

Models: 56104002 (51D)

Instructions for Use
Original Instructions
Kullanım Talimatları
Инструкции за употреба
Instrucțiuni de utilizare

SC1500 INSTRUCTIONS FOR USE



TABLE OF CONTENTS

	Page
Introduction.....	A-3
Cautions and Warnings.....	A-4 - A-5
Know Your Machine.....	A-6 - A-7
Control Panel.....	A-8 - A-9
Prepare the Machine for Use	
Install the Batteries.....	A-10
Install the Brush.....	A-11
Install the Squeegee.....	A-12
Fill the Solution Tank.....	A-13
Detergent System.....	A-14 - A-15
Operating the Machine	
Scrubbing.....	A-16 - A-17
After Use.....	A-18
Maintenance Schedule.....	A-18
Lubricating the Machine.....	A-19
Electromagnetic Brake.....	A-19
Charging the Batteries (Wet).....	A-20
Check the Battery Water Level.....	A-20
Charging the Batteries (Gel).....	A-21
Squeegee Maintenance.....	A-22
Squeegee Adjustment.....	A-22
Troubleshooting.....	A-23
Technical Specifications.....	A-24

INTRODUCTION

This manual will help you get the most from your Nilfisk Scrubber. Read it thoroughly before operating the machine.

Note: Bold numbers in parentheses indicate an item illustrated on pages A-6 – A-9.

This machine is only suitable for commercial use, for example in hotels, schools, hospitals, factories, shops, offices and rental businesses. The SC1500 is a battery powered floor cleaning machine.

PARTS AND SERVICE

Repairs, when required, should be performed by your Authorized Nilfisk Service Center, who employs factory trained service personnel, and maintains an inventory of Nilfisk original replacement parts and accessories.

Call the NILFISK DEALER named below for repair parts or service. Please specify the Model and Serial Number when discussing your machine.

MODIFICATIONS

Modifications and additions to the cleaning machine which affect capacity and safe operation shall not be performed by the customer or user without prior written approval from Nilfisk-Advance Inc. Unapproved modifications will void the machine warranty and make the customer liable for any resulting accidents.

NAME PLATE

The Model Number 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 Number and Serial Number of your machine for future reference.

MODEL NUMBER _____

SERIAL NUMBER _____

UNCRATE THE MACHINE

When the machine is delivered, carefully inspect the shipping packaging and the machine for damage. If damage is evident, save the shipping carton (if applicable) so that it can be inspected. Contact the Nilfisk Customer Service Department immediately to file a freight damage claim. Refer to the unpacking instruction sheet included with the machine to remove the machine from the pallet.

TRANSPORTING THE MACHINE

CAUTION!

Before transporting the machine on an open truck or trailer, make sure that . . .

- All tanks are empty.
- Recovery tank cover is latched securely.
- The machine is tied down securely - see Tie Down Locations **(6)** in *Know Your Machine*.
- The machine's electromagnetic brake is engaged (not manually overridden).

CAUTIONS AND WARNINGS

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.

DANGER!

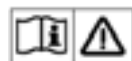
Is used to warn of immediate hazards that will cause severe personal injury or death.

WARNING!

Is used to call attention to a situation that could cause severe personal injury.

CAUTION!

Is used to call attention to a situation that could cause minor personal injury or damage to the machine or other property.



Read all instructions before using.

GENERAL SAFETY INSTRUCTIONS

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

This machine is for commercial use, for example in hotels, schools, hospitals, factories, shops and offices other than normal residential housekeeping purposes.

WARNING!

- This machine shall be used only by properly trained and authorized persons.
- This machine is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge.
- While on ramps or inclines, avoid sudden stops. Avoid abrupt sharp turns. Use low speed down ramps.
- Observe the Gross Vehicle Weight, GVW, of the machine when loading, driving, lifting or supporting the machine.
- Keep sparks, flame and smoking materials away from batteries. Explosive gases are vented during normal operation.
- Charging the batteries produces highly explosive hydrogen gas. Charge batteries only in well-ventilated areas, away from open flame. Do not smoke while charging the batteries.
- Remove all jewelry when working near electrical components.
- 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.
- Do not clean this machine with a pressure washer.
- Only use the brushes provided with the appliance or those specified in the instruction manual. The use of other brushes may impair safety.

CAUTIONS AND WARNINGS - CONTINUED



CAUTION!

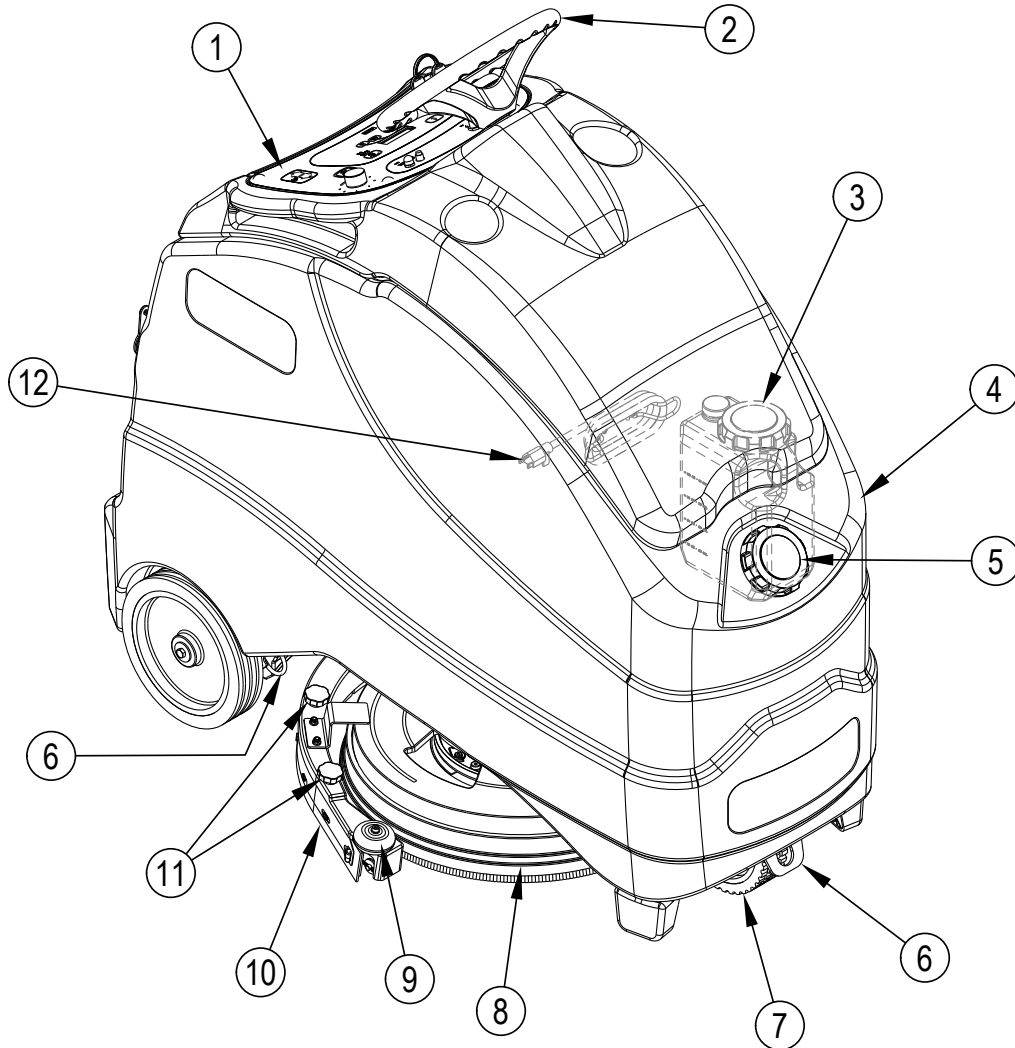
- This machine is not approved for use on public paths or roads.
- This machine is not suitable for picking up hazardous dust.
- Do not use scarifier discs and grinding stones. Nilfisk will not be held responsible for any damage to floor surfaces caused by scarifiers or grinding stones (can also cause damage to the brush drive system).
- 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 changing the brushes, and before opening any access panels.
- Take precautions to prevent hair, jewelry, or loose clothing from becoming caught in moving parts.
- Use caution when moving this machine in below freezing temperature conditions. Any water in the solution, recovery or detergent tanks or in the hose lines could freeze, causing damage to valves and fittings. Flush with windshield washer fluid.
- The batteries must be removed from the machine before the machine is scrapped. The disposal of the batteries should be safely done in accordance with your local environmental regulations.
- Do not use on surfaces having a gradient exceeding that marked on the machine.
- All doors and covers are to be positioned as indicated in the instruction manual before using the machine.
- This machine should only be used and stored indoors.

SAVE THESE INSTRUCTIONS

KNOW YOUR MACHINE

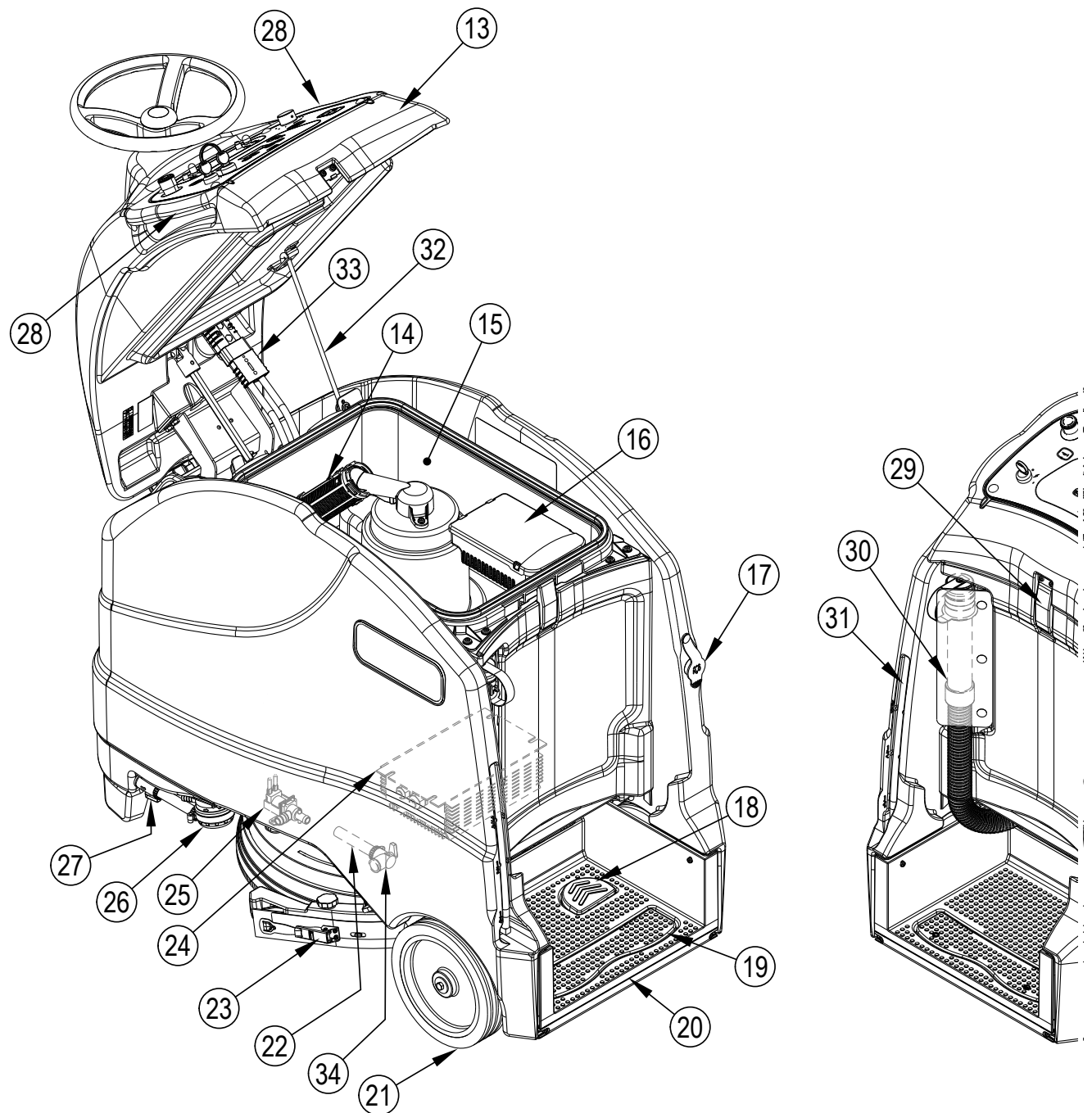
As you read this manual, you will occasionally run across a bold number or letter in parentheses - example: **(2)**. These numbers refer to an item shown on these pages unless otherwise noted. Refer back to these pages whenever necessary to pinpoint the location of an item mentioned in the text. **NOTE:** Refer to the service manual for detailed explanations of each item illustrated on the next 4 pages.

- 1 Control Panel
- 2 Steering Wheel
- 3 Detergent Cartridge
- 4 Solution Tank
- 5 Solution Tank Fill Cap
- 6 Tie Down Locations
- 7 Drive Wheel
- 8 Scrub Deck
- 9 Squeegee Roller
- 10 Squeegee Assembly
- 11 Squeegee Cover Knobs (4)
- 12 On-Board Charger Power Cord



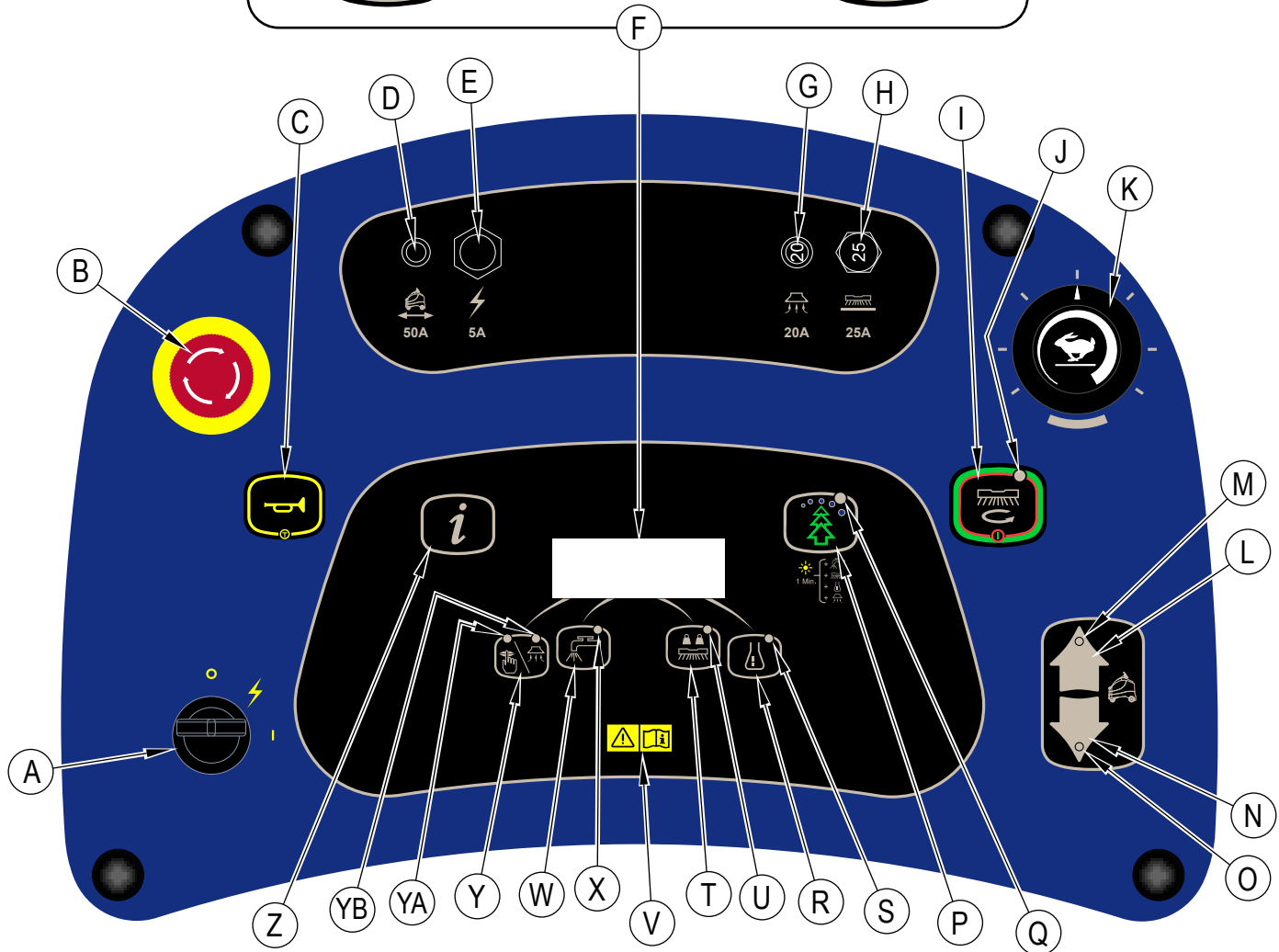
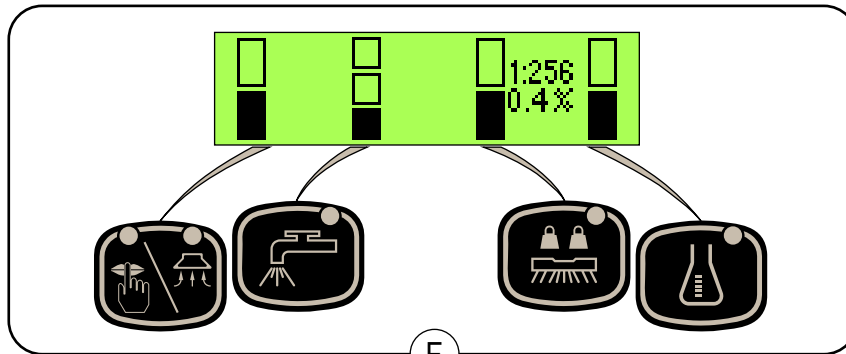
KNOW YOUR MACHINE

- | | | | |
|----|---|----|--------------------------------|
| 13 | Control Panel Housing / Recovery Tank Cover | 24 | Battery Charger |
| 14 | Automatic Vacuum Motor Shutoff Float | 25 | Solution Solenoid Valve |
| 15 | Recovery Tank | 26 | Solution Filter |
| 16 | Debris Catch Tray | 27 | Solution Shutoff Valve |
| 17 | Solution Tank Rear Fill Port | 28 | Hand Holds |
| 18 | Go Pedal | 29 | Latch |
| 19 | Operator Presence Pedal | 30 | Recovery Tank Drain Hose |
| 20 | Platform | 31 | Solution Tank Level Sight Tube |
| 21 | Rear Wheel | 32 | Prop Rod |
| 22 | Solution Tank Drain Hose | 33 | Battery Connector |
| 23 | Rear Squeegee Blade Removal Latch | 34 | Solution Drain Valve |



CONTROL PANEL

- | | | | |
|---|---|----|---|
| A | Key Switch | P | EcoFlex Switch |
| B | Emergency Stop | Q | EcoFlex Indicator |
| C | Horn Switch | R | Detergent Strength Switch |
| D | Drive Wheel Circuit Breaker (50 Amp) | S | Detergent ON/OFF Indicator |
| E | Control Circuit Circuit Breaker (5 Amp) | T | Extra Pressure Switch |
| F | Graphic Display (see Control Panel-Continued) | U | Extra Pressure Indicator |
| G | Vacuum Motor Circuit Breaker (20 Amp) | V | Read All Instructions Before Using Symbol |
| H | Brush Motor Circuit Breaker (25 Amp) | W | Solution Flow Adjustment Switch |
| I | One-Touch™ Scrub ON/OFF Switch | X | Solution ON/OFF Indicator |
| J | Scrub ON/OFF Indicator | Y | Vacuum Power Adjustment Switch |
| K | Speed Adjustment Knob | YA | Quiet Vacuum Mode Indicator |
| L | Forward Drive Switch | YB | Standard Vacuum Mode Indicator |
| M | Forward Drive Indicator | Z | Information Switch |
| N | Reverse Drive Switch | | |
| O | Reverse Drive Indicator | | |



CONTROL PANEL - CONTINUED

- 1 Scrubbing Screen
- 2 Information Screen
- 3 Battery Low Voltage Screen
- 4 Battery Charger Screen

F Graphic Display

F1 Vacuum Level Bar Graph
 TOP = High
 BOTTOM = Low
 NONE = Off

F2 Solution Flow Rate Bar Graph
 TOP = High
 MIDDLE = Medium
 BOTTOM = Low
 NONE = Off

F3 Scrub Brush Pressure Bar Graph
 TOP = Extra Pressure
 BOTTOM = Standard Pressure

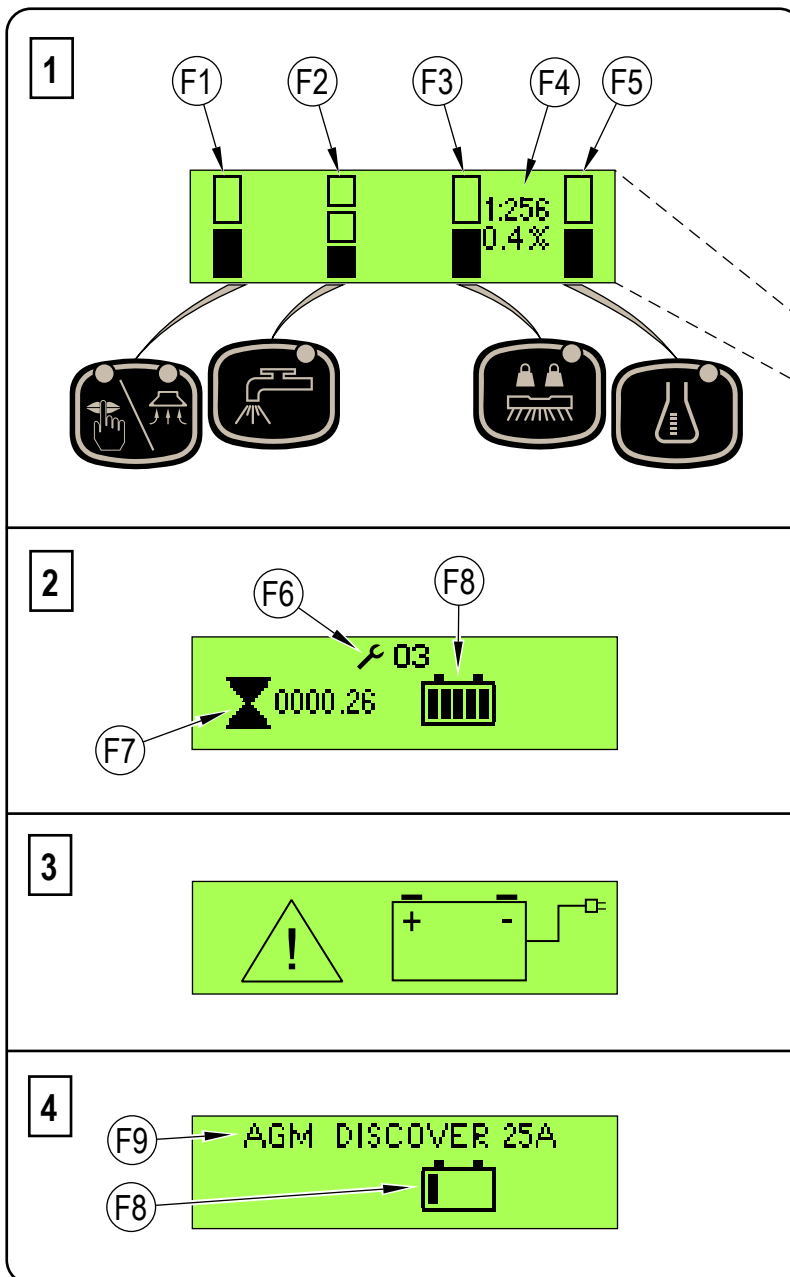
F4 Detergent Ratio/Percentage Indicator
F5 Detergent Indicator Bar Graph
 TOP = Strong Detergent
 BOTTOM = Weak Detergent
 NONE = Off

F6 Fault Codes

F7 Hour Meter

F8 Battery Charge Level Indicator

F9 Battery Type



BATTERIES

If your machine shipped with batteries installed do the following:

- Check that the batteries are connected to the machine.
- Turn ON the Key Switch (A) and check the Battery Indicator (F8). If the gauge is completely filled the batteries are ready for use. If the gauge is less than full the batteries should be charged before use. See the "Charging The Batteries" section.
- **IMPORTANT!** IF YOUR MACHINE HAS AN ONBOARD BATTERY CHARGER REFER TO THE OEM PRODUCT MANUAL FOR INSTRUCTIONS REGARDING SETTING THE CHARGER FOR BATTERY TYPE.

If your machine shipped without batteries installed do the following:

- Consult your Authorized Nilfisk dealer for recommended batteries.
- Install the batteries by following the instructions below.
- **DO NOT install two 12 volt batteries in your machine. This affects the stability of the machine.**
- **IMPORTANT!** IF YOUR MACHINE HAS AN ONBOARD BATTERY CHARGER REFER TO THE OEM PRODUCT MANUAL FOR INSTRUCTIONS REGARDING SETTING THE CHARGER FOR BATTERY TYPE.

INSTALL THE BATTERIES



WARNING !

Use extreme caution when working with batteries. Sulfuric acid in batteries can cause severe injury if allowed to contact the skin or eyes. Explosive hydrogen gas is vented from inside the batteries through openings in the battery caps. This gas can be ignited by any electrical arc, spark or flame. If battery acid makes contact with your skin, flush the affected area with water for 5 minutes and seek medical attention.

When Servicing Batteries...

- Remove all jewelry.
- Do not smoke.
- Wear safety glasses, a rubber apron and rubber gloves.
- Work in a well-ventilated area.
- Do not allow tools to touch more than one battery terminal at a time.
- ALWAYS disconnect the negative (ground) cable first when replacing batteries to prevent sparks.
- ALWAYS connect the negative cable last when installing batteries.



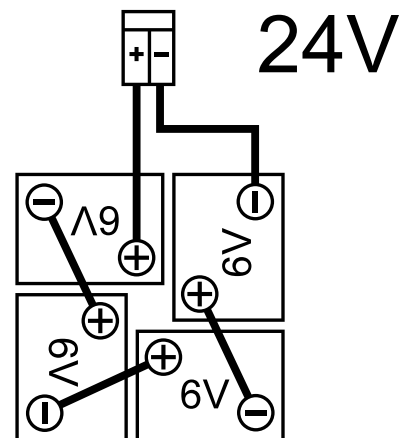
CAUTION !

Electrical components in this machine can be severely damaged if the batteries are not installed and connected properly. Batteries should be installed by Nilfisk or by a qualified electrician.

- 1 Empty the Recovery Tank (15) using the Recovery Tank Drain Hose (30).
- 2 Turn the Key Switch (A) off (O) and remove the key. Unlatch (29) then swing open the Recovery Tank Cover (13) and set the Prop Rod (32).
- 3 Tip the Recovery Tank (15) back towards the operator's platform to expose the battery compartment.
- 4 Using (2) people and an appropriate lifting strap, carefully lift the batteries into the compartment tray exactly as shown. Refer to the molded diagram on the underside of the Recovery Tank Cover.
- 5 **See Figure 1.** Install battery cables as shown and tighten the nuts on the battery terminals.
- 6 Install the battery boots and secure tightly to the battery cables with the supplied tie straps.
- 7 Connect the machine's main power cables to the batteries or if so equipped plug together the battery connector (33). Close the recovery tank cover.

When changing batteries or the charger, please contact your local authorized service center for correct battery, charger and machine settings to prevent battery damage.

FIGURE 1



260A/H-20HR-RATE

INSTALL THE BRUSH

1 Make sure the Scrub Deck (8) is in the RAISED position. Make sure the Key Switch (A) is off (O).

CAUTION!

Turn the key switch off (O) and remove the key, before changing the brush.

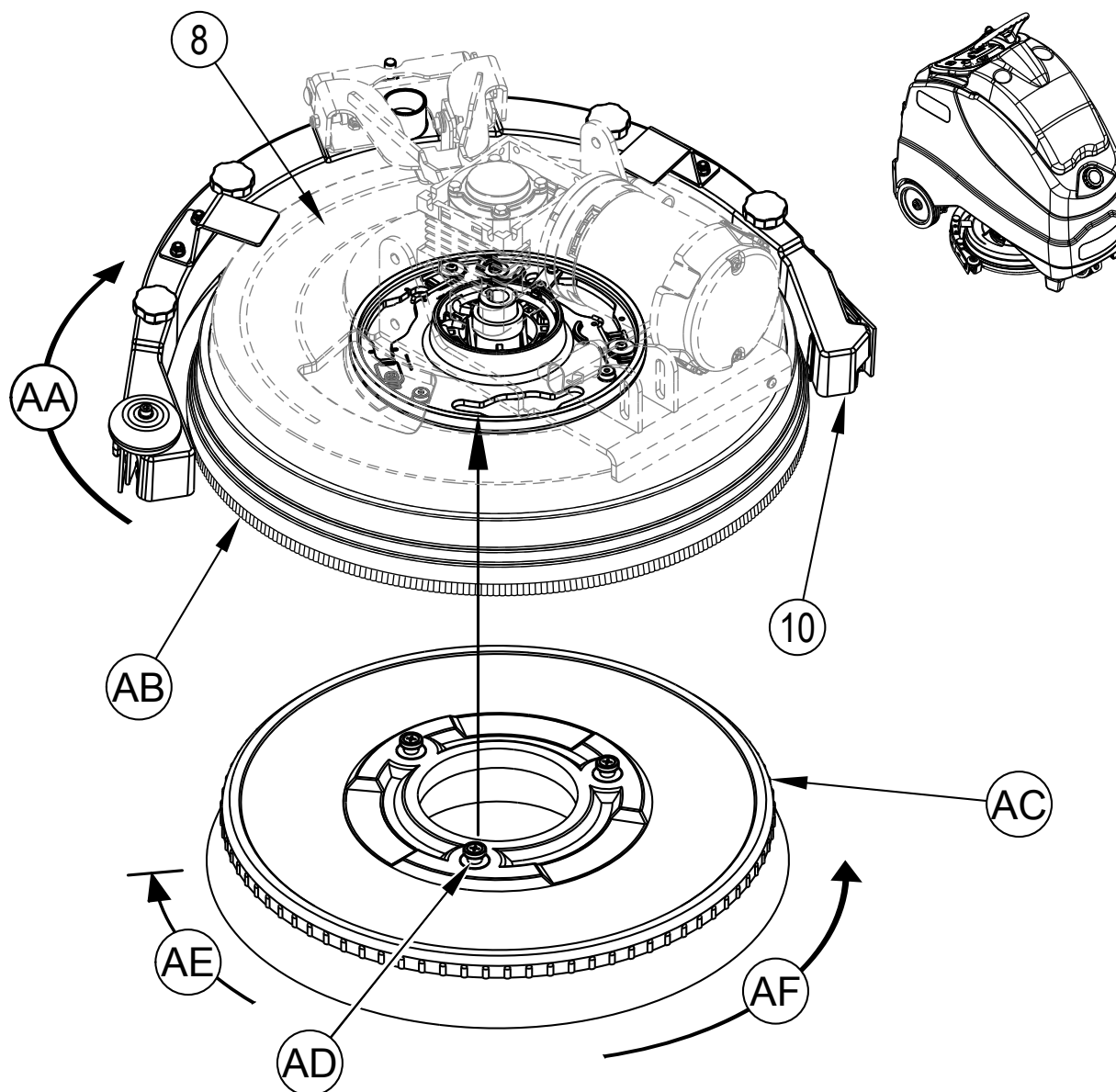
2 See Figure 2. Rotate the Squeegee Assembly (10) away from your side of the machine to create better access to the brush, (AA).

3 Lift the Scrub Deck Skirt (AB) up and slide the brush under the scrub deck.

4 If using a pad, install the pad on the pad holder.

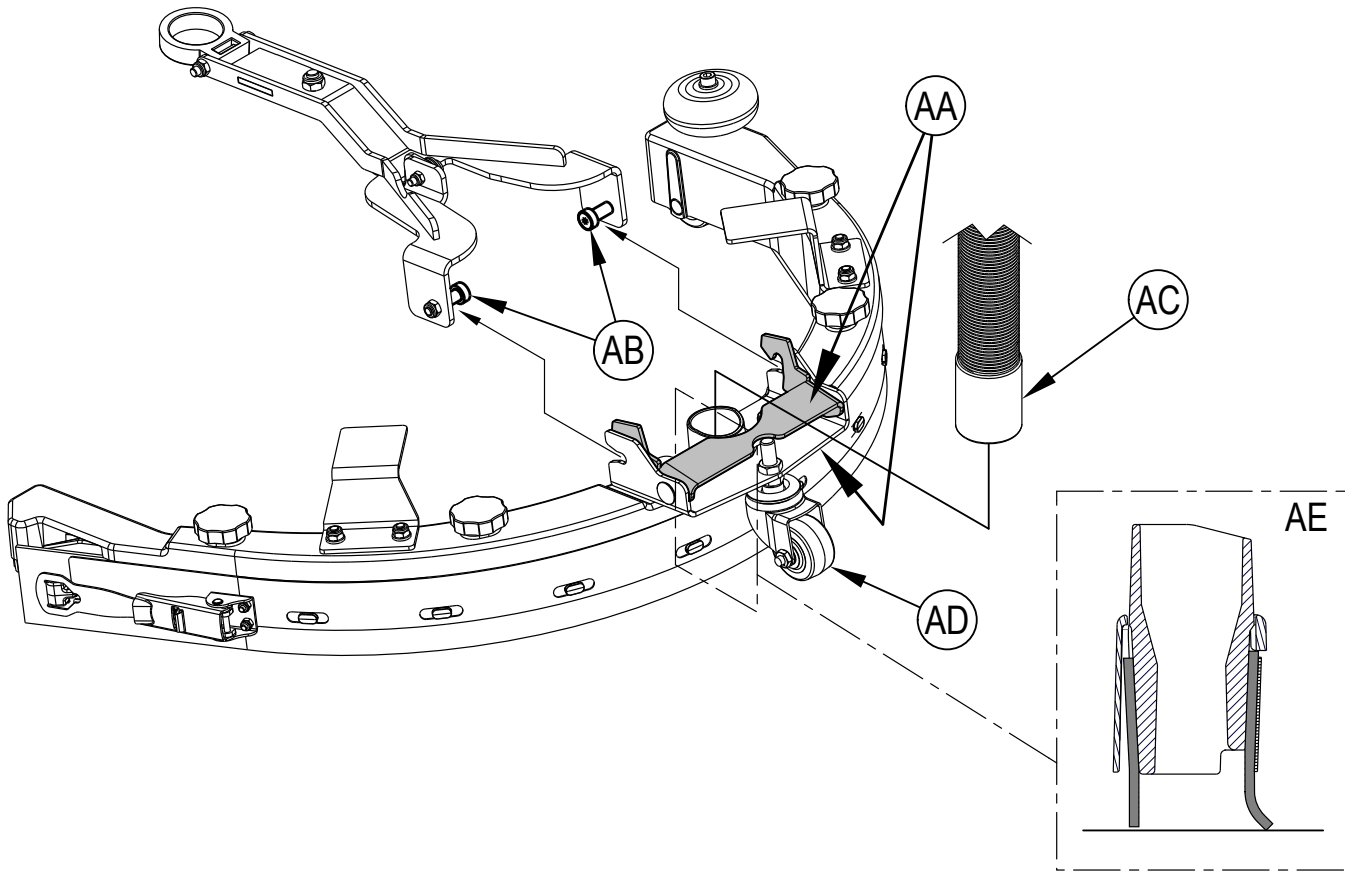
5 To mount the Brush (AC) (or pad holder) lift the brush and align the Lugs (AD) on the brush with the holes on the mounting plate then turn to lock in place (from the right side of the machine, turn the outside edge of brush towards the rear of machine as shown (AE)). **NOTE:** During operation the brush should rotate in direction (AF).

FIGURE 2



INSTALL THE SQUEEGEE

- 1 See Figure 4. Squeeze the back of the Squeegee Mount Bracket (AA) to open and release the bracket once it's in place over the deck arm Pins (AB).
- 2 Connect the Recovery Hose (AC) to the squeegee inlet.
- 3 Lower the scrub deck and squeegee, move the machine ahead slightly. If necessary adjust the rear squeegee height using the Rear Caster Wheel (AD) so that the rear squeegee blade touches the floor evenly across its entire width and is bent over slightly as shown in the squeegee cross section (AE).

FIGURE 4

FILL THE SOLUTION TANK

Read the cleaning chemical label and calculate the proper amount of chemical to mix for a tank that holds 12 US gallons (45 liters).

Open the Solution Tank Fill Cap (5) or the Solution Tank Rear Fill Port (17), then fill the tank 1/3 full of water, add the cleaning chemical, then fill up the tank the remainder of the way. The amount of solution in the tank can be observed by looking at the Solution Tank Level Sight Tube (31).



CAUTION!

Use only low-foaming, non-flammable liquid detergents intended for automatic scrubber machine applications. Water temperature should not exceed 130 degrees Fahrenheit (55 degrees Celsius).

DETERGENT SYSTEM PREPARATION AND USE (ECOFLEX)

COMMON INSTRUCTIONS:

The Detergent Cartridge (3) is located under the Control Panel Housing (13). Fill the detergent cartridge with a maximum of 1 gallon (4 Liters) of detergent. **SERVICE NOTE:** Remove the detergent cartridge from the machine prior to filling to avoid spilling detergent on the machine.

It is recommended that a separate cartridge be used for each detergent you plan to use. The detergent cartridges have a white decal on them so you can write the detergent name on each cartridge to avoid mixing them up. When installing a new cartridge, remove the factory cap and place the cartridge in the machine. Install the Dry Break Cap (AA) as shown in Figure 5.

The system should be purged of previous detergent when switching to a different detergent. **SERVICE NOTE:** Move machine over floor drain before purging because a small amount of detergent will be dispensed in the process.

To Purge When Changing Detergent (SCRUB AND SOLUTION SYSTEMS MUST BE OFF):

- 1 Disconnect and remove the detergent cartridge.
- 2 Turn the key switch (A) to the ON (I) position. Wait a few seconds for the start-up sequence to finish.
- 3 Press and hold the Detergent Switch (R) and the Solution Switch (W) for 3 seconds. Release the switches when the chemical purge icon (F10) appears on the display and the Detergent Indicator (S) starts flashing. **NOTE:** Once activated the purge process takes at least 10 seconds. See illustration on next page for Detergent System indicators. Normally one purge cycle is adequate to purge the system.

To Purge Weekly (SCRUB AND SOLUTION SYSTEMS MUST BE OFF):

- 1 Disconnect and remove the detergent cartridge. Install and connect a Cartridge filled with clean warm water.
- 2 Follow steps 2 and 3 from "To Purge When Changing Detergent".

When the detergent level is nearing the bottom of the cartridge it is time to refill or replace the cartridge.

SERVICE NOTE: Follow the "To Purge Weekly" instructions above if the machine is going to be stored for an extended period of time.

Detergent Ratio (SCRUB AND SOLUTION SYSTEM MUST BE ON):

No detergent is dispensed until the scrub and detergent systems are activated, direction is selected (L) or (N) and the Go Pedal (18) is pushed.

- The Detergent Ratio/Percentage Indicator (F4) will always be displayed when the detergent system is on.

There are 4 modes of EcoFlex operation:

1. *Chemical Free Cleaning Mode* – During scrubbing, the detergent system can be turned off at any time to allow scrubbing with water only. Press the Detergent Switch (R) until the Detergent Indicator (S) is OFF and Detergent Indicator Bar Graph (F5) displays both top and bottom boxes empty.
2. *Weak Detergent Mode* – Detergent Indicator (S) ON, Detergent Indicator Bar Graph (F5) displays bottom box filled and top box empty. Pressing the Detergent Switch (R) will cycle from weak to strong to OFF and back to weak in a repeating sequence. See below the steps "To program the Weak Detergent Ratio/Percentage".
3. *Strong Detergent Mode* – Detergent Indicator (S) ON, Detergent Indicator Bar Graph (F5) displays both top and bottom boxes filled. Pressing the Detergent Switch (R) will cycle from weak to strong to OFF and back to weak in a repeating sequence. See below the steps "To program the Strong Detergent Ratio/Percentage". Do not use a detergent level exceeding the detergent manufacturer's recommendation.
4. *Burst of Power Cleaning Mode* – Press the EcoFlex Switch (P) to temporarily (1 minute) engage the strong detergent strength, extra scrub pressure, full vacuum power and increase the solution flow rate to the next available level. The EcoFlex Indicator (Q) will blink during this 1 minute interval, after which all scrub parameters will return to their previous state.

To program the Strong Detergent Ratio/Percentage (set this first)

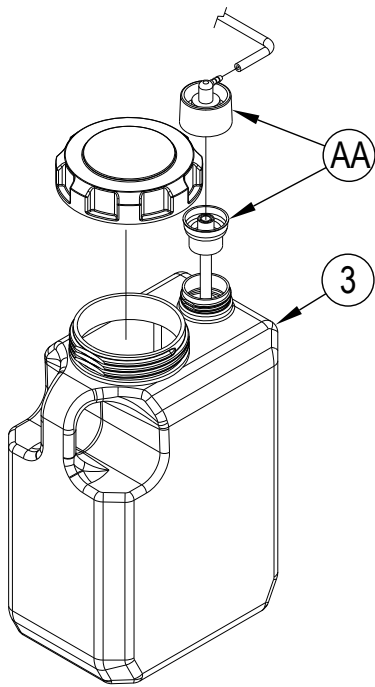
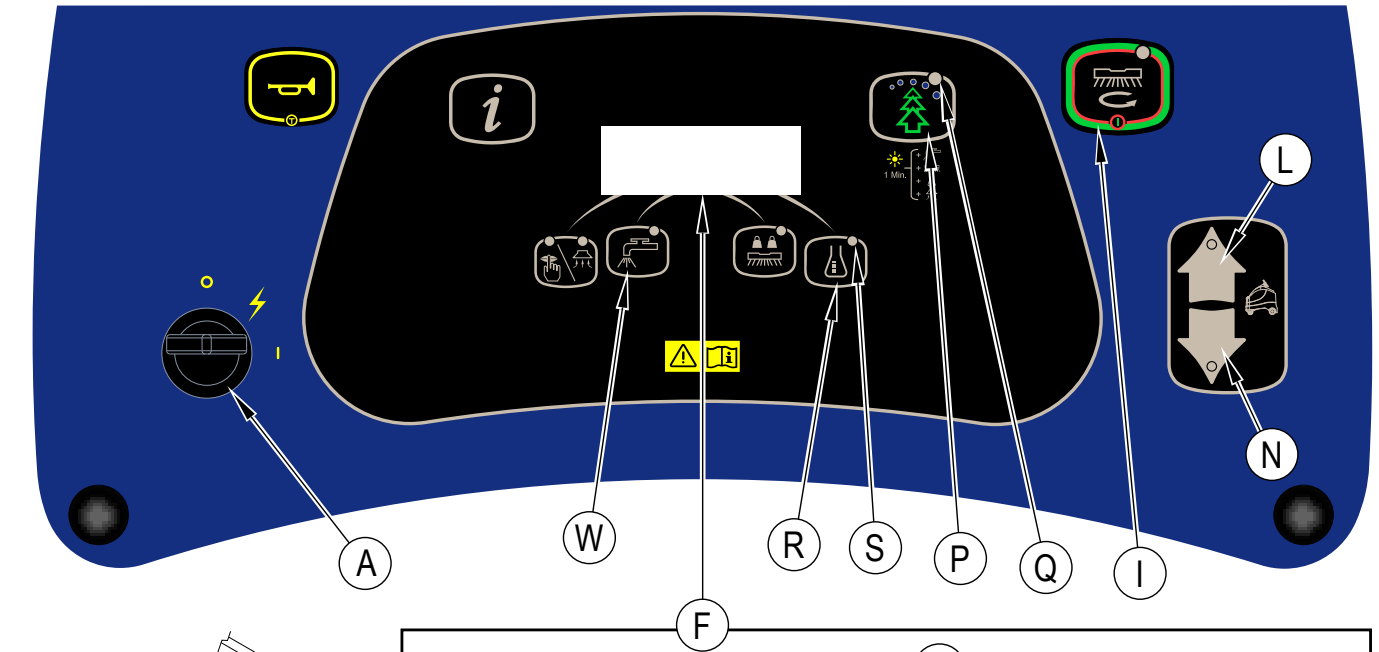
1. Press the OneTouch™ Scrub Switch (I) to activate the scrub system.
2. Press the Detergent Switch (R) until the Bar Graph (F5) displays Strong detergent (both top and bottom boxes filled).
3. Press and hold the Detergent Switch (R) again for 3 seconds to enter the programming mode. Once you have entered the strong detergent adjustment mode the top box of (F5) will flash. Also the detergent ratio/percentage (F4) and indicator (S) will begin to flash.
4. While the indicators are flashing, pressing and releasing the detergent switch (R) will cycle through the options. The ratio and it's corresponding percentage are displayed together.
Ratio = 1:32, 1:50, 1:64, 1:100, 1:128, 1:150, 1:200, 1:256, 1:300, 1:400.
Percentage = 3%, 2%, 1.5%, 1%, 0.8%, 0.66%, 0.5%, 0.4%, 0.3%, 0.25%.
5. Once the desired ratio/percentage is displayed on the screen (F4), stop and it will save the setting after 3 seconds.
6. If the weak setting is currently set to a higher value than the new strong programmed setting, the software will automatically adjust the weak setting to be one value weaker than the strong setting.

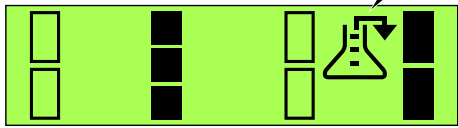
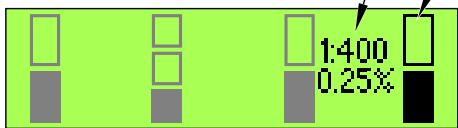
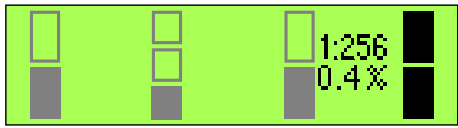
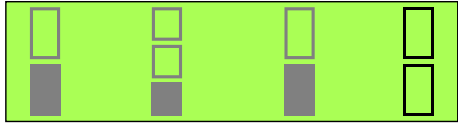
To program the Weak Detergent Ratio/Percentage

1. Press the OneTouch™ Scrub Switch (I) to activate the scrub system.
2. Press the Detergent Switch (R) until the Bar Graph (F5) displays Weak detergent (bottom box filled and top box empty).
3. Press and hold the Detergent Switch (R) again for 3 seconds to enter the programming mode. Once you have entered the weak detergent adjustment mode the bottom box of (F5) will flash. Also the detergent ratio/percentage (F4) and indicator (S) will begin to flash.
4. While the indicators are flashing, pressing and releasing the detergent switch (R) will cycle through the available options. The weak setting must be a value weaker than or equal to the strong setting, so only the values that fall within that range will be displayed as you cycle through them.
5. Once the desired ratio/percentage is displayed on the screen (F4), stop and it will save the setting after 3 seconds.

DETERGENT SYSTEM PREPARATION AND USE (ECOFLEX)

FIGURE 5



	F10	Purge Press and hold (R) & (W) for 3 seconds to purge
	F4	Weak detergent
	F5	Strong detergent
		Detergent OFF

OPERATING THE MACHINE

WARNING!

Be sure you understand the operator controls and their functions.

While on ramps or inclines, avoid sudden stops. Avoid abrupt sharp turns. Use low speed down ramps.

To Scrub...

Follow the instructions in "Preparing the Machine for Use" section of this manual.

- 1 **See Figure 6.** Step onto the Platform (20) compressing Operator's Presence Pedal (19). **NOTE:** Do not press the Go Pedal (18) until you are ready to move the machine.
- 2 Turn the Key Switch (A) ON (I). Wait a few seconds for the start-up sequence to finish. The graphic display (F) will show the information screen [2]. Reference the Battery Charge Level Indicator (F8) before proceeding.
- 3 To transport the machine to the work area, first push the Forward Drive Switch (L) or Reverse Drive Switch (N) to select the direction of travel and then apply pressure with your foot on the Go Pedal (18). **Safety Feature:** If you press and hold the Go Pedal (18) prior to pressing either Forward (L) or Reverse (N) an "error 03" (F6) will appear on the screen preventing the machine from moving. If this occurs cycle the key switch OFF and ON in order to operate the machine. An audible alert from the horn will sound in reverse. Adjust machine speed by rotating the Speed Adjustment Knob (K) clockwise to go faster or counterclockwise to go slower.
- 4 Press and hold the Solution Switch (W) to pre-wet the floor, solution will be dispensed at the HIGH rate while the switch is held. **NOTE:** This will help prevent scarring of the floor surface when starting to scrub with dry brushes. This can only be done prior to pressing the One-Touch Scrub Switch (I).
- 5 Press the One-Touch Scrub Switch (I). The graphic display (F) will change to the scrubbing screen [1]. The scrub deck and squeegee will be lowered to the floor. The scrub, vacuum, solution and detergent systems are enabled and will all start when the Go Pedal (18) is activated. The scrub parameters return to fixed settings after each use. When the key is turned on and the One-Touch scrub button is pressed the scrub parameters will be as follows: vacuum is set to high, solution flow rate is set to low, the pressure is set to standard and the detergent strength will be remembered from previous use. See an authorized service center regarding changing the default scrub parameters.

Scrub: Each press of the Brush Pressure Switch (T) will change between STANDARD pressure ((F3) bottom box filled top box empty) and EXTRA pressure ((F3) both bottom and top boxes filled). The scrub system can only be turned OFF by pressing the One-Touch Scrub Switch (I).

Solution: The solution flow rate can be changed independently of the scrub pressure by pressing the Solution Switch (W). Each press of the switch will cycle between LOW, MEDIUM, HIGH, OFF and back to LOW. LOW is indicated when (F2) displays bottom box filled, MEDIUM is indicated when (F2) displays bottom and middle boxes filled, HIGH is indicated when (F2) displays all three boxes filled, and OFF is indicated when (F2) displays all three boxes empty.

Vacuum: The vacuum level can be changed independently. Each press of the Vacuum Switch (Y) will cycle between LOW, HIGH, OFF and back to LOW. LOW is indicated when Vacuum Level Bar Graph (F1) displays bottom box filled, HIGH is indicated when (F1) displays both bottom and top boxes filled. OFF is indicated when (F1) displays both bottom and top boxes empty. **NOTE:** To pick up solution without scrubbing, press the Vacuum Switch (Y) while in transport mode. This will cause the squeegee to lower and the vac motor to turn ON at the LOW level.

Detergent: See "Detergent System Preparation and Use (EcoFlex)" for more detailed information regarding the adjustment and use of the detergent system.
- 6 **Daily Scrub:** Begin scrubbing by driving the machine forward in a straight line at a safe speed and overlap each path by 2-3 inches (50-75 mm). Adjust the machine speed, scrub pressure, solution flow and detergent level when necessary according to the condition of the floor. **NOTE:** The machine speed can be adjusted by rotating the Speed Adjustment Knob (K) clockwise to go faster or counterclockwise to go slower.
- 7 Press the EcoFlex Switch (P) to temporarily (1 minute) engage the strong detergent strength, extra scrub pressure, full vacuum power and increase the solution flow rate to the next available level. The EcoFlex Indicator (Q) will blink during this 1 minute interval, after which all scrub parameters will return to their previous state.

CAUTION!

To avoid damaging the floor, only start and stop the scrubbing function while the machine is in motion.

- 8 When scrubbing, check behind the machine occasionally to see that all of the waste water is being picked up. If there is water trailing the machine, you may be dispensing too much solution, the recovery tank may be full, or the squeegee tool may require adjustment.
- 9 For extremely dirty floors, a one-pass scrubbing operation may not be satisfactory and a "double-scrub" operation may be required. This operation is the same as a one-pass scrubbing except on the first pass the squeegee is in the up position. Lift up the squeegee assembly and rotate the double scrub bracket (AA) down, to hold the squeegee off the floor. This allows the cleaning solution to remain on the floor to work longer. The final pass is made over the same area, with the squeegee lowered to pick up the accumulated solution.
- 10 The recovery tank has a shut-off float (14) that causes a change in pitch in the vac motor. When this float is activated, the recovery tank must be emptied. The machine will not pick up water with the float activated.
- 11 When the operator wants to stop scrubbing:

Press the One-Touch Scrub Switch (I) once. This will automatically stop the scrub brushes and solution flow and the scrub deck will raise up. The squeegee will raise up after a brief delay with the scrub deck and the vacuum will stop after a brief time delay (this is to allow any remaining water to be picked up without turning the vacuum back on) if the vacuum switch is pressed during this time delay the vacuum will turn off.
- 12 Drive the machine to a designated waste water "DISPOSAL SITE" and empty the recovery tank. To empty, pull the Recovery Tank Drain Hose (30) from its rear storage area, then unscrew the cap (hold the end of the hose above the water level in the tank to avoid sudden, uncontrolled flow of waste water). The drain hose can be squeezed to regulate the flow. Unlatch (29) and lift open the Recovery Tank Cover (13) to inspect and empty the Debris Catch Tray (16) in the recovery tank. Refill the solution tank and continue scrubbing.

NOTE: Make sure the Recovery Tank Cover (13) and the Recovery Tank Drain Hose (30) cap are properly seated or the machine will not pick-up water correctly.

When the batteries require recharging the Battery Low Voltage Screen [3] will come on. Then the scrub brushes and solution flow will stop and the scrub deck will raise up. Once the battery voltage drops below a second cutoff level the squeegee will raise up and the vacuum will stop after a brief delay. Transport the machine to a service area and recharge the batteries according to the instructions in the Battery section of this manual.

AFTER USE

- 1 When finished scrubbing, press the One-Touch Scrub Switch **(1)**, this will automatically raise, retract and stop all the machine systems (brush, squeegee, vacuum, solution and detergent). Then drive the machine to a service area for daily maintenance and review of other needed service upkeep.
- 2 To empty the solution tank:
Direct the Solution Tank Drain Hose **(22)** toward a designated "DISPOSAL SITE" and open the Solution Drain Valve **(34)**. Also the tank can be drained by closing the Solution Shutoff Valve **(27)** and removing the cap from the Solution Filter **(26)**, then open the Solution Shutoff Valve to drain the solution out through the filter. Rinse the tank with clean water.
- 3 To empty the recovery tank, pull the Recovery Tank Drain Hose **(30)** from its storage area. Direct the hose to a designated "DISPOSAL SITE" and unscrew the cap (hold the end of the hose above the water level in the tank to avoid sudden, uncontrolled flow of waste water). Unlatch **(29)** and lift open the Recovery Tank Cover **(13)** set the prop rod **(32)**. Inspect and empty the Debris Catch Tray **(16)** in the recovery tank. Rinse the tank with clean water.
- 4 Remove the brush or pad holder. Rinse the brush or pad in warm water and hang up to dry.
- 5 Remove the squeegee, rinse it with warm water and hang it up to dry.
- 6 Check the maintenance schedule below and perform any required maintenance before storage.
- 7 Store the machine indoors in a clean dry place. Keep from freezing. Leave the tanks open to air them out.
- 8 Turn the Key Switch **(A)** OFF (O) and remove the key.
- 9 Batteries are the most expensive replacement item on this machine. To protect your investment and to get as many cycles from the batteries as possible, remember the following:
 - Batteries will last longer if kept fully charged.
 - Batteries equipped with this machine will not develop a memory.
 - Batteries will last longer and will deliver more cycles if they are opportunity charged.
 - Battery chargers will not over or undercharge the batteries.
 - Batteries will prematurely fail if stored in a discharged state.
 - When the machine is not being used, plug the machine in to charge the batteries.
 - Every day after use, the battery charger must be plugged in and the charger must be allowed to run through a full charging sequence to fully charge the batteries.

MAINTENANCE SCHEDULE

MAINTENANCE ITEM	Daily	Weekly	Monthly	Yearly
Charge Batteries	X			
Check/Clean Tanks & Hoses	X			
Check/Clean the Brushes/Pads	X			
Check/Clean the Squeegee	X			
Check/Clean Vacuum Shut-Off Float	X			
Empty/Clean Debris Catch Tray in Recovery Tank	X			
Check Each Battery Cell(s) Water Level		X		
Inspect Scrub Housing Skirt		X		
Inspect and clean Solution Filter		X		
Purge Detergent System (if installed)		X		
Lubrication of Machine			X	
* Check Carbon Brushes				X

* Have an Authorized Nilfisk Service Center check the vacuum motor carbon motor brushes once a year or after 300 operating hours. The brush and drive motor carbon brushes should be checked every 500 hours or once a year.

LUBRICATING THE MACHINE

Apply grease to (or grease fitting locations) (AA):

Use grease type Lubriplate® 730-2 or equivalent

- Steering Chain
- Drive Wheel Chain
- Drive Chain Idler Sprocket (grease fitting)
- Steering Shaft (steering assembly tube)

Once a month, apply light machine oil to lubricate the (AB):

- Steering shaft universal joints

FIGURE 7

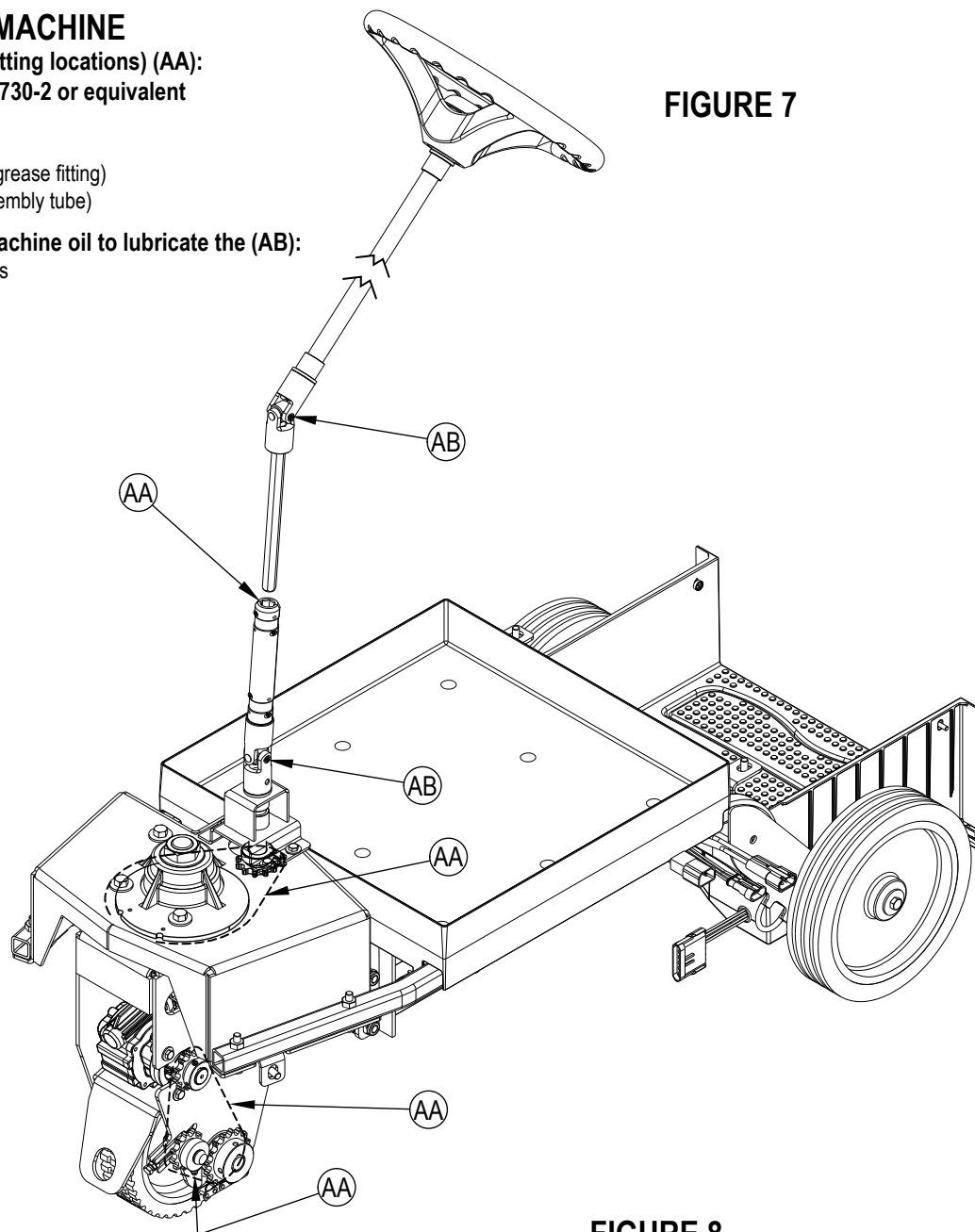
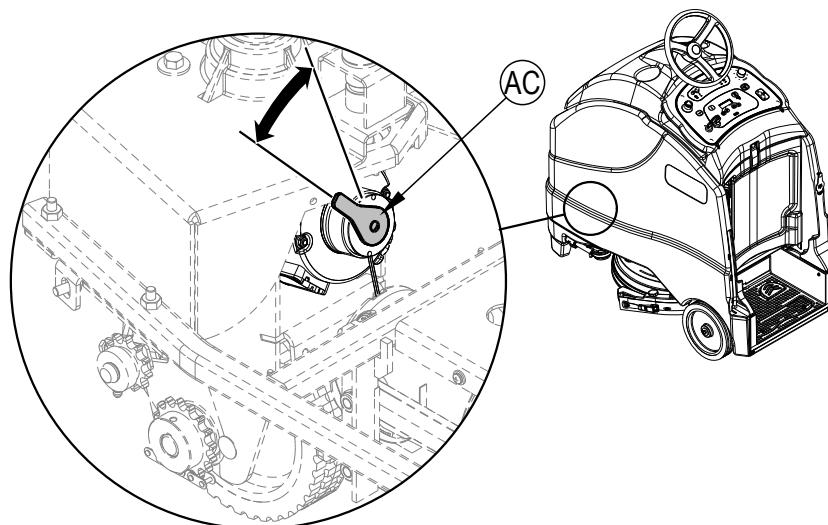


FIGURE 8

ELECTROMAGNETIC BRAKE

See Figure 8. The drive wheel motor has a built in electromagnetic brake that is engaged whenever the Key Switch (A) is OFF or the Go Pedal (18) is not being pressed, machine in neutral. This brake can be manually overridden if necessary by reaching up around the back of the front drive wheel and rotating the Brake Arm (AC) up as shown. This should only be done in the event you need to push or pull the unit. Remember to re-engage the brake arm once you finish moving the machine. **NOTE:** Turn the drive wheel 45° to the right for easier access to the brake arm.



CHARGING WET BATTERIES

Charge the batteries each time the machine is used or when the Battery Charge Level Indicator (F8) is reading less than full.

WARNING!

Do not top off the batteries before charging. Check to ensure the plates are covered only.

Charge batteries in a well-ventilated area. If battery acid makes contact with your skin, flush the affected area with water for 5 minutes and seek medical attention.

Do not smoke while servicing the batteries.

When Servicing Batteries...

- * Remove all jewelry
- * Do not smoke
- * Wear safety glasses, rubber gloves and a rubber apron
- * Work in a well-ventilated area
- * Do not allow tools to touch more than one battery terminal at a time
- * ALWAYS disconnect the negative (ground) cable first when replacing batteries to prevent sparks.
- * ALWAYS connect the negative cable last when installing batteries.

If your machine shipped **with** an onboard battery charger do the following:

- 1 Turn the Key Switch (A) OFF.
- 2 **See Figure 9.** Open the Control Panel Housing (13) set the Prop Rod (32).
- 3 Empty the Recovery Tank (15) using the Recovery Tank Drain Hose (30). Tip the Recovery Tank (15) back for proper ventilation.
- 4 Unwind the electrical cord for the onboard charger near the front of the machine and plug it into a properly grounded outlet. Refer to the OEM product manual for more detailed operating instructions. **NOTE:** The Battery Charger Screen [4] will be displayed on the Graphic Display (F) while AC power is applied to the onboard charger (during which time all machine functions are disabled). This screen will display Battery Charge Level Indicator (F8) and Battery Type (F9).
- 5 The Battery Charge Level Indicator (F8) will display full once the batteries are done charging.

If your machine shipped **without** an onboard battery charger do the following:

- 1 Turn the Key Switch (A) OFF.
- 2 **See Figure 9.** Open the Control Panel Housing (13) set the Prop Rod (32).
- 3 Empty the Recovery Tank (15) using the Recovery Tank Drain Hose (30). Tip the Recovery Tank (15) back for proper ventilation.
- 4 Disconnect the batteries from the machine and push the connector from the charger into the Machine Battery Connector (33). Follow the instructions on the battery charger. **SERVICE NOTE:** Make sure you plug the battery charger into the connector that attaches to the batteries.

CAUTION!

To avoid damage to floor surfaces, wipe water and acid from the top of the batteries after charging. Under or overcharging will shorten battery life and limit performance. Be sure to FOLLOW PROPER CHARGING INSTRUCTIONS!

CHECKING THE BATTERY WATER LEVEL

Check the water level of the batteries at least once a week.

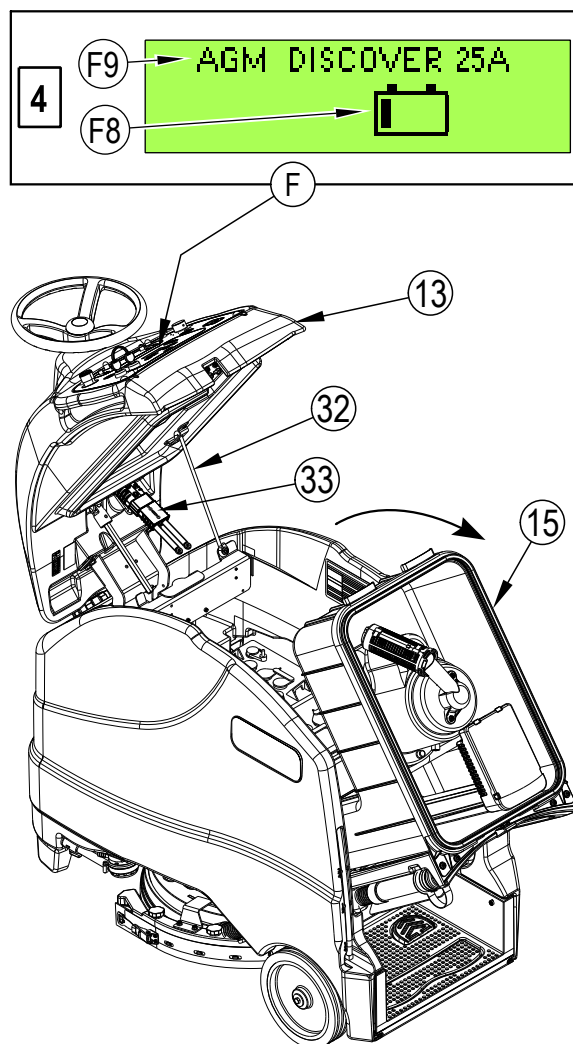
Remove the vent caps and check the water level in each battery cell. Use distilled or demineralized water in a battery filling dispenser (available at most auto parts stores) to fill each cell to the level indicator (or to .39 inches / 10 mm over the top of the separators). DO NOT over-fill the batteries!

CAUTION!

Acid can spill onto the floor if the batteries are overfilled.

Tighten the vent caps. Wash the tops of the batteries with a solution of baking soda and water (2 tablespoons of baking soda to 1 liter of water).

FIGURE 9



CHARGING GEL/AGM (VRLA) BATTERIES

Charge the batteries each time the machine is used or when the Battery Charge Level Indicator (F8) is reading less than full.



WARNING!

Charge batteries in a well-ventilated area. If battery acid makes contact with your skin, flush the affected area with water for 5 minutes and seek medical attention.

Do not smoke while servicing the batteries.

When Servicing Batteries...

- * Remove all jewelry
- * Do not smoke
- * Wear safety glasses, rubber gloves and a rubber apron
- * Work in a well-ventilated area
- * Do not allow tools to touch more than one battery terminal at a time
- * ALWAYS disconnect the negative (ground) cable first when replacing batteries to prevent sparks.
- * ALWAYS connect the negative cable last when installing batteries.



CAUTION!

Your voltage regulated lead acid (VRLA) battery will deliver superior performance and life ONLY IF IT IS RECHARGED PROPERLY! Under or overcharging will shorten battery life and limit performance. Be sure to FOLLOW PROPER CHARGING INSTRUCTIONS! DO NOT ATTEMPT TO OPEN THIS BATTERY! If a VRLA battery is opened, it loses its pressure and the plates become oxygen contaminated. THE WARRANTY WILL BE VOIDED IF THE BATTERY IS OPENED.

If your machine shipped with an onboard battery charger do the following:

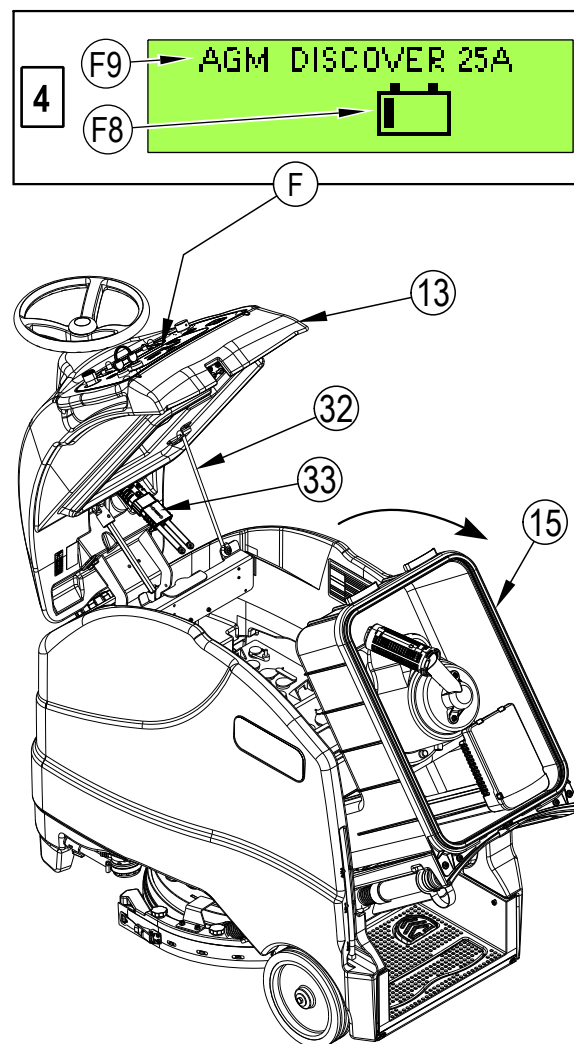
- 1 Turn the Key Switch (A) OFF.
- 2 **See Figure 9.** Open the Control Panel Housing (13) set the Prop Rod (32).
- 3 Empty the Recovery Tank (15) using the Recovery Tank Drain Hose (30). Tip the Recovery Tank (15) back for proper ventilation.
- 4 Unwind the electrical cord for the onboard charger near the front of the machine and plug it into a properly grounded outlet. Refer to the OEM product manual for more detailed operating instructions. **NOTE:** The Battery Charger Screen [4] will be displayed on the Graphic Display (F) while AC power is applied to the onboard charger (during which time all machine functions are disabled). This screen will display Battery Charge Level Indicator (F8) and Battery Type (F9).
- 5 The Battery Charge Level Indicator (F8) will display full once the batteries are done charging.

If your machine shipped without an onboard battery charger do the following:

- 1 Turn the Key Switch (A) OFF.
- 2 **See Figure 9.** Open the Control Panel Housing (13) set the Prop Rod (32).
- 3 Empty the Recovery Tank (15) using the Recovery Tank Drain Hose (30). Tip the Recovery Tank (15) back for proper ventilation.
- 4 Disconnect the batteries from the machine and push the connector from the charger into the Machine Battery Connector (33). Follow the instructions on the battery charger. **SERVICE NOTE:** Make sure you plug the battery charger into the connector that attaches to the batteries.

IMPORTANT: Make sure you have an appropriate charger for use on Gel cell batteries. Use only "voltage-regulated" or "voltage-limited" chargers. Standard constant current or taper current chargers MUST NOT be used. A temperature-sensing charger is recommended, as manual adjustments are never accurate and will damage any VRLA battery.

FIGURE 9



SQUEEGEE MAINTENANCE

If the squeegee leaves narrow streaks or water, the blades may be dirty or damaged. Remove the squeegee, rinse it under warm water and inspect the blades. Reverse or replace the blades if they are cut, torn, wavy or worn.

To Reverse or Replace the Rear Squeegee Wiping Blade...

- 1 See **Figure 10**. Raise the deck and squeegee assembly off the floor, then unsnap the Rear Squeegee Blade Removal Latch (**23**).
- 2 Remove the Tension Strap (**AA**).
- 3 Slip the rear blade (**AB**) off the alignment pins.
- 4 The squeegee blade has 4 working edges. Turn the blade so a clean, undamaged edge points toward the front of the machine. Replace the blade if all 4 edges are nicked, torn or worn to a large radius.
- 5 Install the blade, following the steps in reverse order and adjust the squeegee tilt if necessary.

To Reverse or Replace the Front Squeegee Blade...

- 1 Raise the squeegee off the floor, then rotate the squeegee towards the outside of the machine to access. Disconnect the squeegee hose (**AD**) from the squeegee. Squeeze the back of the Squeegee Mount Bracket (**AE**) to open the bracket and pull the squeegee assembly off the machine.
- 2 Loosen the four Squeegee Cover Knobs (**11**). Then lift the Squeegee Cover (**AF**) off of the Squeegee Casting (**AG**).
- 3 Slip the front blade (**AH**) off the alignment pins.
- 4 The squeegee blade has 4 working edges. Turn the blade so a clean, undamaged edge points toward the front of the machine. Replace the blade if all 4 edges are nicked, torn or worn to a large radius.
- 5 Install the blade, following the steps in reverse order and adjust the squeegee tilt if necessary.

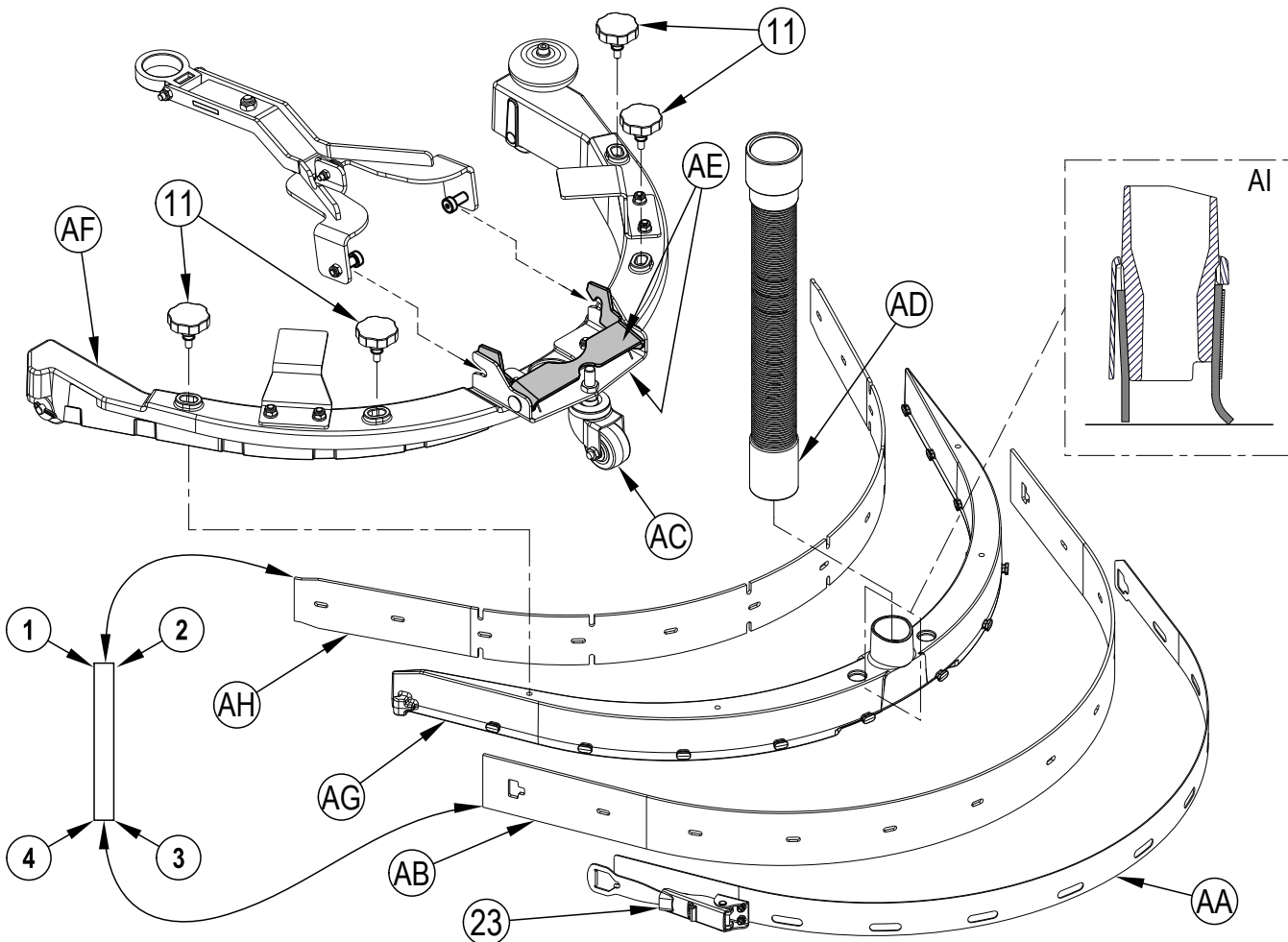
SQUEEGEE ADJUSTMENT

There is only one squeegee assembly adjustment possible, tilt.

Adjust the squeegee tilt if the squeegee is not wiping the floor dry.

- 1 Park the machine on a flat, even surface and lower the squeegee. Then drive the machine forward enough to have the squeegee blades fold over to the rear.
- 2 Adjust the squeegee tilt using the Rear Caster Wheel (**AC**) so that the rear squeegee blade touches the floor evenly across its entire width and is bent over slightly as shown in the squeegee cross section (**AI**).

FIGURE 10



GENERAL MACHINE TROUBLESHOOTING

Problem	Possible Cause	Remedy
Poor water pick-up	Worn or torn squeegee blades	Reverse or replace
	Squeegee out of adjustment	Adjust so blades touch floor evenly across entire width
	Recovery tank full	Empty recovery tank
	Recovery Tank Drain Hose (30) leak	Secure drain hose cap or replace
	Recovery Tank Cover (13) gasket leak	Replace gasket / Seat cover properly
	Debris caught in Squeegee (10)	Clean squeegee assembly
	Recovery Hose between squeegee and recovery tank clogged	Remove debris
	Vacuum set to quiet mode	Set vacuum to high
Poor scrubbing performance	Worn brush or pad	Replace brush or pad
	Wrong brush or pad type	Consult Nilfisk
	Wrong cleaning chemical	Consult Nilfisk
	Moving machine too fast	Slow down
	Not using enough solution	Increase solution flow
Inadequate or no solution flow	Solution tank empty	Fill solution tank
	Solution lines, valves or filter (26) clogged	Flush lines and clean solution filter
	Solution Shutoff Valve (27) closed	Open solution shutoff valve
	Solution Solenoid Valve (25)	Clean or replace valve
Machine does not power ON	Machine Battery Connector (33) disconnected	Reconnect battery connectors
	Tripped 5 Amp circuit breaker (E)	Check for electrical short circuit & reset
	Key Switch (A) failure	(contact Nilfisk Authorized Service Center)
No FWD/REV wheel drive	Emergency Stop Switch (B) tripped	Reset the Emergency Stop Switch
	Drive system speed controller	Check error fault codes (contact Nilfisk Authorized Service Center)
	Tripped 50 Amp circuit breaker (D)	Check for drive motor overload
No Detergent Flow	Empty Detergent Container (3)	Fill detergent container
	Plugged or kinked detergent flow line	Purge system, straighten lines to remove any kinks
	Detergent pump	Check pump, wiring and lines

ACCESSORIES / OPTIONS

In addition to the standard components, the machine can be equipped with the following accessories/options, according to the machine specific use:

- Brushes with harder or softer bristles
- Pads with more or less abrasiveness
- On Board Charger
- Battery Full Indicator
- On Board Chemical

For further information about the above-mentioned accessories, contact an authorized Retailer.

TECHNICAL SPECIFICATIONS (as installed and tested on the unit)

Model		SC1500-51D
Model No.		56104002
Voltage, Batteries	V	24V
Battery Capacity	Ah	260
Protection Grade		IPX3
Sound Pressure Level IEC 60335-2-72: 2002 Amend. 1:2005, ISO 11201	dB(A)	63 dB LpA, ± 3 dB KpA
Gross Vehicle Weight / Transport Weight	lbs / kg	897 / 407
Empty Weight	lbs / kg	620 / 281
Maximum Wheel Floor Loading (center front)	psi / N/mm ²	160 / 1.10
Maximum Wheel Floor Loading (right rear)	psi / N/mm ²	139 / .96
Maximum Wheel Floor Loading (left rear)	psi / N/mm ²	135 / .93
Vibrations at the Hand Controls (ISO 5349-1)	m/s ²	.17
Vibrations for the Whole Body (ISO 2631-1)	m/s ²	.01
Gradeability Transport		14% (7.1°)
Gradeability Cleaning		8.3% (4.75°)

Material Composition and Recyclability

Type	% of machine weight	% recyclable
Aluminum	2%	100%
Electrical / motors / engines - misc.	14%	38%
Ferrous metals	41%	100%
Harnesses / cables	6%	83%
Liquids	0%	0%
Plastic - non-recyclable	4%	0%
Plastic - recyclable	5%	100%
Polyethylene	27%	90%
Rubber	1%	33%

Overenstemmelseserklæring
Declaration of conformity
Konformitætserklæring
Declaración de conformidad
Atbilstības deklarācija
Megfelelősségi nyilatkozat
Certifikát o ustreznosti

Declaration de conformité
Verklaring van overeenstemming
Dichiarazione di conformità
Vastavussertifikaat
Deklaracja zgodności
Försäkran om överensstämmelse

Samsvarserklæring
Vaatumustenmukaisuusvakuutus
Atitikties deklaracija
Osvědčení o shodě
Certifikát súladu

Modell/ Modèle/ Model/ Malli/ Modelo/ Μοντέλο/ Modelo/ Modelis/Модель: Scrubber
Type/ Τυππι/ Tipo/ Τύπος/ Tüüp/ Tipas/ Tips/ Тип/ Típus/ Тип/ Tip: SC1500
Year of Affixing CE marking: 2013

- D** Der Unterzeichner bestätigt hiermit dass die oben erwähnten Modelle gemäß den folgenden Richtlinien und Normen hergestellt wurden. Die technische Dokumentation wird vom Hersteller erstellt.
- GB** The undersigned certify that the above mentioned model is produced in accordance with the following directives and standards. The technical file is compiled by the manufacturer
- DK** Undertegnede attesterer herved, at ovennævnte model er produceret i overensstemmelse med følgende direktiver og standarder. Den tekniske fil er udarbejdet af fabrikanten.
- N** Undertegnede attesterer att ovennevnte modell är produsert i overensstemmelse med följande direktiv og standarder. Den tekniske filen er opprettet av produsenten.
- E** El abajo firmante certifica que los modelos arriba mencionados han sido producidos de acuerdo con las siguientes directivas y estandares. El fascículo técnico está redactado por el fabricante
- I** Il sottoscritto dichiara che i modelli sopra menzionati sono prodotti in accordo con le seguenti direttive e standard. Il fascicolo tecnico è redatto dal costruttore.
- EST** Allakirjutanu kinnitab, et ülalnimetatud mudel on valmistatud kooskõlas järgmiste direktiivide ja normidega. Tehnilise dokumentatsiooni koostab tootja.
- LV** Ar šo tiek apliecināts, ka augstākminētais modelis ir izgatavots atbilstoši šādām direktīvām un standartiem. Tehnisko aprakstu ir sastādījis ražotājs.
- CZ** Niže podepsaný stvrzuje, že výše uvedený model byl vyroben v souladu s následujícími směrnici a normami. Autorem technického listu je výrobce.
- SLO** Spodaj podpisani potrjujem, da je zgoraj omenjeni model izdelan v skladu z naslednjimi smernicami in standardi. Spis s tehnično dokumentacijo pripravi izdelovalec.
- F** Je soussigné certifie que les modèles ci-dessus sont fabriqués conformément aux directives et normes suivantes. Le dossier technique est rédigé par le fabricant.
- NL** Ondergetekende verzekert dat de bovengenoemde modellen geproduceerd zijn in overeenstemming met de volgende richtlijnen en standaards. Het technische bestand is door de fabrikant samengesteld.
- FIN** Allekirjoittaja vakuuttaa että yllämainittu malli on tuotettu seuraavien direktiivien ja standardien mukaan. Valmistaja kääntää teknisen tiedoston.
- S** Undertecknad intyggar att ovannämnda modell är producerad i överensstämmelse med följande direktiv och standarder. Den tekniska filen är sammanställd av tillverkaren.
- GR** Ο κάτωθι υπογεγραμμένος πιστοποιεί ότι η παραγωγή του προαναφερθέντος μοντέλου γίνεται σύμφωνα με τις ακόλουθες οδηγίες και πρότυπα. Το τεχνικό αρχείο συντάσσεται από τον κατασκευαστή.
- P** A presente assinatura serve para declarar que os modelos supramencionados são produtos em conformidade com as seguintes directivas e normas. A ficha técnica é redigida pelo fabricante.
- LT** Toliau pateiktu dokumentu patvirtinama, kad minėtas modelis yra pagamintas laikantis nurodytų direktyvų bei standartų. Techninę bylą sudarė gamintojas.
- PL** Niżej podpisany zaświadcza, że wymieniony powyżej model produkowany jest zgodnie z następującymi dyrektywami i normami. Dokumenty techniczne zostały przygotowane przez producenta.
- H** Alulírottak igazoljuk, hogy a fent említett modellt a következő irányelvek és szabványok alapján hoztuk létre. A műszaki fájlt a gyártó készítette.
- SK** Dolu podpísaný osvedčuje, že hore uvedený model sa vyrába v súlade s nasledujúcimi smernicami a normami. Technický súbor vytvoril výrobca.

EC Machinery Directive 06/42/EEC, EC Low Voltage Directive 06/95/EEC
EC EMC Directive 2004/108/EEC

EN 60335-1, EN 60335-2-72
EN 61000-3-2, EN 61000-3-3, EN 55012, EN 55014-1

This product is declared on our sole responsibility.



1.16.2013

Don Legatt, Engineering Director
Nilfisk-Advance, Inc.
14600 21st Avenue North
Plymouth, MN 55447 USA

Nilfisk-Advance A/S
Sognevej 25
DK-2605 Brøndby, Denmark

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

