



**E27200 E27400**  
**E27300 E27500**



# GENESYS™ SERIES

**26", 28" and 32"**  
**Mid-Size Scrubber**  
with Wet or AGM Batteries



**Operator and Parts  
Manual**

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# SPECIFICATIONS

| Specifications                        | GeneSys™ 26D                                                                                                  | GeneSys™ 28D                                                                                                  | GeneSys™ 32D                                                                                                  | GeneSys™ 280RB                                                                                                                                       |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Productivity (sq. ft./hour)           | Up to 29,250                                                                                                  | Up to 31,500                                                                                                  | Up to 36,000                                                                                                  | Up to 31,500                                                                                                                                         |
| Cleaning Pad Width                    | 26 in.                                                                                                        | 28 in.                                                                                                        | 32 in.                                                                                                        | 28 in.                                                                                                                                               |
| Pad / Brush Dimensions                | (2) 14 in. Disk                                                                                               | (2) 13 in. Disk                                                                                               | (2) 16 in. Disk                                                                                               | (1) 14 in. x 28 in. Disk                                                                                                                             |
| Brush Motor(s)                        | (2) 1.0 HP                                                                                                    | (2) 1.0 HP                                                                                                    | (2) 1.0 HP                                                                                                    | (1) .75 HP                                                                                                                                           |
| Pad Speed                             | 300 RPM                                                                                                       | 300 RPM                                                                                                       | 300 RPM                                                                                                       | 2,000 RPM                                                                                                                                            |
| Down Pressure                         | 60, 120 & 180 lb.                                                                                             | 60, 120 & 185 lb.                                                                                             | 60, 120 & 185 lb.                                                                                             | 60, 120 & 185 lb.                                                                                                                                    |
| Solution Tank                         | 25-gal.                                                                                                       | 25-gal.                                                                                                       | 25-gal.                                                                                                       | 25-gal.                                                                                                                                              |
| Recovery Tank                         | 28-gal.                                                                                                       | 28-gal.                                                                                                       | 28-gal.                                                                                                       | 28-gal.                                                                                                                                              |
| Solution Flow                         | 0 - .75 gpm                                                                                                   | 0 - .75 gpm                                                                                                   | 0 - .75 gpm                                                                                                   | 0 - .75 gpm                                                                                                                                          |
| Battery Options                       | (4) 6v 260 AH Wet<br>(4) 6v 220 AH AGM                                                                        | (4) 6v 260 AH Wet<br>(4) 6v 220 AH AGM                                                                        | (4) 6v 260 AH Wet<br>(4) 6v 220 AH AGM                                                                        | (4) 6v 260 AH Wet<br>(4) 6v 220 AH AGM                                                                                                               |
| Run Time                              | Up to 4.5 hr.                                                                                                 | Up to 4.5 hr.                                                                                                 | Up to 4.0 hr.                                                                                                 | Up to 5.5 hr.                                                                                                                                        |
| Sound Level                           | <65 dBa                                                                                                       | <65 dBa                                                                                                       | <65 dBa                                                                                                       | <65 dBa                                                                                                                                              |
| Vac Motor / Filter                    | .72 HP / HEPA                                                                                                 | .72 HP / HEPA                                                                                                 | .72 HP / HEPA                                                                                                 | .72 HP / HEPA                                                                                                                                        |
| Machine Weight (w/260AH Batteries)    | 625 lb.                                                                                                       | 630 lb.                                                                                                       | 640 lb.                                                                                                       | 630 lb.                                                                                                                                              |
| Machine Dimensions                    | 55 in. x 28 in. x 44 in.                                                                                      | 56 in. x 30 in. x 44 in.                                                                                      | 59 in. x 34 in. x 44 in.                                                                                      | 54 in. x 29 in. x 44 in.                                                                                                                             |
| Squeegee Width                        | 35 in.                                                                                                        | 40 in.                                                                                                        | 45 in.                                                                                                        | 40 in.                                                                                                                                               |
| Warranty*                             | 10 - Years Rotomold<br>3 - Years Parts/Labor<br>180 - Days Travel<br>1 - Year Pro-rated Wet and AGM Batteries | 10 - Years Rotomold<br>3 - Years Parts/Labor<br>180 - Days Travel<br>1 - Year Pro-rated Wet and AGM Batteries | 10 - Years Rotomold<br>3 - Years Parts/Labor<br>180 - Days Travel<br>1 - Year Pro-rated Wet and AGM Batteries | 10 - Years Rotomold<br>3 - Years Parts/Labor<br>180 - Days Travel<br>1 - Year Pro-rated Wet and AGM Batteries<br>3 - Years / 3,000 Hours - Isolators |
| <b>*See full warranty for details</b> |                                                                                                               |                                                                                                               |                                                                                                               |                                                                                                                                                      |

## Key Options & Accessories

Fortify™ Wet Battery Protection System  
 Fortify™ Programmable timer Lock-out  
 Fortify™ Armor Telemetry & Reporting  
 Fortify™ Foam Control  
 Brush: General Purpose

**SoliChem™ Chemicals:** Daily: pH7 Ultra  
 Degreaser: Green Earth® BioActive Solutions™ Grease Solv



## SAFETY INFORMATION



**The safety instructions and guidelines below must be carefully followed in order to avoid harm to the operator and damage to the machine.**

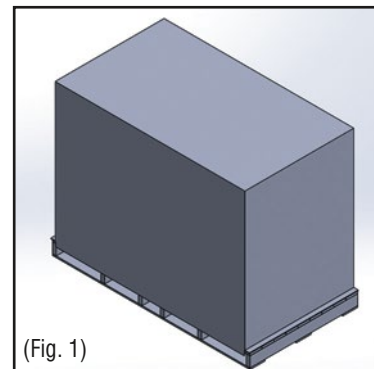
- Read all labels on the machine carefully. Do not cover them for any reason and replace them immediately if they become damaged.
- The machine must be used exclusively by authorized and trained personnel.
- When operating the machine be careful of other people.
- The machine is not designed for cleaning carpets.
- The power cable outlet must be provided with a proper ground.
- Avoid damaging the power cable of the battery charger by crushing, bending, cutting or stressing it.
- Whenever the power cable of the battery charger is damaged, immediately contact a BETCO service center.
- Do not mix different types of detergent as this may produce harmful gases.
- Do not set containers on the machine.
- Machine storage temperature is between -10°F and 130°F, never store outside under humid conditions.
- Operating conditions: room temperature between 33°F and 100°F with relative humidity between 30% to 95%.
- Only use the machine in closed areas and do not expose it directly to rain.
- Never use the machine in an explosive environment.
- Do not use the machine as a means of transport.
- Never use acidic chemicals which could damage the machine.
- Avoid running the brushes with the machine stopped; this could damage the floor.
- Never vacuum up flammable liquids.
- Never use the machine to gather dangerous powders.
- Use a powder fire extinguisher in case of fire. Do not use water.
- Do not hit against shelving or scaffolding. The operator must always be equipped with the appropriate safety device (gloves, shoes, helmet, glasses, etc.)
- Do not use the machine on surfaces with an inclination greater than the one shown on the serial plate.
- The machine is designed to wash and dry floors simultaneously. Signal the presence of wet floors with suitable signs.
- If the machine does not work properly, perform routine maintenance. Otherwise, request the assistance of the BETCO® technical service.
- When replacing parts ask for ORIGINAL spare parts from your Authorized BETCO Dealer and/or Retailer.
- Always turn off the machine and disconnect the battery connector whenever maintenance is performed.
- Never remove guards that require tools for removal.
- Never wash the machine with direct or pressurized jets of water or with corrosive substances.
- Have your BETCO service center check the machine once a year.
- To prevent the formation of scale in the solution tank filter, do not store the machine with detergent solution in the tanks.
- Before using the machine make sure that all doors and covers are positioned as shown in this operating and maintenance manual.
- When your BETCO machine is ready to be retired, the machine must be disposed of properly. It contains oils and electronic components. The machine was built using totally recyclable materials.
- Use only pads furnished with the machine or those specified in the user's manual. Use of other pads can compromise safety.
- When removing the battery, unplug the battery connection, unplug the charger and disconnect the battery terminals.
- Before recycling the machine, remove the battery.

# MACHINE PREPARATION: UNPACKING

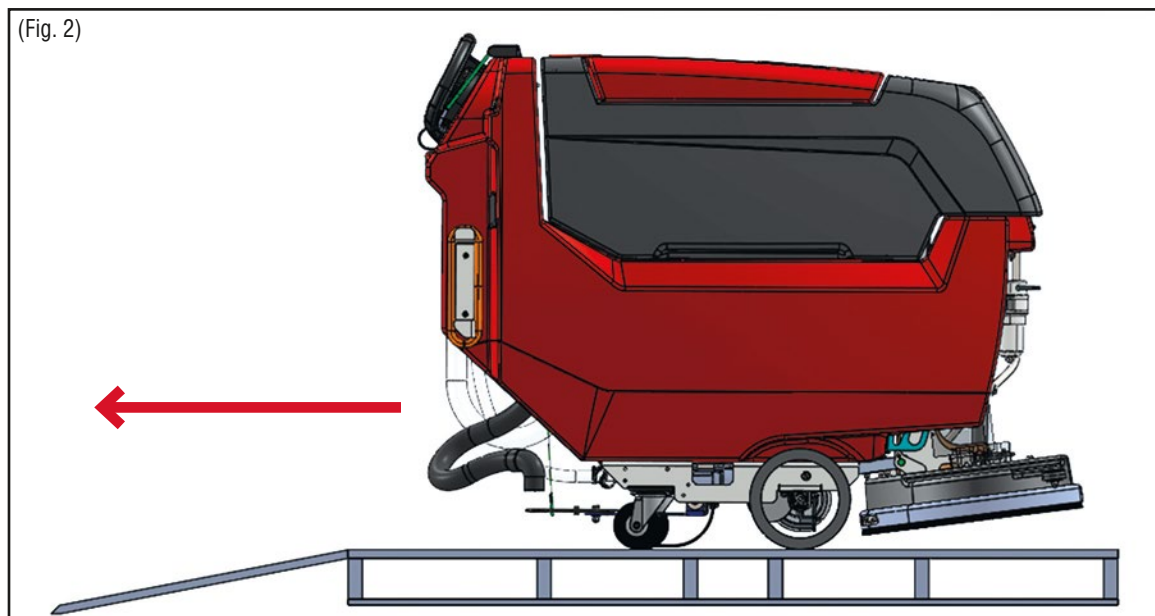
**Note:** Immediately check, when receiving the machine, that all the materials indicated on delivery documents have been received and also that the machine has not been damaged in transit. If it has been damaged, this damage must be immediately reported to the carrier and also to our customer's service department. Only acting promptly in this manner will make it possible to receive missing material and to be compensated for shipping damage.

**INTRODUCTION** This is an automatic scrubber which, via the mechanical action of the rotating brush and the chemical action of a water/detergent solution, can clean many types of hard flooring. As it advances, it also collects the dirt removed and the detergent solution used to clean the floor. The machine must be used only for this purpose. Even the best machines will only work well if used correctly and kept in good working order. We therefore suggest you read this instruction booklet carefully and re-read it whenever difficulties arise while using the machine. Please contact our technical service department or your dealers if you have any questions about the machine.

1. Remove the outer packing from the machine's shipping pallet. (Fig. 1)
2. Inspect the machine and contents for damage. Make a freight claim if machine is damaged.
3. Remove and place contents of the box away from the pallet.
  - a. Remove interior packing materials and place away from the pallet.
  - b. Cut all banding straps from machine.
  - c. Use a screwdriver to remove squeegee blocks and squeegee.
4. Raise the recovery tank and connect the red battery plug.
5. Tuck the Squeegee hose behind the water sight hose so it doesn't get run over.
6. Fold down hinged ramp at back of machine. (Fig. 2)
7. Power the unit on with the key and raise the scrub head up to transport position.
8. Slowly reverse the machine backwards down the ramp. (Fig. 2)



(Fig. 1)



(Fig. 2)

# TRANSPORTING THE MACHINE: TIE DOWN PROCEDURE

If you are planning to transport the GeneSys scrubber, securing the machine(s) is key to keeping the machine(s) protected and in good working condition. Below are some suggestions for how to efficiently and effectively secure the GeneSys™ scrubbers.

The GeneSys™ design lends itself to easy trailering and tying down – it only takes two straps strategically located.



## STEP 1

Before transporting up a trailer ramp - remove the squeegee assembly and put it in an open, secure location on the trailer. If possible, wrap with a shipping blanket.



## STEP 2

Transport machine up the ramp into trailer and position it so that tie downs can be used forward and rear of the machine and lower the scrub deck (with pads on – especially the Orbital!)



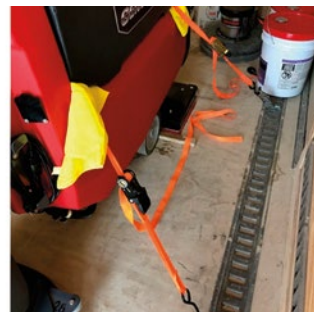
## STEP 3

Open the tank and route tie down straps across the front and rear of the battery compartment as shown here. *(Note the placement of micro-fiber cloths or other material to protect the rotomold tanks from scratches).*



## STEP 4

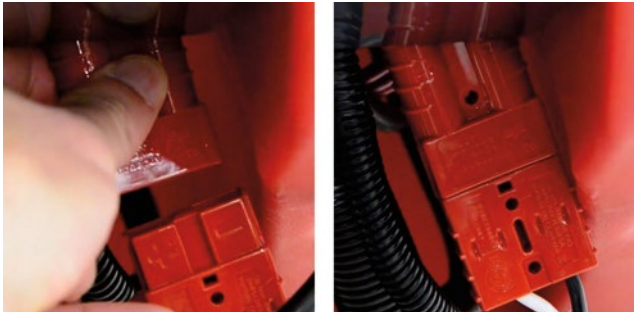
For the front straps, route them to tie down locations forward of the machine. For the rear straps, route them to tie down locations to the rear of the machine. See below. Ratchet tie down until machine is secure.



# BATTERIES

## BATTERY CONNECTION

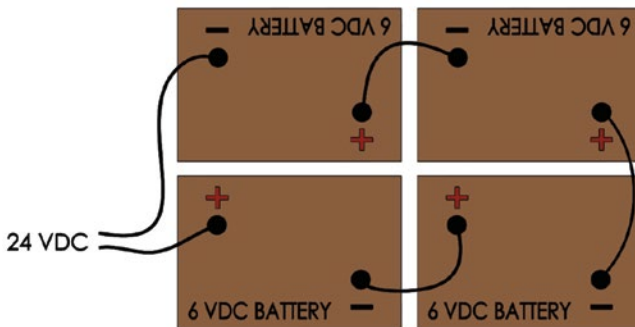
The machine will be supplied with an onboard battery charger and either four 6 V Wet or AGM batteries. The batteries must be housed in the battery compartment beneath the recovery tank. To connect the battery pack, you simply connect the two red Anderson plugs located on the right side of the back-control panel.



## BATTERY INSTALLATION/REPLACEMENT

1. Lower the squeegee and brush deck.
2. Open the recovery tank as far as it will go, using the side handle.
3. Place the four 6-volt batteries into the battery compartment as shown below.
4. Wire the batteries with battery jumpers. Torque 95-105 in-lb. (11-12 Nm) Thread: 5/16"
5. Using the supplied 9/16" wrench, tighten the nuts to the battery terminals.

**WARNING:** Perform one battery charging cycle before using the machine.



The batteries are positioned in the machine as shown for ease of wiring the batteries in series. When replacing batteries make sure to position the batteries in the same configuration.

**WARNING:** Batteries emit hydrogen and oxygen gas - Keep sparks and open flame away.

**Do not smoke near the machine - Charge batteries in a well-ventilated area with the battery compartment open.**

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

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

## LEAD ACID, WET BATTERIES ONLY

**Wet batteries need water.**

More importantly, watering must be done at the right time and in the right amount or the battery's performance and longevity suffers.

Water should always be added after fully charging the battery. Prior to charging, there should be enough water to cover the plates. If the battery has been discharged (partially or fully), the water level should also be above the plates. Keeping the water at the correct level after a full charge will prevent having to worry about the water level at a different state of charge.

Depending on the local climate, charging methods, application, etc., Betco recommends that batteries be checked no less than once a month until you get a feel for how often your batteries need watering.

## Important Things to Remember

1. Do not let the plates get exposed to air. This will damage (corrode) the plates.
2. Do not fill the water level in the filling well to the cap. This most likely will cause the battery to overflow acid, consequently losing capacity and causing a corrosive spill.
3. Do not use water with a high mineral content. Use distilled or deionized water only.

**CAUTION:** The electrolyte is a solution of acid and water so skin contact should be avoided.

# BATTERIES *continued*

## GENERAL WATERING INSTRUCTIONS

- Add water, never acid, to cells (distilled water recommended).
- DO NOT OVER WATER.
- For fully charged standard deep-cycle batteries, add water to the level of 1/8 below bottom of vent well (see diagram A below).
- For fully charged Plus Series batteries, add water to the maximum water level indicator (see diagram B below).
- If the batteries are discharged, only add water if the plates are exposed. Add just enough water to cover the plates, then charge the batteries. Once fully charged, add water to the proper level indicated above.
- After watering, secure vent caps on batteries.

DIAGRAM A



Add water to 0.125" below bottom of the vent well.

DIAGRAM B



Add water to the maximum water level indicator.

## BATTERIES *Servicing Lead Acid Batteries*

### MAINTAINING THE BATTERIES

Batteries can attract dust, dirt, and grime. Keeping them clean will help spot signs of trouble when they appear and avoid problems associated with grime.

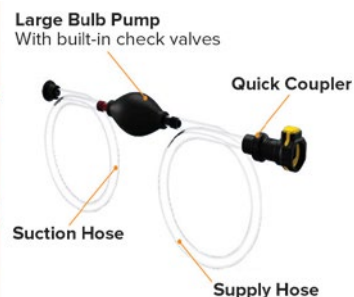
1. Check that all vent caps are tightly in place.
2. Clean the battery top with a cloth or brush and a solution of baking soda and water.
  - When cleaning, do not allow any cleaning solution or other foreign matter to get inside the battery.
3. Rinse with water and dry with a clean cloth.
4. Clean battery terminals and the inside of cable clamps using a post and clamp cleaner.
  - Clean terminals will have a bright metallic shine.
5. Reconnect the clamps to the terminals and thinly coat them with an anti-corrosive spray or silicone gel.
6. Keep the area around batteries clean and dry.

## *Maintaining Lead Acid Batteries with Fortify™ Wet Battery Protection System*

The wet battery protection system tells the operator when to water the batteries. This system has a sensor that's inserted into the machine's batteries with a light to tell the operator when to fill the batteries. The scrubbing functions will be disabled until watering is completed. See below watering instructions with watering system.



**WARNING: Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm, and during charging, strong inorganic acid mists containing sulfuric acid are evolved, a chemical known to the State of California to cause cancer.**



### WATERING THE BATTERIES

1. Use distilled water for filling the batteries. Place the distilled water jug below the top of the batteries to prevent siphoning. Insert the open end of the bulb pump into the jug of distilled water and prime the pump bulb by squeezing it until it is filled with water.
2. Attach the other end of the hose to the quick connect already on the batteries.
3. Squeeze the bulb to pump water into the battery cells. When the bulb becomes firm, all cells are full.



**NOTE: Battery packs equipped with Fortify™ Wet Battery Protection may use more distilled water than expected to make the light turn off. Compress the bulb pump until is no longer compresses. Not doing so may result in uneven filling and premature battery failure.**

4. Immediately disconnect the couplers and replace the cap.



**NOTE: Do not leave the pump and hose connected to the batteries after filling is complete.**



# CHARGING

**WARNING:** Perform one battery charging cycle before using the machine.

## ON-BOARD CHARGER

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

### SIGNAL (LED)

Red LED flashing twice

Green LED is flashing twice

Red LED is on

Yellow LED is on

Green LED is on

Yellow LED is flashing

Red LED Flashing

### MEANING

Battery charger is set to charge LEAD-ACID batteries

Battery charger is set to charge GEL and /or AGM batteries

First phase of charging is in progress

Second phase of charging is in progress

End of charge or maintenance phase

Issue with battery or battery not connected or output short circuit

Safety timer exceeded internal short circuit



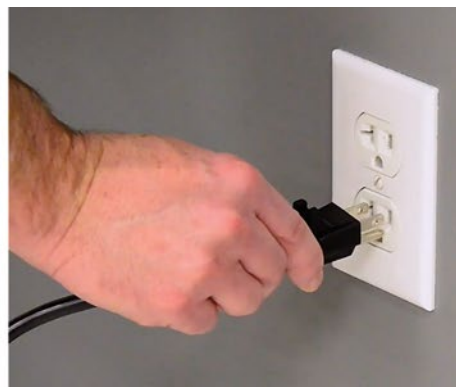
**Green LED Light**

**Yellow LED Light**

**Red LED Light**



**NOTE:** Do not use an extension cord. This voids the warranty of the charger.



## BATTERY AMP HOUR RANGE

| Model       | Battery Voltage | Charging Current | Battery Range (5 hour) | Battery Range (20 hour) |
|-------------|-----------------|------------------|------------------------|-------------------------|
| CBHD3 12-25 | 24V             | 25A              | 180Ah - 260Ah          | 220Ah - 315Ah           |

# MACHINE PREPARATION / SETUP

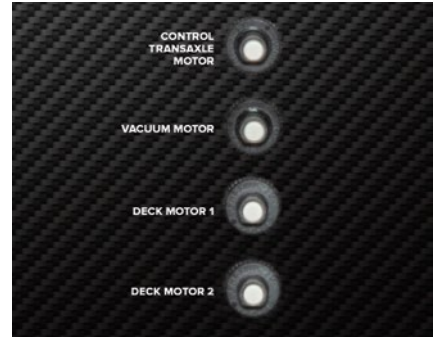
## TURNING THE MACHINE ON/OFF

The key switch to turn on the machine is located on the lower control panel. Turn clockwise for on (I) and counter clockwise for off (O).

## CIRCUIT BREAKERS

Circuit breakers protect the GeneSys machine's motors. These circuit breakers will trip under misapplications of the machine. Repeatedly tripping the breaker will cause the need for motor replacement.

**⚠ NOTE: If a breaker becomes tripped simply press in the white button on the circuit breaker. This might require a cooling down period of the machine's tripped component before the breaker is allowed to be reset.**



## BATTERY METER

When the machine's key is switched to the "ON" position the battery meter gives a readout of the charge remaining on the battery pack. LED lights will reduce in number as the charge on the batteries goes down.

**⚠ NOTE: A flashing battery meter will indicate a fault.**



## SQUEEGEE INSTALLATION

1. Position the squeegee behind the machine and align the knob posts with the squeegee carrier slots.
2. Lift the squeegee and slide into the slots. (Fig. 1)
3. Tighten down the knobs to secure the squeegee. (Fig. 2)
4. Attach the vacuum hose to the squeegee. (Fig. 3)



(Fig. 1)



(Fig. 2)



(Fig. 3)

# DRIVE SYSTEM

## OPERATING THE MACHINE

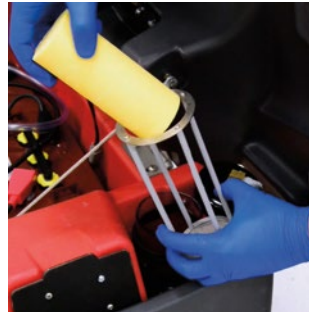
1. To control the machine, place hand(s) around the console and bail. Squeezing the bail activates the transaxle drive forward and, when the scrub deck is in operating position, the brush motors and solution flow.
2. To reverse the machine, push the bail wire away from the console handle. To slow down or stop simply release the bail.
3. The centralized Speed Control Knob on the console handle is used to reduce or increase the machine's speed. This can be done while moving or standing still.



 **NOTE: Use good judgment when selecting a higher speed.**  
**Turn Clockwise to go faster / Turn Counterclockwise to go slower.**

# SOLICHEM™ SOLUTION DISTRIBUTION SYSTEM

Solid on-board chemical delivery technology removes the need to pour chemical into the solution tank. Water dissolves the SoliChem™ solid and adds the cleaning chemical directly onto the floor wetting system. The SoliChem System also alerts the operator of low SoliChem solid with an LED light.



**⚠ NOTE: Do not use pure acids in this machine.**

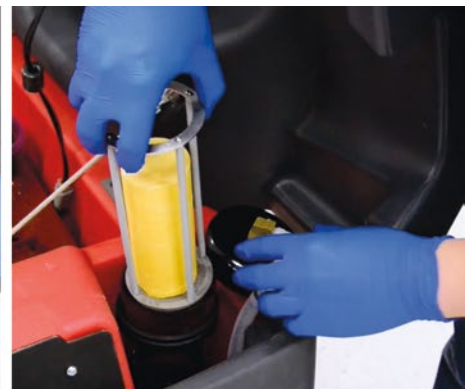
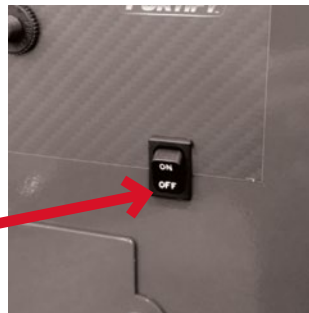
## FILLING SOLUTION THE TANK

1. Add water to the solution tank from the front or rear fill locations. Do not use water exceeding 120° F (48.9°Celsius)
2. While filling the machine, watch the sight tube on the back of the machine to determine when the machine is full.



## CONVENTIONAL OPERATION

1. Remove the SoliChem™ solid from the solution system (See Below).
  - a. Lift recovery tank.
  - b. Remove SoliChem canister cap.
  - c. Lift out SoliChem cage and ensure that all SoliChem solid pieces are removed from canister.
  - d. Replace SoliChem canister cap on canister.
2. Turn off Solichem Technology.
3. Pour in properly diluted chemical into the front fill port.



# SOLUTION FLOW

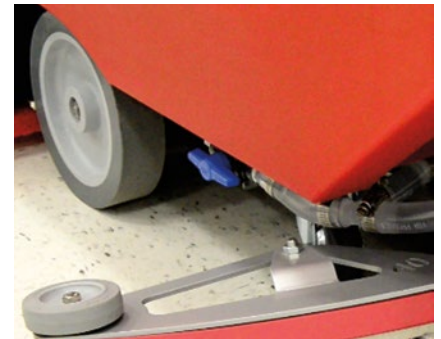
The solution control knob is located on the lower control panel left of the key. This controls the water pump and is only active when the scrub head is in an operating position. This knob adjusts water flow rate. For Touch Encoder machines, adjusting flow rate is found in the settings.



## FILTER INSPECTION AND CLEANING

**NOTE:** If there is excessive debris found in the screen and bowl then drain and flush the solution tank.

1. Close the shutoff valve for the solution tank. The screen and bowl are under the frame between the transaxle and casters on the left side of the machine.
2. Unscrew and remove the filter bowl and screen to clean and remove debris.
3. In the case of mineral deposits on the screen, descale the screen using a descaler or white vinegar as necessary.
4. Place the screen in the filter bowl, and screw the bowl into the appropriate location on the frame.



# MACHINE OPERATIONAL SETTINGS

## HEAD LIFT

- 1. The head lift is controlled by a linear actuator which raises and lowers the scrub deck.
- 2. The standard controls knob on the console has 3 down pressure settings and transport mode.
- 3. Disk machines are equipped with a self-adjusting shroud and bristle skirt that virtually eliminates overspray.



## SELECTING DOWN PRESSURE

- 1. Low pressure: 60 lb. - Daily cleaning of normal soils.
- 2. Medium pressure: 120 lb. – Heavy soils or chemical-free finish removals.
- 3. High pressure: 180 - 185 lb. – Heavy soils, orbital finish removal or chemical stripping.



| SCRUB HEAD DOWN PRESSURE SETTING |          |          |          |             |
|----------------------------------|----------|----------|----------|-------------|
|                                  | 26" Disk | 28" Disk | 32" Disk | 28" Orbital |
| Low                              | 60       | 60       | 60       | 60          |
| Medium                           | 120      | 120      | 120      | 120         |
| High                             | 180      | 185      | 185      | 185         |

# DISK MACHINE PAD DRIVERS AND BRUSHES

## PAD DRIVER AND BRUSH REMOVAL

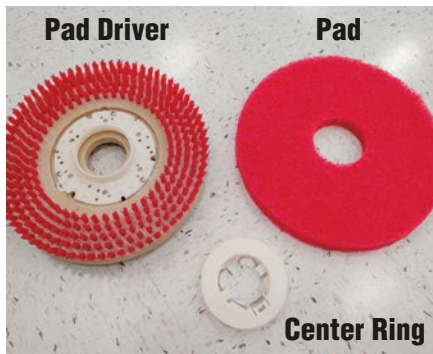
**NOTE:** *DO NOT use any machine without a pad or brush. Operating a machine without a pad or brush will damage the machine.*

1. Remove the pad drivers or brushes from the machine by pushing and holding the red "Auto Off" button, found in the center of the lower control panel, until the pad drivers or brushes release from the scrub deck.
2. Remove the pad drivers or brushes from under the scrub deck



## NEW PAD INSTALLATION

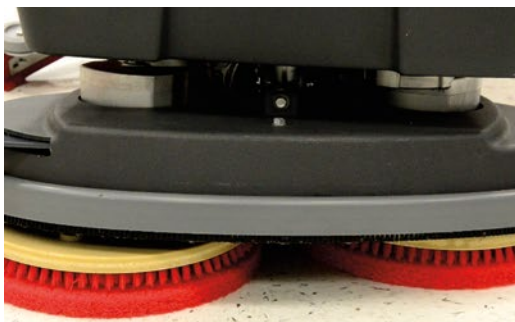
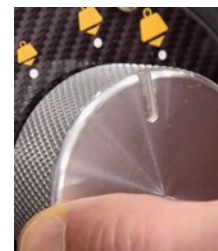
1. Release the centering ring by pressing down on the pad and squeezing the wire lock tabs of the centering ring inward until it releases.
2. Remove the old pad and any remnants from the bristles of the pad driver.
3. Place the new pad on the bristles of the pad driver, making sure to align center holes of the pad and pad driver.
4. Place the centering ring over the center of the pad and press down until the wire lock tabs click into place, securing the pad and centering ring to the pad driver.



## PAD DRIVER AND BRUSH INSTALLATION

1. Place the pad driver assemblies under the scrub deck of the machine. Try to align the assemblies under the scrub deck shroud.
2. Turn the key on and lower the head to medium or second down pressure position.
3. Turn the speed setting to the lowest position.
4. Slightly push or pull the machine to align the pad drive assemblies to help align the attachment lugs.
5. Pull the bail back to engage the pad drivers to the machine's pad drive train.
6. Once the pad drive assemblies are attached, adjust down pressure setting to perform desired application.

**NOTE:** *If the pad drivers do not connect the first time return to step 4 and repeat.*

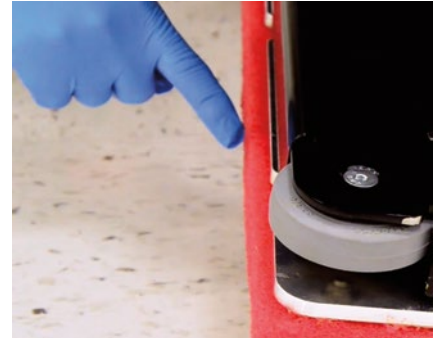


# ORBITAL PADS AND ORBITAL FINISH REMOVAL

## STANDARD CLEANING OPERATIONS

**⚠ NOTE: Do NOT lower the Orbital Scrub Head without a pad attached. This will damage the scrub head.**

1. Attach the pad ½" in front of the scrub head and align the front corners and sides. Press the pad into position once the pad is aligned (the ½" forwarding will help in pad wetting).
2. Lower the scrub deck onto the floor once the pad is aligned.
3. Check to make sure the pad is aligned on all four sides.



## ORBITAL FINISH REMOVAL PAD SETUP

Finish removal utilizes a two-pad setup. A red or white pad acts as a “backer pad” that helps compensate for flaws and variances in the floor. The maroon pad is for surface preparation.

1. Attach the red pad to the orbital pad drive plate as shown above.
2. Wet the maroon pad prior to installation to minimize excessive friction upon initial start up.
3. Place the maroon pad on the floor and position it so that when the scrub deck is lowered the red and maroon pads are aligned and stacked.



## MACHINE SETUP FOR ORBITAL FINISH REMOVAL

1. Fill the solution tank with clean water.
2. Install the pad assembly as described above.
3. The down pressure should be on medium or high pressure; depending on condition or hardness of the finish being removed.
4. The solution flow rate should be set to a low flow rate (approximately 25% of full flow rate) for this operation to maximize finish removal, to rinse, clean the floor and pad.
5. Forward speed should be set to 25% to 50% of normal speed to ensure maximum finish removal ; approximately 50-100 feet per minute.

# RECOVERY SYSTEM

## RECOVERY TANK: Draining

1. Find an approved drain location to empty the recovery tank.
2. Lift the drain hose off of the hose hook, remove the cap (keeping it above the tank's water level), fold over the collar and lower into the drain location.
3. Let the dirty water drain by releasing the collar into the drain slowly.
4. Lift the recovery tank lid to the wide-open position.



## CLEANING THE RECOVERY TANK WHEN DRAINING

1. Rinse out the recovery tank often to prevent debris, dirt buildup and any contaminants.
2. Use a hose to remove debris and sediment from the bottom of the tank with clean water.

**⚠ NOTE: Regularly use cleaner and sanitizer with a cloth or sponge to prevent mold and mildew inside the recovery tank.**

## VACUUM BALL CAGE

1. Remove clamp (if present) and vacuum ball cage filter.
2. Rinse the filter thoroughly.
3. Replace vacuum ball cage filter and clamp (if present).



## RECOVERY SYSTEM *continued*

### FORTIFY™ FOAM CONTROL / VACUUM PROTECTION SYSTEM

Proactively control the foam and protect the vacuum fan with the Fortify foam control puck underneath the debris tray inside the recovery tank.

### FORTIFY™ FOAM CONTROL PUCK REPLACEMENT

1. Open the recovery tank lid. Remove the debris tray and flip it over.
2. Turn the puck cage counter clockwise to release it from the debris tray.  
Replace puck as needed. Return debris basket to recovery tank.

**⚠ CAUTION: Do not use chlorine. Harmful fumes can be created from mixed cleaners and chlorine.**



### RECOVERY LID

Leave the recovery lid open while in storage and after cleaning. This enables the recovery tank to dry quickly and reduce the chance of mold and mildew from growing.



# SQUEEGEE ASSEMBLY

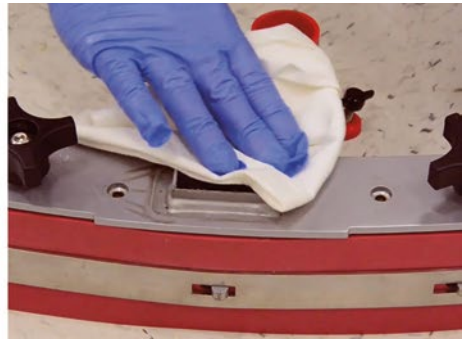
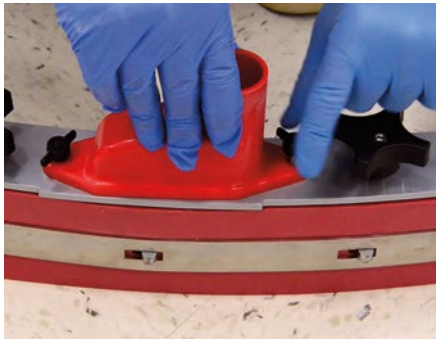
## CLEANING THE SQUEEGEE BLADES

1. Remove the squeegee assembly from the machine by loosening the two knobs.
2. Thoroughly clean and rinse the underside of the squeegee frame, blades and neck
3. Wipe down and dry the squeegee to remove any water and loose debris.



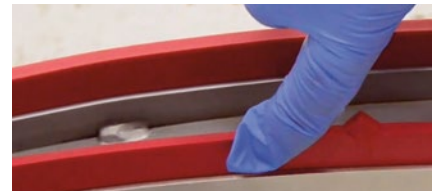
## DRIP TRAP INSPECTION

1. Inspect the drip trap on the topside of the squeegee by removing the 2 thumb screws.
2. Rinse off the drip trap and remove any debris.
3. Wipe and clean the squeegee frame before re-installing the drip trap.



## SQUEEGEE BLADES: INSPECT

1. Inspect the front and rear squeegee blades. The forward edges should be sharp and defined.
2. Worn blades should be flipped or replaced if worn halfway through the thickness.



# SQUEEGEE SELECTION GUIDE

The GeneSys™ Mid-Size Scrubber comes standard with Linatex® squeegee blade material. This has been proven to be a very versatile, high performance material across multiple flooring types.

As an option, sold separately, the GeneSys™ can be equipped with Primothane® urethane squeegee blades. Both blades utilize the patented Airoflex® design that increases vacuum performance by up to 40%.



The Airoflex design features the Airoflex valves along the squeegee blade edge, which flex open when on smooth floors and close on porous or grouted tile floors to increase vacuum performance.

**NOTE:** If cleaning and recovering petroleum or organic based oils, choose Primothane® regardless of floor surface.



| Floor Type                                                                                                    | Suggested Squeegee      | Comments                                                                                                    |
|---------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------------------------------------------------------------------------------------|
| Vinyl Composite Tile (VCT)<br>Grouted Tile<br>Natural Stone<br>Terrazzo<br>Polished / Sealed Concrete<br>Wood | LINATEX®                | Best combination of performance, durability and wear life                                                   |
| Luxury Vinyl Tile (LVT)<br>Rough Concrete                                                                     | LINATEX® or PRIMOTHANE® | Both will have good performance. Primothane® will last longer if floor is highly textured.                  |
| Rubber<br>Other Non-Slip / Grit Surfaces                                                                      | PRIMOTHANE®             | Best combination of performance, durability and wear life.<br>- Additional benefit of “Ultra-Quiet” in use. |

## REMOVE AND INSTALL THE SQUEEGEE BLADES

1. Release the latch and slide the band clamp off the hook on the other side.
2. Blades can be flipped length wise or top to bottom to use all four edges over the lifetime of the blade.
3. Place the blade over the assembly ensuring the holes align and replace the band clamp - make sure snug and tight when clamped.

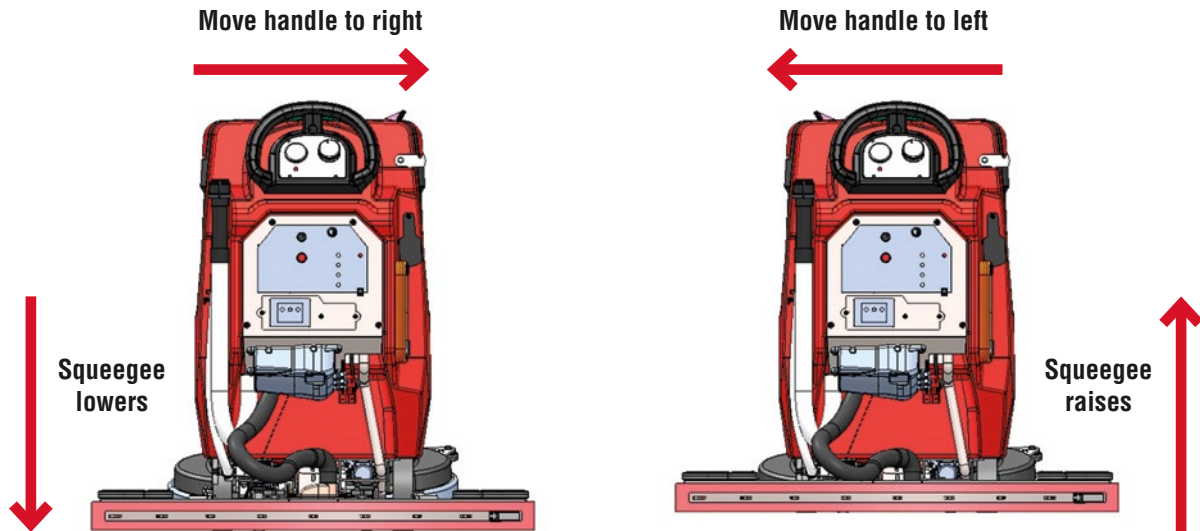


# SQUEEGEE OPERATION

1. Lower the squeegee: Move the squeegee lever to the right. The vacuum motor will come on.
2. Raise the squeegee: Move the squeegee lever to the left. The vacuum motor will turn off after 7 seconds.



***SQUEEGEE CASTER HEIGHT has been set at the factory for optimal squeegee performance. DO NOT ADJUST.***



# FORTIFY™ ARMOR™ TELEMETRY

The Betco® Genesys™ machine has an optional ARMOR™ Telemetry unit that can monitor the machine through a cellular network. The ARMOR unit is capable of monitoring daily run times, charge times, charge cycles, maintenance needs, location, and if the machine has experienced an impact. This information can be monitored by logging into Armordata.com.

## BUTTONS

|                                |                                                              |
|--------------------------------|--------------------------------------------------------------|
| <b>Maintenance Performed</b>   | Press and hold to log that the machine has been maintained   |
| <b>New Batteries Installed</b> | Press and hold to log that new batteries have been installed |
| <b>Silence Alarm</b>           | Press to silence the alarm for 24 hours                      |



## REGISTERING THE DEVICE

1. Locate and write down the serial number of the machine on the bottom of the recovery tank in the battery compartment.
2. Determine the facility that the machine will operate in, the person that will be monitoring the machine, and the main service contact.
3. Go to [www.armordata.com](http://www.armordata.com) and click the “Register an ARMOR Device” link under ARMOR Support
4. Fill out the form and click “Save info and register device”

**NOTE:** The machine data will appear in the [armordata.com](http://armordata.com) dashboard on the next business day. The included 12 month free subscription will start once this process is complete.

## OPERATION

The data that is logged by the ARMOR device can be viewed from any computer that has an internet connection. The device automatically sends its data once every day and after every charge/discharge event. If the device does not have a cellular connection, it will store the data and send as soon as it has a connection. To view the machines information, visit ARMOR's website at <http://armordata.com>.

## SETTING MAINTENANCE REMINDERS

The ARMOR device has several functions that can be performed at the machine. When maintenance is performed, press and hold the “Maintenance Performed” button to log the event. When batteries are replaced, press and hold the “New Batteries Installed” button to log the event. An end user can silence the alarm by pressing the “Silence Alarm” button, note that the alert on Armordata.com will remain. When the end user has an issue with the machine and needs assistance, they can send a notification to Armordata.com by pressing and holding the “Maintenance Performed” button and the “Silence Alarm” button at the same time.

# TIMER LOCKOUT

The Betco Genesys machine has an optional lockout timer that can limit the time of day, and days, that the machine can be operated. Limiting the hours that the machine can function prevents unauthorized use while not interfering with productivity. The timer is located on the back panel of the machine and is protected from tampering by a metal plate.



## BUTTONS

- WEEK** Changes the day of the week for the clock or the days of the week for a program.
- HOUR** Increments the hour unit up one.
- MIN** Increments the minute unit up one.
- RECALL** Recalls or clears the last settings of a program.
- CLOCK** Allows adjustment of the clock when held down.
- PROG** Indexes through each programs on/off settings.
- MANUAL** Cycles through the machine being off, on, or in auto mode.
- R** Resets the timer to the factory settings.

## SETTING THE TIME

1. Press the "CLOCK" button to ensure that the clock is displayed.
2. Press and hold the "CLOCK" button.
3. While holding the clock button, press the "WEEK" button until the proper day is displayed
4. Still holding the clock button, press the "HOUR" button until the correct hour is shown and repeat with the "MIN" button until the proper minute is shown.
5. Release the "CLOCK" button



**NOTE: Pressing and holding the "CLOCK" button for 3 seconds switches from 12 hour time to 24 hour time and back.**

## OPERATION

The timer can store up to 16 programs that can be individually programmed. These programs are active when the timer shows "AUTO" next to the clock. The machine can be cycled to "ON", "OFF", and "AUTO" by pressing the "MANUAL" button. The machine can only be operated when the red light is illuminated on the timer. If the machine is to be used outside of the programmed time, the manual button can be pressed until "ON" is displayed. Ensure that the machine is turned back to "AUTO" to re-enable the programs.

"ON" – The machine is active and will not be disabled at any time.

"OFF" – The machine is disabled and will not be active at any time.

"AUTO" – The machine will be active when the programs on time has been reached and be disabled at the set off time.

## PROGRAMMING THE TIMER

1. Press the "PROG" button to enter programming mode.



**NOTE: Pressing the "PROG" button again will cycle through the 16 programs. The program number is displayed on the left with an indication of whether the time to turn the machine on, or turn the machine off is being set.**

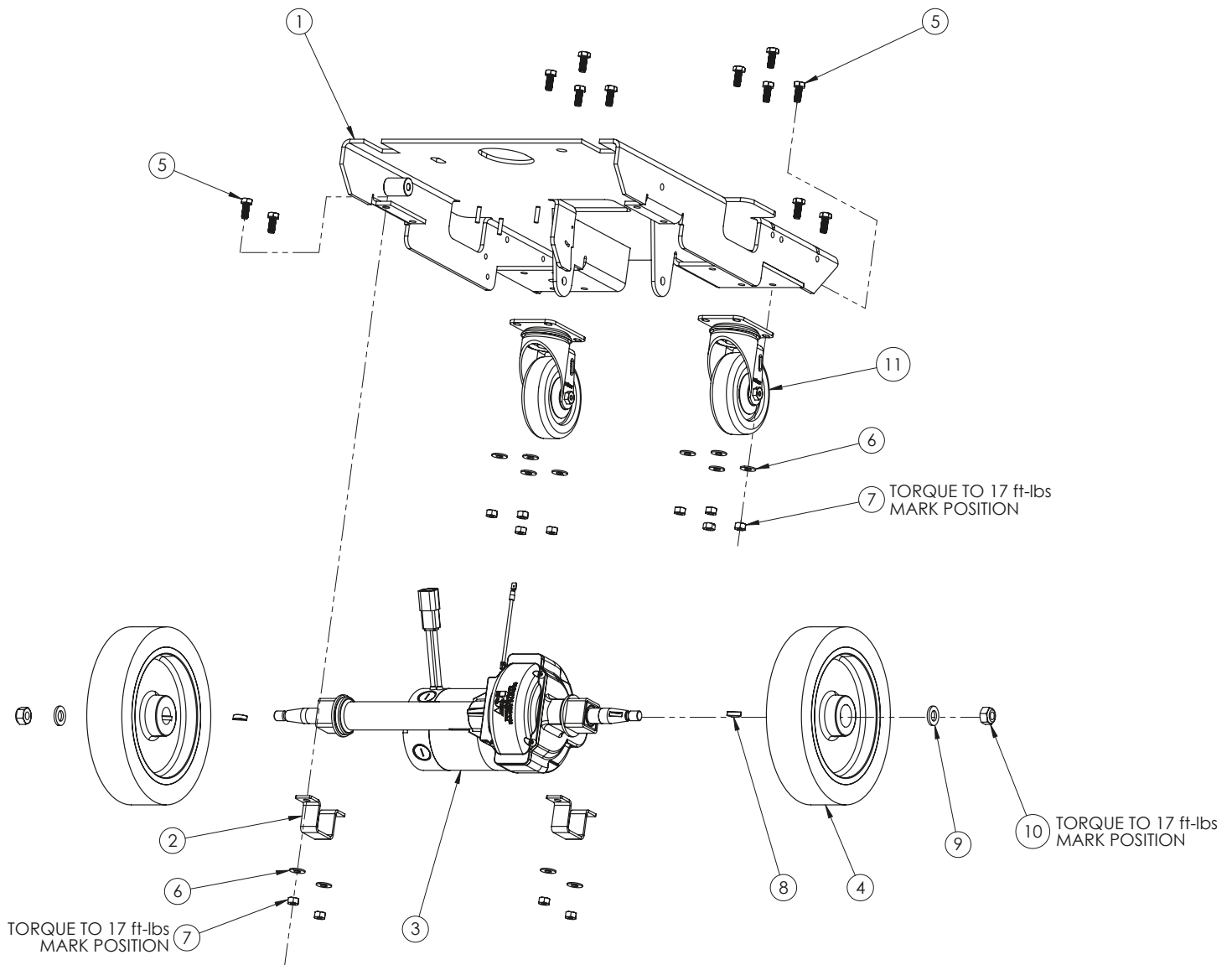
2. Cycle to the program number that is to be set and ensure on is shown on the left next to the number.
3. Press the "WEEK" button until the desired days are displayed at the top of the screen that the machine will turn on.
4. Press the "HOUR" button until the desired hour is shown and repeat with the "MIN" button until the desired minute is shown.
5. Press the "PROG" button to display the programs off time.
6. Repeat step 3 and 4 to set the off time.
7. Press the "CLOCK" button.
8. Press the "MANUAL" button until "AUTO" is shown on the right to enable the programs.



**NOTE: While in the programming mode "RECALL" will disable the displayed program or load the previous setting used for that program.**

**NOTE: When setting the program to be used overnight, ensure that the off setting is the next day that the on setting is. (IE: Friday 10PM on, Saturday 8AM off).**

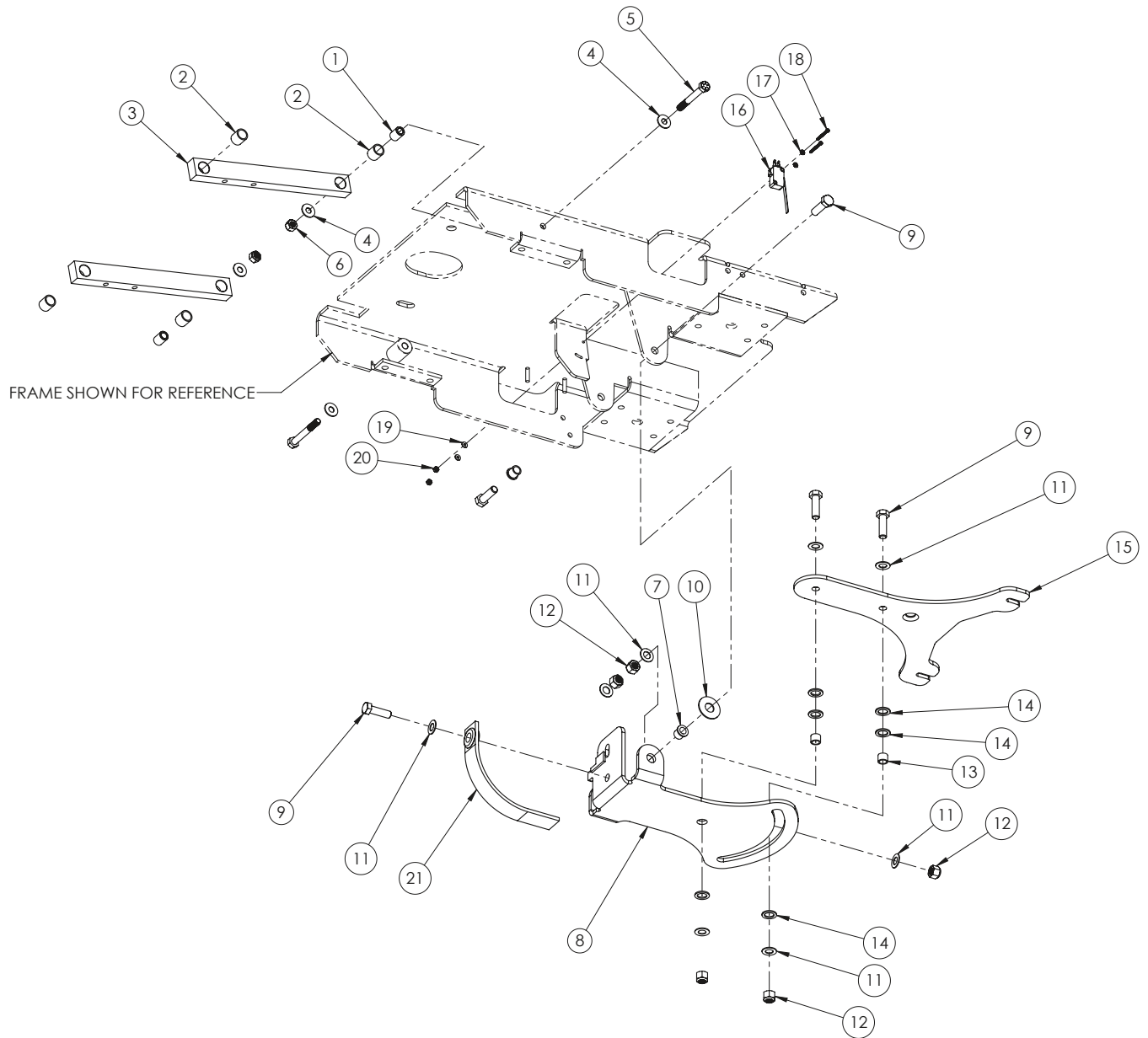
# TRANSAXLE AND WHEELS DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                                  | Qty. |
|-------|--------|----------------------------------------------|------|
| 1     | E28511 | FRAME WELDMENT                               | 1    |
| 2     | E29400 | BRACKET, TRANSAXLE MTG                       | 2    |
| 3     | E28512 | TRANSAXLE, 20.4 LG                           | 1    |
| 4     | E28515 | WHEEL, 0.500 ID X 8.660 OD, 1.970 W, GRAY    | 2    |
| 5     | E81089 | BOLT, HEX HD, 5/16-18 x 0.750 LG, ZP         | 12   |
| 6     | E29403 | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.057 THK | 12   |

| Item# | Part # | Description                                | Qty. |
|-------|--------|--------------------------------------------|------|
| 7     | E12524 | NUT, HEX, 5/16-18, SS                      | 12   |
| 8     | E29439 | KEY, WOODRUFF, 19mm DIA x 5mm              | 2    |
| 9     | E83702 | WASHER, FLAT, 13mm ID x 24mm OD, 2.7mm THK | 2    |
| 10    | E86489 | NUT, HEX, M12-1.75, NYLOC                  | 2    |
| 11    | E28514 | CASTER, SWIVEL PLATE, 4.000 OD             | 2    |

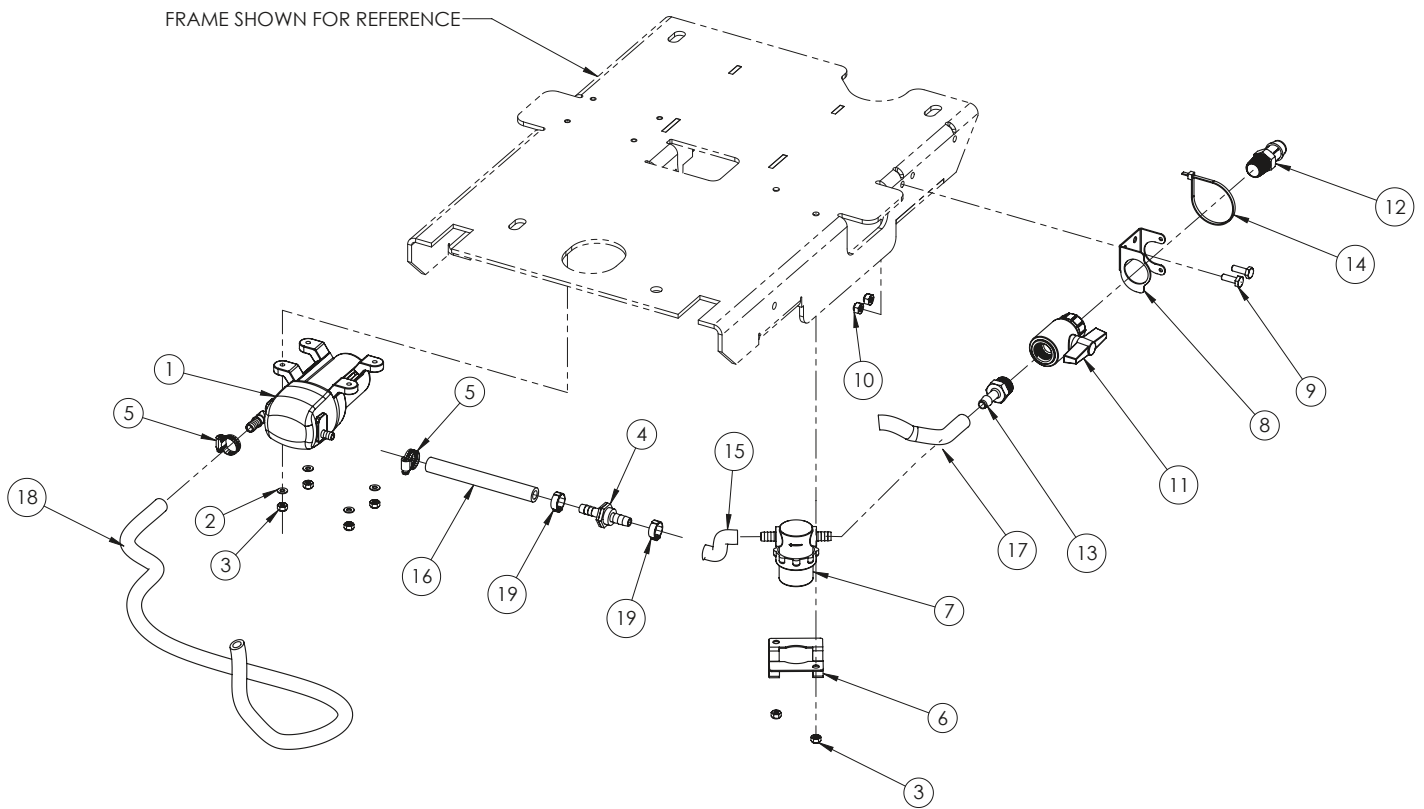
# LIFT ARMS AND SQUEEGEE MOUNT DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                                             | Qty. |
|-------|--------|---------------------------------------------------------|------|
| 1     | E28684 | BUSHING, SLEEVE, 0.323 ID x 0.497 OD, 0.655 LG          | 2    |
| 2     | E28685 | BUSHING, SLEEVE, 0.501 ID x 0.627 OD, 0.625 LG          | 4    |
| 3     | E28625 | ARM, HEAD LIFT                                          | 2    |
| 4     | E28622 | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.050 THK, SS        | 4    |
| 5     | E28822 | BOLT, HEX HD, 5/16-18 x 2.500 LG, YC, GRADE 8           | 2    |
| 6     | E81063 | NUT, HEX, 5/16-18, NYLOC, ZP                            | 2    |
| 7     | E28591 | BEARING, SLEEVE, 0.376 ID x 0.501 OD, 0.500 LG, FLANGED | 2    |
| 8     | E28519 | BRACKET, SQUEEGEE LIFT, WELDMENT, MSAS                  | 1    |
| 9     | E29436 | BOLT, HEX HD, 3/8-16 x 1.250 LG, SS                     | 5    |
| 10    | E83145 | WASHER, FLAT, 0.520 ID x 1.252 OD, 0.061 THK, NYLON     | 1    |
| 11    | E29438 | WASHER, FLAT, 0.406 ID x 0.750 OD, 0.040 THK            | 8    |

| Item# | Part # | Description                                         | Qty. |
|-------|--------|-----------------------------------------------------|------|
| 12    | E11146 | NUT, HEX, 3/8-16, NYLOC, ZP                         | 5    |
| 13    | E28936 | BEARING, SLEEVE, 0.375 ID x 0.501 OD x 0.375 LG     | 2    |
| 14    | E28937 | WASHER, FLAT, 0.505 ID x 0.750 OD, 0.067 THK, NYLON | 6    |
| 15    | E28520 | PLATE, SQUEEGEE SWING, MSAS                         | 1    |
| 16    | E28952 | SWITCH, SNAP ACTION, SPDT                           | 1    |
| 17    | E28821 | WASHER, LOCK, 0.115 ID x 0.260 OD, EXT TOOTH, ZP    | 2    |
| 18    | E28762 | SCREW, SOC HD HEX, #4-40 x 1.000 LG, BO             | 2    |
| 19    | E29368 | WASHER, FLAT, 0.125 ID x 0.312 OD, 0.030 THK        | 2    |
| 20    | E28770 | NUT, HEX, #4-40, NYLOC                              | 2    |
| 21    | E29459 | STATIC STRAP                                        | 1    |

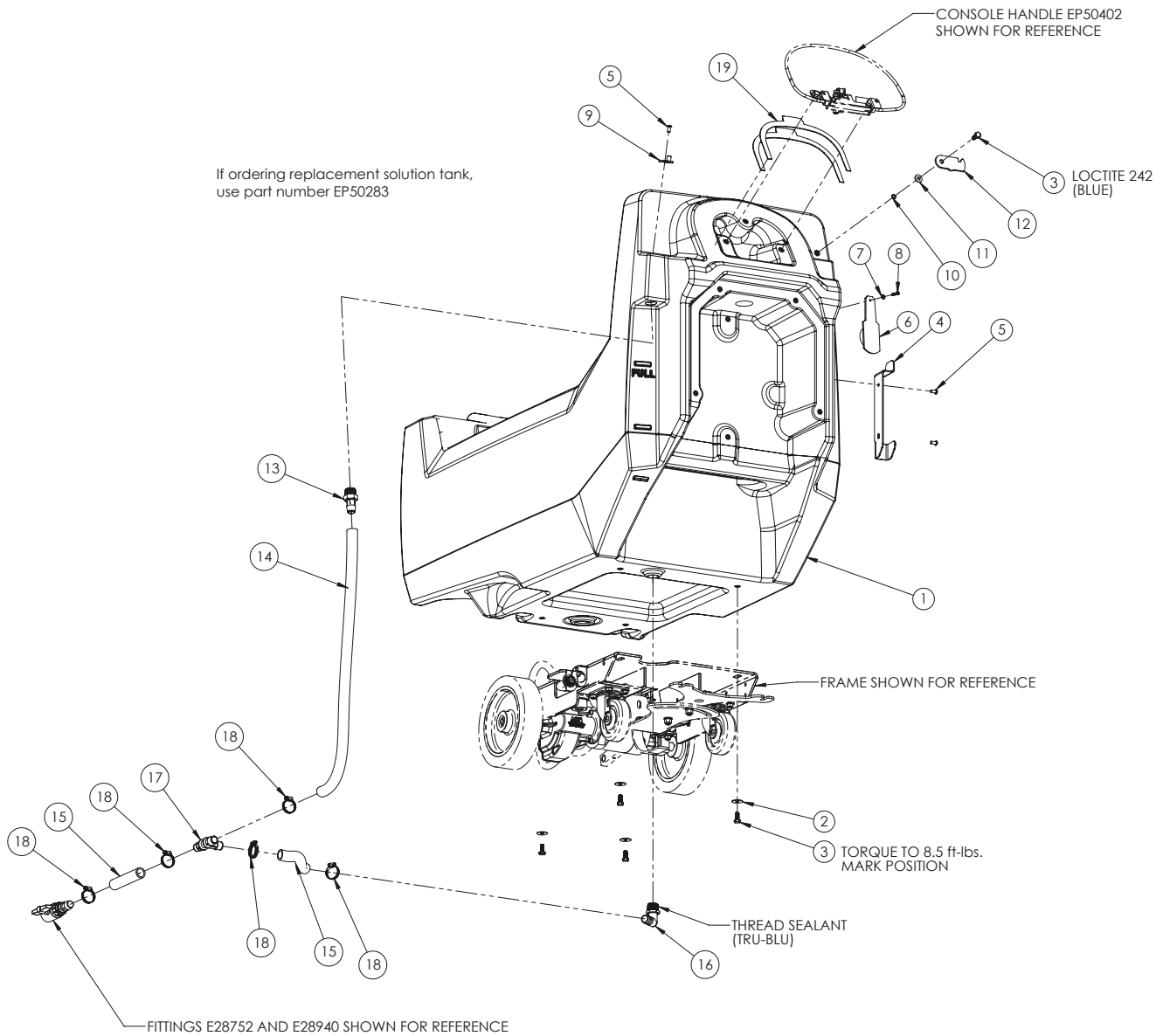
# FRAME FLUID DELIVERY DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 1     | E29601 | PUMP, WATER, 1.0 gpm                             | 1    |
| 2     | E28775 | WASHER, FLAT, 0.203 ID x 0.438 OD, 0.040 THK, SS | 4    |
| 3     | E28753 | NUT, HEX, #10-24, NYLOC, SS                      | 6    |
| 4     | E28816 | CHECK VALVE, 3/8 BARB, PLASTIC                   | 1    |
| 5     | E89720 | CLAMP, HOSE, 0.438 - 0.782 DIA                   | 2    |
| 6     | E28740 | BRACKET, STRAINER-CHEM PUMP                      | 1    |
| 7     | E28942 | STRAINER, IN-LINE                                | 1    |
| 8     | E28746 | BRACKET, BALL VALVE-SOLUTION TANK                | 1    |
| 9     | E29410 | BOLT, HEX HD, 1/4-20 x 0.750 LG                  | 2    |
| 10    | E28853 | NUT, HEX, 1/4-20, FLEX-TOP LOCK, CDPL            | 2    |

| Item# | Part #  | Description                                  | Qty. |
|-------|---------|----------------------------------------------|------|
| 11    | E28940  | VALVE, BALL, 1/2 FNPT, PLASTIC               | 1    |
| 12    | E28752  | FITTING, ADAPTER, 3/4 BARB X 3/4 MNPT        | 1    |
| 13    | E28751  | FITTING, ADAPTER, 3/8 BARB X 1/2 MNPT        | 1    |
| 14    | E28831  | WIRE TIE, 7.000 LG, NYLON                    | 1    |
| 15    | EP50410 | HOSE, 3/8 ID, REINFORCED CLEAR PVC, 2.50 LG  | 1    |
| 16    | EP50411 | HOSE, 3/8 ID, REINFORCED CLEAR PVC, 5.25 LG  | 1    |
| 17    | EP50412 | HOSE, 3/8 ID, REINFORCED CLEAR PVC, 4.50 LG  | 1    |
| 18    | EP50413 | HOSE, 3/8 ID, REINFORCED CLEAR PVC, 38.00 LG | 1    |
| 19    | E28773  | CLAMP, HOSE, SINGLE PINCH                    | 2    |

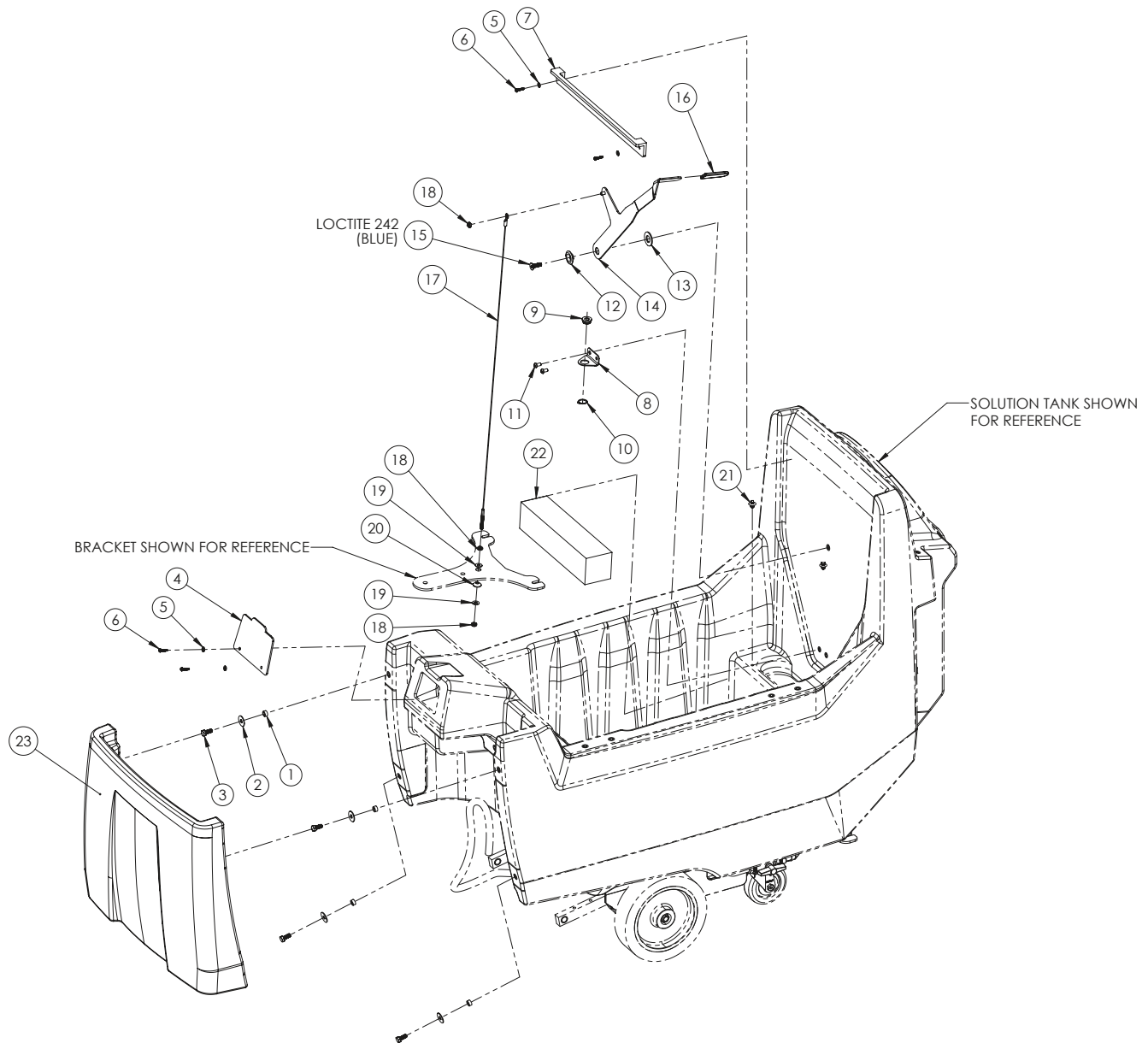
# SOLUTION TANK BACK DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 1     | E28563 | SOLUTION TANK, GS MSAS                           | 1    |
| 2     | E29388 | WASHER, FLAT, 0.344 ID x 1.000 OD, 0.062 THK     | 4    |
| 3     | E81089 | BOLT, HEX HD, 5/16-18 x 0.750 LG, ZP             | 5    |
| 4     | E28737 | BRACKET, CHARGER CORD WRAP                       | 1    |
| 5     | E28648 | SCREW, BUTTON HD HEX, 1/4-20 x 0.500 LG          | 3    |
| 6     | E28837 | COVER, REAR FILL PORT                            | 1    |
| 7     | E28775 | WASHER, FLAT, 0.203 ID x 0.438 OD, 0.040 THK, SS | 1    |
| 8     | E28761 | SCREW, PAN HD TORX, #8-16 TF x 0.750 LG          | 1    |
| 9     | E28712 | HANGER, DRAIN CUFF                               | 1    |
| 10    | E28765 | WASHER, LOCK, 0.320 ID x 0.437 OD, WAVE, ZP      | 1    |

| Item# | Part #  | Description                                    | Qty. |
|-------|---------|------------------------------------------------|------|
| 11    | E29403  | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.057 THK   | 1    |
| 12    | E28707  | HANGER, SQUEEGEE                               | 1    |
| 13    | E29305  | FITTING, ADAPTER, 3/4 BARB x 3/4 NPT, PLASTIC  | 1    |
| 14    | EP50414 | TUBE, 3/4 ID, CLEAR PVC, 26.00 LG              | 1    |
| 15    | EP50415 | TUBE, 3/4 ID, CLEAR PVC, 5.00 LG               | 2    |
| 16    | E28750  | FITTING, ELBOW 90, 3/4 BARB, 3/4 MNPT, PLASTIC | 1    |
| 17    | E28749  | FITTING, TEE, 3/4 HOSE, PLASTIC                | 1    |
| 18    | E28766  | CLAMP, HOSE, 0.680-1.250 DIA                   | 5    |
| 19    | E28823  | GASKET, GENESYS CONSOLE HANDLE                 | 2    |

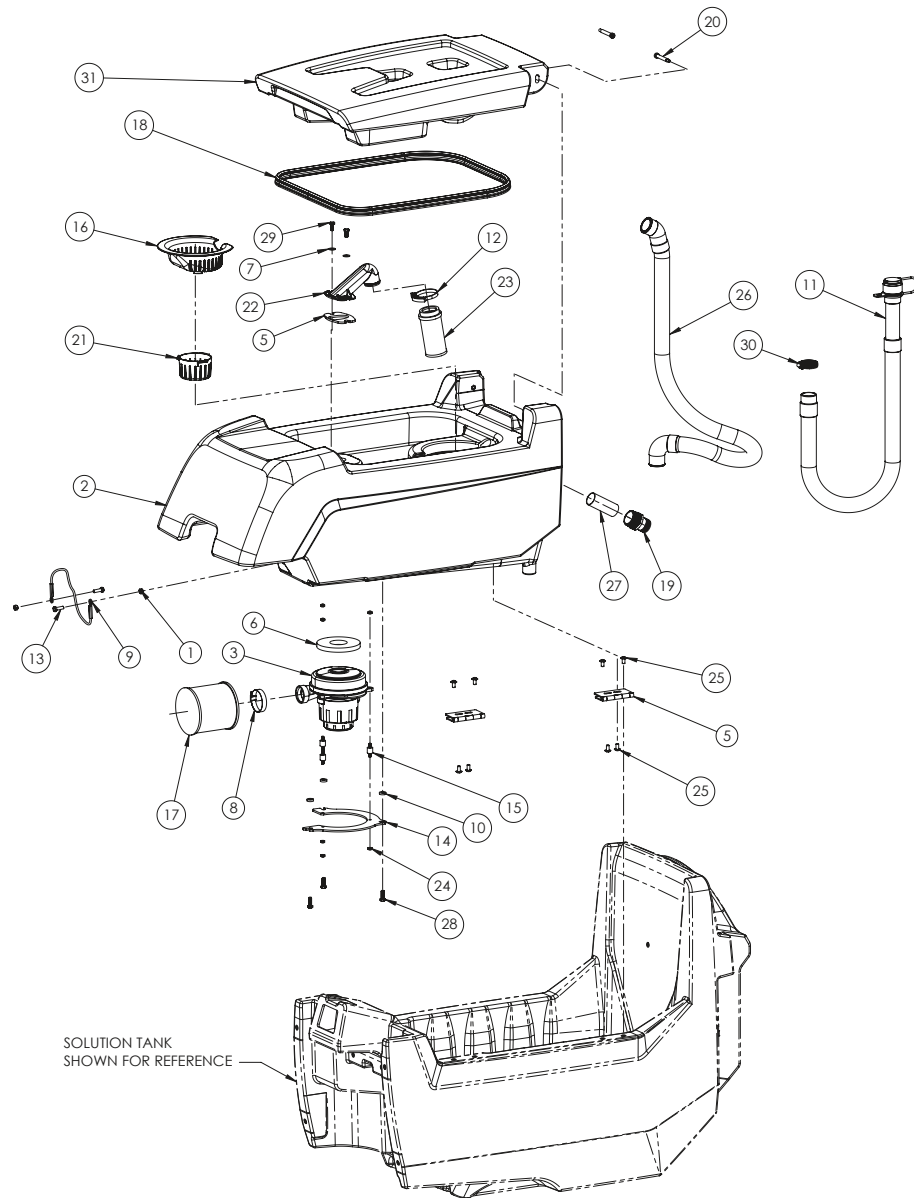
# SOLUTION TANK FRONT DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                                         | Qty. |
|-------|--------|-----------------------------------------------------|------|
| 1     | E29579 | BUSHING, SLEEVE, 0.315 ID x 0.500 OD, 0.250 LG, OIB | 4    |
| 2     | E29388 | WASHER, FLAT, 0.344 ID x 1.000 OD, 0.062 THK        | 4    |
| 3     | E81089 | BOLT, HEX HD, 5/16-18 x 0.750 LG, ZP                | 4    |
| 4     | E28825 | COVER, FRONT FILL PORT                              | 1    |
| 5     | E28775 | WASHER, FLAT, 0.203 ID x 0.438 OD, 0.040 THK, SS    | 4    |
| 6     | E28761 | SCREW, PAN HD TORX, #8-16 TF x 0.750 LG             | 4    |
| 7     | E28756 | SQUEEGEE LEVER GUIDE                                | 1    |
| 8     | E28714 | BRACKET, CABLE GUIDE                                | 1    |
| 9     | E28715 | GUIDE, SQUEEGEE CABLE                               | 1    |
| 10    | E28722 | RETAINING RING, EXTERNAL, 0.75 SHAFT X 0.046 GROOVE | 1    |
| 11    | E28648 | SCREW, BUTTON HD HEX, 1/4-20 X 0.500 LG             | 2    |
| 12    | E28718 | BUSHING, SQUEEGEE LEVER                             | 1    |

| Item# | Part # | Description                                         | Qty. |
|-------|--------|-----------------------------------------------------|------|
| 13    | E28719 | WASHER, FLAT, 0.656 ID x 1.312 OD, 0.094 THK, NYLON | 1    |
| 14    | E28909 | LEVER, SQUEEGEE LIFT, WELDMENT                      | 1    |
| 15    | E28763 | SCREW, FLAT HD HEX, 5/16-18 x 1.000 LG, BO          | 1    |
| 16    | E28721 | CAP, SQUEEGEE LEVER                                 | 1    |
| 17    | E28759 | SQUEEGEE LIFT CABLE ASSY                            | 1    |
| 18    | E29565 | NUT, HEX, 1/4-20, THIN, NYLOC                       | 3    |
| 19    | E28617 | WASHER, FLAT, 0.281 ID x 0.625 OD, 0.050 THK, SS    | 2    |
| 20    | E28717 | WASHER, SPHERICAL, 0.280 ID x 0.750 OD, ZP          | 1    |
| 21    | E28621 | WIRE TIE PUSH MOUNT                                 | 2    |
| 22    | E28785 | FOAM BLOCK, BATTERY SPACER                          | 1    |
| 23    | E28579 | SOLUTION TANK FRONT COVER w/ INSERTS AND COUTOUTS   | 1    |

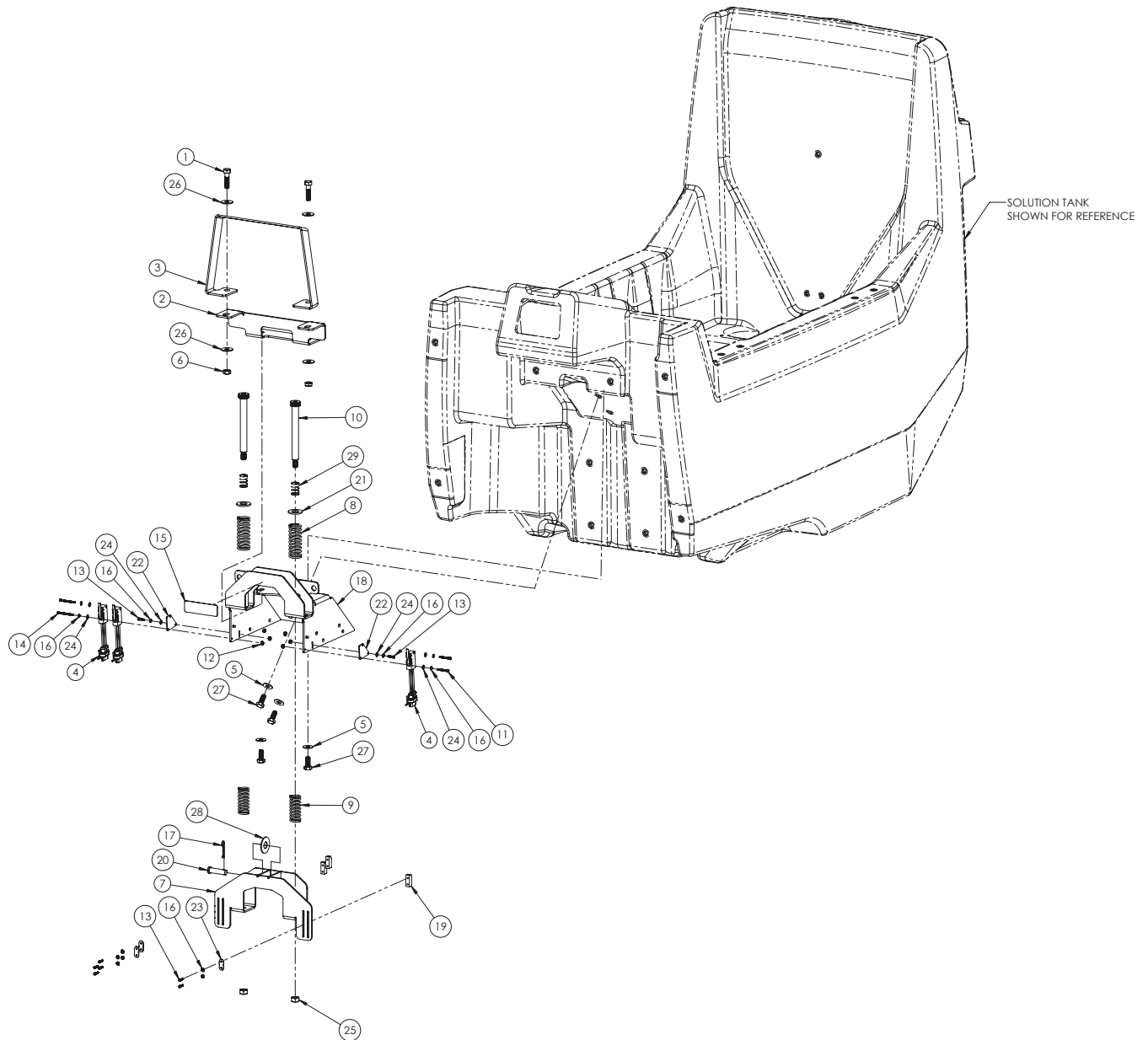
# RECOVERY TANK DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 1     | E12524 | NUT, HEX, 5/16-18, SS                            | 2    |
| 2     | E28575 | RECOVERY TANK, GS MSAS                           | 1    |
| 3     | E28581 | VACUUM FAN, 24VDC, 450W                          | 1    |
| 4     | E28596 | HINGE, 4.000 LEAF HT                             | 2    |
| 5     | E28607 | GASKET, FLOAT MOUNT                              | 1    |
| 6     | E28608 | GASKET, FOAM, 2.000 ID x 5.000 OD, 0.500 THK     | 1    |
| 7     | E28622 | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.050 THK, SS | 2    |
| 8     | E28755 | CLAMP, HOSE, 1.560 - 2.500 ID, 0.500 W           | 1    |
| 9     | E28760 | CABLE, RECOVERY TANK                             | 1    |
| 10    | E28850 | SPACER, 0.315 ID X 0.750 OD, 0.188 THK, AI       | 3    |
| 11    | E28921 | HOSE, RECOVERY TANK DRAIN                        | 1    |
| 12    | E28990 | CLAMP, DOUBLE SNAP GRIP                          | 1    |
| 13    | E29392 | BOLT, HEX HD, 5/16-18 x 1.000 LG                 | 2    |
| 14    | E29523 | VACUUM MOUNT BRACKET                             | 1    |
| 15    | E29524 | ISOLATOR, DUAL STUD, 1/4-20 THD                  | 3    |
| 16    | E29525 | DEBRIS TRAY                                      | 1    |

| Item# | Part #  | Description                                                         | Qty. |
|-------|---------|---------------------------------------------------------------------|------|
| 17    | E29527  | HEPA FILTER-GENESYS MS                                              | 1    |
| 18    | EP50286 | SEAL, MSAS RECOVERY TANK LID, 83 IN LG                              | 1    |
| 19    | E29531  | FITTING, ADAPTER, 1.500 BARB x 1 1/2 NPT, PLASTIC                   | 1    |
| 20    | E29558  | BOLT, SOC HD HEX, 5/16-18 x 0.500 LG, 0.375 DIA x 2.250 LG SHOULDER | 2    |
| 21    | E29561  | HOLDER, DEFOAMING CHEMICAL PUCK                                     | 1    |
| 22    | E29562  | MOUNT, FLOAT BALL CAGE                                              | 1    |
| 23    | E29563  | CAGE, FLOAT BALL                                                    | 1    |
| 24    | E29565  | NUT, HEX, 1/4-20, THIN, NYLOC                                       | 6    |
| 25    | E29569  | SCREW, FLANGED BUTTON HD HEX, 5/16-18 x 0.625 LG, SS                | 8    |
| 26    | E29576  | HOSE, SQUEEGEE VACUUM                                               | 1    |
| 27    | EP50441 | TUBE, PVC RIGID, 1.375 ID X 1.500 OD, 3.625 LG                      | 1    |
| 28    | E81072  | BOLT, HEX HD, 5/16-18 x 1.000 LG                                    | 3    |
| 29    | E81089  | BOLT, HEX HD, 5/16-18 x 0.750 LG, ZP                                | 2    |
| 30    | E83966  | CLAMP, HOSE, 2.000 ID x 0.500 ID                                    | 1    |
| 31    | E28577  | COVER, GS MSAS RECOVERY TANK                                        | 1    |

# HEAD LIFT DIAGRAM AND PARTS LISTING

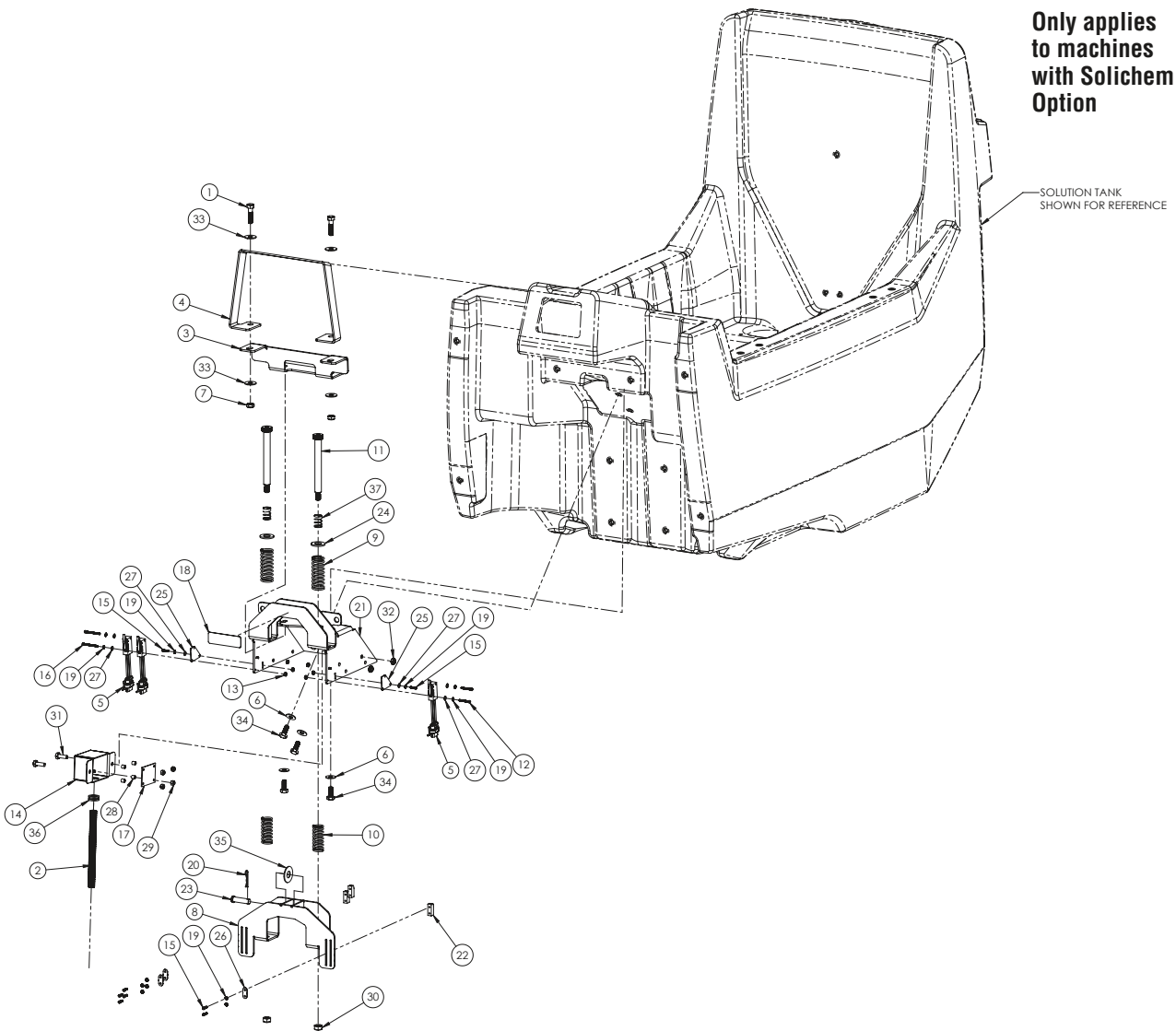


| Item# | Part # | Description                                                            | Qty. |
|-------|--------|------------------------------------------------------------------------|------|
| 1     | E10112 | BOLT, HEX HD, 5/16-18 x 1.250 LG, ZP                                   | 2    |
| 2     | E20702 | BRACKET, HEAD LIFT SUPPORT                                             | 1    |
| 3     | E20703 | STRAP, HEAD LIFT SUPPORT                                               | 1    |
| 4     | E20704 | ASSEMBLY, HEAD LIFT SWITCH, GENESYS                                    | 3    |
| 5     | E28622 | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.050 THK, SS                       | 4    |
| 6     | E28623 | NUT, HEX, 5/16-18, THIN, NYLOC, SS                                     | 2    |
| 7     | E28726 | BRACKET, ACTUATOR SPRING WELDMENT                                      | 1    |
| 8     | E28727 | SPRING, COMPRESSION, 0.760 ID X 0.970 OD, 2.500 LG, ZP                 | 2    |
| 9     | E28728 | SPRING, COMPRESSION, 0.645 ID X 0.845 ID, 2.000 LG, ZP                 | 2    |
| 10    | E28730 | BOLT, SOC HD HEX, 3/8-16 x 4.250 LG, 0.500 DIA x 4.250 LG SHOULDER, ZP | 2    |
| 11    | E28769 | SCREW, SOC HD HEX, #4-40 x 0.875 LG, SS                                | 2    |
| 12    | E28770 | NUT, HEX, #4-40, NYLOC                                                 | 6    |
| 13    | E28779 | SCREW, SOC HD HEX, #4-40 X 0.438 LG, SS                                | 8    |
| 14    | E28782 | SCREW, SOC HD HEX, #4-40 X 1.250 LG, SS                                | 2    |
| 15    | E28796 | DECAL, PINCH POINT                                                     | 1    |

| Item# | Part #  | Description                                         | Qty. |
|-------|---------|-----------------------------------------------------|------|
| 16    | E28821  | WASHER, LOCK, 0.115 ID x 0.260 OD, EXT TOOTH, ZP    | 12   |
| 17    | E28847  | COTTER PIN, 0.25 EYE, 0.125 WIRE, ZP                | 1    |
| 18    | E29000  | BRACKET, ACTUATOR MOUNTING, WELDMENT                | 1    |
| 19    | E29002  | CAM, SWITCH                                         | 3    |
| 20    | E29003  | CLEVIS PIN, 0.375 DIA X 1.125 LG                    | 1    |
| 21    | E29005  | WASHER, FLAT, 0.531 ID x 1.062 OD, 0.098 THK        | 2    |
| 22    | E29009  | PLATE, SWITCH MOUNTING                              | 2    |
| 23    | E29010  | PLATE, CAM MOUNTING                                 | 3    |
| 24    | E29368  | WASHER, FLAT, 0.125 ID x 0.312 OD, 0.030 THK        | 6    |
| 25    | E29393  | NUT, HEX, 3/8-16, THIN, NYLOC, SS                   | 2    |
| 26    | E81062  | WASHER, FLAT, 0.344 ID x 0.875 OD, 0.063 THK, ZP    | 4    |
| 27    | E81089  | BOLT, HEX HD, 5/16-18 x 0.750 LG, ZP                | 4    |
| 28    | E83145  | WASHER, FLAT, 0.520 ID x 1.252 OD, 0.061 THK, NYLON | 1    |
| 29    | F091510 | SPRING                                              | 2    |

# HEAD LIFT WITH SOLICHEM OPTION DIAGRAM AND PARTS LISTING

Only applies  
to machines  
with Solichem  
Option

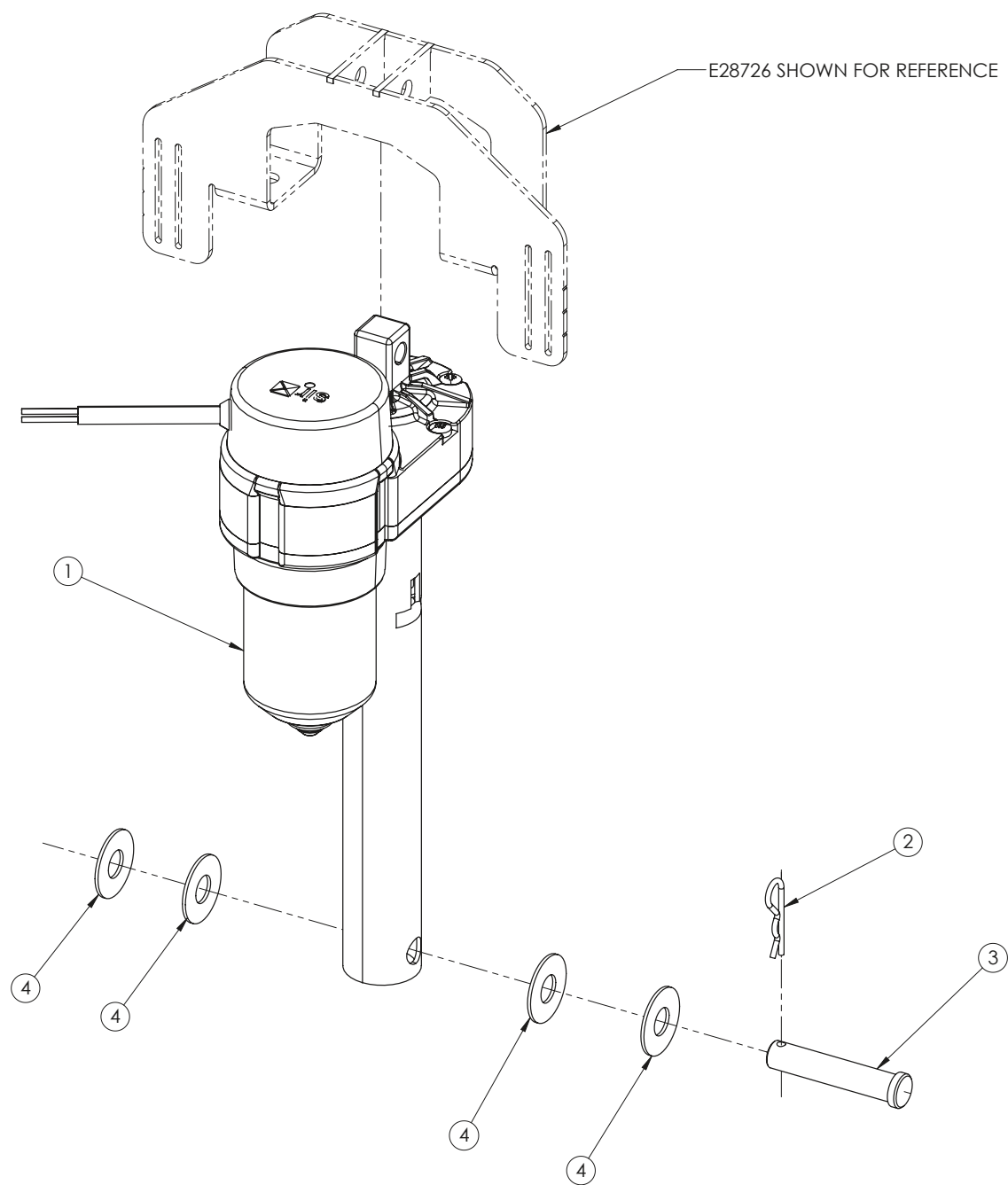


| Item# | Part #  | Description                                                            | Qty. |
|-------|---------|------------------------------------------------------------------------|------|
| 1     | E10112  | BOLT, HEX HD, 5/16-18 x 1.250 LG, ZP                                   | 2    |
| 2     | EP50420 | LOOM, CONVOLUTED, 3/8in, 12.00LG                                       | 1    |
| 3     | E20702  | BRACKET, HEAD LIFT SUPPORT                                             | 1    |
| 4     | E20703  | STRAP, HEAD LIFT SUPPORT                                               | 1    |
| 5     | E20704  | ASSEMBLY, HEAD LIFT SWITCH, GENESYS                                    | 3    |
| 6     | E28622  | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.050 THK, SS                       | 4    |
| 7     | E28623  | NUT, HEX, 5/16-18, THIN, NYLOC, SS                                     | 2    |
| 8     | E28726  | BRACKET, ACTUATOR SPRING WELDMENT                                      | 1    |
| 9     | E28727  | SPRING, COMPRESSION, 0.760 ID X 0.970 OD, 2.500 LG, ZP                 | 2    |
| 10    | E28728  | SPRING, COMPRESSION, 0.645 ID X 0.845 ID, 2.000 LG, ZP                 | 2    |
| 11    | E28730  | BOLT, SOC HD HEX, 3/8-16 x 4.250 LG, 0.500 DIA x 4.250 LG SHOULDER, ZP | 2    |
| 12    | E28769  | SCREW, SOC HD HEX, #4-40 x 0.875 LG, SS                                | 2    |
| 13    | E28770  | NUT, HEX, #4-40, NYLOC                                                 | 6    |
| 14    | E28778  | BRACKET, TDS SHEILD                                                    | 1    |
| 15    | E28779  | SCREW, SOC HD HEX, #4-40 X 0.438 LG, SS                                | 8    |
| 16    | E28782  | SCREW, SOC HD HEX, #4-40 X 1.250 LG, SS                                | 2    |
| 17    | E28784  | PCB, TDS SENSOR                                                        | 1    |
| 18    | E28796  | DECAL, PINCH POINT                                                     | 1    |
| 19    | E28821  | WASHER, LOCK, 0.115 ID x 0.260 OD, EXT TOOTH, ZP                       | 12   |

| Item# | Part #  | Description                                         | Qty. |
|-------|---------|-----------------------------------------------------|------|
| 20    | E28847  | COTTER PIN, 0.25 EYE, 0.125 WIRE, ZP                | 1    |
| 21    | E29000  | BRACKET, ACTUATOR MOUNTING, WELDMENT                | 1    |
| 22    | E29002  | CAM, SWITCH                                         | 3    |
| 23    | E29003  | CLEVIS PIN, 0.375 DIA X 1.125 LG                    | 1    |
| 24    | E29005  | WASHER, FLAT, 0.531 ID x 1.062 OD, 0.098 THK        | 2    |
| 25    | E29009  | PLATE, SWITCH MOUNTING                              | 2    |
| 26    | E29010  | PLATE, CAM MOUNTING                                 | 3    |
| 27    | E29368  | WASHER, FLAT, 0.125 ID x 0.312 OD, 0.030 THK        | 6    |
| 28    | E29373  | SPACER, 0.140 ID x 0.250 OD, 0.250 LG               | 4    |
| 29    | E29381  | NUT, HEX, #6-32, NYLOC, ZP                          | 4    |
| 30    | E29393  | NUT, HEX, 3/8-16, THIN, NYLOC, SS                   | 2    |
| 31    | E29410  | BOLT, HEX HD, 1/4-20 x 0.750 LG                     | 2    |
| 32    | E29565  | NUT, HEX, 1/4-20, THIN, NYLOC                       | 2    |
| 33    | E81062  | WASHER, FLAT, 0.344 ID x 0.875 OD, 0.063 THK, ZP    | 4    |
| 34    | E81089  | BOLT, HEX HD, 5/16-18 x 0.750 LG, ZP                | 4    |
| 35    | E83145  | WASHER, FLAT, 0.520 ID x 1.252 OD, 0.061 THK, NYLON | 1    |
| 36    | E88708  | GROMMET, EPDM 60 DURO                               | 1    |
| 37    | F091510 | SPRING                                              | 2    |

# DISC MACHINE ACTUATOR DIAGRAM AND PARTS LISTING

Only applies to machines with disc heads

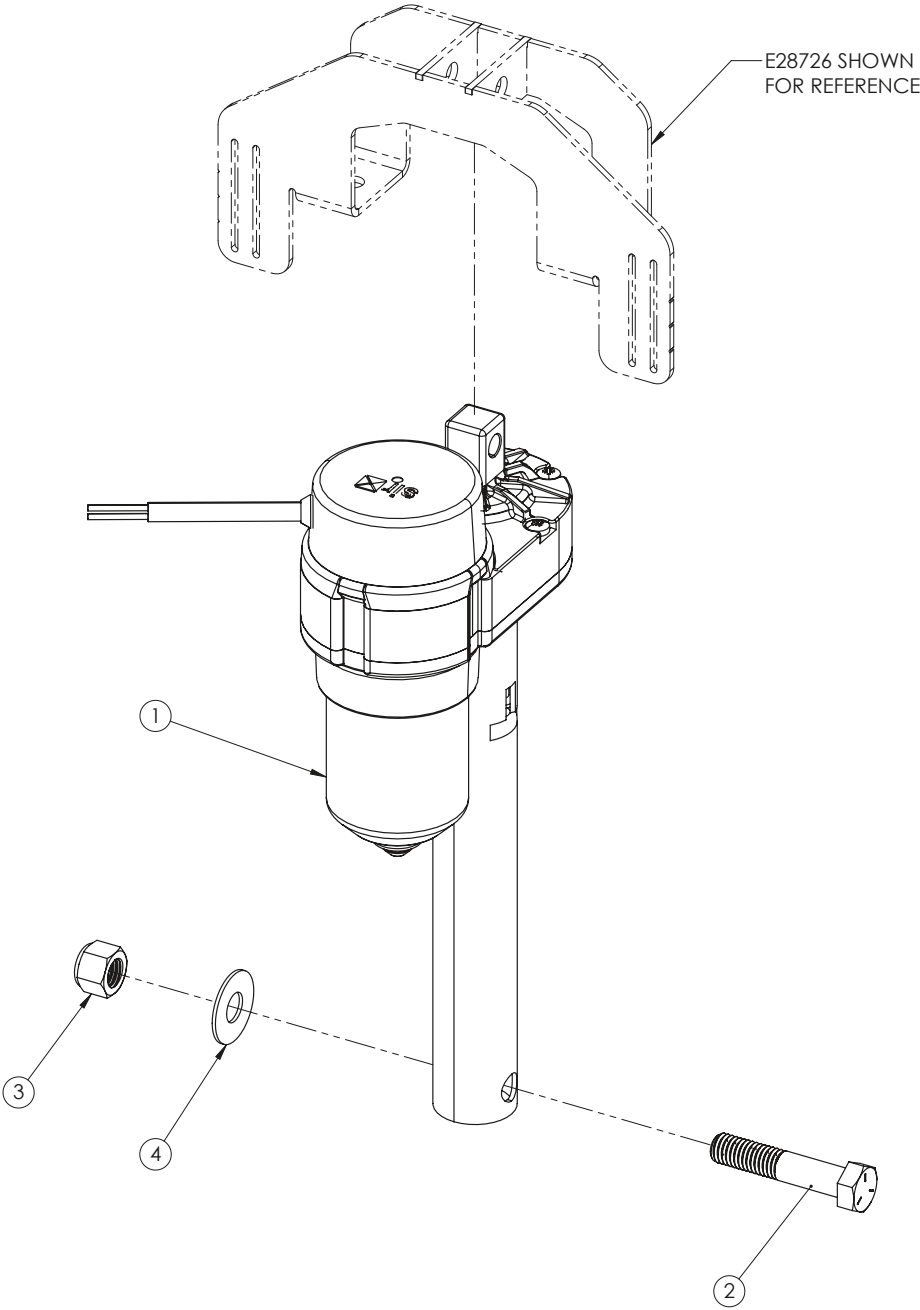


| Item# | Part # | Description          | Qty. |
|-------|--------|----------------------|------|
| 1     | E28628 | ACTUATOR, HEAD LIFT  | 1    |
| 2     | E28671 | PIN, COTTER, HAIRPIN | 1    |

| Item# | Part # | Description                                         | Qty. |
|-------|--------|-----------------------------------------------------|------|
| 3     | E28699 | PIN, CLEVIS, 0.500 OD X 2.250 LG                    | 1    |
| 4     | E83145 | WASHER, FLAT, 0.520 ID x 1.252 OD, 0.061 THK, NYLON | 4    |

# ORBITAL MACHINE ACTUATOR DIAGRAM AND PARTS LISTING

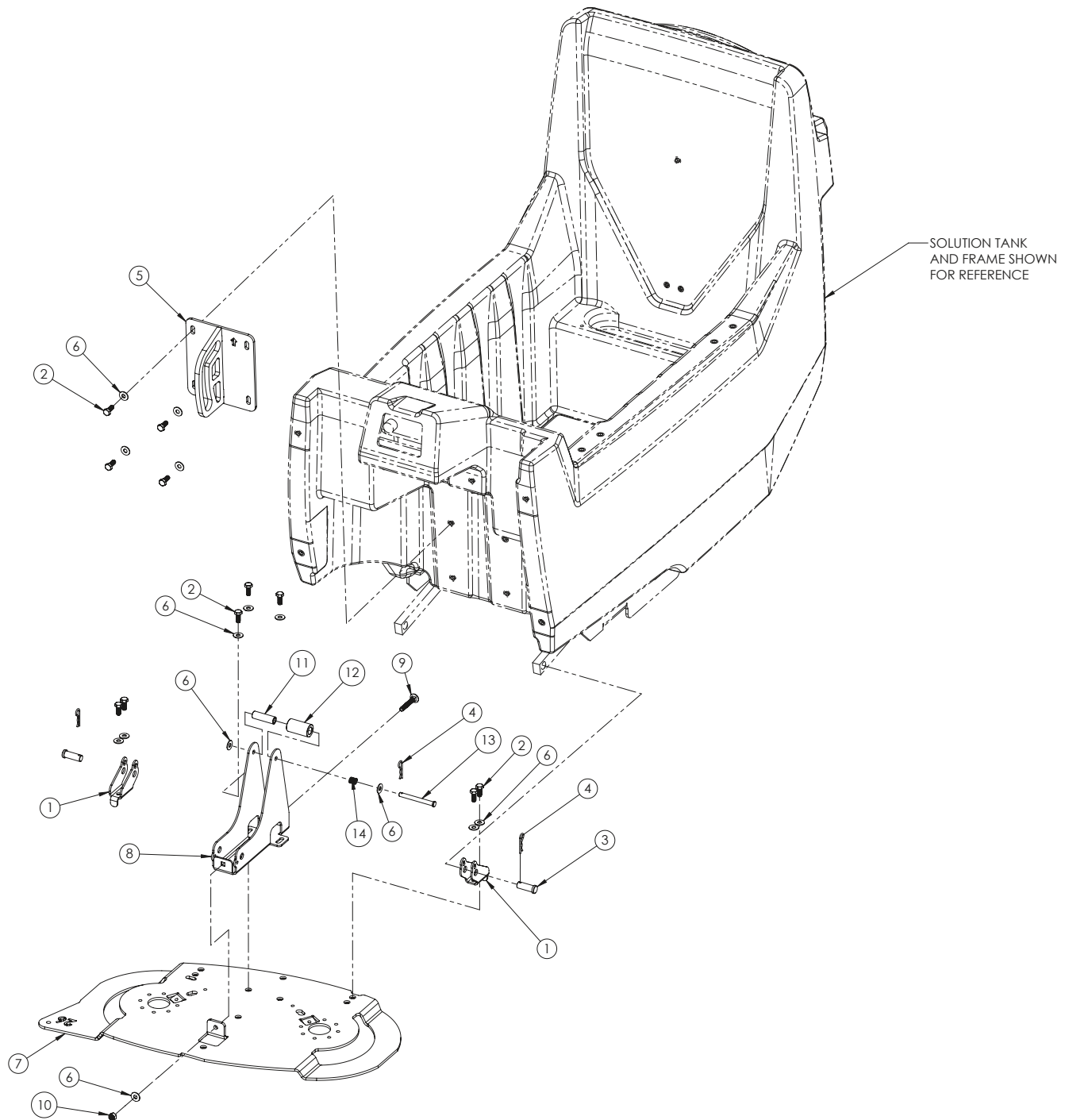
Only applies to machines with orbital heads



| Item# | Part # | Description                         | Qty. |
|-------|--------|-------------------------------------|------|
| 1     | E28628 | ACTUATOR, HEAD LIFT                 | 1    |
| 2     | E28815 | BOLT, HEX HD, 1/2-13 x 2.500 LG, ZP | 1    |

| Item# | Part # | Description                                         | Qty. |
|-------|--------|-----------------------------------------------------|------|
| 3     | E12410 | NUT, HEX, 1/2-13, NYLOC, GRADE 5, ZP                | 1    |
| 4     | E83145 | WASHER, FLAT, 0.520 ID x 1.252 OD, 0.061 THK, NYLON | 1    |

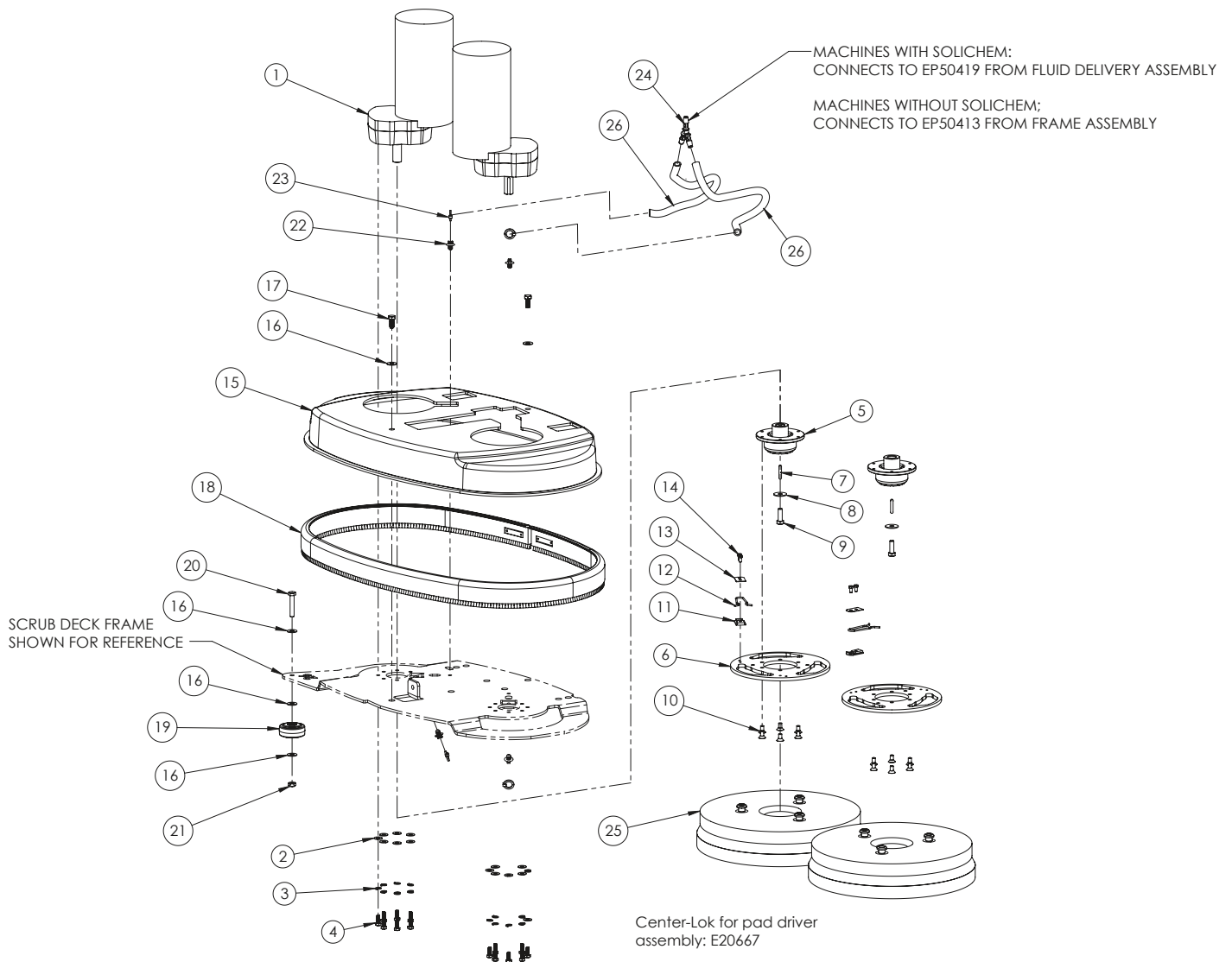
## 26" DISC LIFT BRACKETS DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 1     | E29514 | BRACKET, LIFT ARM PIVOT                          | 2    |
| 2     | E81089 | BOLT, HEX HD, 5/16-18 x 0.750 LG, ZP             | 11   |
| 3     | E28697 | PIN, CLEVIS, 0.500 OD X 1.125 LG                 | 2    |
| 4     | E28671 | PIN, COTTER, HAIRPIN                             | 3    |
| 5     | E28679 | DISK ROLLER TRACK WELDMENT                       | 1    |
| 6     | E28622 | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.050 THK, SS | 14   |
| 7     | E28933 | FRAME, DISC HEAD, WELDMENT, 26IN                 | 1    |

| Item# | Part # | Description                                           | Qty. |
|-------|--------|-------------------------------------------------------|------|
| 8     | E28654 | BRACKET, DISK HEAD ROLLER                             | 1    |
| 9     | E11043 | BOLT, CARRIAGE, 5/16-18 x 2.000 LG                    | 1    |
| 10    | E81063 | NUT, HEX, 5/16-18, NYLOC, ZP                          | 1    |
| 11    | E28664 | BUSHING, 0.323 ID X 0.563 OD, 1.860 LG, STEEL, ZP     | 1    |
| 12    | E28663 | ROLLER, 0.575 ID X 1.000 OD, 1.830 LG, DELRIN         | 1    |
| 13    | E28783 | CLEVIS PIN, 0.313 OD x 3.000 LG, 2.750 USEABLE LG, ZP | 1    |
| 14    | E29328 | SPRING, COMPRESSION, 0.376 ID x 0.500 OD, 0.750 LG    | 1    |

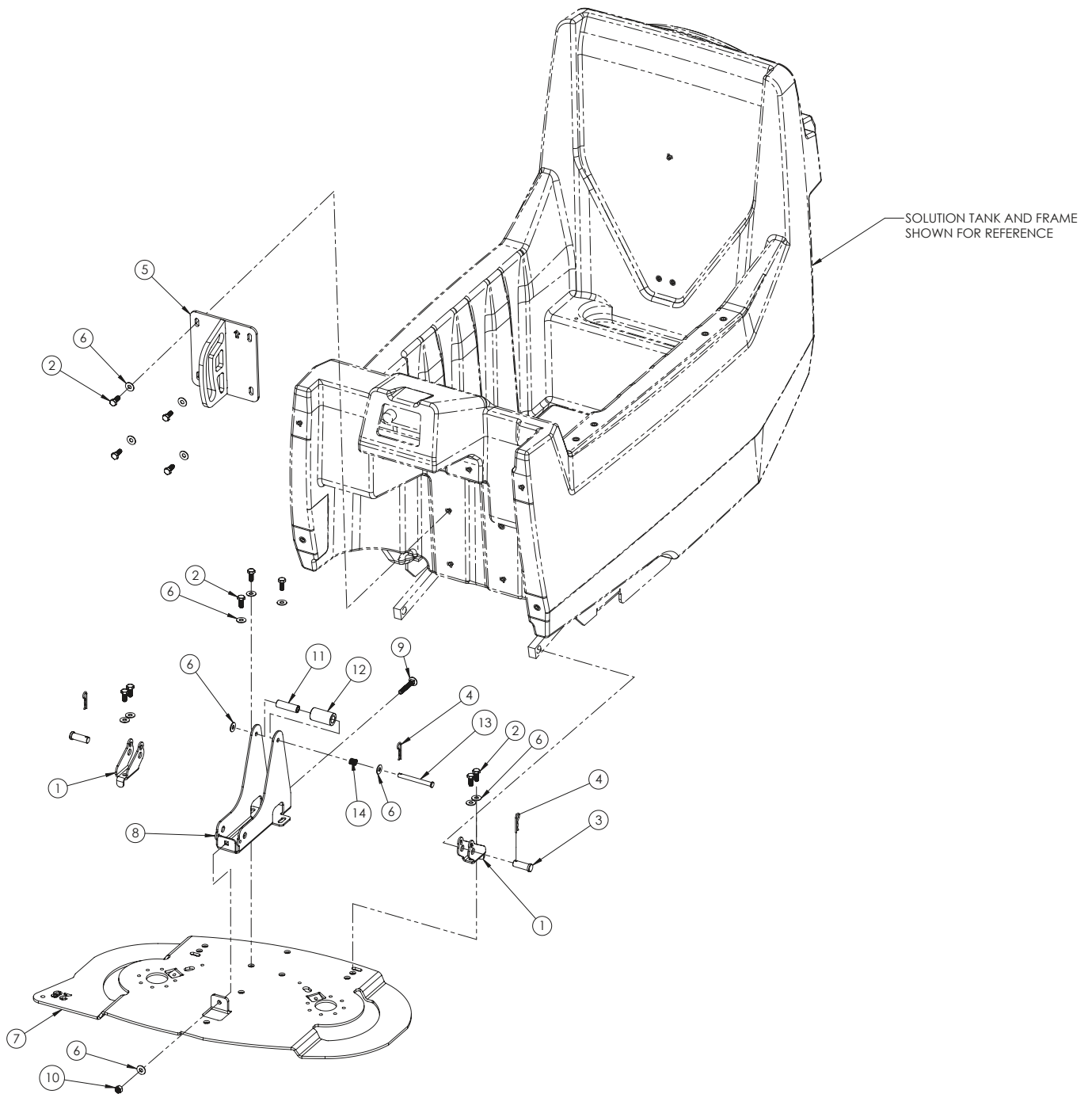
## 26" DISC HEAD DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 1     | E28541 | MOTOR, 24VDC, 300 RPM                            | 2    |
| 2     | E28617 | WASHER, FLAT, 0.281 ID x 0.625 OD, 0.050 THK, SS | 14   |
| 3     | E29385 | WASHER, LOCK, 6.5mm x 11.8mm, SPLIT, ZP          | 14   |
| 4     | E20087 | BOLT, HEX HD, M6-1 x 16mm LG, SS                 | 14   |
| 5     | E28588 | COUPLER, DISK ALIGNMENT                          | 2    |
| 6     | E28589 | PLATE, DISC ENGAGEMENT                           | 2    |
| 7     | E29389 | KEY, MACHINE, 5mm x 5mm, ROUNDED                 | 2    |
| 8     | E29388 | WASHER, FLAT, 0.344 ID x 1.000 OD, 0.062 THK     | 2    |
| 9     | E29426 | BOLT, HEX HD, M8-1.25 x 20mm LG                  | 2    |
| 10    | E29391 | SCREW, FLAT HD HEX, 1/4-20 x 0.375 LG            | 12   |
| 11    | E29519 | RETAINER, LUG SPRING                             | 2    |
| 12    | E29518 | SPRING CLIP, WIRE, DISC LOCK                     | 2    |
| 13    | E29515 | SHIM, SPRING FOR LUG                             | 2    |

| Item# | Part #  | Description                                      | Qty. |
|-------|---------|--------------------------------------------------|------|
| 14    | E29390  | BOLT, HEX HD, #10-24 x 0.375 LG                  | 4    |
| 15    | E29571  | SHROUD, DISC HEAD, 26in, w/ CUTOUTS              | 1    |
| 16    | E28622  | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.050 THK, SS | 5    |
| 17    | E81089  | BOLT, HEX HD, 5/16-18 x 0.750 LG, ZP             | 2    |
| 18    | E29341  | SKIRT ASSEMBLY, 26in DISC HEAD                   | 1    |
| 19    | E28598  | WHEEL, COLSON ROLLER, 2in                        | 1    |
| 20    | E29513  | BOLT, HEX HD, 5/16-18 x 1.750 LG                 | 1    |
| 21    | E28623  | NUT, HEX, 5/16-18, THIN, NYLOC, SS               | 1    |
| 22    | E28621  | WIRE TIE PUSH MOUNT                              | 4    |
| 23    | E83523  | CABLE TIE, 4.125 LG x 0.125 W                    | 4    |
| 24    | E28747  | FITTING, WYE, 3/8 BARB, PLASTIC                  | 1    |
| 25    | E29537  | PAD DRIVER ASSEMBLY, 13in                        | 2    |
| 26    | EP50418 | TUBE, 3/8 ID, CLEAR PVC, 14.00LG                 | 2    |

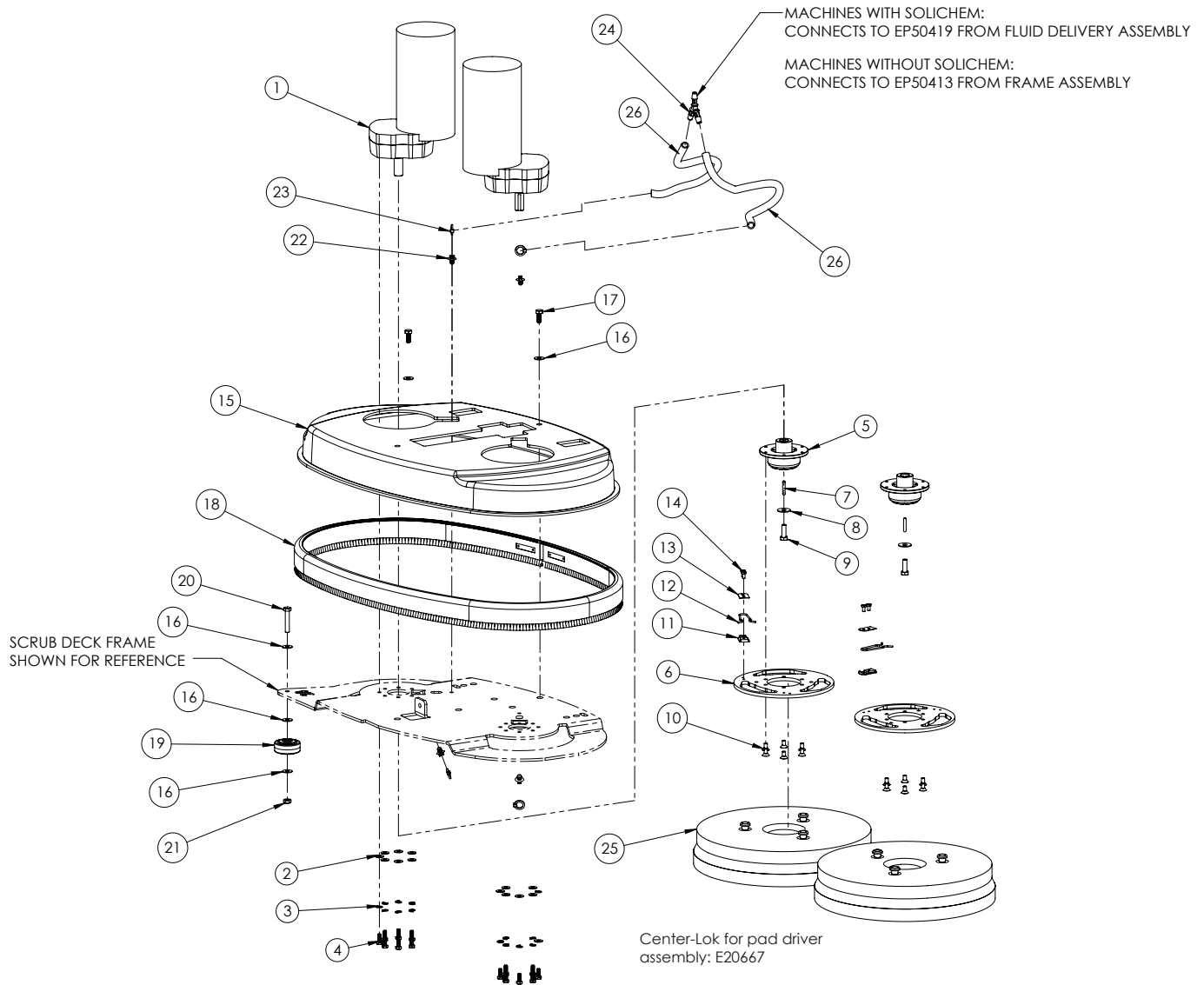
# 28" DISC LIFT BRACKETS DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 1     | E29514 | BRACKET, LIFT ARM PIVOT                          | 2    |
| 2     | E81089 | BOLT, HEX HD, 5/16-18 x 0.750 LG, ZP             | 11   |
| 3     | E28697 | PIN, CLEVIS, 0.500 OD X 1.125 LG                 | 2    |
| 4     | E28671 | PIN, COTTER, HAIRPIN                             | 3    |
| 5     | E28679 | DISK ROLLER TRACK WELDMENT                       | 1    |
| 6     | E28622 | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.050 THK, SS | 14   |
| 7     | E28916 | FRAME, DISC HEAD, 28IN, WELDMENT                 | 1    |

| Item# | Part # | Description                                           | Qty. |
|-------|--------|-------------------------------------------------------|------|
| 8     | E28654 | BRACKET, DISK HEAD ROLLER                             | 1    |
| 9     | E11043 | BOLT, CARRIAGE, 5/16-18 x 2.000 LG                    | 1    |
| 10    | E81063 | NUT, HEX, 5/16-18, NYLOC, ZP                          | 1    |
| 11    | E28664 | BUSHING, 0.323 ID X 0.563 OD, 1.860 LG, STEEL, ZP     | 1    |
| 12    | E28663 | ROLLER, 0.575 ID X 1.000 OD, 1.830 LG, DELRIN         | 1    |
| 13    | E28783 | CLEVIS PIN, 0.313 OD x 3.000 LG, 2.750 USEABLE LG, ZP | 1    |
| 14    | E29328 | SPRING, COMPRESSION, 0.376 ID x 0.500 OD, 0.750 LG    | 1    |

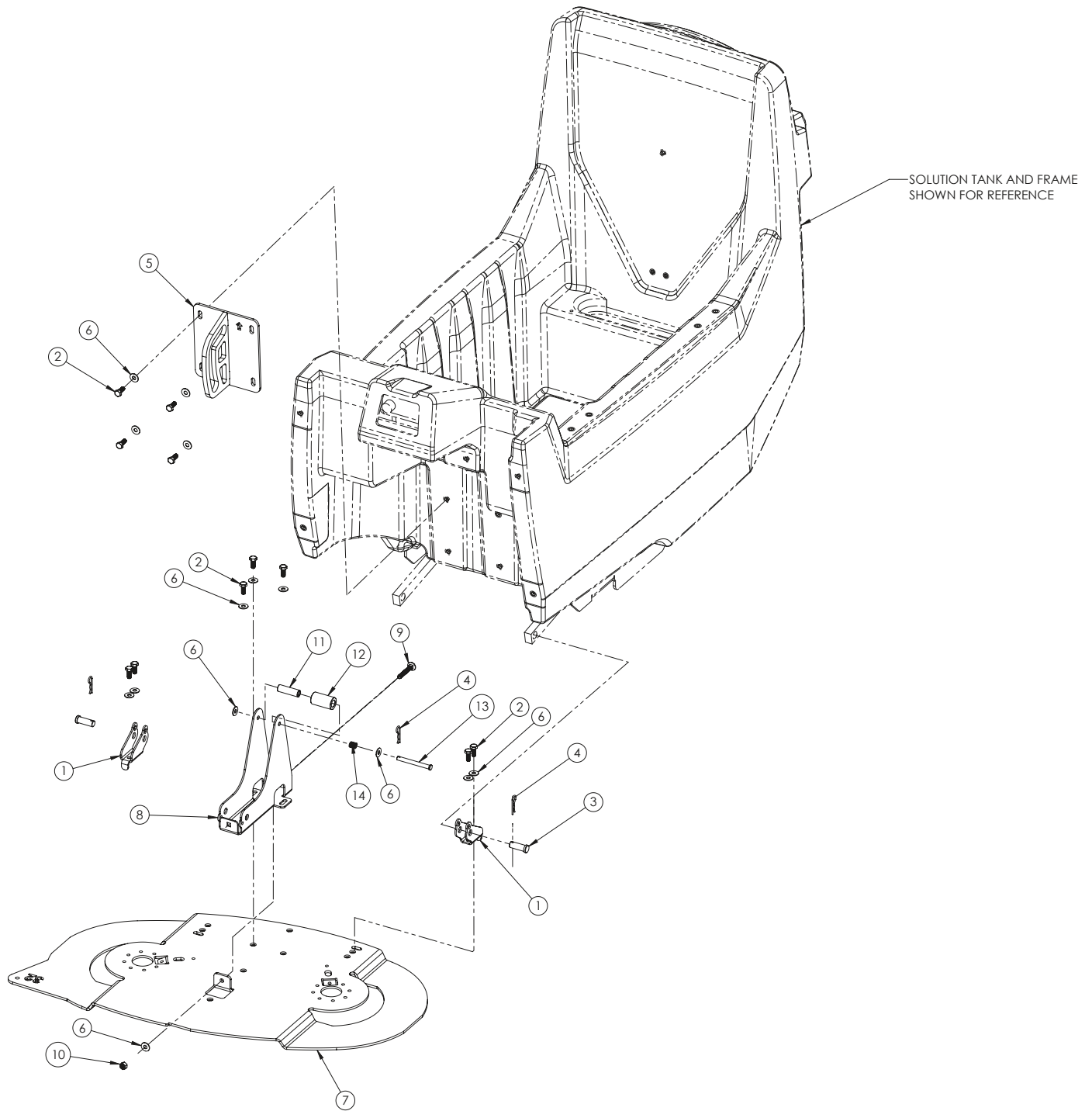
# 28" DISC HEAD DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 1     | E28541 | MOTOR, 24VDC, 300 RPM                            | 2    |
| 2     | E28617 | WASHER, FLAT, 0.281 ID x 0.625 OD, 0.050 THK, SS | 14   |
| 3     | E29385 | WASHER, LOCK, 6.5mm x 11.8mm, SPLIT, ZP          | 14   |
| 4     | E20087 | BOLT, HEX HD, M6-1 x 16mm LG, SS                 | 14   |
| 5     | E28588 | COUPLER, DISK ALIGNMENT                          | 2    |
| 6     | E28589 | PLATE, DISC ENGAGEMENT                           | 2    |
| 7     | E29389 | KEY, MACHINE, 5mm x 5mm, ROUNDED                 | 2    |
| 8     | E29388 | WASHER, FLAT, 0.344 ID x 1.000 OD, 0.062 THK     | 2    |
| 9     | E29426 | BOLT, HEX HD, M8-1.25 x 20mm LG                  | 2    |
| 10    | E29391 | SCREW, FLAT HD HEX, 1/4-20 x 0.375 LG            | 12   |
| 11    | E29519 | RETAINER, LUG SPRING                             | 2    |
| 12    | E29518 | SPRING CLIP, WIRE, DISC LOCK                     | 2    |
| 13    | E29515 | SHIM, SPRING FOR LUG                             | 2    |

| Item# | Part #  | Description                                      | Qty. |
|-------|---------|--------------------------------------------------|------|
| 14    | E29390  | BOLT, HEX HD, #10-24 x 0.375 LG                  | 4    |
| 15    | E29570  | SHROUD, DISC HEAD, 28IN w/ CUTOUTS               | 1    |
| 16    | E28622  | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.050 THK, SS | 5    |
| 17    | E81089  | BOLT, HEX HD, 5/16-18 x 0.750 LG, ZP             | 2    |
| 18    | E29342  | SKIRT ASSEMBLY, 28in DISK HEAD                   | 1    |
| 19    | E28598  | WHEEL, COLSON ROLLER, 2in                        | 1    |
| 20    | E29513  | BOLT, HEX HD, 5/16-18 x 1.750 LG                 | 1    |
| 21    | E28623  | NUT, HEX, 5/16-18, THIN, NYLOC, SS               | 1    |
| 22    | E28621  | WIRE TIE PUSH MOUNT                              | 4    |
| 23    | E83523  | CABLE TIE, 4.125 LG x 0.125 W                    | 4    |
| 24    | E28747  | FITTING, WYE, 3/8 BARB, PLASTIC                  | 1    |
| 25    | E29535  | PAD DRIVER, 14" MALISH                           | 2    |
| 26    | EP50418 | TUBE, 3/8 ID, CLEAR PVC, 14.00LG                 | 2    |

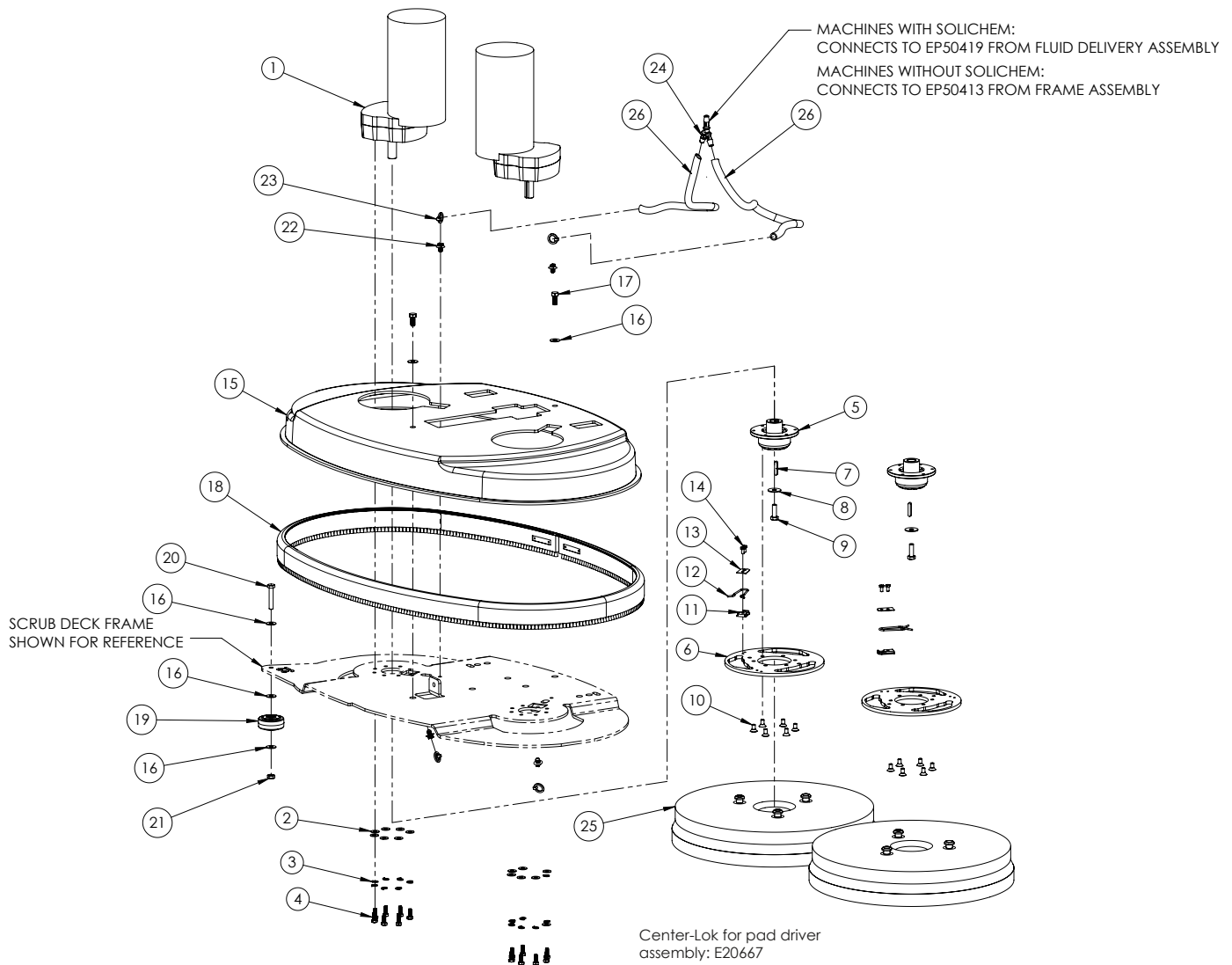
# 32" DISC LIFT BRACKETS DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 1     | E29514 | BRACKET, LIFT ARM PIVOT                          | 2    |
| 2     | E81089 | BOLT, HEX HD, 5/16-18 x 0.750 LG, ZP             | 11   |
| 3     | E28697 | PIN, CLEVIS, 0.500 OD X 1.125 LG                 | 2    |
| 4     | E28671 | PIN, COTTER, HAIRPIN                             | 3    |
| 5     | E28679 | DISK ROLLER TRACK WELDMENT                       | 1    |
| 6     | E28622 | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.050 THK, SS | 14   |
| 7     | E28934 | DISK HEAD FRAME WELDMENT 32IN                    | 1    |

| Item# | Part # | Description                                           | Qty. |
|-------|--------|-------------------------------------------------------|------|
| 8     | E28654 | BRACKET, DISK HEAD ROLLER                             | 1    |
| 9     | E11043 | BOLT, CARRIAGE, 5/16-18 x 2.000 LG                    | 1    |
| 10    | E81063 | NUT, HEX, 5/16-18, NYLOC, ZP                          | 1    |
| 11    | E28664 | BUSHING, 0.323 ID X 0.563 OD, 1.860 LG, STEEL, ZP     | 1    |
| 12    | E28663 | ROLLER, 0.575 ID X 1.000 OD, 1.830 LG, DELRIN         | 1    |
| 13    | E28783 | CLEVIS PIN, 0.313 OD x 3.000 LG, 2.750 USEABLE LG, ZP | 1    |
| 14    | E29328 | SPRING, COMPRESSION, 0.376 ID x 0.500 OD, 0.750 LG    | 1    |

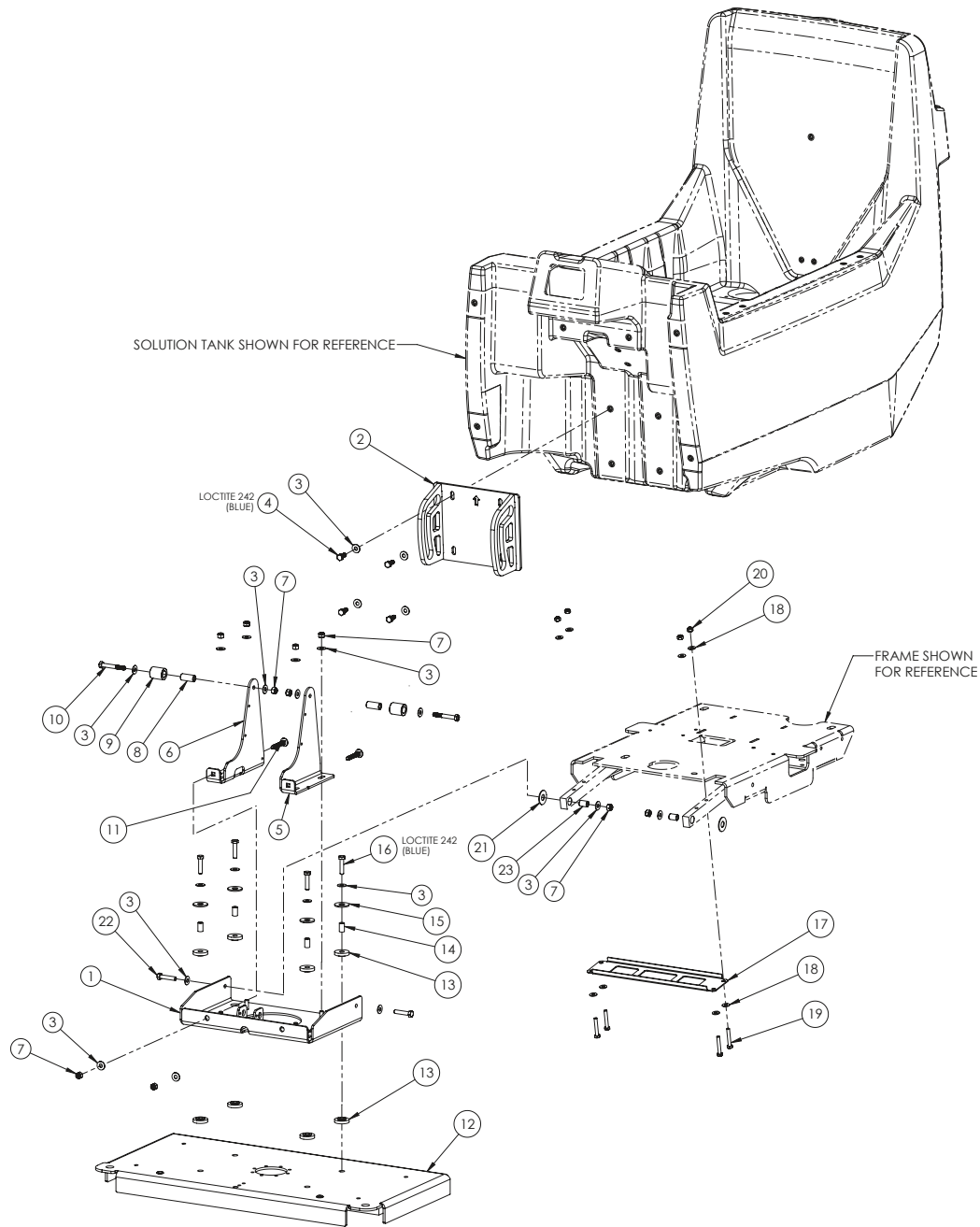
# 32" DISC HEAD DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 1     | E28541 | MOTOR, 24VDC, 300 RPM                            | 2    |
| 2     | E28617 | WASHER, FLAT, 0.281 ID x 0.625 OD, 0.050 THK, SS | 14   |
| 3     | E29385 | WASHER, LOCK, 6.5mm x 11.8mm, SPLIT, ZP          | 14   |
| 4     | E20087 | BOLT, HEX HD, M6-1 x 16mm LG, SS                 | 14   |
| 5     | E28588 | COUPLER, DISK ALIGNMENT                          | 2    |
| 6     | E28589 | PLATE, DISC ENGAGEMENT                           | 2    |
| 7     | E29389 | KEY, MACHINE, 5mm x 5mm, ROUNDED                 | 2    |
| 8     | E29388 | WASHER, FLAT, 0.344 ID x 1.000 OD, 0.062 THK     | 2    |
| 9     | E29426 | BOLT, HEX HD, M8-1.25 x 20mm LG                  | 2    |
| 10    | E29391 | SCREW, FLAT HD HEX, 1/4-20 x 0.375 LG            | 12   |
| 11    | E29519 | RETAINER, LUG SPRING                             | 2    |
| 12    | E29518 | SPRING CLIP, WIRE, DISC LOCK                     | 2    |
| 13    | E29515 | SHIM, SPRING FOR LUG                             | 2    |

| Item# | Part #  | Description                                      | Qty. |
|-------|---------|--------------------------------------------------|------|
| 14    | E29390  | BOLT, HEX HD, #10-24 x 0.375 LG                  | 4    |
| 15    | E29572  | SHROUD, DISC HEAD, 32IN W/ CUTOUTS               | 1    |
| 16    | E28622  | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.050 THK, SS | 5    |
| 17    | E81089  | BOLT, HEX HD, 5/16-18 x 0.750 LG, ZP             | 2    |
| 18    | E29343  | SKIRT, DISC HEAD, 32in                           | 1    |
| 19    | E28598  | WHEEL, COLSON ROLLER, 2in                        | 1    |
| 20    | E29513  | BOLT, HEX HD, 5/16-18 x 1.750 LG                 | 1    |
| 21    | E28623  | NUT, HEX, 5/16-18, THIN, NYLOC, SS               | 1    |
| 22    | E28621  | WIRE TIE PUSH MOUNT                              | 4    |
| 23    | E83523  | CABLE TIE, 4.125 LG x 0.125 W                    | 4    |
| 24    | E28747  | FITTING, WYE, 3/8 BARB, PLASTIC                  | 1    |
| 25    | E29539  | PAD DRIVER, 16in, 3-LUG, MALISH                  | 2    |
| 26    | EP50418 | TUBE, 3/8 ID, CLEAR PVC, 14.00LG                 | 2    |

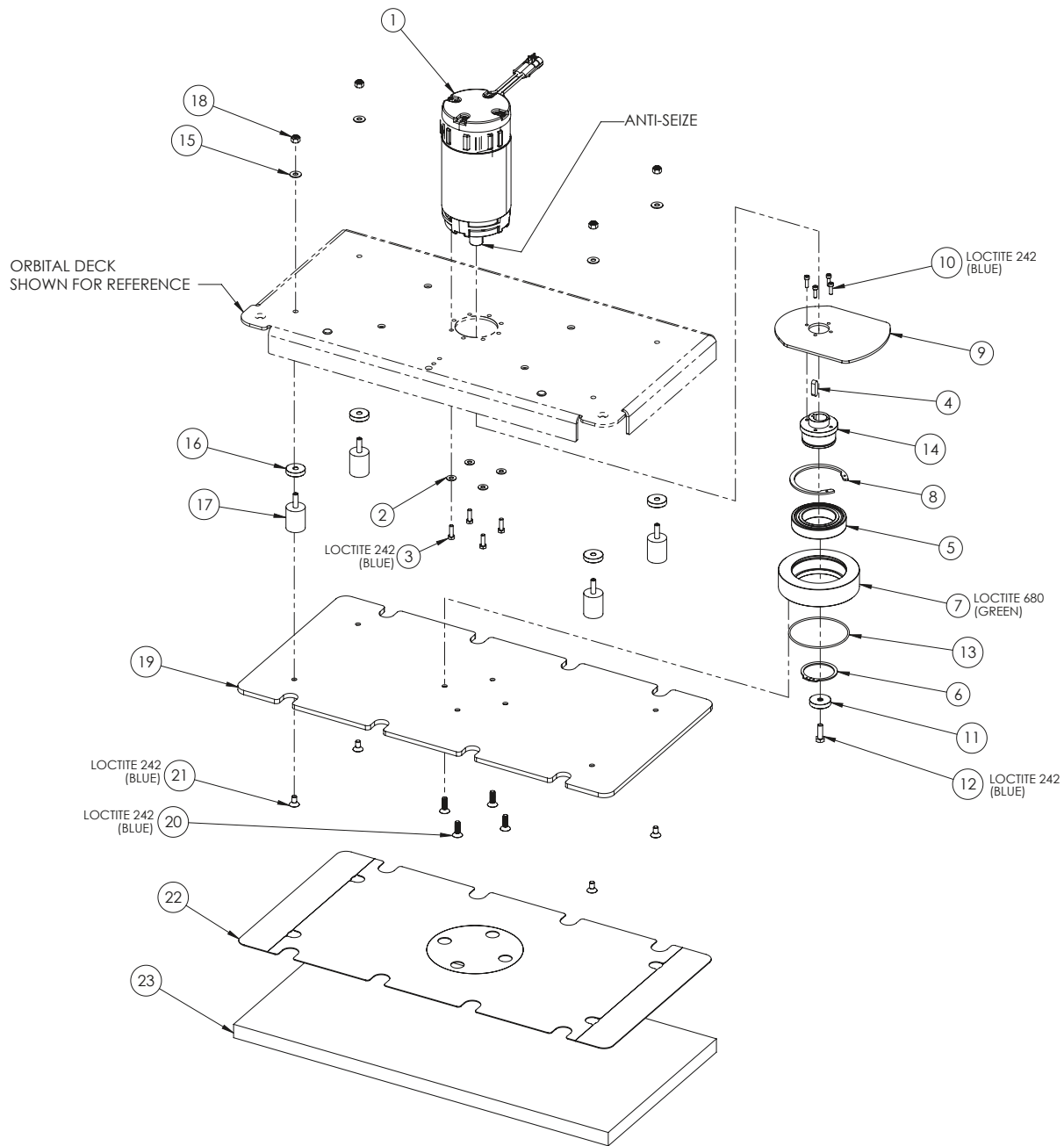
# 28" ORBITAL LIFT BRACKETS DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                                       | Qty. |
|-------|--------|---------------------------------------------------|------|
| 1     | E28650 | BRACKET, ORBITAL HEAD LIFT WELDMENT               | 1    |
| 2     | E28680 | BRACKET, ORB ROLLER TRACK, WELDMENT               | 1    |
| 3     | E28622 | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.050 THK, SS  | 22   |
| 4     | E81089 | BOLT, HEX HD, 5/16-18 x 0.750 LG, ZP              | 4    |
| 5     | E28630 | BRACKET, ORBITAL HEAD ROLLER, L.H.                | 1    |
| 6     | E28653 | BRACKET, ORBITAL HEAD ROLLER, R.H.                | 1    |
| 7     | E81063 | NUT, HEX, 5/16-18, NYLOC, ZP                      | 10   |
| 8     | E28835 | BUSHING, 0.323 ID X 0.563 OD, 1.250 LG, STEEL, ZP | 2    |
| 9     | E28836 | ROLLER, 1.000 O.D. 1.188 LG, DELRIN               | 2    |
| 10    | E84556 | BOLT, HEX HD, 5/16-18 x 2.250 LG                  | 2    |
| 11    | E11043 | BOLT, CARRIAGE, 5/16-18 x 2.000 LG                | 2    |
| 12    | E28518 | BRACKET, ORBITAL HEAD MOTOR, WELDMENT             | 1    |

| Item# | Part # | Description                                         | Qty. |
|-------|--------|-----------------------------------------------------|------|
| 13    | E28531 | ISOLATOR BUSHING, 0.313 ID x 1.250 OD, PVC BLUE     | 8    |
| 14    | E28656 | BUSHING, 0.313 ID x 0.439 OD, 0.750 HT, BRONZE      | 4    |
| 15    | E28764 | WASHER, FLAT, 0.500 ID x 1.250 OD, 0.104 THK        | 4    |
| 16    | E29553 | BOLT, HEX HD, 5/16-18 x 1.375 LG, SS                | 4    |
| 17    | E28678 | BRACE, LIFT ARM                                     | 1    |
| 18    | E28617 | WASHER, FLAT, 0.281 ID x 0.625 OD, 0.050 THK, SS    | 8    |
| 19    | E28702 | BOLT, HEX HD, 1/4-20 x 1.625 LG                     | 4    |
| 20    | E28853 | NUT, HEX, 1/4-20, FLEX-TOP LOCK, CDPL               | 4    |
| 21    | E83145 | WASHER, FLAT, 0.520 ID x 1.252 OD, 0.061 THK, NYLON | 2    |
| 22    | E28694 | BOLT, HEX HD, 5/16-18 x 1.500 LG, PT                | 2    |
| 23    | E28693 | BUSHING, SLEEVE, 0.323 ID x 0.497 OD, 0.720 LG      | 2    |

# 28" ORBITAL MOTOR AND HUB DIAGRAM AND PARTS LISTING

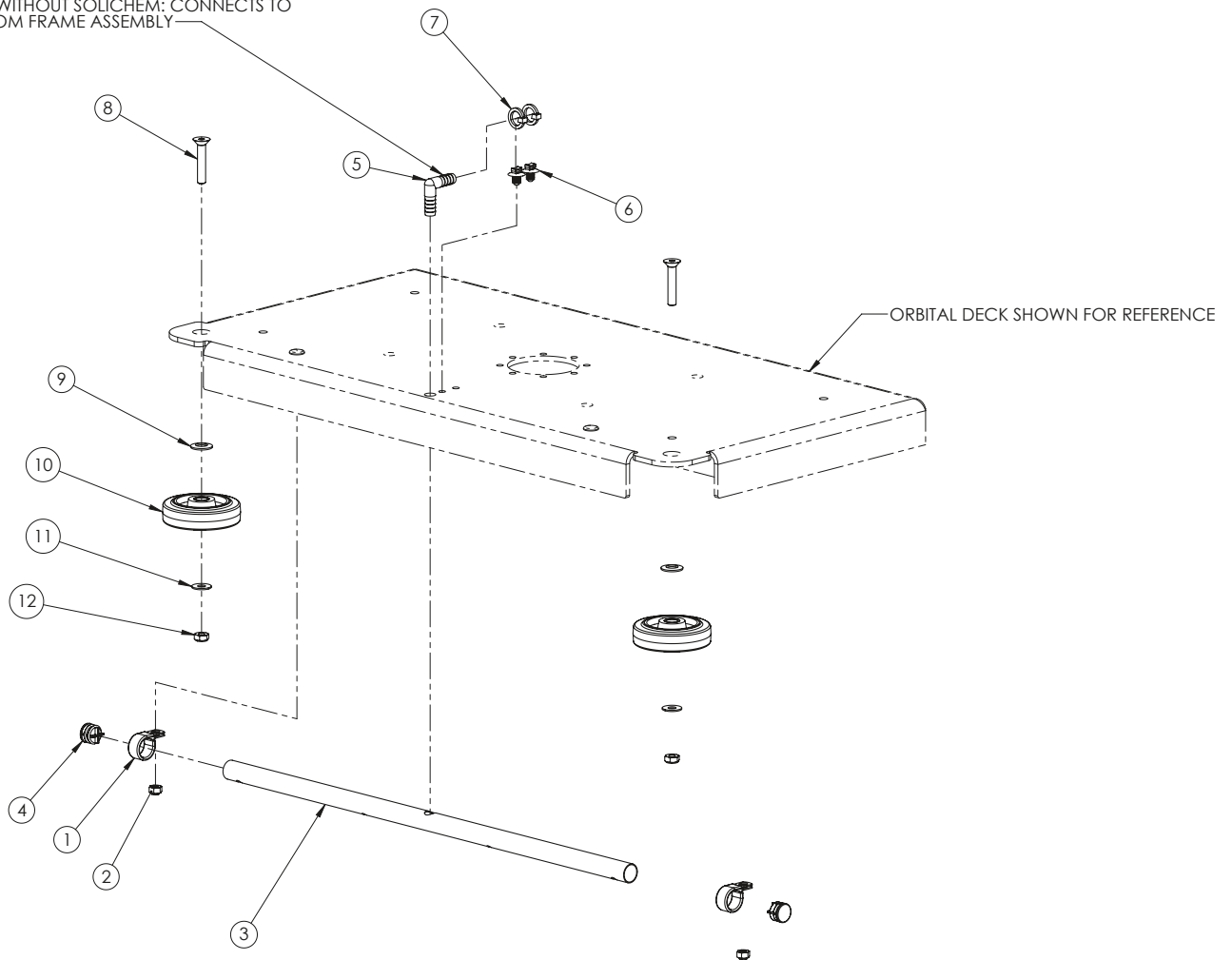


| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 1     | E28521 | MOTOR, 24VDC, 2200 RPM, 0.75 HP                  | 1    |
| 2     | E28617 | WASHER, FLAT, 0.281 ID x 0.625 OD, 0.050 THK, SS | 4    |
| 3     | E83914 | BOLT, HEX HD, M6-1 x 15mm LG                     | 4    |
| 4     | E28635 | MACHINE KEY, 8mm x 7mm x 28mm, ROUNDED           | 1    |
| 5     | E28524 | BALL BEARING, SKF DEEP GROOVE, 6011 2RS1/C3GJN   | 1    |
| 6     | E28529 | RETAINING RING, EXT. 55mm SHAFT x 3.15mm GROOVE  | 1    |
| 7     | E28525 | HUB, ORBITAL BEARING                             | 1    |
| 8     | E28632 | RETAINING RING, INT., 90mm BORE x 3.15mm GROOVE  | 1    |
| 9     | E28523 | BRACKET, ORBITAL COUNTERWEIGHT                   | 1    |
| 10    | E29431 | SCREW, SOC HD HEX, #10-24 x 0.625 LG             | 4    |
| 11    | E28631 | HUB WASHER                                       | 1    |
| 12    | E29426 | BOLT, HEX HD, M8-1.25 x 20mm LG                  | 1    |

| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 13    | E28527 | O-RING, 3.737 ID x 0.103 DIA, BUNA-N             | 1    |
| 14    | E28522 | BEARING HUB, ECCENTRIC                           | 1    |
| 15    | E28622 | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.050 THK, SS | 4    |
| 16    | E28633 | SPACER, 0.328 ID x 1.250 OD, ZINC                | 4    |
| 17    | E28530 | ISOLATOR MOUNT, 1.563 TALL x 1.250 DIA, RUBBER   | 4    |
| 18    | E81063 | NUT, HEX, 5/16-18, NYLOC, ZP                     | 4    |
| 19    | E28526 | PLATE, ORBITAL PAD DRIVER                        | 1    |
| 20    | E28763 | SCREW, FLAT HD HEX, 5/16-18 x 1.000 LG, BO       | 4    |
| 21    | E28639 | SCREW, FLAT HD HEX, 5/16-18 x 0.625 LG           | 4    |
| 22    | E28513 | POLYMERIC FACE, PAD DRIVER, 18x24in              | 1    |
| 23    | E89832 | PAD, ORBITAL BACKER, 28 x 14 in, RED             | 1    |

## 28" ORBITAL FLUID FEED DIAGRAM AND PARTS LISTING

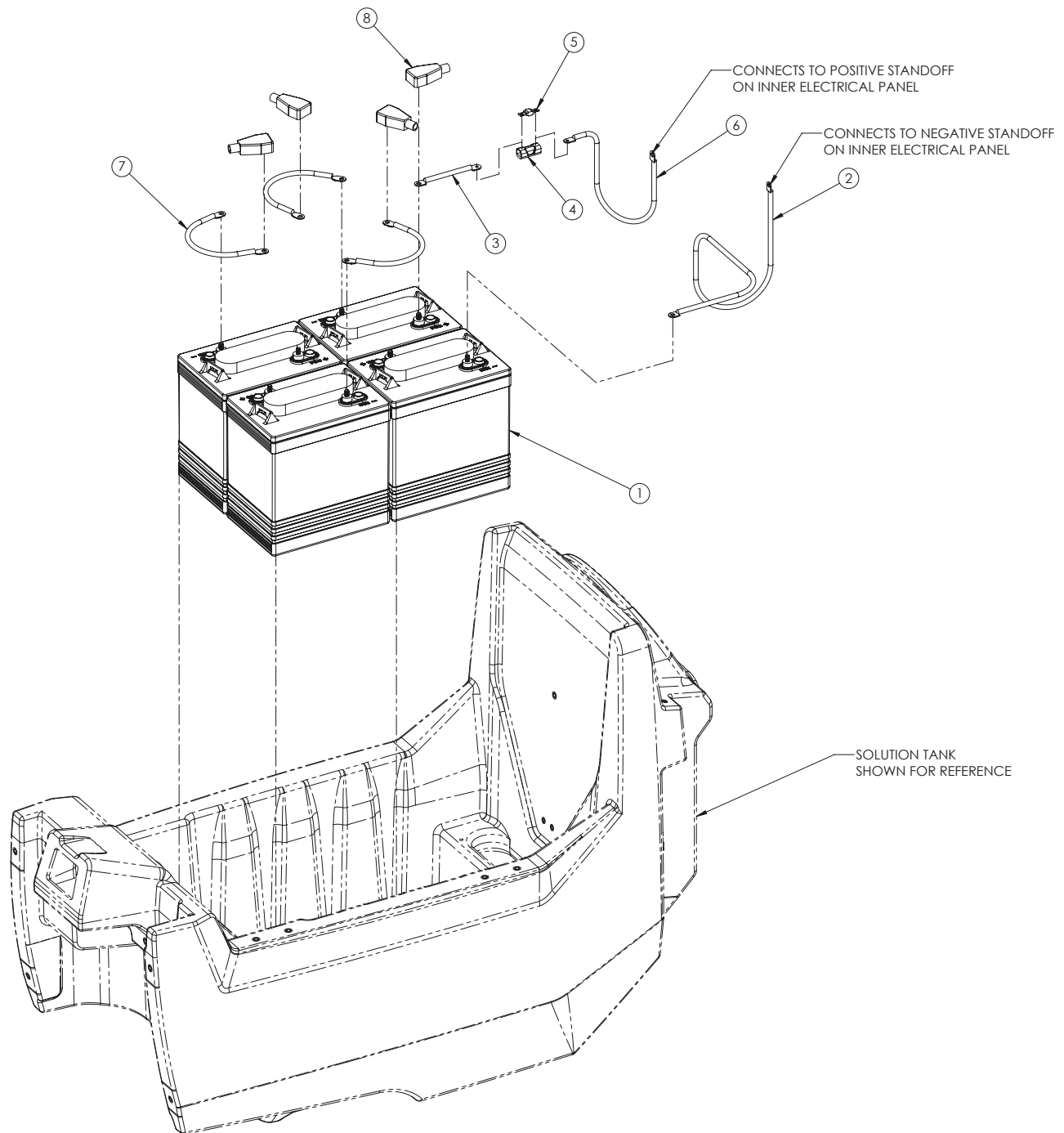
MACHINES WITH SOLICHEM: CONNECTS TO EP50428 FROM ORBITAL FLUID DELIVERY ASSEMBLY  
MACHINES WITHOUT SOLICHEM: CONNECTS TO EP50413 FROM FRAME ASSEMBLY



| Item# | Part # | Description                                     | Qty. |
|-------|--------|-------------------------------------------------|------|
| 1     | E28534 | LOOP CLAMP, 0.75 DIA                            | 2    |
| 2     | E28853 | NUT, HEX, 1/4-20, FLEX-TOP LOCK, CDPL           | 2    |
| 3     | E28533 | MANIFOLD, WATER FEED                            | 1    |
| 4     | E28535 | HOLE PLUG, 0.59-0.70 DIA                        | 2    |
| 5     | E28536 | FITTING, ELBOW 90, 3/8 BARB x 3/8 BARB, PLASTIC | 1    |
| 6     | E28621 | WIRE TIE PUSH MOUNT                             | 2    |

| Item# | Part # | Description                                        | Qty. |
|-------|--------|----------------------------------------------------|------|
| 7     | E83523 | CABLE TIE, 4.125 LG x 0.125 W                      | 2    |
| 8     | E28634 | SCREW, FLAT HD HEX, 5/16-18 x 1.750 LG             | 2    |
| 9     | E28640 | WASHER, LOCK, 0.451 ID x 0.848 OD, SPRING, PLASTIC | 2    |
| 10    | E28509 | WHEEL, COLSON ROLLER, 3in                          | 2    |
| 11    | E28622 | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.050 THK, SS   | 2    |
| 12    | E28623 | NUT, HEX, 5/16-18, THIN, NYLOC, SS                 | 2    |

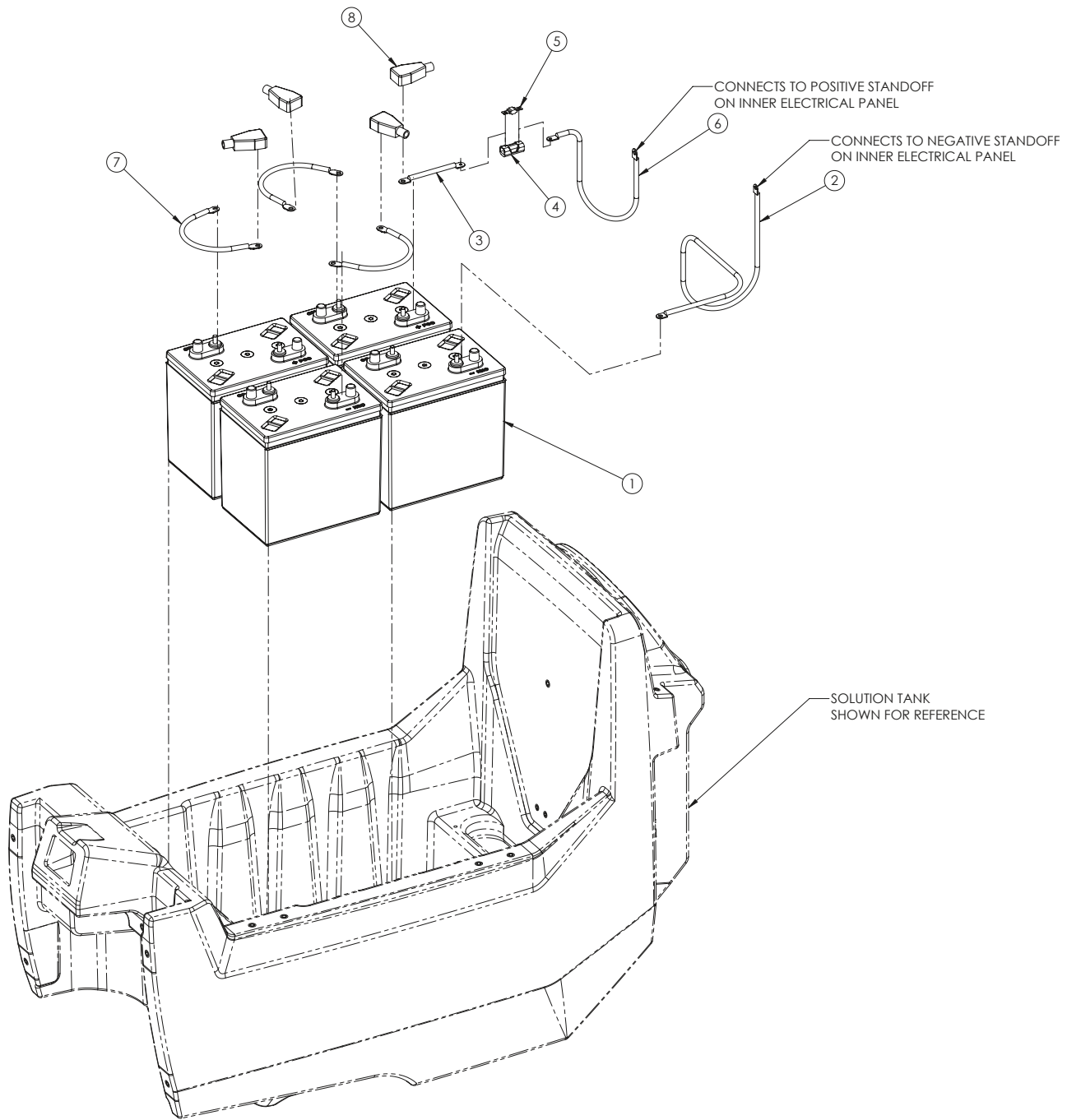
# 260AH WET BATTERY DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                                    | Qty. |
|-------|--------|------------------------------------------------|------|
| 1     | E28506 | BATTERY, GC2H, 6V 260 Ah, WET CELL, DEEP CYCLE | 4    |
| 2     | E29201 | BATTERY CABLE, 34.00 LG, BLACK                 | 1    |
| 3     | E29204 | BATTERY CABLE, 5.00 LG, RED                    | 1    |
| 4     | E28974 | FUSE HOLDER                                    | 1    |

| Item# | Part # | Description                      | Qty. |
|-------|--------|----------------------------------|------|
| 5     | E28975 | FUSE, 100A                       | 1    |
| 6     | E29202 | BATTERY CABLE, 23.00 LG, RED     | 1    |
| 7     | E29203 | BATTERY CABLE, 12.00 LG, BLACK   | 3    |
| 8     | E12543 | TERMINAL PROTECTOR, RED STRAIGHT | 4    |

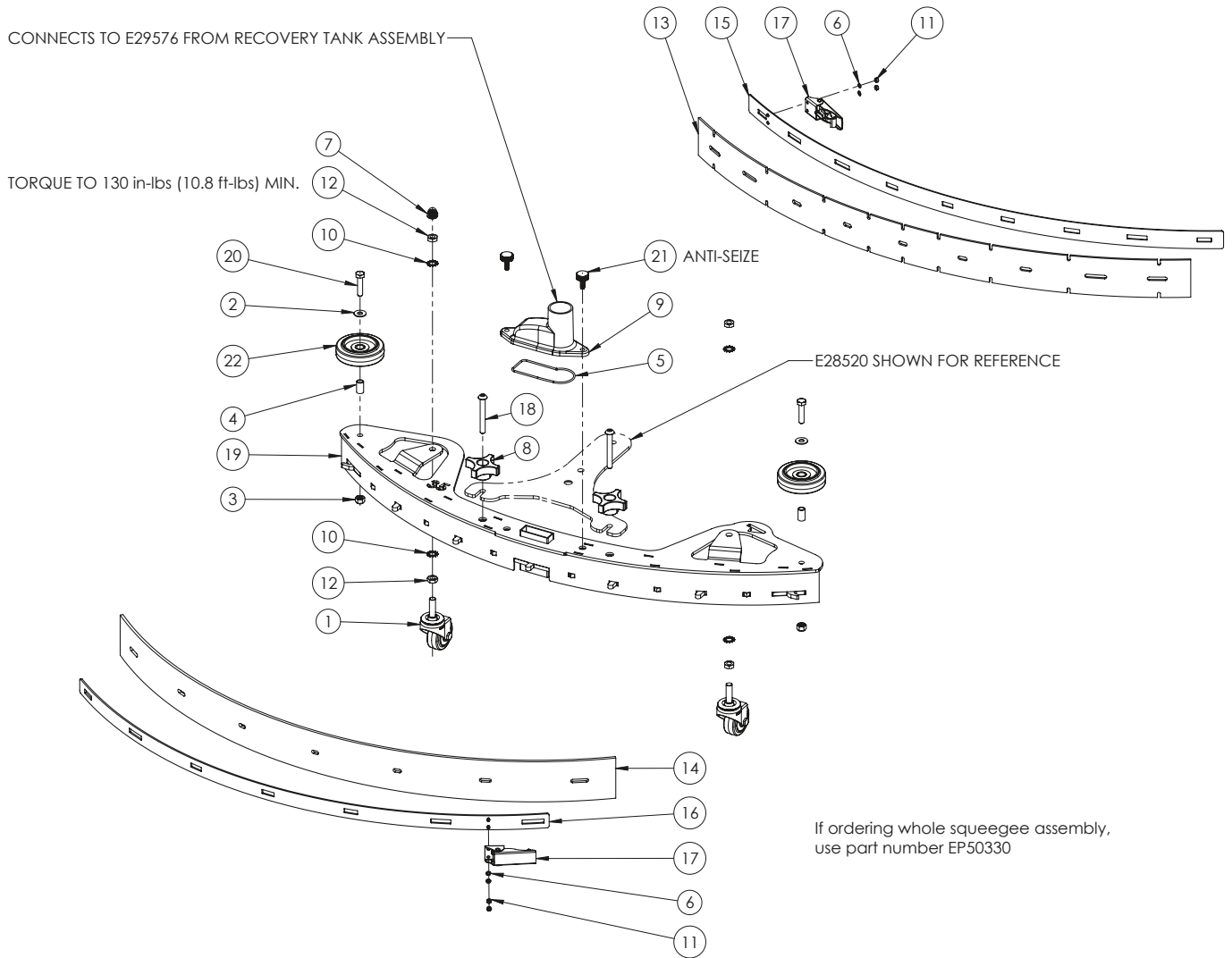
# 220AH AGM BATTERY DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                    | Qty. |
|-------|--------|--------------------------------|------|
| 1     | E88031 | BATTERY, AGM, 6V 220 AH        | 4    |
| 2     | E29201 | BATTERY CABLE, 34.00 LG, BLACK | 1    |
| 3     | E29204 | BATTERY CABLE, 5.00 LG, RED    | 1    |
| 4     | E28974 | FUSE HOLDER                    | 1    |

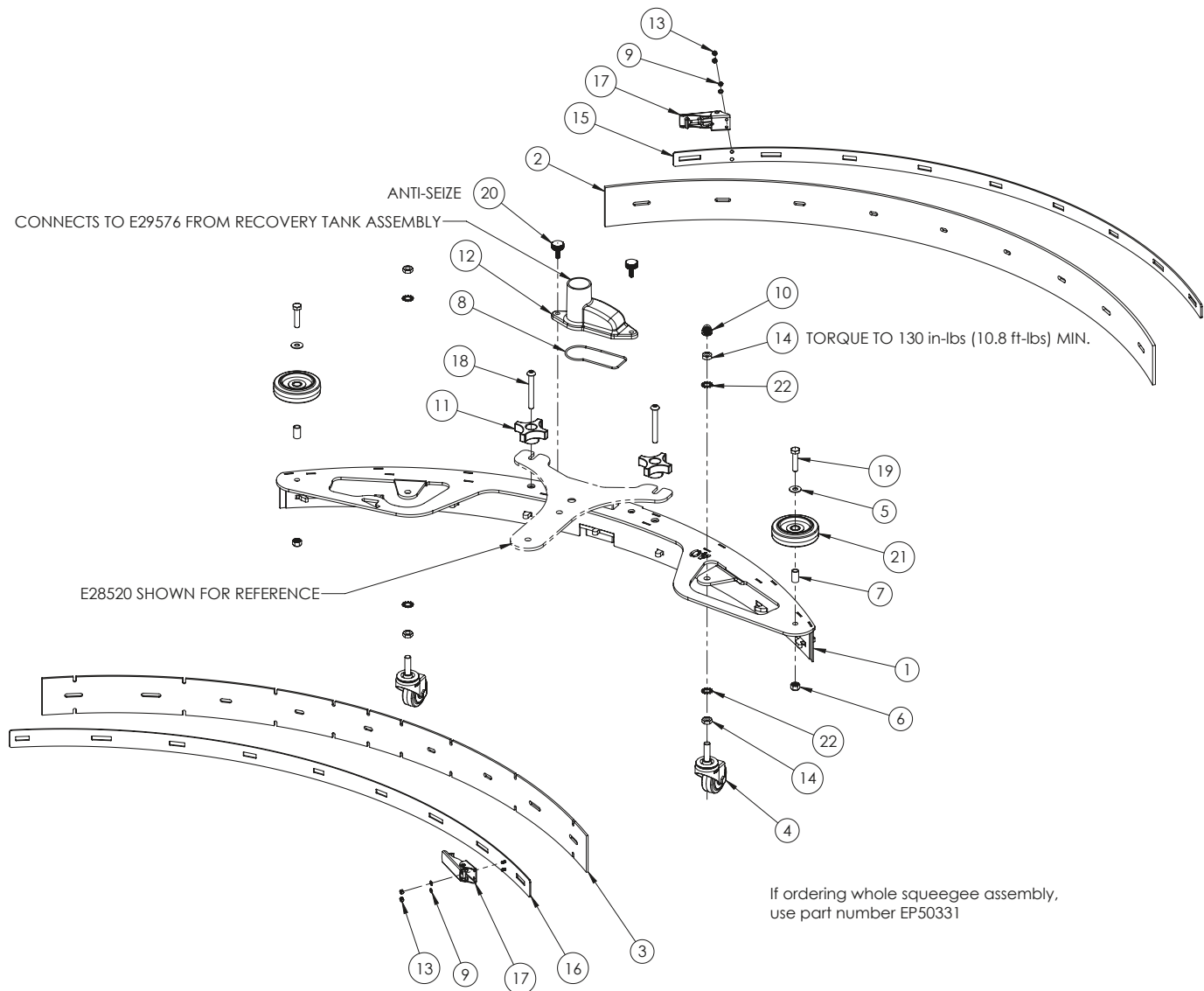
| Item# | Part # | Description                      | Qty. |
|-------|--------|----------------------------------|------|
| 5     | E28975 | FUSE, 100A                       | 1    |
| 6     | E29202 | BATTERY CABLE, 23.00 LG, RED     | 1    |
| 7     | E29203 | BATTERY CABLE, 12.00 LG, BLACK   | 3    |
| 8     | E12543 | TERMINAL PROTECTOR, RED STRAIGHT | 4    |

# 35" SQUEEGEE DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                                      | Qty. | Item# | Part #  | Description                              | Qty. |
|-------|--------|--------------------------------------------------|------|-------|---------|------------------------------------------|------|
| 1     | E28568 | CASTER, SWIVEL, STUD MOUNT, 2in                  | 2    | 12    | E29398  | NUT, HEX, 5/16-16, THIN, ZP              | 4    |
| 2     | E28622 | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.050 THK, SS | 2    | 13    | E29449  | BLADE, FRONT SQUEEGEE, 35IN              | 1    |
| 3     | E81063 | NUT, HEX, 5/16-18, NYLOC, ZP                     | 2    | 14    | E29450  | BLADE, REAR SQUEEGEE, 35IN               | 1    |
| 4     | E28656 | BUSHING, 0.313 ID x 0.439 OD, 0.750 HT, BRONZE   | 2    | 15    | E29451  | CLAMP, FRONT SQUEEGEE, 35IN              | 1    |
| 5     | E28754 | O-RING, SIZE - 151, VITON                        | 1    | 16    | E29452  | REAR SQUEEGEE CLAMP ASSEMBLY 35IN        | 1    |
| 6     | E28806 | WASHER, LOCK, 0.141 ID x 0.295 OD, INT TOOTH, SS | 4    | 17    | E29521  | CLAMP, OVER CENTER                       | 2    |
| 7     | E28851 | NUT, ACORN HEX, 3/8-16, NYLON (BLACK)            | 1    | 18    | E29547  | SCREW, BUTTON HD HEX, 5/16-18 x 2.500 LG | 2    |
| 8     | E28903 | KNOB, 4-ARM, 5/16-18 HOLE, PLASTIC               | 2    | 19    | E29552  | FRAME, SQUEEGEE WELDMENT, 35IN           | 1    |
| 9     | E28908 | DRIP TRAP, SQUEEGEE                              | 1    | 20    | E29553  | BOLT, HEX HD, 5/16-18 x 1.375 LG, SS     | 2    |
| 10    | E29050 | WASHER, LOCK, 0.384 ID x 0.694 OD, EXT TOOTH, ZP | 4    | 21    | E29554  | SCREW, THUMB, 1/4-20 x 0.750 LG, SS      | 2    |
| 11    | E29397 | NUT, HEX, #6-32, SS                              | 4    | 22    | EP50279 | WHEEL, COLSON ROLLER, 3in                | 2    |

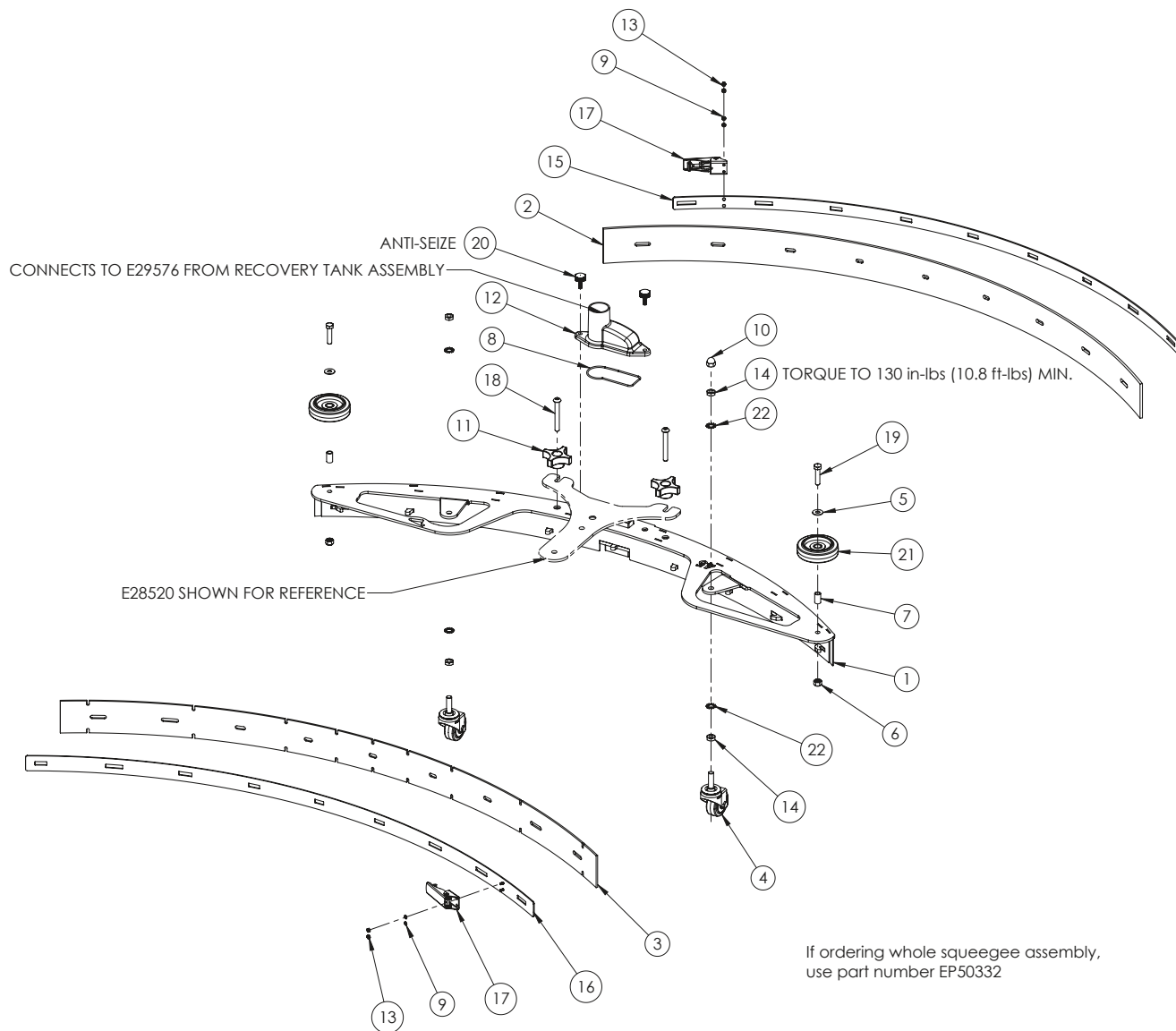
# 40" SQUEEGEE DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 1     | E28501 | FRAME, SQUEEGEE WELDMENT, 40IN                   | 1    |
| 2     | E28502 | SQUEEGEE BLADE, REAR, 40IN                       | 1    |
| 3     | E28504 | SQUEEGEE BLADE, FRONT, 40IN                      | 1    |
| 4     | E28568 | CASTER, SWIVEL, STUD MOUNT, 2in                  | 2    |
| 5     | E28622 | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.050 THK, SS | 2    |
| 6     | E81063 | NUT, HEX, 5/16-18, NYLOC, ZP                     | 2    |
| 7     | E28656 | BUSHING, 0.313 ID x 0.439 OD, 0.750 HT, BRONZE   | 2    |
| 8     | E28754 | O-RING, SIZE - 151, VITON                        | 1    |
| 9     | E28806 | WASHER, LOCK, 0.141 ID x 0.295 OD, INT TOOTH, SS | 4    |
| 10    | E28851 | NUT, ACORN HEX, 3/8-16, NYLON (BLACK)            | 1    |
| 11    | E28903 | KNOB, 4-ARM, 5/16-18 HOLE, PLASTIC               | 2    |

| Item# | Part #  | Description                                      | Qty. |
|-------|---------|--------------------------------------------------|------|
| 12    | E28908  | DRIP TRAP, SQUEEGEE                              | 1    |
| 13    | E29397  | NUT, HEX, #6-32, SS                              | 4    |
| 14    | E29398  | NUT, HEX, 5/16-16, THIN, ZP                      | 4    |
| 15    | E29517  | CLAMP, REAR SQUEEGEE ASSEMBLY, 40IN              | 1    |
| 16    | E29520  | FRONT SQUEEGEE CLAMP ASSEMBLY                    | 1    |
| 17    | E29521  | CLAMP, OVER CENTER                               | 2    |
| 18    | E29547  | SCREW, BUTTON HD HEX, 5/16-18 x 2.500 LG         | 2    |
| 19    | E29553  | BOLT, HEX HD, 5/16-18 x 1.375 LG, SS             | 2    |
| 20    | E29554  | SCREW, THUMB, 1/4-20 x 0.750 LG, SS              | 2    |
| 21    | EP50279 | WHEEL, COLSON ROLLER, 3in                        | 2    |
| 22    | E29050  | WASHER, LOCK, 0.384 ID x 0.694 OD, EXT TOOTH, ZP | 4    |

# 45" SQUEEGEE DIAGRAM AND PARTS LISTING

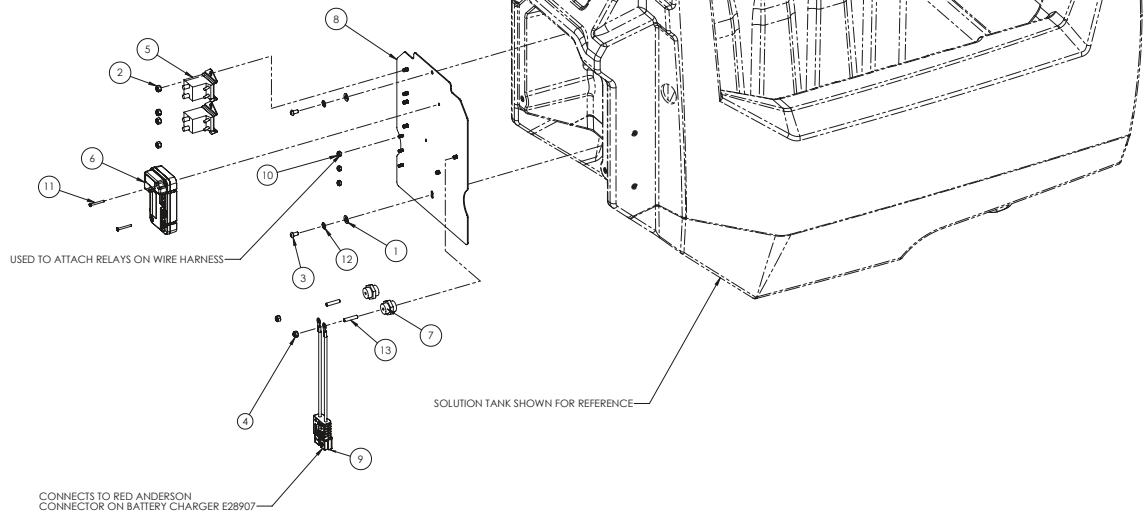


| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 1     | E29551 | FRAME, SQUEEGEE WELDMENT 45IN                    | 1    |
| 2     | E29455 | BLADE, REAR SQUEEGEE, 45IN                       | 1    |
| 3     | E29454 | BLADE, FRONT SQUEEGEE, 45IN                      | 1    |
| 4     | E28568 | CASTER, SWIVEL, STUD MOUNT, 2in                  | 2    |
| 5     | E28622 | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.050 THK, SS | 2    |
| 6     | E81063 | NUT, HEX, 5/16-18, NYLOC, ZP                     | 2    |
| 7     | E28656 | BUSHING, 0.313 ID x 0.439 OD, 0.750 HT, BRONZE   | 2    |
| 8     | E28754 | O-RING, SIZE - 151, VITON                        | 1    |
| 9     | E28806 | WASHER, LOCK, 0.141 ID x 0.295 OD, INT TOOTH, SS | 4    |
| 10    | E28851 | NUT, ACORN HEX, 3/8-16, NYLON (BLACK)            | 1    |
| 11    | E28903 | KNOB, 4-ARM, 5/16-18 HOLE, PLASTIC               | 2    |

| Item# | Part #  | Description                                      | Qty. |
|-------|---------|--------------------------------------------------|------|
| 12    | E28908  | DRIP TRAP, SQUEEGEE                              | 1    |
| 13    | E29397  | NUT, HEX, #6-32, SS                              | 4    |
| 14    | E29398  | NUT, HEX, 5/16-16, THIN, ZP                      | 4    |
| 15    | E29457  | CLAMP, REAR SQUEEGEE ASSEMBLY, 45IN              | 1    |
| 16    | E29456  | CLAMP, FRONT SQUEEGEE ASSEMBLY, 45IN             | 1    |
| 17    | E29521  | CLAMP, OVER CENTER                               | 2    |
| 18    | E29547  | SCREW, BUTTON HD HEX, 5/16-18 x 2.500 LG         | 2    |
| 19    | E29553  | BOLT, HEX HD, 5/16-18 x 1.375 LG, SS             | 2    |
| 20    | E29554  | SCREW, THUMB, 1/4-20 x 0.750 LG, SS              | 2    |
| 21    | EP50279 | WHEEL, COLSON ROLLER, 3in                        | 2    |
| 22    | E29050  | WASHER, LOCK, 0.384 ID x 0.694 OD, EXT TOOTH, ZP | 4    |

# DISC MACHINE INNER ELECTRICAL PANEL DIAGRAM AND PARTS LISTING

Only applies to machines with disc heads

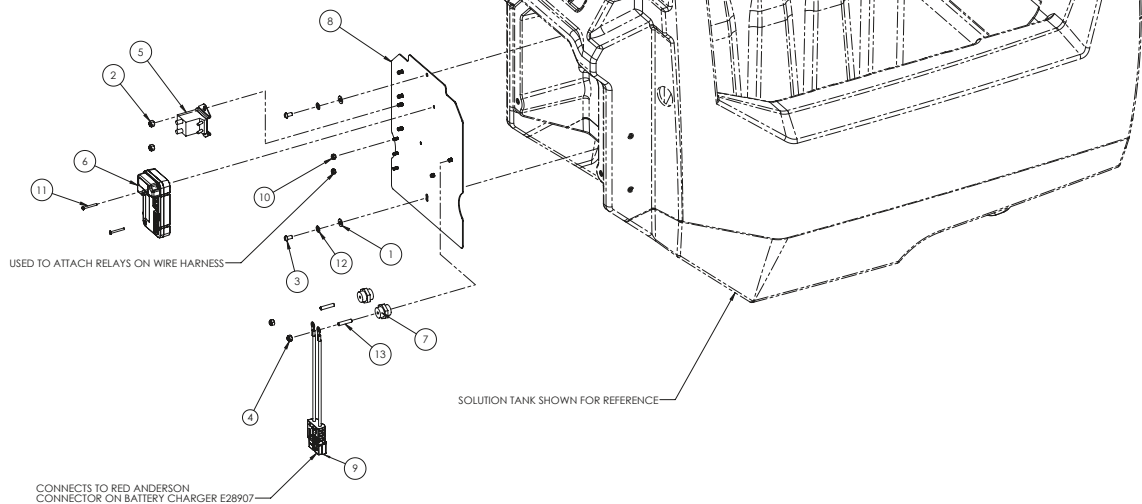


| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 1     | E28617 | WASHER, FLAT, 0.281 ID x 0.625 OD, 0.050 THK, SS | 2    |
| 2     | E28618 | NUT, HEX, 1/4-20, NYLOC, SS                      | 4    |
| 3     | E28648 | SCREW, BUTTON HD HEX, 1/4-20 X 0.500 LG          | 2    |
| 4     | E28853 | NUT, HEX, 1/4-20, FLEX-TOP LOCK, CDPL            | 2    |
| 5     | E28924 | CONTACTOR, 100A 24V                              | 2    |
| 6     | E28949 | CONTROLLER, I-DRIVE                              | 1    |
| 7     | E28950 | STANDOFF, ELECTRICAL, 1/4-20 FEMALE THREADS      | 2    |

| Item# | Part # | Description                                  | Qty. |
|-------|--------|----------------------------------------------|------|
| 8     | E28963 | PANEL, INNER ELECTRICAL, MSAS                | 1    |
| 9     | E28979 | HARNESS, CHARGER                             | 1    |
| 10    | E29366 | NUT, HEX, #10-32, THIN, NYLOC, ZP            | 3    |
| 11    | E29382 | SCREW, PAN HD PHIL, #6-32 x 1.250 LG         | 2    |
| 12    | E29446 | WASHER, LOCK, 0.256 ID x 0.540 OD, INT TOOTH | 2    |
| 13    | E29447 | SCREW, SET, CUP POINT, 1/4-20 x 1.250 LG     | 2    |

# ORBITAL MACHINE INNER ELECTRICAL PANEL DIAGRAM AND PARTS LISTING

Only applies to machines with orbital heads



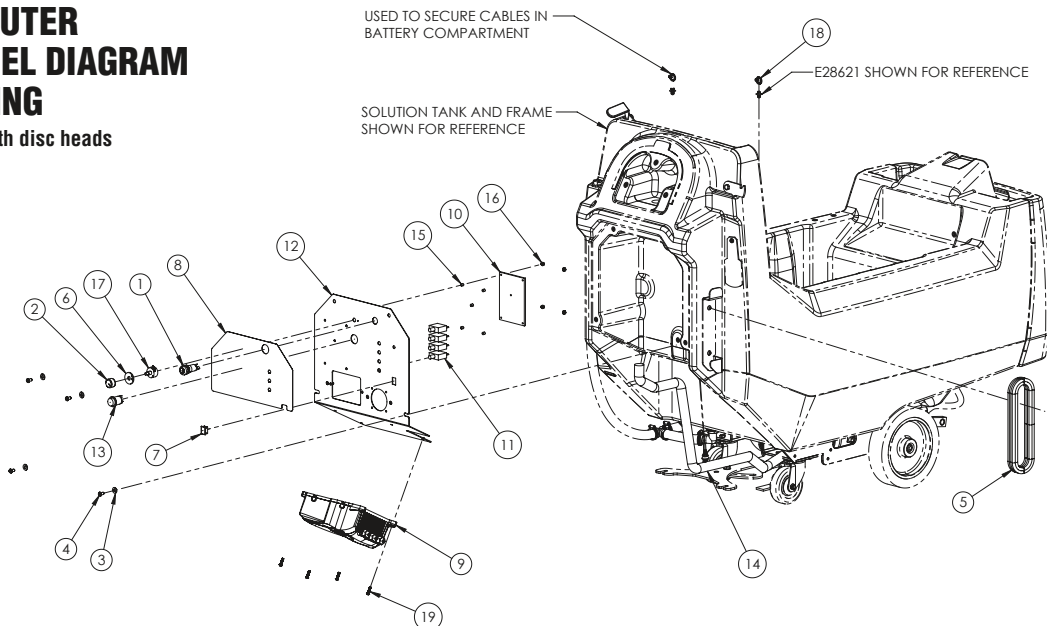
| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 1     | E28617 | WASHER, FLAT, 0.281 ID x 0.625 OD, 0.050 THK, SS | 2    |
| 2     | E28618 | NUT, HEX, 1/4-20, NYLOC, SS                      | 2    |
| 3     | E28648 | SCREW, BUTTON HD HEX, 1/4-20 X 0.500 LG          | 2    |
| 4     | E28853 | NUT, HEX, 1/4-20, FLEX-TOP LOCK, CDPL            | 2    |
| 5     | E28924 | CONTACTOR, 100A 24V                              | 1    |
| 6     | E28949 | CONTROLLER, I-DRIVE                              | 1    |
| 7     | E28950 | STANDOFF, ELECTRICAL, 1/4-20 FEMALE THREADS      | 2    |

| Item# | Part # | Description                                  | Qty. |
|-------|--------|----------------------------------------------|------|
| 8     | E28963 | PANEL, INNER ELECTRICAL, MSAS                | 1    |
| 9     | E28979 | HARNESS, CHARGER                             | 1    |
| 10    | E29366 | NUT, HEX, #10-32, THIN, NYLOC, ZP            | 2    |
| 11    | E29382 | SCREW, PAN HD PHIL, #6-32 x 1.250 LG         | 2    |
| 12    | E29446 | WASHER, LOCK, 0.256 ID x 0.540 OD, INT TOOTH | 2    |
| 13    | E29447 | SCREW, SET, CUP POINT, 1/4-20 x 1.250 LG     | 2    |

# DISC MACHINE OUTER ELECTRICAL PANEL DIAGRAM AND PARTS LISTING

Only applies to machines with disc heads

Control Board Fuse: E28852  
Replacement Key: E89382



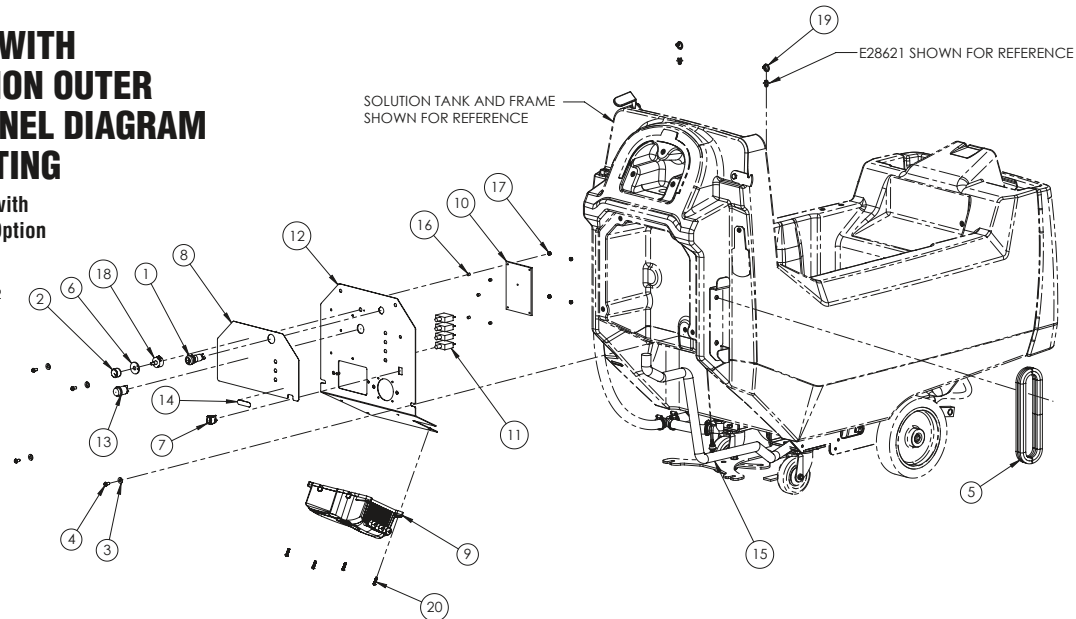
| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 1     | E12629 | SWITCH, KEYED, SPE, WITH 2 KEYS                  | 1    |
| 2     | E28606 | KNOB, KNURLED, 0.250 SHAFT, 0.925 OD, METAL      | 1    |
| 3     | E28617 | WASHER, FLAT, 0.281 ID x 0.625 OD, 0.050 THK, SS | 4    |
| 4     | E28648 | SCREW, BUTTON HD HEX, 1/4-20 X 0.500 LG          | 4    |
| 5     | E28704 | ELECTRICAL CORD, 18/3 105C, BLACK                | 1    |
| 6     | E28768 | POT SPACER AND PIN ASSEMBLY                      | 1    |
| 7     | E28771 | SWITCH BLANK, D-SUB, BLACK                       | 1    |
| 8     | E28793 | DECAL, BACK PANEL                                | 1    |
| 9     | E28907 | CHARGER, SPE CBHD3, 24V DC                       | 1    |
| 10    | E28951 | CONTROL BOARD - BASE                             | 1    |

| Item# | Part # | Description                                 | Qty. |
|-------|--------|---------------------------------------------|------|
| 11    | E28954 | BREAKER, 30A                                | 4    |
| 12    | E28964 | PANEL, ELECTRICAL, FRONT                    | 1    |
| 13    | E28967 | SWITCH, PUSH BUTTON, SPST NO, MOMENTARY     | 1    |
| 14    | E29200 | MACHINE HARNESS, GS MSAS, STANDARD DISC     | 1    |
| 15    | E29373 | SPACER, 0.140 ID x 0.250 OD, 0.250 LG       | 5    |
| 16    | E29381 | NUT, HEX, #6-32, NYLOC, ZP                  | 4    |
| 17    | E29706 | POTENTIOMETER, 5K ohm                       | 1    |
| 18    | E83523 | CABLE TIE, 4.125 LG x 0.125 W               | 2    |
| 19    | E28912 | SCREW, BUTTON HD HEX, #10-32 x 0.750 LG, SS | 4    |

# DISC MACHINE WITH SOLICHEM OPTION OUTER ELECTRICAL PANEL DIAGRAM AND PARTS LISTING

Only applies to machines with disc heads and Solichem Option

Control Board Fuse: E28852  
Replacement Key: E89382



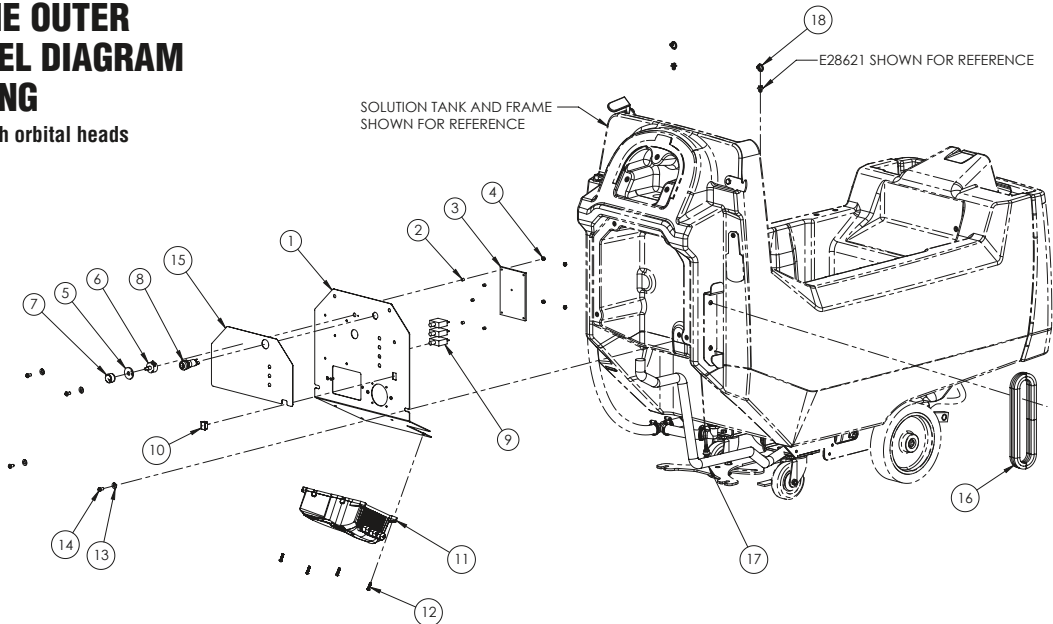
| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 1     | E12629 | SWITCH, KEYED, SPE, WITH 2 KEYS                  | 1    |
| 2     | E28606 | KNOB, KNURLED, 0.250 SHAFT, 0.925 OD, METAL      | 1    |
| 3     | E28617 | WASHER, FLAT, 0.281 ID x 0.625 OD, 0.050 THK, SS | 4    |
| 4     | E28648 | SCREW, BUTTON HD HEX, 1/4-20 X 0.500 LG          | 4    |
| 5     | E28704 | ELECTRICAL CORD, 18/3 105C, BLACK                | 1    |
| 6     | E28768 | POT SPACER AND PIN ASSEMBLY                      | 1    |
| 7     | E28781 | SWITCH, ROCKER, BLACK                            | 1    |
| 8     | E28793 | DECAL, BACK PANEL                                | 1    |
| 9     | E28907 | CHARGER, SPE CBHD3, 24V DC                       | 1    |
| 10    | E28951 | CONTROL BOARD - BASE                             | 1    |

| Item# | Part # | Description                                 | Qty. |
|-------|--------|---------------------------------------------|------|
| 11    | E28954 | BREAKER, 30A                                | 4    |
| 12    | E28964 | PANEL, ELECTRICAL, FRONT                    | 1    |
| 13    | E28967 | SWITCH, PUSH BUTTON, SPST NO, MOMENTARY     | 1    |
| 14    | E29006 | DECAL, SOLICHEM ON/OFF                      | 1    |
| 15    | E29200 | MACHINE HARNESS, GS MSAS, STANDARD DISC     | 1    |
| 16    | E29373 | SPACER, 0.140 ID x 0.250 OD, 0.250 LG       | 5    |
| 17    | E29381 | NUT, HEX, #6-32, NYLOC, ZP                  | 4    |
| 18    | E29706 | POTENTIOMETER, 5K ohm                       | 1    |
| 19    | E83523 | CABLE TIE, 4.125 LG x 0.125 W               | 2    |
| 20    | E28912 | SCREW, BUTTON HD HEX, #10-32 x 0.750 LG, SS | 4    |

# ORBITAL MACHINE OUTER ELECTRICAL PANEL DIAGRAM AND PARTS LISTING

Only applies to machines with orbital heads

Control Board Fuse: E28852  
Replacement Key: E89382



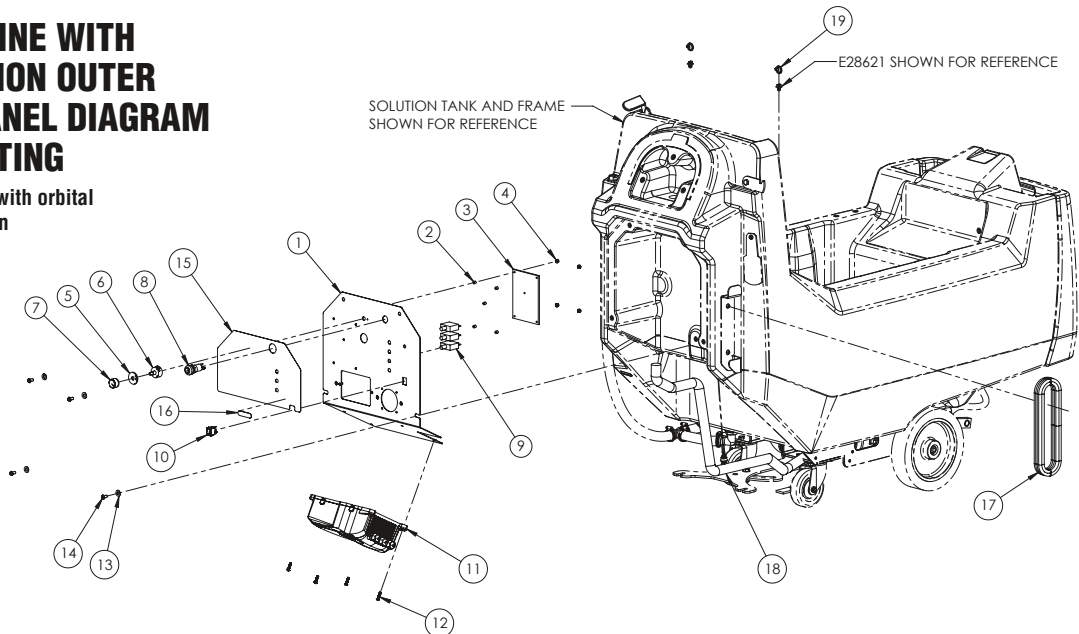
| Item# | Part # | Description                                 | Qty. |
|-------|--------|---------------------------------------------|------|
| 1     | E28964 | PANEL, ELECTRICAL, FRONT                    | 1    |
| 2     | E29373 | SPACER, 0.140 ID x 0.250 OD, 0.250 LG       | 5    |
| 3     | E28951 | CONTROL BOARD - BASE                        | 1    |
| 4     | E29381 | NUT, HEX, #6-32, NYLOC, ZP                  | 4    |
| 5     | E28768 | POT SPACER AND PIN ASSEMBLY                 | 1    |
| 6     | E29706 | POTENTIOMETER, 5K ohm                       | 1    |
| 7     | E28606 | KNOB, KNURLED, 0.250 SHAFT, 0.925 OD, METAL | 1    |
| 8     | E12629 | SWITCH, KEYED, SPE, WITH 2 KEYS             | 1    |
| 9     | E28954 | BREAKER, 30A                                | 3    |

| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 10    | E28771 | SWITCH BLANK, D-SUB, BLACK                       | 1    |
| 11    | E28907 | CHARGER, SPE CBHD3, 24V DC                       | 1    |
| 12    | E28912 | SCREW, BUTTON HD HEX, #10-32 x 0.750 LG, SS      | 4    |
| 13    | E28617 | WASHER, FLAT, 0.281 ID x 0.625 OD, 0.050 THK, SS | 4    |
| 14    | E28648 | SCREW, BUTTON HD HEX, 1/4-20 X 0.500 LG          | 4    |
| 15    | E28793 | DECAL, BACK PANEL                                | 1    |
| 16    | E28704 | ELECTRICAL CORD, 18/3 105C, BLACK                | 1    |
| 17    | E29210 | MACHINE HARNESS, GS MSAS, ORBITAL                | 1    |
| 18    | E83523 | CABLE TIE, 4.125 LG x 0.125 W                    | 2    |

# ORBITAL MACHINE WITH SOLICHEM OPTION OUTER ELECTRICAL PANEL DIAGRAM AND PARTS LISTING

Only applies to machines with orbital heads and Solichem Option

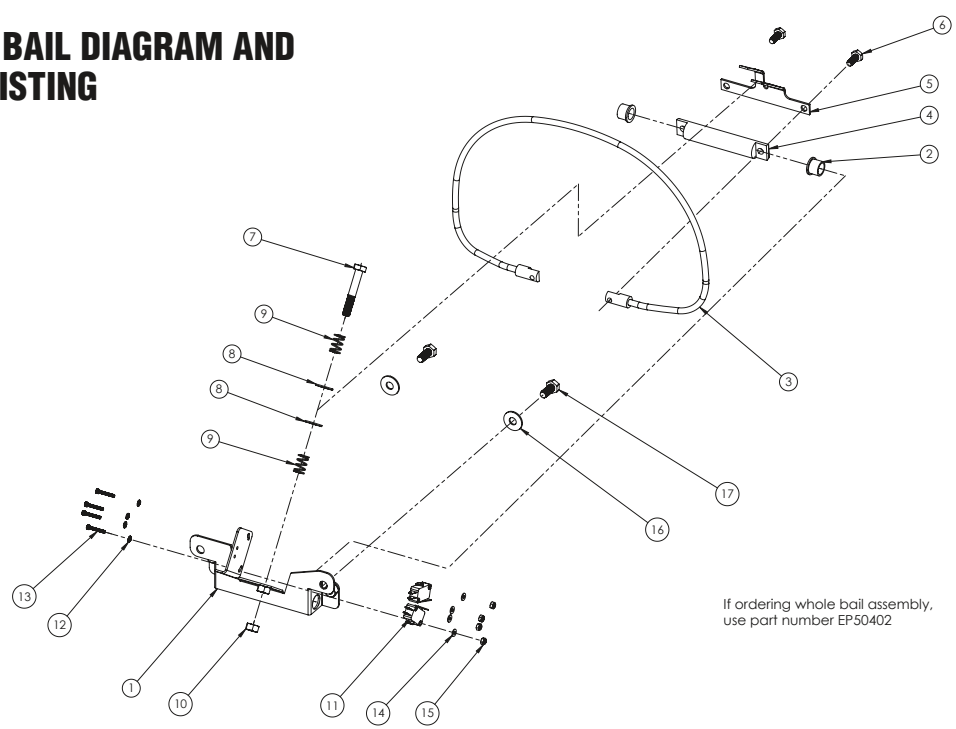
Control Board Fuse: E28852  
Replacement Key: E89382



| Item# | Part # | Description                                 | Qty. |
|-------|--------|---------------------------------------------|------|
| 1     | E28964 | PANEL, ELECTRICAL, FRONT                    | 1    |
| 2     | E29373 | SPACER, 0.140 ID x 0.250 OD, 0.250 LG       | 5    |
| 3     | E28951 | CONTROL BOARD - BASE                        | 1    |
| 4     | E29381 | NUT, HEX, #6-32, NYLOC, ZP                  | 4    |
| 5     | E28768 | POT SPACER AND PIN ASSEMBLY                 | 1    |
| 6     | E29706 | POTENTIOMETER, 5K ohm                       | 1    |
| 7     | E28606 | KNOB, KNURLED, 0.250 SHAFT, 0.925 OD, METAL | 1    |
| 8     | E12629 | SWITCH, KEYED, SPE, WITH 2 KEYS             | 1    |
| 9     | E28954 | BREAKER, 30A                                | 3    |
| 10    | E28781 | SWITCH, ROCKER, BLACK                       | 1    |

| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 11    | E28907 | CHARGER, SPE CBHD3, 24V DC                       | 1    |
| 12    | E28912 | SCREW, BUTTON HD HEX, #10-32 x 0.750 LG, SS      | 4    |
| 13    | E28617 | WASHER, FLAT, 0.281 ID x 0.625 OD, 0.050 THK, SS | 4    |
| 14    | E28648 | SCREW, BUTTON HD HEX, 1/4-20 X 0.500 LG          | 4    |
| 15    | E28793 | DECAL, BACK PANEL                                | 1    |
| 16    | E29006 | DECAL, SOLICHEM ON/OFF                           | 1    |
| 17    | E28704 | ELECTRICAL CORD, 18/3 105C, BLACK                | 1    |
| 18    | E29210 | MACHINE HARNESS, GS MSAS, ORBITAL                | 1    |
| 19    | E83523 | CABLE TIE, 4.125 LG x 0.125 W                    | 2    |

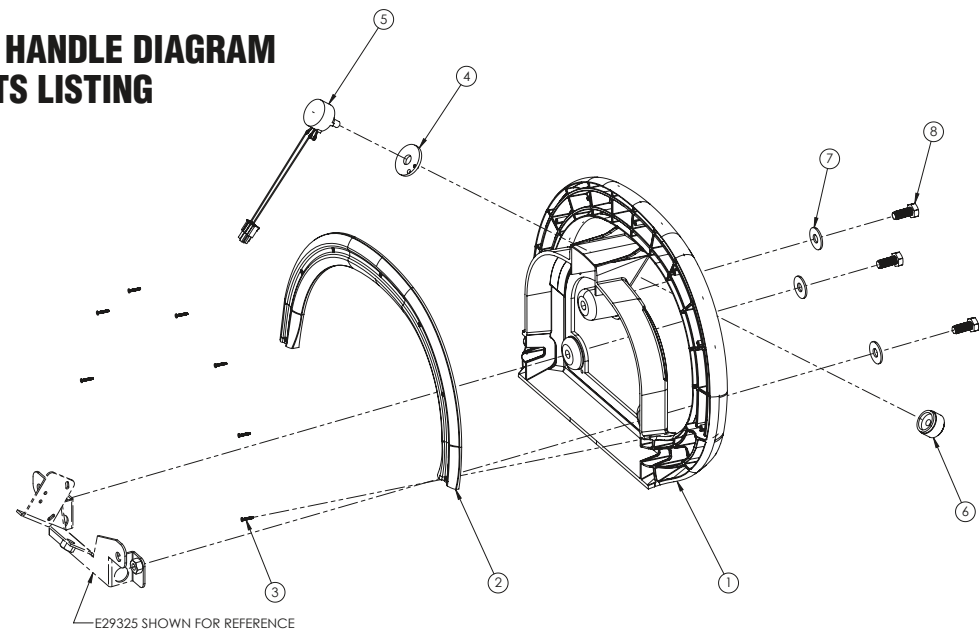
HANDLE BAIL DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                                        | Qty. |
|-------|--------|----------------------------------------------------|------|
| 1     | E29325 | BRACKET, CONTROLS HANDLE, WELDMENT                 | 1    |
| 2     | E29337 | BEARING, SLEEVE, 0.500 ID x 0.750 OD, 0.500 LG     | 2    |
| 3     | E29335 | HANDLE BAIL WELDMENT                               | 1    |
| 4     | E29326 | BAIL PIVOT                                         | 1    |
| 5     | E29327 | ARM, HANDLE BAIL                                   | 1    |
| 6     | E10734 | BOLT, HEX HD, 1/4-20 x 0.625 LG, ZP                | 2    |
| 7     | E29329 | BOLT, HEX HD, 5/16-18 x 2.000 LG                   | 1    |
| 8     | E28622 | WASHER, FLAT, 0.344 ID x 0.750 OD, 0.050 THK, SS   | 2    |
| 9     | E29328 | SPRING, COMPRESSION, 0.376 ID x 0.500 OD, 0.750 LG | 2    |

| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 10    | E12524 | NUT, HEX, 5/16-18, SS                            | 1    |
| 11    | E28669 | SWITCH, 15A SPDT, LEVER ACTION                   | 2    |
| 12    | E28821 | WASHER, LOCK, 0.115 ID x 0.260 OD, EXT TOOTH, ZP | 4    |
| 13    | E28758 | SCREW, SOC HD HEX, #4-40, 0.750 LG, BO           | 4    |
| 14    | E29368 | WASHER, FLAT, 0.125 ID x 0.312 OD, 0.030 THK     | 4    |
| 15    | E28770 | NUT, HEX, #4-40, NYLOC                           | 4    |
| 16    | E81062 | WASHER, FLAT, 0.344 ID x 0.875 OD, 0.063 THK, ZP | 2    |
| 17    | E81089 | BOLT, HEX HD, 5/16-18 x 0.750 LG, ZP             | 2    |

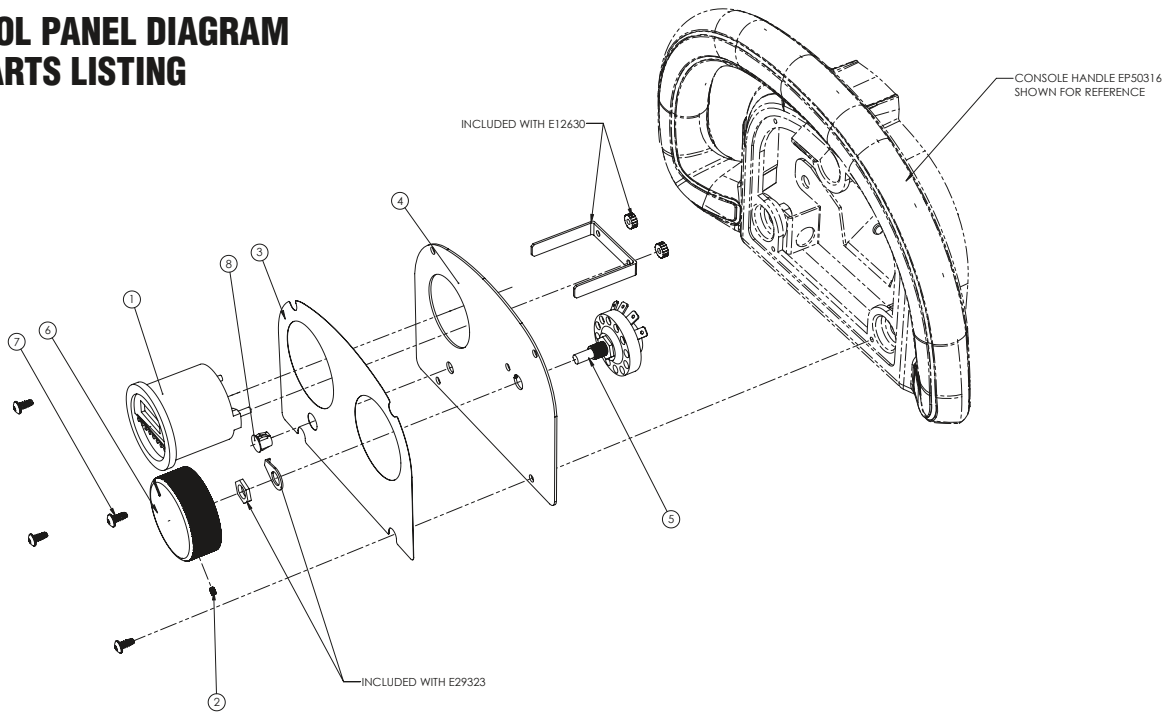
CONSOLE HANDLE DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                              | Qty. |
|-------|--------|------------------------------------------|------|
| 1     | E28915 | HANDLE, CONSOLE CONTROLS, FRONT, GENESYS | 1    |
| 2     | E29301 | HANDLE, CONSOLE CONTROLS, BACK, GENESYS  | 1    |
| 3     | E29336 | SCREW, FLAT HD TORX, #2 TF x 0.500 LG    | 7    |
| 4     | E28768 | POT SPACER AND PIN ASSEMBLY              | 1    |

| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 5     | E28955 | POTENTIOMETER, SPEED CONTROL                     | 1    |
| 6     | E28606 | KNOB, KNURLED, 0.250 SHAFT, 0.925 OD, METAL      | 1    |
| 7     | E81062 | WASHER, FLAT, 0.344 ID x 0.875 OD, 0.063 THK, ZP | 3    |
| 8     | E81089 | BOLT, HEX HD, 5/16-18 x 0.750 LG, ZP             | 3    |

CONTROL PANEL DIAGRAM  
AND PARTS LISTING

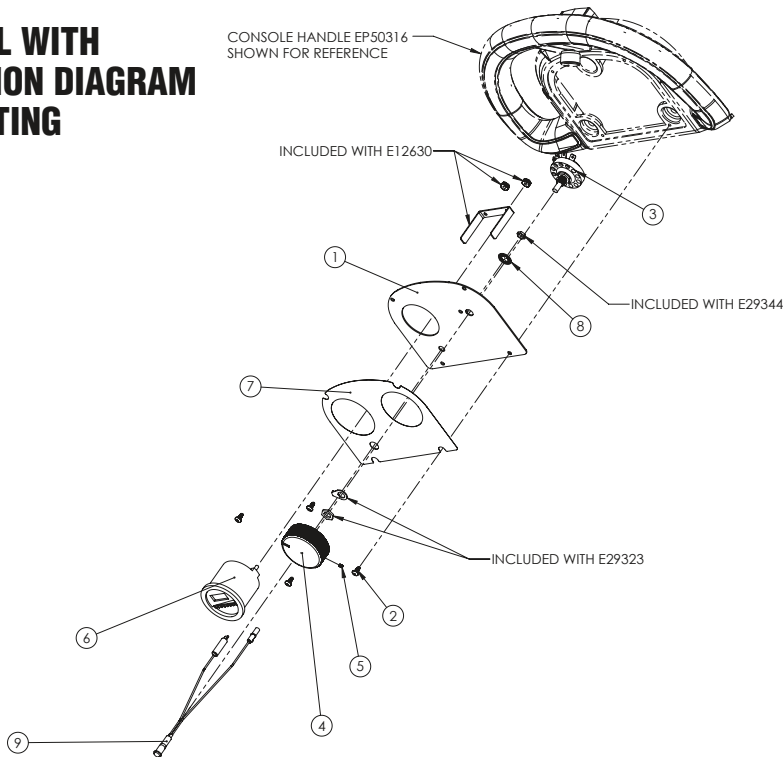


| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 1     | E12630 | BDI (BATTERY DISCHARGE INDICATOR AND HOUR METER) | 1    |
| 2     | E28788 | SCREW, SET, CUP POINT, #5-40 x 0.188 LG          | 1    |
| 3     | E28794 | DECAL, CONTROL PANEL, STANDARD                   | 1    |
| 4     | E29322 | CLUSTER PANEL, STANDARD                          | 1    |

| Item# | Part # | Description                                 | Qty. |
|-------|--------|---------------------------------------------|------|
| 5     | E29323 | SWITCH, ROTARY                              | 1    |
| 6     | E29324 | KNOB, 2.200 OD x 0.830 HT, KNURLED          | 1    |
| 7     | E29334 | SCREW, PAN HD TORX, #8-16 TF x 0.375 LG     | 4    |
| 8     | E81582 | PLUG, 0.375 OD x 0.468 HD DIA, NYLON, BLACK | 1    |

CONTROL PANEL WITH  
SOLICHEM OPTION  
DIAGRAM  
AND PARTS LISTING

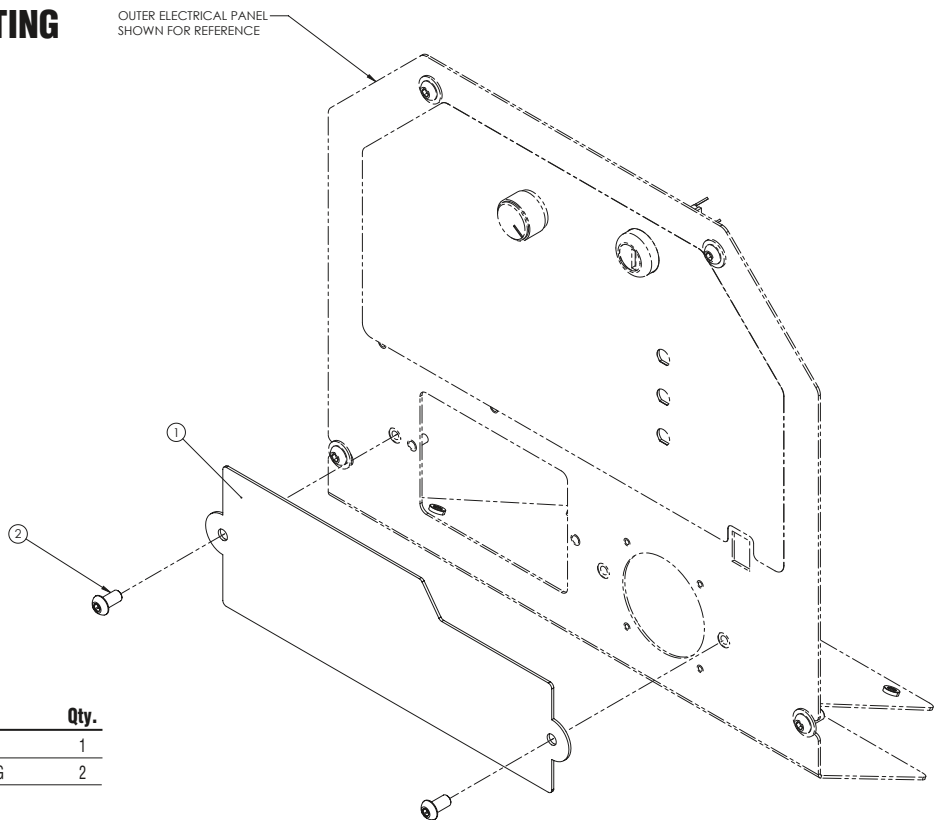
Only applies to machines  
with Solichem Option



| Item# | Part # | Description                             | Qty. |
|-------|--------|-----------------------------------------|------|
| 1     | E29322 | CLUSTER PANEL, STANDARD                 | 1    |
| 2     | E29334 | SCREW, PAN HD TORX, #8-16 TF x 0.375 LG | 4    |
| 3     | E29323 | SWITCH, ROTARY                          | 1    |
| 4     | E29324 | KNOB, 2.200 OD x 0.830 HT, KNURLED      | 1    |
| 5     | E28788 | SCREW, SET, CUP POINT, #5-40 x 0.188 LG | 1    |

| Item# | Part # | Description                                      | Qty. |
|-------|--------|--------------------------------------------------|------|
| 6     | E12630 | BDI (BATTERY DISCHARGE INDICATOR AND HOUR METER) | 1    |
| 7     | E28794 | DECAL, CONTROL PANEL, STANDARD                   | 1    |
| 8     | E28991 | WASHER, LOCK, 0.384 ID X 0.692 OD, INT TOOTH, ZP | 1    |
| 9     | E29344 | ASSEMBLY, LED INDICATOR                          | 1    |

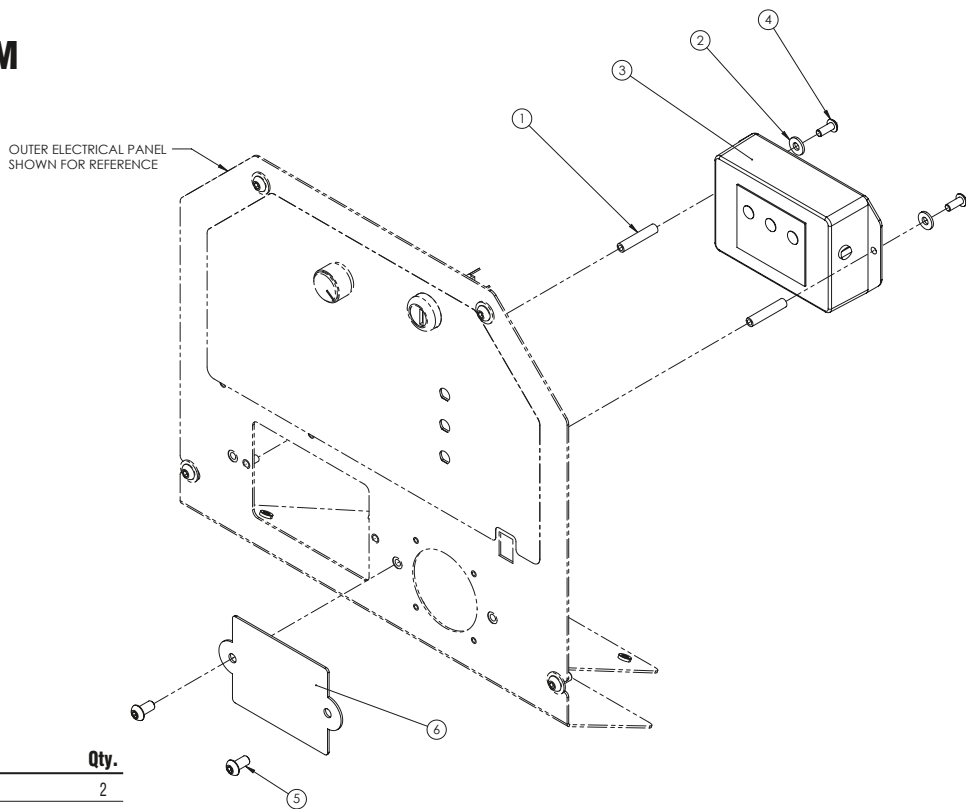
ARMOR SLOT COVER PLATE  
DIAGRAM AND PARTS LISTING



| Item# | Part # | Description                             | Qty. |
|-------|--------|-----------------------------------------|------|
| 1     | E29363 | PLATE, TIMER, ARMOR COVER               | 1    |
| 2     | E28648 | SCREW, BUTTON HD HEX, 1/4-20 X 0.500 LG | 2    |

ARMOR OPTION DIAGRAM  
AND PARTS LISTING

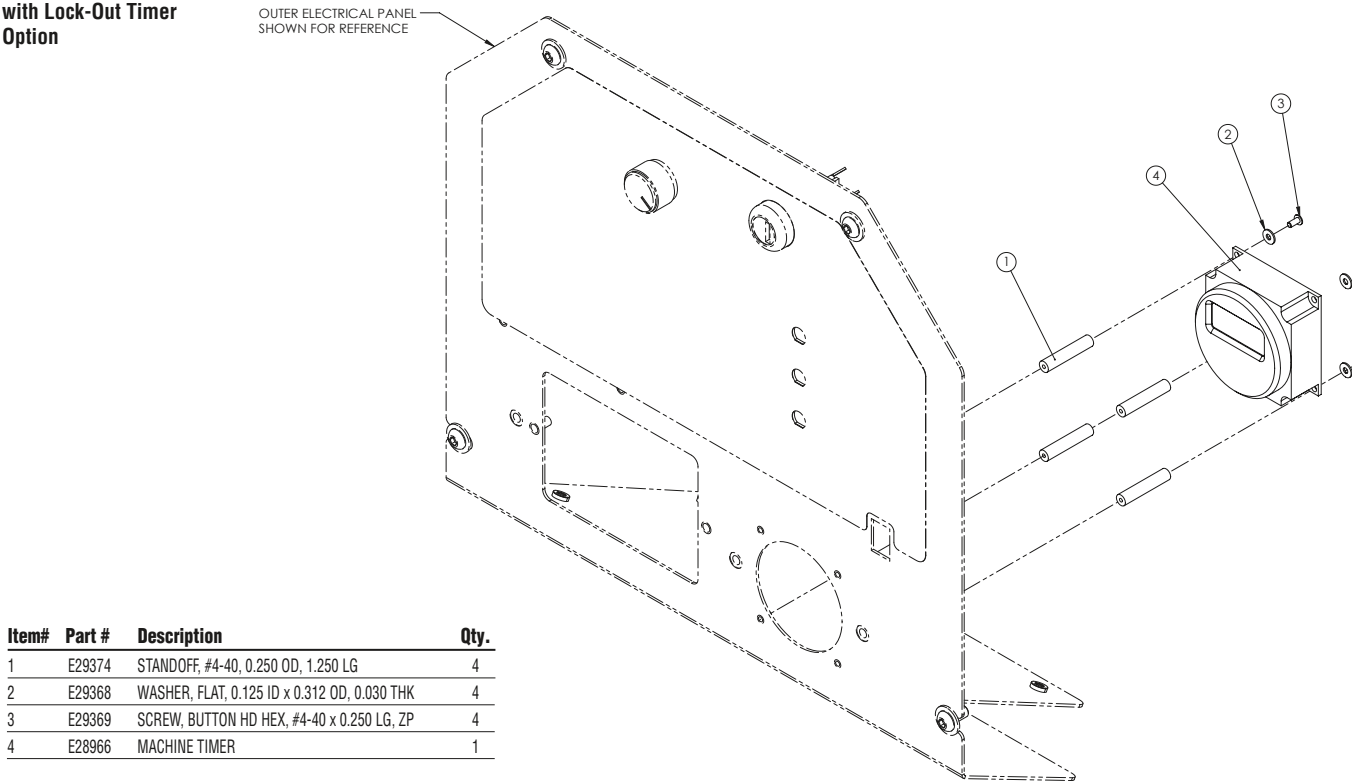
Only applies to machines  
with Armor Option



| Item# | Part # | Description                                  | Qty. |
|-------|--------|----------------------------------------------|------|
| 1     | E29375 | STANDOFF, #10-32, 0.250 OD, 1.250 LG         | 2    |
| 2     | E29580 | WASHER, FLAT, 0.210 ID x 0.500 OD, 0.050 THK | 2    |
| 3     | E28965 | ARMOR BATTERY PROTECTION DEVICE              | 1    |
| 4     | E29367 | SCREW, BUTTON HD HEX, #10-32 x 0.500 LG, ZP  | 2    |
| 5     | E28648 | SCREW, BUTTON HD HEX, 1/4-20 X 0.500 LG      | 2    |
| 6     | E29364 | PLATE, TIMER COVER                           | 1    |

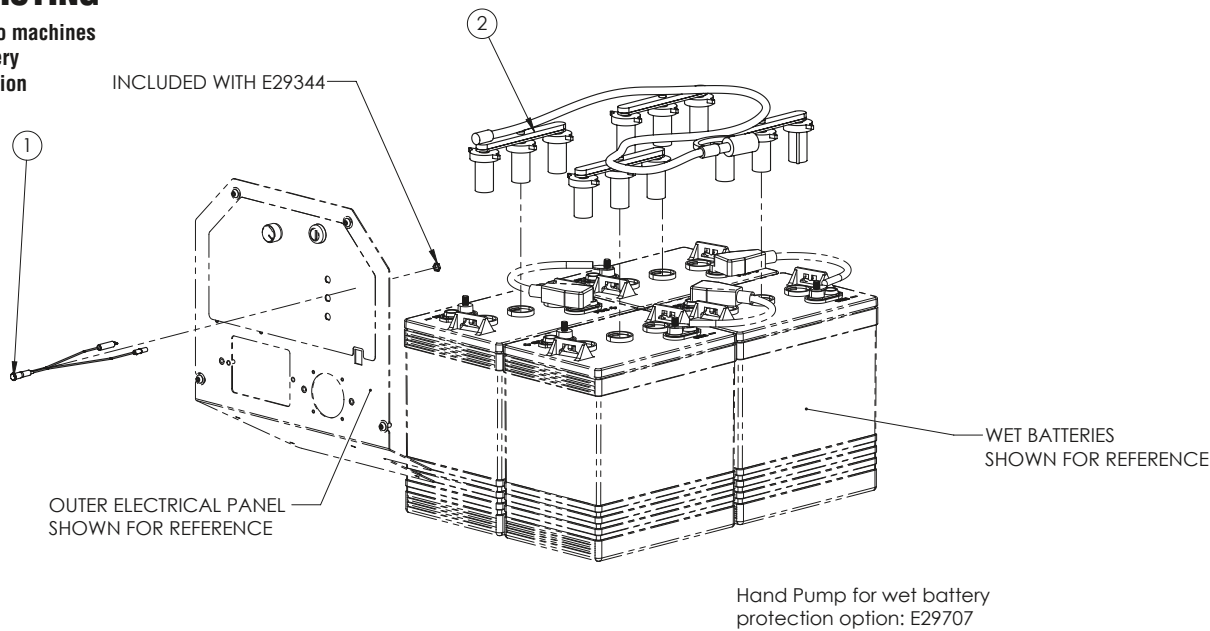
# LOCK-OUT TIMER OPTION DIAGRAM AND PARTS LISTING

Only applies to machines  
with Lock-Out Timer  
Option



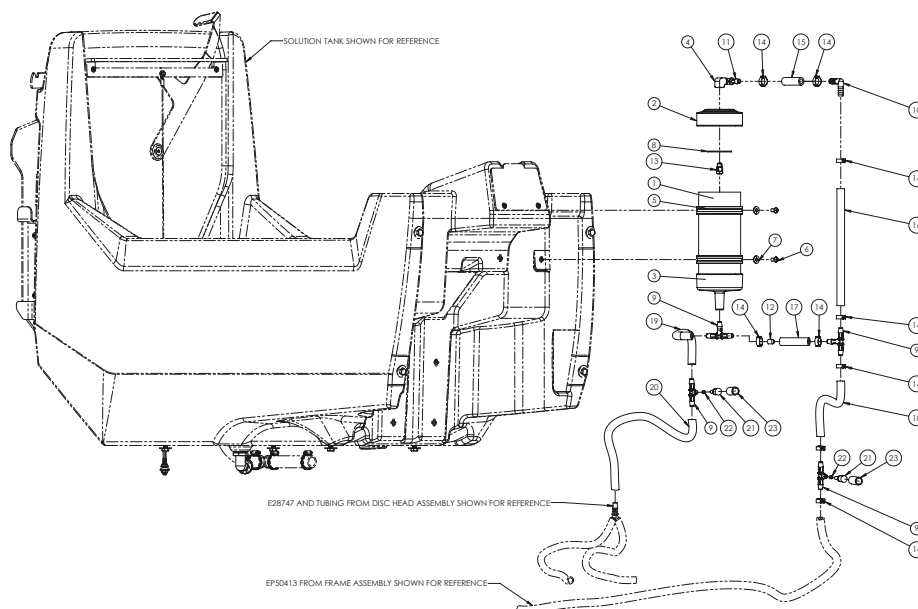
# WET BATTERY PROTECTION OPTION DIAGRAM AND PARTS LISTING

Only applies to machines  
with Wet Battery  
Protection Option



## DISC HEAD SOLICHEM OPTION DIAGRAM AND PARTS LISTING

Only applies to machines with disc heads and Solichem Option

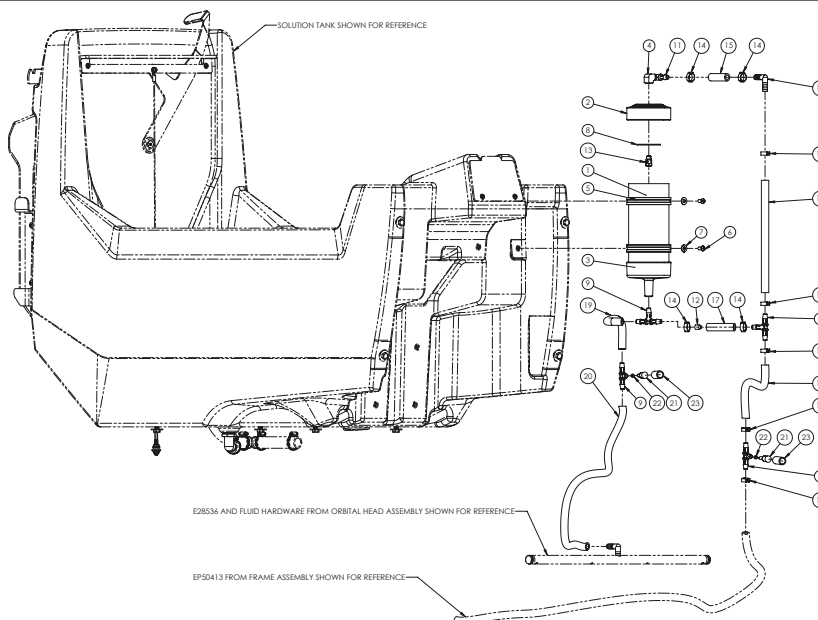


| Item# | Part # | Description                                        | Qty. |
|-------|--------|----------------------------------------------------|------|
| 1     | E29306 | TUBE, 3.500 OD X 3.250 ID, CLEAR PC                | 1    |
| 2     | E29307 | CAP, CHEM TUBE END, TOP                            | 1    |
| 3     | E29316 | CAP, CHEM TUBE END, BOTTOM                         | 1    |
| 4     | E29320 | FITTING, ELBOW 90, 1/4 NPT, BRASS                  | 1    |
| 5     | E28969 | LOOP CLAMP, 3.50 ID, EPDM RUBBER CUSHION, ZINC PL2 | 1    |
| 6     | E28648 | SCREW, BUTTON HD HEX, 1/4-20 X 0.500 LG            | 2    |
| 7     | E28617 | WASHER, FLAT, 0.281 ID x 0.625 OD, 0.050 THK, SS   | 2    |
| 8     | E28767 | WASHER, FENDER, 0.406 ID x 1.250 OD, 0.069 THK     | 1    |
| 9     | E29315 | FITTING, TEE, 3/8 BARB, PLASTIC                    | 4    |
| 10    | E28536 | FITTING, ELBOW 90, 3/8 BARB x 3/8 BARB, PLASTIC    | 1    |
| 11    | E28786 | FITTING, ELBOW 90, 3/8 BARB x 1/4 NPT              | 1    |
| 12    | E29345 | FITTING, RESTRICTION PLUG                          | 1    |

| Item# | Part #  | Description                                                | Qty. |
|-------|---------|------------------------------------------------------------|------|
| 13    | E29313  | FITTING, NOZZLE, BRASS                                     | 1    |
| 14    | E28773  | CLAMP, HOSE, SINGLE PINCH                                  | 9    |
| 15    | EP50224 | HOSE, 3/8 ID, REINFORCED CLEAR PVC, 2.00 LG                | 1    |
| 16    | EP50422 | HOSE, 3/8 ID, REINFORCED CLEAR PVC, 9.75 LG                | 1    |
| 17    | EP50410 | HOSE, 3/8 ID, REINFORCED CLEAR PVC, 2.50 LG                | 1    |
| 18    | EP50423 | HOSE, 3/8 ID, REINFORCED CLEAR PVC, 8.00 LG                | 1    |
| 19    | EP50424 | HOSE, 3/8 ID, REINFORCED CLEAR PVC, 6.00 LG                | 1    |
| 20    | EP50419 | HOSE, 3/8 ID, REINFORCED CLEAR PVC, 12.00LG                | 1    |
| 21    | E28774  | SENSOR, CONDUCTIVITY 1/4" PROBE DIA                        | 2    |
| 22    | EP50425 | TUBING, 0.156 ID x 0.250 OD, 0.250 LG, LATEX RUBBER, BLACK | 2    |
| 23    | EP50426 | HEAT SHRINK, 0.500 ID, 1.50 LG, BLACK                      | 2    |

## ORBITAL HEAD SOLICHEM OPTION DIAGRAM AND PARTS LISTING

Only applies to machines with orbital heads AND Solichem Option



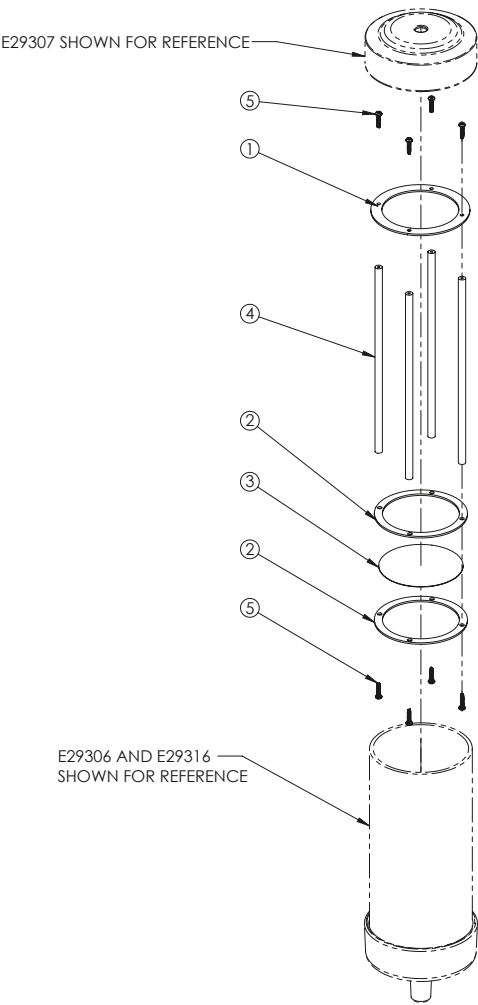
| Item# | Part # | Description                                         | Qty. |
|-------|--------|-----------------------------------------------------|------|
| 1     | E29306 | TUBE, 3.500 OD X 3.250 ID, CLEAR PC                 | 1    |
| 2     | E29307 | CAP, CHEM TUBE END, TOP                             | 1    |
| 3     | E29316 | CAP, CHEM TUBE END, BOTTOM                          | 1    |
| 4     | E29320 | FITTING, ELBOW 90, 1/4 NPT, BRASS                   | 1    |
| 5     | E28969 | LOOP CLAMP, 3.50 ID, EPDM RUBBER CUSHION, ZINC PL 2 | 1    |
| 6     | E28648 | SCREW, BUTTON HD HEX, 1/4-20 X 0.500 LG             | 2    |
| 7     | E28617 | WASHER, FLAT, 0.281 ID x 0.625 OD, 0.050 THK, SS    | 2    |
| 8     | E28767 | WASHER, FENDER, 0.406 ID x 1.250 OD, 0.069 THK      | 1    |
| 9     | E29315 | FITTING, TEE, 3/8 BARB, PLASTIC                     | 4    |
| 10    | E28536 | FITTING, ELBOW 90, 3/8 BARB x 3/8 BARB, PLASTIC     | 1    |
| 11    | E28786 | FITTING, ELBOW 90, 3/8 BARB x 1/4 NPT               | 1    |
| 12    | E29345 | FITTING, RESTRICTION PLUG                           | 1    |

| Item# | Part #  | Description                                                | Qty. |
|-------|---------|------------------------------------------------------------|------|
| 13    | E29313  | FITTING, NOZZLE, BRASS                                     | 1    |
| 14    | E28773  | CLAMP, HOSE, SINGLE PINCH                                  | 9    |
| 15    | EP50224 | HOSE, 3/8 ID, REINFORCED CLEAR PVC, 2.00 LG                | 1    |
| 16    | EP50422 | HOSE, 3/8 ID, REINFORCED CLEAR PVC, 9.75 LG                | 1    |
| 17    | EP50410 | HOSE, 3/8 ID, REINFORCED CLEAR PVC, 2.50 LG                | 1    |
| 18    | EP50423 | HOSE, 3/8 ID, REINFORCED CLEAR PVC, 8.00 LG                | 1    |
| 19    | EP50424 | HOSE, 3/8 ID, REINFORCED CLEAR PVC, 6.00 LG                | 1    |
| 20    | EP50416 | HOSE, 3/8 ID, REINFORCED CLEAR PVC, 28.00 LG               | 1    |
| 21    | E28774  | SENSOR, CONDUCTIVITY 1/4" PROBE DIA                        | 2    |
| 22    | EP50425 | TUBING, 0.156 ID x 0.250 OD, 0.250 LG, LATEX RUBBER, BLACK | 2    |
| 23    | EP50426 | HEAT SHRINK, 0.500 ID, 1.50 LG, BLACK                      | 2    |

# SOLICHEM PUCK CAGE DIAGRAM AND PARTS LISTING

Only applies to machines  
with Solichem Option

| Item# | Part #  | Description                                        | Qty. |
|-------|---------|----------------------------------------------------|------|
| 1     | E28757  | FLANGE, INNER PUCK CAGE, TOP                       | 1    |
| 2     | E29308  | FLANGE, INNER PUCK CAGE                            | 2    |
| 3     | E29309  | SCREEN, PUCK CAGE, SS                              | 1    |
| 4     | EP50421 | ROD, 0.25 OD, PVC, GRAY, 7.25" LG                  | 4    |
| 5     | E29311  | SCREW, #4, 1/2" LG., THREAD FORMING, 18-8 TORQ, SS | 8    |

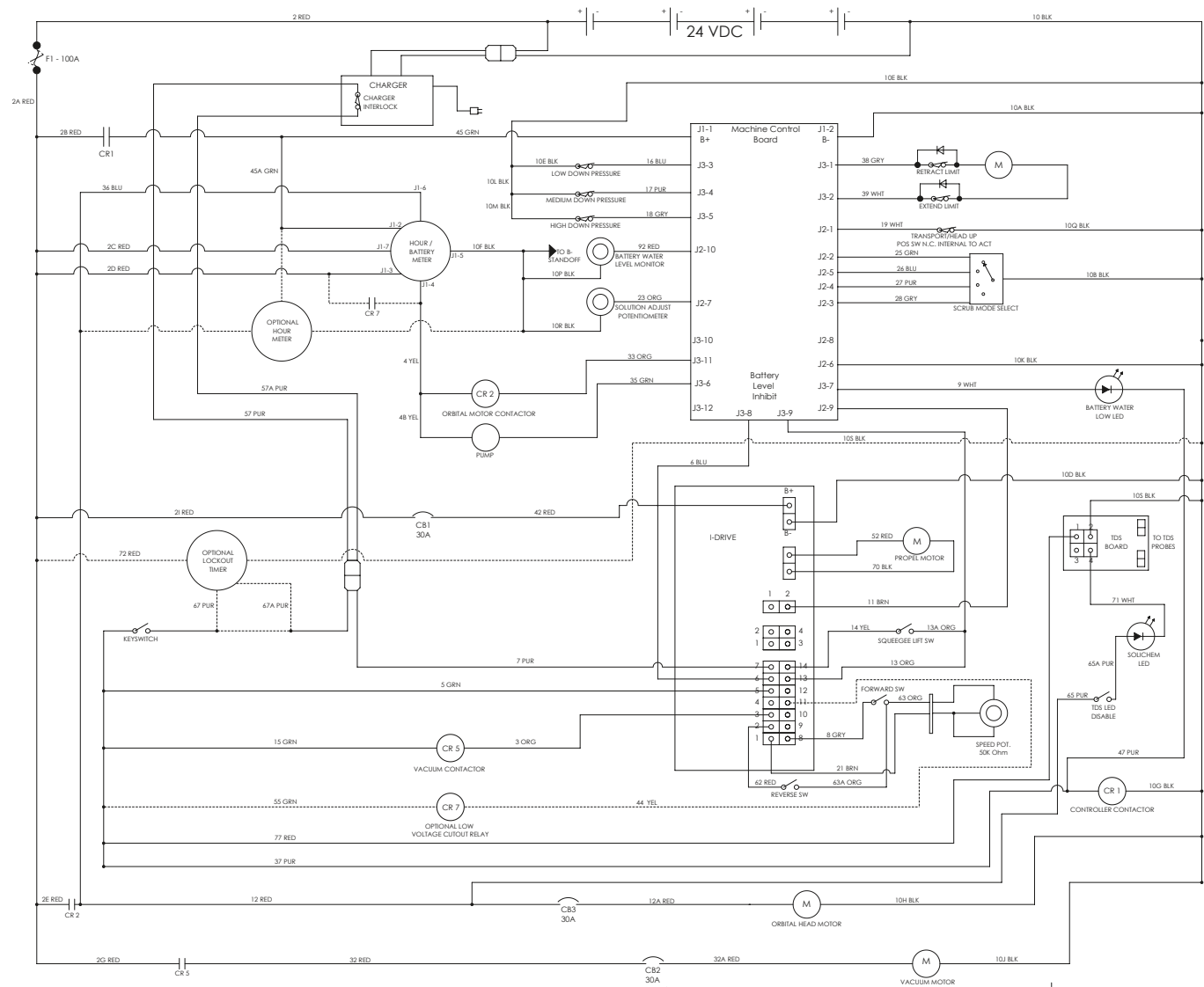


### Only applies to machines with disc heads



# ORBITAL MACHINE ELECTRICAL SCHEMATIC

Only applies to machines with orbital heads



# GENESYS™ RECOMMENDED SPARE PARTS

| Part # | Part Name                                   | Machine Sub-System | 26D | 28D | 32D | 280RB |
|--------|---------------------------------------------|--------------------|-----|-----|-----|-------|
| E29449 | Front Squeegee Blade 35in                   | Squeegee           | X   |     |     |       |
| E29450 | Rear Squeegee Blade 35in                    | Squeegee           | X   |     |     |       |
| E28504 | Front Squeegee Blade 40in                   | Squeegee           |     | X   |     | X     |
| E28502 | Rear Squeegee Blade 40in                    | Squeegee           |     | X   |     | X     |
| E29454 | Front Squeegee Blade 45in                   | Squeegee           |     |     | X   |       |
| E29455 | Rear Squeegee Blade 45in                    | Squeegee           |     |     | X   |       |
| E28903 | Squeegee Attachment Knob                    | Squeegee           | X   | X   | X   | X     |
| E28530 | Rubber Isolator Mount 1.563 Tall x 1.25 Dia | Orbital Head       |     |     |     | X     |
| E28531 | Isolator Bushing 1.25 OD x 0.313 ID         | Orbital Head       |     |     |     | X     |
| E28506 | Battery, 6V, Wet                            | Solution Tank      | X   | X   | X   | X     |
| E28704 | Charger Cord                                | Solution Tank      | X   | X   | X   | X     |
| E29537 | 13in Pad Driver Assembly                    | Disk Head          | X   |     |     |       |
| E29535 | 14in Pad Driver Assembly                    | Disk Head          |     | X   |     |       |
| E29539 | 16in Pad Driver Assembly                    | Disk Head          |     |     | X   |       |
| E29527 | HEPA Filter                                 | Recovery Tank      | X   | X   | X   | X     |
| E29563 | Ball Float Shut-Off                         | Recovery Tank      | X   | X   | X   | X     |
| E29576 | Hose, Squeegee Vacuum                       | Recovery Tank      | X   | X   | X   | X     |
| E28921 | Hose, Recovery Tank Drain                   | Recovery Tank      | X   | X   | X   | X     |
| E28975 | 100A Fuse                                   | Electrical         | X   | X   | X   | X     |
| E28954 | 30A Breaker                                 | Electrical         | X   | X   | X   | X     |
| E12629 | Key Switch w/ 2 Keys                        | Electrical         | X   | X   | X   | X     |
| E28956 | 80A Relay                                   | Electrical         | X   | X   | X   | X     |
| E28978 | 40A Relay                                   | Electrical         | X   | X   | X   | X     |
| E20704 | Head Lift Switch                            | Head Lift          | X   | X   | X   | X     |
| E29324 | Switch, Rotary                              | Handle Console     | X   | X   | X   | X     |

# GENESYS™ RECOMMENDED MAINTENANCE

| SYSTEM                                                          | REFERENCE SECTION     | DAILY | WEEKLY | MONTHLY | SIX MONTHS |
|-----------------------------------------------------------------|-----------------------|-------|--------|---------|------------|
| <b>CONTROL PANEL</b>                                            |                       |       |        |         |            |
| INSPECT ALL CONTROLS AND HARDWARE FOR SECURITY & SERVICEABILITY | PARTS DIAGRAMS        | X     |        |         |            |
| VERIFY PROPER OPERATION OF ALL CONTROLS                         | ALL                   | X     |        |         |            |
| <b>SOLUTION DISTRIBUTION</b>                                    |                       |       |        |         |            |
| VERIFY SOLUTION FLOW AND ADJUSTMENT OPERATION                   | SOLUTION DISTRIBUTION | X     |        |         |            |
| CLEAN AND INSPECT INLINE FILTER                                 | SOLUTION DISTRIBUTION |       | X      |         |            |
| FLUSH TANK WITH FRESH WATER                                     | SOLUTION DISTRIBUTION |       |        | X       |            |
| <b>SCRUB DECK</b>                                               |                       |       |        |         |            |
| RINSE BRUSHES AND PADS                                          | SCRUB DECK SETUP      | X     |        |         |            |
| RINSE AND DRY SCRUB DECK                                        | SCRUB DECK SETUP      | X     |        |         |            |
| CLEAN MOTOR VENTS                                               | PARTS DIAGRAMS        |       |        | X       |            |
| INSPECT ISOLATORS ( ORBITAL ONLY)                               | PARTS DIAGRAMS        |       |        |         | X          |
| INSPECT LIFT LINKAGE AND PIVOTS                                 | SCRUB DECK SETUP      |       |        |         | X          |
| <b>RECOVERY SYSTEM</b>                                          |                       |       |        |         |            |
| RINSE OUT AND LET THE RECOVERY TANK AIR DRY                     | RECOVERY SYSTEM       | X     |        |         |            |
| CLEAN AND INSPECT DEBRIS TRAY                                   | RECOVERY SYSTEM       | X     |        |         |            |
| VERIFY DRAIN HOSE CAP IS SEALED TIGHT WHEN INSTALLED            | RECOVERY SYSTEM       | X     |        |         |            |
| INSPECT LID SEAL                                                | RECOVERY SYSTEM       |       | X      |         |            |
| INSPECT/REPLACE DEFOAMER PUCK AS NEEDED                         | RECOVERY SYSTEM       |       | X      |         |            |
| INSPECT HEPA FILTER                                             | RECOVERY SYSTEM       |       |        | X       |            |
| CLEAN AND SANITIZE RECOVERY TANK                                | RECOVERY SYSTEM       |       |        | X       |            |
| <b>BATTERIES AND CHARGER</b>                                    |                       |       |        |         |            |
| INSPECT CABLES & TERMINALS FOR CORROSION, SECURITY & DAMAGE     | BATTERIES             |       |        | X       |            |
| SERVICE LEAD ACID BATTERIES IF APPLICABLE                       | BATTERIES             |       | X      |         |            |
| CLEAN ONBOARD CHARGER VENTS IF APPLICABLE                       | PARTS DIAGRAMS        |       |        | X       |            |
| INSPECT WET BATTERY PROTECTION SYSTEM                           | BATTERIES             |       |        |         | X          |
| <b>SQUEEGEE ASSEMBLY</b>                                        |                       |       |        |         |            |
| CLEAN AND INSPECT THE BLADES AND ENTIRE SQUEEGEE ASSEMBLY       | RECOVERY SYSTEM       | X     |        |         |            |
| INSPECT VACUUM HOSE                                             | RECOVERY SYSTEM       |       | X      |         |            |
| <b>FRAME AND CHASSIS COMPONENTS</b>                             |                       |       |        |         |            |
| CLEAN AND INSPECT WHEELS AND CASTORS                            | PARTS DIAGRAMS        |       |        | X       |            |
| CLEAN AND INSPECT LINKAGE, CHASSIS AND HARDWARE                 | PARTS DIAGRAMS        |       |        | X       |            |
| CLEAN AND INSPECT VISIBLE WIRES FOR DAMAGE AND SECURITY         | PARTS DIAGRAMS        |       |        |         | X          |

# TROUBLESHOOTING GUIDE

| SUB-SYSTEM        | SYMPTOM                                                                                    | POSSIBLE ROOT CAUSE                              | HOW TO CHECK                                                                       | POSSIBLE FIX                                                              |
|-------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Solution System   | Poor or No Water Flow                                                                      | Solution Tank is empty                           | Check Sight Tube                                                                   | Fill with wate                                                            |
|                   |                                                                                            | Ball Valve is closed                             | Visual Check of valve                                                              | Open Valve                                                                |
|                   |                                                                                            | Debris in line                                   | Visual Check of solution lines                                                     | Clear blockages                                                           |
|                   |                                                                                            | Plugged Filter                                   | Unscrew cap and check screen                                                       | Clean and re-install                                                      |
|                   |                                                                                            | Kinked line near the deck                        | Visual Inspection                                                                  | Re-route or replace hose                                                  |
|                   |                                                                                            | Solution Flow knob turned all the way down       | Visual Check of Solution Control Knob                                              | Turn flow up                                                              |
|                   |                                                                                            | Solution Pump not working                        | Check pump for proper operation                                                    | Replace component                                                         |
| Vacuum System     | Poor Water Recovery<br><br>Could Result in:<br>• Severe Streaking<br>• Water Left on Floor | Recovery Tank is Full                            | Visual Inspection                                                                  | Drain the tank                                                            |
|                   |                                                                                            | Worn or dirty blades                             | Visual Inspection                                                                  | Flip to a different edge, clean, or replace                               |
|                   |                                                                                            | Hole in Recovery/Squeegee Hose                   | Visual Inspection                                                                  | Replace component                                                         |
|                   |                                                                                            | Plugged squeegee or recovery hose                | Visual Inspection                                                                  | Remove Clog                                                               |
|                   |                                                                                            | Debris in squeegee                               | Visual Inspection                                                                  | Clear debris                                                              |
|                   |                                                                                            | Squeegee Out of Adjustment                       | Check for proper blade deflection                                                  | Adjust swivel casters                                                     |
|                   |                                                                                            | Stuck Float Ball                                 | Visual Inspection                                                                  | Dislodge Float ball from tube                                             |
|                   |                                                                                            | Recovery Tank Lid not sealing properly           | Check seal for damage and proper seating                                           | Re-install seal or replace                                                |
|                   |                                                                                            | Drain Hose Cap not installed                     | Visual Inspection                                                                  | Install cap                                                               |
|                   |                                                                                            | Clogged HEPA filter                              | Visual Inspection                                                                  | Replace component                                                         |
|                   |                                                                                            | Defective Vac Motor                              | Vac runs but struggles & can't generate suction                                    | Replace component                                                         |
|                   |                                                                                            | Squeegee hose not attached on one end            | Visual Inspection                                                                  | Properly Install Hose ends                                                |
| Electrical System | • Machine will not turn on<br>• No lights on the BDI                                       | Main Machine Fuse Blown                          | Inspection of 100A fuse                                                            | Replace Component                                                         |
|                   |                                                                                            | Faulty Battery Connection                        | Check Connections at the battery pack and into panel                               | Fix any bad connections                                                   |
|                   |                                                                                            | Faulty Key Switch                                | Check Key Switch Continuity                                                        | Replace Key Switch                                                        |
|                   |                                                                                            | Charger Interlock not plugged in                 | Visual Inspection                                                                  | Connect if disconnected                                                   |
|                   |                                                                                            | Discharged Batteries                             | Check Battery Voltage                                                              | Charge Batteries                                                          |
| Vacuum System     | Vacuum will not turn on                                                                    | Vac Switch out of adjustment                     | Switch is not actuated                                                             | Adjust switch                                                             |
|                   |                                                                                            | Vac Motor Circuit Breaker Tripped                | Visual Inspection                                                                  | Reset Circuit Breaker                                                     |
|                   |                                                                                            | Defective Vac Motor                              | Motor doesn't run when 24V is confirmed to be present                              | Replace Component                                                         |
|                   |                                                                                            | Faulty Vac Relay                                 | Check for proper operation                                                         | Replace Component                                                         |
|                   | Vacuum will not turn off                                                                   | Still in the 7 second delay mode                 | Wait 7 seconds                                                                     | None. Works as designed                                                   |
|                   |                                                                                            | Vac Switch out of adjustment                     | Switch is not actuated                                                             | Adjust Switch                                                             |
| Scrub Deck        | Deck Motor(s) will not run<br><br>This assumes the scrub deck is in the down position      | Brush Motor Circuit Breaker(s) Needs Reset       | Visual Inspection                                                                  | Reset Circuit Breaker                                                     |
|                   |                                                                                            | Low Voltage Cutoff Engaged                       | Check BDI to see if Low Voltage Cutoff has kicked in                               | Charge Machine                                                            |
|                   |                                                                                            | Faulty motor contactor(s)                        | Check for proper operation                                                         | Replace Component                                                         |
|                   |                                                                                            | Defective Motor(s)                               | Check for proper operation                                                         | Replace Component                                                         |
| Transaxle         | Machine will not drive                                                                     | Bail Switches may be faulty or out of adjustment | Verify that the switches engage in forward and reverse                             | Adjust switches                                                           |
|                   |                                                                                            |                                                  | Confirm that the switches have continuity and have voltage being supplied to them. | Replace Component                                                         |
|                   |                                                                                            | Speed knob turned all the way down               | Turn the knob up to a faster speed                                                 | Turn the knob up                                                          |
|                   |                                                                                            | Transaxle circuit breaker tripped                | Visual Inspection                                                                  | Reset Circuit Breaker                                                     |
|                   |                                                                                            | Faulty I-Drive                                   | Confirm proper operation of I-Drive                                                | Replace or re-program                                                     |
|                   |                                                                                            | Defective transaxle                              | Confirm voltage supplied to the motor                                              | Replace Component                                                         |
| Head Lift         | Actuator does not move                                                                     | Loose down pressure knob                         | Set screw is loose and knob spins without turning the down pressure switch stem    | Reposition and tighten set screw. Add loctite to set screw if available   |
|                   |                                                                                            | 12.5A Fuse is blown on the control board         | Visual check of the fuse                                                           | Replace Fuse                                                              |
|                   |                                                                                            | Failed Down Pressure Selector Switch             | Check switch for damage and proper operation                                       | Replace Component                                                         |
|                   |                                                                                            | Head lift switch issue                           | Check switches for proper position and operation                                   | Adjust Cam's if needed to ensure they engage in the appropriate locations |
|                   |                                                                                            | WBP System Activated                             | Check for battery watering light to be on                                          | Water batteries                                                           |
|                   |                                                                                            | Failed Actuator                                  | Check for proper supplied voltage and operation                                    | Replace Actuator                                                          |

## TROUBLESHOOTING GUIDE *continued*

| SUB-SYSTEM        | SYMPTOM                                                      | POSSIBLE ROOT CAUSE                                   | HOW TO CHECK                                                                                         | POSSIBLE FIX                                                                   |
|-------------------|--------------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Head Lift         | Actuator Extends Fully when a pressure is selected           | Cams need adjusted                                    | Verify Cams are in the appropriate location                                                          | Adjust Cam location                                                            |
|                   |                                                              | Switch Position (Angle) Changed                       | Verify that the switches are engaging properly as the actuator moves                                 | Adjust the angle to where the Cam will engage                                  |
|                   |                                                              | Defective Head Lift Switches                          | Fails a continuity check                                                                             | Replace Switch                                                                 |
| Scrub Deck        | Pad Auto-Off feature does not work<br><br>Disk Machines Only | Machine is not in transport mode                      | Verify that the down pressure knob is in Transport Mode and the head is up                           | Turn the knob to the Transport Position                                        |
|                   |                                                              | Defective Auto Off relay                              | Check relay for proper operation                                                                     | Replace relay                                                                  |
|                   |                                                              | Defective Auto Off button                             | Check switch for proper operation                                                                    | Replace button                                                                 |
|                   |                                                              | Pad Drivers are stuck                                 | The brushes turn and function properly when the button is pressed but the pad drivers do not release | Manually will need to remove pad drivers and correct what is making them stick |
| Electrical System | Machine doesn't charge                                       | Defective Charger                                     | Check for 25A coming from the charger when plugged in                                                | Replace Charger                                                                |
|                   |                                                              | Anderson SB50 connector is disconnected               | Visual check of connection                                                                           | Connect it                                                                     |
|                   |                                                              | Battery Pack is bad                                   | Check for an extremely low pack voltage. The charger may not pickup on it.                           | Replace batteries or place on another appropriate charger to bump them         |
|                   |                                                              | Wiring issue between charger, battery pack, and panel | Visual check of wiring and connections                                                               | Repair or replace any defective wiring or connections                          |
|                   |                                                              | Blown 100A main machine fuse                          | Check for continuity through the fuse                                                                | Replace fuse and try to determine what may have made the fuse blow             |
| Operation         | Run Time is too short                                        | Defective Batteries                                   | Load test the batteries                                                                              | Replace battery if it fails                                                    |
|                   |                                                              | Scrub head is in high down pressure                   | Check down pressure knob setting                                                                     | Lower down pressure                                                            |
|                   |                                                              | Batteries are low on water (Wet batteries only)       | Remove a cap and do a visual inspection of the water level. Plates should not be exposed.            | Water batteries per manual instructions                                        |
|                   |                                                              | Charger is not allowed to finish charge cycle         | Check the charger status prior to disconnecting                                                      | Allow cycle to complete prior to unplugging                                    |



# BETCO US WARRANTY POLICY

## **10 Year Coverage**

Subject to the conditions stated below, Betco warrants parts and labor on rotationally molded polyethylene tanks/housings and injection molded vacuum head assemblies to be free from defects in materials and workmanship for a period of ten years to the original purchaser.

## **5 Year Coverage**

Subject to the conditions stated below, Betco warrants parts and labor on all other Betco components to be free from defects in materials and workmanship for a period of five years to the original purchaser.

- Lithium Ion batteries for GeneSys™ Scrubbers is full 5 years

## **3 Year Coverage**

Subject to the conditions stated below, Betco warrants parts and labor on all other Betco components to be free from defects in materials and workmanship for a period of three years to the original purchaser.

- Lithium Ion battery for MotoMop™ is a full 3 years

## **1 Year Coverage**

Subject to the conditions stated below, Betco offers a limited warranty on parts and labor on the following equipment: parts and accessories to be free from defects in materials and workmanship for a period of one year to the original purchaser.

- PowerUp™ 14 Upright Vacuum: #E29990-00
- Bac Pac Lite Vacuum: #85903-00
- FiberPRO® Floor Dryer: #85507-00
- WORKMAN™ Series Vacuums: #85024-00, #85025-00, #83012-00, #85027-00
- All Tools and Accessories
- All Battery Chargers
- Deep cycle batteries are pro-rated for 1 year

## **Allowable Travel Time Warranty Reimbursement:**

Eligible equipment: All battery and propane powered equipment products. Warranty period: 90 days (GeneSys™ Mid-Size Scrubber: 180-days) from date of sale to the original purchaser. A maximum 180 mile round trip at 50 cents per mile will be allowed for warranty consideration.

## **Propane Machine Warranty:**

Kawasaki/Subaru engines are warranted by Kawasaki/Subaru for a period of 2 years against manufacturer defects. All other components (except wear items)\* are warranted by Betco for a period of 3 years.

**\*Wear Items exempt from Warranty consideration include but may not be limited to: power cords, transport wheels, vacuum bags, belts, squeegee blades, pad drivers, clutch plates, handle grips, filters, screens, throttle cables, brushes and carbon brushes.**

Subject to the conditions and exceptions stated in this warranty, Betco warrants the Betco products to be free from defects in material and workmanship, under normal use and service, for the periods listed under the warranty policy to the original purchaser. At any time during the warranty period, Betco will furnish replacement parts for the Betco parts to the original purchaser. Such parts will be furnished and charged including transportation costs, to the original owner through any Betco authorized Service Distributor. If the original part is returned within the warranty policy period from date of delivery for inspection by Betco and is found to be defective the owner will be credited for the cost of replacement parts plus shipping and handling. Replacement parts that have become defective through wear or abuse are not included in this warranty.

This warranty does not apply to damage or defect caused by accident, misuse, negligence, fire, or to any Betco product which has been serviced or repaired by other than an authorized Betco Service Distributor or Betco factory personnel. This warranty is void if unauthorized modifications are made to any Betco products. This warranty is void if products are used for any purpose other than that which was intended. There are no other warranties expressed or implied. In no event shall Betco be liable for incidental or consequential damages or any damage to person or property. (Please note some states do not allow the exclusion or limitations for incidental and consequential damages).

