

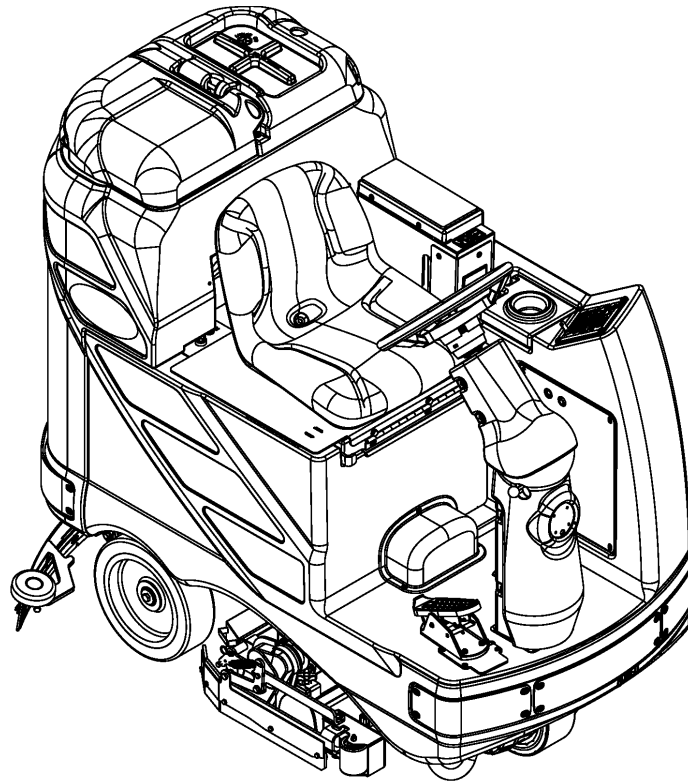
Adgressor™

Adgressor™ AXP™, Adgressor™ EcoFlex™

BR 850S, BR 1050S

BR 850S EDS™, BR 1050S EDS™

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SERVICE MANUAL

Advance MODELS: 56390900(2820D), 56390904(3220D), 56390902(2820C), 56390906(3220C)
56390908(3520D), 56390912(3820D), 56390910(3520C), 56390914(3820C),
56390903(2820C-AXP), 56390901(2820D-AXP), 56390907(3220C-AXP), 56390905(3220D-AXP),
56390911(3520C-AXP), 56390909(3520D-AXP), 56390915(3820C-AXP), 56390913(3820D-AXP)
56381000(X2820D), 56381002(X3220D), 56381004(X3520D), 56381006(X3820D)
56381001(X2820C), 56381003(X3220C), 56381005(X3520C), 56381007(X3820C)

Nilfisk MODELS: 56390916(850S), 56390919(850SC), 56390921(1050S), 56390923(1050SC)
56390924(1050SC EDS), 56390922(1050S EDS), 56390920(850SC EDS), 56390918(850S EDS)
56381008(850S X), 56381010(1050S X), 56381009(850SC X), 56381011(1050SC X)



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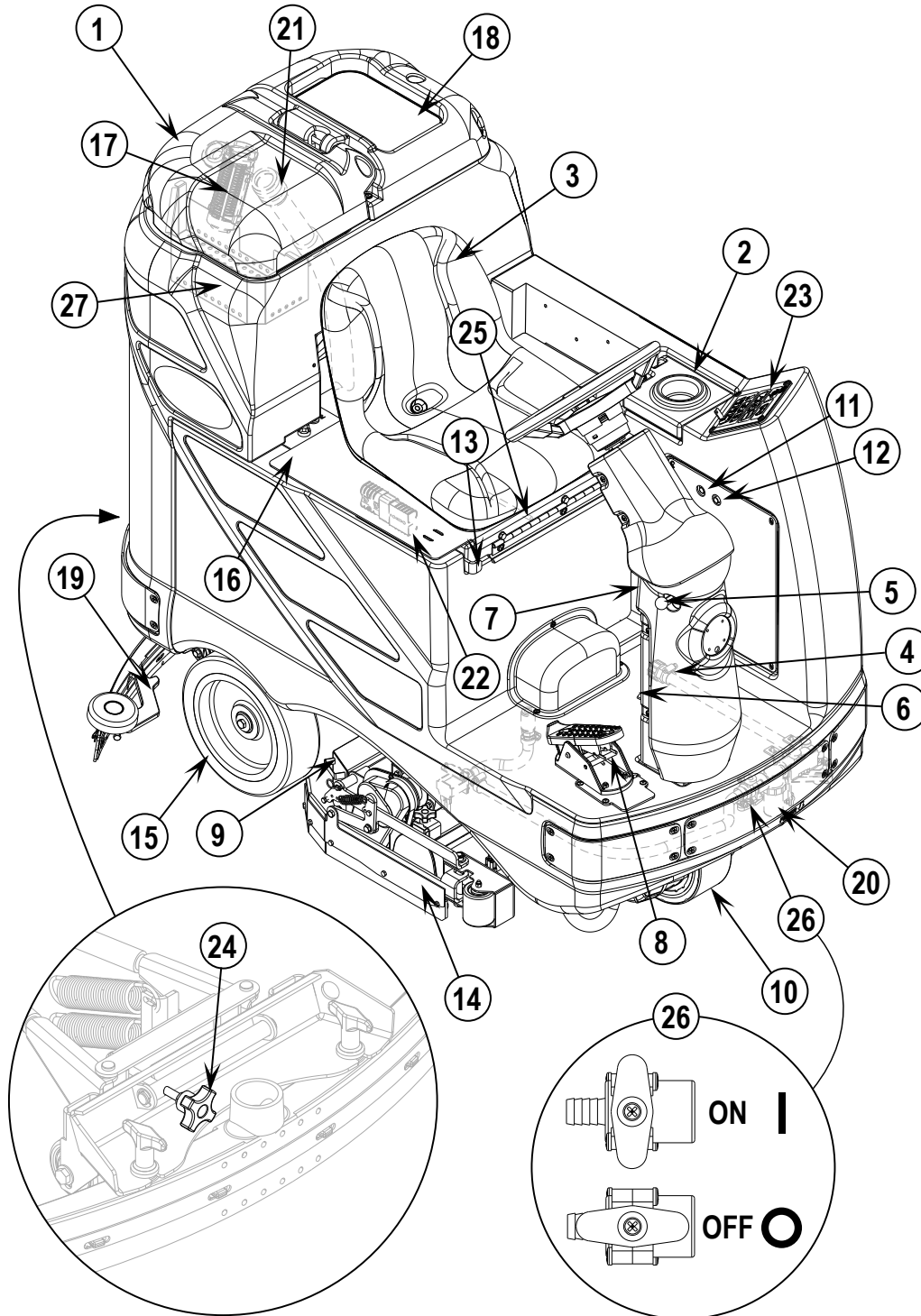


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KNOW YOUR MACHINE

- | | | |
|------------------------------------|-----------------------------------------------|-----------------------------------|
| 1 Recovery Tank Cover | 10 Drive and Steer Wheel | 18 Vacuum Motor Filter Housing |
| 2 Solution Tank Fill Cover | 11 Wheel Drive Circuit Breaker | 19 Squeegee Assembly |
| 3 Operator's Seat | 12 Control Circuit Circuit Breaker | 20 Solution Filter |
| 4 Solution Tank Drain Hose | 13 Emergency Stop Switch / Battery Disconnect | 21 Recovery Tank Drain Hose |
| 5 Steering Wheel Tilt Adjust Knob | 14 Scrub Deck | 22 Machine Battery Connector |
| 6 Brake Pedal / Parking Brake | 15 Rear Wheel | 23 Control Panel |
| 7 Solution Flow Control Lever | 16 Battery Compartment (under seat) | 24 Squeegee Tilt Adjust Knob |
| 8 Drive Pedal, Directional/Speed | 17 Recovery Tank Shutoff Float | 25 Operator Seat Adjustment Lever |
| 9 Hopper (cylindrical models only) | | 26 Smart Solutions™ |
| | | 27 Strainer Basket |



WHEEL DRIVE SYSTEM

FIGURE 1

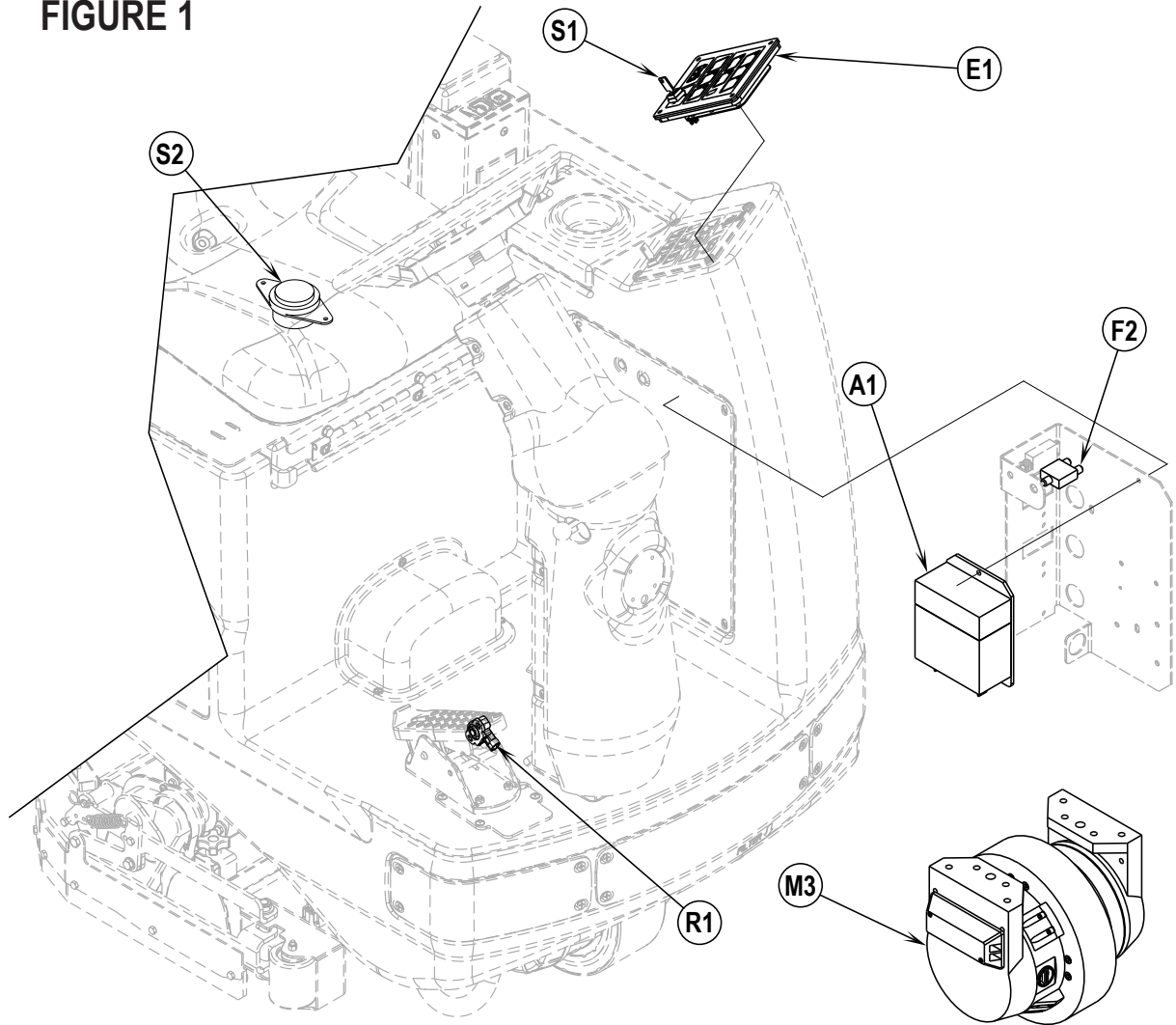
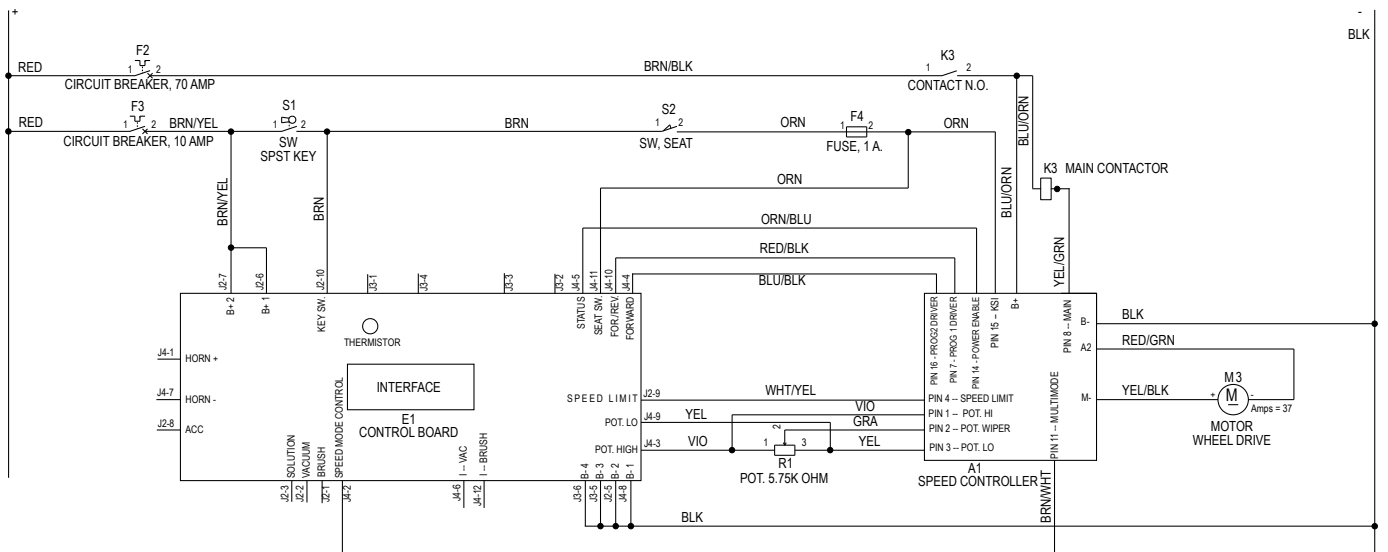


FIGURE 2

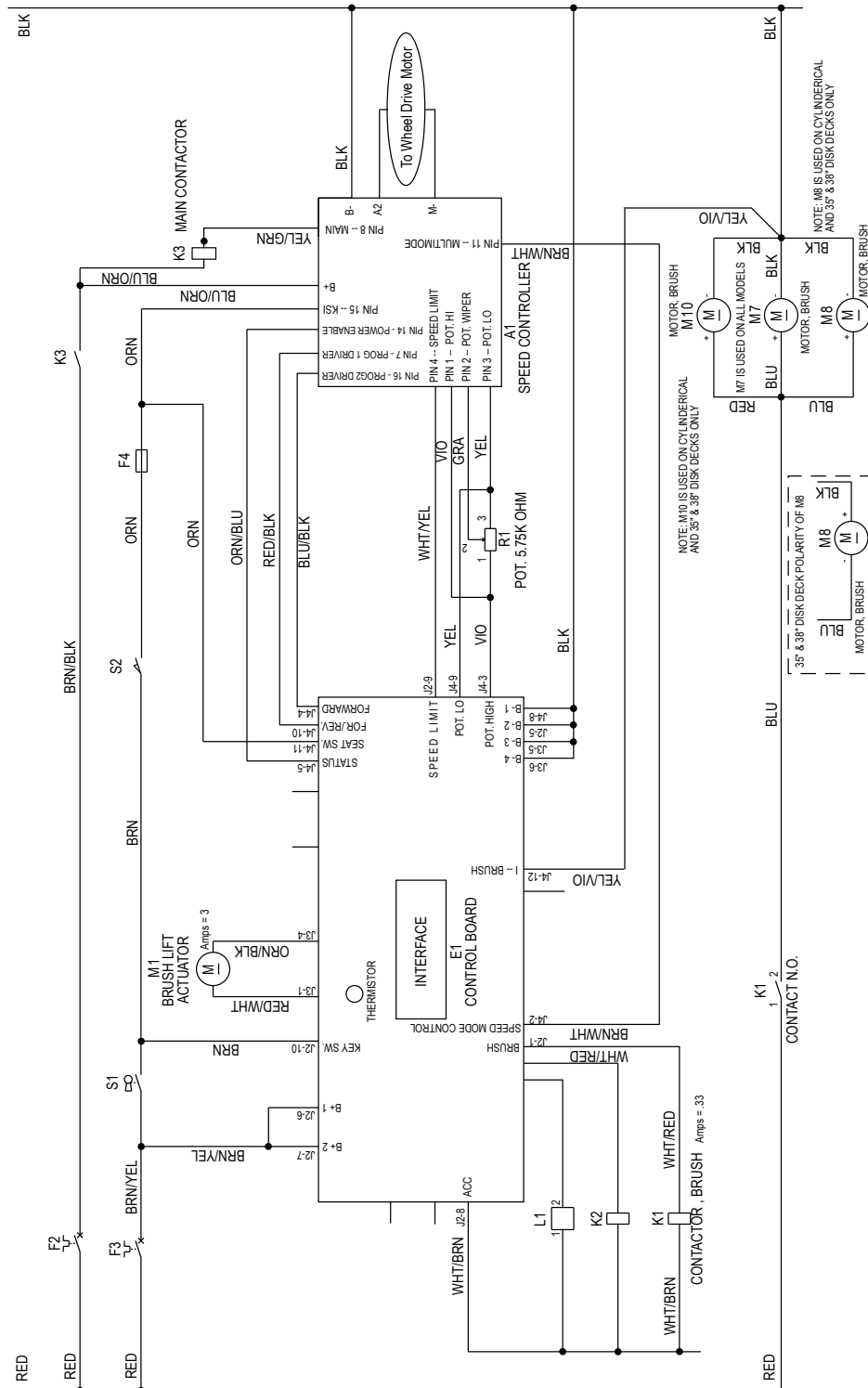


SCRUB BRUSH SYSTEM

SCRUB BRUSH SYSTEM TROUBLESHOOTING

On all models (disc & cylindrical) the scrub system's major electrical components are monitored by the main controller (E1) to detect any system function failures (error codes). The system components covered are the brush motor(s) (M7 & M8), brush solenoid (K1) and brush lift actuator motor (M1). Detected error codes from the main controller are displayed on the hour meter LED display (G) as they occur. Note: Reference the *Main Control Board Troubleshooting Guide* in the Electrical System of this manual for specific fault descriptions and service repair actions.

FIGURE 1



SOLUTION SOLENOID CIRCUIT OVERVIEW

Auto Mode

+ Positive battery circuit inputs and outputs

Inputs:

- A Solenoid circuit control coil (+) voltage input to control board E1 connector J2 pin #'s 6 & 7 (wire colors Brn/Yel).
- A closed S1 key switch supplies (+) input voltage to the E1 terminal J2 pin #10 (wire Brn). This powers up (turns on) the control board's processing logic functions.
- A closed S2 operator safety seat switch enables allows the starting of the entire automatic machine scrubbing system functions. Its E1 terminal connection is J4 pin #11 (wire Orn).

Outputs:

- A control board E1 battery (+) voltage output from the solenoid accessory terminal connection J2 pin #8 Wht/Brn wire.

- Negative battery circuit inputs and outputs

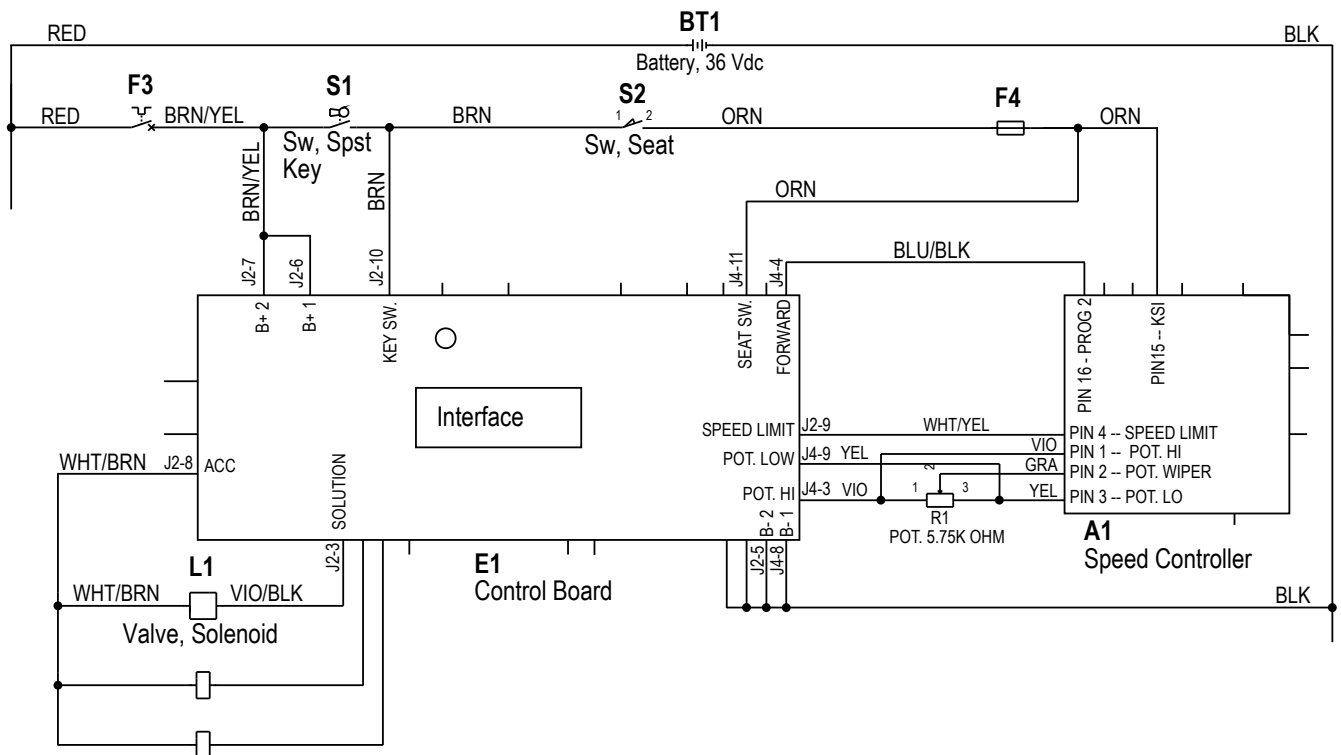
Inputs:

- A main (-) battery ground input for the control board E1 terminal J4 pin#8 BLK wire. This supports the operation of the boards processing logic functions.
- Battery ground supply input for all the (control boards) negative output coil circuits. Its E1 terminal connection is J2 pin #5 (wire Blk).

Outputs:

- A battery ground output from the E1 control board terminal connector J2 pin #3 wire Vio/Blk. This controlled output turns on and off the L1 solenoid coil that stops and starts the solution flow through the valve body. This occurs every time the throttle is moved off its neutral setting into forward.

FIGURE 2



ELECTRICAL SYSTEM

BATTERY SPECIFICATIONS

- Use a combination of multiple 2-volt cell units (wired in series) to construct a 36 Volt DC battery pack system.
- Nilfisk-Advance recommended battery pack capacity is a 305 or 395 AH @ 20 Hour Rate deep cycle battery system (six 6V-batteries). Note: The battery pack must fit the battery compartment size listed in *Specifications*.

BATTERY CHARGER SPECIFICATIONS

- Use a 36 Volt DC output charger matching the DC battery pack voltage and the input AC line voltage supply being used.
- Always when selecting a battery charger follow the recommendation of the battery supplier to match the proper charger DC output amperage to the amp/hour rating batteries being installed. This will prevent the battery pack from being over or under charged.
- The recommended 305 AH battery should be matched to a 36V, 20 or 25 Amp charger.
- The recommended 395 AH battery should be matched to a 36V, 36 Amp charger.

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.

When Servicing Batteries...

- Remove all jewelry.
- Do not smoke.
- Wear chemical goggles, rubber gloves and a protective apron.
- Work in a well-ventilated area.
- Do not allow tools to touch more than one battery terminal at a time.

⚠ CAUTION!

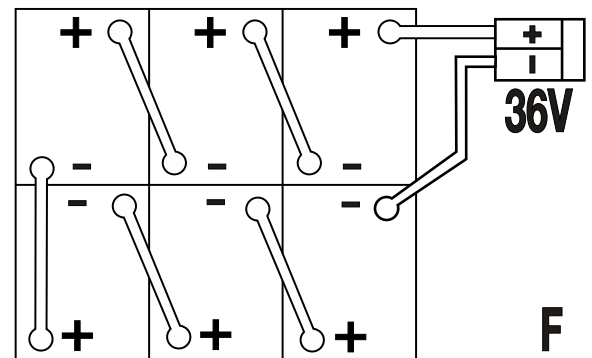
Electrical components in this machine can be severely damaged if the batteries are not installed and connected properly. Batteries should be installed by Nilfisk-Advance or by a qualified electrician.

- 1 Remove the batteries from their shipping crate and carefully inspect them for cracks or other damage. If damage is evident, contact the carrier that delivered them or the battery manufacturer to file a damage claim.
- 2 Turn the Master Key Switch (J) OFF (O) and remove the key.
- 3 To access the battery compartment tip the operator's seat forward and set the prop rod. Remove the battery cables from inside the battery compartment.
- 4 Your machine comes from the factory with enough battery cables to install six (6 volt), 305 - 395 Amp hour batteries. Using two people and an appropriate lifting strap, carefully lift* the batteries into the compartment tray exactly as shown on machine decal (Figure 1).
- 5 The terminals on the battery cables are marked "+" for positive and "-" for negative. Install the battery cables as shown, with the terminals marked "+" on the positive battery terminals and the terminals marked "-" on the negative terminals. Position the cables so the battery caps can be easily removed for battery service.
- 6 Carefully tighten the nut in each battery terminal until the terminal will not turn on the battery post. Then tighten the nut half an additional turn. Do not over-tighten the terminals, or they will be very difficult to remove for future service.
- 7 Coat the terminals and posts with spray-on battery terminal coating (available at most auto parts stores).
- 8 Put one of the black rubber boots over each of the terminals and retain with supplied tie straps.
- 9 Connect the battery pack connector to the Machine Battery Connector (22) and close the operator's seat platform.

*Note: Removal of the recovery tank can make battery installation easier.

FIGURE 1

CAUTION: Before changing batteries, consult TSBUS2008-984 or call Technical Service at USA: 800-989-2235 / Canada: 800-668-8400 Mexico: +52 (55) 2591 1002 ext.228



415A/H - 20HR - RATE

F
↑
56015242

ELECTRICAL SYSTEM

Error Code	Fault Description	Troubleshooting Action
E17	Scrub deck lift actuator circuit open (**)	1. Check for disconnected actuator wiring, open in wiring or defective actuator motor. Repair or replace. 2. Check controller output voltage should be 36V if 0V controller failure (replace).
E18	Scrub deck lift actuator short	1. Check for binding or frozen brush lift linkage and excessive weight on brush deck. 2. Check for short circuit* in brush lift motor and wiring. Repair or replace.
E19	Squeegee lift actuator circuit open (**)	1. Check for disconnected actuator wiring, open in wiring or defective actuator motor, Repair or replace. 2. Check controller output voltage should be 36V if 0V controller failure (replace).
E20	Squeegee lift actuator short	Check for binding or frozen squeegee lift linkage and excessive weight on squeegee. 2. Check for short circuit* in wiring or actuator motor. Repair or replace.
E21	Scrub motor circuit open (**)	1. Check for open in brush motor wiring or defective motor. 2. Check the negative supply cable at the brush motor for a wiring problem or improper modifications (this is a special cable and must be replaced with the original OEM). 3. Check resistance on brush motor solenoid. Nominal resistance specs are: <ul style="list-style-type: none"> • K1 - White-Rodgers brand = 120 Ohms • K1 - Ametek® brand = 98.5 Ohms If the resistance is less than 20% from spec, replace the solenoid. 4. Check if brushes are installed.
E22	Scrub motor short	Same as E06.
E23	Vacuum motor circuit open (**)	1. Check for disconnected vacuum motor wiring, open in wiring and defective vacuum motor. Repair or replace. 2. Check resistance on vac motor solenoid. Nominal resistance specs are: <ul style="list-style-type: none"> • K2 - White-Rodgers brand = 120 Ohms • K2 - Ametek® brand = 102 Ohms If the resistance is less than 20% from spec, replace the solenoid. 3. Check controller output voltage should be 36V if 0V controller failure (replace).
E24	Vacuum motor short	Same as E07
E25	Solution solenoid circuit open (**)	1. Check for disconnected solenoid wiring plug, open in wiring or defective solenoid. Repair or replace. 2. Check controller output voltage should be 36V if 0V controller failure (replace).
E26	Coil / solution solenoid short	1. Check for a short circuit* in wiring or solenoid coil. Repair or replace.
E27	No accessory / wiring	1. Loss of battery (pos.) output to all system contactors (brush, solution solenoid and vacuum) and system accessories (headlight, warning beacon, solution pump). 2. Check controller accessory terminal output (J2-8 Wht/Brn wire) voltage should be 36V if 0V controller failure (replace).

*Short Circuit definition:

- A short circuit is a parallel path of very low resistance, often caused accidentally.
- With low resistance there is an excessive amount of current.
- The excessive current will either melt the wires or open a fusible link.

*** See the *Main Control Board Special Program Options* section to activate the Brush Type Selection function.

SPECIAL PROGRAM OPTIONS (CONTINUED)

Recall Of Stored Error Codes:

Whenever an electrical system fault is detected by the main control unit, one or more error codes are displayed and stored by the control unit. If it is desired, the error code (if any) from the previous operation of the machine can be recalled for troubleshooting purposes. To recall the last stored error codes perform the following steps:

- 1 Turn the main power key switch to the off position.
- 2 Press and hold the **solution switch**.
- 3 While holding the solution switch, turn the main power key switch to the on position.
- 4 Continue to hold the solution switch until the solution indicator is green.
- 5 Release the solution switch.
- 6 If there were previously no error codes stored, the display will now show "-". Go to step 11.
- 7 If error codes were stored, the display will now show the stored code(s) and the scrub system off indicator will now be red. An example of how two codes, 6 and 18, would be displayed is as follows:
 - The display will show "E" followed by a brief blank period
 - The display will show "0" followed by a brief blank period
 - The display will show "6" followed by a slightly longer blank period
 - The display will show "E" followed by a brief blank period
 - The display will show "1" followed by a brief blank period
 - The display will show "8" followed by a long blank period
 - The above sequence will repeat
- 8 To pause the display, press and hold the solution switch.
- 9 To clear the stored codes press and release the scrub system off switch. The display will now show "-". Go to step 11.
- 10 If it is desired to save the codes, go to step 11.
- 11 To exit the error code recall mode, turn the main power key switch to the off position.

Turning Fault Detection On or Off:

FACTORY DEFAULT: ON

Normally, the main control unit will perform checks of the electrical system during operation. If a fault occurs in a particular system that system (and possibly others) will be shut down. This can make troubleshooting the system difficult. This option will allow service personnel to disable some of the fault detection checks to facilitate troubleshooting. This will *not* disable the over-current protection on any of the systems. To turn the fault checking on or off:

- 1 Turn the main power key switch to the off position.
- 2 Press and hold the **scrub system off switch** and the **solution switch**.
- 3 While holding both switches turn the main power key switch to the on position.
- 4 Continue to hold both switches until the solution indicator is yellow.
- 5 Release both switches. The status display will now indicate "E" or "d".
- 6 Pressing and releasing the solution switch will now select between "E" for enabled or "d" for disabled. Enabled means that the fault checking is turned on, disabled means that the fault checking is turned off.
- 7 To save the new setting turn the main power key switch to the off position.
- 8 The new setting will be saved and will remain in effect until it is changed again.

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