



Electronic Service Manuals

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Serving the Cleaning Industry Since 1922

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PACIFIC®
F L O O R C A R E

PURPOSE BUILT.®

S-20 / S-20HD / S-24XM

11 GALLON AUTOSCRUBBER

PARTS & OPERATING MANUAL



Thank you for purchasing a Pacific Floorcare product. Carefully inspect all components for freight damage. If such damage is discovered, file a “CONCEALED DAMAGE REPORT” immediately with the delivering carrier.

Read this manual carefully and keep it near the machine, protected from liquids and other damaging substances. Failure to follow the instructions may result in injury or damage to equipment and property.

The contents of this manual are based on the latest product information available at the time of publication. Pacific Floorcare reserves the right to make changes or improvements without being obliged to apply changes to the machines previously sold.

New manuals can be downloaded from: www.pacificfloorcare.com/manuals

11 GALLON AUTOSCRUBBER SPECIFICATIONS

Features		Specifications	
Model:	S-20 Disk Pad Assist	S-20 Disk Transaxle Drive	S-20HD Disk Transaxle Drive
Solution Delivery System			
Solution Capacity:	11 gal / 42 l	11 gal / 42 l	11 gal / 42 l
Solution Control:	0-.5 gpm / 1-1.9 lpm - Variable Knob Adjustment	0-.5 gpm / 1-1.9 lpm - Variable Knob Adjustment	0-.5 gpm / 1-1.9 lpm - Variable Knob Adjustment
Scrubbing System			
Cleaning Path:	20 in / 510 mm	20 in / 510 mm	20 in / 510 mm
Pad/Brush Size:	(1) 20 in / 510 mm	(1) 20 in / 510 mm	(1) 20 in / 510 mm
Productivity (per hour) - Theoretical Max:	23,800 ft² / 2,211 m²	23,800 ft² / 2,211 m²	23,800 ft² / 2,211 m²
Productivity (per hour) - Average Coverage Rate:*	10,630 ft² / 988 m²	14,175 ft² / 1,317 m²	14,175 ft² / 1,317 m²
Brush Drive System			
Brush Motor Horsepower:	.75 hp / 560 W	.75 hp / 560 W	1 hp / 750 W
Brush RPM:	230 RPM	230 RPM	220 RPM
Brush / Pad Pressure:	60 & 90 lb / 27 & 41 kg	60 & 90 lb / 27 & 41 kg	60 & 90 lb / 27 & 41 kg
Brush / Pad Attachment / Removal:	Auto on/off	Auto on/off	Auto on/off
Recovery System			
Recovery Tank Accessibility:	Full Cleanout Access	Full Cleanout Access	Full Cleanout Access
Recovery Tank Capacity:	13 gal / 49 l (2 gal / 7.6 l demisting chamber)	13 gal / 49 l (2 gal / 7.6 l demisting chamber)	13 gal / 49 l (2 gal / 7.6 l demisting chamber)
Vacuum Motor:	.51 hp / 380 W , 2-stage	.51 hp / 380 W , 2-stage	.51 hp / 380 W , 2-stage
Vacuum Motor cfm / cmm:	68 cfm / 1.9 cmm	68 cfm / 1.9 cmm	68 cfm / 1.9 cmm
Vacuum Motor Water-Lift:	46 in / 117 cm	46 in / 117 cm	46 in / 117 cm
Squeegee Width:	30 in / 76 cmm	30 in / 76 cmm	30 in / 76 cmm
Drive System			
Drive Type:	Pad Assist	Transaxle Drive	Transaxle Drive
Motor Horsepower:	N/A	.25 hp / 187 W	.25 hp / 187 W
Battery System			
System Voltage:	24V	24V	24V
Battery Amp Hour Rating:	130 AH (wet) / 105 AH (MF)	155 AH (wet) / 140 AH (MF)	155 AH (wet) / 140 AH (MF)
Battery Run Time:	Up to 3 hours	Up to 3.5 hours	Up to 3.5 hours
Charger Description:	On-board (standard) Off-board (optional)	On-board (standard) Off-board (optional)	On-board (standard) Off-board (optional)
Machine Specifications			
Product Length:	50 in / 127 cm	50 in / 127 cm	50 in / 127 cm
Product Width (w/o squeegee):	21 in / 53 cm	21 in / 53 cm	21 in / 53 cm
Product Height:	43 in / 10 cm	43 in / 109 cm	43 in / 109 cm
Product Weight:	380 lb / 172kg	400 lb / 181kg	400 lb / 181kg
Sound Level (operator's ear):	63 dBA	63 dBA	63 dBA
Construction:	Rotationally molded polyethylene tanks, powder coated steel frame	Rotationally molded polyethylene tanks, powder coated steel frame	Rotationally molded polyethylene tanks, powder coated steel frame
*Productivity calculations utilize key factors from ISSA 540 cleaning times handbook			
Note: Specifications subject to change without notice			

11 GALLON AUTOSCRUBBER SPECIFICATIONS

Features	Specifications	
Model:	S-20 Orbital	S-24XM Disk
Solution Delivery System		
Solution Capacity:	11 gal / 42 l	11 gal / 42 l
Solution Control:	0-.5 gpm / 1-1.9 lpm - Variable Knob Adjustment	0-.5 gpm / 1-1.9 lpm - Variable Knob Adjustment
Scrubbing System		
Cleaning Path:	20 in / 510 mm	20 in / 510 mm
Pad/Brush Size:	(1) 20 in / 510 mm	(1) 20 in / 510 mm
Productivity (per hour) - Theoretical Max:	23,800 ft2 / 2.211 m²	23,800 ft2 / 2.211 m²
Productivity (per hour) - Average Coverage Rate:*	14,175 ft² / 1,317 m² (scrubbing) 9,000 ft² / 836 m² (finish removal at 100 ft/min / 30 m/min)	17,325 ft² / 1,610 m²
Brush Drive System		
Brush Motor Horsepower:	1 hp / 750 W	1 hp / 750 W
Brush RPM:	2,200 RPM	360 RPM
Brush / Pad Pressure:	75 & 100 lb / 34 & 45 kg	60 & 90 lb / 27 & 41 kg
Brush / Pad Attachment / Removal:	Manual	Auto on/off
Recovery System		
Recovery Tank Accessibility:	Full Cleanout Access	Full Cleanout Access
Recovery Tank Capacity:	13 gal / 49 l (2 gal / 7.6 l demisting chamber)	13 gal / 49 l (2 gal / 7.6 l demisting chamber)
Vacuum Motor:	.51 hp / 380 W , 2-stage	.51 hp / 380 W , 2-stage
Vacuum Motor cfm / cmm:	68 cfm / 1.9 cmm	68 cfm / 1.9 cmm
Vacuum Motor Water-Lift:	46 in / 117 cm	46 in / 117 cm
Squeegee Width:	30 in / 76 cmm	30 in / 76 cmm
Drive System		
Drive Type:	Traction	Transaxle
Motor Horsepower:	.25 hp / 187 W	.25 hp / 187 W
Battery System		
System Voltage:	24V	24V
Battery Amp Hour Rating:	155 AH (wet) / 140 AH (MF)	130 AH (wet) / 105 AH (MF)
Battery Run Time:	Up to 4 hours	Up to 3.5 hours
Charger Description:	On-board (standard) Off-board (optional)	On-board (standard) Off-board (optional)
Machine Specifications		
Product Length:	45 in / 114 cm	48 in / 122 cm
Product Width (w/o squeegee):	21 in / 53 cm	26 in / 66 cm
Product Height:	43 in / 109 cm	43 in / 109 cm
Product Weight:	400 lb / 181kg	410 lb / 186kg
Sound Level (operator's ear):	60 dBA	63 dBA
Construction:	Rotationally molded polyethylene tanks, powder coated steel frame	Rotationally molded polyethylene tanks, powder coated steel frame
*Productivity calculations utilize key factors from ISSA 540 cleaning times handbook		
Note: Specifications subject to change without notice		

TABLE OF CONTENTS

1. SAFETY INFORMATION	4
2. UNPACKING THE MACHINE	5
3. TRANSPORTING THE MACHINE	
• TIE DOWN PROCEDURE	5
4. BATTERIES	
• SELECTION AND INSTALLATION	6
• SERVICING LEAD ACID BATTERIES (NON-HYDROLINK® MODELS)	7
• SERVICING LEAD ACID BATTERIES W/ HYDROLINK™ WATERING SYSTEM	8
• BATTERYSHIELD® AUTOMATED WET BATTERY PROTECTION SYSTEM	9
5. CHARGING	
• ON-BOARD CHARGER	11
• OFF-BOARD CHARGER	13
6. PRE-USE SETUP	
• TURNING THE UNIT ON/OFF	14
• BATTERY POWER LEVEL AND FAULT INDICATOR	14
7. DRIVE SYSTEM	
• DRIVING OPERATION	15
8. SOLUTION DISTRIBUTION	
• FILLING THE SOLUTION TANK	16
• SOLUTION FLOW	16
• FILTER INSPECTION AND CLEANING	17
9. SCRUB DECK SETUP	
• HEAD LIFT	17
• SELECTING DOWN PRESSURE	17
• ORBITAL PADS & CHEMICAL FREE FINISH REMOVAL	18
• DISK MACHINE PAD DRIVERS AND BRUSHES	19
10. RECOVERY SYSTEM	
• RECOVERY TANK	20
• SQUEEGEE BLADE INSPECTION AND SELECTION	20
RECOMMENDED MAINTENANCE	23
RECOMMENDED SERVICE PARTS	24
TROUBLESHOOTING GUIDE	27
PARTS DIAGRAMS	29
WIRING DIAGRAMS	51
WARRANTY INFORMATION	59
MANUAL REVISION LOG	60



1. SAFETY INFORMATION



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

The following categories are used in this manual to identify noteworthy concerns:



- WARNING:** A potentially hazardous situation that, if not avoided, could result in death or serious injury.
- CAUTION:** A potentially hazardous situation that, if not avoided, could result in moderate injury or serious property damage.
- NOTE:** Information that will prevent premature equipment failure or minor property damage.
- WARNING:** This product can expose you to chemicals including lead and lead compounds which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.
- WARNING:** This machine is not equipped with explosion proof motors. Never use near flammable or reactive materials, liquids, vapors or combustible dusts. Electric motors spark internally during operation and could cause a flash fire or explosion.
- WARNING:** Batteries emit hydrogen and oxygen gas.
- Keep sparks and open flame away. Do not smoke near the machine
 - Charge batteries in a well-ventilated area with the battery compartment open
- WARNING:** Do not plug in charger cable if wall cord or battery harness is damaged.
- WARNING:** Disconnect battery cables before servicing.
- WARNING:** Do not wear jewelry when working near moving or electrical components.
- WARNING:** Do not use the machine as a means for transport.
- WARNING:** Never allow children to play on or around machine.
- WARNING:** Do not bump into shelves or scaffoldings, especially where there is a risk of falling objects.
- WARNING:** Support the machine on safety stands before working underneath.
- CAUTION:** Keep hands away from spinning brushes.
- CAUTION:** Do not operate machine unless trained and authorized.
- CAUTION:** Do not modify the machine from its original design.
- CAUTION:** Do not operate machine if it is not in proper operating condition.
- CAUTION:** Wear non-slip shoes when operating machine.
- CAUTION:** Reduce speed when turning or operating on inclines and slippery surfaces.
- CAUTION:** Use Bromine only in your tank treatment system! Do not use chlorine. Chlorine can interact with ammonia-based detergents and cause harmful fumes.
- CAUTION:** Follow mixing and handling instructions on chemical containers.
- CAUTION:** Remove the batteries and get assistance before lifting the machine manually.
- CAUTION:** Park and service the machine on a level surface and remove the key.
- CAUTION:** Always wear protective clothing, gloves and goggles when handling and charging batteries.
- CAUTION:** Avoid moving parts and do not wear loose jackets, shirts or sleeves when servicing.
- NOTE:** Do not power spray or hose off the machine. Electrical malfunction may occur.
- NOTE:** All repairs must be performed by a qualified service technician using approved replacement parts.
- NOTE:** To avoid damaging the floor, do not allow the brush/pad to operate while the machine is stationary.
- NOTE:** Use a ramp with no more than a 12° incline when loading or unloading the machine.
- NOTE:** Use tie down straps to secure the machine to the truck or trailer during transport.
- NOTE:** Turn power off and put the scrub head in the lowered position during transport.
- NOTE:** Discontinue use and report machine damage or faulty operation immediately.
- NOTE:** Store the machine indoors where the temperature is between 32° and 104°F (0° and 40°C).
- NOTE:** Do not lower the orbital head without a pad. Doing so damages the Mighty-Lok® face.
- NOTE:** Failure to clean the HydroLink® light pipe will limit BatteryShield's® ability to read the water level and will reduce battery life.
- NOTE:** Do not use an extension cord. This will void the warranty on the charger.
- NOTE:** Batteries designed for automotive or marine and RV use are not suited for use in floor scrubbers.
- NOTE:** Ensure battery charging and storage locations comply with OSHA and any governing agencies' standards based on your particular location and application.

2. UNPACKING THE MACHINE

NOTE: Use a ramp with no more than a 12° incline when loading or unloading the machine

1. Remove the outer packaging
2. Remove the four cleats and two tie down brackets holding the machine to the pallet
3. Raise the scrub head into the transport position.
4. Use a suitable ramp or platform and carefully pull the machine backwards down from the pallet



3. TRANSPORTING THE MACHINE

CAUTION: Remove the batteries and get assistance before lifting the machine manually.

NOTE: Use a ramp with no more than a 12° incline when loading or unloading the machine.

NOTE: Turn power off and put the scrub head in the lowered position during transport.

NOTE: Do not rest the orbital head on a hard surface without a pad. Doing so damages the Mighty-Lok® face.

TIE DOWN PROCEDURE

The S-Series Scrubber was designed for easy transport on a route cleaning program. Two options are available for tying the machine down to a truck or trailer during transport.

Tie down holes are located on both sides of the main frame



Run tie down straps between the recovery tank and solution tank



4. BATTERIES



WARNING: Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm, and during charging, strong inorganic acid mists containing sulfuric acid are involved, a chemical known to the State of California to cause cancer. Wash hands after handling. For more information go to www.P65Warnings.ca.gov.



WARNING: Batteries emit hydrogen and oxygen gas.
-Keep sparks and open flame away. Do not smoke near the machine.
-Charge batteries in a well-ventilated area with the battery compartment open.

WARNING: Do not wear jewelry when working near moving or electrical components.

CAUTION: Remove the batteries and get assistance before lifting the machine manually.

CAUTION: Park and service the machine on a level surface and remove the key.

CAUTION: Always wear protective clothing, gloves and goggles when handling and charging batteries.

NOTE: All repairs must be performed by a qualified service technician using approved replacement parts.

NOTE: Batteries designed for automotive or marine and RV use are not suited for use in floor scrubbers.

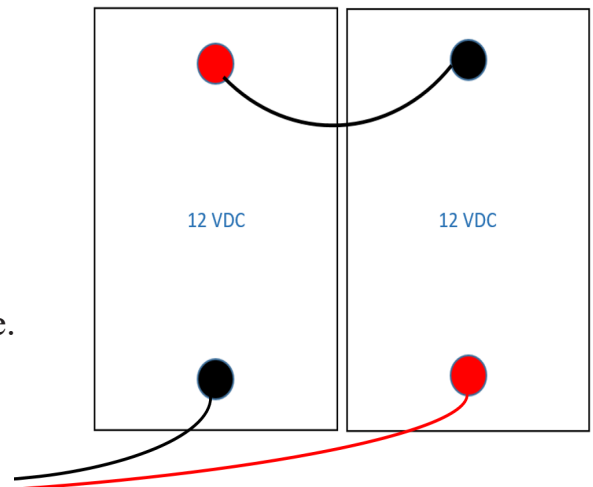
SELECTION

The machine requires two 12 VDC Lead Acid or AGM Deep Cycle batteries designed for floor scrubber use with the following maximum dimensions:

- Width: 7 1/8 in (181 mm)
- Length: 12 15/16 in (264 mm)
- Height: 10 5/8 in (295 mm)

INSTALLATION

1. Open the recovery tank.
2. Use a lifting device capable of transferring the batteries safely.
3. Slide the batteries forward.
4. Connect the batteries in series, to obtain overall voltage of 24V on the lugs.
5. Fully charge the batteries before using the machine.



SERVICING LEAD ACID BATTERIES (NON-HYDROLINK® MODELS)

WARNING: Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm, and during charging, strong inorganic acid mists containing sulfuric acid are involved, a chemical known to the State of California to cause cancer. Wash hands after handling. For more information go to www.P65Warnings.ca.gov.



WARNING: Batteries emit hydrogen and oxygen gas.
-Keep sparks and open flame away. Do not smoke near the machine.
-Charge batteries in a well-ventilated area with the battery compartment open.

WARNING: Do not wear jewelry when working near moving or electrical components.

CAUTION: Always wear protective clothing, gloves and goggles when handling and charging batteries.

REQUIRED EQUIPMENT

- Eye protection
- Acid resistant gloves
- Distilled water
- Baking soda (neutralizes acid spills)

SAFETY

NEVER:

- Add acid to a battery
- Smoke near batteries
- Charge a frozen battery
- Leave an acid spill unattended
- Store batteries unless they are fully charged
- Charge a battery when the temperature is above 122°F (50°C)
- Charge a flooded battery without securing vent caps on the cells
- Place objects on top of batteries, which can cause a short circuit



Remove the caps and place them upside down to inspect

ALWAYS:

- Neutralize acid spills with baking soda and water
- Use insulated tools and check connections for proper torque

WATERING

- If contact with electrolyte (sulfuric acid) occurs, flush with large amounts of water.
- Use only distilled water (tap water can contain contaminants that will damage the battery).
- Remove the caps and place them upside down to check electrolyte levels.
- For discharged or partially charged batteries, add just enough water to cover the plates.
- Fully charge the batteries.
- Add distilled water to a level of 1/8" below the vent well.

CLEANING & INSPECTION

- Fluid on the top of a battery may mean it is being over-watered or overcharged.
- Check cleanliness and keep terminals and connectors free of corrosion.
- Clean with a solution of 1 cup baking soda to 1 gallon of water.
- Do not allow cleaning solution to get inside the battery.
- Rinse with water and dry with a clean cloth.
- Keep the area around batteries clean and dry.
- Properly secure all vent caps.
- Check battery cables and connections. Replace any damaged cables and tighten any loose connections.



Add distilled water to a level of 1/8" below the vent well

SERVICING LEAD ACID BATTERIES WITH HYDROLINK® WATERING SYSTEM

WARNING: Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm, and during charging, strong inorganic acid mists containing sulfuric acid are involved, a chemical known to the State of California to cause cancer. Wash hands after handling. For more information go to www.P65Warnings.ca.gov.



1. Position the water jug at a level below the top of the batteries to prevent siphoning. Insert the open end of the hand pump assembly servicing tube into a jug of distilled water.
2. Prime the bulb by squeezing it until it is filled with water.
3. Remove the dust cap from the quick disconnect on the battery servicing manifold and snap the couplers together.



NOTE: Battery packs equipped with BatteryShield® may take **more than 1/2 gallon of water** after the BatteryShield® LED has illuminated. **Failure to pump the HydroLink™ bulb until it will no longer compress may result in uneven battery servicing and premature battery failure.**



4. Squeeze the hand pump bulb with firm pressure to pump water into the battery cells. When the bulb is **solid and will no longer compress**, the cells are full.
5. Press the yellow button to separate the quick disconnect assembly. Replace the dust cap on the servicing manifold coupler. Any remaining water in the pump lines can be pumped back into the water jug.



NOTE: Do not leave the hand pump connected to the batteries after servicing is complete.



BATTERYSHIELD® AUTOMATED WET BATTERY PROTECTION SYSTEM

Scrubbers equipped with BatteryShield® technology have a sensor on the battery pack and a red LED indicator on the control panel which monitor and communicate low water conditions.

1. When batteries are fully charged and the key is turned on, BatteryShield® will check the water level.
 - If the LED remains off, there is sufficient water in the batteries.
 - A solid red LED means BatteryShield® senses a low-water level. The brush motor will be disabled to prevent battery damage.
 - A blinking red LED means the BatteryShield® light pipe needs to be cleaned (see below).

NOTE: Failure to clean the HydroLink® light pipe will limit the BatteryShield's® ability to read the water level and will reduce battery life.



2. Turn the key off and use the HydroLink® single-point battery watering system to fill the batteries.

NOTE: Battery packs equipped with BatteryShield® may take *more than 1/2 gallon of water* after the BatteryShield® LED has illuminated. **Failure to pump the HydroLink™ bulb until it will no longer compress may result in uneven battery servicing and premature battery failure.**

3. After completing the HydroLink® watering procedure, cycle the key to verify the LED stays off.

CLEANING THE BATTERYSHIELD® SENSOR LIGHT PIPE

WARNING: Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm, and during charging, strong inorganic acid mists containing sulfuric acid are involved, a chemical known to the State of California to cause cancer. Wash hands after handling. For more information go to www.P65Warnings.ca.gov.



WARNING: Do not wear jewelry when working near moving or electrical components.

WARNING: Batteries emit hydrogen and oxygen gas.
-Keep sparks and open flame away. Do not smoke near the machine.
-Charge batteries in a well-ventilated area with the battery compartment open.

CAUTION: Always wear protective clothing, gloves and goggles when handling and charging batteries.

NOTE: Failure to clean the HydroLink® light pipe will limit the BatteryShield's® ability to read the water level and will reduce battery life.

1. Remove the cap with the black sensor module, being careful not to damage the yellow floats. Do not remove the black module from the cap assembly.
2. Thoroughly wipe the clear light pipe next to the middle yellow float, paying attention to the tip of the pipe.
3. While the cap is still removed, cycle the key and verify the LED stays on steady. Turn the key off.
4. Carefully align the cap and press it firmly onto the battery making sure it is fully seated.
5. Complete the battery servicing procedures above, cycle the key, and verify the light stays off.
6. The machine is ready for use.



5. CHARGING

WARNING: Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm, and during charging, strong inorganic acid mists containing sulfuric acid are involved, a chemical known to the State of California to cause cancer. Wash hands after handling. For more information go to www.P65Warnings.ca.gov.



WARNING: Do not plug in charger cable if wall cord or battery harness is damaged.

NOTE: Do not use an extension cord. This will void the warranty on the charger.

NOTE: Ensure battery charging and storage locations comply with OSHA and any governing agencies' standards based on your particular location and application.

ON-BOARD CHARGER

The on-board charger has three LEDs to indicate the status of the charging cycle when it is plugged in:

LED INDICATION	MEANING
GREEN flashing (2 seconds)	Charger is set for AGM batteries
YELLOW flashing (continuous)	Unsuitable battery connected or output short circuit
RED flashing (2 seconds)	Charger is set for Lead Acid batteries
RED flashing (continuous)	Safety timer exceeded or internal short circuit
Solid GREEN	The unit is fully charged
Solid YELLOW	Phase 2 of charging is in progress
Solid RED	Charging cycle has begun

NOTE: Do not use an extension cord. This will void the warranty on the charger.

SETTING THE CHARGER ON MACHINES PURCHASED WITHOUT BATTERIES

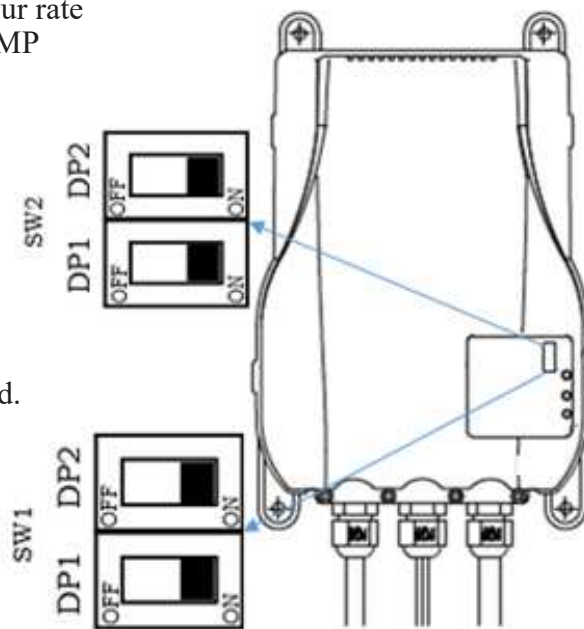
Configure the charging profile to the type of batteries installed on the machine. Switch banks SW1 and SW2 are located behind the label on the lower right corner of the charger next to the green LED.

SW2: Set the charge current according to the battery amp hour rate (Reference CHARGE CURRENT AND BATTERY AMP HOURS table below).

DP2	DP1	CHARGING CURRENT
ON	ON	15A
ON	OFF	20A
OFF	ON	25A
OFF	OFF	25A

SW1: Set the current profile according to the battery installed.

DP2	DP1	CHARGING CURRENT
OFF	ON	Lead-Acid (Wet) Batteries
OFF	OFF	AGM FULLRIVER
ON	OFF	AGM DISCOVER
ON	ON	Gel



CHARGING CURRENT	BATTERY AMP HOUR RANGE	
	(5h)	(20h)
15A	100-150 Ah	130-180 Ah
20A	120-195 Ah	150-240 Ah
25A	180-258 Ah	220-315 Ah

OFF-BOARD CHARGER

WARNING: Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm, and during charging, strong inorganic acid mists containing sulfuric acid are involved, a chemical known to the State of California to cause cancer. Wash hands after handling. For more information go to www.P65Warnings.ca.gov.



WARNING: Do not plug in charger cable if wall cord or battery harness is damaged.

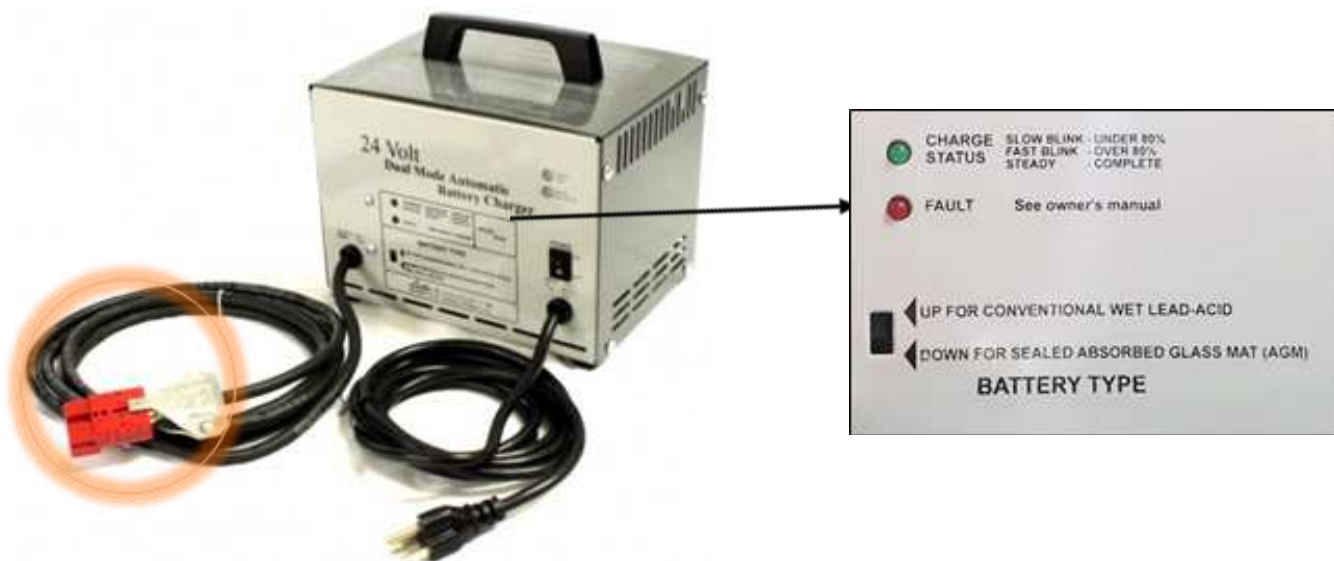
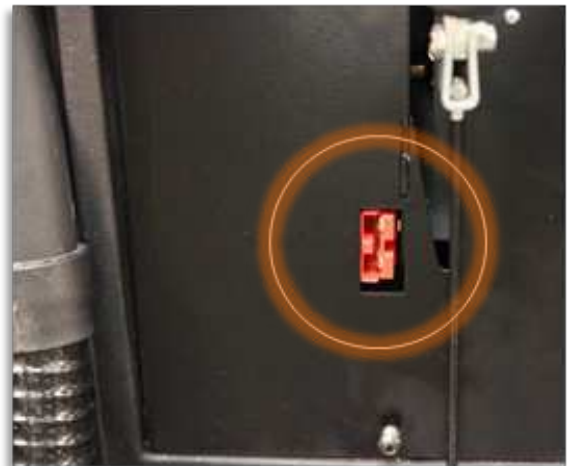
NOTE: Ensure battery charging and storage locations comply with OSHA and any governing agencies' standards based on your particular location and application.

Set the **Battery Type** switch to match the battery configuration of the machine.

- Up for Lead Acid batteries.
 - Down for sealed, maintenance-free AGM batteries
1. Connect the charger to the wall outlet.
 2. Connect the red plug (pictured below) to the battery harness below the control panel at the rear of the machine.

Off-board status LEDs:

- Primary (green) LED:
 - Blinking slowly: Batteries are below 80% of full charge.
 - Blinking rapidly: Batteries are above 80% of full charge.
 - Solid: Batteries are fully charged.
- Fault (red) LED:
 - See the charger manual for fault information.



6. PRE-USE SETUP

TURNING THE UNIT ON/OFF

The key switch is located on the control panel. When the machine is not in use, remove the key and store it in a secure location.

CIRCUIT BREAKERS

The circuit breakers on the control panel protect the components from high amp-draw. In particular, the scrub head circuit will draw too many amps when overloaded by improper application setup. Solution flow, floor surface, and down-pressure should be considered when operating the machine (example: high down-pressure on a rough floor with no solution flow will overload the circuit). Repeatedly tripping the breaker will cause the need for replacement.

TRACTION DRIVE BATTERY POWER LEVEL & FAULT INDICATOR

When switched to the ON position, the Battery Power Level Indicator illuminates indicating the battery charge level. A full charge is indicated when all LEDs are lit. As the power level decreases, the LEDs go out from right to left.



When the battery charge is depleted, the last red LED will flash and the brush motor will turn off. The vacuum and traction drive will continue to function allowing final water recovery and transport to the charging station.

NOTE: Using AGM battery-equipped units after the last yellow LED goes out can reduce the life of the batteries.

NOTE: After a full charge, operate the machine for at least 30 minutes before recharging the batteries again. Do not leave the batteries discharged overnight.

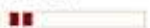
A flashing **Battery Power Level Indicator** indicates a detected fault. The following is a list of fault codes:

1 Bar



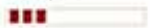
The battery needs to be charged or there is a faulty connection to the battery.

2 Bar



Check the connection to the motor.

3 Bar



The motor has a short circuit.

6 Bar



The controller is being inhibited from driving.

7 Bar



Throttle fault, check the connection.

8 Bar



Controller fault, check connections

9 Bar



Parking brake fault, check the motor connections.

10 Bar



Excessive voltage, check the battery connections.

PAD/BRUSH ASSIST BATTERY POWER LEVEL INDICATOR

Pad/brush assist models have a Power Level Indicator that uses seven LEDs to communicate the level of charge in the batteries. When the LED starts to flash, the brush motor will shut down but the vacuum will still recover water.



NOTE: The Power Level Indicator will display the lowest level indicated and will not reset until a full charge has been applied. If the meter does not reset, diagnose the health of the batteries and the charger.

7. DRIVE SYSTEM (TRACTION MODELS)

DRIVING OPERATION

1. Bail: Squeezing the Bail activates solution flow, the brush motor, and traction drive.
2. Speed Control: Rotate the Speed Control with either thumb.
 - Clockwise: Faster
 - Counter-Clockwise: Slower
3. Reverse Button: Depress Reverse Button and squeeze Bail for reverse operation.



8. SOLUTION DISTRIBUTION

FILLING THE SOLUTION TANK

Use liquid detergent in the concentration and manner specified by the manufacturer for a 22-gallon solution tank. Excess foam will damage the vacuum motor. In addition to properly-mixed low-foam detergent, use a small amount of de-foaming liquid in the recovery tank. Never use pure acids.

NOTE: The front fill port strainer blocks debris from falling into the tank. Keep the solution tank free from debris to prevent filter clogs and reduced solution flow.

1. Add water and cleaning agent via the front or rear fill port. Water temperature should not exceed 120°F (50°C).
2. Monitor the solution level through the sight tube and the marks on the tank at the rear of the machine.
3. To drain the tank, slide the solution sight tube off of the upper fitting and lower to a drain or mop sink.



SOLUTION FLOW

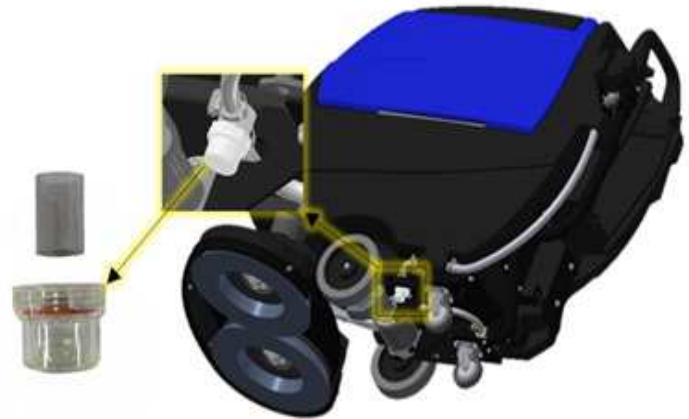
The Solution Control Knob is located on the top left corner of the control panel. The valve electrically turns on and off with the Scrub Head. The knob controls how much solution passes through the valve when activated.



INSPECTION & CLEANING

NOTE: If excessive debris is present, drain and flush the solution tank.

1. Close the shutoff valve.
2. Remove the filter bowl and screen.
3. Clean and rinse any debris in the filter assembly.



9. SCRUB DECK SETUP

HEAD LIFT

- Depress the foot lever (located at the lower right rear corner of the machine) and shift it to the right.
- Once clear of the notch, allow the lever to rise while the head lowers into the operating position.
- Disk machines are equipped with a self-adjusting shroud and bristle skirt that virtually eliminates over-spray.

SELECTING DOWN PRESSURE

1. Standard: For daily cleaning of normal soils.
2. Heavy: For toughest soils or chemical-free finish removal.



LOWER SCRUB
HEAD



STANDARD DOWN
PRESSURE



HEAVY DOWN
PRESSURE

ORBITAL PADS & CHEMICAL-FREE FINISH REMOVAL (CFR)

NOTE: Do not lower the orbital head without a pad installed. Doing so may damage the Mighty-Lok® face.

STANDARD CLEANING OPERATIONS

1. Align the corners of the pad to the corners of the aluminum plate and press to attach.



2. Lower the scrub deck onto the pad.
3. Ensure the pad is properly aligned front-to-back and left-to-right.

CHEMICAL-FREE FINISH REMOVAL (CFR) PAD ASSEMBLY

A specialized surface preparation pad, in addition to the traditional cleaning pad, is required for chemical-free finish removal. The traditional pad acts as a “backer pad” and compensates for variances in the floor.

1. Place the black retainer pad 2” back from the front of the red scrub pad and the maroon CFR pad to allow water saturation.
2. Align and assemble the pads with the red pad on top and the maroon pad on the bottom facing the floor.
3. Ensure the gap mentioned in step 1 is facing forward and refer to steps 1-3 of “**Standard Cleaning Operations**” above to install the CFR Pad Assembly.



MACHINE SETUP

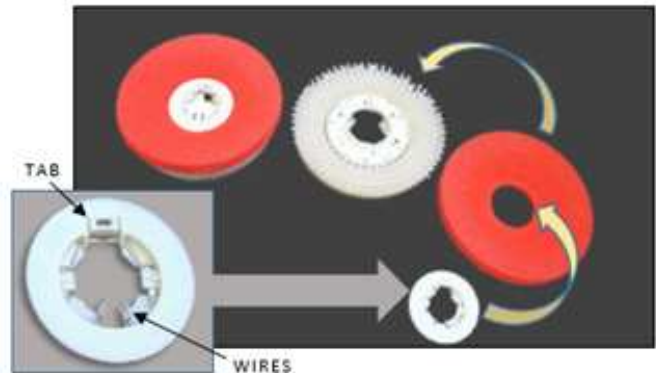
1. Install the CFR Pad Assembly as described above.
2. Fill the solution tank with clean water.
3. Set the down pressure to Heavy (see “Selecting Down Pressure” above).
4. Set the solution flow to midrange. Adjust as needed for maximum finish removal, using the least amount of water needed for effective rinsing.
5. Adjust the machine speed as required.

DISK MACHINE PAD DRIVERS & BRUSHES

PAD & BRUSH REMOVAL

NOTE: Using a pad driver without a pad will damage the floor surface.

1. Toggle the “Brush On/Off” switch to position “A” for 1 second and then immediately to position “B”. The brush will spin in position “A” and abruptly stop in position “B”, releasing the pad drivers.
2. Remove the center lock fitting by squeezing the wires inward and pulling the center lock away.
3. To connect the cleaning pad to the drivers, center the pad on the driver, squeeze the center lock wires inward, and press down (tab side first). Press the pad and release the wires so that they lock in place.



PAD & BRUSH INSTALLATION

1. Turn the key switch on and rotate the speed control knob to the full slow position.
2. Place the pad drivers or brushes on the floor in front of the scrub head.
3. Push or drive the machine into position centering the scrub head over the pad drivers or brushes.
4. Lower the scrub deck onto the pad drivers or brushes.



NOTE: When properly aligned, the scrub deck shroud bristle skirt should almost be touching the floor.

5. Quickly pulse and release the activation trigger to “CLICK ON” the pad drivers or brushes.

NOTE: If the pad drivers or brushes do not quickly engage, return to step two and try again.

10. RECOVERY SYSTEM

RECOVERY TANK

To drain and rinse the recovery tank:

1. Lift the hose off the holder and lower the hose end to the desired drain location.
2. Remove the press-fit cap from the drain hose and squeeze the restriction collar to control the flow.
3. As the tank drains, lift the recovery tank lid to the fully open position.
4. Thoroughly clean and rinse out the sediment from the bottom of the tank with a clean water hose.
 - Periodically use cleaner and sanitizer with a cloth or sponge to prevent mold and mildew.
5. Inspect and clean the debris tray and the vacuum mesh filter screen and ball float system.
6. Leave the lid open to dry



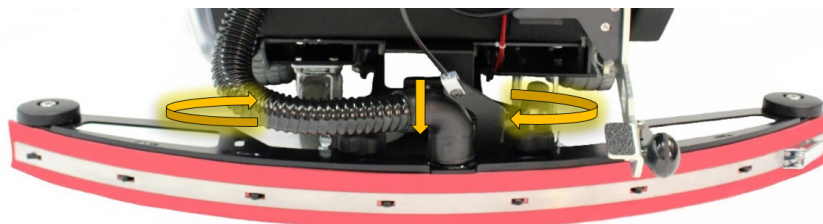
SQUEEGEE SYSTEM

SQUEEGEE ASSEMBLY SETUP

Inspect and maintain the squeegee system to achieve peak machine performance.

REMOVAL & INSTALLATION

- Install: Align the assembly, attach the vacuum hose, and tighten the easy grip knobs.
- Remove: Loosen the easy-grip knobs and detach the recovery hose (reverse of installation).



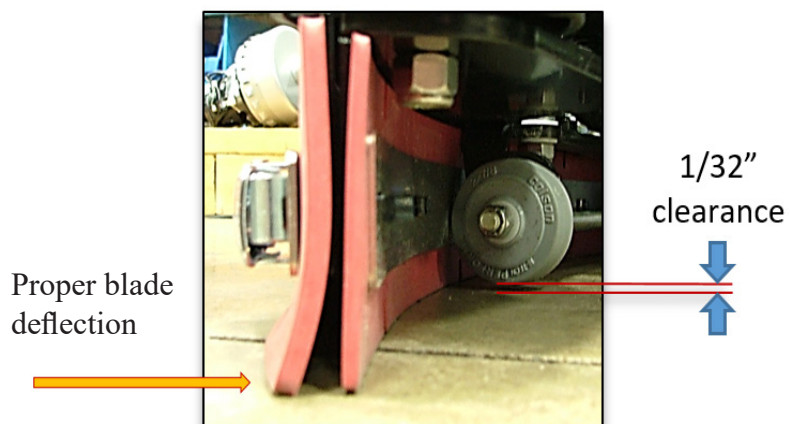
SQUEEGEE USE

1. Lower: Lift the squeegee lever, shift it left, and lower. The vacuum motor will activate.
2. Raise: Lift the lever and shift it right. The vacuum motor will run for 10 seconds to prevent recovered solution from running back out of the hose.



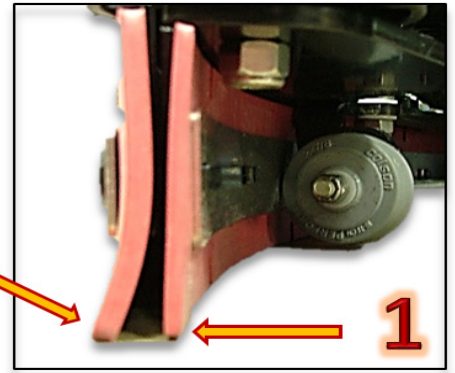
HEIGHT ADJUSTMENT

If the squeegee blade height requires adjustment, turn the button screws on the squeegee frame assembly clockwise to raise and counter-clockwise to lower the wheels until proper blade deflection is achieved.



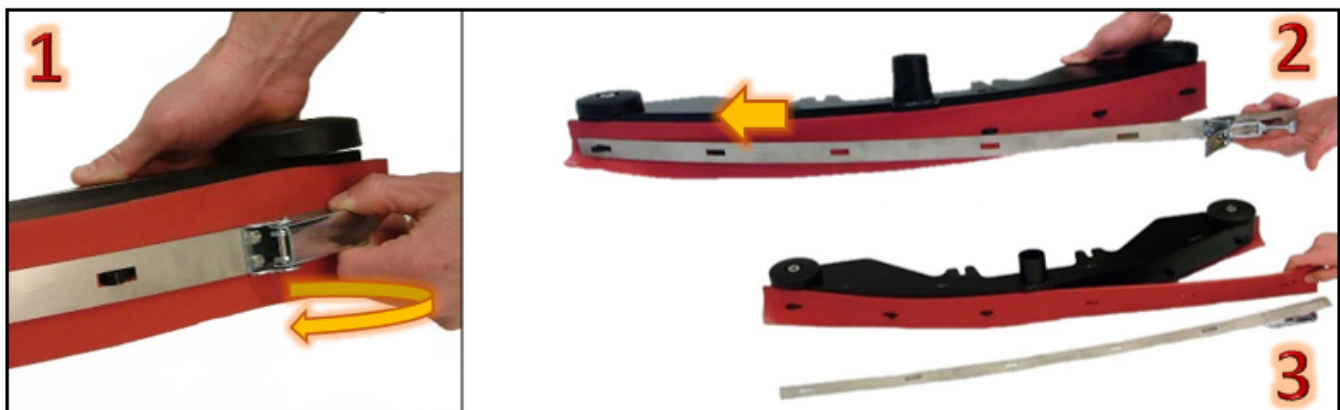
CLEAN & INSPECT

1. Inspect both squeegee blades. If the blade edges are not clearly defined or are worn halfway through the thickness of the blade, flip the blades to another edge or replace as required.
2. Thoroughly clean and rinse the underside of the squeegee frame, blades and neck.



REMOVE & INSTALL SQUEEGEE BLADES

1. Release the over-center latch and slide the band clamp off the hook on the other side.
2. Blades can be flipped length wise or top to bottom to utilize another blade edge.
3. Blade installation is the reverse of the removal.



RECOMMENDED MAINTENANCE

SYSTEM	REFERENCE SECTION	DAILY	WEEKLY	MONTHLY	BIANNUALLY
CONTROL PANEL					
INSPECT ALL CONTROLS AND HARDWARE FOR SECURITY AND SERVICEABILITY	PARTS DIAGRAM	X			
VERIFY PROPER OPERATION OF ALL CONTROLS	ALL	X			
SOLUTION DISTRIBUTION					
VERIFY SOLUTION FLOWS AND ADJUSTS AS EXPECTED	SOLUTION DISTRIBUTION	X			
CLEAN AND INSPECT IN-LINE FILTER	SOLUTION DISTRIBUTION			X	
FLUSH TANK WITH FRESH WATER	SOLUTION DISTRIBUTION			X	
SCRUB DECK					
RINSE BRUSHES & PADS	SCRUB DECK SETUP	X			
RINSE & DRY SCRUB DECK	SCRUB DECK SETUP	X			
CLEAN MOTOR VENTS	PARTS DIAGRAM			X	
INSPECT ISOLATORS *(ORBITAL ONLY)	PARTS DIAGRAM				X
INSPECT LIFT LINKAGE & PIVOT BLOCKS	SCRUB DECK SETUP				X
RECOVERY SYSTEM					
RINSE & AIR DRY RECOVERY TANK	RECOVERY SYSTEM	X			
VERIFY DRAIN HOSE CAP IS SEALED TIGHT WHEN INSTALLED	RECOVERY SYSTEM	X			
INSPECT LID SEAL	RECOVERY SYSTEM		X		
CLEAN & SANITIZE RECOVERY TANK	RECOVERY SYSTEM			X	
BATTERIES AND CHARGER					
INSPECT TERMINALS & CABLES FOR SECURITY, CORROSION, OR DAMAGE	BATTERIES			X	
SERVICE LEAD ACID BATTERIES *(IF EQUIPPED)	BATTERIES		X		
CLEAN ONBOARD CHARGER VENTS *(IF EQUIPPED)	PARTS DIAGRAM			X	
CLEAN BATTERYSHIELD* LIGHT PIPE *(IF EQUIPPED)	BATTERIES				X
PERFORM BATTERYSHIELD* OPERATIONAL CHECKS *(IF EQUIPPED)	BATTERIES				X
SQUEEGEE ASSEMBLY					
CLEAN & INSPECT SQUEEGEE ASSEMBLY & BLADES	RECOVERY SYSTEM	X			
INSPECT VACUUM HOSE	RECOVERY SYSTEM		X		
CHASSIS AND UNDERCARRIAGE					
CLEAN & INSPECT WHEELS & CASTERS	PARTS DIAGRAM			X	
CLEAN & INSPECT LINKAGES, CHASSIS & HARDWARE	PARTS DIAGRAM			X	
CLEAN & INSPECT VISIBLE WIRES FOR DAMAGE & SECURITY	PARTS DIAGRAM				X

RECOMMENDED SERVICE PARTS

(PAGE 1 OF 3)

PART NUMBER	DESCRIPTION	DIAGRAM	WEAR ITEM	S-20 PAD ASSIST DISK	S-20 TRACTION DISK	S-20HD TRACTION DISK	S-20 ORBITAL	S-24XM	OPTIONAL
903046	BELT, V-GROOVE, STRETCH	SCRUB HEAD	X					X	
850701	BLADE, FRONT, 30 INCH	SQUEEGEE	X	X	X	X	X	X	
850703	BLADE, FRONT, 30 INCH, URETH (OPT)	SQUEEGEE	X	X	X	X	X	X	
850704	BLADE, REAR, 30 IN, URETH (OPT)	SQUEEGEE	X	X	X	X	X	X	
850702	BLADE, REAR, 30 INCH	SQUEEGEE	X	X	X	X	X	X	
850905	BRUSH CARBON KIT 4 PC 855201	SCRUB HEAD	X		X	X			
850906	BRUSH CARBON KIT 4 PC 855204 & 875201	SCRUB HEAD	X				X		
870919	BRUSH KIT REPL FOR TRANSAXLE 859201	FRAME	X		X	X	X	X	
870909	BRUSH, GRIT, 12 INCH	SCRUB HEAD	X					X	
850903	BRUSH, GRIT, 20 INCH	SCRUB HEAD	X		X	X			
870908	BRUSH, NYLON, 12 INCH	SCRUB HEAD	X					X	
850902	BRUSH, NYLON, 20 INCH	SCRUB HEAD	X		X	X			
870902	BRUSH, POLY, 12 INCH	SCRUB HEAD	X		X	X		X	
850901	BRUSH, POLY, 20 INCH	SCRUB HEAD	X		X	X			
852401	CABLE, LIFT, CLEVIS	CONTROLS		X	X	X	X	X	
911622	CIRCUIT BREAKER, 30 AMPS	CONTROLS		X	X	X	X	X	
911681	CIRCUIT BREAKER, 35 AMPS	CONTROLS				X			
852002	CLAMP, OVER-CENTER, BAND	SQUEEGEE		X	X	X	X	X	
912401	CONTACTOR, 24V, 100A	ELECTRONICS		X	X	X	X		
912402	CONTACTOR, 24VDC, 70A	ELECTRONICS		X	X	X	X		
875901	DRIVER, PAD, 12INCH, BRISTLE	SCRUB HEAD	X					X	
855901	DRIVER, PAD, 20INCH, BRISTLE	SCRUB HEAD	X		X	X			
843319	FILTER, SCREEN, BOWL	FRAME	X	X	X	X	X	X	
223370	FLOAT, SHUTOFF	RECOVERY TANK	X	X	X	X	X	X	
853309	FOAM NOISE SHORT	RECOVERY TANK	X	X	X	X	X	X	
853305	FOAM, NOISE, VACUUM	RECOVERY TANK	X	X	X	X	X	X	

RECOMMENDED SERVICE PARTS

(PAGE 2 OF 3)

PART NUMBER	DESCRIPTION	DIAGRAM	WEAR ITEM	S-20 PAD ASSIST DISK	S-20 TRACTION DISK	S-20HD TRACTION DISK	S-20 ORBITAL	S-24XM	OPTIONAL
858202	FOAM, SPACER, BATTERY	BATTERIES	X	X	X	X	X	X	
873314	GASKET, FOAM, VACUUM	RECOVERY TANK	X	X	X	X	X	X	
853803	GUIDE, DRIVER	SCRUB HEAD	X		X	X		X	
873802	GUIDE, DRIVER, RH	SCRUB HEAD	X						
873801	GUIDE, PAD, PLASTIC	SCRUB HEAD	X						
853804	GUIDE, PAD, PLASTIC	SCRUB HEAD	X		X	X			
854104	HOSE DRAIN CAPPED CHEM RESIST	RECOVERY TANK	X	X	X	X	X	X	
854105	HOSE SQUEEGEE S-20 CHEM RESIST	RECOVERY TANK	X	X	X	X	X	X	
854101	HOSE, DRAIN, CAPPED	RECOVERY TANK	X	X	X	X	X	X	
854102	HOSE, SQUEEGEE, 90 CUFF	RECOVERY TANK	X	X	X	X	X	X	
854103	HOSE, VACUUM, 1.5INCH	RECOVERY TANK	X	X	X	X	X	X	
854302	HUB, DRIVER, BRUSH	SCRUB HEAD	X		X	X			
874305	HUB, PULLEY, MACH FLAT	SCRUB HEAD	X					X	
874306	HUB, PULLEY, MACH GROOVED	SCRUB HEAD	X					X	
855012	KEY, REPLACEMENT, SCRUBBER	CONTROLS	X	X	X	X	X	X	
855015	ASSY, CASTER 3 INCH REPLACEMENT	FRAME	X	X	X	X	X	X	
875019	ASSY, SKIRT REPLACEMENT (ITEMS 6 - 10)	SCRUB HEAD	X					X	
855014	ASSY, VALVE SCRUBBER REPLACEMENT	FRAME		X	X	X	X	X	
855010	ASSY, BEARING, REPLACEMENT, ORBITAL	SCRUB HEAD	X				X		
855205	MOTOR, VAC, 24VDC, PERIPH	RECOVERY TANK		X	X	X	X	X	
555901	PAD 12" BLACK STRIP CASE 5	SCRUB HEAD	X					X	
555941	PAD 12" RED SCRUB CASE 5	SCRUB HEAD	X					X	
555951	PAD 12" WHITE POLISH CASE 5	SCRUB HEAD	X					X	
555908	PAD 14"X20" BLACK STRIP CASE 5	SCRUB HEAD	X				X		
555928	PAD 14"X20" MAROON CFR CASE 10	SCRUB HEAD	X				X		
555948	PAD 14"X20" RED SCRUB CASE 5	SCRUB HEAD	X				X		

RECOMMENDED SERVICE PARTS

(PAGE 3 OF 3)

PART NUMBER	DESCRIPTION	DIAGRAM	WEAR ITEM	S-20 PAD ASSIST DISK	S-20 TRACTION DISK	S-20HD TRACTION DISK	S-20 ORBITAL	S-24XM	OPTIONAL
555968	PAD 14"X20" TURF CASE 4	SCRUB HEAD	X				X		
555958	PAD 14"X20" WHITE POLISH CASE 5	SCRUB HEAD	X				X		
555906	PAD 20" BLACK STRIP CASE 5	SCRUB HEAD	X	X	X	X			
555926	PAD 20" MAROON CFR CASE 10	SCRUB HEAD	X	X	X	X			
555946	PAD 20" RED SCRUB CASE 5	SCRUB HEAD	X	X	X	X			
555966	PAD 20" TURF CASE 4	SCRUB HEAD	X	X	X	X			
555956	PAD 20" WHITE POLISH CASE 5	SCRUB HEAD	X	X	X	X			
875903	PAD, MIGHTY-LOK ADH UNIVERSAL	SCRUB HEAD	X				X		
855909	PAD, RETAINER, 12X20	SCRUB HEAD	X						
857009	PLUNGER BALL PRESS-IN	SCRUB HEAD	X	X	X	X		X	
857003	PUMP ASSY HAND HYDROLINK (NOT SHOWN, OPTIONAL)	BATTERIES	X						X
911685	RELAY, 24VDC, BATTERYSHIELD	ELECTRONICS		X	X	X			
858503	SKIRT, BRISTLE	SCRUB HEAD	X		X	X		X	
878504	STRAP, GROUNDING, STATIC	SQUEEGEE LINK	X	X	X	X	X	X	
911647	SWITCH, KEY	CONTROLS		X	X	X	X	X	
911649	SWITCH, ROCKER, AUTO ON-OFF	CONTROLS			X	X	X	X	
911653	SWITCH, ROUND, ON - MOM	CONTROLS			X	X	X	X	
911682	SWITCH, SNAP, BENT LEVER	FRAME		X	X	X	X	X	
911646	SWITCH, SNAP, WITH ROLLER	CONTROLS		X	X	X	X	X	
879002	TUBE & PUMP ASSY (NOT SHOWN, OPTIONAL)	BATTERIES	X	X	X	X	X	X	
859003	TUBE, SIGHT, REPLACEMENT	SOLUTION TANK	X	X	X	X	X	X	
859402	VALVE SOLENOID 24V NONADJ	FRAME		X	X	X	X	X	
849709	WHEEL, 2 OD, .31 ID	SQUEEGEE LINK	X	X	X	X	X	X	
859702	WHEEL, BRG, 8 INCH	FRAME	X	X					
855022	KIT-GUIDE WHEEL REPLACEMENT, ANTI RATTLE	SCRUB HEAD	X	X	X	X	X		
859704	WHEEL, TRACTION, 200MM	FRAME	X		X	X	X	X	

TROUBLESHOOTING GUIDE

(PAGE 1 OF 2)

ISSUE	POTENTIAL CAUSE	PROPOSED SOLUTION	MANUAL SECTION
INSUFFICIENT WATER TO SCRUB HEAD	SOLUTION FLOW SETTING IS TOO LOW	ADJUST SOLUTION CONTROL	SOLUTION DISTRIBUTION
	SOLUTION TANK IS EMPTY	ADD WATER/SOLUTION TO THE TANK	SOLUTION DISTRIBUTION
	IN-LINE SOLUTION FILTER IS CLOGGED	REMOVE AND CLEAN THE FILTER	SOLUTION DISTRIBUTION
	SOLUTION TUBE IS CLOGGED, KINKED, OR DAMAGED	INSPECT TUBES	PARTS DIAGRAMS
	SOLUTION SHUT OFF VALVE IS CLOSED	OPEN VALVE	SOLUTION DISTRIBUTION
	SOLUTION SOLENOID VALVE MAY BE FAULTY	VERIFY OPERATION AND REPLACE IF NECESSARY	PARTS DIAGRAMS
POOR WATER RECOVERY	RECOVERY TANK IS FULL	EMPTY RECOVERY TANK	RECOVERY SYSTEM
	DIRTY OR WORN SQUEEGEE BLADES	INSPECT AND ROTATE OR REPLACE AS REQUIRED	RECOVERY SYSTEM
	RECOVERY HOSE LOOSE OR DAMAGED	INSPECT AND REPAIR	PARTS DIAGRAMS
	RECOVERY HOSE OR SQUEEGEE ASSEMBLY HAS AN OBSTRUCTION	CLEAR OBSTRUCTIONS FROM RECOVERY SYSTEM	PARTS DIAGRAMS
	SQUEEGEE ASSEMBLY MAY BE OUT OF ADJUSTMENT	ADJUST AS NECESSARY	RECOVERY SYSTEM
	STUCK OR DAMAGED BALL FLOAT	INSPECT AND REPAIR/REPLACE	RECOVERY SYSTEM
	RECOVERY TANK LID IS NOT SEALING PROPERLY	INSPECT RECOVERY LID GASKET. REPAIR OR REPLACE IF NEEDED	PARTS DIAGRAM
	DRAIN HOSE CAP IS NOT INSTALLED PROPERLY	INSTALL DRAIN HOSE SECURELY	RECOVERY SYSTEM
	LOW BATTERY VOLTAGE	CHARGE BATTERIES	CHARGING
MACHINE WILL NOT TURN ON	FAULTY KEY SWITCH	DIAGNOSE AND REPLACE	WIRING DIAGRAMS
	DISCHARGED BATTERIES	CHARGE BATTERIES	CHARGING
	LOOSE OR DAMAGED WIRE	REPAIR	WIRING DIAGRAMS
MACHINE NOT CLEANING FLOOR PROPERLY	WORN PAD OR BRUSH	INSPECT AND REPLACE AS REQUIRED	SCRUB DECK SETUP
	WRONG PAD OR BRUSH FOR APPLICATION	CONTACT YOUR LOCAL DISTRIBUTOR FOR RECOMMENDED APPLICATION	SCRUB DECK SETUP
	INSUFFICIENT CLEANING SOLUTION FOR APPLICATION	ADJUST THE MIXTURE AS REQUIRED	SOLUTION DISTRIBUTION
EXCESSIVE FOAM IN RECOVERY TANK	IMPROPER DETERGENT TYPE	USE A LOW-FOAM DETERGENT OR ADD A DEFOAMING AGENT TO THE RECOVERY TANK. READ ALL CHEMICAL LABELS THOROUGHLY BEFORE USE	RECOVERY SYSTEM
VACUUM MOTOR WILL NOT RUN	SQUEEGEE LIFT LEVER IS STILL RAISED	LOWER SQUEEGEE LEVER	RECOVERY SYSTEM
	VACUUM RELAY MAY BE FAULTY	CONTACT SERVICE TECHNICIAN TO TROUBLESHOOT AND ISOLATE	WIRING DIAGRAMS
	VACUUM SWITCH OR WIRING MAY BE FAULTY	CONTACT SERVICE TECHNICIAN TO TROUBLESHOOT AND ISOLATE	WIRING DIAGRAMS
VACUUM MOTOR WILL NOT TURN OFF	STILL IN DELAY MODE	ALLOW 10 SECONDS FOR VACUUM TO SHUT DOWN	RECOVERY SYSTEM
	VACUUM RELAY MAY BE FAULTY	CONTACT SERVICE TECHNICIAN TO TROUBLESHOOT AND ISOLATE	WIRING DIAGRAM

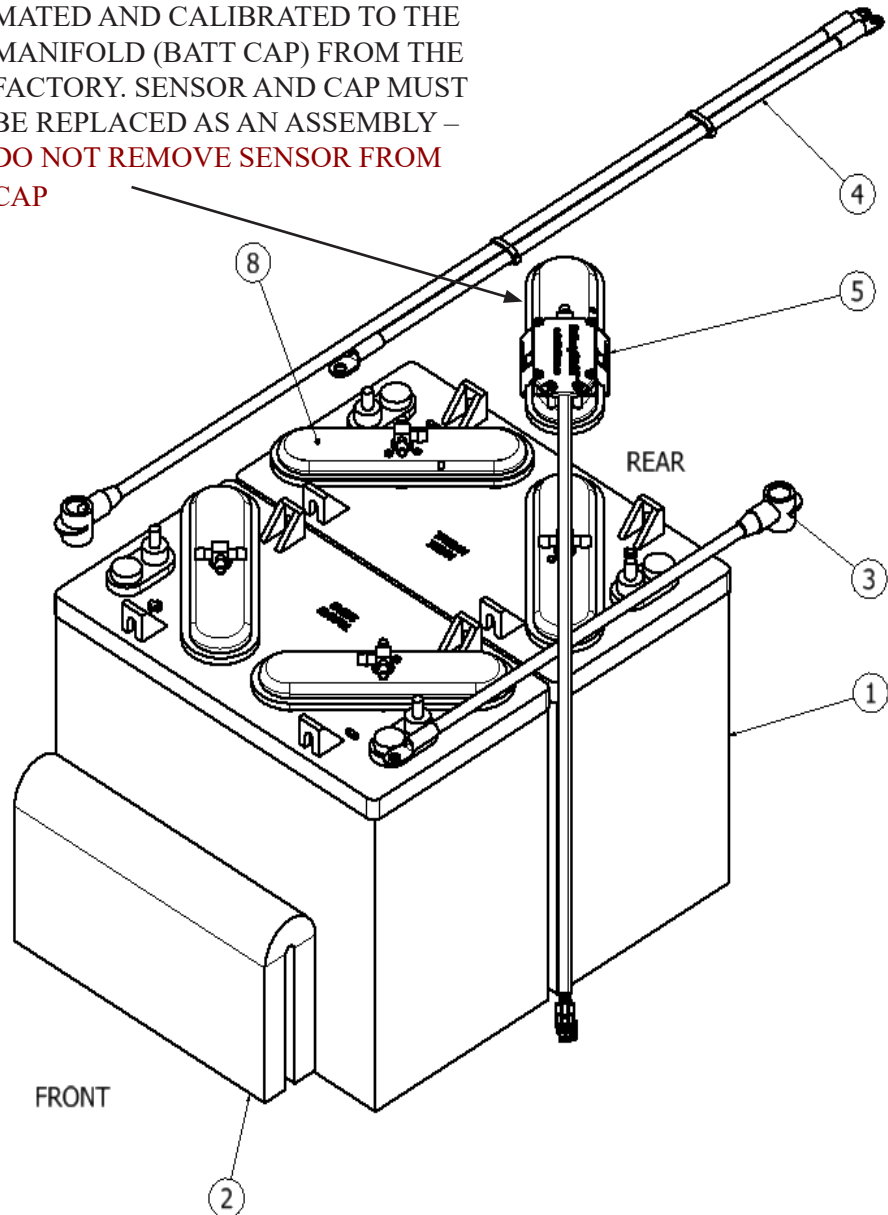
TROUBLESHOOTING GUIDE

(PAGE 2 OF 2)

ISSUE	POTENTIAL CAUSE	PROPOSED SOLUTION	MANUAL SECTION
SCRUB HEAD WILL NOT RUN	SCRUB HEAD IS STILL RAISED	LOWER SCRUB HEAD	SCRUB DECK SETUP
	BATTERYSHIELD® LED IS ILLUMINATED AND HAS DISABLED THE SCRUB HEAD (IF EQUIPPED)	SERVICE THE BATTERIES	BATTERIES
	BATTERIES ARE DISCHARGED BELOW THRESHOLD VOLTAGE	CHARGE BATTERIES	CHARGING
	BRUSH MOTOR CIRCUIT BREAKER HAS TRIPPED	SEE NEXT TOPIC ON THIS TABLE	TROUBLESHOOTING TABLE
	SCRUB HEAD LIFT ARM SWITCH MAY BE STUCK OR FAULTY	INSPECT AND REPAIR SWITCH AS REQUIRED	PARTS DIAGRAMS
	TRIGGER SWITCH IN HANDLE MAY BE FAULTY	INSPECT AND REPAIR AS REQUIRED	PARTS DIAGRAMS
	SOLUTION SOLENOID VALVE MAY HAVE AN INTERNAL SHORT	DISCONNECT WIRES FROM SOLENOID VALVE AND TRY RUNNING THE SCRUB HEAD AGAIN. REPLACE SOLENOID IF REQUIRED	WIRING DIAGRAM
	BATTERYSHIELD® RELAY MAY BE FAULTY (IF EQUIPPED)	CONTACT SERVICE TECHNICIAN TO TROUBLESHOOT AND ISOLATE	WIRING DIAGRAM
SCRUB HEAD CIRCUIT BREAKER IS TRIPPED	INADEQUATE SOLUTION FOR APPLICATION	INCREASE SOLUTION TO SCRUB HEAD	PRE-USE SETUP
	SCRUB HEAD IS SET TO HEAVY DOWN PRESSURE	REDUCE DOWN PRESSURE SETTING	PRE-USE SETUP
	PAD IS TOO AGGRESSIVE FOR APPLICATION	CONTACT YOUR LOCAL DISTRIBUTOR FOR RECOMMENDED APPLICATION	PRE-USE SETUP
	FAULTY OR SHORTED WIRE	REPAIR	WIRING DIAGRAM
	WEAK CIRCUIT BREAKER	CONTACT SERVICE TECHNICIAN TO TROUBLESHOOT AND ISOLATE. BREAKER SHOULD NOT TRIP BELOW ITS STATED RATING	PARTS DIAGRAMS
MACHINE WILL NOT DRIVE	CIRCUIT BREAKER MAY BE TRIPPED	INSPECT AND RESET. IF PROBLEM PERSISTS CONTACT SERVICE TECHNICIAN	PRE-USE SETUP
	BATTERY METER IS FLASHING A FAULT CODE	REFERENCE FAULT CODE AND TROUBLESHOOT AS REQUIRED	PRE-USE SETUP
	BATTERIES DISCHARGED TOO LOW	CHARGE BATTERIES	CHARGING
	SPEED CONTROL KNOB TURNED ALL THE WAY DOWN	INCREASE SPEED SETTING	DRIVE SYSTEM
	FAULTY CONTROLLER	CONTACT SERVICE TECHNICIAN TO TROUBLESHOOT AND ISOLATE	WIRING DIAGRAM
	FAULTY WIRING	CONTACT SERVICE TECHNICIAN TO TROUBLESHOOT AND ISOLATE	WIRING DIAGRAM
RUN TIME IS SHORT	BATTERIES ARE LOW ON WATER (LEAD ACID ONLY)	SERVICE BATTERIES	BATTERIES
	CHARGER IS NOT SET PROPERLY FOR BATTERY TYPE	SET CHARGER TO BATTERY SPECIFICATIONS	CHARGING
	SCRUB HEAD IS IN HEAVY DOWN PRESSURE	REDUCE SCRUB HEAD PRESSURE	PRE-USE SETUP
	BATTERY CHARGER IS NOT ABLE TO FINISH CHARGE CYCLE	CONFIRM A STEADY GREEN LED AFTER THE CHARGE CYCLE (BEFORE UNPLUGGING FROM THE OUTLET)	CHARGING
	BATTERIES ARE DEFECTIVE OR AT THE END OF THEIR LIFE	CONTACT SERVICE TECHNICIAN TO TROUBLESHOOT AND ISOLATE	BATTERIES

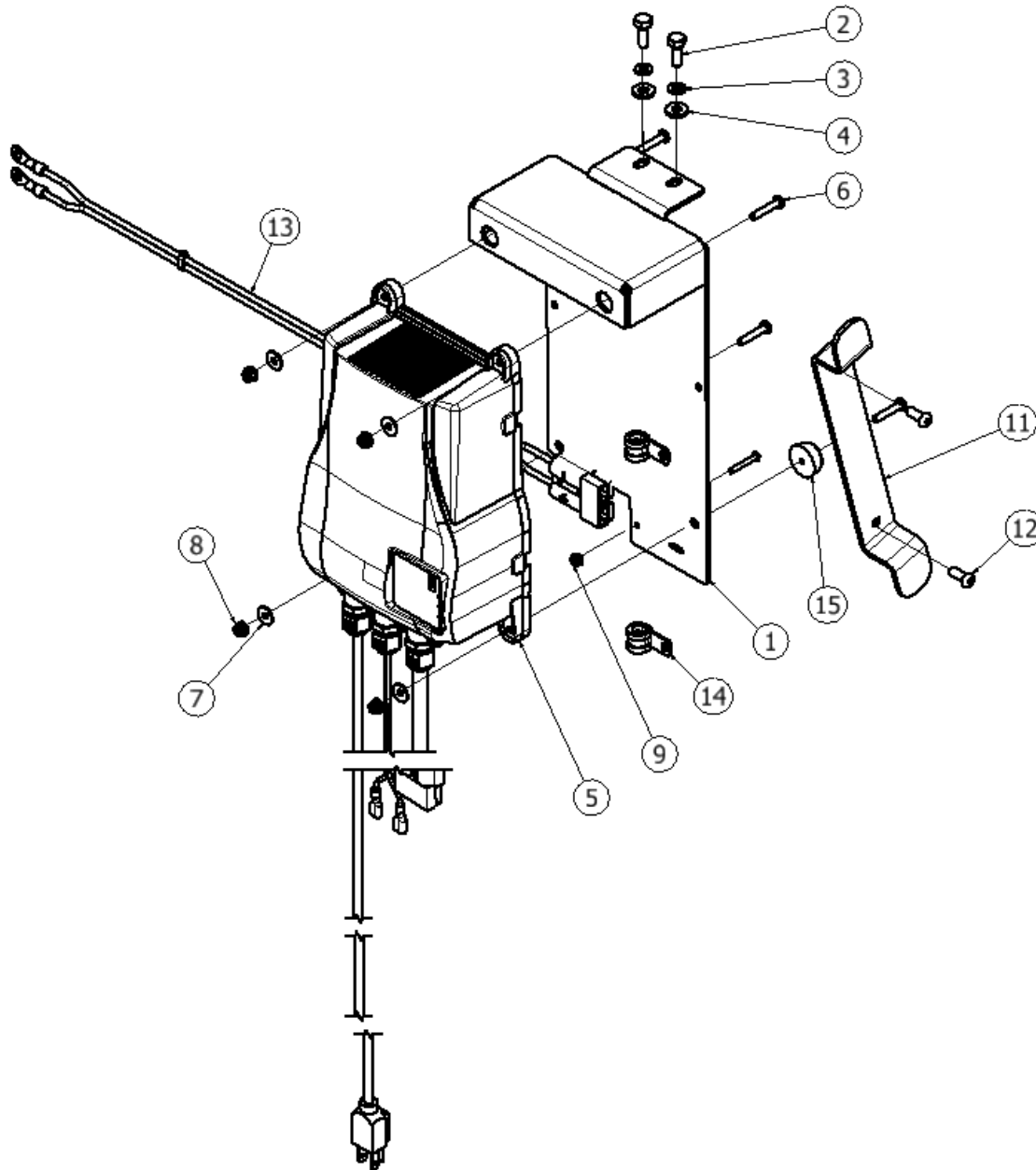
BATTERIES, BATTERYSHIELD® & HYDROLINK®

BATTERYSHIELD® SENSOR IS MATED AND CALIBRATED TO THE MANIFOLD (BATT CAP) FROM THE FACTORY. SENSOR AND CAP MUST BE REPLACED AS AN ASSEMBLY – **DO NOT REMOVE SENSOR FROM CAP**



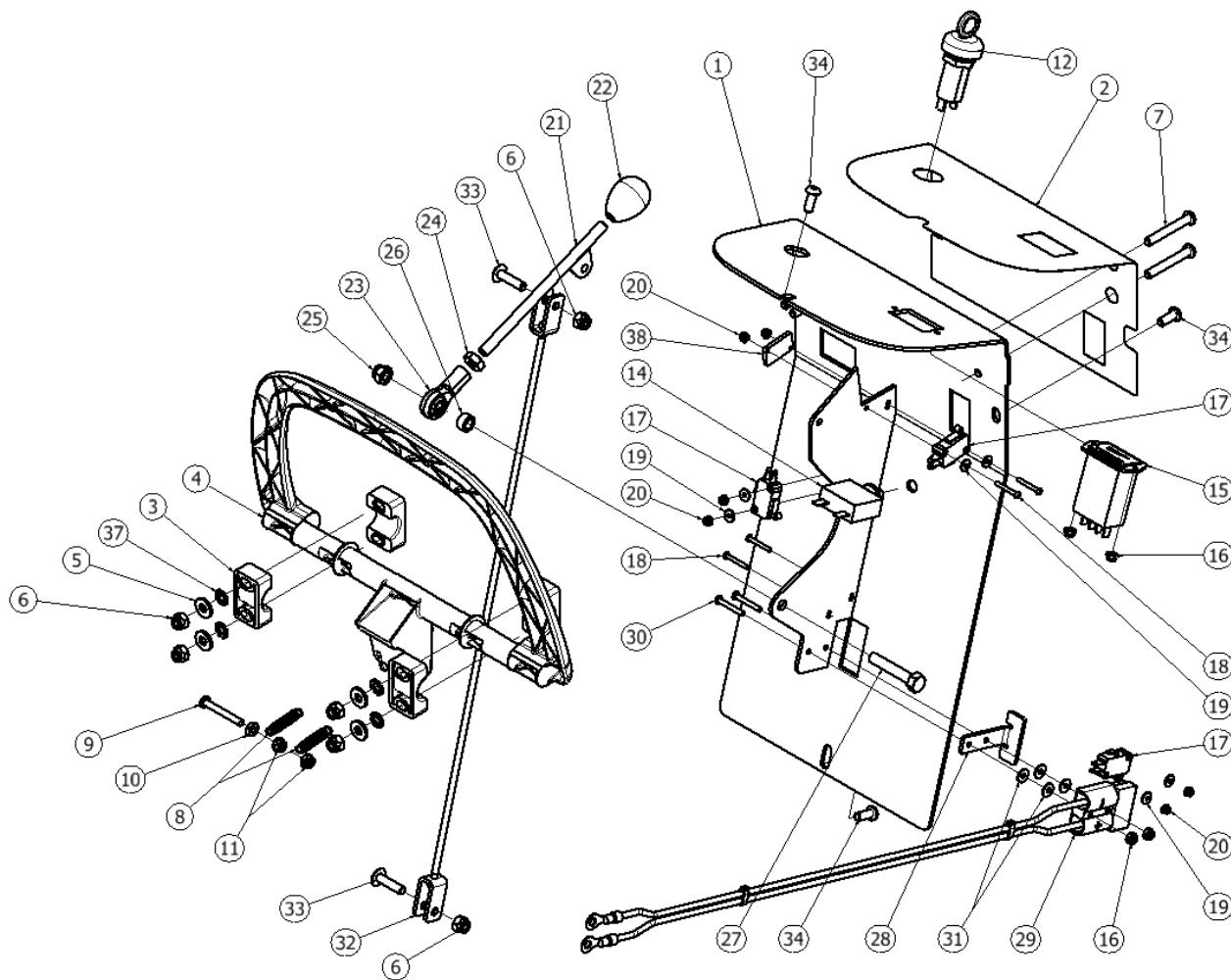
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	851303	BATTERY, 12V, 155AH, LEAD ACID
1	2	841311	BATTERY, 12V, 140AH, AGM
1	2	881350	BATTERY, 12V, 130AH, LEAD ACID
1	2	851302	BATTERY, 12V, 105AH, AGM
2	1	858202	FOAM, SPACER, BATTERY
3	1	911640	HARNESS, CONN, BATTERY (ALL OTHER MACHINES)
3	1	911683	HARNESS, CONN, BATTERY (PAD ASSIST LEAD ACID)
4	1	911641	HARNESS, BATT-MACHINE (ALL OTHER MACHINES)
4	1	911671	HARNESS, BATT-MACHINE (PAD ASSIST LEAD ACID)
5	1	878520	SENSOR ASSY BATTERYSHIELD FIELD REPLACEMENT
6	1	879002	COMPLETE SET MANIFOLDS (BATT CAP), SERV TUBE, & PUMP
7	1	857003	PUMP ASSY HAND HYDROLINK (OPTIONAL)
8	1	855605	MANIFOLD INDIV HYDROLINK (BATT CAP, OPTIONAL)

OPTIONAL ONBOARD CHARGER



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	850804	BRACKET, MTG, CHARGER
2	2	W189D	SCREW, HEX, 1/4-20 X .75, SS, PATCH
3	2	980002	WASHER, LOCK, SPLIT, .25
4	2	W104D	WASHER, FLAT, .25
5	1	852407	CHARGER, 24V, ONBRD, CULUS
6	4	962186	SCREW, PAN, #10-32 X 1.0, SS
7	4	W401D	WASHER, FLAT, #10
8	4	920666	NUT, NYLOCK, #10-32, SS
9	1	920034	NUT, NYLOCK, #6-32, SS
10	1	W132D	SCREW, PAN, #6-32 X 1.0, ZINC
11	1	850805	BRACKET, MTG, CORD
12	2	962263	SCREW, BUTT, SOCK, .25-20X.62, SS BO
13	1	911645	HARNESS, CHARGER, POST
14	2	852101	CLAMP, WIRE, P-SHAPED
15	2	501210	BUMPER

S-20 PAD ASSIST CONTROLS

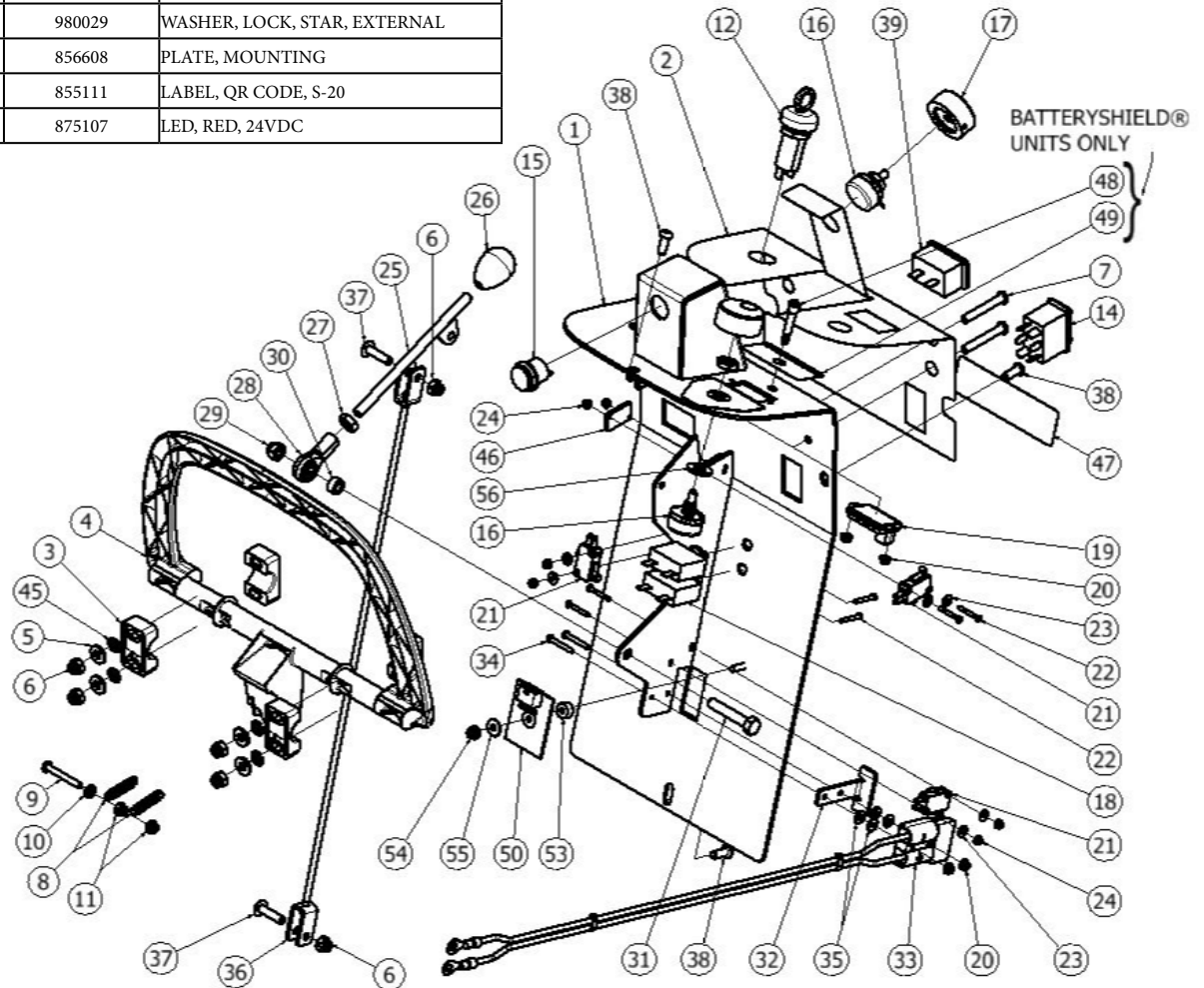


ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	857001	PANEL, CONTROLS
2	1	855101	LABEL, CONTROL, BA
3	4	855601	MOUNT, BEARING, PLASTIC
4	1	851301	BAIL, MOLDED
5	4	W104D	WASHER, FLAT, .25
6	6	920011	NUT, NYLOCK, 1/4-20, ZINC
7	4	962264	SCREW, BUTTON, SOCKET, .25 X 1.75, SS
8	2	858302	SPRING, EXTENSION
9	1	962146	SCREW, PAN, #10-32 X 1.5, FULL, ZINC
10	1	920013	NUT, #10-32, ZINC
11	2	920666	NUT, NYLOCK, #10-32, SS
12	1	911647	SWITCH KEY
13	1	855012	KEY, REPLACEMENT, SCRUBBER
14	1	911622	CIRCUIT BREAKER, 30 AMPS
15	1	915602	METER, BATTERY
16	4	920034	NUT, NYLOCK, #6-32, SS
17	3	911646	SWITCH, SNAP, WITH ROLLER
18	6	962273	SCREW, PAN, #4-40 X .88, ZINC
19	6	980682	WASHER, FLAT, #4, ZINC
20	6	W385D	NUT, NYLOCK, #4-40, ZINC
21	1	855106	LEVER, LIFT, SQUEEGEE
22	1	855004	KNOB, OVAL, .31-18
23	1	902050	BEARING, ROD END, .31-24
24	1	920038	NUT, HEX, .31-24, SS
25	1	920012	NUT, NYLOCK, 5/16-18, ZINC
26	1	853802	GUIDE, SPACER, ROUND
27	1	962270	SCREW, HEX, 5/16-18X1.75,SS
28	1	850806	BRACKET, PLUG
29	1	911645	HARNESS, CHARGER, POST
30	2	W132D	SCREW, PAN, #6-32 X 1.0, ZINC
31	4	980033	WASHER, FLAT, #6, SS
32	1	852401	CABLE, LIFT, CLEVIS
33	2	962455	SCREW, TRUSS, .25-20 X 1.0
34	4	962263	SCREW, BUTT, SOCK, .25-20X.62, SS BO
35	1	911669	HARNESS, SIGNAL, S-20 PAD ASSIST
36	1	911644	HARNESS, POWER, S-20 PAD ASSIST
37	4	980029	WASHER, LOCK, STAR, EXTERNAL
38	1	856608	PLATE, MOUNTING

S-20 TRACTION & S-24XM CONTROLS

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	857101	PANEL, CONTROLS
2	1	855117	LABEL CONTROL 11GAL DISK
2	1	855118	LABEL CONTROL 11GAL ORB
3	4	855601	MOUNT, BEARING, PLASTIC
4	1	851301	BAIL, MOLDED
5	4	W104D	WASHER, FLAT, .25
6	6	920011	NUT, NYLOCK, 1/4-20, ZINC
7	4	962264	SCREW, BUTTON, SOCKET, .25 X 1.75, SS
8	2	858302	SPRING, EXTENSION
9	1	962146	SCREW, PAN, #10-32 X 1.5, FULL, ZINC
10	1	920013	NUT, #10-32, ZINC
11	2	920666	NUT, NYLOCK, #10-32, SS
12	1	911647	SWITCH, KEY
13	1	855012	KEY, REPLACEMENT, SCRUBBER
14	1	911649	SWITCH, ROCKER, AUTO ON-OFF
15	1	911653	SWITCH, ROUND, ON - MOM
16	2	911664	POTENTIOMETER ASSY, 5K
17	2	855001	KNOB, ADJUST, .25 BORE
18	2	911622	CIRCUIT BREAKER, 30 AMPS
19	1	911621	METER, BATTERY
20	4	920034	NUT, NYLOCK, #6-32, SS
21	3	911646	SWITCH, SNAP, WITH ROLLER
22	6	962273	SCREW, PAN, #4-40 X .88, ZINC
23	6	980682	WASHER, FLAT, #4, ZINC
24	6	W385D	NUT, NYLOCK, #4-40, ZINC
25	1	855106	LEVER, LIFT, SQUEEGEE
26	1	855004	KNOB, OVAL, .31-18
27	1	920038	NUT, HEX, .31-24, SS
28	1	902050	BEARING, ROD END, .31-24
29	1	920012	NUT, NYLOCK, 5/16-18, ZINC
30	1	853802	GUIDE, SPACER, ROUND
31	1	962270	SCREW, HEX, 5/16-18X1.75,SS
32	1	850806	BRACKET, PLUG
33	1	911645	HARNESS, CHARGER, POST
34	2	W132D	SCREW, PAN, #6-32 X 1.0, ZINC
35	4	980033	WASHER, FLAT, #6, SS
36	1	852401	CABLE, LIFT, CLEVIS

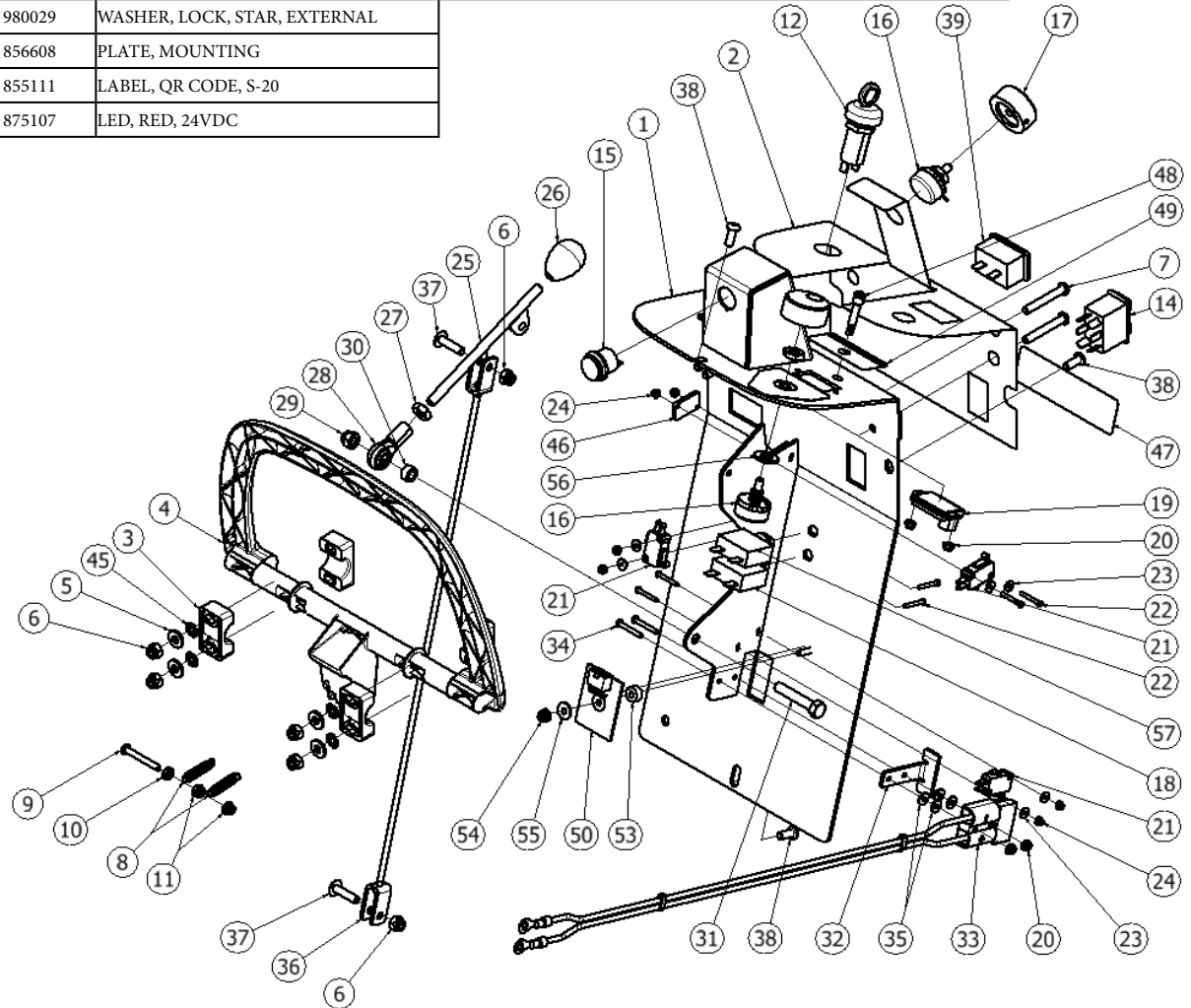
ITEM	QTY	PART NUMBER	DESCRIPTION	ITEM	QTY	PART NUMBER	DESCRIPTION
37	2	962455	SCREW, TRUSS, .25-20 X 1.0	49	1	855115	LABEL BATTERYSHIELD WITH QR CODE
38	4	962263	SCREW, BUTT, SOCK, .25-20X.62, SS BO	50	1	872413	CONTROLLER FLOW WATER
39	1	911661	METER, HOUR, DIGITAL (OPTIONAL)	51	1	911722	HARNESS SOLUTION FLOW S-SERIES
40	1	911643	HARNESS, POWER, TRACTION, S-20	53	1	878208	SPACER PLASTIC #10 X .25 THICK
41	1	911670	HARNESS, POWER, ORBITAL, S-20	54	1	920001	NUT, NYLOCK, #10-32, ZINC
42	1	911688	HARNESS, POWER, S-24XM	55	1	W401D	WASHER, FLAT, #10
43	1	911667	HARNESS, SIGNAL, DISK, S-20	56	1	980003	WASHER, FLAT, .38
44	1	911668	HARNESS, SIGNAL, ORBITAL, S-20				
45	4	980029	WASHER, LOCK, STAR, EXTERNAL				
46	2	856608	PLATE, MOUNTING				
47	1	855111	LABEL, QR CODE, S-20				
48	1	875107	LED, RED, 24VDC				



S-20HD TRACTION CONTROLS

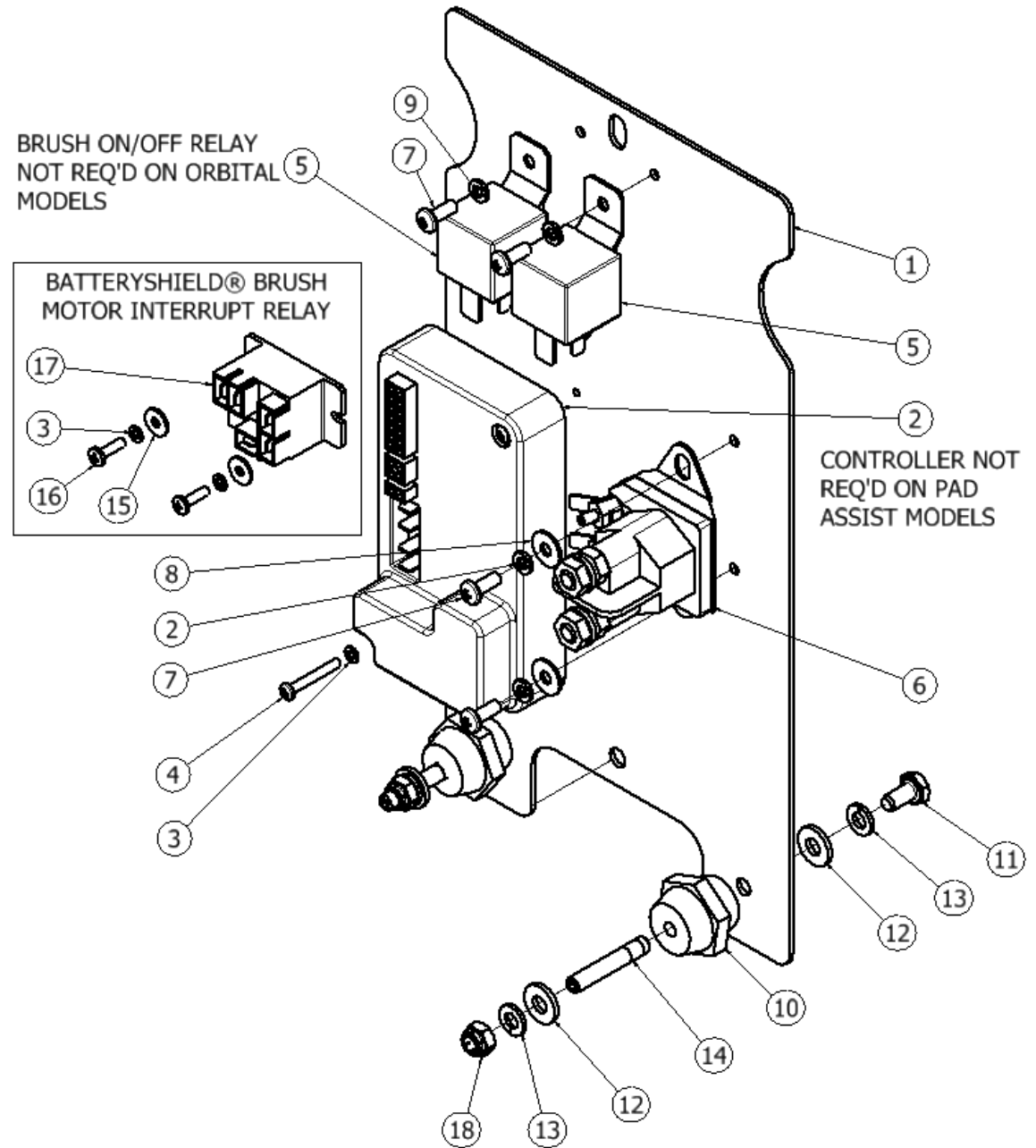
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	857101	PANEL, CONTROLS
2	1	855117	LABEL CONTROL 11GAL DISK
2	1	855118	LABEL CONTROL 11GAL ORB
3	4	855601	MOUNT, BEARING, PLASTIC
4	1	851301	BAIL, MOLDED
5	4	W104D	WASHER, FLAT, .25
6	6	920011	NUT, NYLOCK, 1/4-20, ZINC
7	4	962264	SCREW, BUTTON, SOCKET, .25 X 1.75, SS
8	2	858302	SPRING, EXTENSION
9	1	962146	SCREW, PAN, #10-32 X 1.5, FULL, ZINC
10	1	920013	NUT, #10-32, ZINC
11	2	920666	NUT, NYLOCK, #10-32, SS
12	1	911647	SWITCH, KEY
13	1	855012	KEY, REPLACEMENT, SCRUBBER
14	1	911649	SWITCH, ROCKER, AUTO ON-OFF
15	1	911653	SWITCH, ROUND, ON - MOM
16	2	911664	POTENTIOMETER ASSY, 5K
17	2	855001	KNOB, ADJUST, .25 BORE
18	1	911622	CIRCUIT BREAKER, 30 AMPS
19	1	911621	METER, BATTERY
20	4	920034	NUT, NYLOCK, #6-32, SS
21	3	911646	SWITCH, SNAP, WITH ROLLER
22	6	962273	SCREW, PAN, #4-40 X .88, ZINC
23	6	980682	WASHER, FLAT, #4, ZINC
24	6	W385D	NUT, NYLOCK, #4-40, ZINC
25	1	855106	LEVER, LIFT, SQUEEGEE
26	1	855004	KNOB, OVAL, .31-18
27	1	920038	NUT, HEX, .31-24, SS
28	1	902050	BEARING, ROD END, .31-24
29	1	920012	NUT, NYLOCK, 5/16-18, ZINC
30	1	853802	GUIDE, SPACER, ROUND
31	1	962270	SCREW, HEX, 5/16-18X1.75,SS
32	1	850806	BRACKET, PLUG
33	1	911645	HARNESS, CHARGER, POST
34	2	W132D	SCREW, PAN, #6-32 X 1.0, ZINC
35	4	980033	WASHER, FLAT, #6, SS
36	1	852401	CABLE, LIFT, CLEVIS

ITEM	QTY	PART NUMBER	DESCRIPTION	ITEM	QTY	PART NUMBER	DESCRIPTION
37	2	962455	SCREW, TRUSS, .25-20 X 1.0	49	1	855115	LABEL BATTERYSHIELD WITH QR CODE
38	4	962263	SCREW, BUTT, SOCK, .25-20X.62, SS BO	50	1	872413	CONTROLLER FLOW WATER
39	1	911661	METER, HOUR, DIGITAL (OPTIONAL)	51	1	911722	HARNESS SOLUTION FLOW S-SERIES
40	1	911643	HARNESS, POWER, TRACTION, S-20	53	1	878208	SPACER PLASTIC #10 X .25 THICK
41	1	911670	HARNESS, POWER, ORBITAL, S-20	54	1	920001	NUT, NYLOCK, #10-32, ZINC
42	1	911688	HARNESS, POWER, S-24XM	55	1	W401D	WASHER, FLAT, #10
43	1	911667	HARNESS, SIGNAL, DISK, S-20	56	1	980003	WASHER, FLAT, .38
44	1	911668	HARNESS, SIGNAL, ORBITAL, S-20	57	1	911681	CIRCUIT BREAKER, 35 AMPS
45	4	980029	WASHER, LOCK, STAR, EXTERNAL				
46	2	856608	PLATE, MOUNTING				
47	1	855111	LABEL, QR CODE, S-20				
48	1	875107	LED, RED, 24VDC				



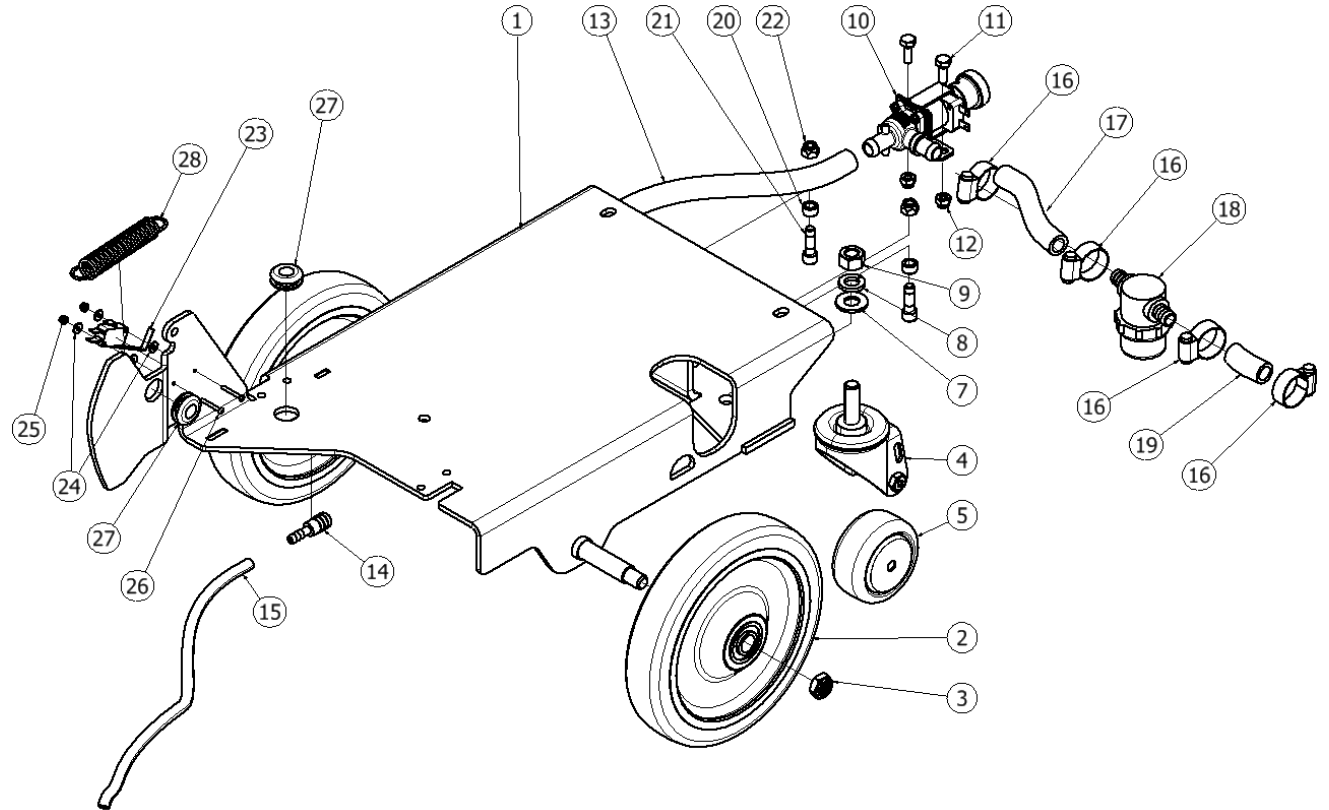
ELECTRONICS

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	859801	PANEL, ELECTRONICS
2	1	859101	CONTROLLER, TRACTION, S20
3	4	980025	WASHER, SPLIT LOCK, #6, ZINC
4	2	W323D	SCREW, PAN, #6-32 X 1.0, ZINC
5	2	912402	CONTACTOR, 24VDC, 70A
6	1	912401	CONTACTOR, 24V, 100A
7	4	962363	SCREW, PAN, #10-32 X .50, SS
8	2	W401D	WASHER, FLAT, #10
9	4	980022	WASHER, LOCK, SPLIT, #10
10	2	858501	STAND-OFF, INSULATED, .25-20
11	4	W169D	SCREW, HEX, .25-20 X .50
12	6	W104D	WASHER, FLAT, .25
13	6	980002	WASHER, LOCK, SPLIT, .25
14	2	962276	SCREW, SET, .25-20 X 1.25, ZINC, PATCH
15	2	980033	WASHER, FLAT, #6, SS
16	2	W315D	SCREW, PAN, #6-32 X .50, BLK
17	1	911685	RELAY, 24VDC, BATTERYSHIELD
18	2	924083	NUT .25-20 FLEX LOCK ZINC



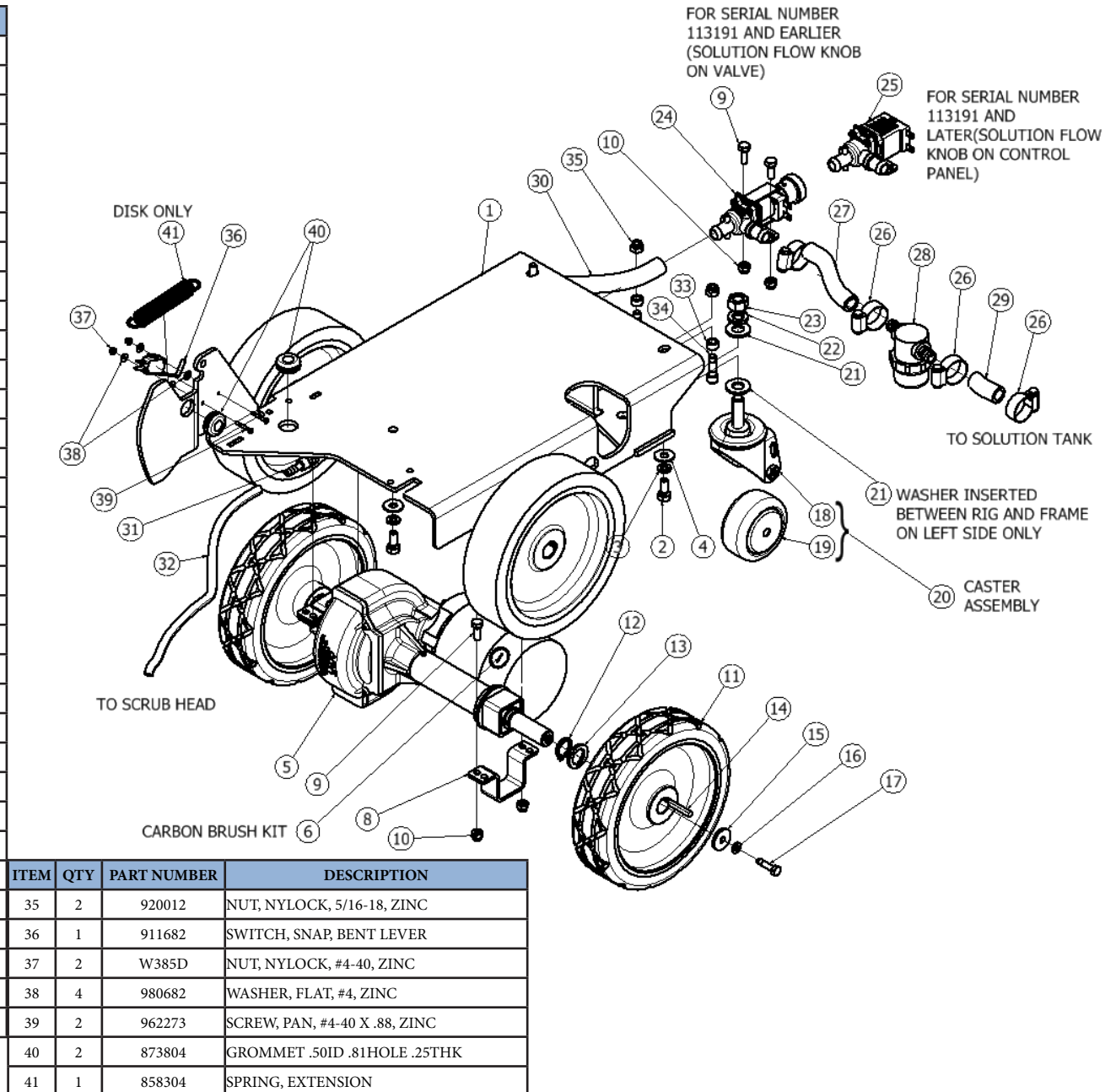
S-20 PAD ASSIST FRAME

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	853201	FRAME, SCRUBBER, 20 BA
2	2	859702	WHEEL, BRG, 8 INCH
3	2	W502D	NUT, NYLOCK, .5-13, THIN, ZINC
4	2	857502	RIG CASTER 3INCH WITH AXLE
5	2	859709	WHEEL CASTER 3INCH
6	2	855015	ASSY CASTER 3 INCH REPLACEMENT
7	2	980079	WASHER, FLAT, .5, ZINC
8	2	980019	WASHER .50INCH SPLIT LOCK
9	2	920022	NUT HEX .50-13 ZINC
10	1	855014	ASSY VALVE SCRUBBER REPLMNT
11	2	W189D	SCREW, HEX, 1/4-20 X .75, SS, PATCH
12	2	920011	NUT, NYLOCK, 1/4-20, ZINC
13	1	224130 - 9.50"	HOSE, 1/2" DIA X 9.50" LONG
14	1	853301	FITTING, REDUCER, BM08, BM04
15	1	204179 - 17.0"	HOSE, 1/4" DIA X 12.50" LONG
16	4	S453P	CLAMP, HOSE, WORM
17	1	224130 - 3.75"	HOSE, 1/2" DIA X 3.75" LONG
18	1	843319	FILTER, SCREEN, BOWL
19	1	224130 - 1.56"	HOSE, 1/2" DIA X 1.56" LONG
20	2	853802	GUIDE, SPACER, ROUND
21	2	962279	SCREW, SOCKET CAP, .31X1.0, SS
22	2	920012	NUT, NYLOCK, 5/16-18, ZINC
23	1	911682	SWITCH, SNAP, BENT LEVER
24	4	980682	WASHER, FLAT, #4, ZINC
25	2	W385D	NUT, NYLOCK, #4-40, ZINC
26	2	962273	SCREW, PAN, #4-40 X .88, ZINC
27	2	873804	GROMMET .50ID .81HOLE .25THK
28	1	858304	SPRING, EXTENSION



S-20 / S-20HD TRACTION, ORBITAL & S-24XM FRAME

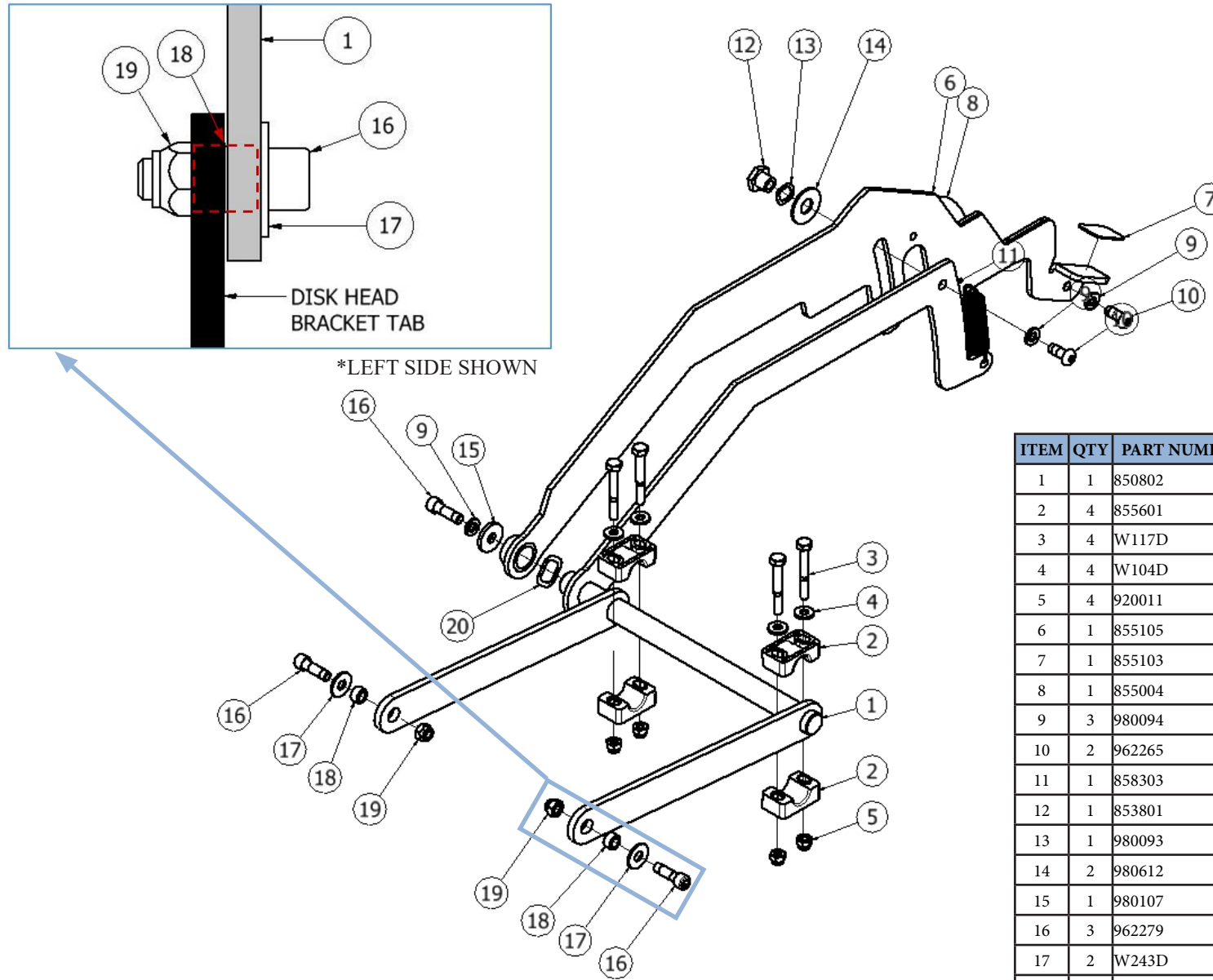
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	853202	FRAME, SCRUBBER, 20 TRACT
2	3	962269	SCREW, HEX, .31-18 X .75, SS
3	3	980094	WASHER, SPLIT LOCK, .31, SS
4	3	W243D	WASHER, FLAT, 5/16, SS
5	1	859201	TRANSAXLE, 24VDC, 20 IN
6	1	870919	BRUSH KIT REPL FOR TRANSAXLE 859201
7	1	855206	MOTOR REPL FOR TRANSAXLE 859201
8	2	850807	BRACKET, RETAINING, TRANS
9	6	W189D	SCREW, HEX, 1/4-20 X .75, SS, PATCH
10	6	920011	NUT, NYLOCK, 1/4-20, ZINC
11	2	859704	WHEEL, TRACTION, 200MM
12	2	847306	RING, RETAINING, EXT, .75
13	2	980780	WASHER, KEYED
14	2	915003	KEY, SQ, .188 X 1.31
15	2	980106	WASHER, FLAT, .25ID, 1.0OD, .12THK, SS
16	2	980002	WASHER, LOCK, SPLIT, .25
17	2	964008	SCREW, HEX, M6 X 25, SS, PATCH
18	2	857502	RIG CASTER 3INCH WITH AXLE
19	2	859709	WHEEL CASTER 3INCH
20	2	855015	ASSY CASTER 3 INCH REPLACEMENT
21	3	980079	WASHER, FLAT, .5, ZINC
22	2	980019	WASHER .50INCH SPLIT LOCK
23	2	920022	NUT HEX .50-13 ZINC
24	1	855014	ASSY VALVE SCRUBBER REPLMNT
25	1	859402	VALVE SOLENOID 24V NONADJ
26	4	S453P	CLAMP, HOSE, WORM
27	1	224130 - 3.75"	HOSE, 1/2" DIA X 3.75" LONG
28	1	843319	FILTER, SCREEN, BOWL
29	1	224130 - 1.56"	HOSE, 1/2" DIA X 1.56" LONG
30	1	224130 - 9.50"	HOSE, 1/2" DIA X 9.50" LONG
31	1	853301	FITTING, REDUCER, BM08, BM04
32	1	204179 - 19.0"	HOSE, 1/4" DIA X 12.50" LONG
33	2	853802	GUIDE, SPACER, ROUND
34	2	962279	SCREW, SOCKET CAP, .31X1.0, SS



ITEM	QTY	PART NUMBER	DESCRIPTION
35	2	920012	NUT, NYLOCK, 5/16-18, ZINC
36	1	911682	SWITCH, SNAP, BENT LEVER
37	2	W385D	NUT, NYLOCK, #4-40, ZINC
38	4	980682	WASHER, FLAT, #4, ZINC
39	2	962273	SCREW, PAN, #4-40 X .88, ZINC
40	2	873804	GROMMET .50ID .81HOLE .25THK
41	1	858304	SPRING, EXTENSION

S-20 / S-20HD TRACTION (DISK) & PAD ASSIST HEAD LIFT

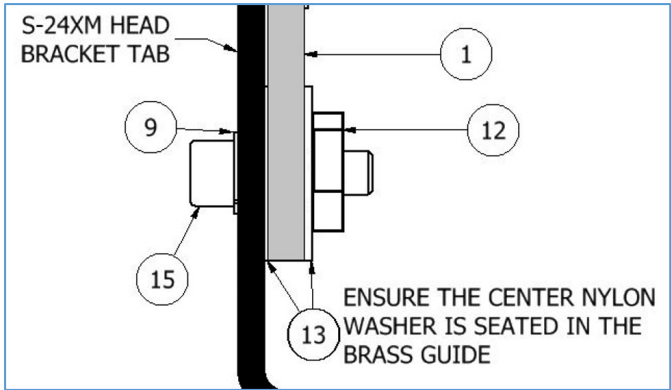
HEAD MOUNTING HARDWARE SEQUENCE



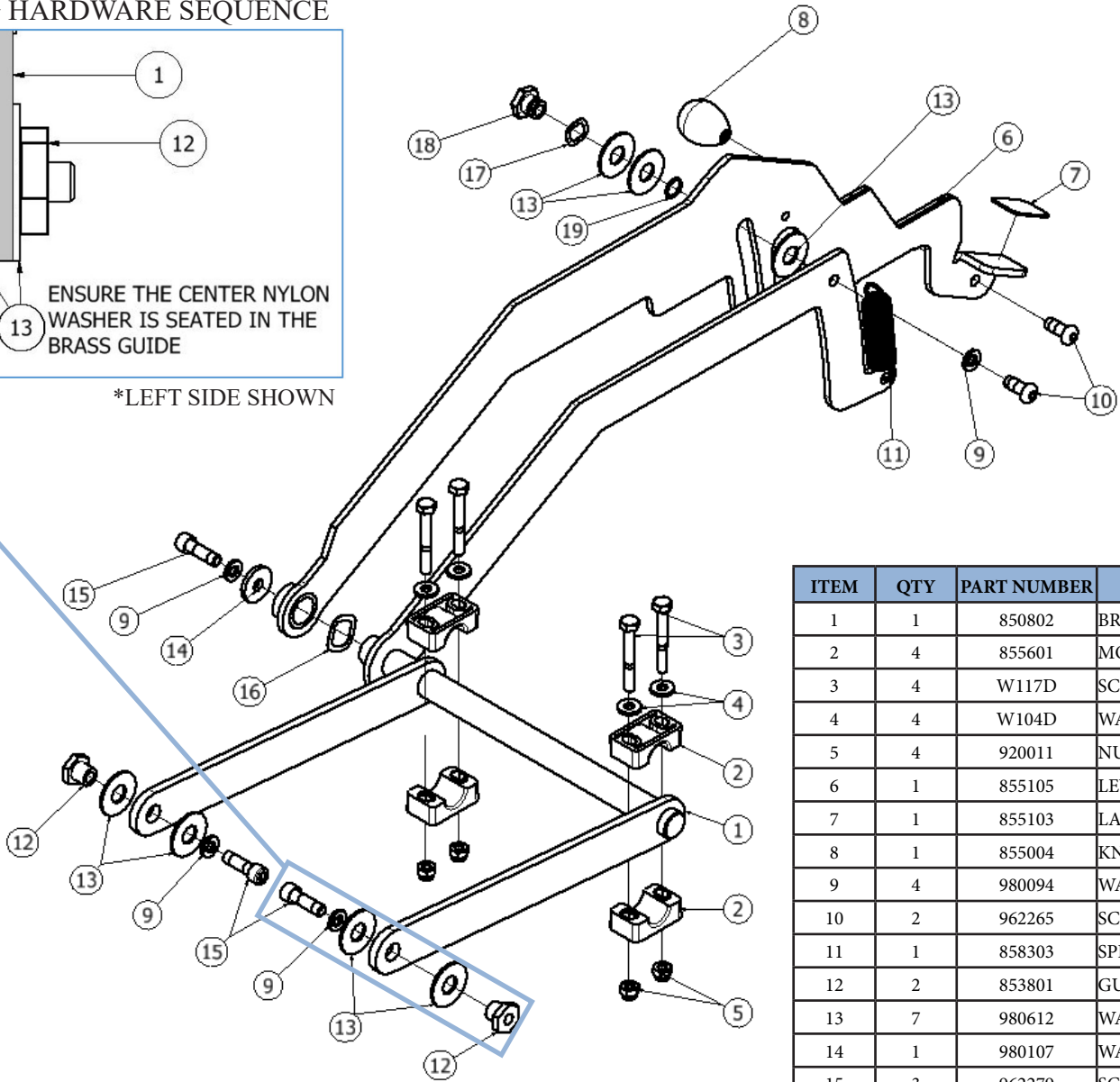
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	850802	BRACKET, LIFT, HEAD
2	4	855601	MOUNT, BEARING, PLASTIC
3	4	W117D	SCREW, HEX, .25-20 X 2.0, SS
4	4	W104D	WASHER, FLAT, .25
5	4	920011	NUT, NYLOCK, 1/4-20, ZINC
6	1	855105	LEVER, DOWNPRESSURE, DUAL
7	1	855103	LABEL, GRIP, FOOT
8	1	855004	KNOB, OVAL, .31-18
9	3	980094	WASHER, SPLIT LOCK, .31, SS
10	2	962265	SCREW, BUTTON, SOCKET, .31-18 X .75, SS
11	1	858303	SPRING, EXTENSION
12	1	853801	GUIDE, LEVER
13	1	980093	WASHER, WAVE, .50INCH
14	2	980612	WASHER, NYL, .50 X 1.25 X .062
15	1	980107	WASHER, FLAT, .31ID, 1.0OD, .12THK, SS
16	3	962279	SCREW, SOCKET CAP, .31X1.0, SS
17	2	W243D	WASHER, FLAT, 5/16, SS
18	2	853802	GUIDE, SPACER, ROUND
19	2	920012	NUT, NYLOCK, 5/16-18, ZINC
20	1	980783	WASHER WAVE .75ID

S-24XM HEAD LIFT

HEAD MOUNTING HARDWARE SEQUENCE



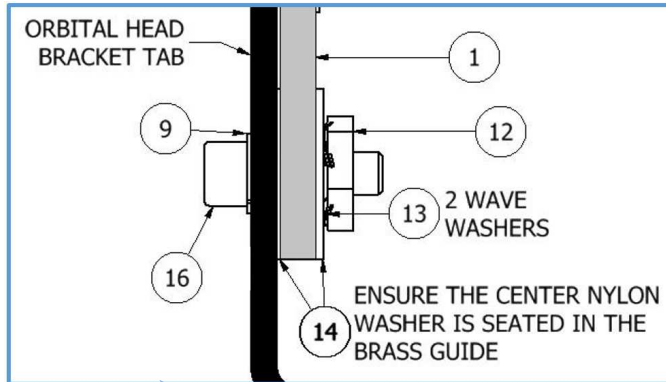
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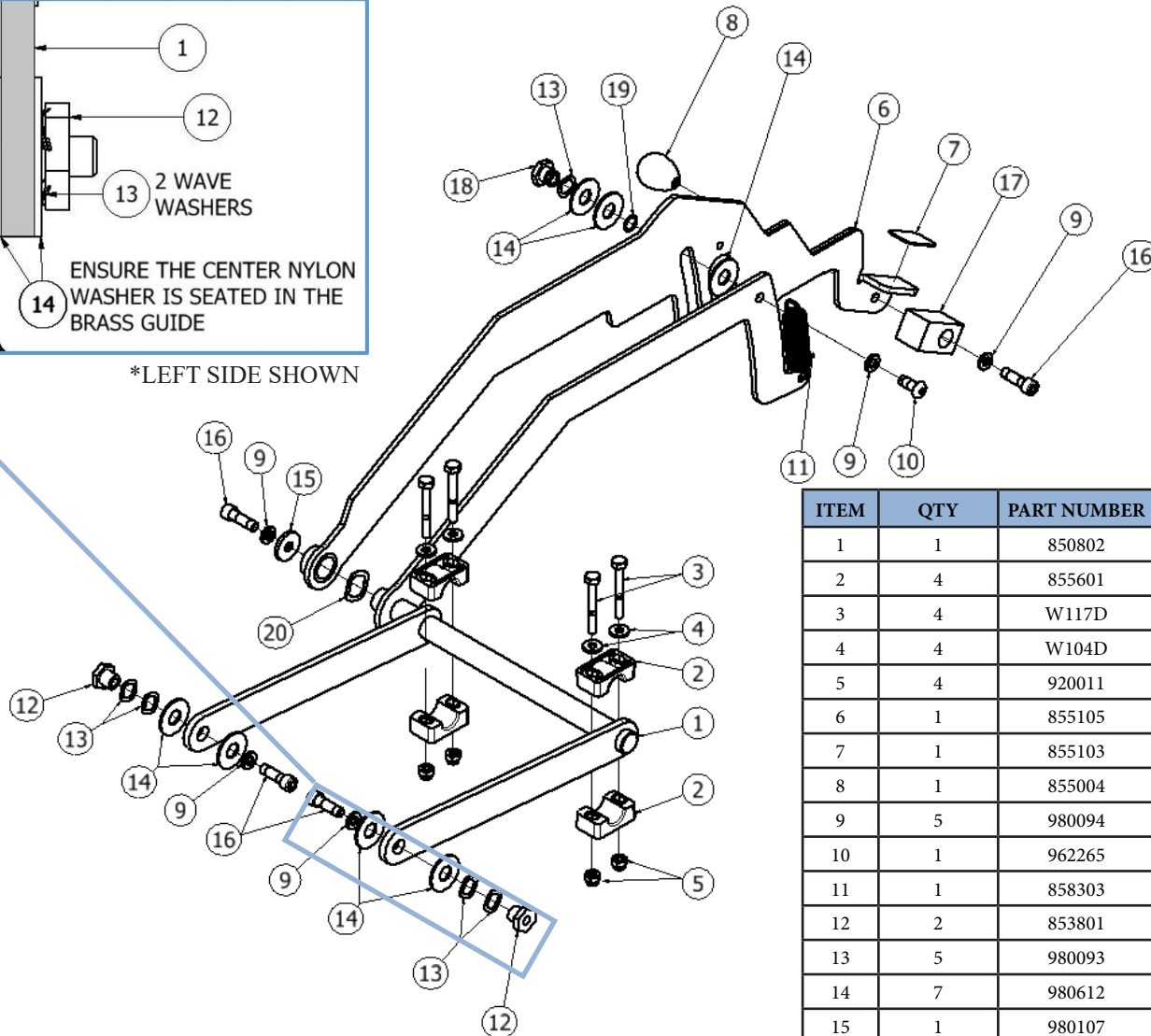
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	850802	BRACKET, LIFT, HEAD
2	4	855601	MOUNT, BEARING, PLASTIC
3	4	W117D	SCREW, HEX, .25-20 X 2.0, SS
4	4	W104D	WASHER, FLAT, .25
5	4	920011	NUT, NYLOCK, 1/4-20, ZINC
6	1	855105	LEVER, DOWNPRESSURE, DUAL
7	1	855103	LABEL, GRIP, FOOT
8	1	855004	KNOB, OVAL, .31-18
9	4	980094	WASHER, SPLIT LOCK, .31, SS
10	2	962265	SCREW, BUTTON, SOCKET, .31-18 X .75, SS
11	1	858303	SPRING, EXTENSION
12	2	853801	GUIDE, LEVER
13	7	980612	WASHER, NYL, .50 X 1.25 X .062
14	1	980107	WASHER, FLAT, .31ID, 1.0OD, .12THK, SS
15	3	962279	SCREW, SOCKET CAP, .31X1.0, SS
16	1	980783	WASHER WAVE .75ID
17	1	980093	WASHER, WAVE, .50INCH
18	1	853805	GUIDE, LEVER, WITH GROOVE
19	1	855801	O-RING, .44X.56X.062

S-20 ORBITAL HEAD LIFT

HEAD MOUNTING HARDWARE SEQUENCE

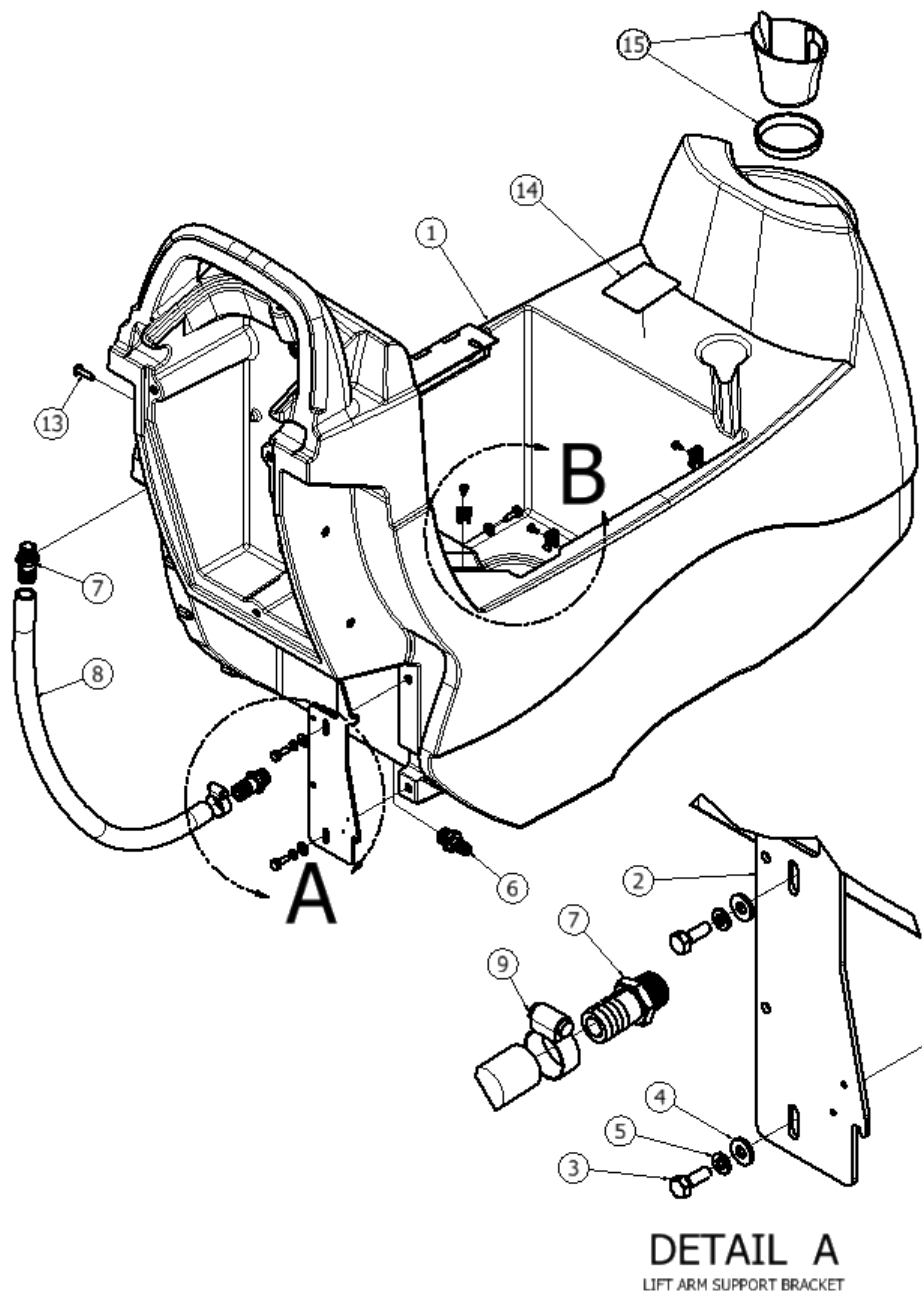


*LEFT SIDE SHOWN



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	850802	BRACKET, LIFT, HEAD
2	4	855601	MOUNT, BEARING, PLASTIC
3	4	W117D	SCREW, HEX, .25-20 X 2.0, SS
4	4	W104D	WASHER, FLAT, .25
5	4	920011	NUT, NYLOCK, 1/4-20, ZINC
6	1	855105	LEVER, DOWNPRESSURE, DUAL
7	1	855103	LABEL, GRIP, FOOT
8	1	855004	KNOB, OVAL, .31-18
9	5	980094	WASHER, SPLIT LOCK, .31, SS
10	1	962265	SCREW, BUTTON, SOCKET, .31-18 X .75, SS
11	1	858303	SPRING, EXTENSION
12	2	853801	GUIDE, LEVER
13	5	980093	WASHER, WAVE, .50INCH
14	7	980612	WASHER, NYL, .50 X 1.25 X .062
15	1	980107	WASHER, FLAT, .31ID, 1.0OD, .12THK, SS
16	3	962279	SCREW, SOCKET CAP, .31X1.0, SS
17	1	851304	BLOCK, WEIGHT, BALANCE
18	1	853805	GUIDE, LEVER, WITH GROOVE
19	1	855801	O-RING, .44X.56X.062
20	1	980783	WASHER WAVE .75ID

SOLUTION TANK

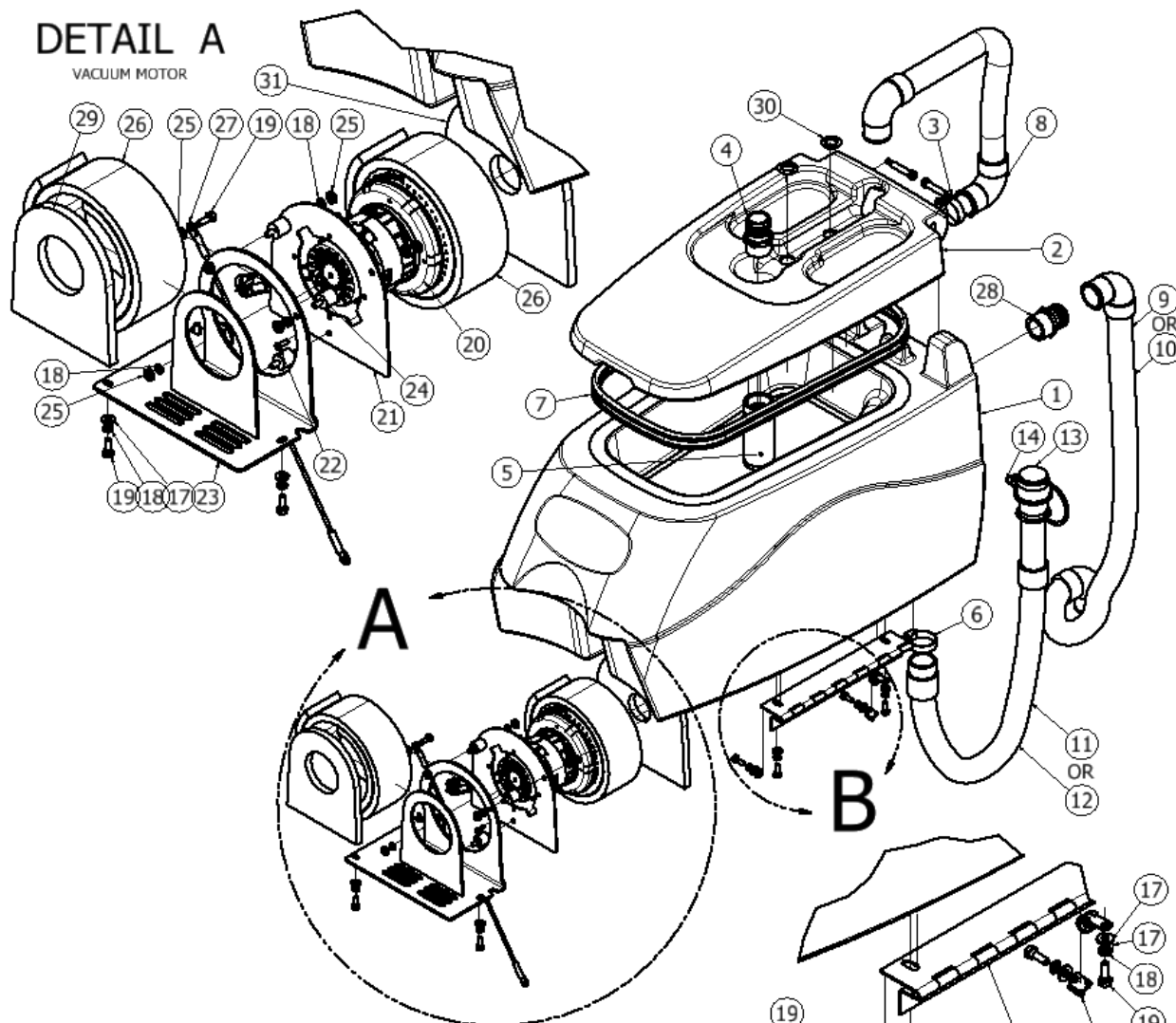


ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	858601	TANK, SOLUTION, 11 GAL
2	1	850814	BRACKET, SUPPORT, LEVER
3	3	W189D	SCREW, HEX, 1/4-20 X .75, SS, PATCH
4	2	W104D	WASHER, FLAT, .25
5	2	980002	WASHER, LOCK, SPLIT, .25
6	1	223343	FITTING, STR, BM08, PM08
7	2	853303	FITTING, STR, BM12, PM08
8	1	859003	TUBE, SIGHT, REPLACEMENT
9	1	S453P	CLAMP, HOSE, WORM
10	4	225670	PAD, WIRE TIE
11	4	962271	SCREW, PAN, #10 X .38L, ZINC, SELF-TAPPING
12	1	920037	NUT, THIN JAM, 1/4-20, ZINC
13	1	962455	SCREW, TRUSS, .25-20 X 1.0
14	1	855108	LABEL, INSTRUCTION, BATTERY
15	1	875011	KIT, STRAINER, PORT, FILL

RECOVERY TANK & VACUUM

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	858602	TANK, RECOVERY, 11 GA
2	1	852301	COVER, TANK, RECOVERY
3	2	962462	SCREW, SHOULDER, .38 X 1.75, SS
4	1	853304	FITTING, STR, BM24, PM20
5	1	223370	FLOAT, SHUTOFF
6	3	S611A	CLAMP, HOSE, WORM
7	1	853402	GASKET, COVER, PRESS-IN
8	1	854103	HOSE, VACUUM, 1.5INCH
9	1	854102	HOSE, SQUEEGEE, 90 CUFF
10	1	854105	HOSE SQUEEGEE S-20 CHEM RESIST
11	1	854101	HOSE, DRAIN, CAPPED
12	1	854104	HOSE DRAIN CAPPED CHEM RESIST
13	1	851501	CAP HOSE DRAIN - REPL FOR 854101
14	1	858506	STRAP SUPPORT HOSE
15	1	854501	HINGE, TANK, RECOVERY
16	2	852101	CLAMP, WIRE, P-SHAPED
17	9	W104D	WASHER, FLAT, .25
18	14	980002	WASHER, LOCK, SPLIT, .25
19	8	W189D	SCREW, HEX, 1/4-20 X .75, SS, PATCH
20	1	855205	MOTOR VAC 24VDC PERIPH
21	1	850812	BRACKET, MTG, ISOLATOR
22	4	964224	SCREW, PAN, #10 X .5, SELF TAPPING
23	1	852303	COVER, MTG, VACUUM
24	3	855603	MOUNT, RUBBER, .25-20
25	8	920037	NUT, THIN JAM, 1/4-20, ZINC
26	2	853305	FOAM, NOISE, VACUUM
27	1	852409	CABLE RETENTION TANK S-20 LONG
28	1	853308	FITTING, MODIFIED
29	1	873314	GASKET, FOAM, VACUUM
30	2	856803	PLUG HOLE 1 INCH BLACK
31	1	853310	FOAM BARRIER NOISE

DETAIL A



AVAILABLE VACUUM MOTOR KIT - #855019

PART NUMBER	DESCRIPTION	QTY
857802	SHEET INSTRUCTION S-20 VAC MTR REPL	1
853305	FOAM,NOISE,VACUUM	2
911104	TIE-CABLE 14.5 LG 9531 H400014 H400002	4
873314	GASKET, FOAM, VACUUM	1
853310	FOAM BARRIER NOISE	1
855205	MTR, VAC,24VDC,2STG - KIT 855019 AVAIL	1

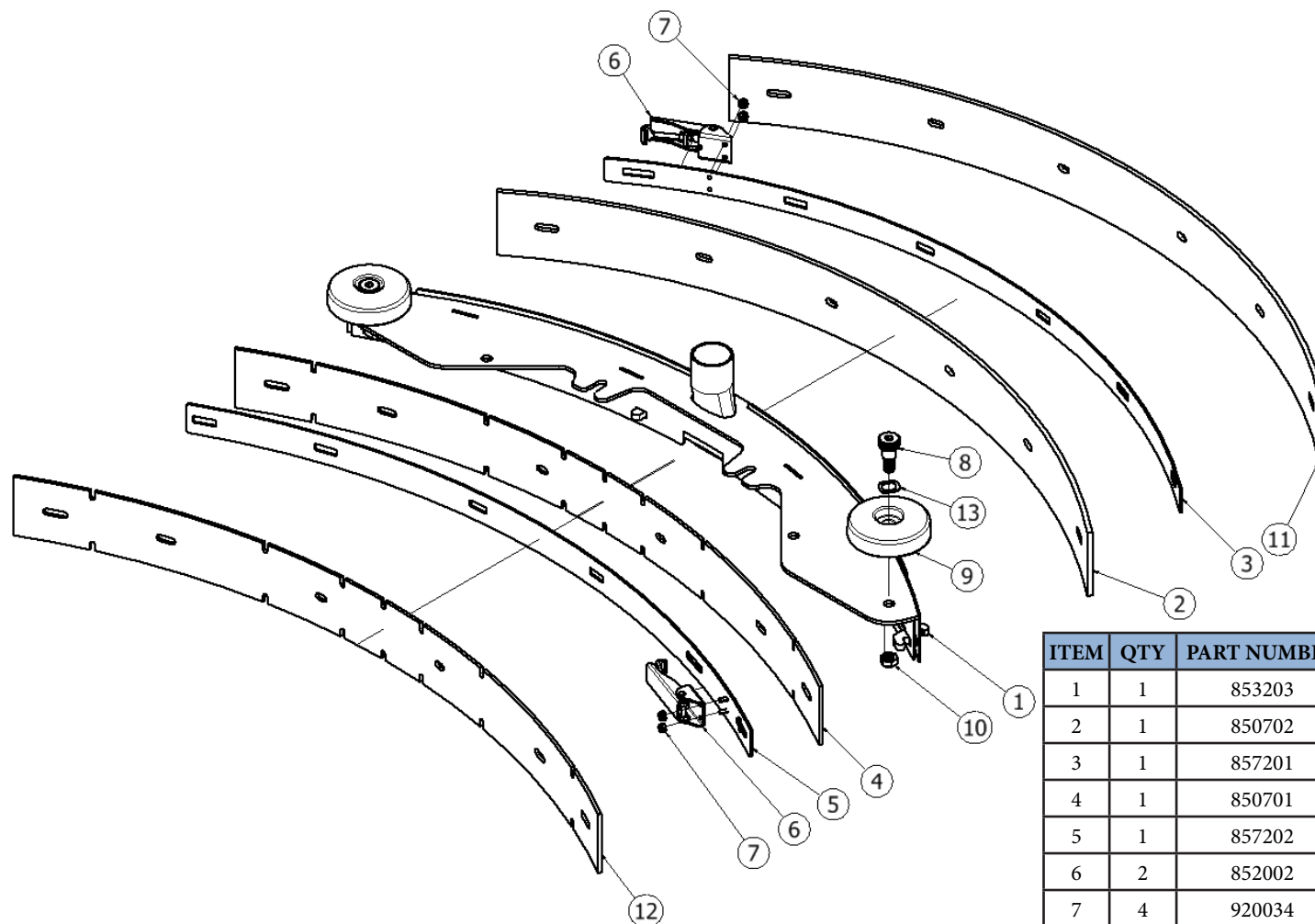
DETAIL B

RECOVERY TANK HINGE

SQUEEGEE ASSEMBLY

LINATEX: 878516

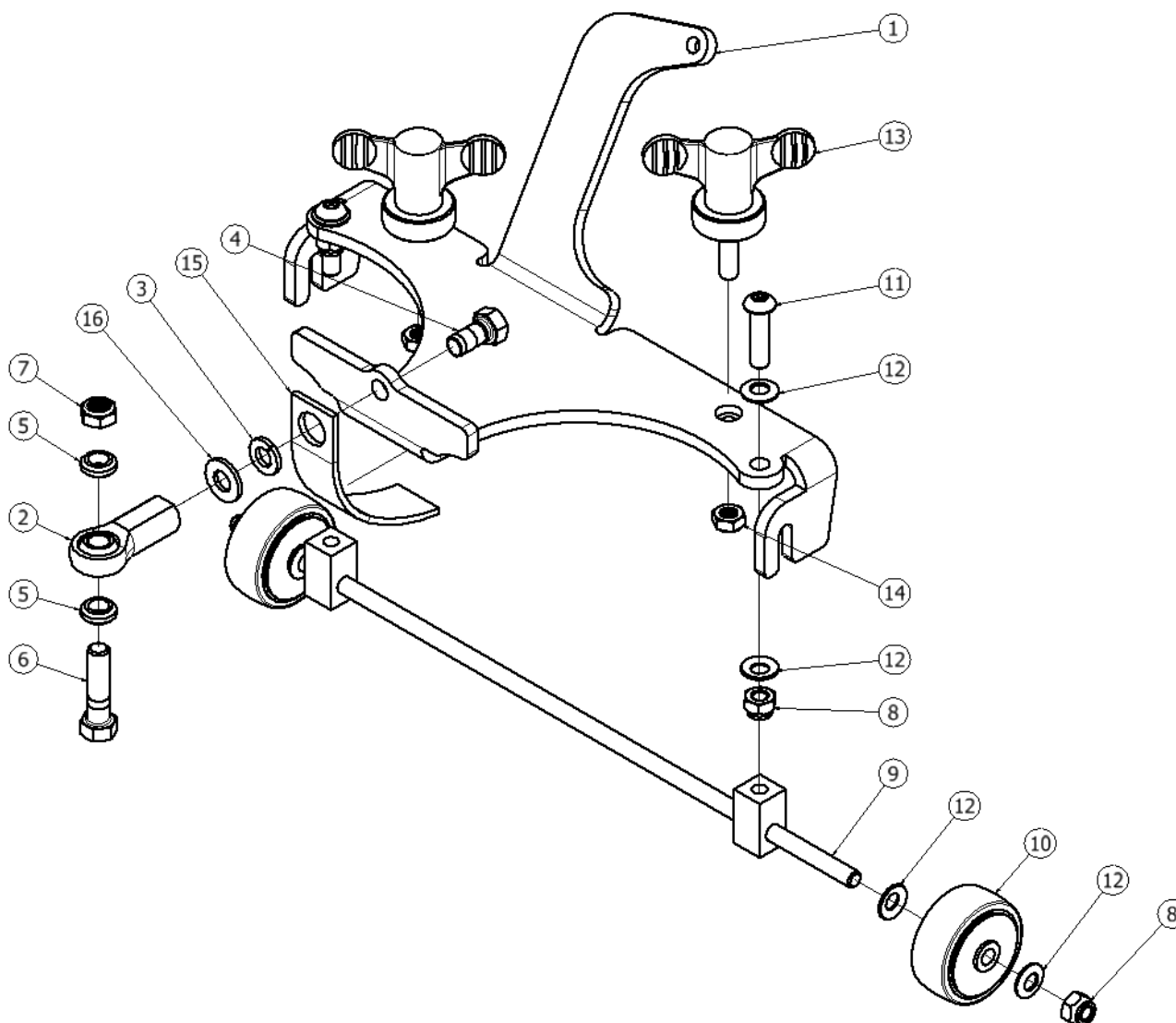
URETHANE: 878517



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	853203	FRAME SQUEEGEE 30 INCH
2	1	850702	BLADE REAR 30 INCH LINATEX
3	1	857201	RETAINER REAR 30 INCH
4	1	850701	BLADE FRONT 30 INCH LINARD
5	1	857202	RETAINER FRONT 30 INCH
6	2	852002	CLAMP, OVER-CENTER, BAND
7	4	920034	NUT, NYLOCK, #6-32, SS
8	2	962465	SCREW, SHOULDER, .50 X .50
9	2	859703	WHEEL, GUIDE
10	2	920035	NUT, NYLOCK, .38-16, SS
11	1	850704	BLADE, REAR, 30 IN, URETH (OPTIONAL)
12	1	850703	BLADE, FRONT, 30 INCH, URETH (OPTL)
13	2	980093	WASHER, WAVE, .50INCH

SQUEEGEE LINK

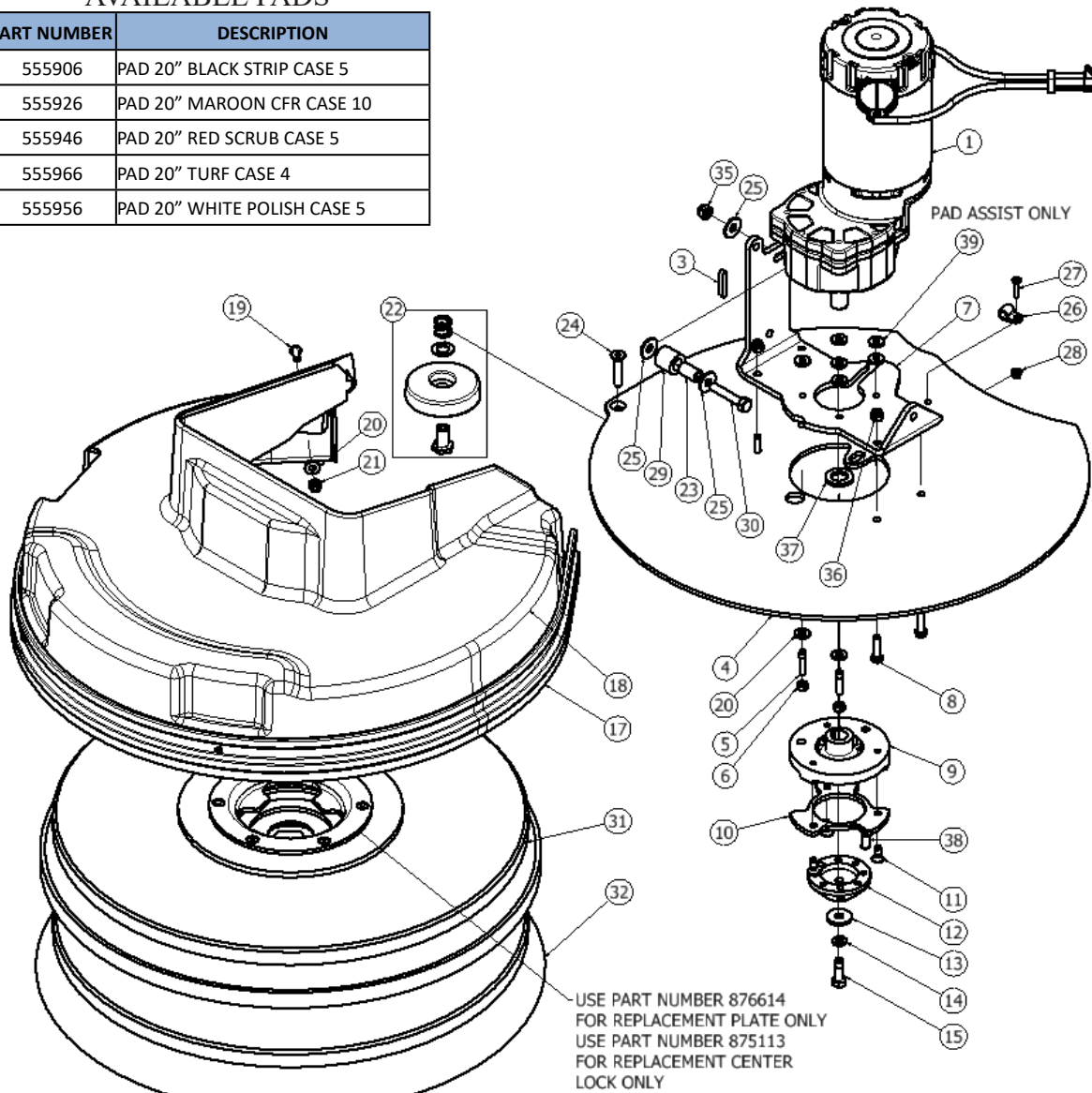
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	850816	BRACKET LINK SQUEEGEE S-20
2	1	902051	BEARING, ROD END, .38 FEM
3	1	980009	WASHER, SPLIT LOCK, 3/8, SS
4	1	962028	SCREW, HX, .38-24X.75,SS,PTCH
5	2	858204	SPACER, LINK, SQUEEGEE
6	1	962075	SCREW, HEX, 3/8-16 X 1.5, SS
7	1	920035	NUT, NYLOCK, .38-16, SS
8	4	920036	NUT, NYLOCK, 5/16-18, SS
9	1	850501	AXLE, WHEEL, SQUEEGEE
10	2	849709	WHEEL, 2 OD, .31 ID
11	2	962464	SCREW, BUTTON, .31-18X1.25, ZINC
12	8	980105	WASHER, PLASTIC, THRUST
13	2	545010	KNOB KIT WEIGHT RETENTION
14	2	920040	NUT, .31-18, NYLOCK, SS, LOW
15	1	878504	STRAP, GROUNDING, STATIC
16	1	980003	WASHER, FLAT, .38



S-20 DISK SCRUB HEAD

AVAILABLE PADS

PART NUMBER	DESCRIPTION
555906	PAD 20" BLACK STRIP CASE 5
555926	PAD 20" MAROON CFR CASE 10
555946	PAD 20" RED SCRUB CASE 5
555966	PAD 20" TURF CASE 4
555956	PAD 20" WHITE POLISH CASE 5

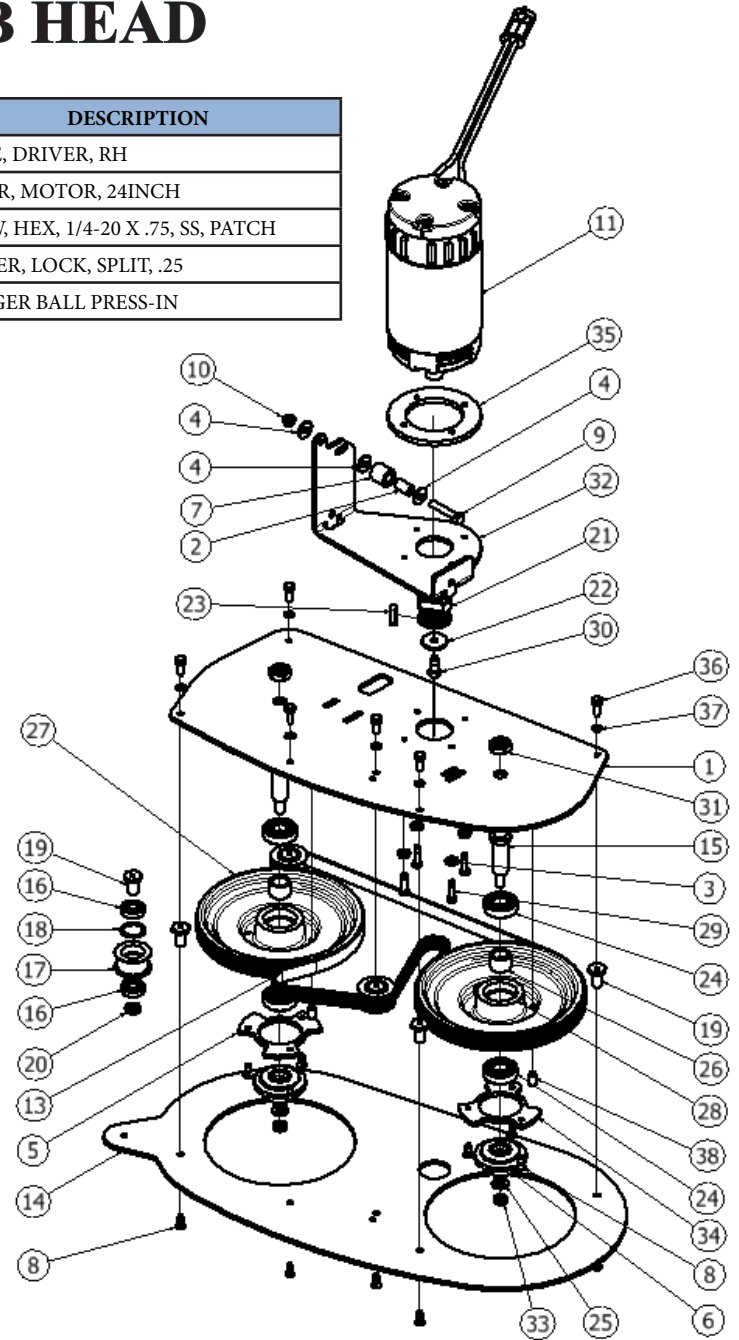


ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	855201	MOTOR, GEAR, BRUSH
2	1	850905	BRUSH CARBON KIT 2 PC 855201
3	1	915005	KEY, SQUARE, 5MM X 1.25
4	1	856602	PLATE, MTG, MOTOR
5	4	964010	SCREW, SET, M6 X 30, SS, PATCH
6	4	924082	NUT, NYLOCK, M6X1.0, SS
7	1	850808	BRACKET, SUPPORT, HEAD
8	4	962221	SCREW, HEX, .25-20 X 1.0, SS
9	1	854302	HUB, DRIVER, BRUSH
10	1	853803	GUIDE, DRIVER
11	3	962274	SCREW, FLAT, SOCK, .25-20X.62, SS, PATCH
12	1	853804	GUIDE, PAD, PLASTIC
13	1	980107	WASHER, FLAT, .31ID, 1.0OD, .12THK, SS
14	1	980094	WASHER, SPLIT LOCK, .31, SS
15	1	962466	SCREW, HEX, M8-1.25 X 25, SS, PATCH
16	1	855016	KIT SHROUD REPLACEMENT (ITEMS 16 - 20)
17	1	858503	SKIRT, BRISTLE
18	1	852302	SHROUD, HEAD, CUTOUT
19	4	962263	SCREW, BUTT, SOCK, .25-20X.62, SS BO
20	12	W104D	WASHER, FLAT, .25
21	4	920665	NUT, NYLOCK, 1/4-20, SS
22	1	855022	KIT-GUIDE WHEEL REPLACEMENT, ANTI RATTLE
23	1	858203	SPACER, WHEEL, GUIDE
24	1	962266	SCREW, FLAT, SOCKET, .31-18 X 1.5, SS
25	3	W243D	WASHER, FLAT, 5/16, SS
26	1	612001	CLAMP, PLASTIC, P-SHAPED
27	1	962003	SCREW, PAN, #10-32 X .75, ZINC
28	1	920666	NUT, NYLOCK, #10-32, SS
29	1	857501	ROLLER, PLASTIC
30	1	962270	SCREW, HEX, 5/16-18X1.75,SS
31	1	855901	DRIVER, PAD, 20INCH, BRISTLE
32	1	850901	BRUSH, POLY, 20 INCH
33	1	850902	BRUSH, NYLON, 20 INCH
34	1	850903	BRUSH, GRIT, 20 INCH
35	1	920012	NUT, NYLOCK, 5/16-18, ZINC
36	4	920011	NUT, NYLOCK, 1/4-20, ZINC
37	1	858201	SPACER, DRIVER, ROUND
38	1	857009	PLUNGER BALL PRESS-IN
39	6	980784	WASHER .26 ID .094 THICK SS

S-24XM SCRUB HEAD

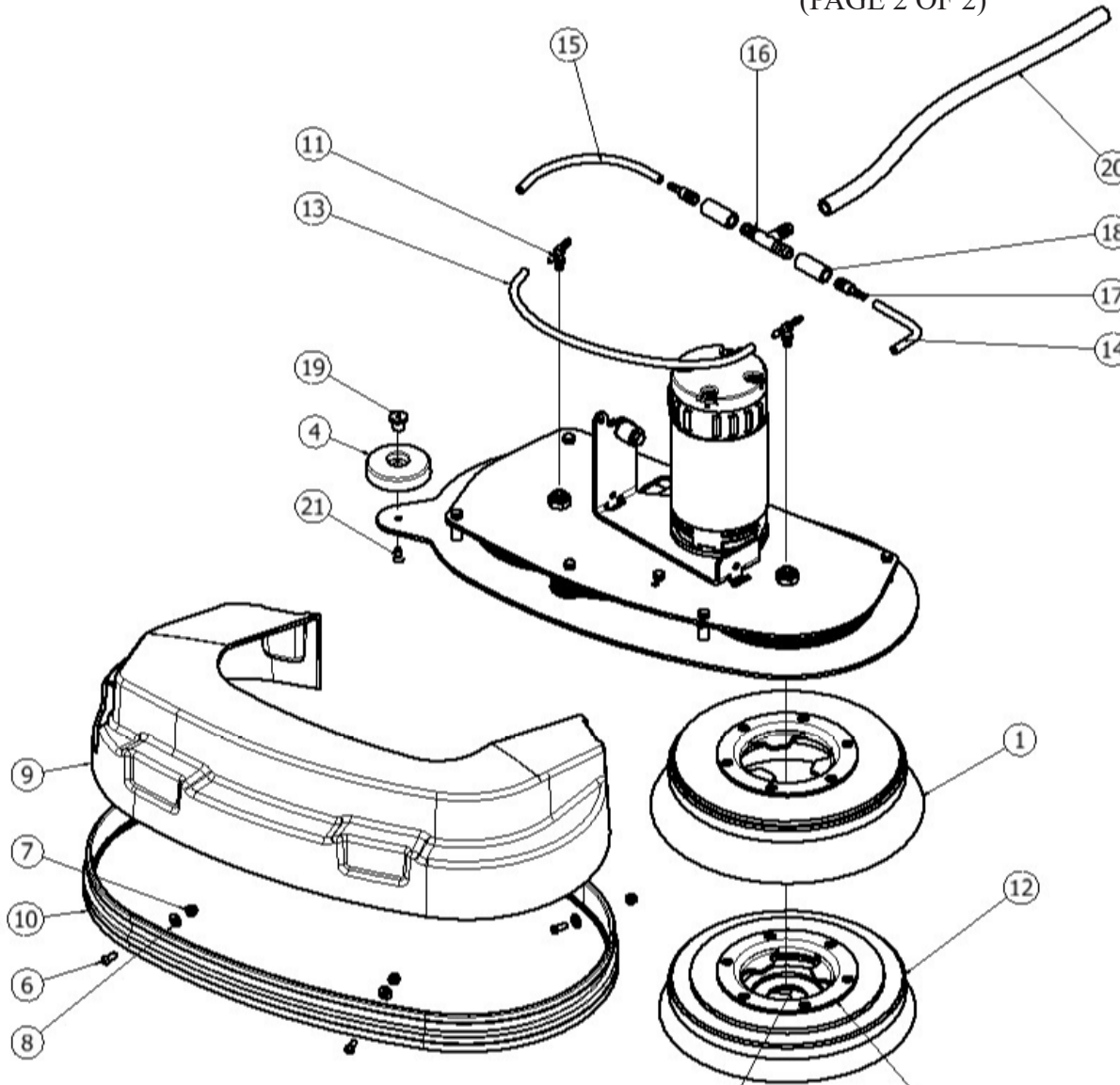
(PAGE 1 OF 2)

ITEM	QTY	PART NUMBER	DESCRIPTION	ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	876602	PLATE, MTG, 24 INCH	34	1	873802	GUIDE, DRIVER, RH
2	3	858203	SPACER, WHEEL, GUIDE	35	1	878206	SPACER, MOTOR, 24INCH
3	8	W104D	WASHER, FLAT, .25	36	6	W189D	SCREW, HEX, 1/4-20 X .75, SS, PATCH
4	9	W243D	WASHER, FLAT, 5/16, SS	37	6	980002	WASHER, LOCK, SPLIT, .25
5	1	853803	GUIDE, DRIVER	38	2	857009	PLUNGER BALL PRESS-IN
6	2	873801	GUIDE, PAD, PLASTIC				
7	3	857501	ROLLER, PLASTIC				
8	12	962274	SCREW, FLAT, SOCK, .25-20X.62, SS, PATCH				
9	3	962270	SCREW, HEX, 5/16-18X1.75,SS				
10	3	920012	NUT, NYLOCK, 5/16-18, ZINC				
11	1	855204	MOTOR, 24V, 2200 RPM, .75HP				
12	1	850906	BRUSH CARBON KIT 4 PC 855204 & 875201				
13	1	903046	BELT, V-GROOVE, STRETCH				
14	1	876606	PLATE, COVER, 24 INCH				
15	2	877701	SHAFT, PULLEY, HEAD				
16	6	902035	BEARING, .5 ID, 1.1875 OD				
17	3	876901	PULLEY, IDLER				
18	3	877302	RING, RETAINING, INT, 1.12 DIA				
19	6	878201	SPACER, IDLER				
20	3	878202	SPACER, IDLER, PLAIN				
21	1	876902	PULLEY, MOTOR, DRIVE				
22	1	980108	WASHER, FLAT, .31ID, 1.25OD, .12THK, SS				
23	1	915006	KEY, 8MM X 7MM X 28MM				
24	4	902053	BEARING, .75 ID, DBL SEAL				
25	2	980003	WASHER, FLAT, .38				
26	2	878203	SPACER, BEARING				
27	1	874306	HUB, PULLEY, MACH GROOVED				
28	1	874305	HUB, PULLEY, MACH FLAT				
29	4	964008	SCREW, HEX, M6 X 25, SS, PATCH				
30	1	964060	SCREW, HEX, M8-1.25 X 20, SS				
31	2	920039	NUT, .62-18, NYLOCK, LOW				
32	1	870814	BRACKET, SUPPORT, 24XM				
33	2	920035	NUT, NYLOCK, .38-16, SS				



S-24XM SCRUB HEAD

(PAGE 2 OF 2)



USE PART NUMBER 875113 FOR
REPLACEMENT CENTER LOCK ONLY

USE PART NUMBER
876614 FOR REPLACEMENT
PLATE ONLY

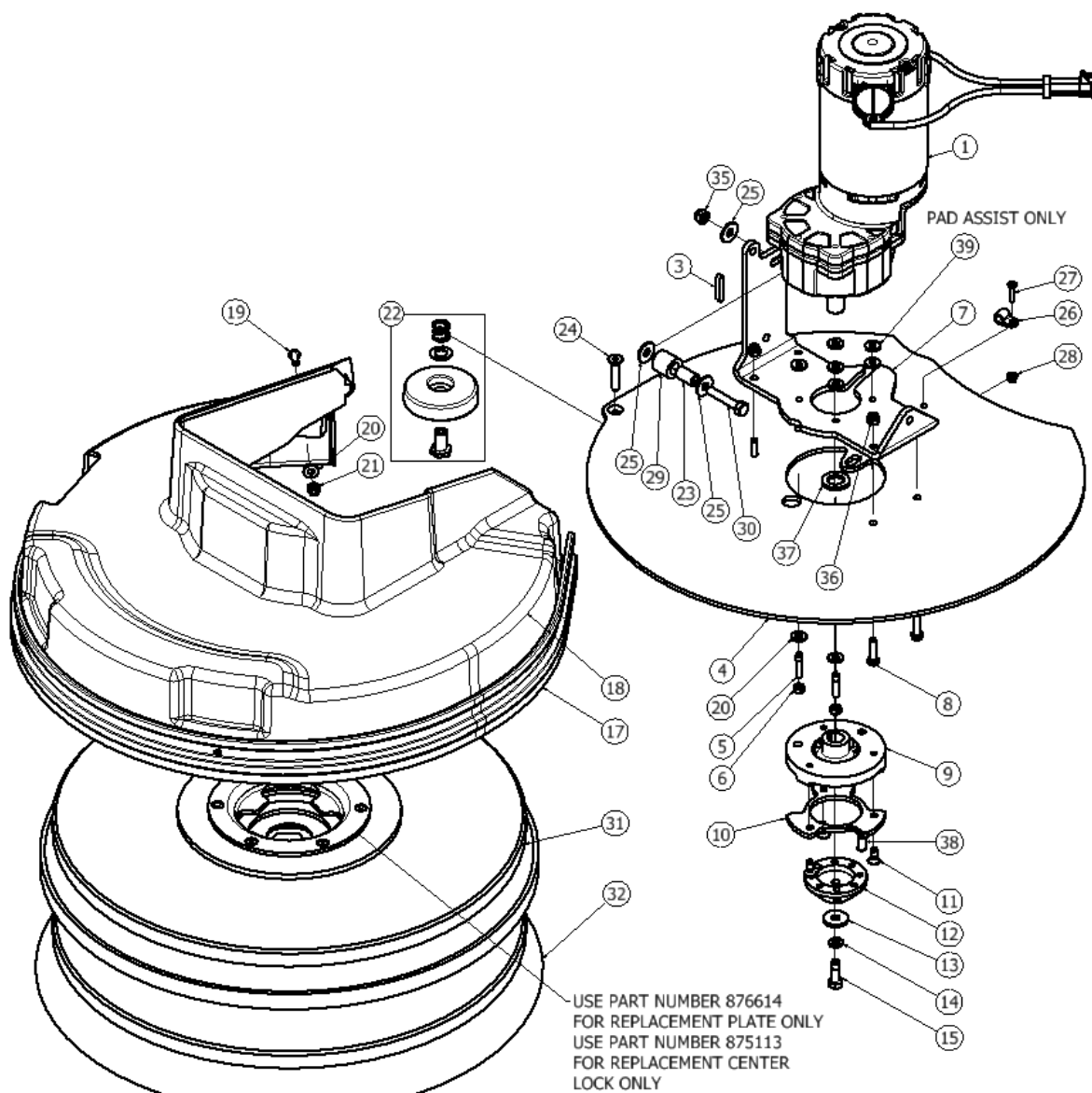
AVAILABLE PADS

PART NUMBER	DESCRIPTION
555901	PAD 12" BLACK STRIP CASE 5
555941	PAD 12" RED SCRUB CASE 5
555951	PAD 12" WHITE POLISH CASE 5

ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	870902	BRUSH, POLY, 12 INCH
2	2	870908	BRUSH, NYLON, 12 INCH
3	2	870909	BRUSH, GRIT, 12 INCH
4	1	859703	WHEEL, GUIDE
5	1	875019	KIT SKIRT REPLACEMENT (ITEMS 6 - 10)
6	4	962263	SCREW, BUTT, SOCK, .25-20X.62, SS BO
7	4	920665	NUT, NYLOCK, 1/4-20, SS
8	8	W104D	WASHER, FLAT, .25
9	1	872305	SHROUD, HEAD, 24INCH
10	1	858503	SKIRT, BRISTLE
11	2	873302	FITTING, TEE, PM02XBM04
12	2	875901	DRIVER, PAD, 12INCH, BRISTLE
13	1	204179 - 16.0"	TUBING, 1/4"
14	1	204179 - 9.75"	TUBING, 1/4"
15	1	204179 - 8.25"	TUBING, 1/4"
16	1	873308	FITTING, TEE, 0.50 INCH
17	2	853301	FITTING, REDUCER, BM08, BM04
18	2	224130 - 1.75"	TUBING, 1/2"
19	1	878205	SPACER, WHEEL, GUIDE
20	1	224130 - 20.0"	TUBING, 1/2"
21	1	962274	SCREW, FLAT, SOCK, .25-20X.62, SS, PATCH

S-20HD DISK SCRUB HEAD

(PAGE 1 OF 2)



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	855207	MOTOR, GEAR, BRUSH
2	1	850905	BRUSH CARBON KIT 2 PC 855201
3	1	915005	KEY, SQUARE, 5MM X 1.25
4	1	856602	PLATE, MTG, MOTOR
5	4	964010	SCREW, SET, M6 X 30, SS, PATCH
6	4	924082	NUT, NYLOCK, M6X1.0, SS
7	1	850808	BRACKET, SUPPORT, HEAD
8	4	962221	SCREW, HEX, .25-20 X 1.0, SS
9	1	854302	HUB, DRIVER, BRUSH
10	1	853803	GUIDE, DRIVER
11	3	962274	SCREW, FLAT, SOCK, .25-20X.62, SS, PATCH
12	1	853804	GUIDE, PAD, PLASTIC
13	1	980107	WASHER, FLAT, .31ID, 1.0OD, .12THK, SS
14	1	980094	WASHER, SPLIT LOCK, .31, SS
15	1	962466	SCREW, HEX, M8-1.25 X 25, SS, PATCH
16	1	855016	KIT SHROUD REPLACEMENT (ITEMS 16 - 20)
17	1	858503	SKIRT, BRISTLE
18	1	852302	SHROUD, HEAD, CUTOUT
19	4	962263	SCREW, BUTT, SOCK, .25-20X.62, SS BO
20	12	W104D	WASHER, FLAT, .25
21	4	920665	NUT, NYLOCK, 1/4-20, SS
22	1	855022	KIT-GUIDE WHEEL REPLACEMENT, ANTI RATTLE
23	1	858203	SPACER, WHEEL, GUIDE
24	1	962266	SCREW, FLAT, SOCKET, .31-18 X 1.5, SS
25	3	W243D	WASHER, FLAT, 5/16, SS
26	1	612001	CLAMP, PLASTIC, P-SHAPED
27	1	962003	SCREW, PAN, #10-32 X .75, ZINC
28	1	920666	NUT, NYLOCK, #10-32, SS
29	1	857501	ROLLER, PLASTIC
30	1	962270	SCREW, HEX, 5/16-18X1.75,SS
31	1	855901	DRIVER, PAD, 20INCH, BRISTLE
32	1	850901	BRUSH, POLY, 20 INCH
33	1	850902	BRUSH, NYLON, 20 INCH
34	1	850903	BRUSH, GRIT, 20 INCH
35	1	920012	NUT, NYLOCK, 5/16-18, ZINC
36	4	920011	NUT, NYLOCK, 1/4-20, ZINC
37	1	858201	SPACER, DRIVER, ROUND
38	1	857009	PLUNGER BALL PRESS-IN
39	6	980784	WASHER .26 ID .094 THICK SS

S-20HD DISK SCRUB HEAD

(PAGE 2 OF 2)

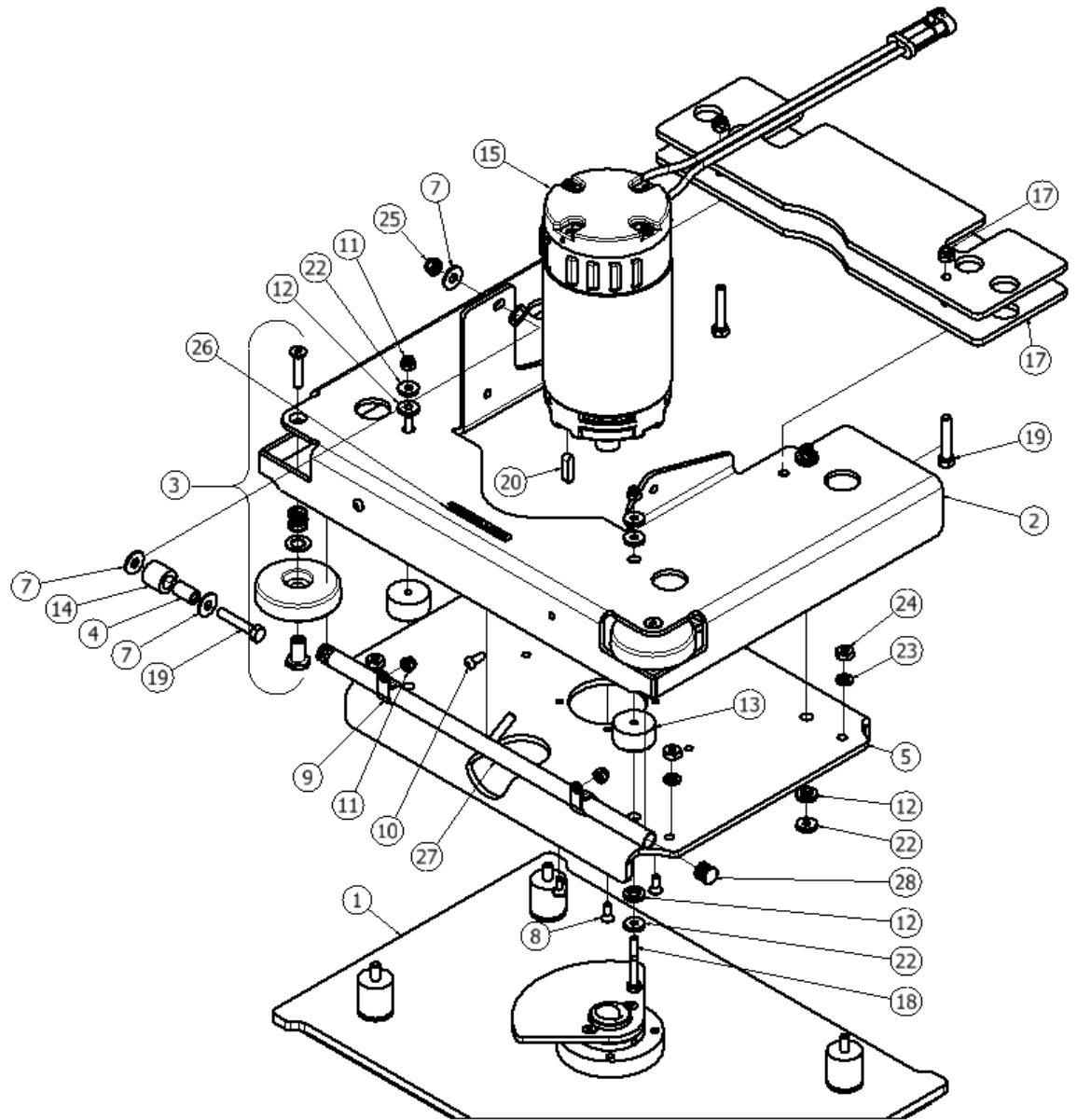
AVAILABLE ACCESSORIES

PART NUMBER	DESCRIPTION
555906	PAD 20" BLACK STRIP CASE 5
555926	PAD 20" MAROON CFR CASE 10
555946	PAD 20" RED SCRUB CASE 5
555966	PAD 20" TURF CASE 4
555956	PAD 20" WHITE POLISH CASE 5
555980	PAD 20" 800 GRIT CASE 5
555981	PAD 20" 1500 GRIT CASE 5
555984	PAD 20" 3000 GRIT CASE 5
850903	DISC 20" 80-GRIT BRUSH
859206	TRIGGER CHEMICAL DILUTION S-20HD
852411	CLEANER ENHANCER S-20HD 4/2L CASE
855024	KIT HOOK-UP POD

S-20 ORBITAL SCRUB HEAD

(PAGE 1 OF 2)

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	NONE	SUB ASSY - HEAD, 20 INCH, ORBITAL
2	1	850813	BRACKET, MTG, HEAD, ORBITAL
3	2	855022	KIT WHEEL GUIDE REPLACEMENT, ANTI RATTLE
4	1	858203	SPACER, WHEEL, GUIDE
5	1	856603	PLATE, MOUNTING, MOTOR
7	3	W243D	WASHER, FLAT, 5/16, SS
8	4	964009	SCREW, SCK, FLT, M6-1 X 20, SS, PATCH
9	2	852003	CLAMP, P-SHAPED, .62 DIA
10	2	962263	SCREW, BUTT, SOCK, .25-20X.62, SS BO
11	6	920665	NUT, NYLOCK, 1/4-20, SS
12	8	851101	BUSHING, RUBBER
13	4	858205	SPACER, RUBBER
14	1	857501	ROLLER, PLASTIC
15	1	855204	MOTOR, 24V, 2200 RPM, .75HP
16	1	850906	BRUSH CARBON KIT 4 PC 855204 & 875201
17	2	856611	PLATE, WEIGHT
18	4	W117D	SCREW, HEX, .25-20 X 2.0, SS
19	3	962270	SCREW, HEX, 5/16-18X1.75,SS
20	1	915006	KEY, 8MM X 7MM X 28MM
21	1	980093	WASHER, WAVE, .50INCH
22	8	980104	WASHER, RUBBER
23	4	980094	WASHER, SPLIT LOCK, .31, SS
24	4	W405D	NUT, .31-18, JAM, SS
25	3	920012	NUT, NYLOCK, 5/16-18, ZINC
26	1	855116	LABEL PATENT ORBITAL HEAD
27	1	859005	TUBE DISTRIBUTION S-20 ORB
28	2	856802	PLUG .62 TUBE



S-20 ORBITAL SCRUB HEAD

(PAGE 2 OF 2)

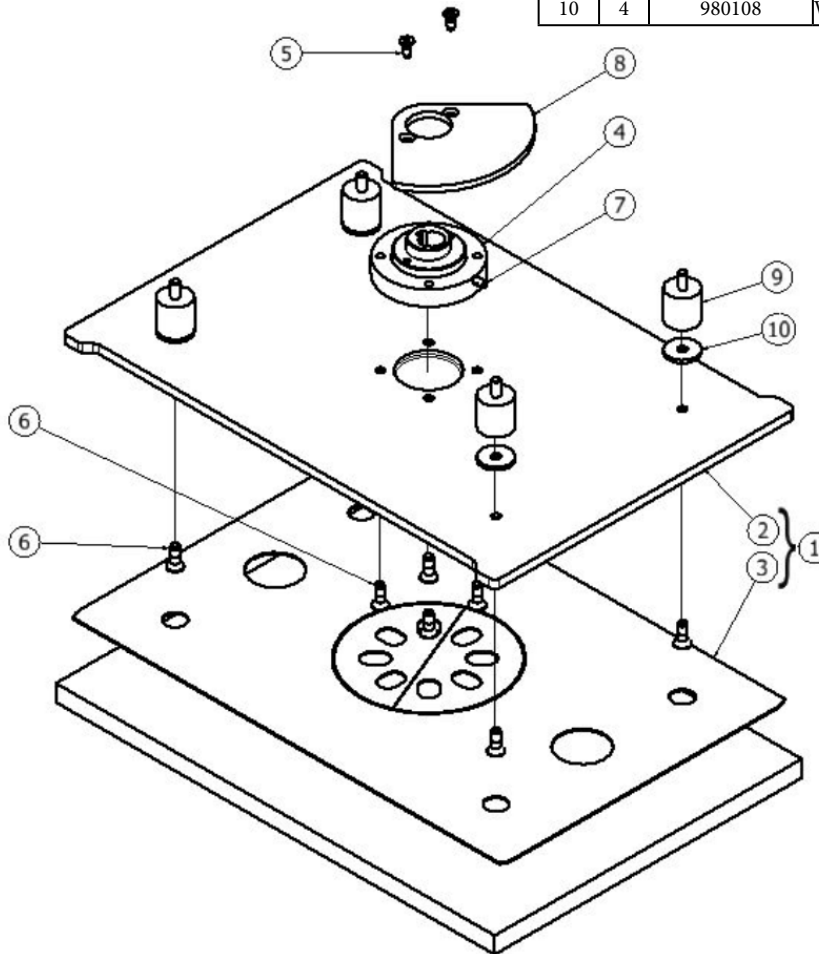
AVAILABLE HEAD REBUILD KIT - #855018

PART NUMBER	DESCRIPTION	QTY
855010	KIT, BEARING, REPL, ORBIT S-20 ORBITAL +	1
204179	1/4 VINYL TUBING	1.58
851101	BUSHING FLNG URETHANE	8
853801	GUIDE,PLUNGER	2
855604	MOUNT ISOLATOR .31THD	4
857501	ROLLER PLASTIC	1
858203	SPACER,WHEEL,GUIDE	3
858205	SPACE RUBBER	4
859703	WHEEL,GUIDE	2
920011	NUT 1/4-20EL STOP H100001 01-0014 198289	6
920012	NUT-5/16-18 ESNA LOCK H100011 TM934/935	3
920036	NUT 5/16-18 NYLOCK SS	2
962263	SCREW 1/4-20X.62 BUTTON SOCKET SS BLACK+	2
962266	SCREW 5/1618X1.5 SOCKETSS	2
962269	SCREW 5/16-18X.75 HEX SS	2
962270	SCREW 5/16-18X1.75 HEX SS FULL THD	3
962274	SCREW 1/4-20X5/8 SCK FLT SS WITH LOCKIN+	4
962278	SCREW 5/16-18X7/8 SOCKET FLT WITH LO+	8
962280	SCREW 1/4-20X1/2 SET SS WITH LOCKING PA+	1
964009	SCREW M6-1X16 SCK FLT SS WITH LOCKING P+	4
980093	WASHER .50 WAVE	7
980094	WASHER, LOCK, 5/16, SS	6
980104	WASHER,RUBBER 1/4 x 3/4 BONDED SS	8
980108	WASHER FLAT 5/16 1 .12 SS	4
980612	WASHER-THRUST	4
W117D	SCREW 1/4-20 x 2 HH SS	4
W243D	WASHER-5/16X.040 FLAT SS	5
W405D	NUT:5/16-18 HEX JAM SS	4
857801	SHEET INSTRUCTION S-20 ORB HEAD REBUILD	1

AVAILABLE PADS

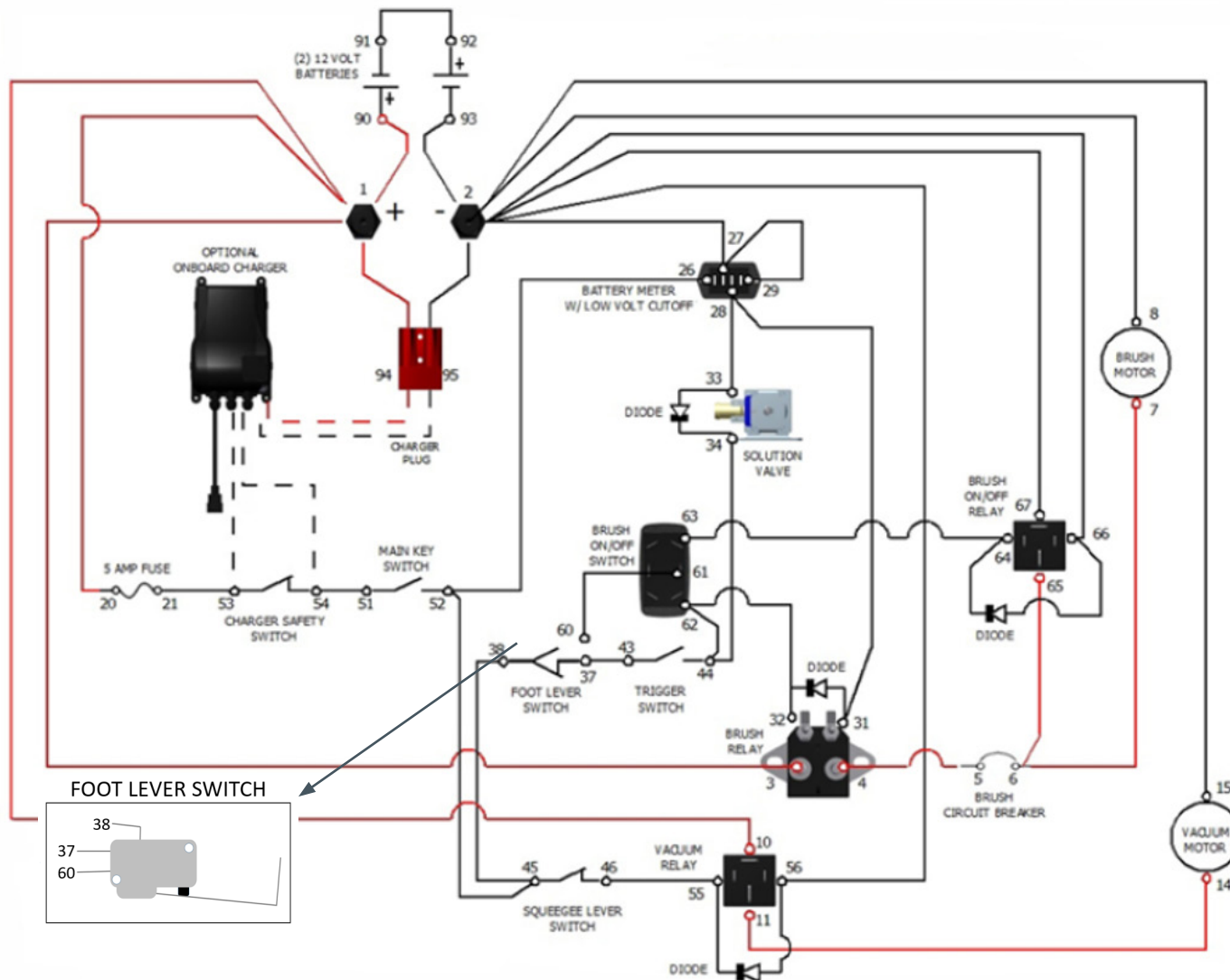
PART NUMBER	DESCRIPTION
555908	PAD 14"X20" BLACK STRIP CASE 5
555928	PAD 14"X20" MAROON CRF CASE 10
555948	PAD 14"X20" RED SCRUB CASE 5
555968	PAD 14"X20" TURF CASE 4
555958	PAD 14"X20" WHITE POLISH CASE 5
855909	PAD, RETAINING, 12X20

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	855011	KIT, PLATE, REPL, ORBIT
2	1	856604	PLATE, ORBITAL, 20 INCH
3	1	875903	PAD, MIGHTYLOK ADH UNIVERSAL
4	1	855010	KIT, BEARING, REPLMNT, ORBITAL
5	2	962274	SCREW, FLAT, SOCK, .25-20X.62, SS, PATCH
6	8	962278	SCREW, SOCKET, FLT, .31-18X.88, SS, PATCH
7	1	962280	SCREW, SET, .25-20X.5, SS, PATCH
8	1	856606	PLATE, BALANCE, 20 INCH
9	4	855604	MOUNT, ISOLATOR, .31THD
10	4	980108	WASHER, FLAT, .31ID, 1.25OD, .12THK, SS



S-20 PAD/BRUSH ASSIST WIRING DIAGRAM

ALL SERIAL NUMBERS

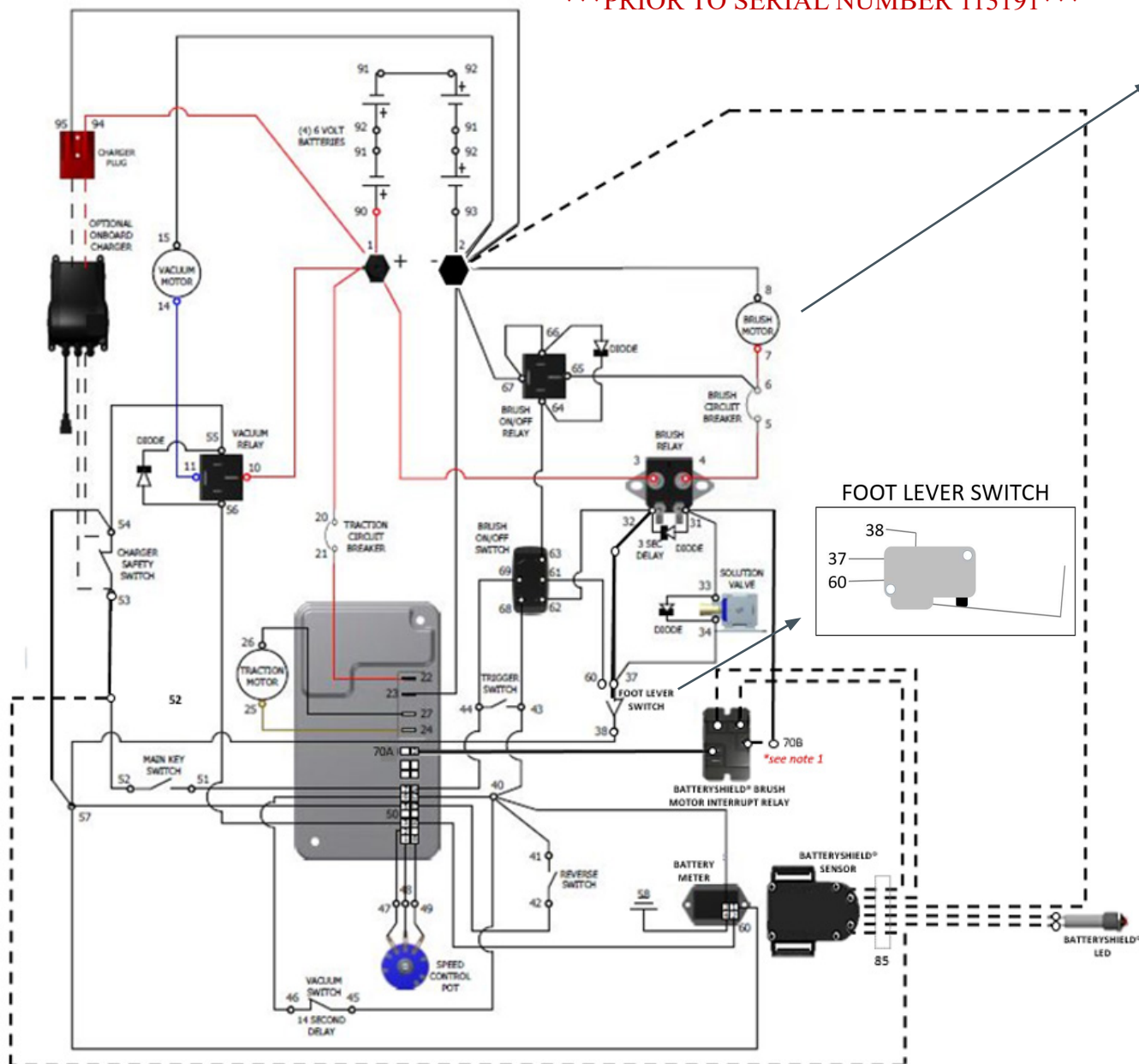


TROUBLESHOOTING TIPS

1. If a yellow LED is flashing on the battery charger, verify continuity between the charger and the battery pack.
2. A circuit breaker is designed to prevent over loading a component/system. If a circuit breaker continues to trip, verify the system is not being overloaded or that a wire is not chaffed creating a short-circuit.

S-20 TRACTION (DISK) & S-24XM WIRING DIAGRAM

PRIOR TO SERIAL NUMBER 113191

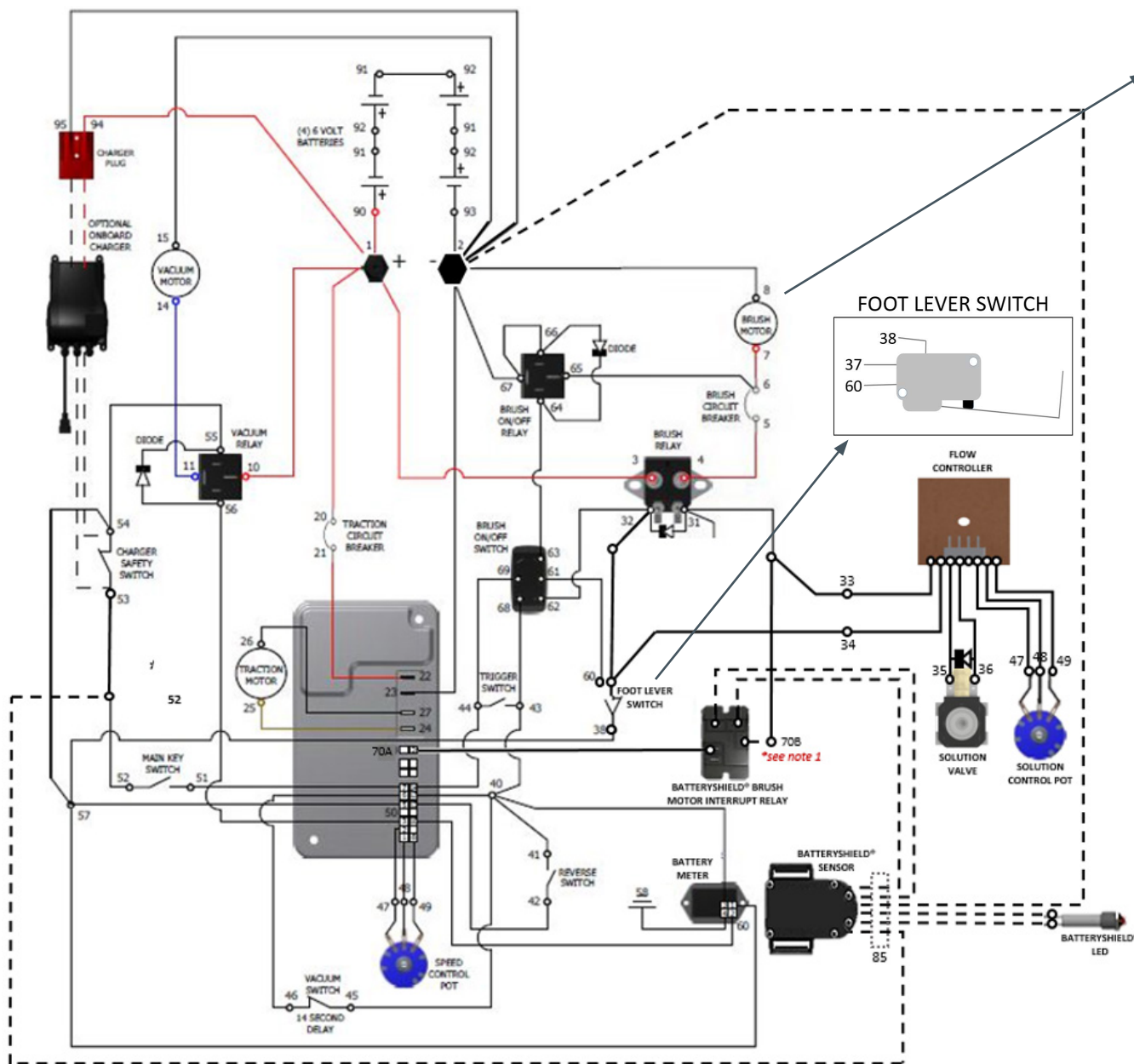


TROUBLESHOOTING TIPS

1. If the scrub head is not working when lowered, be aware that BatteryShield® intentionally disables the scrub head when the batteries need water. Refer to the [BATTERYSHIELD® AUTOMATIC WET BATTERY PROTECTION SYSTEM](#) section of this manual.
2. For machines equipped with BatteryShield® refer to the [BATTERYSHIELD® \(OPTIONAL\) WIRING DIAGRAM](#) and [BATTERYSHIELD® AUTOMATIC WET BATTERY PROTECTION SYSTEM](#) section prior to proceeding.
3. If a yellow LED is flashing on the battery charger, verify continuity between the charger and the battery pack. Refer to the [ON-BOARD CHARGER](#) section of this manual.
4. A circuit breaker is designed to prevent overloading a component/system. If a circuit breaker continues to trip, verify the system is not being overloaded or that a wire is not chafed creating a short-circuit.

S-20 / S-20HD TRACTION (DISK) & S-24XM WIRING DIAGRAM

AFTER SERIAL NUMBER 113191

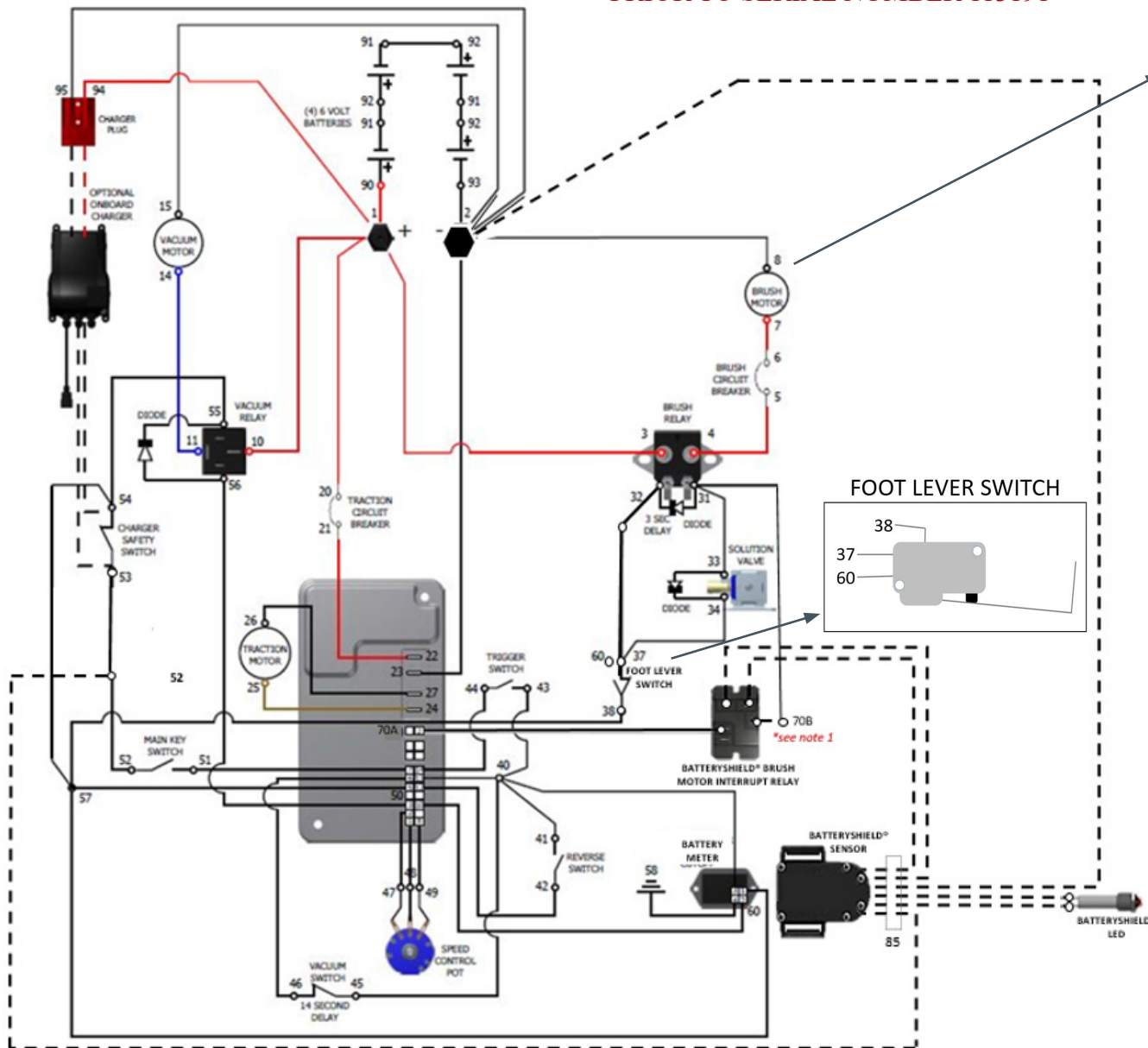


TROUBLESHOOTING TIPS

1. If the scrub head is not working when lowered, be aware that BatteryShield® intentionally disables the scrub head when the batteries need water. Refer to the [BATTERYSHIELD® AUTOMATIC WET BATTERY PROTECTION SYSTEM](#) section of this manual.
2. For machines equipped with BatteryShield® refer to the [BATTERYSHIELD® \(OPTIONAL\) WIRING DIAGRAM](#) and [BATTERYSHIELD® AUTOMATIC WET BATTERY PROTECTION SYSTEM](#) section prior to proceeding.
3. If a yellow LED is flashing on the battery charger, verify continuity between the charger and the battery pack. Refer to the [ON-BOARD CHARGER](#) section of this manual.
4. A circuit breaker is designed to prevent overloading a component/system. If a circuit breaker continues to trip, verify the system is not being overloaded or that a wire is not chafed creating a short-circuit.

S-20 ORBITAL WIRING DIAGRAM

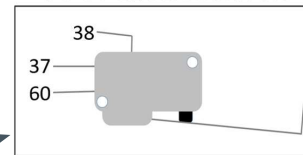
PRIOR TO SERIAL NUMBER 113191



TROUBLESHOOTING TIPS

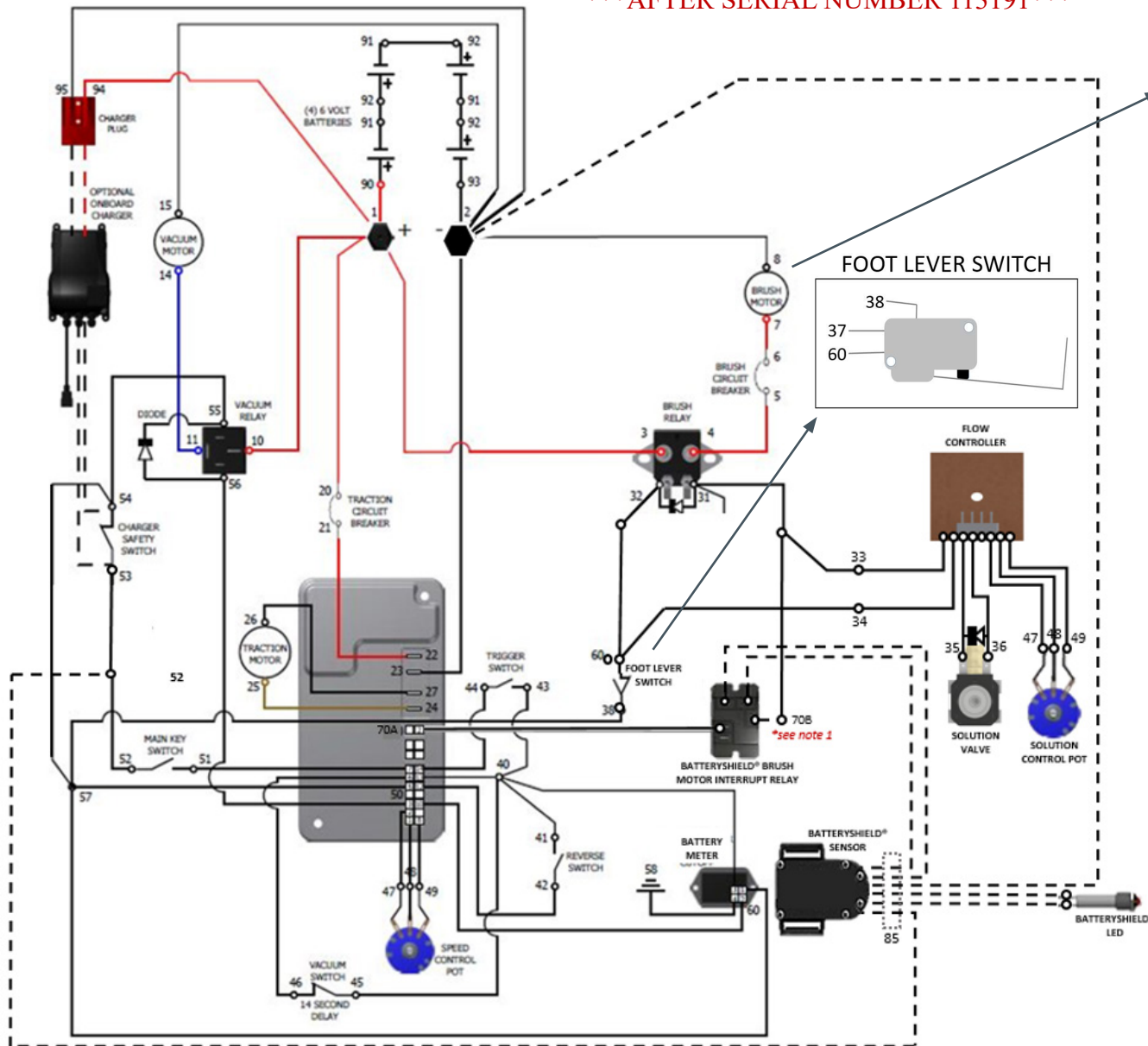
1. If the scrub head is not working when lowered, be aware that BatteryShield® intentionally disables the scrub head when the batteries need water. Refer to the [BATTERYSHIELD® AUTOMATIC WET BATTERY PROTECTION SYSTEM](#) section of this manual.
2. For machines equipped with BatteryShield® refer to the [BATTERYSHIELD® \(OPTIONAL\) WIRING DIAGRAM](#) and [BATTERYSHIELD® AUTOMATIC WET BATTERY PROTECTION SYSTEM](#) section prior to proceeding.
3. If a yellow LED is flashing on the battery charger, verify continuity between the charger and the battery pack. Refer to the [ON-BOARD CHARGER](#) section of this manual.
4. A circuit breaker is designed to prevent overloading a component/system. If a circuit breaker continues to trip, verify the system is not being overloaded or that a wire is not chafed creating a short-circuit.

FOOT LEVER SWITCH



S-20 ORBITAL WIRING DIAGRAM

AFTER SERIAL NUMBER 113191



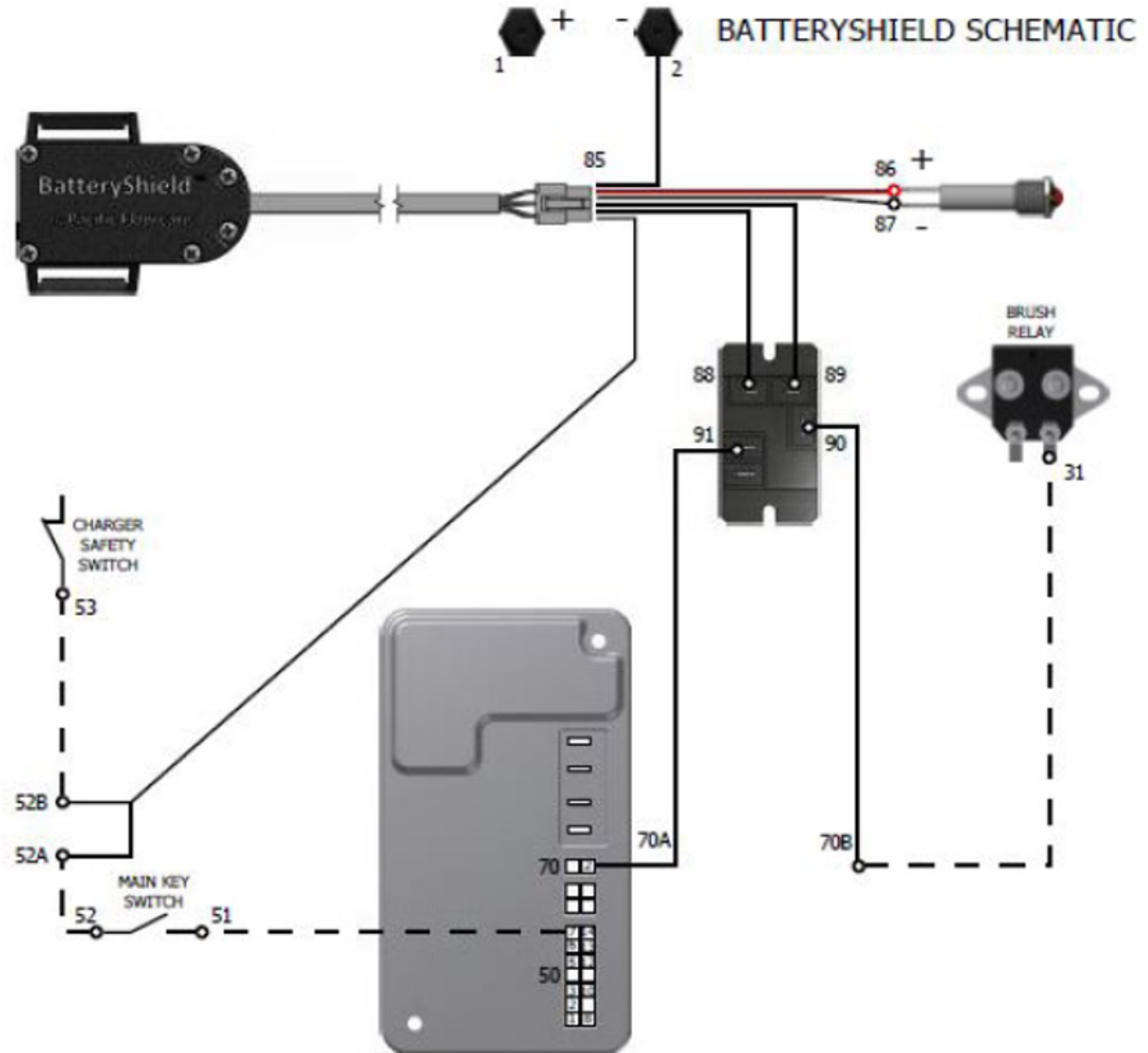
TROUBLESHOOTING TIPS

1. If the scrub head is not working when lowered, be aware that BatteryShield® intentionally disables the scrub head when the batteries need water. Refer to the [BATTERYSHIELD® AUTOMATIC WET BATTERY PROTECTION SYSTEM](#) section of this manual.
2. For machines equipped with BatteryShield® refer to the [BATTERYSHIELD® \(OPTIONAL\) WIRING DIAGRAM](#) and [BATTERYSHIELD® AUTOMATIC WET BATTERY PROTECTION SYSTEM](#) section prior to proceeding.
3. If a yellow LED is flashing on the battery charger, verify continuity between the charger and the battery pack. Refer to the [ON-BOARD CHARGER](#) section of this manual.
4. A circuit breaker is designed to prevent overloading a component/system. If a circuit breaker continues to trip, verify the system is not being overloaded or that a wire is not chafed creating a short-circuit.

BATTERYSHIELD® (OPTIONAL) WIRING DIAGRAM

NOTE: BatteryShield® intentionally interrupts the scrub head circuit when the batteries need water. Refer to the [BATTERYSHIELD® AUTOMATIC WET BATTERY PROTECTION SYSTEM](#) section of this manual.

BATTERYSHIELD® SENSOR IS MATED AND CALIBRATED TO THE MANIFOLD (BATT CAP) FROM THE FACTORY. SENSOR AND CAP MUST BE REPLACED AS AN ASSEMBLY – **DO NOT REMOVE SENSOR FROM CAP**



WARRANTY POLICY

S-20, S-20HD & S-24XM AUTOSCRUBBERS

Pacific Floorcare auto scrubbers have been manufactured, tested, and inspected in accordance with specific engineering requirements. These machines are warranted to be free from defects in workmanship and materials for the durations outlined below. This warranty extends to the original user/purchaser only when used, operated, and maintained in accordance with Pacific Floorcare operating and maintenance instructions. Only a Pacific Floorcare Authorized Factory Service Provider with a written factory service agreement may evaluate and/or repair Pacific Floorcare equipment. This warranty does not extend to damage or equipment failure caused by improper use, abuse, neglect, modifications to the equipment, or the use of non-authorized replacement parts.

Batteries: Only a Pacific Floorcare Authorized Factory Service Provider with a written factory agreement or the battery manufacturer's authorized distributor may evaluate battery serviceability. The battery warranty is rendered null and void if the end-user date of purchase is greater than 180 days from the factory ship date and/or if battery maintenance is not performed in accordance with the manufacture's specifications. Battery cost/price will be determined using the agreed-upon price between Pacific Floorcare and the battery manufacturer. Standard warranty labor and travel policies apply as outlined below.

Wet Lead Acid Batteries: In addition to the terms above, any properly maintained, original-equipment Pacific Floorcare battery which has been diagnosed as unserviceable under normal use within twelve (12) months from date of sale to the original user will be repaired or replaced with one of equal specification with no charge to the user. All battery warranty claims must be accompanied by a completed battery test report. This test is to be completed by a Pacific Floorcare Authorized Factory Service Provider or the battery manufacturer's authorized distributor.

Machines without BatteryShield®: Any properly maintained battery which fails under normal use will be covered by the full twelve (12) month warranty as described above.

Machines equipped with BatteryShield®: After the expiration of the above twelve (12) month period, any properly maintained battery which fails under normal use will be adjusted to the original user with a new battery of equal specification on a thirty-six (36) month pro-rata basis from the date of purchase. Any modification of the BatteryShield® system will void the battery warranty.

AGM Maintenance Free Batteries: In addition to the terms above, any original equipment Pacific Floorcare Battery which becomes unserviceable under normal use within two (2) years (730 days) from date of sale to the original user will be repaired or replaced with one of equal specification with no charge to the user.

Wear Items: This warranty does not apply to wear parts and accessories such as carbon motor brushes, floor brushes, pad drivers, belts, hoses, and squeegee blades. See the Recommended Service Parts section of this manual for a complete list of wear items.

Orbital Scrub Head Isolators: Isolator replacement parts on the Orbital Scrub Head will be covered for 5 years or 5000 hours (whichever comes first) when diagnosed and determined to be faulty by an Authorized Factory Service Provider.

Travel: Travel time for warranty repair is authorized for ninety (90) days following the date of sale to the end-user, with a maximum of three (3) hours per claim.

Labor: Only a Pacific Floorcare Authorized Factory Service Provider with a written factory service agreement may evaluate and/or repair Pacific Floorcare equipment. Labor for any warranty repair is authorized for one (1) year following the date of sale to the end-user. Once an Authorized Factory Service Provider has been identified, it is the end user's responsibility to contract repairs. The authorized service provider will file any verified warranty claims with Pacific Floorcare in accordance with the written factory agreement.

Parts: Parts determined to be defective are covered for three (3) years following the date of sale to the end-user. Pacific Floorcare reserves the right to inspect defective parts prior to crediting any warranty claims.

Rotationally Molded Components: Rotationally molded components determined to be defective as a result of workmanship or material failure are covered for ten (10) years following the date of sale to the end-user.

Return Material Authorization (RMA): Warranty credit or replacement of returned parts is subject to an incoming inspection of those items.

Disclaimer: This warranty limits Pacific Floorcare's liability to the repair of the equipment and/or replacement of the defective parts and does not include incidental or consequential damages arising from the use of a Pacific Floorcare machine whether defective or not. This warranty is in lieu of all other expressed or implied warranties and is extended to the original purchaser/user only.

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F L O O R C A R E

PURPOSE BUILT.[®]

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