





























This machine is intended for commercial use. Only use recommended pads or brushes and commercially approved floor cleaning chemical intended for machine application.

The following symbols will be used to warn you of hazards or unsafe practices which could result in personal injury or death:

-  **CAUTION:** INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, MAY RESULT IN MINOR OR MODERATE INJURY.
-  **WARNING:** INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY.
-  **DANGER:** INDICATES AN IMMINENTLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY.

-  **WARNING:** Fire or explosion hazard: Never use flammable liquids or operate machine in or near flammable liquids, vapors or combustible dusts. This machine is not equipped with explosion proof motors. The electric motors will spark upon start up and during operation which could cause a flash fire or explosion if machine is used in an area where flammable vapors/liquids or combustible dusts are present.
-  **WARNING:** Do not pick up flammable or reactive materials.
-  **WARNING:** Batteries emit hydrogen gas. Keep sparks and open flame away. Keep battery compartment open when charging. Perform this procedure in a well ventilated area.
-  **WARNING:** Electrical hazard. Disconnect battery cables before servicing.
-  **CAUTION:** Spinning brush. Keep hands away. Turn off power before working on machine.
-  **CAUTION:** Do not operate machine unless trained and authorized.
-  **NOTE:** Do not operate machine unless operator manual is read and understood.
-  **CAUTION:** Do not operate machine if it is not in proper operating condition.
-  **CAUTION:** When using the machine, go slow on inclines and slippery surfaces.
-  **CAUTION:** When using the machine, wear non-slip shoes.
-  **CAUTION:** When using the machine, reduce speed when turning.
-  **NOTE:** When using the machine, report machine damage or faulty operation immediately to your supervisor.
-  **CAUTION:** When using the machine, never allow children to play on or around it.
-  **CAUTION:** When using the machine, follow mixing and handling instructions on chemical containers.
-  **WARNING:** When using the machine, do not use the machine as a means for transport.

## SAFETY PRECAUTIONS

- NOTE:** Do not allow the brush/pad to operate while the machine is stationary to avoid damage to the floor.
- CAUTION:**  Before leaving or servicing a machine, stop it on a level surface.
- NOTE:** Before leaving or servicing a machine, turn off the unit and remove the key.
- CAUTION:**  When servicing the machine, avoid moving parts. Do not wear loose jackets, shirts or sleeves
- WARNING:**  When servicing the machine, do not wear jewelry when working near electrical components.
- WARNING:**  When servicing the machine, disconnect battery connections before beginning work.
- NOTE:** Do not power spray or hose off the machine. Electrical malfunction may occur.
- WARNING:**  When servicing the machine, do not work under the lifted machine without supporting it with safety stands.
- NOTE:** When servicing the machine, use manufacturer supplied or approved replacement parts.
- NOTE:** All repairs must be performed by a qualified service person.
- CAUTION:**  When servicing the machine, do not modify the machine from its original design.
- NOTE:** When transporting the machine, turn the machine off.
- CAUTION:**  When transporting the machine, do not lift the machine when batteries are installed.
- CAUTION:**  When transporting the machine, get assistance when lifting the machine.
- NOTE:** Use a recommended ramp with a maximum of a 12° maximum incline when loading or unloading into/off truck or trailer.
- NOTE:** When transporting the machine, use tie down straps to secure the machine to the truck or trailer.
- NOTE:** When transporting the machine, put the scrub head in the lowered position. Make sure the unit is off before doing so.
- WARNING:**  Do not charge the batteries if the battery charger cable or plug is damaged.
- WARNING:**  When charging batteries, do not smoke near the machine.
- NOTE:** When storing the machine, always store it indoors in an area where the temperature is between 32° and 104°F (0° and 40°C)
- NOTE:** Replace any and all safety labels located on the machine if they are missing or become damaged or illegible.

## MACHINE PREPARATION BATTERY POWER LEVEL INDICATORS

The battery power level gage is located on the upper control panel. The gage has a series of LEDs to indicate the amount of power left in the batteries. When the batteries have a full charge, all LEDs are lit. As the batteries are discharged, the LEDs will begin to go out from right to left. To maximize the life of the batteries, do not allow the LEDs to go beyond the discharge level as described below.

To maximize the life of the batteries, only recharge the batteries when the machine is operated for a total of 30 minutes or more and always recharge the batteries immediately after usage when LEDs are indicating charging is required as described below.

### BATTERY POWER LEVEL INDICATOR - TRACTION DRIVE MODELS

The battery power level gage is located on the upper control panel. The gage has red, yellow and green LEDs to indicate the amount of power left in the batteries.

On lead acid battery-equipped units, when the discharge level reaches the first red LED, it is a good time to finish your scrubbing application and recharge the unit. If you do choose to continue scrubbing, when the last red LED begins to flash, the unit will shut down the brush motor but leave the vacuum and traction drive operational to perform final water recovery and transport back to storage. This function not only serves as an indicator that your battery level has reached a point where recharging is required, but also protects the batteries from being fully discharged.

AGM battery-equipped units should not be used after the last yellow LED goes out leaving only red LEDs. Using the unit beyond this point can reduce the life of the batteries.

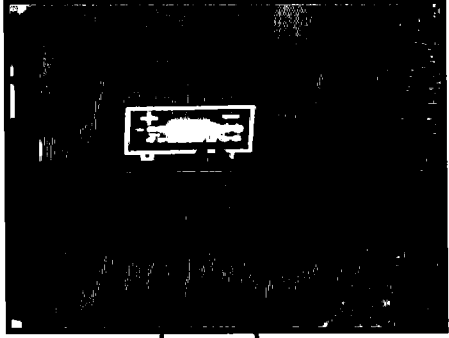
**NOTE:** The traction drive battery power level gage also displays fault codes. The LEDs will flash specific fault codes if a fault is detected. See Troubleshooting section for LED fault codes.

### BATTERY POWER LEVEL INDICATOR - PAD/BRUSH ASSIST MODELS

The battery power level gage is located on the upper control panel. The gage has a series of yellow LEDs to indicate the amount of power left in the batteries. When batteries are fully charged, all LEDs are lit. As the batteries discharge, the LEDs will begin to go out from right to left.

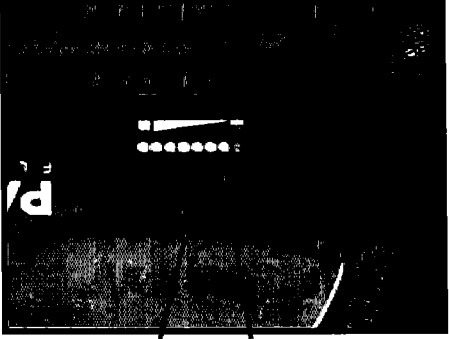
On lead acid battery-equipped units, when the discharge level reaches the last, lit LED (2nd in from left) it is a good time to finish your scrubbing application and recharge the unit. If you do choose to continue scrubbing, when last LED begins to flash, the unit will shut down the brush motor but leave the vacuum operational to perform final water recovery. This function not only serves as an indicator that your battery level has reached a point where recharging is required, but also protects the batteries from being fully discharged.

AGM battery-equipped units should not be used after there are only two LEDs lit. Using the unit beyond this point can reduce the life of the batteries.



Recharge lead acid batteries  
Recharge AGM batteries

Battery Level Indicator -  
Traction Drive Models



Recharge lead acid batteries  
Recharge AGM batteries

Battery Level Indicator -  
Pad/Brush Assist Models

# MACHINE PREPARATION USING YOUR ON-BOARD CHARGER

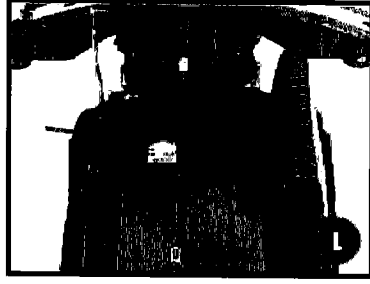
## CHARGING THE BATTERIES WITH AN ON-BOARD CHARGER

Before using your S-20/S-24XM for the first time, fully charge your batteries.

**1** These units can be equipped with an on-board charger.

**2** The on-board charger is equipped with a 9 foot long cord that can be plugged directly into a 120V outlet. Do not use an extension cord. This will void the warranty on the charger.

**3** The cord wrap on the unit has a quick-release hook. The lower hook allows the user to slip the cord off and then the cord can be lifted off the upper hook, all without having to unravel the entire cord.



On-board charger

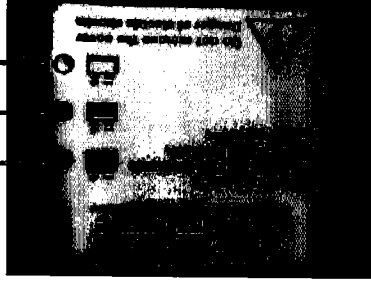


On-board charger cord wrap



Quick release hook

The on-board charger has charging indication LEDs - the red LED means it has just started the charging cycle, the yellow LED indicates that it has reached the second phase of charging and green LED means the unit is fully charged.



Charging indication LEDs

Green indicates charge cycle is complete

Yellow indicates charge cycle is in the second phase

Red indicates charge cycle has just begun

After charging is complete, wrap the cord of your on-board charger securely to ensure the cord is not damaged.

# MACHINE PREPARATION SOLUTION TANK

To prepare the machine for cleaning, the unit must be filled with cleaning solution.

- 1 Water and cleaning agent can be added to the S-20/S-24XM's rear hose fill port located to the left of the control panel.
- 2 There is also a front fill port that is able to accept hose or bucket filling.

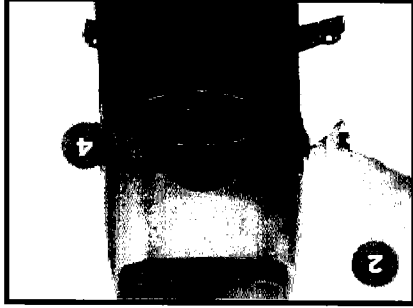
Liquid detergent should be added to the tank in the concentration and manner specified by the manufacturer for an eleven (11) gallon solution tank. The formation of excess foam could damage the vacuum motor, so be sure to use only the correct amount of detergent. Water temperature should not exceed 120°F (50°C).

**NOTE:** Always use low-foam detergent. Introduce a small amount of defoaming liquid in the recovery tank before starting work to prevent foam from being generated. Never use pure acids.

- 3 It is easy to gage the solution level by watching the fog-free solution sight gage at the rear of the machine. Additionally, marks on the tank provide solution level indicators as a guide.
- 4 The bottom of the front fill port is also a full level indicator. Once you are able to see water at the base of the opening, you have reached the full level.
- 5 The sight gage hose performs double-duty as the solution drain hose as well. You simply slide the hose off the press fitting and lower the hose to a drain or mop sink.



Rear hose fill port



Front fill port



Sight gage hose



Sight gage hose released from press fitting

Solution level indicators

# MACHINE PREPARATION ATTACHING A CLEANING PAD TO YOUR PAD DRIVER - DISK HEAD

If using a floor pad with your pad driver:

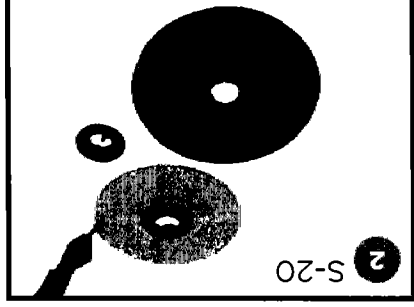
- 1 Remove the pad driver by locating the automatic off switch on the lower control panel at the rear of the machine. Depress position "A" for 1 second and then depress position "B" to "click-off" the pad driver(s).
- 2 Place your pad driver(s) on a work surface and remove the center lock fitting from the pad driver. To do so on the S-20, unscrew the center lock in a counter-clockwise motion. For the S-24XM, squeeze the center lock wires inward and lift the center lock off the pad. Connect the cleaning pad to the disk pad driver by centering it on the driver.
- 3 S-20: Screw on the center lock fitting, making sure that the center lock has compressed the pad and is snug. S-24XM: Squeeze center lock wires inward and press center lock down, tab side first, compressing the pad and then release the tabs so that they lock in place holding the pad. Repeat for the other pad driver.
- 4 **NOTE:** The S-20 and S-24XM pad drivers are tufted pad drivers. Do not use a pad driver on the floor without a pad in place. This will cause damage to your floor.



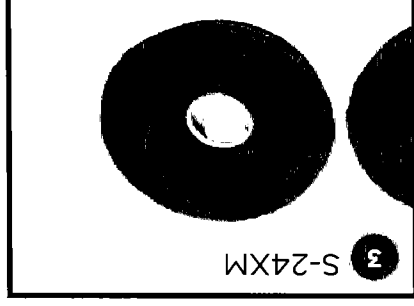
1 Depress position "A" for 1 second then depress position "B"



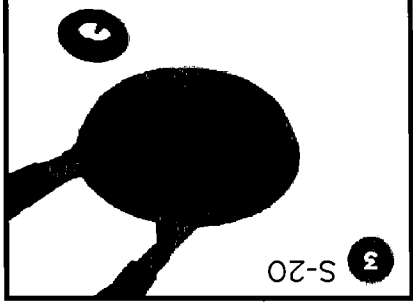
2 S-24XM Disconnect center lock fitting & lay next to the pad driver



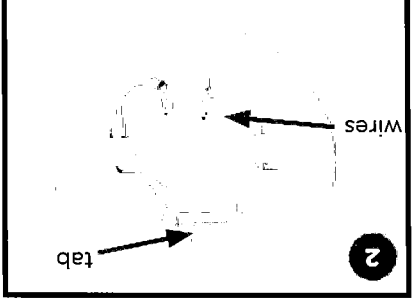
2 S-20 Disconnect center lock fitting & lay next to the pad driver



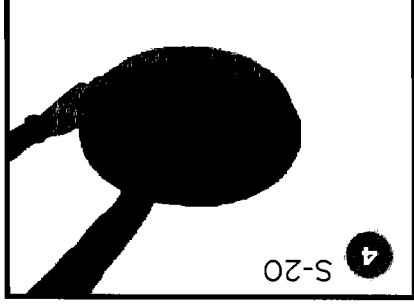
3 S-24XM Center pad on pad driver



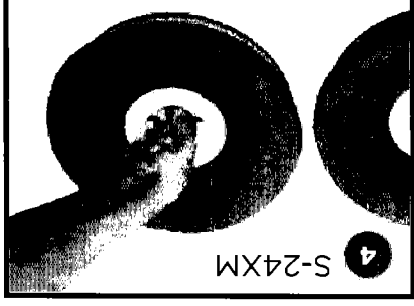
3 S-20 Center pad on pad driver



2 Close up of center lock



4 S-20 Screw on center lock fitting



4 S-24XM Squeeze center lock wires inward, press down onto pad & release wires

## MACHINE PREPARATION ATTACHING YOUR PAD DRIVER OR BRUSH TO THE S-20/S-24XM - DISK HEAD

The pad driver(s) or brush(es) are attached by using the automatic on/off system. This valuable ingenuity removes the need for operators to kneel or strain to attach the pad driver or brush.

First, start by placing the pad driver or brush on the floor in front of the S-20/S-24XM scrubber.

**1** Turn the unit on using the power key switch.

**2** Push or drive it into position so that the unit's scrub head is centered over the pad driver(s) or brush(es).

**3** Utilize the foot pedal to lower the scrub deck down onto the pad driver or brush by depressing the pedal while shifting it to the right. Once clear of the lower notch, lifting your foot will lower the scrub deck. Make sure that the shroud completely covers the pad driver(s) or brush(es) in the lowered position. Should the shroud be resting on a portion of the pad driver or brush, the head isn't centered and will not attach properly.

**4** The operation is completed by quickly pulsing the activation trigger. This will "click on" the pad driver(s) or brush(es). If the pad driver(s) or brush(es) do not quickly engage, do not continue pressing the activation trigger. Realign the scrub deck and try procedure again. When you have the scrub deck aligned properly, you should see a noticeable drop of the scrub deck when lowered and the bristle skirt on the shroud should almost be touching the floor.



Turn unit on using key switch



Position scrub head over pad driver(s) or brush(es) (S-20 shown)



Lower the scrub head using the foot pedal



Quickly pulse the activation trigger

# MACHINE PREPARATION ATTACHING YOUR PAD - ORBITAL HEAD

## ATTACHING A PAD TO YOUR ORBITAL PAD DRIVER

The orbital unit can be used for daily cleaning; however it specializes in chemical-free finish removal for low-cost finish maintenance programs. The following directions show how to prepare the machine for both applications.

For cleaning, the orbital unit is fit with a rectangular, 20 in (508 mm) x 14 in (356 mm) pad. The head comes standard with a rectangular pad drive plate with a Mighty-Lok® connection system.

**1** To attach the pad, align the front corners of the pad to the front corners of the orbital drive plate and press to attach.

**2** Use the foot pedal to lower the scrub deck down onto the pad ensuring alignment from front-to-back and side-to-side.

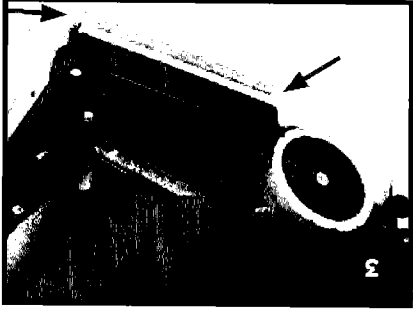
**3** When the head is properly set onto the pad, you are ready for cleaning.



Align the front corners of the pad and press to adhere



Lower the scrub head using the foot pedal

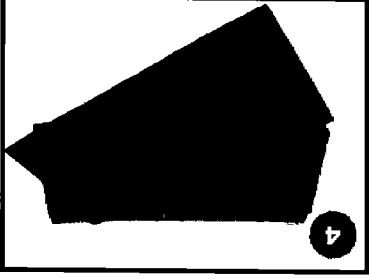


Proper alignment of pad

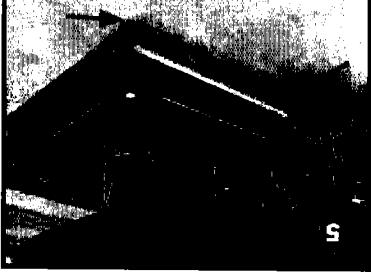
For chemical-free finish removal, it requires the addition of a specialized surface preparation pad. The application still requires the attachment of a traditional cleaning pad first. This pad acts as a "backer pad" which compensates for low and high spots in the floor.

**4** Align the Velcro pad retainer along one length of the red, backer pad and press down. This will leave a 2" gap along one side of the backer pad. Then place the surface prep pad on top of the pad retainer, centering it from front-to-back & side-to-side with the red pad. The 2" gap left by the pad retainer needs to be at the front of the machine so that water can fully saturate the pad. Align your pad assembly with all corners of the pad driver and press upward. The red backer pad should be in closest contact with the pad driver.

Finish the operation by using the foot pedal to lower the scrub deck down onto the surface preparation pad, once again ensuring alignment from front-to-back and side-to-side. When the head is properly set onto the pad, you are ready for your finish maintenance program.



Red backer pad & Velcro pad retainer (black) alignment shown above with surface prep pad (brown) pulled away



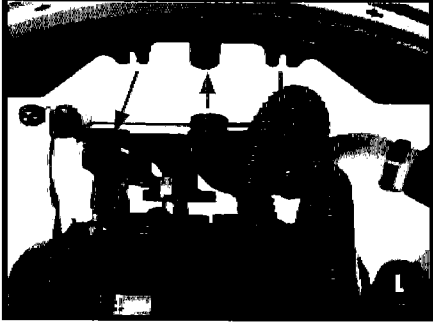
Proper alignment of pad



## MACHINE PREPARATION CONNECTING THE SQUEEGEE AND ADJUSTING SQUEEGEE HEIGHT

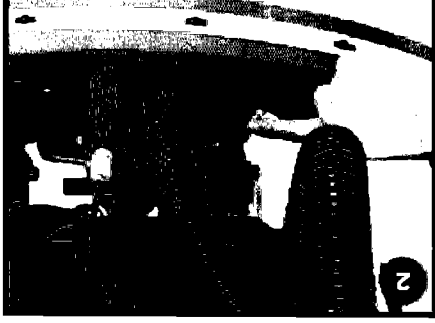
Prior to shipping from the factory, the squegee assembly is removed from the unit. To connect your squegee assembly to the machine:

**1** Align the squegee assembly retention slots with the easy-grip knobs then tighten until secure.



Positioning the squegee assembly to mount onto the squegee frame

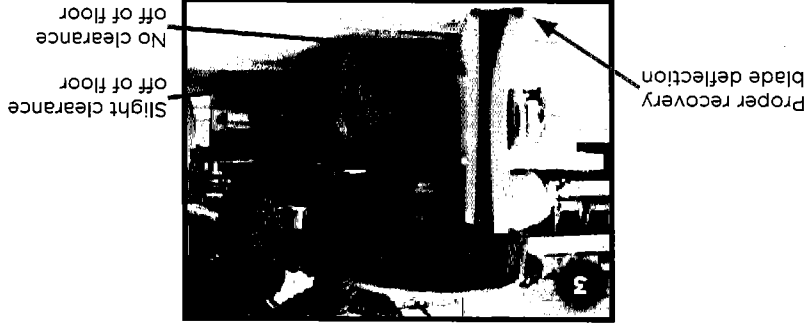
**2** Attach the recovery hose to the squegee assembly neck. Make sure to route the loop hose trap between the squegee assembly neck and left easy-grip knob.



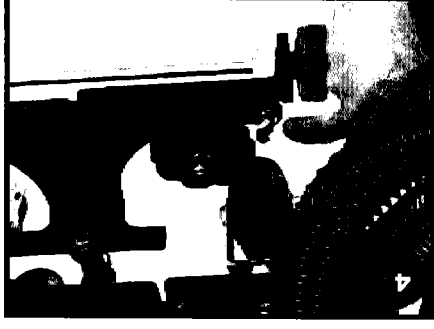
After aligning assembly, tighten the easy-grip knobs and attach the recovery hose.  
\*Arrows indicate proper hose routing

**3** The squegee blade assembly height is factory set at the optimum water recovery position with the squegee wheels being approximately 1/32 inch (1 mm) off the ground allowing the recovery blade to deflect as shown below.

**4** If for some reason your squegee blade height must be adjusted, it is done so by turning the left thumb screw located on the squegee frame assembly clockwise to raise the left squegee wheel and counter-clockwise to lower the wheel. The same is true for the right thumb screw/squegee wheel.



Close up of squegee assembly and blade deflection



Thumb screw to raise and lower squegee assembly wheels

# MACHINE OPERATION OPERATIONAL CONTROLS

The machine operation and controls were designed to minimize operator training and decrease the need for adjustments during operation. Additionally, once in operation, Pacific Floorcare's goal was to provide an ergonomic, easy to use system. Due to this focus, the S-20/S-24XM's key operational controls are all within reach so that the operator doesn't have to remove their hands to perform the operation - a key to safe, trouble-free, highly productive cleaning.

## TURNING THE UNIT ON/OFF

The machine is powered on through a key switch on the upper control panel. Turn the key to the ON position. You will see the battery meter on the left side of the upper control panel light up to show the battery charge level.

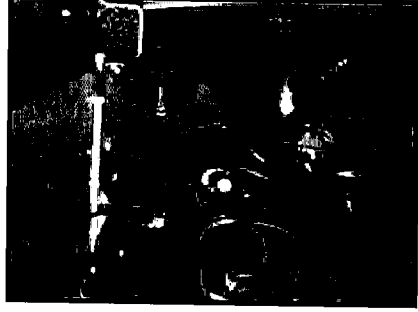
The key switch is a proven way to eliminate unwanted operation. Simply remove the key and safely store it away when you have completed scrubbing.



Transaxle drive unit key switch  
shown above

## SETTING DESIRED SOLUTION FLOW RATE

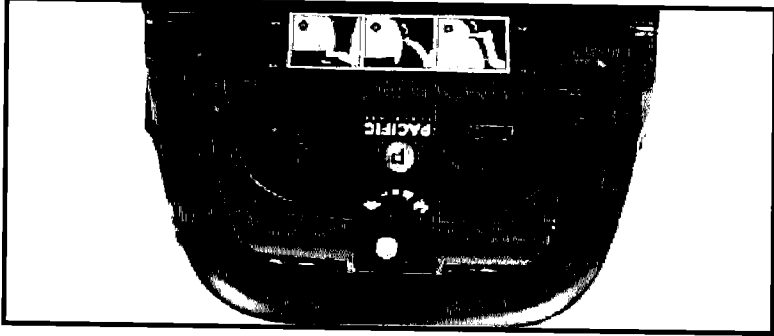
The next step is to set the unit to the desired solution flow. This control feature is located at the lower rear of the machine and can be adjusted from low to high flow spanning a range of 0 to 0.5 gallons (1.9 L) per minute.



Solution flow adjustment knob

# MACHINE OPERATION OPERATIONAL CONTROLS

Once the machine is powered on and the solution flow is set, it takes three simple steps to operate the machine: lower the scrub deck, lower the squeegee and engage the activation trigger. These steps are visually shown on the lower control panel by the S-20/S-24XM's "1, 2, 3-Step" on-board operation guide. Following are the detail steps of how scrubbing and recovery functions are activated.



## LOWERING THE SCRUB DECK

The scrub deck is lowered using the foot pedal at the rear of the unit.

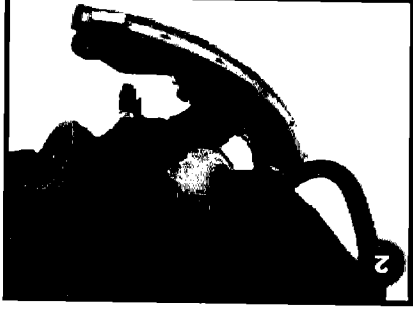
- 1 Place your foot on the pedal and depress the lever while shifting it to the right. Once clear of the lower notch, lifting your foot will lower the scrub deck into the operating position.

- 2 The S-20/S-24XM has two down pressure settings. The disk unit has settings of 60 and 90 lb (27 and 40 kg) and the orbital unit has settings of 75 and 100 lb (34 and 45 kg). When the unit is set into operating position with the foot pedal, it is in the lower down pressure position. This position is typically used for daily cleaning of normal soils. However, should you have tough soils or want to perform chemical-free finish removal, engage the higher down pressure setting by lifting the foot pedal lever to the upper notch position. To disengage high down pressure, simply lift and shift the lever to the right and lower into normal operating position.

- 3 The disk scrub head is equipped with a self-adjusting shroud with bristle skirt that virtually eliminates overspray and increases ease of use.



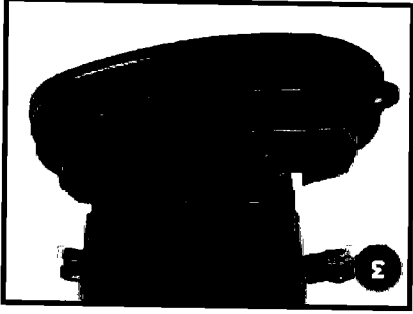
Lowering scrub head using foot pedal



Locking in high down pressure setting by lifting foot lever



Self-adjusting head shroud with bristle skirt (S-20)

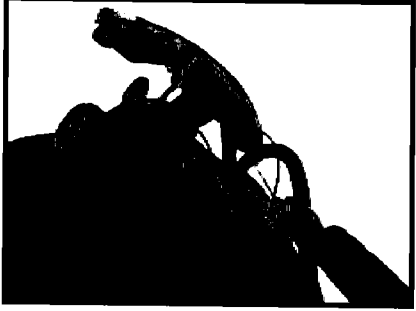


Self-adjusting head shroud with bristle skirt (S-24XM)

# MACHINE OPERATION OPERATIONAL CONTROLS

## LOWERING THE SQUEEGEE

To lower the squeegee, lift the squeegee lever and shift it left to clear the recovery position. Once clear, lower the squeegee into the recovery position. In doing so, the S-20/S-24XM's vacuum motor will activate.



Lowering the squeegee assembly

## ACTIVATING THE SCRUBBER

**1** To begin scrubbing, engage the handle trigger. The trigger activates solution flow, the brush motor and traction drive, if equipped. This unique, ergonomic design accommodates different operator heights by allowing the user to activate the trigger from any position on the handle.

**2** The speed control and reverse switch on the traction drive models are purposely located so that the operator doesn't have to let go of the machine with either hand to perform the function. Speed control is easily thumb adjusted and the reverse can be depressed with your fingers on the back side of the control housing.

**3** This one-handed reverse feature allows the operator to lift the squeegee with the other hand – a small element with big rewards when in tight spaces.



Activating the handle trigger



Speed control adjustment



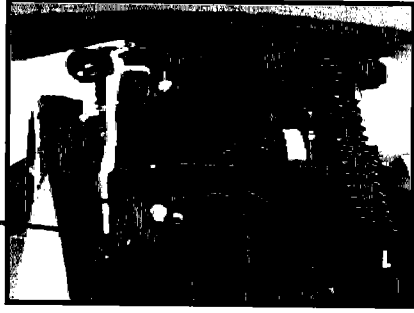
Reverse switch is easily reached with fingertip

# MACHINE OPERATION OPERATIONAL CONTROLS

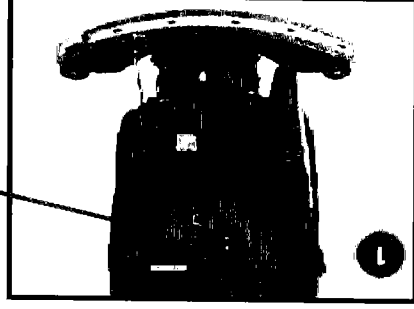
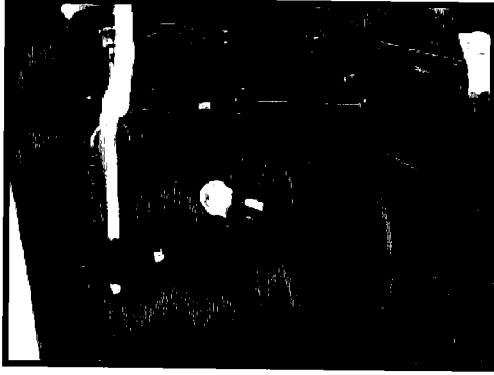
## TRANSPORT MODE

The scrub deck and squeegee must be in the raised position for transport.

- 1 The scrub deck is raised into transport position by placing your foot on the foot pad and depressing the lever until it clears the lower notch. Once clear, shift the lever to the left and place it into the lower notch.
- 2 To raise the squeegee, lift the squeegee lever high enough to clear the notch, shift it to the right and lower it into the resting position. On traction drive models, the vacuum fan will continue to run for 10 seconds in order to evacuate the recovery hose. On pad/brush assist models, the vacuum fan will shut off immediately.



Scrub deck in transport/storage position



Squeegee assembly in transport/storage position

