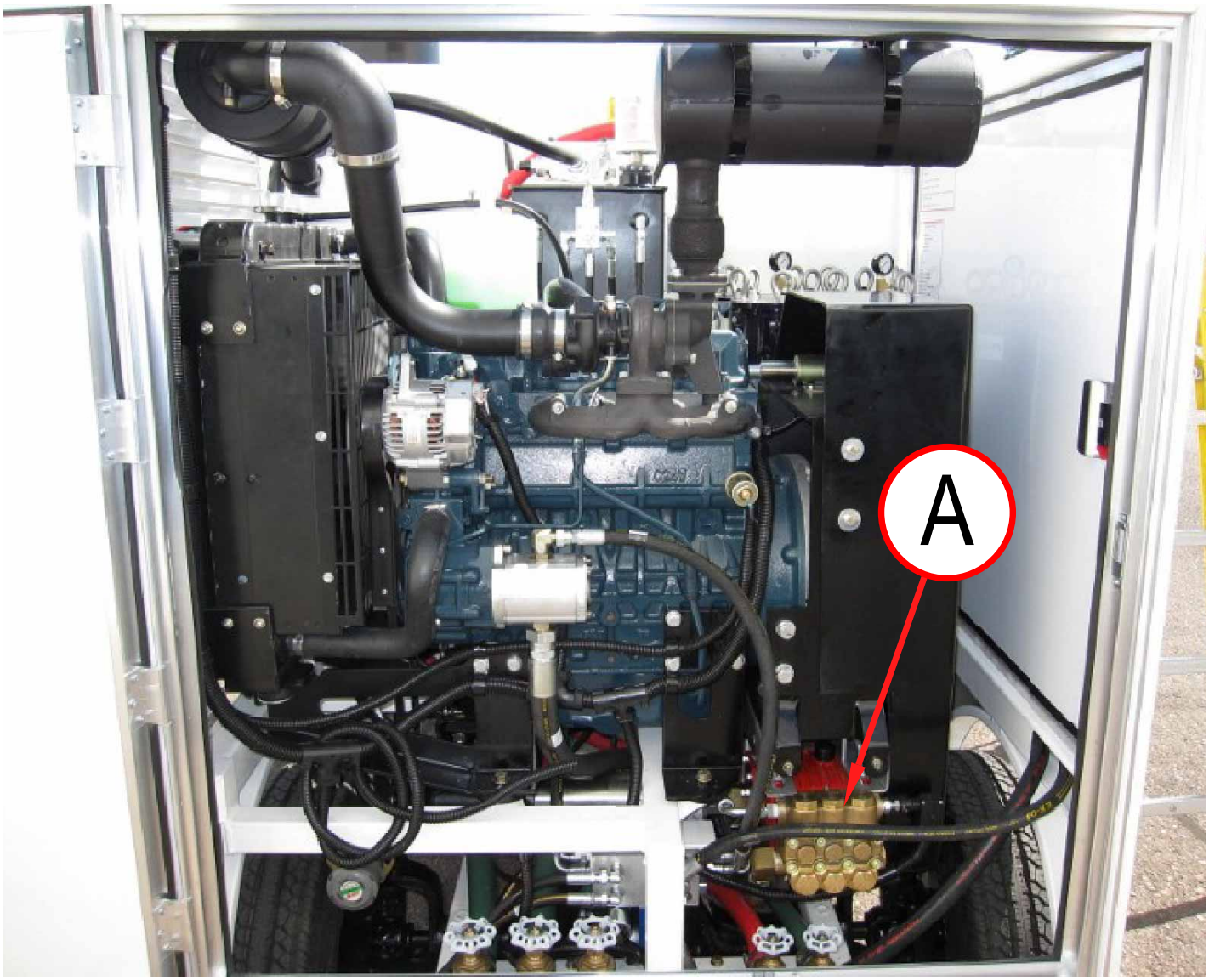


PREPARING THE MACHINE FOR USE
FILLING WATER/RECLAIM TANKS (CONTINUED)

6 See figure 11. The high-pressure pump **(A)** is located to the rear and below the engine bell housing.

7 Once water flows through this valve with no air, the pump supply is primed.

FIGURE 11



⚠ WARNING!

CAUTION: DO NOT OVERFILL RECLAIM TANKS. WATER CAN SPILL ONTO THE GROUND, which defeats the total recovery principal of this machine.

FUEL

The burner and engine use ***DIESEL FUEL***. The diesel fuel tank is located on the left side of the NILFISK CYCLONE.

OPERATING THE MACHINE

START-UP

⚠ WARNING!

Operating the pump without sufficient water in the tank will void the warranty on the pump and any other equipment damaged due to this action.

1 Turn the key to the “ON” and “START” positions on the control panel. Once the engine starts, allow engine to warm up for 3 minutes before increasing RPM.

2 To prime the water filters:
- Rotate the air bleed valves on top of all 4 filter housings to “OPEN” position.
- With the engine running and the pump float control switch in the “UP“ position in Reclaim #3, water will flow into the filter housings
- Run the engine until water flows through each valve.
- Close each valve as water starts to flow.

Note: This filter priming process must be done after every filter cleaning, before resuming cleaning.
Failure to bleed the filters will cause a decrease in cleaning time.

CLEANING OPERATION

⚠ WARNING!

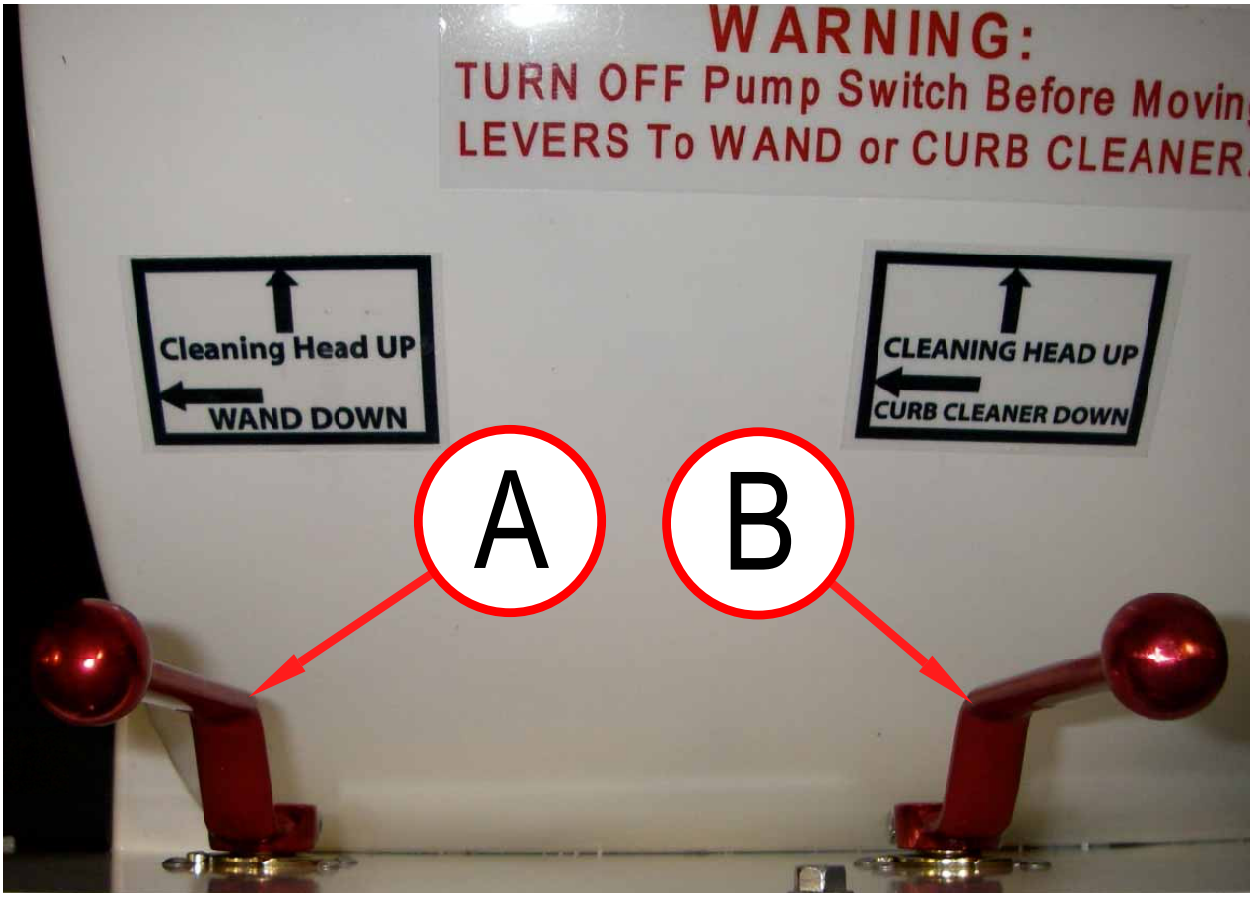
Make sure that all floor grates and covers are secured to the floor, as the Cyclone Cleaning Head could project any loose objects that could cause physical injury and property damage. Do not operate on loose or broken concrete or asphalt as damage to the surface could occur, as well as damage to the cleaning head itself.

1 Drive the unit to the area to be cleaned, and ensure the engine water temperature is 130 degrees or above before cleaning.
2 Survey the area to be cleaned. Make sure it is free of sharp objects that could damage the tires.
3 The cleaning results will be improved if the area is swept of debris before cleaning.
4 Switch the throttle to high speed, move the speed control level forward. After forward motion starts, turn on the Cyclone switch, then the Pump switch, lastly the Burner switch. Operate the unit for 3 to 4 minutes to allow the cleaning water temperature to rise.
Note: To clean without heat, simply leave the burner switch off.
5 This unit must be kept moving whenever the high pressure pump is on; standing still will cause the surface to become scarified.
6 Depending on the severity of the dirt/oil/grease on the surface being cleaned, you may need to decrease your speed and double scrub very soiled areas. (Cleaning the least soiled area first will extend the duration of cleaning time before debris filters need to be serviced.)
7 Once you have cleaned as much area as desired, turn the heater off. It is recommended to run the pump for a few minutes WITHOUT HEAT after your cleaning is complete. This will run fresh water through the burner to allow it to cool before turning off the system.
8 Lastly, turn off the pump, keeping the Cyclone spinning to recover residual water.

OPERATING THE MACHINE

CLEANING WITH THE WAND (SPRAY GUN) OR CURB CLEANER

FIGURE 12



⚠ CAUTION!

Do not move the selector levers with the high pressure switch turned on. Never point the spray wand or the curb cleaner at a person - injury may result.

1 Place the control valve handle in either the Wand **(A)** or the Curb Cleaner **(B)** position, (Figure 12)
2 To pick up water with the cyclone when using the curb cleaner or the wand, leave the cyclone head down and the cyclone switch in the “ON” position.
3 To return to cyclone head cleaning, turn off the high pressure pump and return the levers to the upright position.

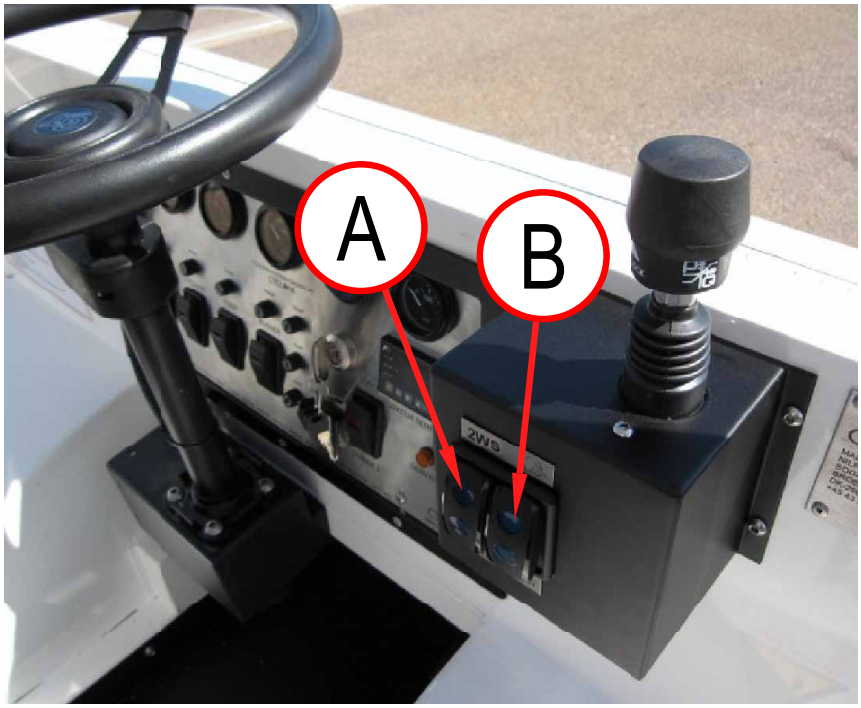
OPERATING THE MACHINE

FOUR WHEEL STEERING / HIGH SPEED OPERATION

To engage the Four Wheel Steering System, switch from 2ws to 4ws. (4ws mode will require more effort to turn the wheels - this is normal). If the NILFISK CYCLONE begins to “crab steer” while in 4 Wheel Mode, simply switch to 2 Wheel Steer and then back to 4 Wheel Steer **(A)**.

To engage in high speed steering , simply switch the high / low switch **(B)** to the high position.

FIGURE 13



AFTER USING THE MACHINE

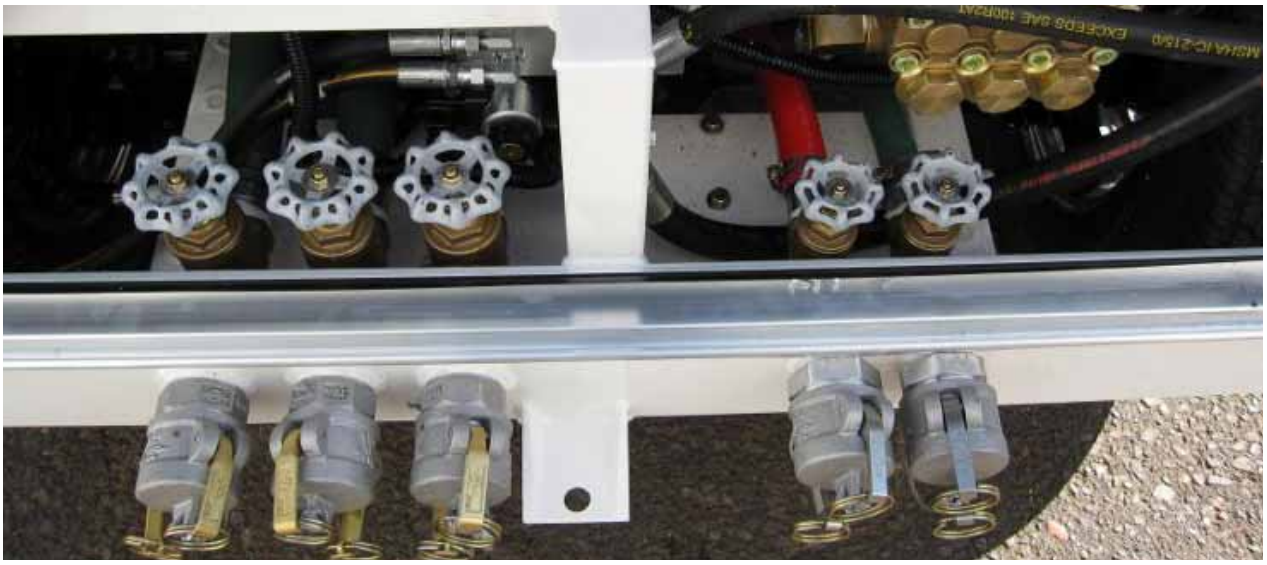
DRAINING/FILTERING/CLEANING THE RECLAIM TANK

1 Tanks should be drained and cleaned at the end of each shift.
2 Run the engine on the Cyclone Head to pump as much water and waste out of the waste tank as possible, then turn off the Cyclone and the engine.
3 Check the waste tank on the Cyclone Cleaning Head to make sure there are no obstructions.
4 If there is debris and the discharge port is plugged, water will not pump out and the tank will overflow.
5 To clean the bottom of the tank, use a putty knife to scrape the debris into an empty tub or bucket.
6 Make sure there is nothing inhibiting water from flowing out of the discharge port at the base of the tank.
7 Close the top of the tank.

⚠ WARNING!

The power plant engine and pump should be turned off while draining the tanks.

FIGURE 14



RECLAIM #1 **RECLAIM #2** **RECLAIM #3** **Filter Drain** **Fresh Water**

1 To drain the tanks, identify each of the connections at the rear of the machine (Figure 14)
2 Attach the 1 1/2" drain hose to the outlet drain that is all the way to the left at the back of the NILFISK CYCLONE. This is attached to Chamber #1 in the reclaim tank.
3 Make sure the connection is securely attached
4 At the other end of the drain hose, securely attach the 100-micron bag filter with a wire-tie.
5 Place the end of the hose over the sanitary sewer opening or into a transport or de-watering tank.
6 The drain valves for each hose connection located just inside the back of the NILFISK CYCLONE (figure 14).
7 Open the drain valve on the NILFISK CYCLONE by unscrewing the blue handle. This releases the water from Chamber #1 in the reclaim tank.
8 Drain until the chamber is empty or the bag filter is full and is no longer allowing water to flow through it.
NOTE: You may need to open the cover on the tank to allow air into the tank.
9 If the chamber will not drain because too many solids have settled at the base of the chamber (sand, dirt, etc.), you need to unclog the drain. To do this, use the handle of a broom or shovel and insert it into the top of the tank and GENTLY prod the sediment at the base of the chamber.
10 If you need to change the bag filter before the chamber is empty, turn off the drain valve. Do this before removing and replacing the filter.
11 Attach the new bag filter and resume draining of Chamber #1.
12 When Chamber #1 is empty, rinse out the chamber using a water hose. When finished rinsing, turn off the drain valve and move the drain hose to the next outlet drain.
Note: Chamber #2 is the MIDDLE outlet; Chamber #3 is the outlet on the FAR RIGHT.
13 Repeat the draining procedures until all three chambers of the reclaim tank are drained and cleaned.
14 Inside Chamber #3 are two stainless steel filter elements. They must be cleaned during each service of the unit. Failure to clean elements will slow down filtration process and may cause damage to filter pump.
15 Do not drain the clean water tank until you have drained and cleaned the filters.

AFTER USING THE MACHINE
SERVICING THE STAINLESS STEEL FILTERS & HOUSINGS

1 Filters should be drained and cleaned at the end of each shift.

2 **See Figure 15.** The stainless steel filters are located on the right side of the NILFISK CYCLONE and are inside the PURPLE housings.

NOTE: The filters are plumbed in series with 75-micron and 30-micron stainless steel elements. After cleaning, these filters MUST be replaced in the same filter housing they came out of. Failure to do so will cause the filters to stop working and back up the water in the reclaim tank.

75-Micron: Next to door

30-Micron: Closest to the hydraulic tank

3 Attach the 1 1/2" drain hose to the outlet drain second to last on FAR RIGHT at the back of the NILFISK CYCLONE, attached to the blue hand valve.

4 At the other end of the drain hose, attach the 100-micron bag filter securely using a wire-tie.

5 Place the end of the hose over the sanitary sewer opening or into a transport or de-watering tank.

FIGURE 15

AFTER USING THE MACHINE

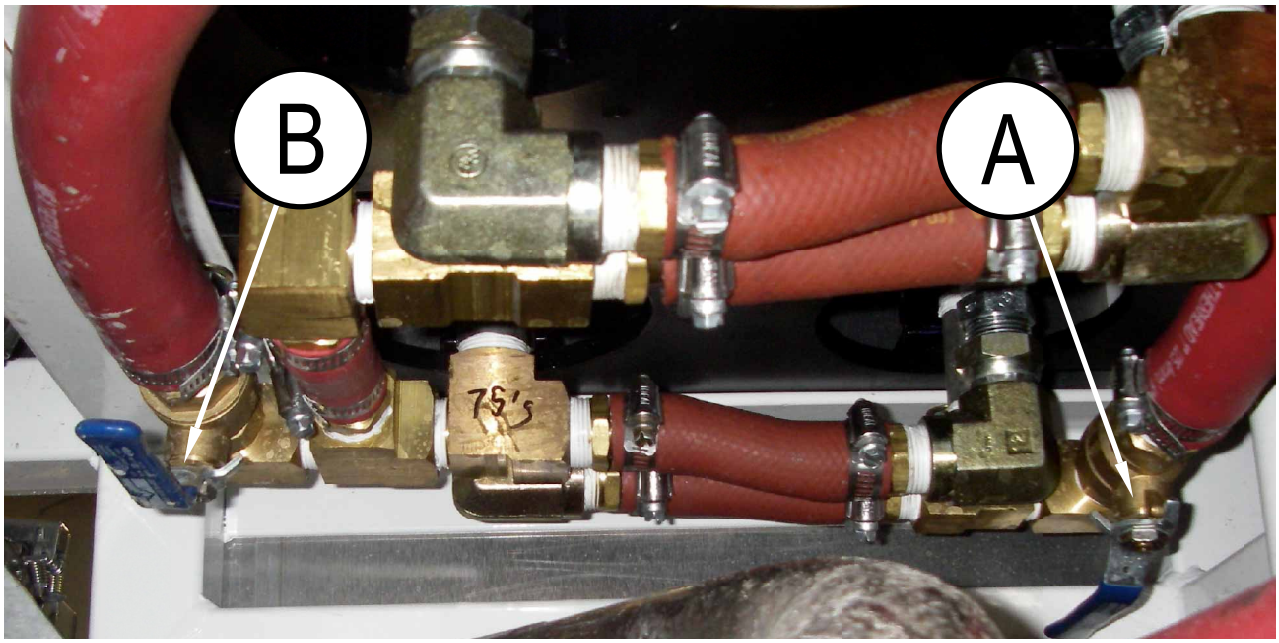
⚠ WARNING!

There must be sufficient water in the clean water tank to clean the filters. Make sure the tank is at least half full before proceeding with the filter cleaning.

STAINLESS STEEL FILTER MAINTENANCE

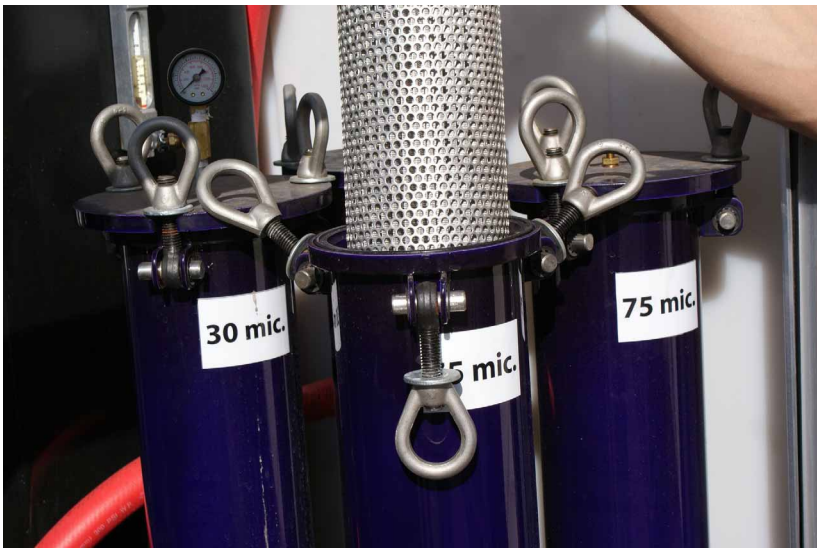
6 **See Figure 16.** The valves for the filters are located in front of the right rear tire, under the NILFISK CYCLONE.
7 Close Valve **(A)** to stop flow of water from reclaim tank #3 to filter housing.
8 Open Valve **(B)** to drain the filters (present on some models)
9 When the filter housings are drained, clean the stainless steel filters.
10 Use a long handled screwdriver to loosen the eyelets on the top of the filters.
Note: The caps are spring loaded.
11 Remove caps by lifting straight up. (Caution: the filter caps are under spring pressure)

FIGURE 16



12 **See Figure 17.** Lift the stainless steel filter straight up and out of the housing.
13 Rinse out the filter housing using a water hose and let it drain through the sock filter.
14 Inspect “O” rings on bottom of filters for wear or breaks. Replace if missing or worn.
15 Clean the filters with the high pressure wand next to the Cyclone Head to contain water.
16 Replace the filters in the housings and recap the housings.
17 Open the left hand valve (A) to resume water flow from reclaim tank #3 through the filters.

FIGURE 17



MAINTENANCE

	Daily	Weekly	Monthly	Annually
Cyclone System				
Cyclone Belt Tension and Condition		X		
Rebuild High Pressure Union @ 150-200 hrs			X	
Grease Bottom Spindle Bearing		X		
Grease Top Spindle Bearing		X		
Grease Return Pump Bearing		X		
Grease Return Pump Idler Bearing		X		
Cyclone Brush Skirting condition @ 40hrs		X		
Check Cyclone High Pressure Tips & Bolts @ 15hrs	X			
Check Cyclone Deck Cables for Wear or Abrasion	X			
Check Cyclone Deck Casters and Blade/Bars			X	
Engine System				
Check Engine Oil	X			
Check Fuel Filter		X		
Check Air Filter & Inlet Tube Service @ 500hrs		X	X	
Check Indicator Lamps	X			
Change Engine Oil & Filter @ 250 Hours			X	
Replace Fuel Filter			X	
Clean Crankcase Vent Tube			X	
Check Engine RPM			X	
Check Belt Tensioner And Belt Wear		X		
Check Engine Ground Connection			X	
Check Engine Mounts			X	
Service Battery Connections			X	
Check Cooling System		X		
Pressure Test Cooling System				X
Flush Cooling System @ 1000 hrs or Annually				X
Test Thermostat				X
Replace Belt				X
Clean Radiator Fins		X		

MAINTENANCE

	Daily	Weekly	Monthly	Annually
Low Pressure Water System				
Check For Leaks & Verify Service Light Operation	X			
Clean 30 and 75 Micron Filters	X			
Clean Debris Tray and Screen	X			
Rinse Out Tanks & Check Seals	X			
Recovery Hose from Tank to Pump Cyclone Deck	X			
High Pressure Water System				
Check Oil Level in High Pressure Pump	X			
Check For Oil / Water Leaks	X			
Verify Pressure		X		
Replace High Pressure Pump Packing @ 150-200 hrs			X	
Oil Change High Pressure Pump @ 500 hrs			X	
Clutch Condition & Pressure Switch			X	
Wand and Curb Sprayer Condition			X	
Drive System				
Check for Leaks	X			
Check Tire Condition and Pressure	X			
Steering System				
Check for Loose Components			X	
Check Tire Wear for Alignment Issues			X	
Verify Rear Steering Operation	X			
Wheels And Axles Grease @ 40hrs		X		
Fuel System				
Drain Water from Fuel Separator		X		
Change Fuel Filter for Burner			X	
Burner System				
Check For Leaks	X			
Check Flame Adjustment		X		
Check Temperature Adjustment		X		
Filter pump				
Check clutch operation		X		
Check Belt Tension		X		

MAINTENANCE

	Daily	Weekly	Monthly	Annually
Braking System				
Check For Leaks	X			
Verify Fluid Level		X		
Check For Brake Wear and Condition			X	
Hydraulic System				
Check For Leaks	X			
Verify Pressures		X		
Verify Lift Lower Switch Operation			X	
Verify Cyclone Pump Operation	X			
Verify Steering Select Valve Operation 4ws	X			
Clean Hydraulic Cooler		X		
Lubricate Overhung Load Adaptor @ 40hrs		X		
Replace Return Filter @ 500 hrs			X	
Replace Hydraulic Breather @ 500hrs			X	
Hydraulic Fluid Sample Test @ 1000 hrs				X
Safety Items				
Verify Seat Belt Latch Operation	X			
Warning System Lights, Backup, Alarm	X			
Service Brake Operation / Parking Brake	X			

MAINTENANCE

CHANGING SPRAY TIPS

1 Spray tips should be changed every 8 - 16 hours depending on the severity of the cleaning being done. This can be determined if the machine is losing pressure due to the tips opening up from excessive wear.

2 Use a 9/16" or 14 mm socket to remove the spray tips from the spray bars. This can be done without removing the protective shield.

3 Wrap the threads of the new tips with a minimum of 5 wraps of Teflon tape and replace into the spray bars. The slot in the tip must be aligned in the direction of the spray bar for the system to operate correctly.

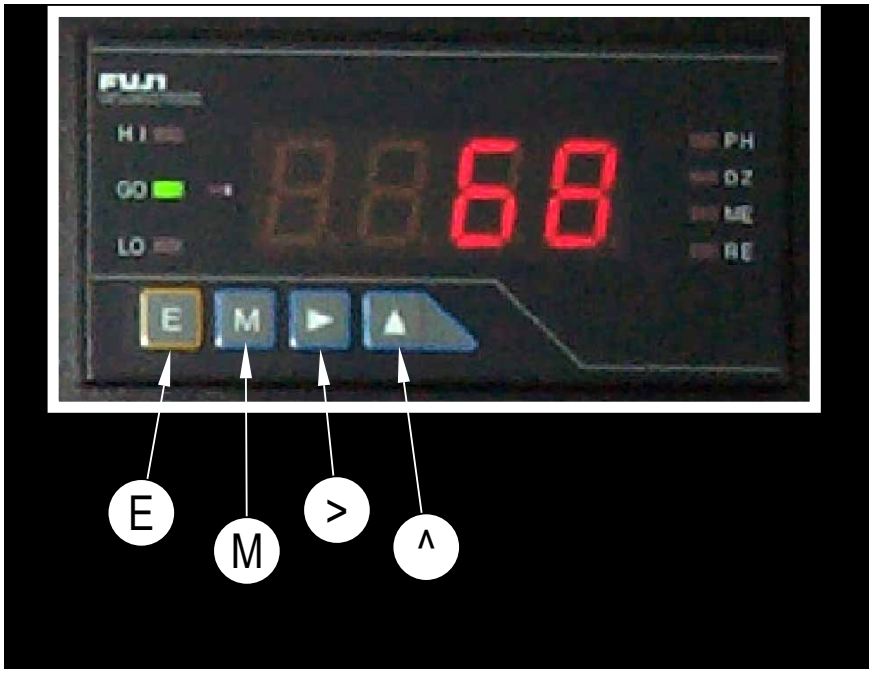
⚠ WARNING!

Always support the Cyclone head prior to working beneath the deck. When installing new spray tips, they must have a MINIMUM of 5 wraps of Teflon tape to make sure the stainless steel threads on the tip DO NOT CONTACT the threads of the stainless steel spray bar. Contact between the two can cause the tip to seize inside the spray bar, and the spray bar will have to be replaced.

TEMPERATURE ON WATER TEMPERATURE CONTROLLER

The temperature setting has been preset to 160 degrees Fahrenheit. The burner will heat the water to this temperature before the fuel supply is shut off.

FIGURE 18



MAINTENANCE

HYDRAULIC FILTER POP-OUT INDICATOR

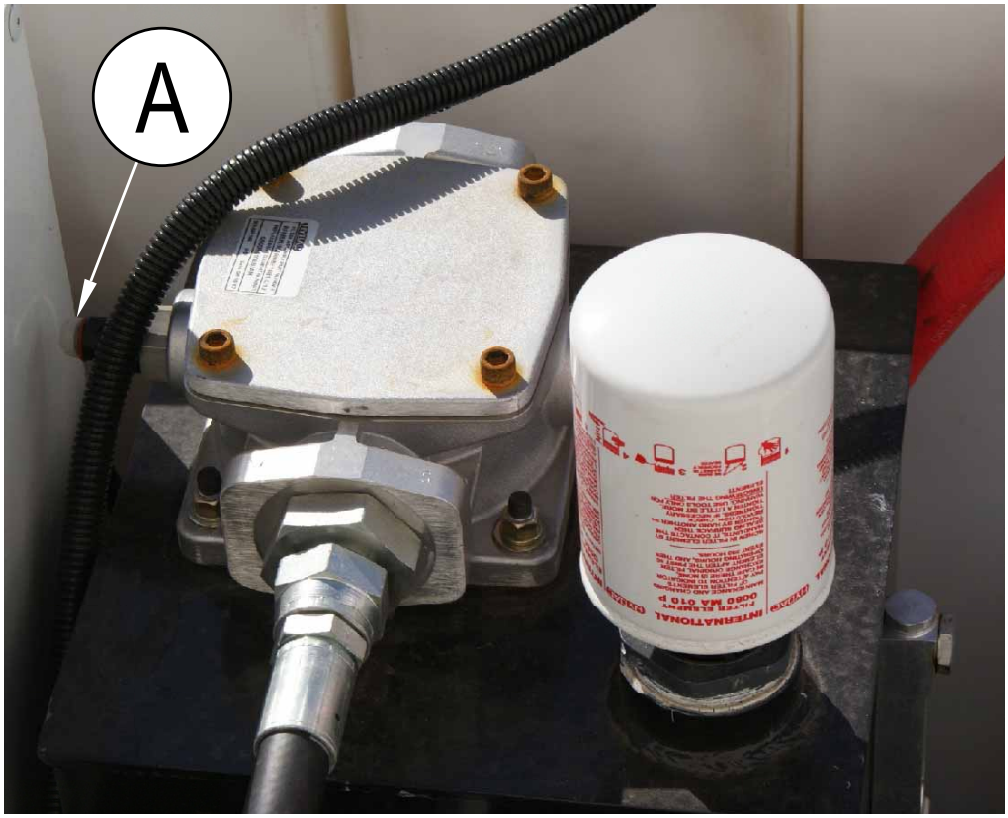
Hydraulic breather should be replaced every 250 hours.

See Figure 19. Indicator **(A)** will indicate when the hydraulic filter needs to be replaced.

Hydraulic filter pop-out should be checked daily.

Never operate the Nilfisk Cyclone with a dirty hydraulic filter. Doing so will cause severe system damage and will VOID MANUFACTURER'S WARRANTY.

FIGURE 19



TROUBLESHOOTING

Heating / Burner System – Diesel Fired

Problem	Probable Cause	Remedy
Burner will not light	Burner switch not on	Turn switch on
	Diesel fuel level low	Fuel tank level must be above 1/4 full on gauge. Fill burner tank with #2 diesel or other approved fuel.
	Water pump not on, no water pressure	Turn pump switch on
	Fuel filter plugged	Clean and / or tighten fuel filter. (Check fuel pressure)
	Burner nozzle dirty	Clean nozzle
	Overload on burner motor tripped	Reset overload, locate and correct source of overload
	Low water pump pressure	See high pressure pump systems troubleshooting
	Fuel pump or nozzle stopped	Check fuel filter and fuel lines. Replace nozzle
Burner will not light, plus diesel fumes are emitted from the exhaust port	Fuel nozzle partially clogged	Replace nozzle of proper size
Burner lights but smokes	Incorrect fuel usage	Only #2 diesel should be used
	Excessive soot on coils	Clean soot off to improve airflow
	Improper voltage at burner	Check battery and alternator
Discharge water temperature exceeds recommended operating temperature	Temperature controller set too high	Adjust the dash-mounted temperature controller
Water sprays out of pressure relief on burner housing	Water flow restricted	Clean or replace nozzle of proper size. De-scale coil and clear obstructions.
Discharge water temperature not reaching maximum operating temperature	Temperature controller set too low	Reset temperature controller
	Battery voltage low	Have battery checked and load test. Charge if low, and replace if necessary. Allow water to cool 2 min. before shutting off engine.

Electrical System

Problem	Probable Cause	Remedy
No power when key is turned on	Battery dead	Replace battery
	Cables disconnected	Reconnect cables
	Cables dirty	Clean cables
System switches do not operate	Burned out fuses	Replace fuses.
	Burned out fuse	Incorrect fuses will cause severe damage to the directional processors.
Direction control stick does not work	Broken wiring	Check for shorts or breaks in the wiring

TROUBLESHOOTING

Filtration System

Problem	Probable Cause	Remedy
Reclaim tanks foaming over	Surface being cleaned had a high foam surfactant previously applied	Apply an anti-foam chemical
High pressure pump shuts off, service light on dash is lit	Filters need to be serviced or clean water tanks are low	Clean filters, drain reclaim tanks and refill with water
Pressure differential between 75 micron filters and 30 micron filters is 50 psi or more	75 micron filters plugged	Clean all filters, drain and refill reclaim tanks
Filters have just been serviced and service light is on	Rubber gasket on bottom of filters is missing, not allowing water to be pumped through the filters	Remove filters and reinstall rubber gasket
	Reclaim tanks are dirty	Drain tanks and refill with clean water
	Water level in clean water tanks is low	Refill water tanks
Filter pump not pumping	Float valve in reclaim tank not operating	Make sure pump is connected
Filters have been serviced, but run time is short	Dirt and contaminants on the surface of tanks and filters	Clean system more completely
	Reclaim tanks and spillover hoses dirty	Thoroughly clean the reclaim tanks, including the filters and the filter housings
	Filters are dirty and clogged	Clean filters
Water coming from breather tube	Clogged water return pump hose	Clear return line or presweep before cleaning.

Hydraulic System

Problem	Probable Cause	Remedy
Hydraulics working, machine won't move	Parking brake on	Release brake
	Fuse in circuit blown	Replace with correct fuse
	Low oil level in hydraulic tank	Fill to middle of sight glass
Cyclone cleaning head won't spin	Blown fuse	Replace fuse
	Wiring disconnected at manifold	Check and reconnect all wiring
	Debris lodged in Cyclone cleaning head	Clean debris from cleaning head

Engine System

Problem	Probable Cause	Remedy
Engine will not start or crank over	Battery dead	Charge or replace battery
	Dirty battery contacts	Clean connections
	Battery cables disconnected	Connect or replace damaged cables
Engine will not start but will crank over	Engine power switch is off or defective	Check engine power switch
Engine bogs down under load	Dirty air filters	Replace filters
	Dirty fuel	Drain and replace with #2 diesel
Engine overheats	Check coolant level	Add as necessary
	Low oil level	Add as necessary
	Debris obstructing air flow through radiator	Clean air inlet system
	Driving with the parking brake on	Release brake

TROUBLESHOOTING

High Pressure Water System

Problem	Probable Cause	Remedy
Pump runs but no spray pressure	Water turned off	Turn water on
	Nozzle is plugged	Clean or replace with proper size
	Pump dry, needs to be primed	Prime high pressure system
Pump runs but has low spray pressure	Nozzle not installed	Install proper sized nozzle
	Excessive leaking from rotating union	Replace rotating union
	Leaky discharge hose or quick coupler	Replace hose, quick coupler, or O-ring in the quick coupler
	Belt slippage	Tighten or replace with correct belt
	Worn or wrong size nozzle	Replace nozzle of proper size
	Air leak in inlet plumbing.	Reseal fittings and inspect inlet hoses for air leaks
Pump runs but there is erratic, fluctuating pressure	Stuck inlet or discharge valves	Clean out or replace worn valves
	Restricted inlet or air entering the inlet plumbing on the pump	Check fittings and hose for airtight seal, clean inlet strainer screen
Relief valve leaking	Excessive pressure and/or spikes	System must be operating at or LESS than 4500psi.
Pressure relief leaking	Excessive pressure	Check for plugged Cyclone spray tips.

Cyclone Deck

Problem	Probable Cause	Remedy
Head leaving water on surface	Loose belt, Cyclone spinning too slowly	Tighten belts
	Foreign objects or debris lodged in head	Check outlet ports for obstruction wedged in blades
	Obstruction in discharge tubes	Disconnect tubes at head and blow water or air through tubes to release
	Return pump not working	Check for plugged pump return line
	Deck / cleaning head not down	Fully lower cleaning head
Excessive foaming	Recovering soap or chemical residue from previous cleaning methods	Treat surface with Teflon-based anti-foam product. Recommend Pool/Spa de-foamer.
Cyclone cleaning head won't spin	Blown fuse	Replace fuse
	Debris lodged in Cyclone cleaning head	Clean debris from cleaning head

TECHNICAL SPECIFICATIONS (as installed and tested on the unit)

Model		**Nilfisk Cyclone**
Model No.		56380676
Sound Pressure Level (IEC 60335-2-72: 2002 Amend. 1:2005, ISO 11201)	dB (A)	91.6
Sound Power Level (IEC 60335-2-72: 2002 Amend. 1:2005, ISO 3744)	Lwa	113dB
Total Weight	lbs/kg	6000 / 2721
Maximum Wheel Floor Loading (right front)	psi / N/mm^2	36 / 0.25
Maximum Wheel Floor Loading (left front)	psi / N/mm^2	35 / 0.24
Maximum Wheel Floor Loading (right rear)	psi / N/mm^2	67 / 0.46
Maximum Wheel Floor Loading (left rear)	psi / N/mm^2	58 / 0.40
Engine Nominal Power	Kw	44 @ 2700 RPM
Vibrations at the Hand Controls (EN 13059 and ISO 5349-1)	m/s2	0.70 m/s^2
Machine Dimensions	LxWxH	135” (342.9cm) x 60”(152.4cm) x 77”(195.58cm)
Vibrations at the Seat (EN 13059 and EN 1032)	m/s2	0.01 m/s^2
Gradeability		
Cleaning		16% (9.9°)
Transport		22% (12.4°)

Nilfisk Advance

setting standards

CE

Overenstemmelseserklaering
Declaration of conformity
Konformitätserklärung
Declaración de conformidad
Atbilstības deklarācija
Megfelelősségi nyilatkozat
Certifikat o ustreznosti
Declaration de conformité
Verklaring van overeenstemming
Dichiarazione di conformità
Vastavussertifikaat
Deklaracja zgodności
Försäkran om överensstämmelse
Samsvarserklaering
Vaatimustenmukaisuusvakuutus
Atitikties deklaracija
Osvědčení o shodě
Certifikát súladu

Modell/ Modèle/ Model/ Malli/ Modelo/ Μοντέλο/ Modelo/ Modelis/Модель: Surface Cleaning machine
Type/ Tyyppi/ Tipo/ Τύπος/ Tüüp/ Tipas/ Tips/ Typ/ Típus/ Тип/ Tip: 4500

D Der Unterzeichner bestätigt hiermit dass die oben erwähnten Modelle gemäß den folgenden Richtlinien und Normen hergestellt wurden.
GB The undersigned certify that the above mentioned model is produced in accordance with the following directives and standards.
DK Undertegnede attesterer herved, at ovennævnte model er produceret i overensstemmelse med følgende direktiver og standarder.
N Undertegnede attesterer att ovennevnte modell är produsert I overensstemmelse med följende direktiv og standarder.
E El abajo firmante certifica que los modelos arriba mencionados han sido producidos de acuerdo con las siguientes directivas y estandares.
I Il sottoscritto dichiara che i modelli sopra menzionati sono prodotti in accordo con le seguenti direttive e standard.
EST Allakirjutanu kinnitab, et ülalnimetatud mudel on valmistatud kooskõlas järgmiste direktiivide ja normidega.
LV Ar šo tiek apliecināts, ka augstākminētais modelis ir izgatavots atbilstoši šādām direktīvām un standartiem.
CZ Níže podepsaný stvrzuje, že výše uvedený model byl vyroben v souladu s následujícími směrnicemi a normami.
SLO Spodaj podpisani potrjujem, da je zgoraj omenjeni model izdelan v skladu z naslednjimi smernicami in standardi.
F Je soussigné certifie que les modèles ci-dessus sont fabriqués conformément aux directives et normes suivantes.
NL Ondergetekende verzekert dat de bovengenoemde modellen geproduceerd zijn in overeenstemming met de volgende richtlijnen en standaards.
FIN Allekirjoittaia vakuuttaa että yllämainittu malli on tuotettu seuraavien direktiivien ja standardien mukaan.
S Undertecknad intygar att ovannämnda modell är producerad i överensstämmelse med följande direktiv och standarder.
GR Ο κάτωθι υπογεγραμμένος πιστοποιεί ότι η παραγωγή του προαναφερθέντος μοντέλου γίνεται σύμφωνα με τις ακόλουθες οδηγίες και πρότυπα.
P A presente assinatura serve para declarar que os modelos supramencionados são produtos em conformidade com as seguintes directivas e normas.
LT Toliau pateiktu dokumentu patvirtinama, kad minėtas modelis yra pagamintas laikantis nurodytų direktyvų bei standartų.
PL Niżej podpisany zaświadcza, że wymieniony powyżej model produkowany jest zgodnie z następującymi dyrektywami I normami.
H Alulírottak igazoljuk, hogy a fent említett modellt a következő irányelvek és szabványok alapján hoztuk létre.
SK Dolu podpísaný osvedčuje, že hore uvedený model sa vyrába v súlade s nasledujúcimi smernicami a normami.

EC Machinery Directive 98/37/EC
EC Low Voltage Directive 73/23/EEC, 93/68/EEC, 06/95/EEC
EC EMC Directive 2004/108/EEC
EC Outdoor Noise Directive 2000/14/EC

EN 12100-1, EN 12100-2, EN ISO 13587, EN 349
EN 60335-1, EN 60335-2-72
EN 55012

23.7.2009

Year of Affixing the CE marking 2009

Richard Kotch , General Manager
Nilfisk-Advance A/S
Sognevej 25
DK-2605 Brøndby, Denmark

Nilfisk-Advance A/S

.pas

Nilfisk-Advance A/S
Sognevej 25
DK-2605 Brøndby
Denmark
Tel: +45 43 23 81 00
Fax: +45 43 43 77 00
www.nilfisk-advance.com