

# WS28

**ORDER #87301**

## **Betco Watchman™ 28 Automatic Scrubber**

### **FEATURES**

- Simple design for easy operation
- Large tank capacity increases productivity
- Easy access parts design
- Heavy duty squeegee assembly
- Built durable for maximum performance
- Self propelled forward and reverse

The Betco Watchman™ series of automatic scrubbers brings a new dimension to cleaning maintenance. A simple design makes the WS28 easy to operate and reduces operator training. The 28" cleaning path along with the 24 gallon solution and recovery tanks increase productivity. A heavy-duty squeegee assembly and adjustable brush pressure provide maximum cleaning performance. Easy access to all areas of the machine reduces service down time. Betco's Watchman™ Automatic Scrubbers are built durable to last and will help make your cleaning maintenance jobs easier!

### **WARRANTY**

Tank: 10 Year

Other components: 3 Year\*

\*Please refer to Betco Equipment Price/Product Guide for complete equipment warranty information.



### **SPECIFICATIONS**

- Cleaning path: 28"
- Pad Drivers: (2) 14"
- Drive Motor: .3 hp
- Brush motors: (2) .75 hp
- Brush pressure: 0 - 150 adjustable
- Brush speed: 200 rpm
- Solution control: gravity feed - adjustable
- Solution tank: 24 gallon
- Recovery tank: 24 gallon
- Volts: 24 volt system
- Weight: 712 lbs. w/o batteries  
1000 lbs. w/batteries
- Tires: (2) 11" pneumatic
- Dimensions: Length 61"  
Width 28"  
Height 41.5"

### **APPLICATIONS**

- General Cleaning
- Heavy Duty Scrubbing
- Stripping

**Authorized Betco Distributor:**

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# BETCO BETTER SOLUTIONS

## OFFERING THE TOTAL SOLUTION.

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*Complete Carpet Care Program.*



*Complete Training Programs.*



*Complete Chemical Programs, Cleaners, Floor Care and specialties.*



*Complete Hand Cleaner Line.*



*Nationwide Support.*

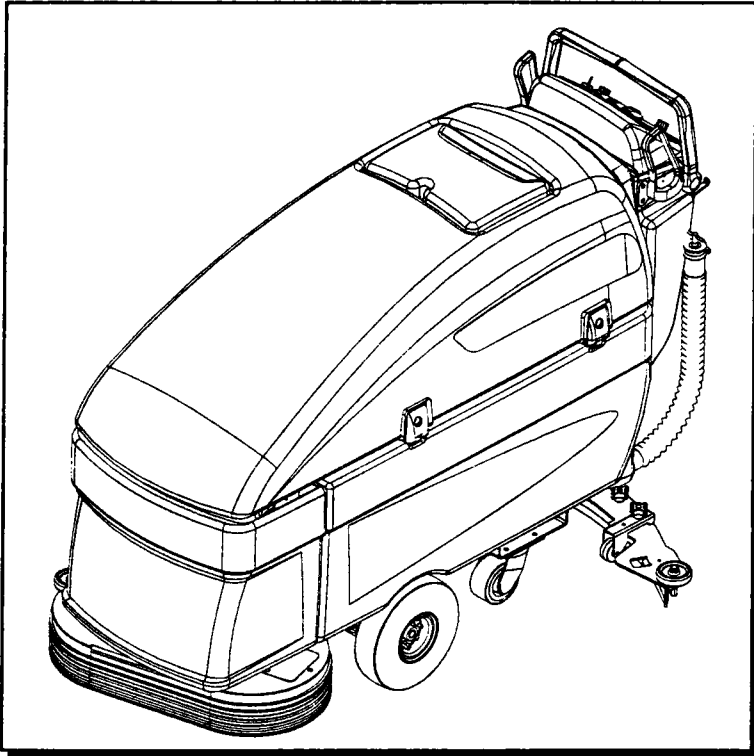
*Let Betco be your single source manufacturer.*

*Better Solutions Come From...*  
**BETCO**<sup>®</sup>

# **WATCHMAN**<sup>TM</sup>

**BETCO.**

## **WALK BEHIND SCRUBBER**



Operating Instructions

**MODELS:** BSS428  
BSS432

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Read these instructions before using the machine

A

**MACHINE DATA LOG/OVERVIEW**

**MODEL** \_\_\_\_\_

**DATE OF PURCHASE** \_\_\_\_\_

**SERIAL NUMBER** \_\_\_\_\_

**SALES REPRESENTATIVE #** \_\_\_\_\_

**DEALER NAME** \_\_\_\_\_

**OPERATIONS GUIDE NUMBER** \_\_\_\_\_

**PUBLISHED** \_\_\_\_\_

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## HOW TO USE THIS MANUAL

This manual contains the following sections:

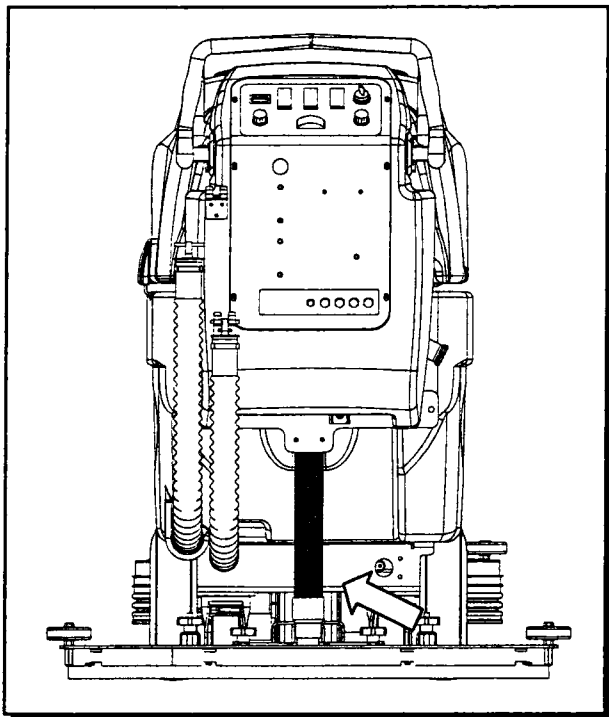
- HOW TO USE THIS MANUAL
- SAFETY
- OPERATIONS
- MAINTENANCE
- PARTS LIST

The HOW TO USE THIS MANUAL section will tell you how to find important information for ordering correct repair parts.

When placing an order for parts, the machine model and machine serial number are important. Refer to the MACHINE DATA box which is filled out during the installation of your machine. The MACHINE DATA box is located on the inside of the front cover of this manual.

|                               |
|-------------------------------|
| MODEL _____                   |
| DATE OF PURCHASE _____        |
| SERIAL NUMBER _____           |
| SALES REPRESENTATIVE # _____  |
| DEALER NAME _____             |
| OPERATIONS GUIDE NUMBER _____ |
| PUBLISHED _____               |

The model and serial number of your machine is on the bottom back-end of the machine.



The SAFETY section contains important information regarding hazard or unsafe practices of the machine. Levels of hazards are identified that could result in product or personal injury, or severe injury resulting in death.

The OPERATIONS section is to familiarize the operator with the operation and function of the machine.

The MAINTENANCE section contains preventive maintenance to keep the machine and its components in good working condition. They are listed in this general order:

- Batteries
- Scrub Brushes
- Adjusting Squeegee
- Scrub Deck Skirt
- Squeegee Blade/Brush Head Options
- Service Schedule

The PARTS LIST section contains assembled parts illustrations and corresponding parts list. The parts lists include a number of columns of information:

- **REF** – column refers to the reference number on the parts illustration.
- **PART NO.** – column lists the part number for the part.
- **QTY** – column lists the quantity of the part used in that area of the machine.
- **DESCRIPTION** – column is a brief description of the part.
- **SERIAL NO. FROM** – column indicates the first machine the part number is applicable to. When the machine design has changed, this column will indicate serial number of applicable machine. The main illustration shows the most current design of the machine. The boxed illustrations show older designs.
- **NOTES** – column for information not noted by the other columns.

*(NOTE: If a service or option kit is installed on your machine, be sure to keep the KIT INSTRUCTIONS which came with the kit. It contains replacement parts numbers needed for ordering future parts.)*

# IMPORTANT SAFETY INSTRUCTIONS

**When using an battery powered appliance, basic precaution must always be followed, including the following:**

**READ ALL INSTRUCTIONS BEFORE USING THIS MACHINE.**



**To reduce the risk of fire, electric shock, or injury:**

**Use only** indoors. Do not use outdoors or expose to rain.

**Use only** as described in this manual. Use only manufacturer's recommended components and attachments.

If the machine is **not working properly**, has been dropped, damaged, left outdoors, or dropped into water, return it to an authorized service center.

**Do not** operate the machine with any openings blocked. Keep openings free of debris that may reduce airflow.

This machine is **not** suitable for picking up hazardous dust.

**Machine can cause a fire** when operating near flammable vapors or materials. Do not operate this machine near flammable fluids, dust or vapors.

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

Maintenance and repairs **must be done** by qualified personnel.

If foam or liquid comes out of machine, **switch off immediately**.

**Disconnect** battery before cleaning or servicing.

Before the machine is discarded, the batteries **must be removed** and properly disposed of.

Make sure all warning and caution labels **are legible and properly attached** to the machine.

**During operation**, attention shall be paid to other persons, especially children.

**Before use** all covers and doors shall be put in the positions specified in the instructions.

**When leaving unattended**, secure against unintentional movement.

**The machine shall only** be operated by instructed and authorized persons.

**When leaving unattended**, switch off or lock the main power switch to prevent unauthorized use.

**Only chemicals recommended** by the manufacturer shall be used.

**This appliance has been designed** for use with the brushes specified by the manufacturer. The fitting of other brushes may affect its safety.

**Do not** use on surfaces having a gradient exceeding 2% unless the optional parking brake is installed on the machine.

## SAVE THESE INSTRUCTIONS

## **HAZARD INTENSITY LEVEL**

The following symbols are used throughout this guide as indicated in their descriptions:

### **HAZARD INTENSITY LEVEL**

There are three levels of hazard intensity identified by signal words -**WARNING** and **CAUTION** and **FOR SAFETY**. The level of hazard intensity is determined by the following definitions:

#### **⚠ WARNING**

**WARNING** - Hazards or unsafe practices which **COULD** result in severe personal injury or death.

#### **⚠ CAUTION**

**CAUTION** - Hazards or unsafe practices which could result in minor personal injury or product or property damage.

#### ***FOR SAFETY: To identify actions which must be followed for safe operation of equipment.***

Report machine damage or faulty operation immediately. Do not use the machine if it is not in proper operating condition. Following is information that signals some potentially dangerous conditions to the operator or the equipment. Read this information carefully. Know when these conditions can exist. Locate all safety devices on the machine. Please take the necessary steps to train the machine operating personnel.

#### ***FOR SAFETY:***

**DO NOT OPERATE MACHINE:**

Unless Trained and Authorized.

Unless Operation Guide is Read and understood.

In Flammable or Explosive areas.

In areas with possible falling objects.

#### ***WHEN SERVICING MACHINE:***

**Avoid moving parts. Do not wear loose clothing; jackets, shirts, or sleeves when working on the machine. Use manufacturer approved replacement parts.**

#### **⚠ WARNING**

**Batteries emit hydrogen gas. Explosion or fire can result. Keep sparks and open flame away. Keep solution tank in raised position when charging. Keep sparks and flames away from the batteries. Do not smoke around batteries.**

#### **⚠ WARNING**

**Disconnect batteries before working on machine. Only qualified personnel should work inside machine. Always wear eye protection and protective clothing when working on or near batteries. Avoid skin contact with the acid contained in the batteries.**

#### **⚠ WARNING**

**Never allow metal to lie across battery tops.**

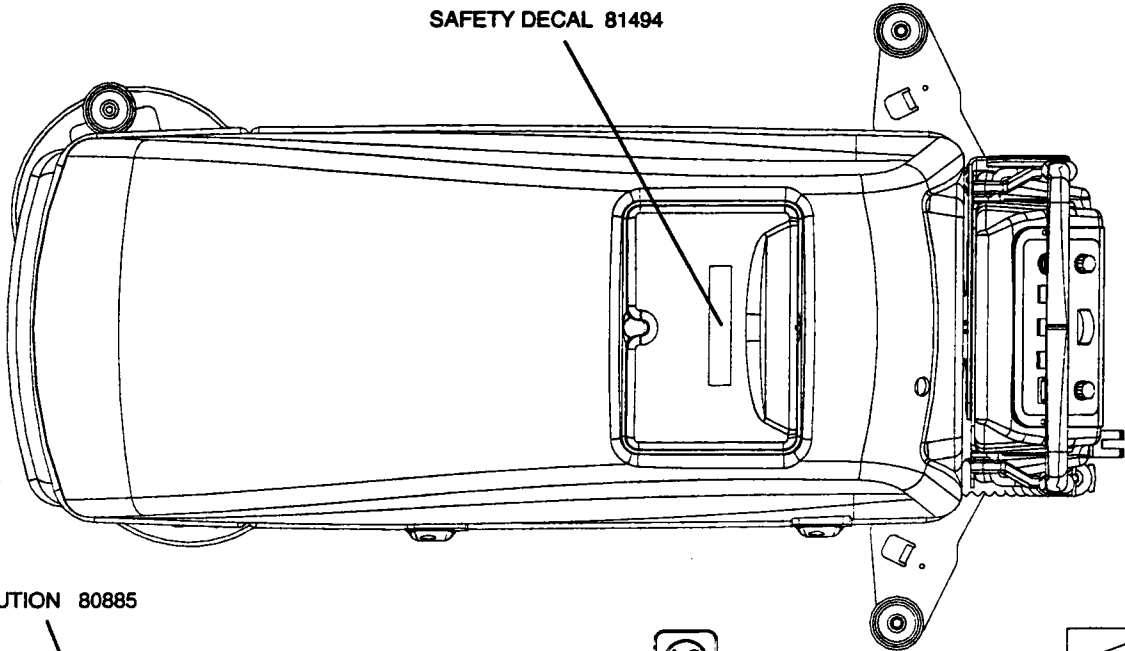


# SAFETY LABEL LOCATION

**NOTE:** These drawings indicate the location of safety labels on the WATCHMAN™. If at any time the labels become illegible, promptly replace them.



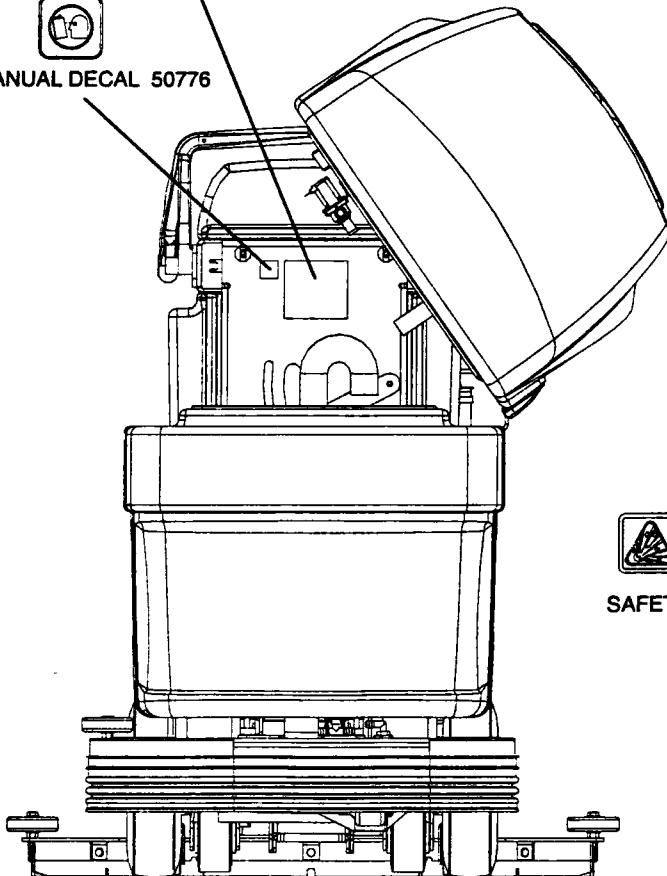
SAFETY DECAL 81494



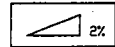
BATTERY CAUTION 80885



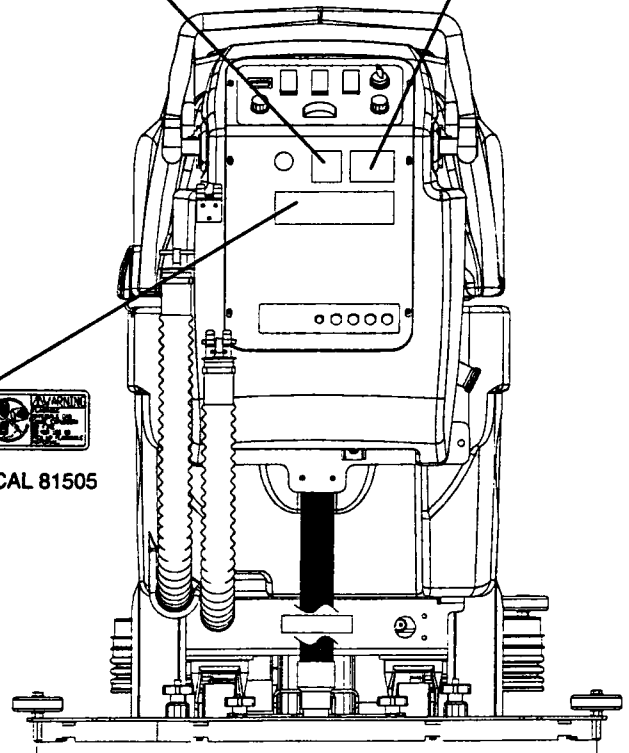
MANUAL DECAL 50776



MANUAL DECAL 50776



2% GRADE DECAL 50926



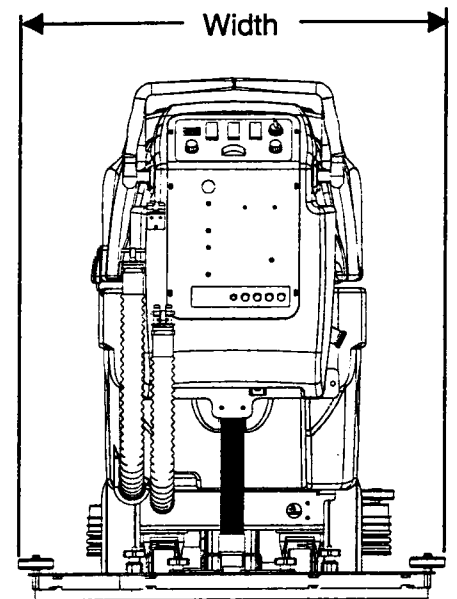
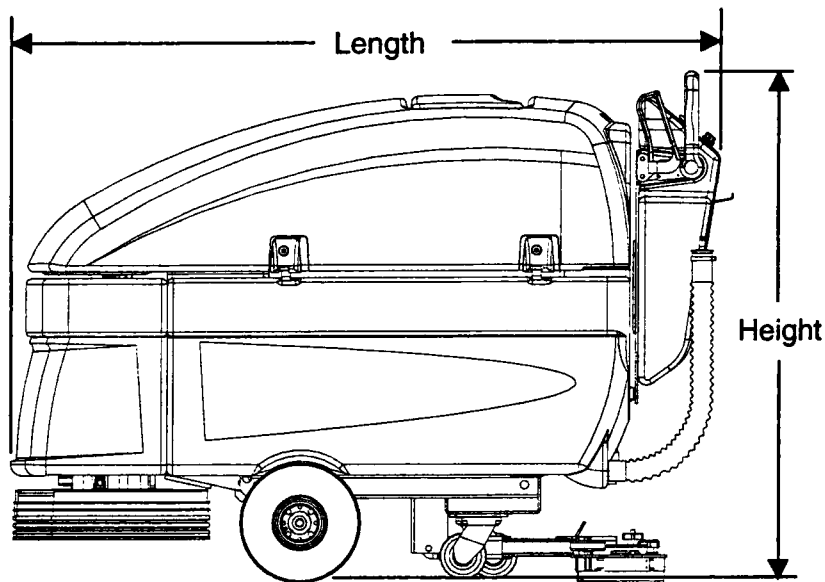
SAFETY DECAL 81505

## TECHNICAL SPECIFICATIONS

| ITEM  | DIMENSION/CAPACITY   |
|---|--|
| Nominal power   | 1.44 kW  |
| Rated Voltage   | 24VDC  |
| Rated Amperage  | 60 Amps  |
| Batteries   | 4 X 6 Volt 250-305 AH @ 20 hr rate                                     |
| Scrub Brush Motors  | 2 X .75 hp (0.56 Kw)   |
| Vacuum Motor  | .75 hp (0.56 Kw)   |
| Propelling Motor  | .3 hp (0.22 Kw)  |
| Mass (GVW)  | 1050 lbs. (480 kg)   |
| Weight empty without batteries  | 425 lbs. (192 kg)  |
| Solution Control  | Gravity feed, fully variable with automatic shut-off in neutral        |
| Solution tank capacity  | 21 gal. (79.5 l)   |
| Recovery tank capacity  | 21 gal. (79.5 l)   |
| Scrub brush diameter for 24 in. (61cm) scrub head   | 12 in (30.5 cm)  |
| Scrub brush diameter for 26 in. (66 cm) scrub head  | 13 in (33.0 cm)  |
| Scrub brush diameter for 28 in. (71 cm) scrub head  | 14 in (35.5 cm)  |
| Scrub brush pressure  | 0-150 lbs. (0-68 kg)   |
| Scrub brush speed   | 200 rpm  |
| Tires   | 2 x 10 in (25.4 cm) pneumatic non-marking standard                     |
| Casters   | 2 X 4 in (10.2 cm) polyurethane solid non-marking                      |
| Foundation Pressure (at recommended tire psi)   | 32 lbs./in <sup>2</sup> (225 kPa)                                      |
| Maximum Speed   | 3.2 Miles/hour (5.2 km/hour)   |
| Coverage with 24 in. (61 cm) scrub head   | 29,040 ft <sup>2</sup> /hour at 3.0 mph with 2 in. overlap             |
| Coverage with 26 in. (66 cm) scrub head   | 31,680 ft <sup>2</sup> /hour at 3.0 mph with 2 in. overlap             |
| Coverage with 28 in. (71 cm) scrub head   | 34,320 ft <sup>2</sup> /hour at 3.0 mph with 2 in. overlap             |
| Frame Construction  | Welded cold rolled steel and steel plate with epoxy powdercoat finish. |
| Brakes (optional)   | Tire lock parking brake, foot activated                                |
| Minimum aisle u-turn width with 24 in. (61 cm) scrub head                                 | 65 in. (165 cm)  |
| Minimum aisle u-turn width with 26 in. (66 cm) scrub head                                 | 65.5 in. (166 cm)  |
| Minimum aisle u-turn width with 28 in. (71 cm) scrub head                                 | 66 in. (168 cm)  |
| Maximum rated climb and descent angle with empty tanks and without optional parking brake | 2%   |
| Maximum rated climb and descent angle with full tanks and without optional parking brake  | 2%   |

## TECHNICAL SPECIFICATIONS

| ITEM  | MEASURE           |
|---|-------------------|
| Height  | 43.5 in. (110 cm) |
| Length with 24 in. (61 cm) scrub head             | 64 in. (163 cm)   |
| Length with 26 in. (66 cm) scrub head             | 64.5 in. (164 cm) |
| Length with 28 in. (71 cm) scrub head             | 65 in. (165 cm)   |
| Width without squeegee and scrub head             | 22 in. (56 cm)    |
| Width of squeegee for 24 in. (61 cm) scrub head   | 36 in. (91 cm)    |
| Width of squeegee for 26 in. (66 cm) scrub head   | 36 in. (91 cm)    |
| Width of squeegee for 28 in. (71 cm) scrub head   | 39.5 in. (100 cm) |
| Width of scrub path for 24 in. (61 cm) scrub head | 24 in. (61 cm)    |
| Width of scrub path for 26 in. (66 cm) scrub head | 26 in. (66 cm)    |
| Width of scrub path for 28 in. (71 cm) scrub head | 28 in. (71 cm)    |



### SPECIAL NOTES:

The sound pressure level at the operator's ear was measured to be 68 dBA. This was a nearfield, broad-band measurement taken in a typical industrial environment on a tile floor. This appliance contains no possible source of impact noise. The instantaneous sound pressure level is below 63 Pa.

The weighted root mean square acceleration at the operator's arms was measured to be below  $2.5\text{m/s}^2$ . This was a tri-axial, third-octave-band measurement made during normal operation on a composite tile floor. The measurement and related calculations were made in accordance with ANSI S3.34-1986.

## **HOW THE MACHINE WORKS**

The *WATCHMAN™* is a battery powered, self-propelled, hard floor scrubber intended for commercial use. The appliance applies a cleaning solution onto a hard floor, scrubs the floor with brushes, and then vacuums the soiled water back into the recovery tank.

The machines primary systems are the solution system, scrub system, recovery system, and directional control system.

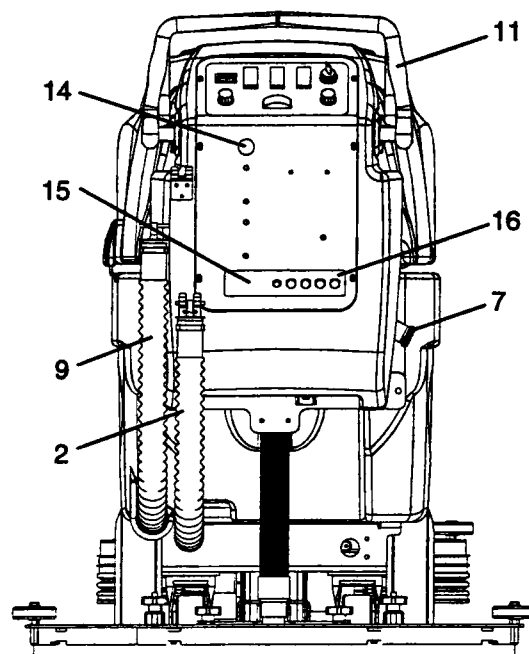
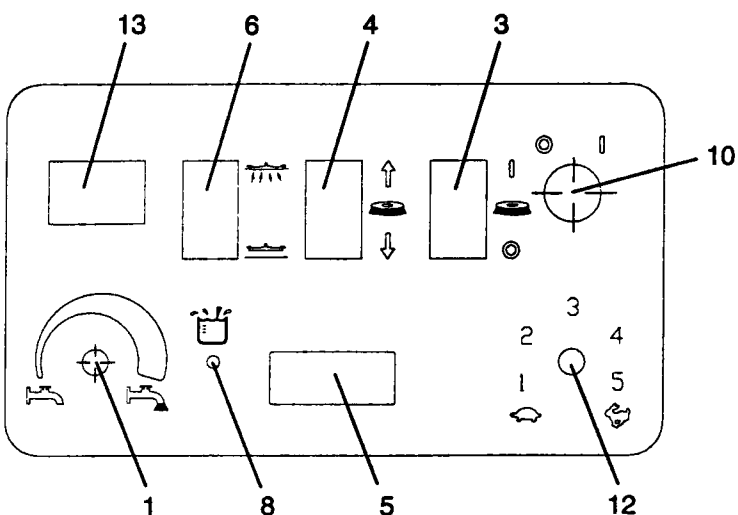
The function of the solution system is to store cleaning solution and deliver it to the scrub system. The solution system consists of the solution tank, strainer, valve and controls. The solution tank stores cleaning solution (water and detergent) until it is delivered to the scrub system. The strainer protects the valve from debris. The valve is a solenoid type valve, which controls the delivery of cleaning solution to the scrub system. The valve automatically prevents solution flow unless the scrub brushes are turned on and the machine is being propelled. The solution control knob controls the amount of cleaning solution delivered to the scrub system by controlling the amount of time the valve is open.

The function of the scrub system is to scrub the floor. The scrub system consists of two rotary type disk scrub brushes, motors, self-adjusting scrub deck skirt, lift actuator and controls. The brushes scrub the floor and the motors drive the brushes. The brush drive hubs allow the scrub brushes to follow irregularities and changes in the floor without losing contact with floor. The self-adjusting scrub deck skirt controls the cleaning solution on the floor so that the squeegee can pick it up. The brush pressure switch controls an actuator, which raises and lowers the scrub deck. The brush pressure indicator corresponds to the amp draw of the scrub brush motors to tell how hard they are working.

The function of the recovery system is to vacuum the soiled water back into the recovery tank. The recovery system consists of the squeegee, vacuum motor, filter, recovery tank and controls. The squeegee wipes the dirty solution off the floor as the machine moves forward. The vacuum motor provides suction to draw the dirty solution off the floor and into the recovery tank. The filter protects the vacuum fan from debris and foam. The recovery tank stores the dirty solution. The float switch in the tank activates the recovery tank full indicator and shuts off the vacuum motor.

The function of the directional control system is to control the direction and speed of the machine. The directional control system consists of the directional control lever, switches, speed control knob/potentiometer, controller and transaxle. The directional control lever actuates switches, which signal forward or reverse. The speed control knob actuates a potentiometer, which signals speed. The controller interprets the forward/reverse signals from the switches and the speed signal from the potentiometer to command the transaxle to propel the machine in the direction, and at the speed, desired.

## CONTROLS



1. **Solution Control Knob**
2. **Solution Tank Drain Hose**
3. **Brush Switch**
4. **Brush Pressure Switch**
5. **Brush Pressure Indicator**
6. **Vacuum Switch**
7. **Squeegee Lift Lever**
8. **Recovery Tank Full Indicator**
9. **Recovery Tank Drain Hose**
10. **Key Switch**
11. **Direction Control Lever**
12. **Speed Control Knob**
13. **Battery Charge Level Indicator**
14. **Emergency Shut Off Switch (Optional)**
15. **Hour Meter (Optional)**
16. **Circuit Breakers**

## CONTROLS

### 1. SOLUTION CONTROL KNOB

Controls solution flow to scrub deck. Rotate the knob clockwise to increase flow. Rotate the knob counterclockwise to decrease flow. If the brush motors are turned off or the direction control lever is in neutral, the flow is automatically interrupted until the motors are turned on again. This feature prevents unintentional draining of the solution tank and allows the operator to adjust the solution flow to the scrub deck without resetting each time the scrubbing operation is interrupted.

### 2. SOLUTION TANK DRAIN HOSE

Located at left rear of machine. Secured by clip and closed by expanding plug.

### 3. BRUSH SWITCH

Turns the scrub motors on and off. Press the top of the switch to turn on. Press the bottom of the switch to turn off. The brushes will not rotate with the direction control lever in neutral.

### 4. BRUSH PRESSURE SWITCH

Adjusts the amount of brush pressure to the floor by raising or lowering the scrub deck. Press the bottom of the switch to increase brush pressure. Press the top of the switch to decrease brush pressure or raise the scrub deck.

### 5. BRUSH PRESSURE INDICATOR

The brush pressure indicator corresponds to the amp draw of the scrub brush motors to tell how hard the motors are working. The green zone indicates proper operating brush pressure. The red zone indicates excessive brush pressure. Operating in the red zone will cause the brush circuit breakers to trip.

### 6. VACUUM SWITCH

Turns the vacuum motor on and off. Press the top of the switch to turn on. Press the bottom of the switch to turn off. The vacuum motor will not operate with the recovery tank full indicator light on.

### 7. SQUEEGEE LIFT LEVER

Raises and lowers the squeegee. Lift the handle from its raised position to lower the squeegee. Lift the handle from its lowered position to raise the squeegee.

### 8. RECOVERY TANK FULL INDICATOR

Will light when the float switch indicates a full recovery tank. The vacuum motor will not operate with recovery tank full. The recovery tank must be drained and the vacuum switch or key switch turned off before the indicator light will turn off.

### 9. RECOVERY TANK DRAIN HOSE

Located at left rear of machine. Secured by clip and closed by expanding plug.

### 10. KEY SWITCH

Controls the power for machine functions. Rotate the key clockwise to turn on the machine. Rotate the key counterclockwise to turn off the machine.

***FOR SAFETY: Always remove the key when machine is unattended or during service to prevent unauthorized movement.***

### 11. DIRECTION CONTROL LEVER

Controls the machine direction, and scrub brushes and solution flow. Push the lever forward to propel the machine forward. Pull the lever toward you to propel the machine backward. The scrub brushes will not rotate and the solution will not flow to scrub deck with the direction control lever in neutral.

### 12. SPEED CONTROL KNOB

Controls the speed of the machine. Rotate the knob clockwise to increase speed. Rotate the knob counterclockwise to decrease speed.

### 13. BATTERY CONDITION METER

The battery condition meter indicates the charge level of the battery. The meter display is divided into 10 vertical bars. Bars illuminated on the far right indicate full charge. Bars flashing near the left side indicate the batteries should be recharged. Further operation of the machine could damage the machine or the batteries.

When the machine is left overnight with less than a full charge, the display may initially indicate a full charge. It will also indicate a full charge if the batteries are disconnected, then reconnected. After a few minutes of operation the meter will give the correct charge level.

## 14. EMERGENCY SHUT-OFF SWITCH (OPTIONAL)

Shuts off machine. Push the switch to shut off machine. Rotate the switch clockwise to restart machine.

## 15. HOUR METER (OPTIONAL)

Records the number of hours the machine has been in operation. This information is useful in determining when to service the machine.

## 16. CIRCUIT BREAKERS

Circuit breakers interrupt the flow of power in the event of an electrical overload. When a circuit breaker is tripped, reset it by pressing the exposed button. If a circuit breaker continues to trip, the cause of the electrical overload should be found and corrected.



3 Amp. Protects the machine controls and scrub deck lift actuator.



30 Amp. Protects the left scrub brush motor.



30 Amp. Protects the right scrub brush motor.



25 Amp. Protects the vacuum motor.



25 Amp. Protects the propel motor.

## MACHINE OPERATION

### PRE-RUN MACHINE INSPECTION

Do a pre-run inspection to find possible problems that could cause poor performance or lost time from breakdown. Follow the same procedure each time to avoid missing steps.

*NOTE: See maintenance section for pre-run machine inspection checklist items.*

### STARTING MACHINE

*NOTE: Perform pre-run machine check before operating machine.*

**FOR SAFETY: Before starting machine, make sure that all safety devices are in place and operating properly.**

1. Turn the machine power on.
2. Release the parking brake, if your machine is equipped with this option.
3. Move the direction control lever in the desired direction.

### EMERGENCY STOP PROCEDURES

1. Release the directional control lever.
2. Turn machine power off with key switch.
3. If an electrical problem is suspected push in emergency stop button, if machine is equipped with this option.
4. Apply brakes, if your machine is equipped with this option.

### FILLING SOLUTION TANK

**FOR SAFETY: Before leaving or servicing machine; stop on level surface, turn off machine and remove key.**

1. Turn the machine power off.
2. Set the parking brake if your machine is equipped with this option.
3. Remove solution tank cover.
4. Fill the solution tank with clean water, leaving enough room for the required amount of cleaning solution. The solution tank capacity filled to 5" (13cm) from bottom of fill inlet is 21 gallons (79.5 liters). The water must not be hotter than 140° F (60°C) to prevent damage to the tank.

5. **Measure** the chemical into the solution tank. Liquid chemicals should be added to the solution tank after filling with water. Dry chemicals should be thoroughly mixed before being added into solution tank. Commercially available, high alkaline floor cleaners, are suitable for use in the solution system.

*NOTE: Read the chemical manufacturers recommended proportion instructions.*

6. Replace solution tank cover.

### WARNING

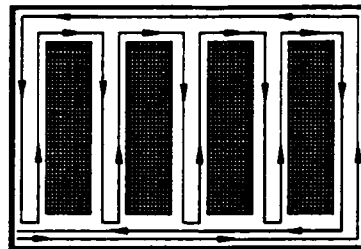
**Flammable materials can cause an explosion or fire. Do not use flammable materials in the tanks.**

### NORMAL SCRUBBING

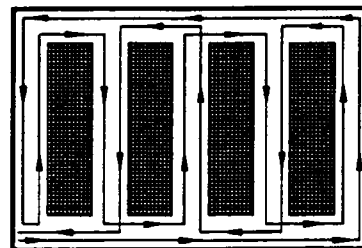
Plan the scrubbing pattern in advance. The longest track is around the perimeter of the area to be cleaned. For efficient operation, the runs should be the longest possible without turning, stopping, or raising and lowering scrub deck/squeegee.

*NOTE: In order to achieve the best possible results, the area which is to be cleaned should be swept before scrubbing. Large debris, strings & wire must be removed to prevent being caught in brushes or squeegee.*

#### INEFFICIENT SCRUBBING PATH



#### RECOMMENDED SCRUBBING PATH





## TO BEGIN SCRUBBING

### CAUTION

When operating the machine around people, pay close attention for unexpected movement. Use extra caution around children.

### WARNING

Flammable liquids and/or reactive metals can cause explosions or fire! Do not pick up.

1. Turn the machine power on.
2. Lower the squeegee.
3. Turn the vacuum on.
4. Lower the scrub brushes to the floor.
5. Turn the scrub brushes on (brushes will start when machine is propelled).
6. Drive machine forward to begin scrubbing.  
*NOTE: Shut machine off immediately if water or foam is expelled from the machine.*
7. Adjust the speed of the machine, solution flow and scrub brush pressure as necessary.  
*NOTE: Once solution flow rate is set it is not necessary to shut off solution when stopping scrubbing. Solution flow is automatically shut off when brush motors stop. When brush motors are activated, flow automatically resumes.*

## TO STOP SCRUBBING

1. Release the directional control lever.
2. Turn the scrub brushes off.
3. Raise the scrub brushes.
4. Raise the squeegee.
5. Turn the vacuum off.
6. Turn the machine power off.

## DOUBLE SCRUB

Floors which are heavily soiled or have thick accumulations of floor finish may not clean sufficiently with one pass. In these cases it will be necessary to double scrub.

To double scrub, make the first pass over the surface being cleaned with the squeegee up, the solution on, and brushes down. This allows the solution to stay in contact with the soil while loosening the surface accumulation with the brushes. Allow time for the first application to stay in contact with the floor. Length of time between the

first and second pass depends on amount of accumulation and the type of chemical being used. A second scrubbing with the squeegee down and again the solution and brushes on will further loosen soil. The additional application of solution will further assist the difficult cleaning job.

**FOR SAFETY:** When using machine, go slow on inclines and slippery services.

## EMPTYING AND CLEANING TANKS

1. Park the machine next to a floor drain. Drain hose is on left rear corner of the machine.
2. Turn the machine power off and set parking brake, if your machine is equipped with this option.

### SOLUTION TANK

1. Unhook the small drain hose from the retainer. Unscrew T-handle on plug enough to loosen plug, then lower hose in direction of the drain. Slowly remove plug from drain hose.
2. Remove the solution tank cover.
3. Flush the solution tank out with clean water and run several gallons of clean water through systems. Do not use water hotter than 140°F (60°C) to clean tank. Damage may occur.  
*NOTE: Never allow solution to remain in tank. Damage to tank, seals and valves could occur.*
4. Replace the drain plug and secure drain hose in bracket.

### RECOVERY TANK

1. Unhook the large drain hose from the retainer. Unscrew the T-handle on plug enough to loosen plug, then lower hose in direction of the drain. Do not stand in front of end of hose. Recovered solution will come out with force. Slowly remove plug from drain hose.
2. Raise solution tank to access recovery tank. Make sure the support arm is fully engaged. Flush the recovery tank out with clean water. Do not use water hotter than 140°F (60°C) to clean tank. Damage may occur.
3. Clean off the float switch and check for free movement of float. The float switch is located in the front of the recovery tank.
4. Replace the drain plug and secure drain hose in bracket.
5. If machine is to be stored, leave solution tank in raised position.

# MAINTENANCE

## BATTERIES

The batteries provide the power to operate the machine. The batteries require regular maintenance to keep them operating at peak efficiency.

The machine batteries will hold their charge for long periods of time, but they can only be charged a certain number of times. To get the greatest life from the batteries, charge them when their charge level reaches 25% of a full charge. Use a hydrometer to check the charge level.

Do not allow the batteries to remain in a discharged condition for any length of time. Never expose a discharged battery to temperatures below freezing. Discharged batteries will freeze causing cracked cases. Do not operate the machine if the batteries are in poor condition or if they have a charge level below 25% (specific gravity below 1.155).

Keep all metallic objects off the top of the batteries, as they may cause a short circuit. Replace worn or damaged cables and terminals.

Check the electrolyte level in each battery cell before and after charging the batteries. Never add acid to the batteries, use distilled water. Do not allow water level to fall below the battery plates. Portions of plates exposed to air will be destroyed. Do not overfill. Keep plugs firmly in place at all times.

### **▲ CAUTION**

When servicing machine, avoid contact with battery acid.

### **▲ WARNING**

Batteries emit hydrogen gas. Explosion or fire can result. Keep sparks and open flame away. Keep covers open when charging.

### **▲ WARNING**

Wear eye protection and protective clothing when working with batteries.

### **▲ WARNING**

Charge batteries in a well ventilated area.

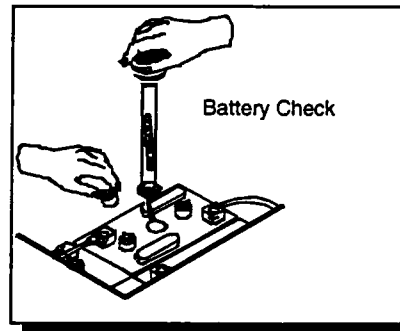
## BATTERY MAINTENANCE

1. When cleaning the batteries, use a solution of baking soda and water. Do not allow the cleaning fluid to enter the battery cells, electrolyte will be neutralized.
2. Maintain the proper electrolyte level in each battery cell. If a cell should accidentally overflow, clean immediately.

3. Wipe off the top of the batteries at least once a week.
4. Test battery condition with a hydrometer at least once a week.
5. Ensure that all connections are tight and all corrosion removed.
6. Every 4 to 6 months, remove that batteries from the machine and clean the battery cases and battery compartment.

## CHECKING BATTERY SPECIFIC GRAVITY

Use a hydrometer to check the battery specific gravity.



## CHECKING GRAVITY

### A. Hydrometer

### B. Battery

*NOTE: Do not take readings immediately after adding distilled water, if the water and acid are not thoroughly mixed, the reading may not be accurate.*

Check the hydrometer readings against this chart.

| SPECIFIC GRAVITY<br>@ 80° F (27°C) | BATTERY CONDITION |
|------------------------------------|-------------------|
| 1.265                              | 100% CHARGED      |
| 1.225                              | 75% CHARGED       |
| 1.190                              | 50% CHARGED       |
| 1.155                              | 25% CHARGED       |
| 1.120                              | DISCHARGED        |

*NOTE: If the readings are taken when the battery electrolyte is any temperature other than 80° F (27°C), the reading must be temperature corrected.*

To find the corrected specific gravity reading when the temperature of the battery electrolyte is other than 80°F (27°): Add (+) to the specific gravity reading 0.004 (4 points), for each 10°F (6°C) above 80° (27°C).

Subtract (-) from the specific reading 0.004 (4 points), for each 10°F (6°C) below 80°F (27°C).

## TO CHARGE THE BATTERIES

### **⚠ CAUTION**

When servicing machine, avoid contact with battery acid.

### **⚠ WARNING**

Batteries emit hydrogen gas. Explosion or fire can result. Keep sparks and open flame away. Keep covers open when charging.

### **⚠ WARNING**

Wear eye protection and protective clothing when working with batteries.

### **⚠ WARNING**

Charge batteries in a well ventilated area. Leave the solution tank open.

Use a 24 volt, 20 amp maximum output, DC charger which will automatically shut off when the batteries are fully charged to charge the four battery pack.

1. Stop the machine in a clean, well ventilated area next to the charger.
2. Turn "OFF" machine.

**FOR SAFETY: Before leaving or servicing machine; stop on level surface, turn off machine and remove key.**

3. Drain solution tank and raise the solution tank and lock the support arm. Make sure the support arm is fully engaged.

### **⚠ WARNING**

Batteries emit hydrogen gas. Explosion or fire can result. Keep sparks and open flame away. Keep covers open when charging.

4. Check the electrolyte level in each battery cell. Before charging, add just enough distilled water to cover the plates. After charging is complete, add just enough distilled water to bring up the level to the indicator ring. If the water level is too high before charging, normal expansion rate of the electrolyte may cause an overflow. Resulting in a loss of battery acid balance and damage the machine.
5. Replace the battery caps, and leave them in place while charging.
6. Unplug the battery connector from the machine.

**FOR SAFETY: When charging, connect the charger to the batteries before connecting the charger to the AC wall outlet. Never connect the charger to the AC wall outlet first. Hazardous sparks may result.**

7. Plug the charger connector into the battery connector. Connect the charger AC plug to a wall outlet. The charger gauge should indicate that the batteries are charging.
8. When the batteries are fully charged, disconnect the charger from the AC wall outlet, then disconnect the charger from the batteries.
9. Connect the batteries to the machine connector.
10. Check the electrolyte level. It should be up to the indicator ring. If necessary, add distilled water.
11. Lower the solution tank.

## CHANGING BATTERIES

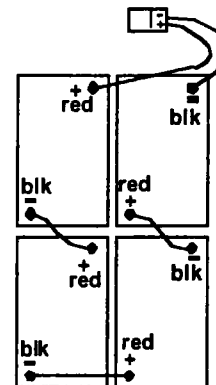
Stop the machine in a clean area next to the charger. Turn off machine.

**FOR SAFETY: Before leaving or servicing the machine; stop on level surface, turn off machine and remove key.**

1. Raise the solution tank.
2. Engage solution tank support arm.
3. Disconnect battery pack from machine.
4. Use the proper size open end wrench to disconnect main ground wire first and secure cable terminal away from batteries.
5. Disconnect main positive lead and secure cable terminals away from batteries.
6. Loosen both terminals on each jumper cable and remove one at a time.
7. Prepare a suitable site to place the batteries.
8. Attach suitable battery lifting device and lift batteries from the machine.

### **⚠ WARNING**

Batteries are a potential environmental hazard. Consult your battery supplier for safe disposal methods.



# MAINTENANCE

## SCRUB BRUSHES

*NOTE: All original equipment brushes are equipped with "Perform Alert®". This feature will tell the operator when it is time to replace the scrub brushes. "Perform Alert®" brushes have pre-trimmed bright yellow tufts to indicate the length of a worn out brush. When the tufts in the scrub brush wear to a length equal to the yellow tufts, the scrub brushes should be replaced.*

There are five different types of brushes available to cover applications from cleaning heavily soiled floors to polishing. A pad driver is also available to take advantage of the many cleaning pads on the market and further add to the flexibility of the BETCO. Please refer to the following to assist in selecting the proper brush or pad for the work at hand.

### UNCOATED FLOORS

**Aggressive Grit** is a nylon fiber impregnated with silicone carbide grit. It grinds away stain, soil, and removes surface material.

**Mild Grit** is a less aggressive silicone carbide grit suitable for cleaning medium soil conditions. Advantages are faster ground speed than nylon bristles on light solid applications.

**Nylon** is a general-purpose scrub brush with stiff bristles. Polypropylene works well for maintaining concrete, wood and tile floors.

### FINISHED FLOORS

**Nylon Polish** is the softest brush. It will gently clean finished tile or terrazzo floors without removing floor finish or floor material. Used for washing highly polished or burnished floors.

**Nylon** bristles are used in a variety of applications on coated or uncoated surfaces.

**White Pads** (Polishing) are used for dry polishing to achieve a high-gloss appearance, or surface washing on highly polished or burnished floors.

**Red Pads** (Buffing) are used for light-duty scrubbing. When used with a mild detergent they will provide surface cleaning without removing the finish.

**Blue Pads** (Scrubbing) are used for heavy-duty scrubbing and light stripping. The blue pads remove less finish than brown stripping pads, yet will remove black marks, stains and dirt.

**Brown Pads** (Stripping) are used for easy and complete removal of old floor waxes/finishes. They will quickly remove ground in dirt, black heel marks, and spills. When used with the proper stripper, this pad leaves the floor clean and ready for finishing.

The scrub brushes should be checked before each days work for wire, string, wear and damage. The scrub brushes should be replaced if brush bristles are missing or if yellow Perform Alert © indicates minimum brush length.

## REPLACING OR INSTALLING SCRUB BRUSHES

1. With the scrub deck up, turn "OFF" the machine.

**FOR SAFETY: Before leaving or servicing the machine; stop on level surface, turn OFF machine and remove key.**

2. Locate release lever on top of brush or pad driver. Rotate release lever counter-clockwise and the brush/pad driver will release and drop down.
3. To reinstall, center the brush driver under the brush drive hub. Raise until it contacts brush driver assembly. Turn clockwise until release lever plate locks into position.

*NOTE: Check that release plate is completely closed and pad/brush is securely attached. Damage to driver or brush could occur.*

4. Repeat the procedure for the opposite side of machine.

## SQUEEGEE BLADES

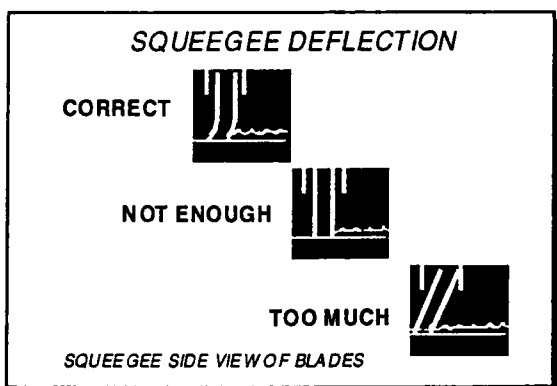
The front squeegee blade allows solution to pass through channels in the blade into the squeegee assembly while maintaining vacuum to provide lift. The front blade has four wear surfaces and can be rotated for extended life. There are three different notch patterns and three different colors of squeegees for varying floor conditions. The red blade has the most notches and is for normal, smooth surfaces. The blue blade has less notches and is for rougher or tiled surfaces. The green blade has no notches and is for rough surfaces such as knobby tile or uneven tile. The linatex blades are used for industrial settings. The front blade should not require regular replacement under normal use.

The rear blade wipes the floor to a near dry condition. It is important the rear blade be in good condition to properly do its job. As with the front blades there are 4 rear blade options; red, blue, green and linatex. Front and rear blades should be color matched. Each squeegee blade assembly has four wear surfaces for extended service.

Check both the front and rear squeegee blades for damage, wear, and adjustment each day in the pre-run check. Change the front blade if it is torn or has an uneven edge. Change the rear blade if it is less than 1/2 the original thickness.

## ADJUSTING SQUEEGEE

Adjusting the squeegee is a two-part process. First, the squeegee assembly must have correct pitch in order for the squeegee blade to have the same deflection at each tip as well as the center. The knob on the squeegee linkage controls the pitch adjustment. The second adjustment is the deflection. Knobs on each end of the squeegee control the Standard Squeegee Assembly adjustment. A color-coded slide bar controls the Smart Squeegee Option adjustment according to the type of floor and squeegee blade employed.



## TO REMOVE SQUEEGEE ASSEMBLY

1. With the squeegee in the up position, turn key switch "OFF".
2. Disconnect vacuum hose from squeegee and loosen both knobs.
3. Pull squeegee assembly rearward from the lifting carrier.
4. Inspect or repair as necessary and reinstall.

## TO REPLACE OR ROTATE REAR SQUEEGEE BLADES

1. With the squeegee in the up position, turn key switch "OFF".

**FOR SAFETY: Before leaving or servicing machine; stop on level surface, turn off machine and remove key.**

2. Remove the squeegee assembly from the machine. Unlatch and remove blade retainer strap and remove squeegee blade.
3. Rotate the squeegee to new edge position or replace as required. Each blade has four new edge positions.
4. Install blade on locating pins of squeegee assembly.
5. Install squeegee retainer strap.
6. For Smart Squeegee Option Only: Fasten and lock latch, adjust latch only tight enough to take up slack in retaining strap.

## TO REPLACE OR ROTATE FRONT SQUEEGEE BLADE – STANDARD SQUEEGEE ASSEMBLY ONLY

1. With the squeegee in the up position, turn key switch "OFF".
2. Remove the squeegee from the machine. Loosen three thumbscrews and remove the retainer strap and squeegee blade.
3. Rotate the squeegee to new edge position or replace as required. Each blade has four new edge positions. When installing the front blade, tighten the center thumbscrew first. Insure that the retainer strap is pressed against the blade before tightening the outer screws.

## MAINTENANCE

### TO REPLACE OR ROTATE FRONT SQUEEGEE BLADE – SMART SQUEEGEE OPTION ONLY

1. With the squeegee in the up position, turn key switch "OFF".
2. Remove the squeegee from the machine. Release latch securing retainer strap.
3. Remove front retainer strap.
4. Remove squeegee blade from locating pins on squeegee assembly and rotate to new position or replace as required.
5. Install blade on locating pins of squeegee tool.
6. Replace front retainer strap.
7. Secure strap by locking latch.

### TO ADJUST SQUEEGEE PITCH

1. Choose a smooth, level surface. Turn "ON" the key switch. Lower the squeegee and drive forward at least 2 feet (60cm.).
2. With the squeegee down, stop the machine. Do not allow machine to roll back.

**FOR SAFETY: Before leaving or servicing the machine; stop on level surface, turn off machine and remove key.**

3. Determine the differences, if any, in deflection of the squeegee blade between each end and the middle. Proper adjustment is obtained when deflection is equal all the way across the squeegee blade.
4. To decrease the deflection of the squeegee blade at the ends, loosen plastic knob near the squeegee center. To increase the deflection at the ends of the squeegee assembly, tighten plastic knob.
5. Check the deflection of the squeegee blades again. Repeat steps 1 through 4 until the deflection is equal across the entire rear squeegee blade.

### TO ADJUST AMOUNT OF REAR SQUEEGEE DEFLECTION

1. Choose a smooth, level surface. Lower the squeegee and drive forward at least 2 feet.
2. With the squeegee down, stop the machine. Do not allow machine to roll back.

**FOR SAFETY: Before leaving or servicing machine; stop on level surface, turn off machine and remove key.**

3. Observe the amount of squeegee deflection. It should deflect 3/8 in. (9.5mm) across the entire width of the squeegee.
4. To increase the squeegee deflection, turn the 2 knobs at the squeegee ends CCW. To decrease the deflection, turn the knob CW.

*NOTE: The deflection should be consistent along the length of the squeegee. If the deflection varies from end to end the knobs can be adjusted independently to correct the variation.*

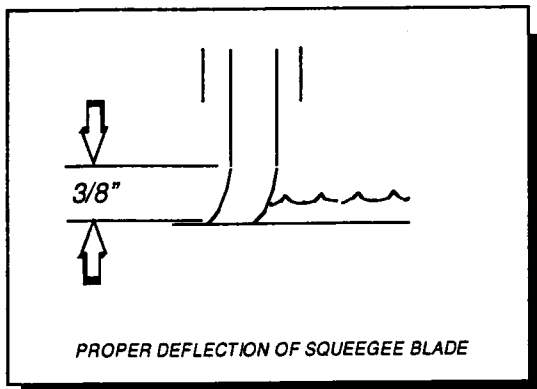
5. Turn on the key switch. Raise, then lower squeegee assembly. Drive forward at least 2 feet.
6. Repeat steps 2 through 4 until deflection of 3/8 in. (9.5mm) is reached.

### SCRUB DECK SKIRT AND SQUEEGEE

The skirts and squeegee should be inspected for wear and damage. The skirt is self-adjusting. Replace skirt when they become cracked, worn, torn or brittle.

### TIRES AND WHEELS

Check for low or worn tires. Fill to proper pressure as needed (50psi). Check wheel nuts for tightness, tighten as necessary.



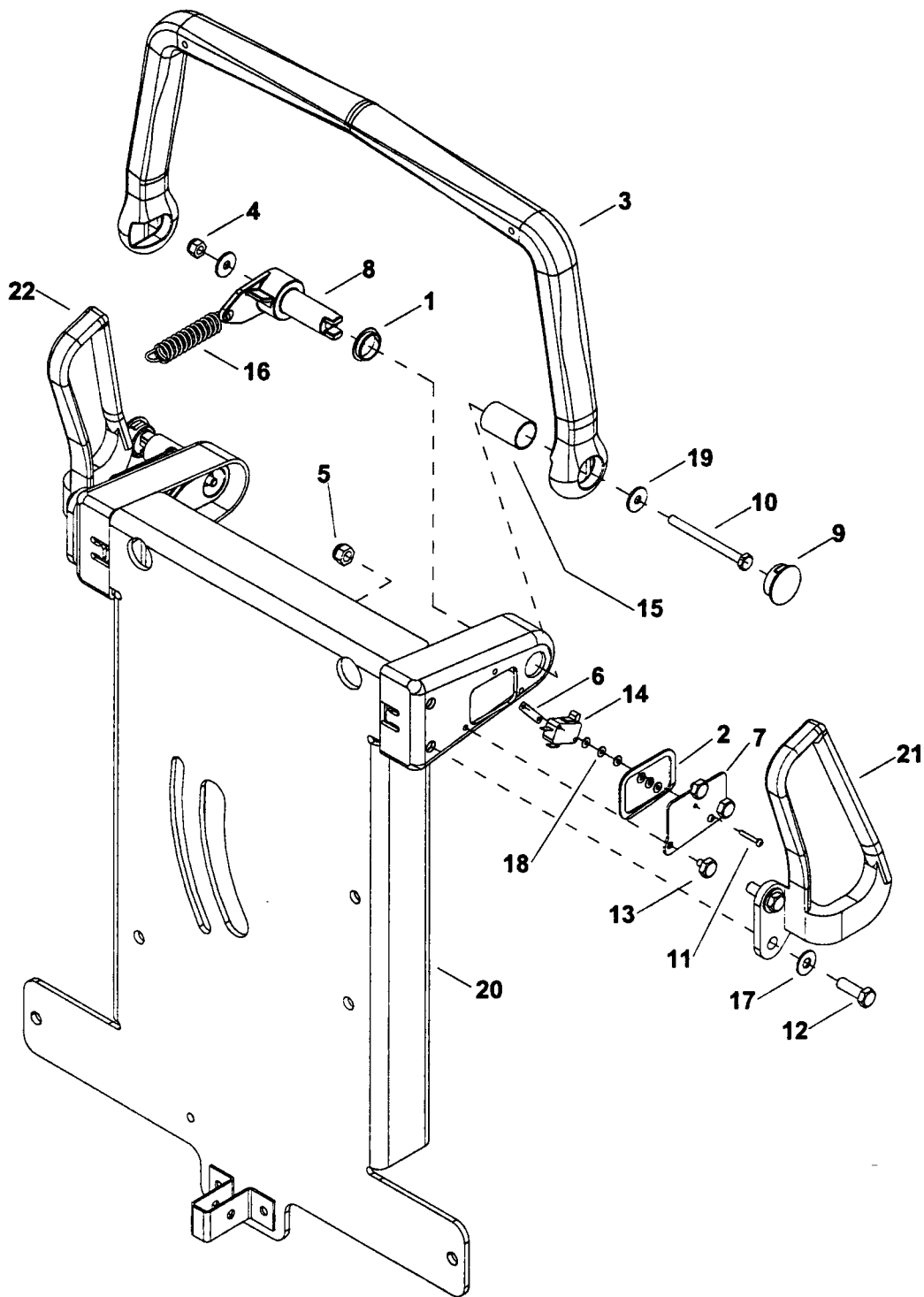
**SERVICE SCHEDULE**

**Before  
starting  
the work  
period**

**End of  
work  
period  
before  
storing**

| MAINTENANCE   | DAILY | WEEKLY | MONTHLY | ANNUALLY |
|---|-------|--------|---------|----------|
| Check battery acid level  | *     |        |         |          |
| Check vac hose connections  | *     |        |         |          |
| Clean the squeegee blades   | *     |        |         |          |
| Inspect brushes or pads for debris:<br>wire string, wear          | *     |        |         |          |
| Inspect vac fan shut off float screen                             | *     |        |         |          |
|   |       |        |         |          |
| Drain & rinse tanks   | *     |        |         |          |
| Raise squeegee assembly   | *     |        |         |          |
| Raise scrub deck assembly   | *     |        |         |          |
| Charge the batteries.   | *     |        |         |          |
| Remove the pad drivers/brushes                                    | *     |        |         |          |
| Check the brushes/pads for damage<br>and/or wear                  | *     |        |         |          |
| Clean squeegee blades.  | *     |        |         |          |
| Clean recovery tank shut off & screen                             | *     |        |         |          |
|   |       |        |         |          |
| Check battery cells w/ hydrometer                                 |       | *      |         |          |
| Check solution strainer   |       | *      |         |          |
| Check pivot points, caster and<br>squeegee for proper lubrication |       | *      |         |          |
| Inspect tank and hoses  |       | *      |         |          |
|   |       |        |         |          |
| Clean tops of batteries and tray                                  |       |        | *       |          |
| Check battery cable clamps  |       |        | *       |          |
| Use a vacuum to remove lint from the<br>motor windings            |       |        | *       |          |
| Grease casters  |       |        | *       |          |
|   |       |        |         |          |
| Inspect all motors for carbon motor<br>brush wear                 |       |        |         | *        |

# CONTROL HANDLE GROUP

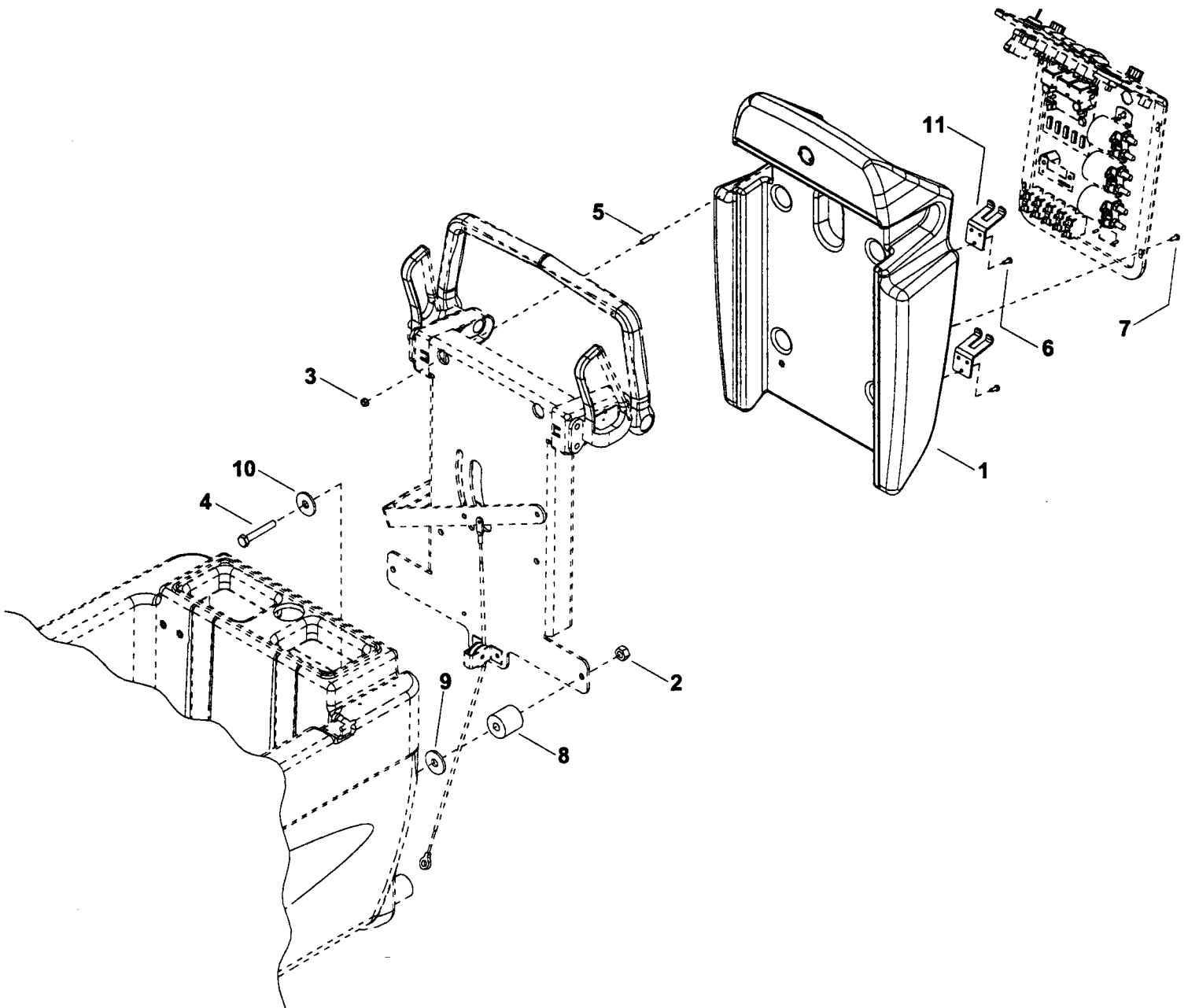




## CONTROL HANDLE GROUP

| REF | PART NO. | QTY | DESCRIPTION                       | SERIAL NO.<br>FROM | NOTES:    |
|-----|----------|-----|-----------------------------------|--------------------|-----------|
| 1   | 09129    | 2   | BEARING, 3/4 NYLINER SI           |                    |           |
| 2   | 35220    | 2   | GASKET, MICRO SWITCH COVER        |                    |           |
| 3   | 38275    | 1   | HANDLE, SABER                     |                    |           |
| 4   | 57047    | 2   | NUT, 1/4-20 HEX NYLOCK            |                    |           |
| 5   | 57113    | 4   | NUT, 5/16-18 HEX NYLOCK           |                    |           |
| 6   | 57247    | 2   | NUT, PLATE SWITCH MOUNTING        |                    |           |
| 7   | 62726    | 2   | PLATE, MICROSWITCH MOUNT          |                    |           |
| 8   | 66293    | 2   | PIVOT, HANDLE                     |                    |           |
| 9   | 66301    | 2   | PLUG, 1.00 HOLE                   |                    |           |
| 10  | 70129    | 2   | SCR, 1/4-20 X 3.00 HHCS           |                    |           |
| 11  | 70245    | 4   | SCR, 4-40 X 3/4 PPHMS             |                    |           |
| 12  | 70302    | 4   | SCR, 5/16-18 X 1.00 HHCS GR5      |                    |           |
| 13  | 70351    | 6   | SCR, 10-32 X 3/8 HHTR W/STAR      |                    |           |
| 14  | 72093    | 2   | SWITCH, MICRO                     |                    |           |
| 15  | 73913    | 2   | SPACER, 7/8 OD X .78 ID X 1.375 L |                    |           |
| 16  | 73938    | 2   | SPRING, EXT. .5D X 2.75L X .075W  |                    |           |
| 17  | 87029    | 4   | WASHER, 5/16 X 3/4 SS             |                    |           |
| 18  | 87068    | 12  | WASHER, 1/8 RIVET BACKUP          |                    |           |
| 19  | 87090    | 4   | WASHER, 1/4 X 3/4 FLAT            |                    |           |
| 20  | 89186    | 1   | WELDMENT, TOWER VALUE             |                    |           |
| 21  | 140247   | 1   | BAR, GRAB HANDLE LEFT             |                    |           |
| 22  | 140248   | 1   | BAR, GRAB HANDLE RIGHT            |                    |           |
| 23  | 98721    | 1   | SERVICE TAG                       |                    | NOT SHOWN |
| 24  | 14382    | 1   | BAND, SERVICE TAG                 |                    | NOT SHOWN |

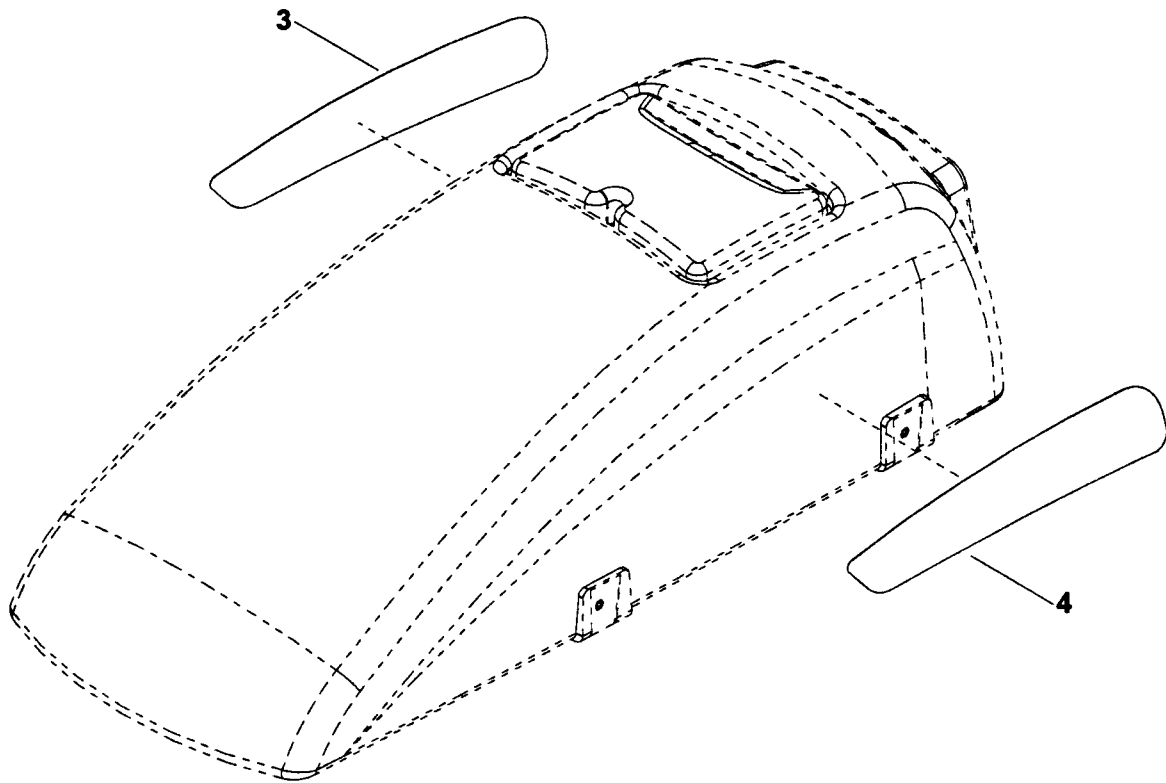
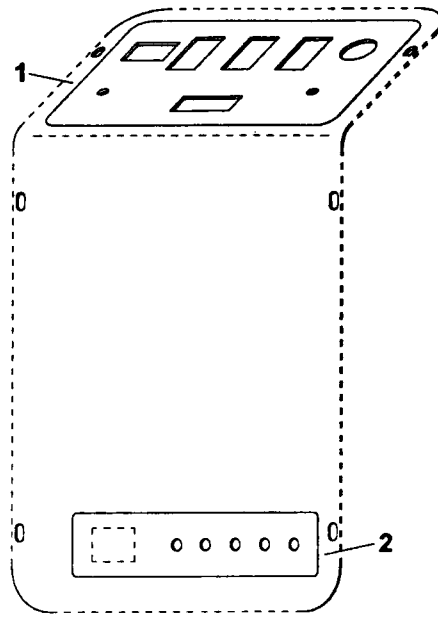
# CONTROL TOWER GROUP



## CONTROL TOWER GROUP

| REF | PART NO. | QTY | DESCRIPTION                   | SERIAL NO.<br>FROM | NOTES: |
|-----|----------|-----|-------------------------------|--------------------|--------|
| 1   | 27874    | 1   | CONSOLE, REAR                 |                    |        |
| 2   | 57119    | 4   | NUT, 3/8-16 HEX NYLOCK        |                    |        |
| 3   | 57189    | 4   | NUT, 1/4-20 FLANGE LOCK       |                    |        |
| 4   | 70070    | 4   | SCR, 3/8-16 X 2 HHCS SS       |                    |        |
| 5   | 70393    | 4   | SET SCR, 1/4-20X 1.25L        |                    |        |
| 6   | 70403    | 6   | SCR, #10 X 1/2 PHST TYPE B    |                    |        |
| 7   | 70532    | 6   | SCR, 10-32 X 1/2 PPHMS BLK    |                    |        |
| 8   | 73974    | 4   | SPACER, 1.13D X .41ID X .5THK |                    |        |
| 9   | 87086    | 2   | WASHER, M10 X 30 PLTD         |                    |        |
| 10  | 87185    | 4   | WASHER, 3/8 SEALING X 3/4 OD  |                    |        |
| 11  | 140133   | 2   | BRACKET, RECOVERY HOSE        |                    |        |

# DECAL GROUP

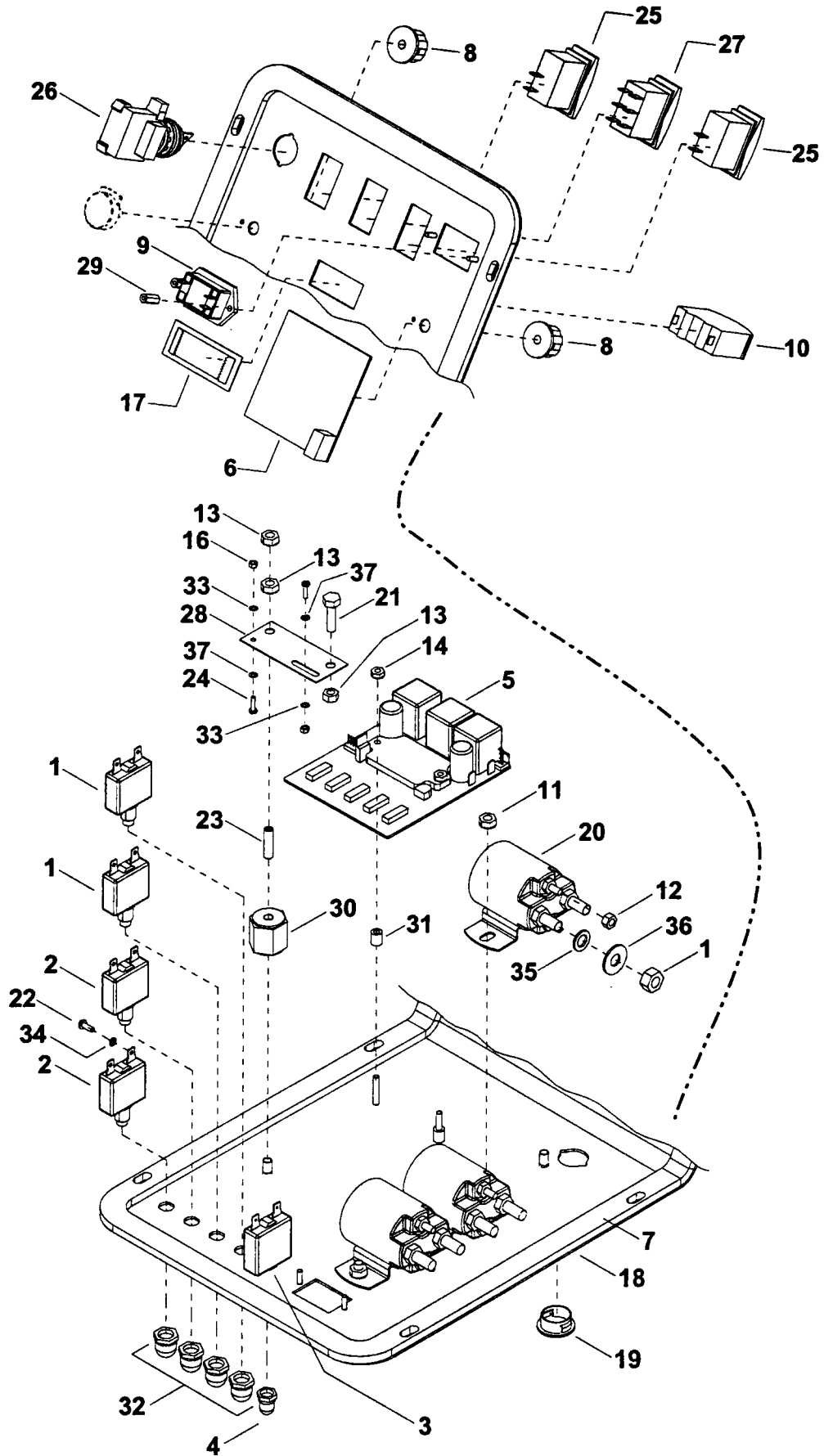


**DECAL GROUP**

| REF | PART NO. | QTY | DESCRIPTION             | SERIAL NO.<br>FROM | NOTES: |
|-----|----------|-----|-------------------------|--------------------|--------|
| 1   | 500023   | 1   | LABEL, SCRUBBER PANEL   |                    |        |
| 2   | 500024   | 1   | LABEL, CIRCUIT BREAKERS |                    |        |
| 3   | 500161   | 1   | LABEL, BETCO RIGHT      |                    |        |
| 4   | 500160   | 1   | LABEL, BETCO LEFT       |                    |        |

**NOTE: SEE "SAFETY LABEL LOCATION" PAGE FOR SAFETY LABEL INFORMATION.**

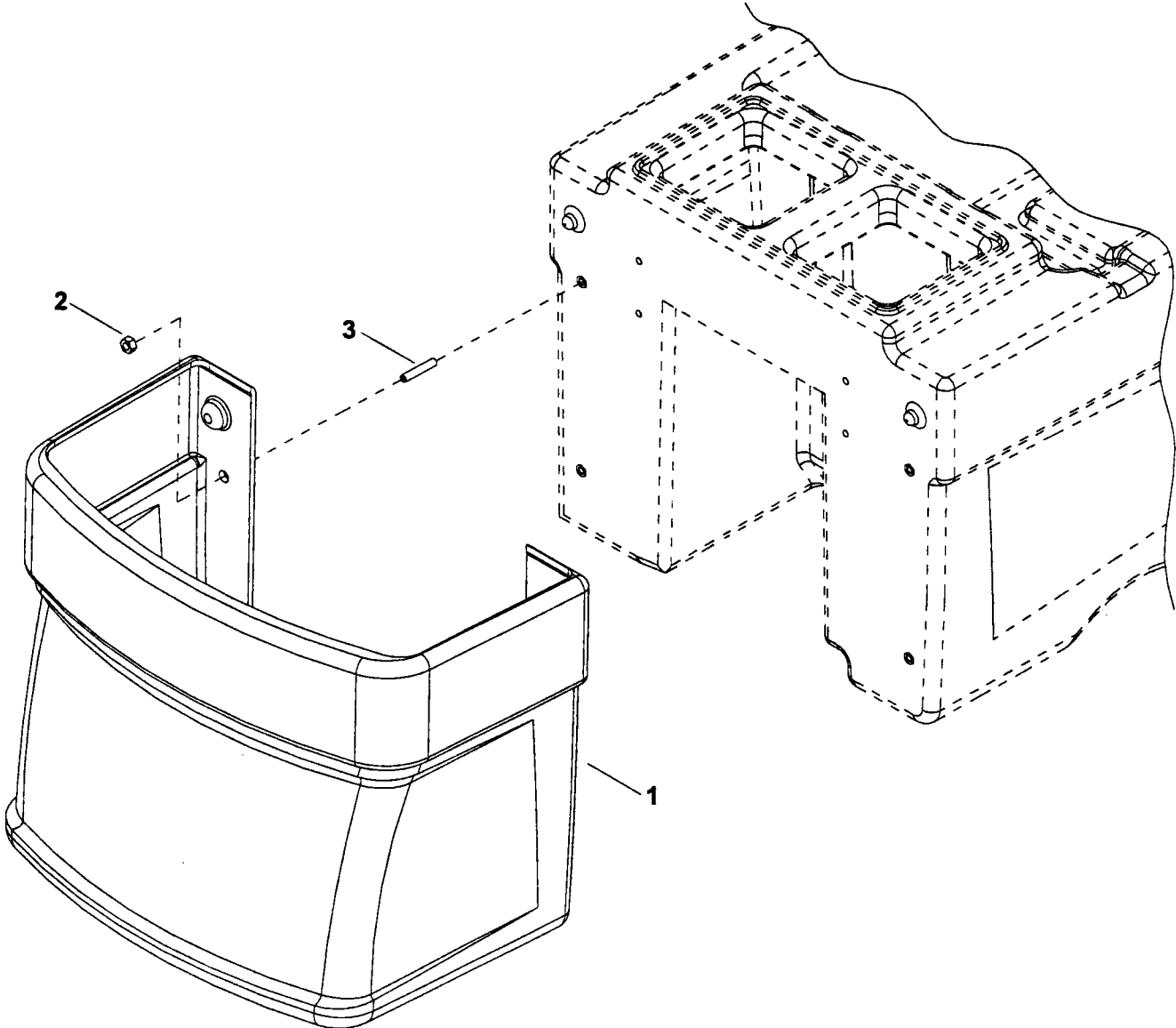
# ELECTRICAL PANEL GROUP



## ELECTRICAL PANEL GROUP

| REF | PART NO. | QTY | DESCRIPTION                          | SERIAL NO.<br>FROM | NOTES: |
|-----|----------|-----|--------------------------------------|--------------------|--------|
| 1   | 14606    | 2   | BREAKER, 30A 250VAC 50VDC            |                    |        |
| 2   | 14607    | 2   | BREAKER, 25A 250VAC 50VDC            |                    |        |
| 3   | 14717    | 1   | BREAKER, 3A 250VAC 50VDC             |                    |        |
| 4   | 14942    | 1   | BOOT, 3/8 CIRCUIT BREAKER            |                    |        |
| 5   | 27695    | 1   | CONTROLLER, 24VDC PROPEL MTR         |                    |        |
| 6   | 27858    | 1   | CIRCUIT BOARD, SOLUTION/FLOAT        |                    |        |
| 7   | 35210    | 1   | GASKET, ELECTRIC PANEL               |                    |        |
| 8   | 48072    | 2   | KNOB, 1.06 OD X .25 ID W/SET SCR     |                    |        |
| 9   | 54145    | 1   | METER, 24V BATTERY CHARGE LEVEL      |                    |        |
| 10  | 54156    | 1   | METER, 0-50 AMP DC                   |                    |        |
| 11  | 57047    | 4   | NUT, 1/4-20 HEX NYLOCK               |                    |        |
| 12  | 57104    | 6   | NUT, 10-32 W/STAR WASHER PLTD        |                    |        |
| 13  | 57105    | 3   | NUT, 1/4-20 HEX W/STAR               |                    |        |
| 14  | 57106    | 2   | NUT, 8-32 HEX W/STAR                 |                    |        |
| 15  | 57117    | 6   | NUT, 5/16-24 HEX PLTD                |                    |        |
| 16  | 57256    | 2   | NUT, 6-32 HEX BRASS                  |                    |        |
| 17  | 62283    | 1   | PLATE, METER RETAINING               |                    |        |
| 18  | 62808    | 1   | PLATE, ELECTRIC PANEL                |                    |        |
| 19  | 66321    | 1   | PLUG, .875 HOLE                      |                    |        |
| 20  | 67393    | 3   | RELAY, 24VDC 100 AMP                 |                    |        |
| 21  | 70011    | 1   | SCR, 1/4-20 X 5/8 HHCS SS DL         |                    |        |
| 22  | 70067    | 8   | SCR, 6-32 X 3/8 PPHMS SS             |                    |        |
| 23  | 70393    | 1   | SET SCR, 1/4-20X 1.25L               |                    |        |
| 24  | 70615    | 2   | SCR, 6-32 X 3/8 SRHMS BR             |                    |        |
| 25  | 72130    | 2   | SWITCH, SPST 2-POSITION ROCKER       |                    |        |
| 26  | 72159    | 1   | SWITCH, KEY 2 POSITION               |                    |        |
| 27  | 72165    | 1   | SWITCH, DPDT 3-POSITION ROCKER       |                    |        |
| 28  | 73987    | 1   | SHUNT, DC AMM. 25 AMP, 50 MV         |                    |        |
| 29  | 73538    | 2   | STANDOFF, 5/8 L, 6-32                |                    |        |
| 30  | 73659    | 1   | STANDOFF, INS. 1.0L, 1/4-20 THD      |                    |        |
| 31  | 73734    | 2   | SPACER, .166 ID X .313 OD X .375L AL |                    |        |
| 32  | 80845    | 4   | BOOT, 3/8 CIRCUIT BREAKER            |                    |        |
| 33  | 87026    | 2   | WASHER, #6 LOCK EXT STAR SS          |                    |        |
| 34  | 87134    | 8   | WASHER, #6 SPLIT                     |                    |        |
| 35  | 87142    | 6   | WASHER, .344X.69X.066 FLAT PLT       |                    |        |
| 36  | 87166    | 6   | WASHER, 5/16 EXT LOCK PLTD           |                    |        |
| 37  | 87187    | 2   | WASHER, #6 FLAT BRASS                |                    |        |

**FRONT COVER GROUP**

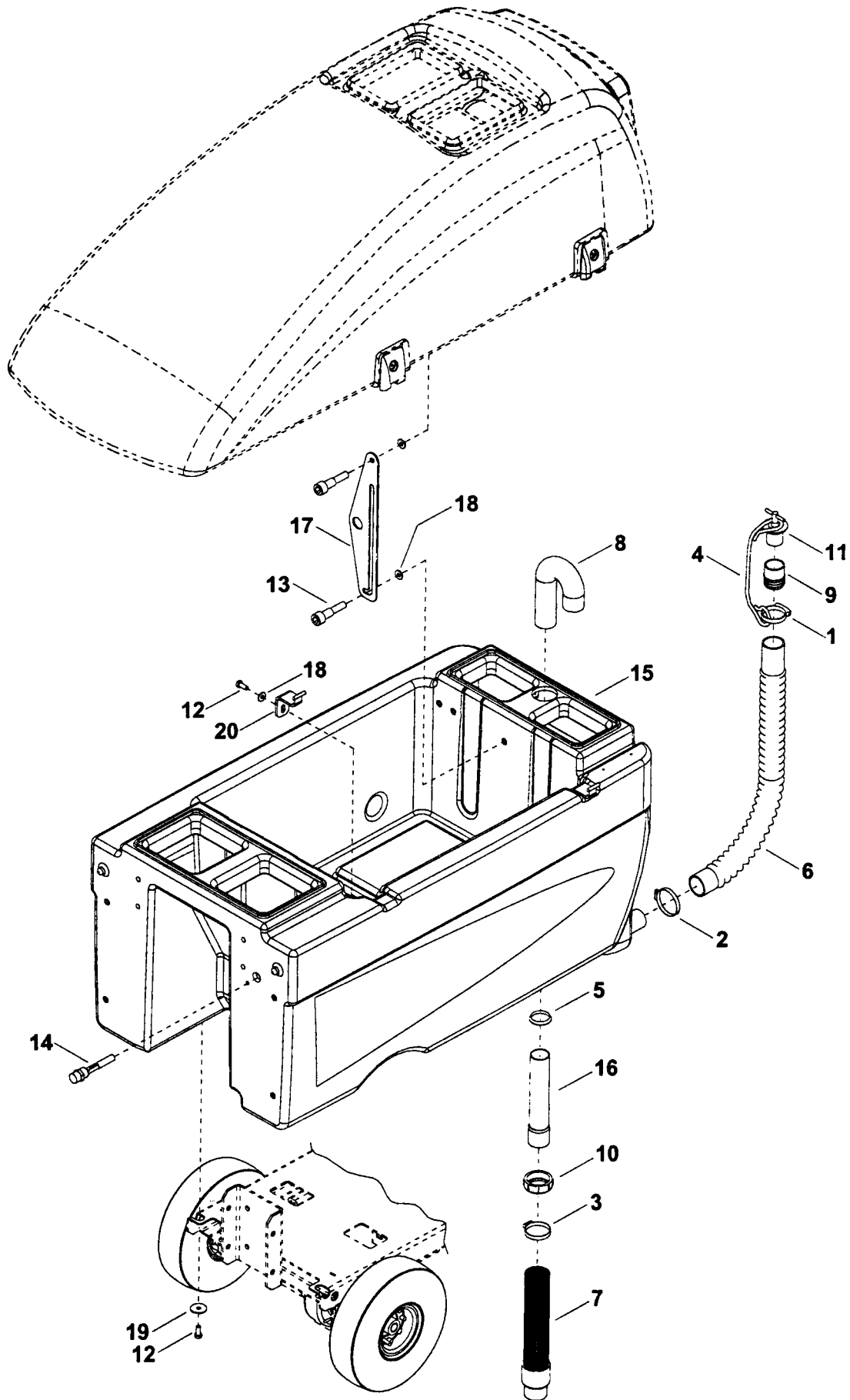




**FRONT COVER GROUP**

| REF | PART NO. | QTY | DESCRIPTION               | SERIAL NO.<br>FROM | NOTES: |
|-----|----------|-----|---------------------------|--------------------|--------|
| 1   | 27875    | 1   | COVER, FRONT              |                    |        |
| 2   | 57112    | 2   | NUT, 5/16-18 SERRATED FLG |                    |        |
| 3   | 70639    | 4   | SCR, 5/16 X 1.75 SSSCU    |                    |        |

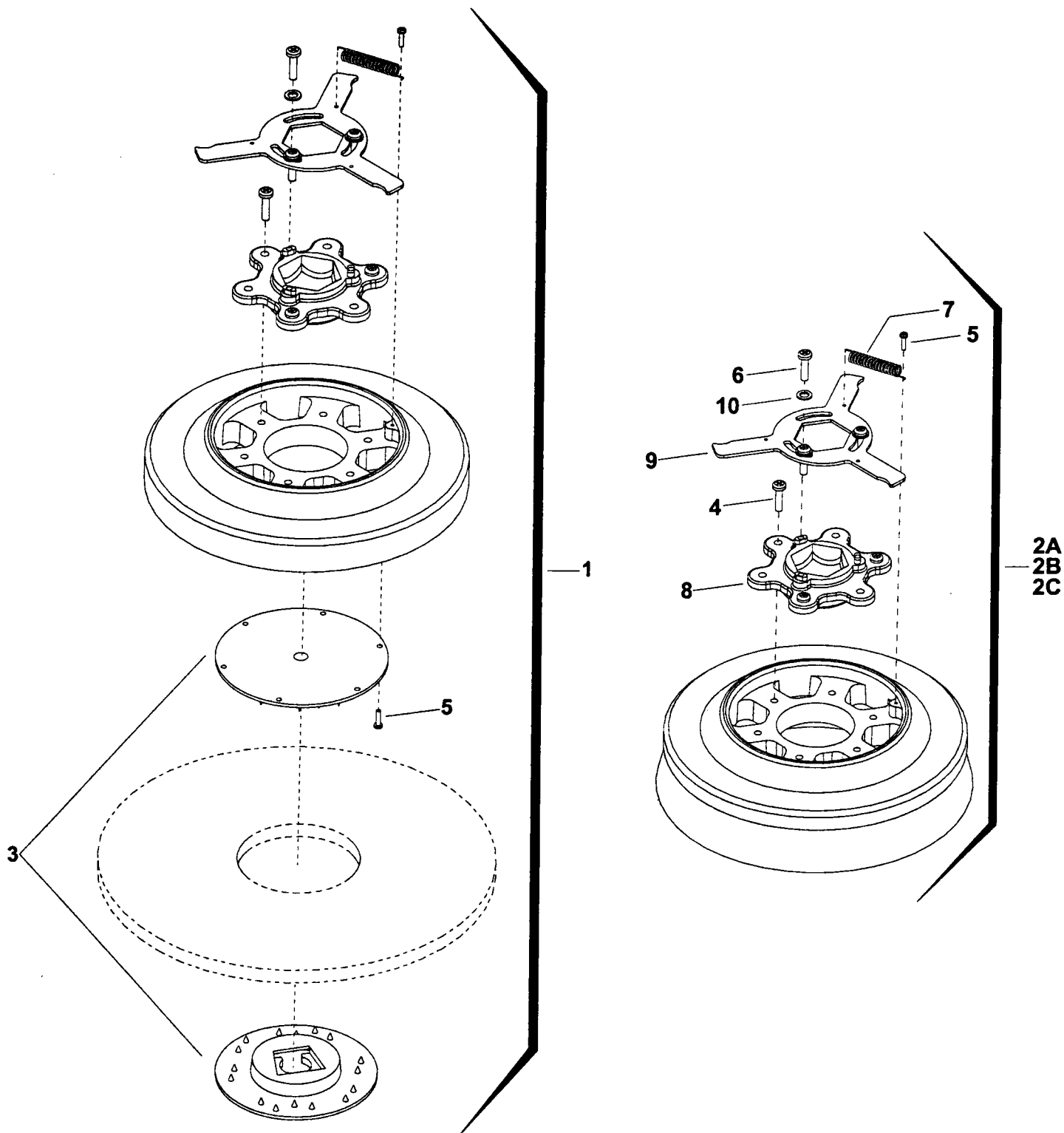
# RECOVERY TANK GROUP



**RECOVERY TANK GROUP**

| REF | PART NO. | QTY | DESCRIPTION                    | SERIAL NO.<br>FROM | NOTES: |
|-----|----------|-----|--------------------------------|--------------------|--------|
| 1   | 20002    | 1   | CLAMP, 2" NYLON RACHET         |                    |        |
| 2   | 20046    | 1   | CLAMP, 2.5" WORM GEAR          |                    |        |
| 3   | 20064    | 1   | CLAMP, 2.0" WORM GEAR X .312W  |                    |        |
| 4   | 27670    | 1   | CORD, DRAIN PLUG               |                    |        |
| 5   | 35219    | 1   | GASKET, 1 1/2 COMPRESSION      |                    |        |
| 6   | 39472    | 1   | HOSE, 1.5 X 24.0 DRAIN         |                    |        |
| 7   | 39511    | 1   | HOSE ASM, 1.5 X 11 BLK VAC     |                    |        |
| 8   | 39519    | 1   | HOSE, P-TRAP                   |                    |        |
| 9   | 40019    | 1   | HOSEBARB, 1.5 DOUBLE MCHD      |                    |        |
| 10  | 57033    | 1   | NUT, 1.5 SLIP JOINT            |                    |        |
| 11  | 66227    | 1   | PLUG, DRAIN HOSE               |                    |        |
| 12  | 70305    | 6   | SCR, 5/16-18 X 3/4HHCSGR5PLTDL |                    |        |
| 13  | 70641    | 2   | SHOULDER BOLT, 3/8OD X 3/8L SS |                    |        |
| 14  | 73906    | 1   | SWITCH ASM, FLOAT              |                    |        |
| 15  | 75309    | 1   | TANK, RECOVERY                 |                    |        |
| 16  | 78406    | 1   | TUBE, 1.50 X 8.00 PVC          |                    |        |
| 17  | 82575    | 1   | PLATE, TANK SUPPORT            |                    |        |
| 18  | 87029    | 4   | WASHER, 5/16 FLAT SS           |                    |        |
| 19  | 87102    | 4   | WASHER, 5/16 ID X 1-1/4 OD     |                    |        |
| 20  | 89127    | 2   | WLDMNT, HINGE PIN              |                    |        |

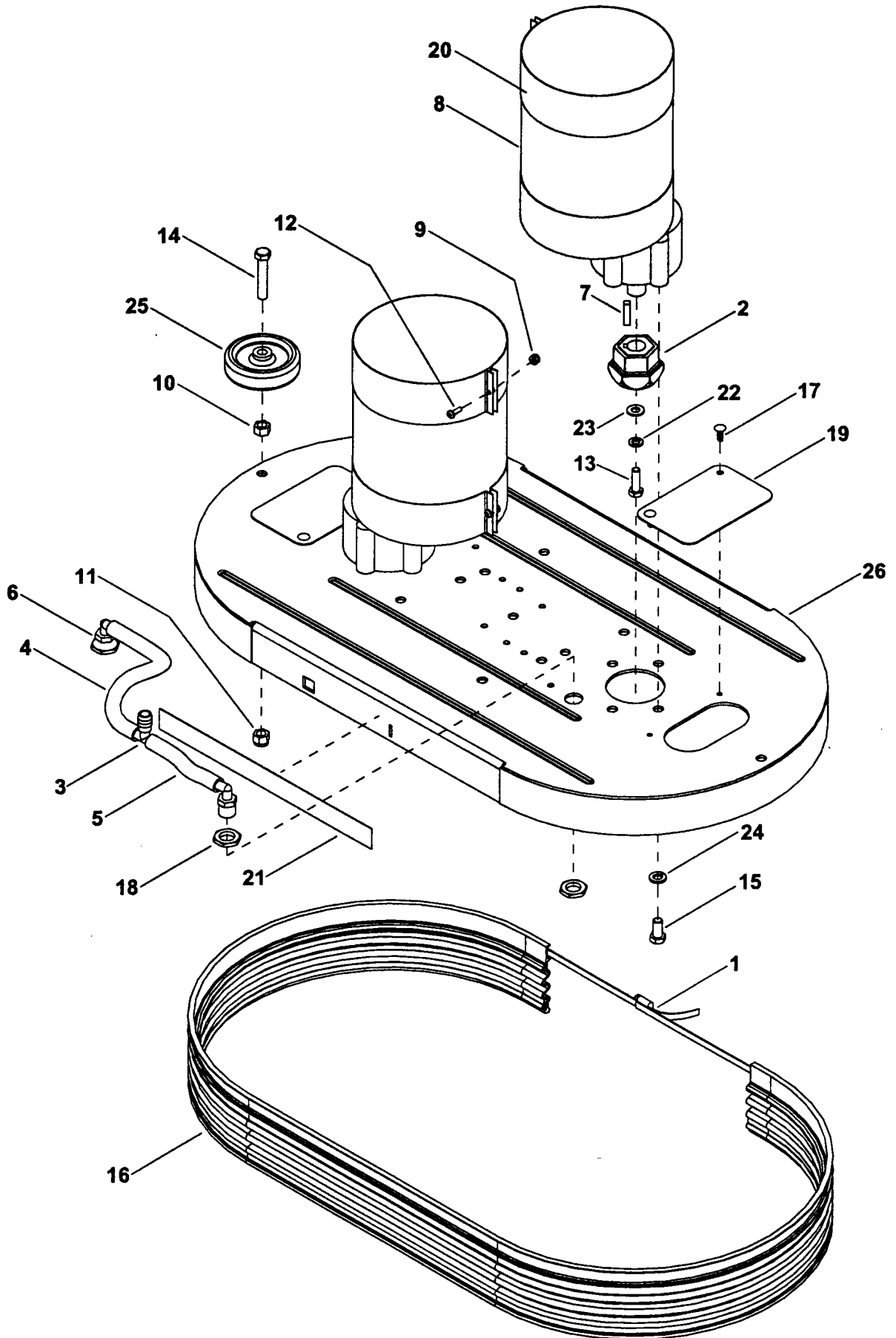
# SCRUB BRUSH/PAD DRIVER GROUP – 28 IN



## SCRUB BRUSH/PAD DRIVER GROUP – 28 IN

| REF | PART NO. | QTY | DESCRIPTION                     | SERIAL NO.<br>FROM | NOTES: |
|-----|----------|-----|---------------------------------|--------------------|--------|
| 1   | 02337    | -   | PAD DRIVER, 14" HEX             |                    |        |
| 2A  | 02344    | -   | BRUSH, 14" POLYPROPYLENE HEX    |                    |        |
| 2B  | 02345    | -   | BRUSH, 14" NYLON HEX            |                    |        |
| 2C  | 02346    | -   | BRUSH, 14" MILD GRIT HEX        |                    |        |
| 3   | 51284    | -   | LOCK, PAD CENTER SNAP, TWO STEP |                    |        |
| 4   | 70682    | -   | SCR, 1/4-20 X 5/8 PPHTC SS      |                    |        |
| 5   | 70576    | -   | SCR, #8 X 1/2 PPH T/S SS        |                    |        |
| 6   | 70682    | -   | SCR, 1/4-20 X 5/8 PPHTC SS      |                    |        |
| 7   | 73817    | -   | SPRING, EXT .31D X 2.0L X .03W  |                    |        |
| 8   | 73861    | -   | CLUTCH, HEX DRIVE               |                    |        |
| 9   | 81471    | -   | PLATE, BRUSH RELEASE            |                    |        |
| 10  | 87013    | -   | WASHER, 1/4 ID X 5/8 OD SS      |                    |        |

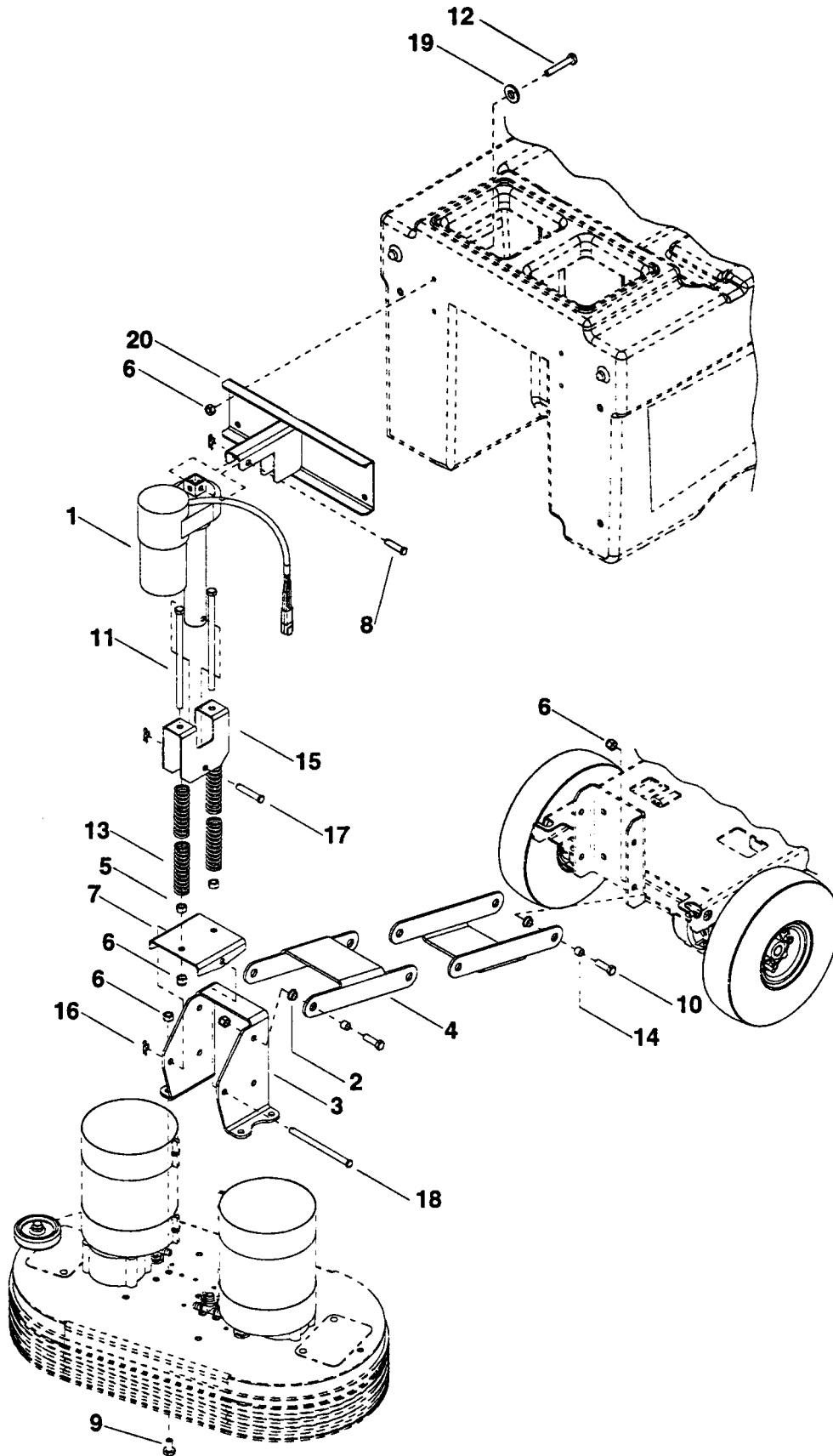
# SCRUBHEAD GROUP - 28 IN



## SCRUBHEAD GROUP – 28 IN

| REF | PART NO. | QTY | DESCRIPTION                       | SERIAL NO.<br>FROM | NOTES:      |
|-----|----------|-----|-----------------------------------|--------------------|-------------|
| 1   | 20076    | 1   | CLAMP, WORM GEAR .5W X 24 #390    |                    |             |
| 2   | 29119    | 2   | DRIVER, BRUSH                     |                    |             |
| 3   | 34327    | 1   | FITTING, 1/2 X 3/8 X 3/8 RED. TEE |                    |             |
| 4   | 39053    | 1   | HOSE, 3/8 NYLOBRAID X 7.0"        |                    |             |
| 5   | 39452    | 1   | HOSE, 3/8 NYLOBRAID X 5-1/2"      |                    |             |
| 6   | 40043    | 2   | HOSEBARB, 3/8 MPT X 3/8 HOSE 90   |                    |             |
| 7   | 48040    | 2   | KEY, 1/4 SQ X 1.00                |                    |             |
| 8   | 53632    | 2   | MOTOR, 36VDC 200 RPM 3/4 HPGEAR   |                    |             |
|     | 14647    | -   | BRUSH SET, IMPERIAL MOTOR         |                    | (NOT SHOWN) |
| 9   | 57026    | 4   | NUT, 8-32 HEX NYLOCK              |                    |             |
| 10  | 57111    | 1   | NUT, 3/8-16 HEX                   |                    |             |
| 11  | 57119    | 1   | NUT, 3/8-16 HEX NYLOCK            |                    |             |
| 12  | 70051    | 4   | SCR, 8-32 X 1/2 PPHMS SS          |                    |             |
| 13  | 70083    | 2   | SCR, 5/16-18 X 1.00 HHCS SS       |                    |             |
| 14  | 70385    | 1   | SCR, 3/8-16 X 2.00 HHCS GR5       |                    |             |
| 15  | 70507    | 8   | SCR, 3/8-16 X 3/4 HHCS GR5        |                    |             |
| 16  | 73889    | 1   | SKIRT, SHROUD 3.25 X 65.0 L       |                    |             |
| 17  | 80805    | 4   | CLIP, TREE .19 HOLE FLAT HEAD     |                    |             |
| 18  | 81380    | 4   | NUT, SEALED BULKHEAD              |                    |             |
| 19  | 81898    | 2   | COVER, BRUSH RELEASE              |                    |             |
| 20  | 82259    | 4   | GUARD, MOTOR                      |                    |             |
| 21  | 82923    | 1   | PAD, ANTI SLIP 1.00 X 12.0 L      |                    |             |
| 22  | 87083    | 2   | WASHER, 5/16 SPLIT                |                    |             |
| 23  | 87142    | 2   | WASHER, .34 X .69 FLAT            |                    |             |
| 24  | 87163    | 8   | WASHER, 3/8 SPLIT                 |                    |             |
| 25  | 89059    | 1   | WHEEL, PT20 SQUEEGEE              |                    |             |
| 26  | 89193    | 1   | WELDMENT, SCRUB HEAD 28IN         |                    |             |

# SCRUBHEAD LIFT GROUP

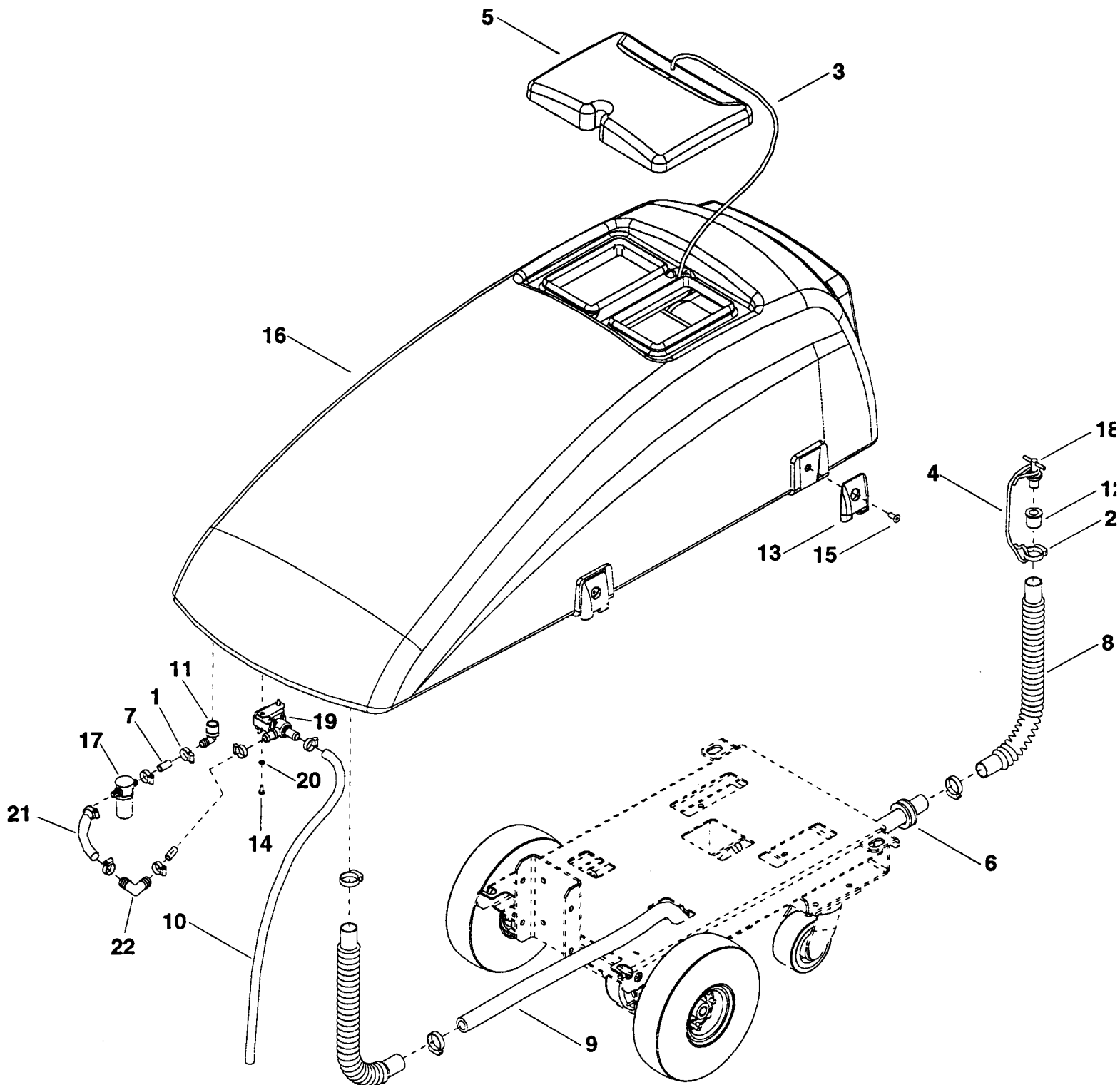




**SCRUBHEAD LIFT GROUP**

| REF | PART NO. | QTY | DESCRIPTION                      | SERIAL NO.<br>FROM | NOTES: |
|-----|----------|-----|----------------------------------|--------------------|--------|
| 1   | 05123    | 1   | ACTUATOR, 24 VDC 5.0 STROKE      |                    |        |
| 2   | 09130    | 8   | BEARING, 1/2 NYLINER SF          |                    |        |
| 3   | 140372   | 1   | BRKT, SCRUB HEAD MOUNT           |                    |        |
| 4   | 27856    | 2   | LINKAGE, SCRUB DECK SV           |                    |        |
| 5   | 57111    | 2   | NUT, 3/8-16 HEX                  |                    |        |
| 6   | 57119    | 18  | NUT, 3/8-16 HEX NYLOCK           |                    |        |
| 7   | 62676    | 1   | PLATE, SPRING SUPPORT            |                    |        |
| 8   | 66232    | 1   | PIN, CLEVIS 3/8 X 1.50           |                    |        |
| 9   | 70266    | 4   | SCR, 3/8-16 X 1" HHCSGR5PLT DL   |                    |        |
| 10  | 70377    | 8   | SCR, 3/8-16 X 1.25 HHCS GR5      |                    |        |
| 11  | 70574    | 2   | SCR, 3/8-16 X 7.5 HHCS GR5 PLTD  |                    |        |
| 12  | 70662    | 4   | SCR, 3/8-16 X 1.25 HHMS SS       |                    |        |
| 13  | 73883    | 4   | SPRING, COMP. .97 OD X 3.5 L     |                    |        |
| 14  | 80102    | 8   | SPACER, .500 OD X .391 ID X .400 |                    |        |
| 15  | 80459    | 1   | PLATE, SPRING RETAINER           |                    |        |
| 16  | 80606    | 3   | COTTER, 3/8" RING                |                    |        |
| 17  | 81406    | 1   | PIN, CLEVIS 3/8" X 2"            |                    |        |
| 18  | 82060    | 1   | PIN, CLEVIS 3/8 X 5.25           |                    |        |
| 19  | 87185    | 4   | WASHER, 3/8 SEALING X 3/4 OD     |                    |        |
| 20  | 89184    | 1   | WELDMENT, ACTUATOR MOUNT         |                    |        |

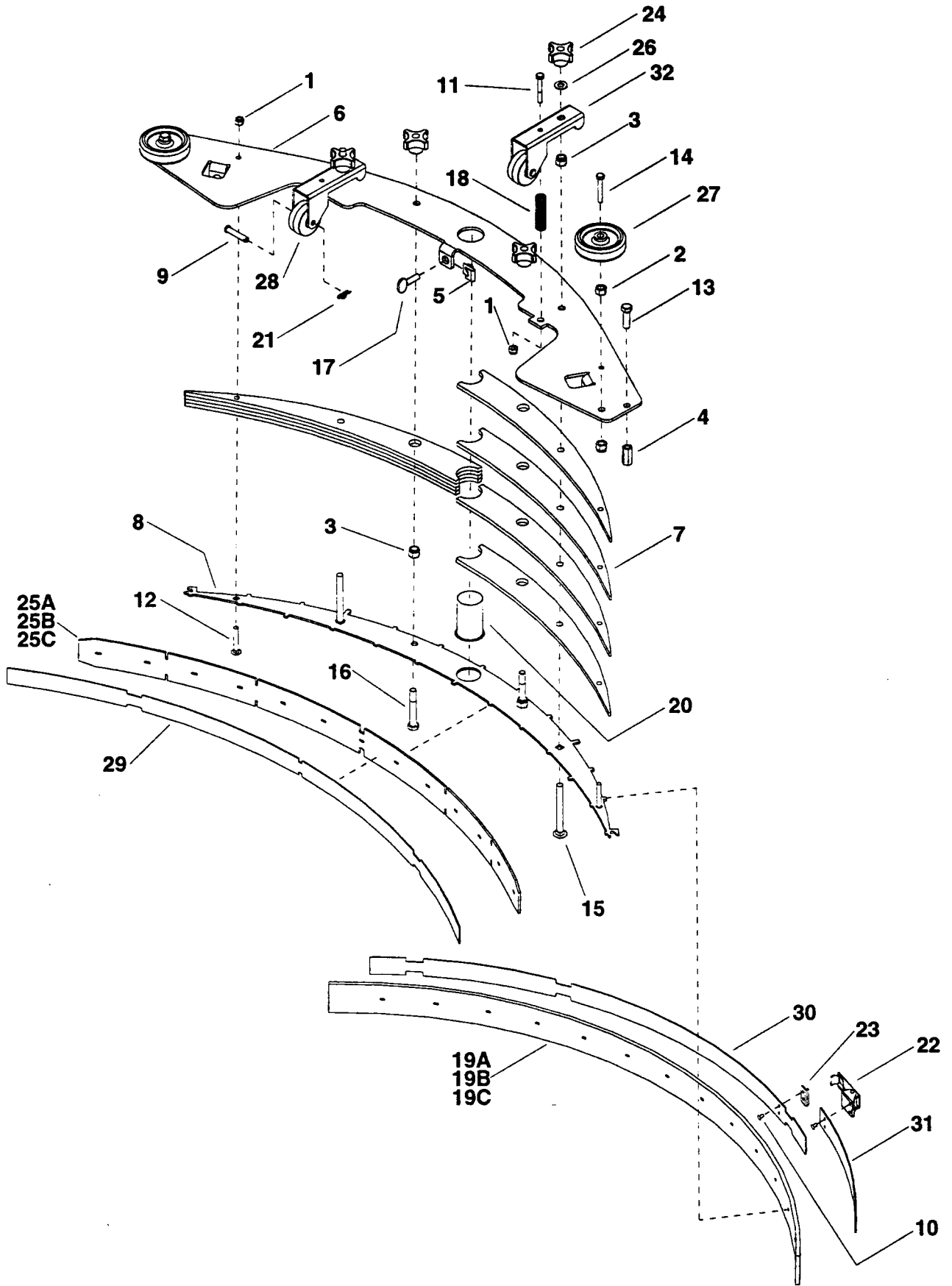
# SOLUTION TANK GROUP



## SOLUTION TANK GROUP

| REF | PART NO. | QTY | DESCRIPTION                    | SERIAL NO.<br>FROM | NOTES: |
|-----|----------|-----|--------------------------------|--------------------|--------|
| 1   | 20042    | 6   | CLAMP, 3/8 HOSE (D-SLOT)       |                    |        |
| 2   | 20090    | 4   | CLAMP, 1.0 NYLON RACHET        |                    |        |
| 3   | 27425    | 1   | CORD, SOLUTION COVER           |                    |        |
| 4   | 27670    | 1   | CORD, DRAIN PLUG               |                    |        |
| 5   | 27772    | 1   | COVER, SOLUTION TANK           |                    |        |
| 6   | 36191    | 1   | GROMMET 1.00 ID 3/16 GRIP      |                    |        |
| 7   | 39498    | 2   | HOSE, 1/2" NYLOBRAID X 1 1/2"  |                    |        |
| 8   | 39505    | 2   | HOSE, 1.0 X 18.0 DRAIN         |                    |        |
| 9   | 39514    | 1   | HOSE, 3/4 ID X .12W X 32" CLR  |                    |        |
| 10  | 39521    | 1   | HOSE, 1/2 NYLOBRAID X 36"      |                    |        |
| 11  | 40039    | 1   | HOSEBARB, 1/2MPT X 1/2 HOSE 90 |                    |        |
| 12  | 40076    | 1   | SLEEVE .63 ID X 1.0 OD         |                    |        |
| 13  | 41333    | 2   | HINGE, SCRUBBER TANK           |                    |        |
| 14  | 70088    | 2   | SCR, 10-32 X 1/2 PPHMS SS      |                    |        |
| 15  | 70632    | 2   | SCR, 5/16-18 X 3/4 FHSCS BLKZC |                    |        |
| 16  | 75310    | 1   | TANK, SOLUTION                 |                    |        |
| 17  | 73999    | 1   | STRAINER, 1/2 HOSE 40 MESH     |                    |        |
| 18  | 82267    | 1   | PLUG, 5/8" DRAIN HOSE          |                    |        |
| 19  | 84141    | 1   | VALVE, 24VDC SOL. 1/2"HOSEBARB |                    |        |
| 20  | 87095    | 2   | WASHER, #10 FLAT PLTD          |                    |        |
| 21  | 39549    | 1   | HOSE, 1/2" WIRE BOUND X 5"     |                    |        |
| 22  | 40082    | 1   | HOSEBARB, 1/2 X 90D            |                    |        |

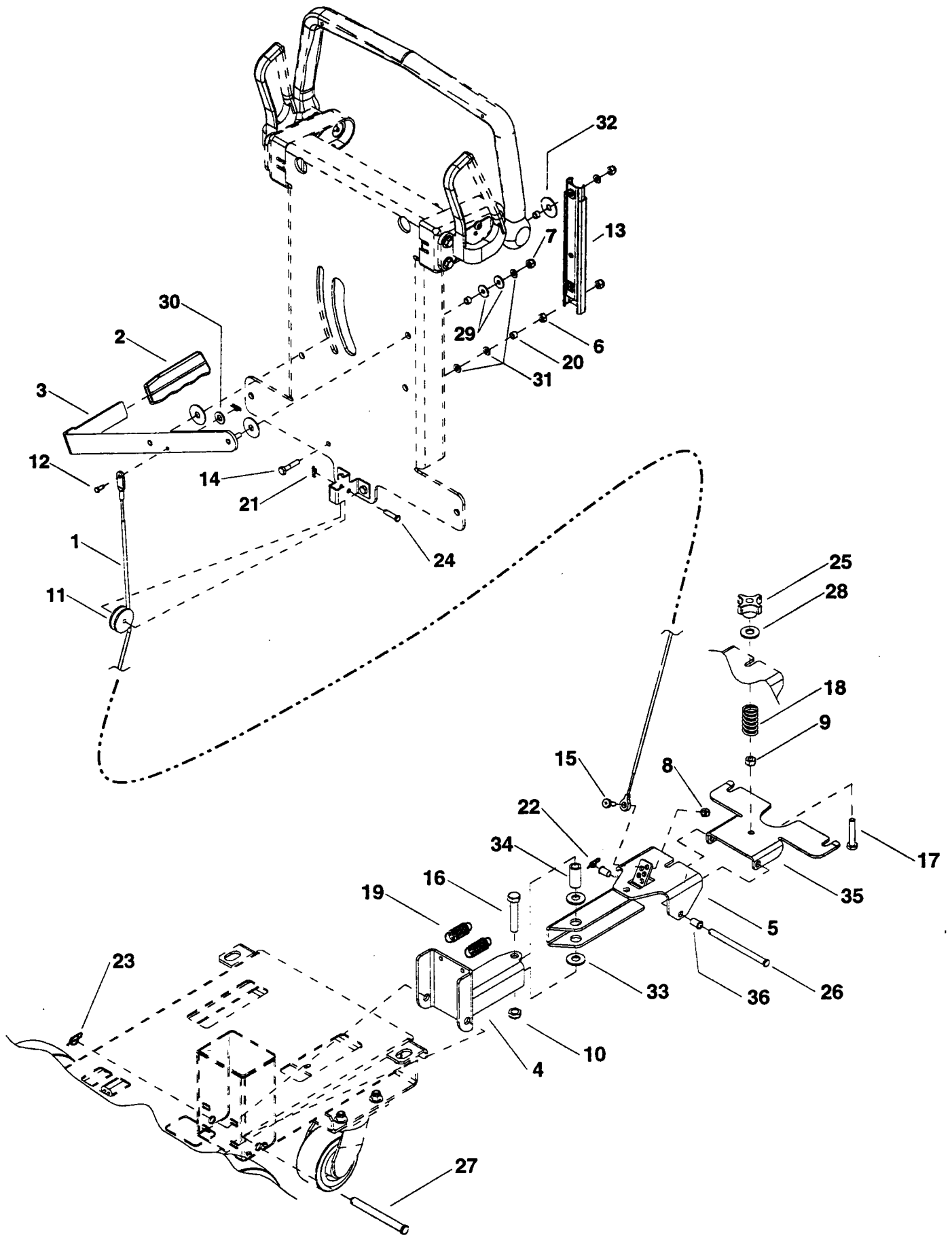
# SQUEEGEE GROUP - 28 IN SCRUBHEAD



## SQUEEGEE GROUP – 28 IN SCRUBHEAD

| REF | PART NO. | QTY | DESCRIPTION                    | SERIAL NO.<br>FROM | NOTES:     |
|-----|----------|-----|--------------------------------|--------------------|------------|
| 1   | 57047    | 4   | NUT, 1/4-20 HEX NYLOCK         |                    |            |
| 2   | 57111    | 2   | NUT, 3/8-16 HEX                |                    |            |
| 3   | 57119    | 6   | NUT, 3/8-16 HEX NYLOCK         |                    |            |
| 4   | 57269    | 2   | NUT, 3/8-16 HEX COUPLING SS    |                    |            |
| 5   | 57270    | 3   | NUT, 5/16-18 CAPTIVE "J" PLTD  |                    |            |
| 6   | 62811    | 1   | PLATE, SQG RETAINER TOP        |                    |            |
| 7   | 62812    | 8   | PLATE, SQUEEGEE FILLER         |                    |            |
| 8   | 62813    | 7   | PLATE, SQG BLADE RETAINER      |                    |            |
| 9   | 66276    | 2   | PIN, CLEVIS 5/16 X 1.625 LG    |                    |            |
| 10  | 67380    | 4   | RIVET, 5/32 OF X 1/8 GRIP      |                    |            |
| 11  | 70105    | 2   | SCR, 1/4-20 X 1.75 HHCS PLTD   |                    |            |
| 12  | 70291    | 2   | SCR, 1/4-20 X 1.5 ELEVATOR     |                    |            |
| 13  | 70377    | 2   | SCR, 3/8-16 X 1.25 HHCS GR5PLT |                    |            |
| 14  | 70385    | 2   | SCR, 3/8-16 X 2.0 HHCS GR5 PLT |                    |            |
| 15  | 70678    | 2   | SCR, 3/8-16X3.5 CARRIAGE PLTD  |                    |            |
| 16  | 70679    | 2   | SCR, 3/8-16 X 2.5 TAP          |                    |            |
| 17  | 70680    | 3   | SCR, 5/16-18X1 THUMB SS TYPE P |                    |            |
| 18  | 73576    | 2   | SPRING, COMP .60D X2.0L X.045W |                    |            |
| 19A | 73900    | 1   | SQGE BLADE, REAR LINATEX 44"   |                    | (STANDARD) |
| 19B | 73902    | -   | SQGE BLADE, REAR (TILE) 44"    |                    | (OPTION)   |
| 19C | 73901    | -   | SQGE BLADE, REAR (BUTTONS) 44" |                    | (OPTION)   |
| 20  | 78034    | 1   | TUBE, 1.5 OD X 2.5 VAC INTAKE  |                    |            |
| 21  | 80605    | 2   | COTTER, 5/16" RING             |                    |            |
| 22  | 81488    | 1   | LATCH, SQUEEGEE STRAP          |                    |            |
| 23  | 81489    | 1   | STRIKER, SQUEEGEE STRAP REAR   |                    |            |
| 24  | 81535    | 4   | KNOB, 3/8-16 4 PRONG           |                    |            |
| 25A | 82528    | 1   | SQUEEGEE, FRONT BLADE LINATEX  |                    | (STANDARD) |
| 25B | 82637    | -   | SQUEEGEE, FRONT BLADE (TILE)   |                    | (OPTION)   |
| 25C | 82640    | -   | SQUEEGEE, FRONT BLADE (BUTTON) |                    | (OPTION)   |
| 26  | 87030    | 2   | WASHER, 3/8 ID X 3/4 OD NYLON  |                    |            |
| 27  | 89059    | 2   | WHEEL, BUMPER                  |                    |            |
| 28  | 89197    | 2   | WHEEL, 2 OD X.31IDX.875W, GRY  |                    |            |
| 29  | 140380   | 1   | BAND, SQUEEGEE FRONT           |                    |            |
| 30  | 140381   | 1   | BAND, SQUEEGEE REAR            |                    |            |
| 31  | 140382   | 1   | BAND, SQUEEGEE REAR (S)        |                    |            |
| 32  | 140385   | 2   | BRKT, WHEEL MOUNT              |                    |            |

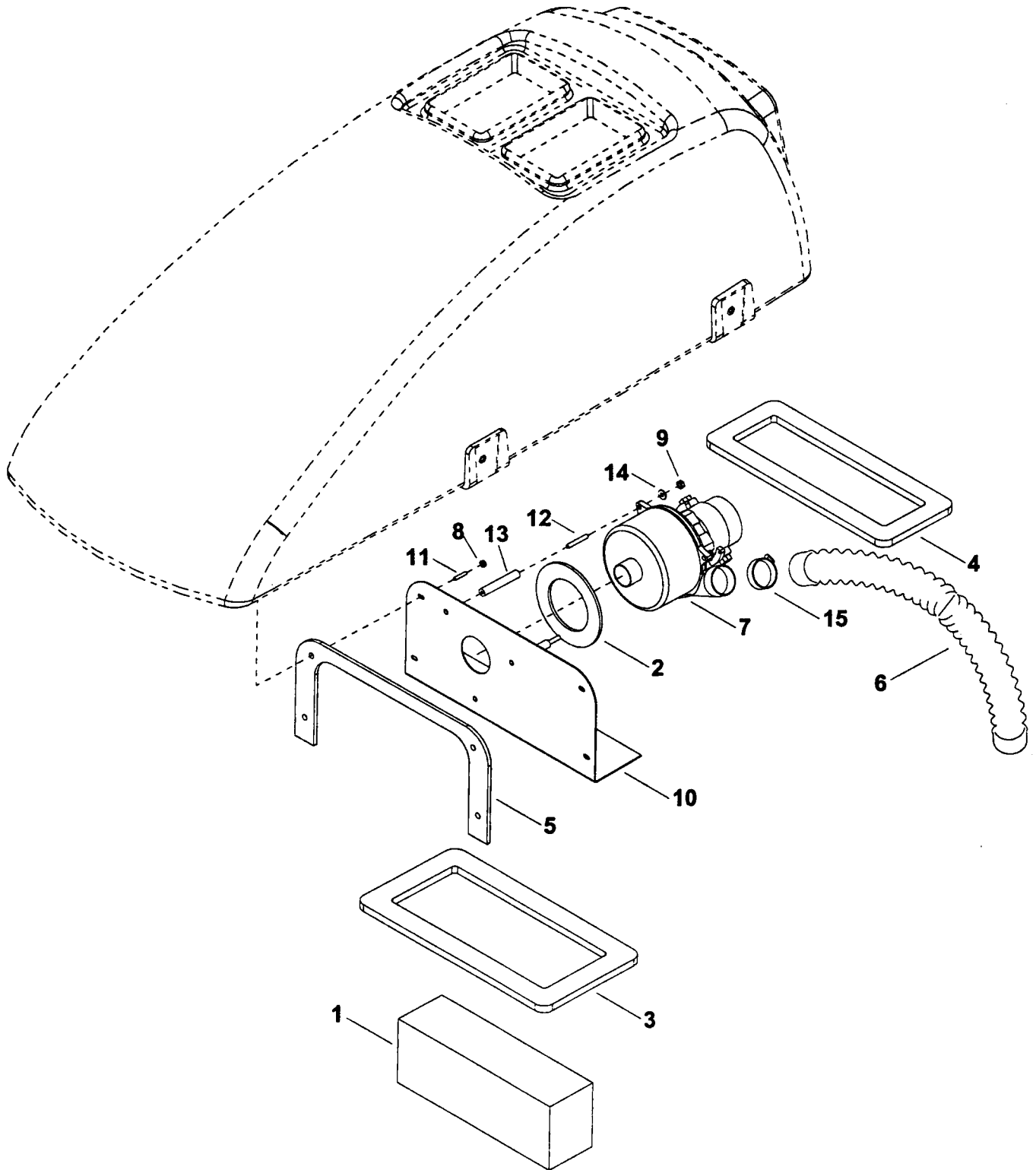
# SQUEEGEE LIFT GROUP



## SQUEEGEE LIFT GROUP

| REF | PART NO. | QTY | DESCRIPTION                      | SERIAL NO.<br>FROM | NOTES: |
|-----|----------|-----|----------------------------------|--------------------|--------|
| 1   | 27794    | 1   | CABLE, 23.70 X 1/8               |                    |        |
| 2   | 36133    | 1   | GRIP, 3/16 X 1.0 FLAT BAR        |                    |        |
| 3   | 51289    | 1   | LEVER, SQUEEGEE LIFT             |                    |        |
| 4   | 51322    | 1   | LINKAGE, SQUEEGEE LIFT           |                    |        |
| 5   | 51323    | 1   | LINKAGE, SQUEEGEE PIVOT          |                    |        |
| 6   | 57006    | 1   | NUT, 1/4-20 HEX                  |                    |        |
| 7   | 57047    | 3   | NUT, 1/4-20 HEX NYLOCK           |                    |        |
| 8   | 57113    | 1   | NUT, 5/16-18 HEX NYLOCK          |                    |        |
| 9   | 57119    | 1   | NUT, 3/8-16 HEX NYLOCK           |                    |        |
| 10  | 57153    | 1   | NUT, 1/2-13 X HEX NYLOCK THIN    |                    |        |
| 11  | 64096    | 1   | PULLEY, 1.5 OD X .5 W X .25 B    |                    |        |
| 12  | 66191    | 1   | PIN, CLEVIS 3/16" X 1/2" PLTD    |                    |        |
| 13  | 67423    | 1   | RAIL RACHET                      |                    |        |
| 14  | 70297    | 1   | SCR, 1/4-20 X 1.5 HHMS           |                    |        |
| 15  | 70641    | 1   | SHOULDER BOLT, 3/8OD X 3/8L SS   |                    |        |
| 16  | 70341    | 1   | SCR, 1/2-13 X 2.5 HHCS GR5PLT    |                    |        |
| 17  | 70685    | 1   | SCR, 3/8-16 X2.75 HHTB GR5 PLTD  |                    |        |
| 18  | 730006   | 1   | SPRING, COMP 1.100DX2.0LX.148W   |                    |        |
| 19  | 73979    | 2   | SPRING, EXT. 1.00 OD X 4.0 L     |                    |        |
| 20  | 78430    | 3   | TUBE, .38 OD X .26 ID X .38 LG   |                    |        |
| 21  | 80604    | 2   | COTTER, 1/4 RING                 |                    |        |
| 22  | 80606    | 1   | COTTER, 3/8 RING                 |                    |        |
| 23  | 80607    | 1   | COTTER, 1/2 RING                 |                    |        |
| 24  | 80612    | 1   | PIN, CLEVIS 1/4 X 1.0            |                    |        |
| 25  | 48077    | 1   | KNOB, 3.50 ODX3/8-16 THRU HOLE   |                    |        |
| 26  | 82060    | 1   | PIN, CLEVIS 3/8 X 5.25           |                    |        |
| 27  | 82322    | 1   | PIN, CLEVIS 1/2 X 4.80           |                    |        |
| 28  | 87086    | 1   | WASHER, M10 X 30 PLTD            |                    |        |
| 29  | 87030    | 2   | WASHER, 3/8 ID X 3/4 OD NYLON    |                    |        |
| 30  | 87056    | 1   | WASHER, M6 FLAT                  |                    |        |
| 31  | 87135    | 4   | WASHER, .26 ID X .50 OD          |                    |        |
| 32  | 87200    | 3   | WASHER, .4 ID X 1.3 OD NYLON     |                    |        |
| 33  | 87201    | 2   | WASHER, 0.781 ID FIBERGLIDE      |                    |        |
| 34  | 140293   | 1   | SPACER, .75 OD X .50 ID X 1.50 L |                    |        |
| 35  | 140379   | 1   | BRACKET, SQUEEGEE MOUNT          |                    |        |
| 36  | 80815    | 2   | BEARING, FLANGED PLASTIC         |                    |        |

# VACUUM GROUP

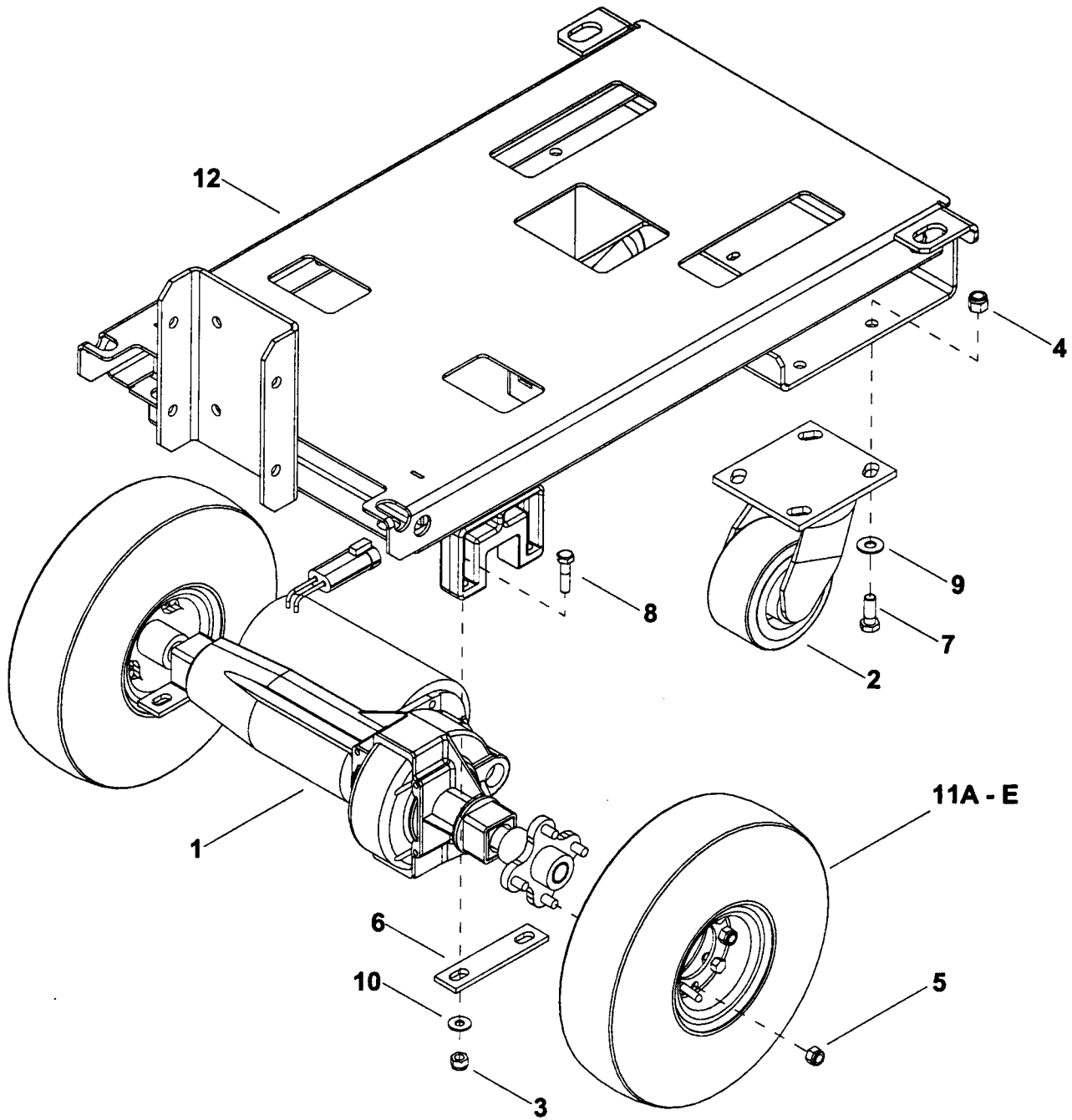




## VACUUM GROUP

| REF | PART NO. | QTY | DESCRIPTION                      | SERIAL NO.<br>FROM | NOTES:      |
|-----|----------|-----|----------------------------------|--------------------|-------------|
| 1   | 34337    | 1   | FILTER, VAC                      |                    |             |
| 2   | 35122    | 1   | GASKET, 230V C17E1/C20 VAC MOTOR |                    |             |
| 3   | 35211    | 1   | GASKET, 8.50 X 16.40 X .50T      |                    |             |
| 4   | 35212    | 1   | GASKET, 6.30 X 16.1 C .50T       |                    |             |
| 5   | 35214    | 1   | GASKET, VAC MOTOR                |                    |             |
| 6   | 39239    | 1   | HOSE, VAC EXHAUST X 24"          |                    |             |
| 7   | 53631    | 1   | VAC MOTOR ASM, 24VDC 3 STAGE     |                    |             |
|     | 14548    | -   | BRUSH SET, 24VDC 5.7 3ST VCMTR   |                    | (NOT SHOWN) |
| 8   | 57104    | 4   | NUT, 10-32 W/STAR WASHER PLTD    |                    |             |
| 9   | 57245    | 3   | NUT, 1/4-20 HEX NYLOCK SS        |                    |             |
| 10  | 62805    | 1   | PLATE, VAC MOUNT                 |                    |             |
| 11  | 70607    | 4   | SET SCR, #10-32 X 1.00 SS        |                    |             |
| 12  | 70638    | 3   | SCR, 1/4-20 X 1.75 SSSCU         |                    |             |
| 13  | 73566    | 3   | SPACER, 1/2 OD X 3.0 W/1/4-20 AL |                    |             |
| 14  | 87013    | 3   | WASHER, 1/4 ID X 5/8 OD SS       |                    |             |
| 15  | 20046    | 1   | CLAMP, 2.25" WORM CLAMP          |                    |             |

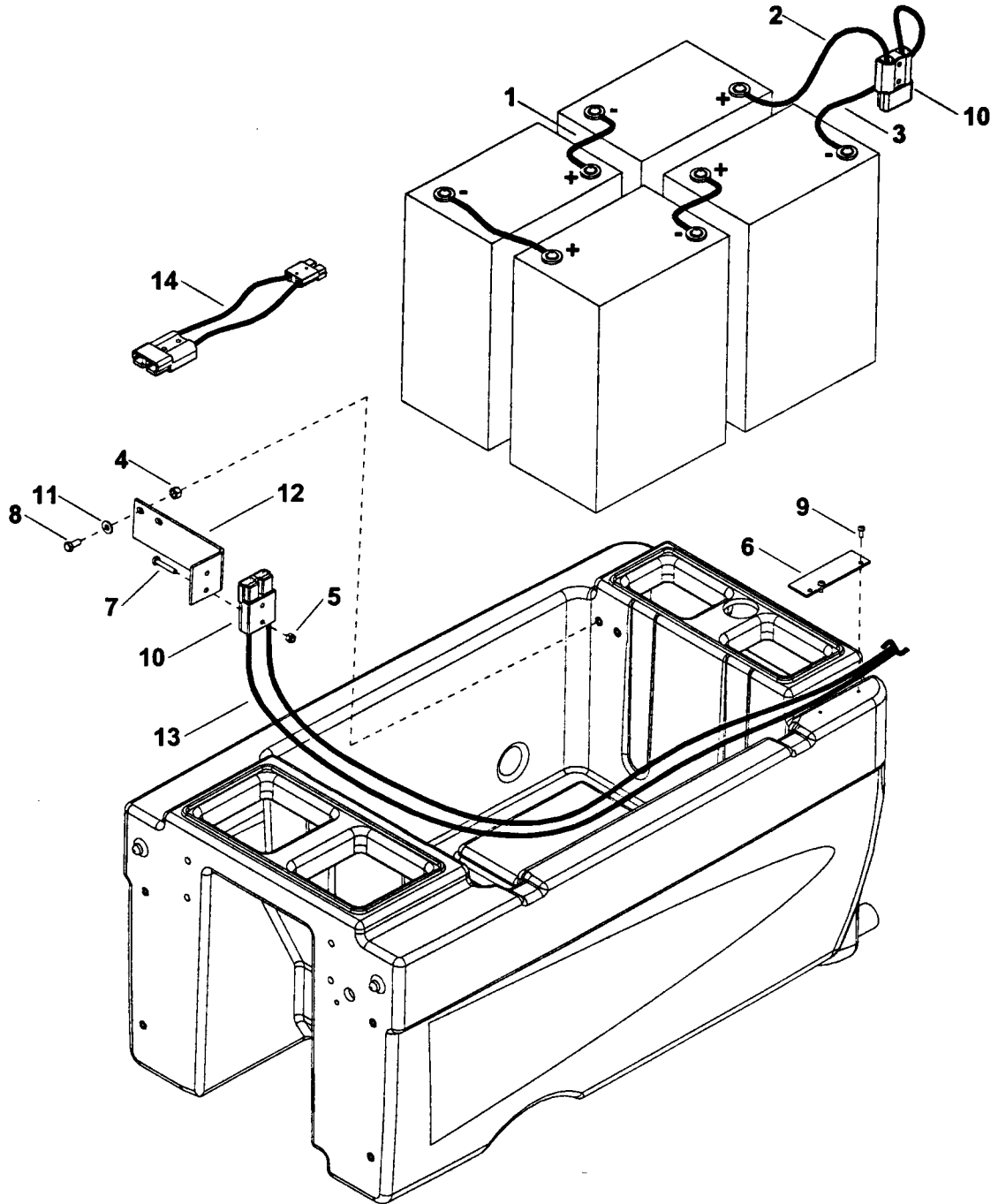
# WHEELS AND FRAME GROUP



## WHEELS AND FRAME GROUP

| REF | PART NO. | QTY | DESCRIPTION                    | SERIAL NO.<br>FROM | NOTES:      |
|-----|----------|-----|--------------------------------|--------------------|-------------|
| 1   | 05128    | 1   | AXLE, MOTOR DRIVE 24 VDC       |                    |             |
| 2   | 18041    | 2   | CASTER, 4" DIA. X 2 X 3.56 R   |                    |             |
| 3   | 57113    | 4   | NUT, 5/16-18 HEX NYLCK         |                    |             |
| 4   | 57119    | 8   | NUT, 3/8-16 HEX NYLOCK         |                    |             |
| 5   | 57128    | 8   | NUT, 5/16-24 HEX NYLOCK        |                    |             |
| 6   | 62714    | 2   | PLATE, DRIVE AXLE              |                    |             |
| 7   | 70266    | 8   | SCR, 3/8-16 X 1.00 HHCS GR5    |                    |             |
| 8   | 70325    | 4   | SCR, 5/16-18 X 1.25 HHCS GR5   |                    |             |
| 9   | 87003    | 8   | WASHER, 3/8 X 7/8 FLAT SS      |                    |             |
| 10  | 87090    | 4   | WASHER, 1/4 ID X 3/4 OD PLTD   |                    |             |
| 11A | 89155    | 2   | WHEEL, 10" PNEU. NON-MARKING   |                    | (STANDARD)  |
|     | 78414    | -   | TUBE, 10" TIRE                 |                    | (NOT SHOWN) |
| 11B | 89175    | -   | WHEEL ASY, 10IN PNEU, BLACK    |                    | (OPTION)    |
|     | 78414    | -   | TUBE, 10" TIRE                 |                    | (NOT SHOWN) |
| 11C | 830748   | -   | WHEEL ASM, 10" SOLID SPCL SCBR |                    |             |
| 11D | 89211    | -   | WHEEL ASM, 10" FMFL N-MARKING  |                    |             |
| 11E | 89212    | -   | WHEEL ASM, 10" FMFL BLK KNOBBY |                    |             |
| 12  | 89190    | 1   | WELDMENT, FRAME                |                    |             |

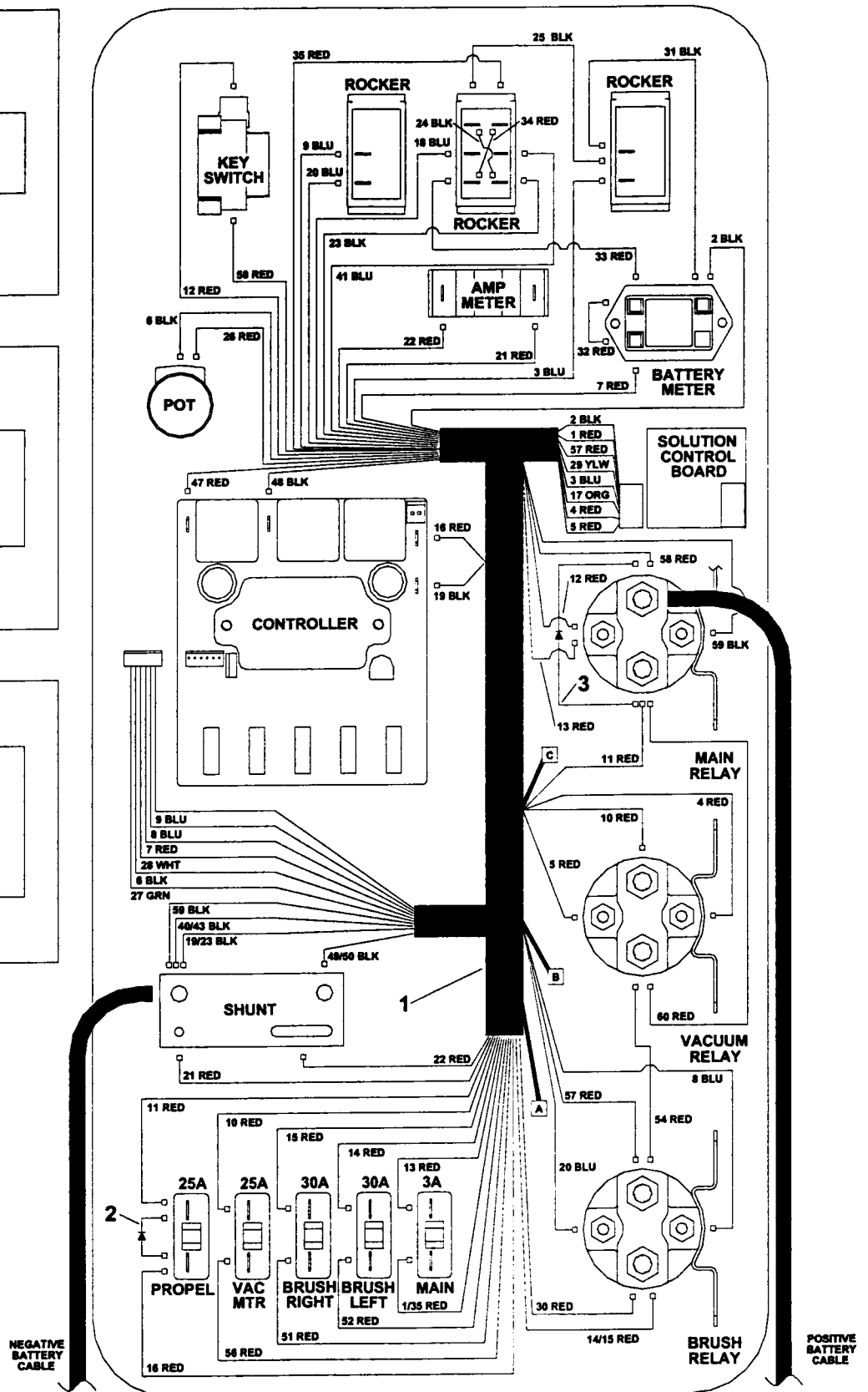
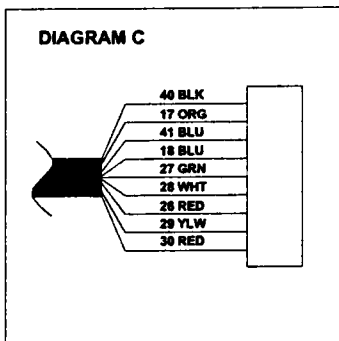
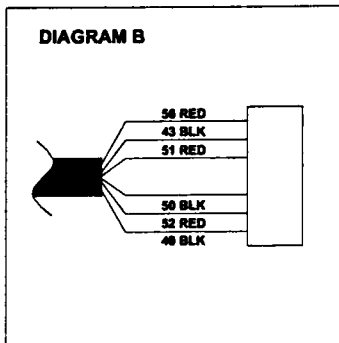
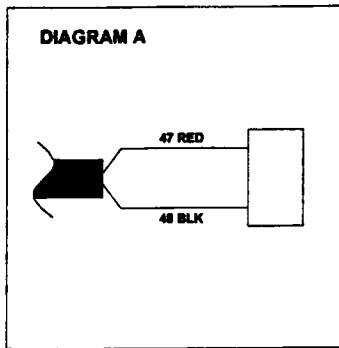
# WIRING GROUP – BATTERY CABLES



## WIRING GROUP - BATTERY CABLES

| REF | PART NO. | QTY | DESCRIPTION                    | SERIAL NO.<br>FROM | NOTES: |
|-----|----------|-----|--------------------------------|--------------------|--------|
| 1   | 23125    | 3   | WIRE, 4 X 15 B CLAMP           |                    |        |
| 2   | 23190    | 1   | CABLE, 4 X 27 RED              |                    |        |
| 3   | 23191    | 1   | CABLE, 4 X 27 BLK              |                    |        |
| 4   | 57111    | 2   | NUT, 3/8-16 HEX                |                    |        |
| 5   | 57245    | 2   | NUT, 1/4-20 HEX NYLOCK SS      |                    |        |
| 6   | 62728    | 1   | PLATE, CABLE MOUNT             |                    |        |
| 7   | 70010    | 2   | SCR, 1/4-20 X 1.5 HHCS SS      |                    |        |
| 8   | 70302    | 2   | SCR, 5/16-18 X 1"HHCSGR5PLT DL |                    |        |
| 9   | 70403    | 2   | SCR, #10X1/2 PPHST TYPE B      |                    |        |
| 10  | 82803    | 2   | CONNECTOR, RED 24V             |                    |        |
| 11  | 87029    | 2   | WASHER, 5/16 FLAT SS           |                    |        |
| 12  | 140322   | 1   | BRKT, BATT CONNECTOR MOUNTING  |                    |        |
| 13  | 880208   | 2   | CABLE, ELECTRICAL 4GA X 80.0   |                    |        |
| 14  | 880209   | 1   | WIRE ASM, CHARGER ADAPTER 24V  |                    |        |

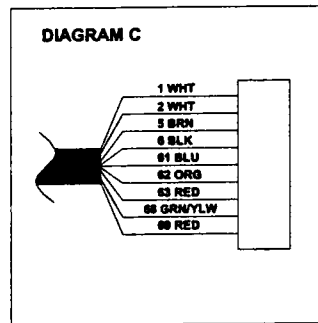
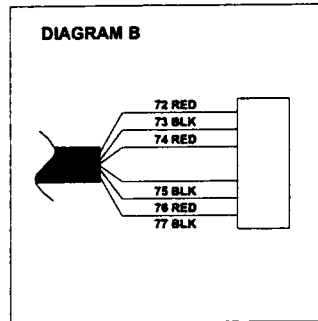
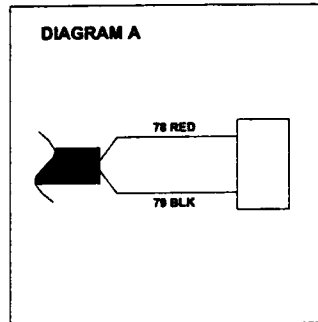
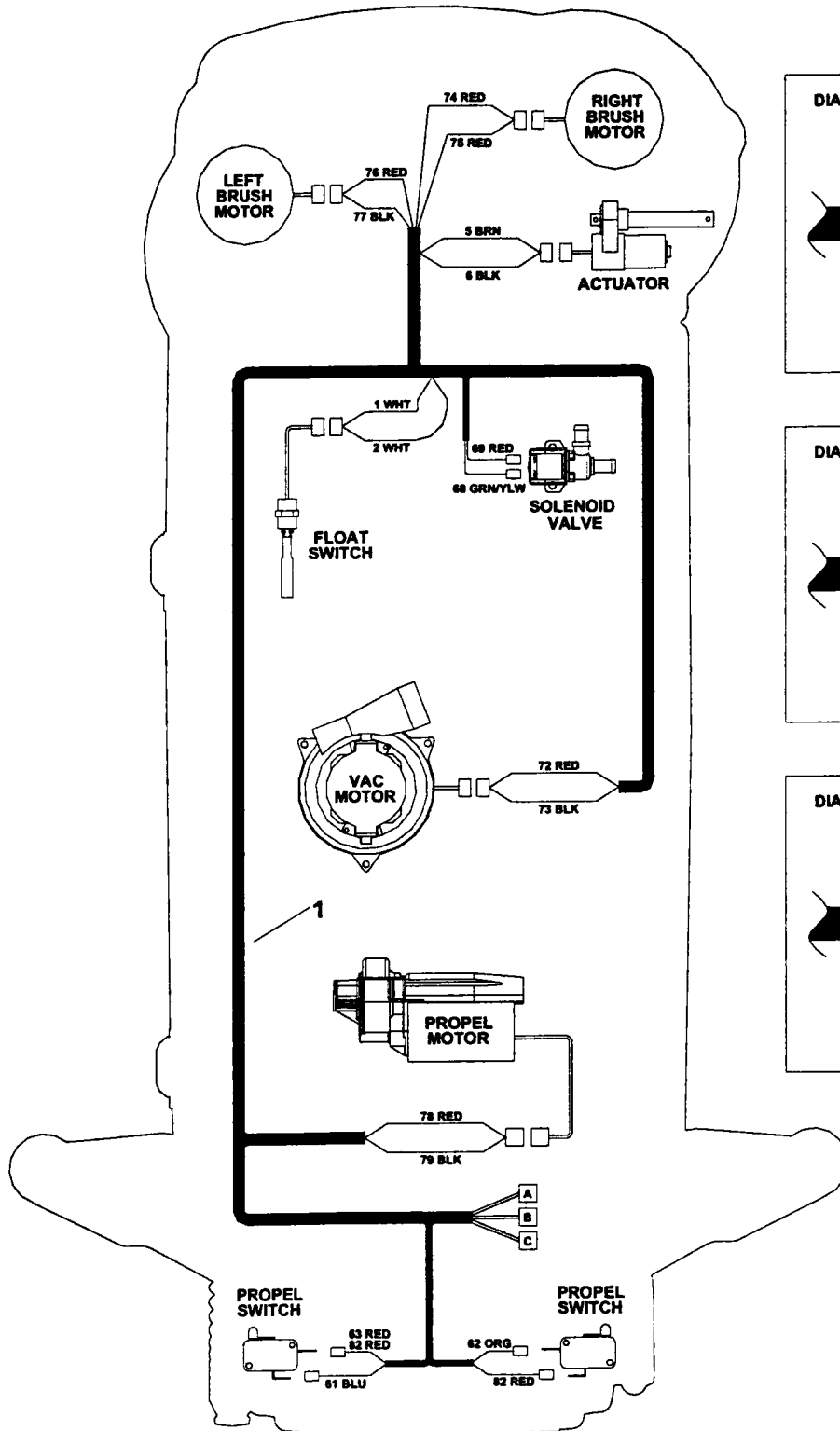
# WIRING GROUP - CONTROL PANEL



# WIRING GROUP – CONTROL PANEL

| REF | PART NO. | QTY | DESCRIPTION              | SERIAL NO.<br>FROM | NOTES: |
|-----|----------|-----|--------------------------|--------------------|--------|
| 1   | 41360    | 1   | HARNESS, PANEL           |                    |        |
| 2   | 29204    | 1   | DIODE ASM, 76008 X 76008 |                    |        |
| 3   | 29215    | 1   | DIODE ASM, 76075 X 76075 |                    |        |

# WIRING GROUP – MAIN HARNESS

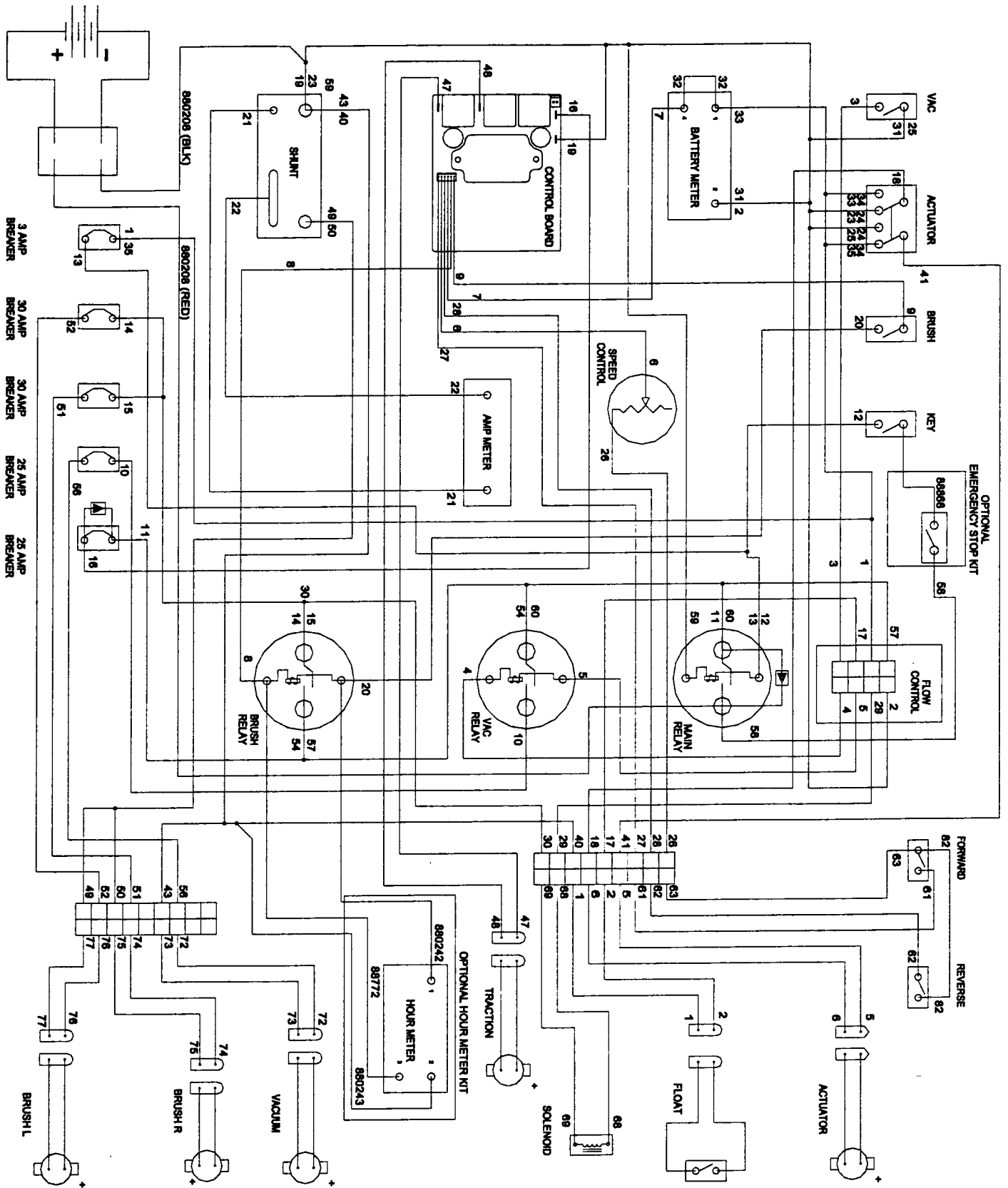




# WIRING GROUP – MAIN HARNESS

| REF | PART NO. | QTY | DESCRIPTION   | SERIAL NO.<br>FROM | NOTES: |
|-----|----------|-----|---------------|--------------------|--------|
| 1   | 41359    | 1   | HARNESS, MAIN |                    |        |

# WIRING GROUP - SCHEMATIC

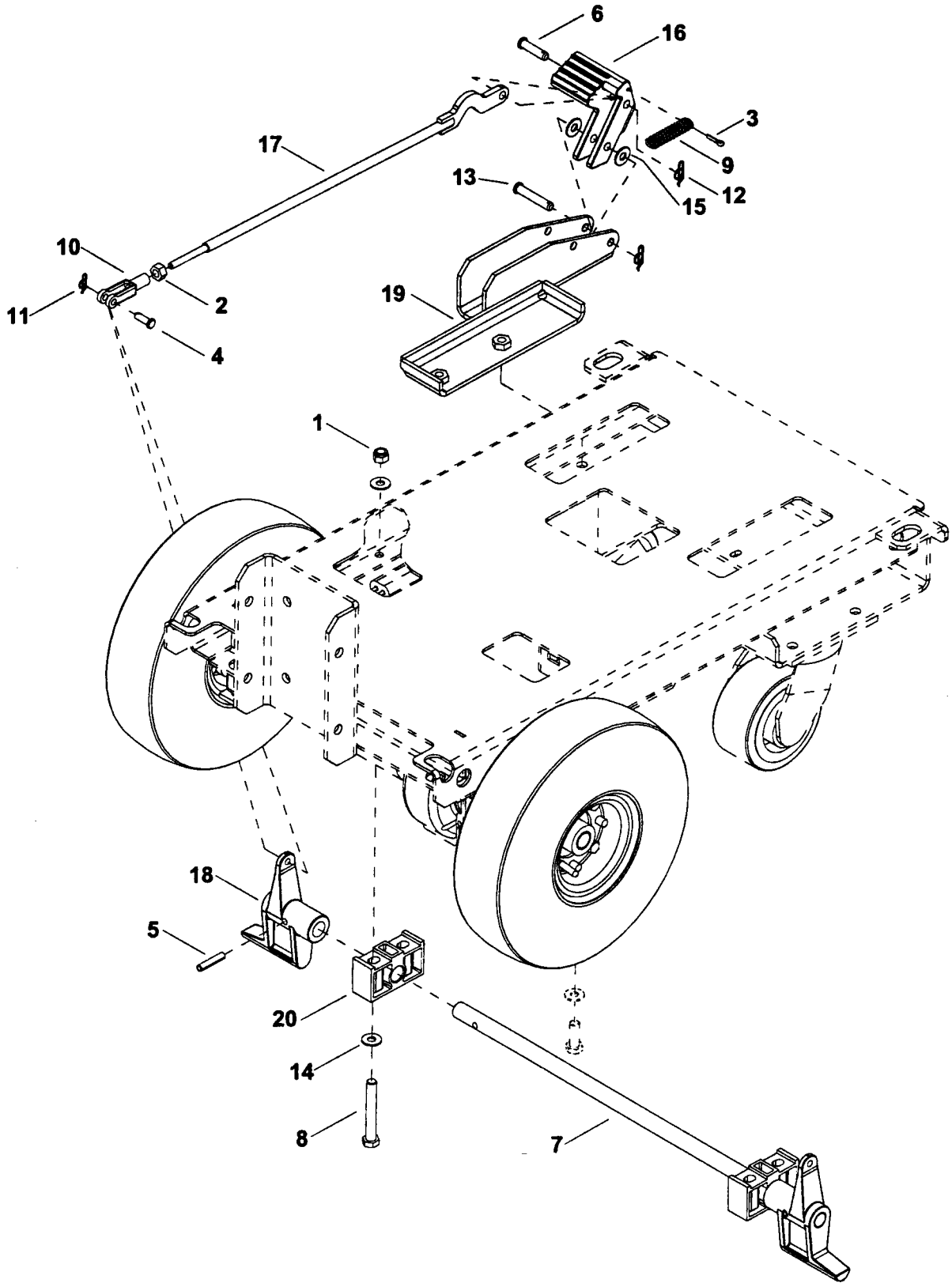


## SUGGESTED SPARE PARTS

| PART NO. | DESCRIPTION                    | SERIAL NO. | NOTES: |
|----------|--------------------------------|------------|--------|
| 14606    | BREAKER, 30A 50VDC             |            |        |
| 14717    | BREAKER, 3A                    |            |        |
| 29119    | DRIVER, BRUSH                  |            |        |
| 35122    | GASKET, 230V VAC MOTOR         |            |        |
| 35211    | GASKET, 8.50 X 16.40           |            |        |
| 35212    | GASKET, 6.30 X 16.10           |            |        |
| 67393    | RELAY, 24VDC 100A              |            |        |
| 72093    | SWITCH, 125VDC SPST            |            |        |
| 72130    | SWITCH, SPST 2-POSITION ROCKER |            |        |
| 72165    | SWITCH, DPDT 3-POSITION ROCKER |            |        |
| 73938    | SPRING, EXTENSION              |            |        |
| 81535    | KNOB                           |            |        |
| 82017    | FILTER, SCREEN                 |            |        |
| 73976    | BLADE, SQUEEGEE REAR LINATEX   |            |        |
| 73894    | BLADE, SQUEEGEE FRONT LINATEX  |            |        |

### NOTES:

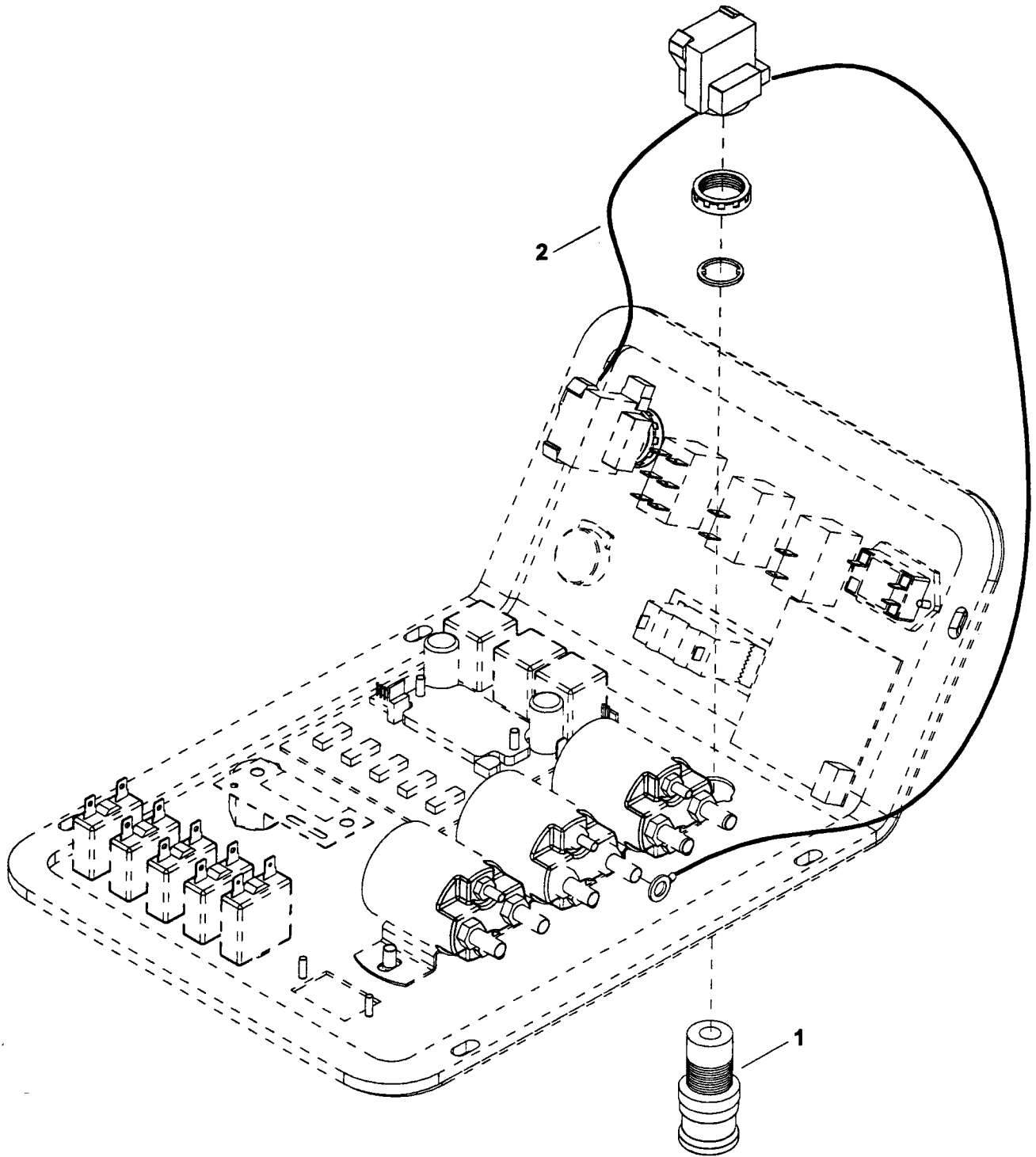
# BRAKE OPTION



**BRAKE OPTION**

| REF | PART NO. | QTY | DESCRIPTION                    | SERIAL NO.<br>FROM | NOTES: |
|-----|----------|-----|--------------------------------|--------------------|--------|
| 1   | 57113    | 4   | NUT, 5/16-18 HEX NYLOCK        |                    |        |
| 2   | 57029    | 1   | NUT, 1/4-28 HEX SS             |                    |        |
| 3   | 66073    | 1   | PIN, COTTER 1/16" X 3/4"L PLTD |                    |        |
| 4   | 66116    | 1   | PIN, CLEVIS 1/4" X 3/4" PLTD   |                    |        |
| 5   | 66192    | 2   | PIN, ROLL 1/4 X 1.25L          |                    |        |
| 6   | 66304    | 1   | PIN, CLEVIS 5/16 X 1-1/4       |                    |        |
| 7   | 67400    | 1   | ROD, TORSION BRAKE             |                    |        |
| 8   | 70349    | 4   | SCR, 5/16-18 X 2.5 HHCS        |                    |        |
| 9   | 73426    | 1   | SPRING, EXT .43D X2.50L X.047W |                    |        |
| 10  | 80603    | 1   | CLEVIS, 1/4" YOKE END 1/4-28   |                    |        |
| 11  | 80604    | 1   | COTTER, 1/4" RING              |                    |        |
| 12  | 80605    | 2   | COTTER, 5/16" RING             |                    |        |
| 13  | 80831    | 1   | PIN, CLEVIS 5/16" X 1.75"L PLT |                    |        |
| 14  | 87029    | 4   | WASHER, 5/16 FLAT SS           |                    |        |
| 15  | 87030    | 2   | WASHER, 3/8 ID X 3/4 OD NYLON  |                    |        |
| 16  | 89151    | 1   | PEDAL, BRAKE                   |                    |        |
| 17  | 89152    | 1   | WELDMT, ROD PRK. BRAKE         |                    |        |
| 18  | 89153    | 2   | PAD, BRAKE                     |                    |        |
| 19  | 89196    | 1   | WELDMENT, BRAKE PEDAL          |                    |        |
| 20  | 140331   | 2   | BUSHING, PILLOW BLOCK          |                    |        |

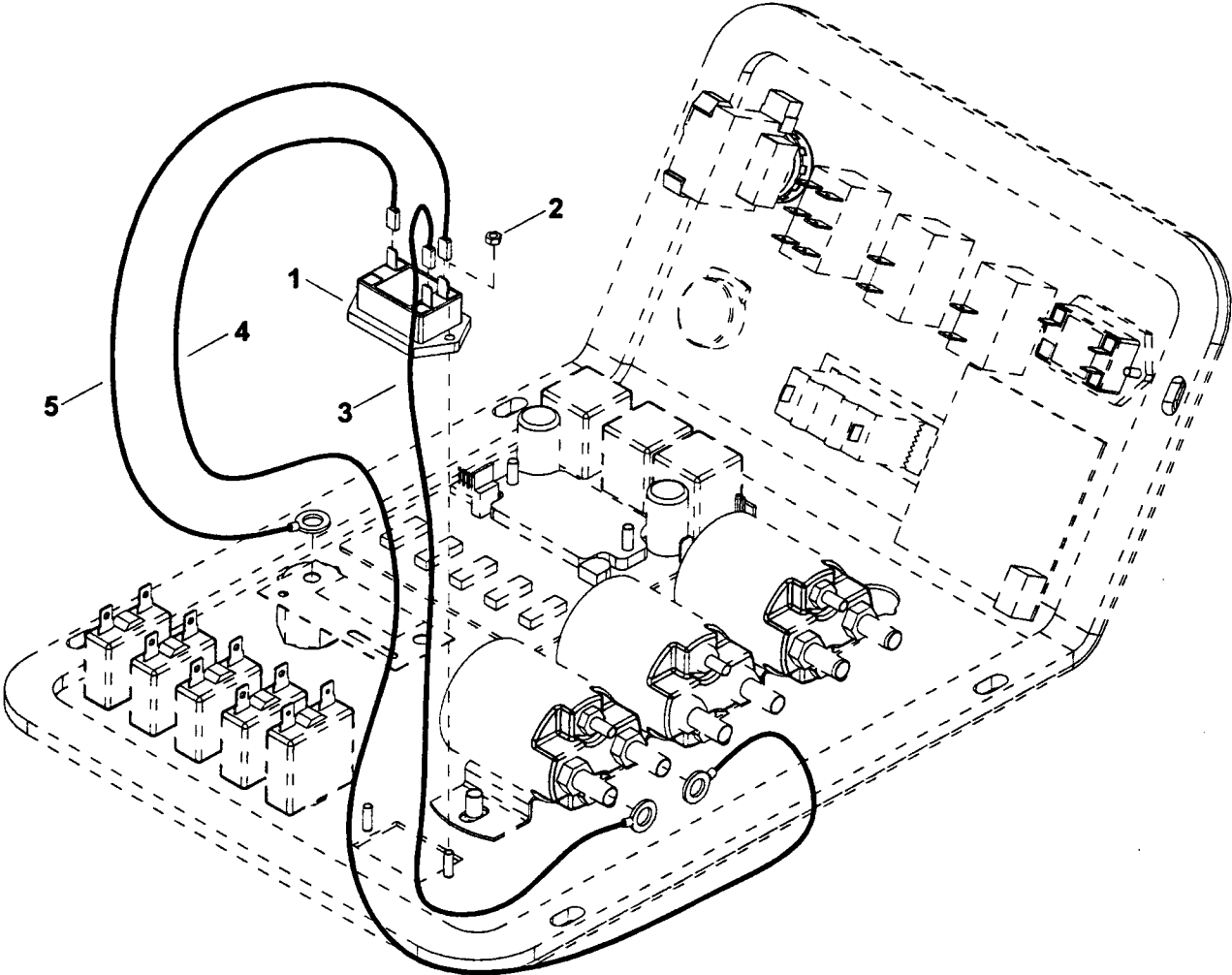
# EMERGENCY STOP OPTION



## **EMERGENCY STOP OPTION**

| REF | PART NO. | QTY | DESCRIPTION                    | SERIAL NO.<br>FROM | NOTES: |
|-----|----------|-----|--------------------------------|--------------------|--------|
| 1   | 72160    | 1   | SWITCH, EMERGENCY STOP         |                    |        |
| 2   | 88868    | 1   | WIRE, 16" RED/18 STRIP X STRIP |                    |        |

**HOUR METER OPTION**

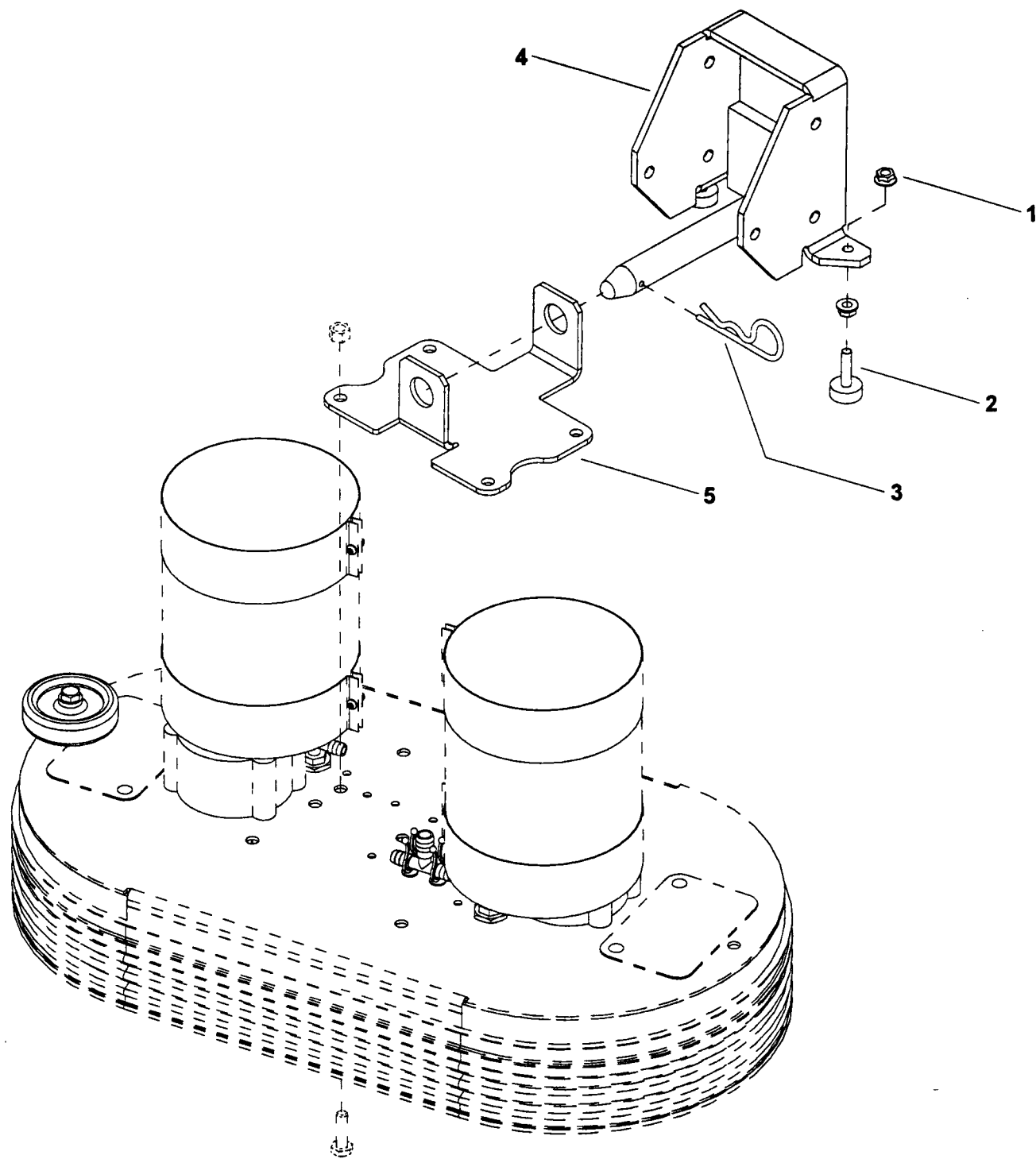




## HOUR METER OPTION

| REF | PART NO. | QTY | DESCRIPTION                   | SERIAL NO.<br>FROM | NOTES: |
|-----|----------|-----|-------------------------------|--------------------|--------|
| 1   | 54154    | 1   | METER, 12-48 VDC LED HOUR     |                    |        |
| 2   | 57078    | 2   | NUT, 4-40 HEX                 |                    |        |
| 3   | 88772    | 1   | WIRE, 6" RED/18 76075 X 76114 |                    |        |
| 4   | 880242   | 1   | WIRE, 9" RED/18 76075 X 76114 |                    |        |
| 5   | 880243   | 1   | WIRE, 9" BLK/18 76011 X 76114 |                    |        |

# QUICK SCRUBHEAD CONNECT OPTION



## QUICK SCRUBHEAD CONNECT OPTION

| REF | PART NO. | QTY | DESCRIPTION                    | SERIAL NO.<br>FROM | NOTES: |
|-----|----------|-----|--------------------------------|--------------------|--------|
| 1   | 57112    | 4   | NUT, 5/16-18 SERRATED FLG      |                    |        |
| 2   | 80654    | 2   | BUMPER, ADJUSTMENT             |                    |        |
| 3   | 82191    | 1   | PIN, COTTER HAIR .178 DIA X 1" |                    |        |
| 4   | 89121    | 1   | WELDMENT, SCRUB DECK PIN       |                    |        |
| 5   | 140389   | 1   | BRKT, SCRUB HEAD MOUNT         |                    |        |