

ICE COBOTICS



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Operator & Parts Manual

Automatic Scrubber



**i28BTL+**  
**i32BTL+**

**i-SYNERGY**  
Cleaning Management in Motion

8210042  
REV.04 (05-2021)

**INTELLIGENT CLEANING EQUIPMENT**

## PARTS LIST

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**READ OPERATOR MANUAL CAREFULLY!**

**IMPORTANT:** To ensure full warranty protection, please fill out & return your warranty card.

Please fill out at time of installation for future reference.

Model No. \_\_\_\_\_

Serial No. \_\_\_\_\_

Machine Options \_\_\_\_\_

Sales Rep. \_\_\_\_\_

Sales Rep. Phone No. \_\_\_\_\_

Customer ID Number \_\_\_\_\_

Installation Date \_\_\_\_\_

### HOW TO ORDER PARTS

Only use ICE Company supplied or equivalent parts. Parts and supplies may be ordered online, by phone, by fax or by mail.

1. Identify the machine model.
2. Identify the machine serial number from the data label.
3. Ensure the proper serial number is used from the parts list.
4. Identify the part number and quantity.  
Do not order by page or reference numbers.
5. Provide your name, company name, customer ID number, billing and shipping address, phone number and purchase order number.



### PROTECT THE ENVIRONMENT

Please dispose of packaging materials, old machine components such as batteries, hazardous fluids, including antifreeze and oil, in an environmentally safe way according to local waste disposal regulations.



Always remember to recycle.

### ICE Company Limited

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**Specifications and parts are subject to change without notice.**

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### SAFETY PRECAUTIONS

This machine is intended for commercial use. It is designed exclusively to scrub hard floors in an indoor environment and is not constructed for any other use. Only use recommended accessories.

**All operators shall read, understand and exercise the following safety precautions:**

**1. Do not operate machine:**

- Unless trained and authorized.
- Unless you have read and understand the operators manual.
- In flammable or explosive areas.
- If not in proper operating condition.
- In outdoors areas.

**2. Before starting machine:**

- Make sure all safety devices are in place and operate properly.

**3. When using machine:**

- Go slow on inclines and slippery surfaces.
- Follow all safety guidelines.
- Be very careful when using the machine in reverse.
- Reduce speed when turning.
- Report and fix any damage to machine prior to operating it.
- Never allow children to play on or around.
- Do not operate on inclines that exceed 5% (3°).

**4. Before leaving or servicing machine:**

- Stop on level surface.
- Turn off machine.

**5. When servicing machine:**

- Read operators manual thoroughly prior to operating or servicing this machine.
- Use manufacturer supplied or approved replacement parts.
- Secure machine with wheel blocks prior to jacking the machine up.
- Use approved jack or hoist to safely elevate the machine.
- Disconnect batteries prior to working on machine.
- Avoid moving parts. Do not wear loose fitting clothing while servicing machine.



**WARNING: Fire or Explosion Hazard. Keep sparks and open flames away! Keep battery compartment open when charging.**



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



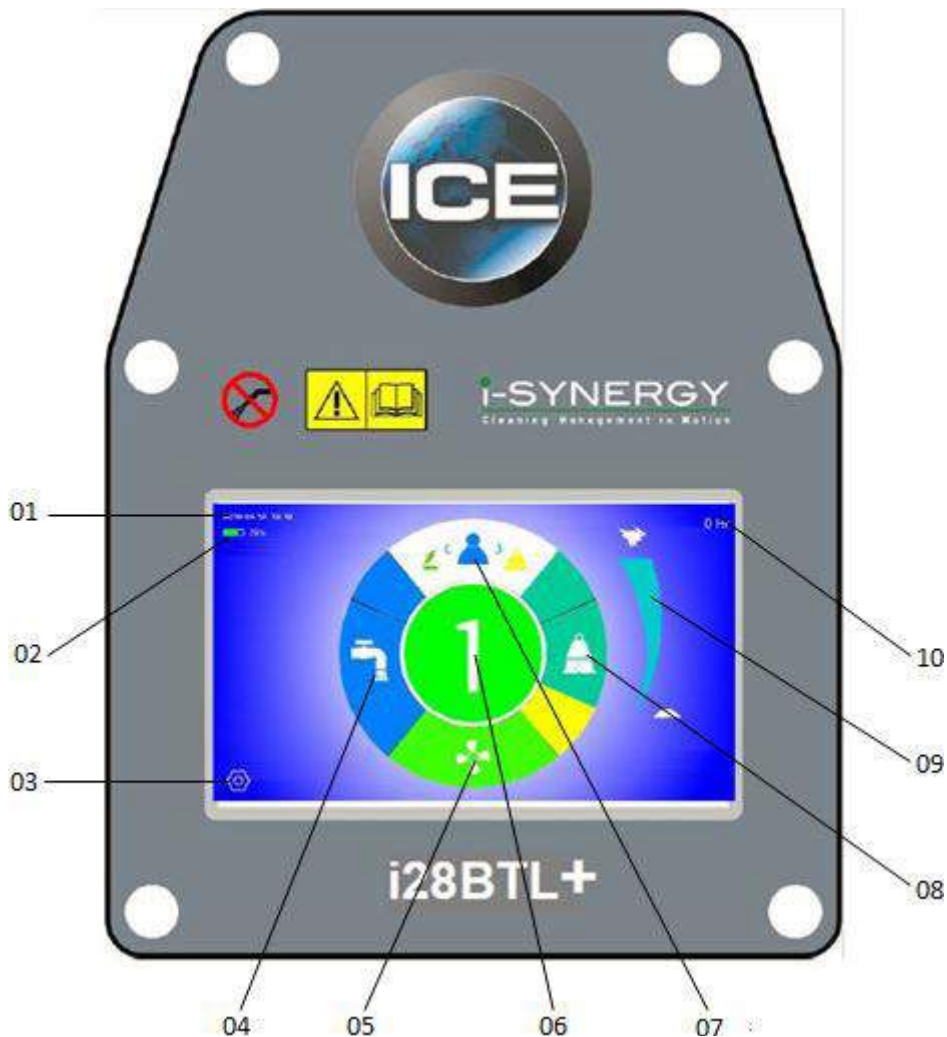
**WARNING: Flammable materials or reactive metals can cause explosion or fire. Do not pick up.**

## MACHINE COMPONENTS



- |   |                                       |
|---|---------------------------------------|
| 1. Control handle                       | 18. i-synergy™, ID card scanning area |
| 2. Control panel (See penal components) | 19. Lithium-ion batteries             |
| 3. Recovery tank drain hose             | 20. Recovery tank support stand       |
| 4. Emergency stop button                | 21. Vacuum motor, 24VDC               |
| 5. Circuit breaker, Controller          | 22. Cup holder                        |
| 6. Circuit breaker, Brake               | 23. Recovery tank cover               |
| 7. Hose fill port                       | 24. Recovery tank                     |
| 8. Squeegee lift lever                  | 25. ICE logo                          |
| 9. Wheels, 8 Inch                       | 26. Bucket fill port/ Clean-out port  |
| 10. Filter assembly                     | 27. Solution tank                     |
| 11. Vacuum hose                         | 28. LED light                         |
| 12. Solution tank level / Drain hose    | 29. Front cover                       |
| 13. Ball valve                          | 30. Brush & Pad realease plunger      |
| 14. On-board battery charger            | 31. Scrub head adjusting bolt         |
| 15. Squeegee assembly                   | 32. Scrub head skirt                  |
| 16. Caster, 2 inch, Squeegee adjustment | 33. Scrub head assembly               |
| 17. Control handle start bail           | 34. Parking brake (Option)            |

### ANDROID LCD SCREEN



- 01 Date & Time
- 02 Battery meter
- 03 Setting button
- 04 Solution flow adjusting button
- 05 Vacuum motor button
- 06 1-step starting button
- 07 Work mode select button
- 08 Scurb head pressure adjusting button
- 09 Speed adjusting button
- 10 Timer



## i-synergy™ INTRODUCTION

i-synergy™ collects operational data from cleaning machines and transmit the information to ICE's server. The ICE server generates daily reports and send them to designated end users by email. From these reports, end users will have information about machines' usage and even specific timings.

Besides, i-synergy™ also collects data on lithium-ion battery, vacuum motor, brush deck motor, transaxle, and other electrical components at least once every minute when the machine is in use and even during battery charging.

i-synergy™ will send notifications instantly to the ICE server in case of any malfunction. ICE maintenance personnel will receive a SMS within minutes from the ICE server for immediate servicing.

## MACHINE SET UP & INSTALLATION

### UNCRATING MACHINE

Be sure and check packing carton for any damage. Immediately report any damage to carrier. Check the contents of package to ensure that the following items are included:

- Machine
- Lithium-ion Batteries
- Squeegee assembly
- 2-Pad Drivers

### INSTALLING BATTERIES

The machine uses the Lithium-ion batteries, the batteries are already in the machine upon delivery; However you will need to connect the Lithium ion batteries to the machine.

**⚠ WARNING: Fire or Explosion Hazard. Keep sparks and open flames away! Keep battery compartment open when charging.**

1. Turn off the machine.
2. Open recovery tank to gain access to battery compartment.
3. Carefully place the Lithium-ion batteries into the compartment. Place the battery brace at the rear of the batteries.

**DO NOT DROP BATTERIES INTO COMPARTMENT!**

4. Plug the batteries connector to the machine adaptor, connect machine i-synergy™ COM port with the batteries.

### MACHINE SET UP

#### PRE-OPERATION CHECKS

1. Sweep or dust mop the surface to be cleaned.
2. Check battery meter to make sure batteries are fully charged. (See BATTERY CHARGING)
3. Check that squeegee is properly installed.
4. Check that brushes / pads is properly installed.

#### INSTALLING BRUSHES OR PADS

1. Turn off the 1-Step scrub head up/down button (Panel components, item #12) and Raise the Scrub head off the floor, then stop machine on the level surface, ensure the machine is turned off.
2. If using the Pad Driver, first attach the appropriate pad to the pad driver surface.
3. Align the pad driver or brush under the motor hub and push it upward to engage.



4. To remove the pad driver or brush, raise the scrub head and push the pad release plunger (Machine components, item #30) downward.

#### MOUNTING THE SQUEEGEE ASSEMBLY

1. Lift the squeegee lift lever (Machine components, item #8) to the upward position.
2. Mount the squeegee assembly to the squeegee pivot bracket. make sure the knobs are completely seated into the slots before securing knobs.
3. Connect the vacuum hose to the squeegee assembly. Loop the hose by using the hose clip provided.
4. Check the squeegee blades for proper adjustment.


## PARTS LIST

### FILLING THE SOLUTION TANK


The machine is equipped with a hose fill-port (Machine components, item #7) at the rear of the machine, and a bucket fill-port (Machine components, item #26) located under the recovery tank. Before accessing the bucket fill-port make sure that the recovery tank is empty.

Fill the solution tank to the "100L" level on the solution tank sight gauge. When using the bucket fill-port, stop filling when the level reaches the bottom edge of the fill-port.

**NOTE:** When filling the solution tank with a bucket, make sure that the bucket is clean. Do not use the same bucket for filling and draining the machine.

 **WARNING:** Do not put any flammable materials into solution tank. this can cause an explosion or a fire. Only use recommended cleaning chemicals. Contact your janitorial supply distributor for recommendations on proper chemicals.

### MACHINE OPERATION

 **WARNING:** Do not operate machine unless you have read and understand this manual.

1. Swiping the ID card (Machine components, item #18) to turn on the machine.
2. Check the LED display screen (Panel components, item #4), if there are fault codes (Panel components, item #18) and the Fault indicator (Panel components, item #1) in blink, please DO NOT operate the machine unless the faults have been eliminated (please see *FAULT CODES AND ELIMINATE* section).
3. Turn on the 1-Step scrub head up/down button, the scrub head will be lowered down automatically.
4. Lower squeegee assembly to the floor by lowering the Squeegee lift lever.
5. Check the solution flow indicator (Panel components, item #9), press the Solution flow adjusting button (Panel components, item #10) to get a desired solution flow.


**NOTE:** Solution will not begin to flow until the control handle bail is pulled.

6. Turn on the Vacuum motor switch (Panel components, item #8).
7. Pull the Control handle bail (machine components, item #17) backwards to start scrubbing. The machine will automatically propel forward. To reverse the machine, simply push the control handle bail forward.  
**NOTE:** Raise squeegee when reversing machine.
8. The scrubbing speed can be adjusted, press the Speed increase/ decrease button (Panel components, item #14, #16) to a desired speed.  
**NOTE:** 45-60 meters (150-200 ft) per minute is the recommended scrubbing speed.
9. The brush pressure can be adjusted, press the Brush pressure increase/ decrease button (Panel components, item #3, #6) to get a desired brush pressure.
10. To stop scrubbing, release the control handle bail, turn off the 1-Step scrub head up/down button to raise the scrub head assembly, raise the squeegee assembly.


### WHILE OPERATING MACHINE

 **WARNING:** Fire Or Explosion Hazard. Do Not Pick Up Flammable Materials Or Reactive Metals.

1. Go slow on inclines and slippery surfaces. Do not operate the machine on inclines that exceed 5% (3°).
2. Do not keep the machine in the same position with pad / brush spinning, keep the machine moving to prevent damage to floor finish.
3. If the squeegee assembly leaves streaks on the floor, raise the squeegee off the floor and wipe the blades down with a damp cloth. Pre-sweep the area to prevent leaving streaks on the floor.
4. Pour a recommended defoamer into the recovery tank if excessive foam appears.

 **WARNING:** Do not allow foam to enter the float shut-off screen, vacuum motor damage will result. Foam will not activate the float shut-off screen.

5. Occasionally check the battery meter (Panel components, item #2). when the battery is very low, stop scrubbing and recharge the batteries.

 **WARNING:** When battery meter is in the red, do not continue to operate the machine. Battery damage may result.



6. When the solution tank runs empty, press the 1-Step switch raise the brush head. Keep the squeegee down and continue to vacuum until all the dirty water is picked up.

**NOTE:** *Brush motors will not work when the scrub head assembly raised.*

**NOTE:** See **TANK DRAINING** section to learn how to drain recovery and solution tanks.

### **CIRCUIT BREAKER / FUSES**

The machine is equipped with 2 resettable circuit breakers(machine components, item #5, item# 6) to protect the main controller from damage. If the circuit breakers should trip, it can't be reset immediately. You must first determine what caused the breaker to trip, and allow the motor to cool down and then you can manually reset the circuit breakers.

The machine is also equipped with a 150A fuse to protect the Lithium-ion batteries from damage. When replacing a fuse never substitute a higher Amps rated fuse than specified.

### **HOURLY METER**

The hour meter (Panel machine components, item #17) records the number of total hours the brush motor has been powered on. Use the hour meter to determine when to perform recommended maintenance procedures and to record service history.

### **EMERGENCY STOP BUTTON/ BRAKE**

The machine is equipped with an Electromagnetic Brake Mechanism on the Transaxle. When in case of Emergency, release the Control Handle bail or strike the Emergency stop button (Machine components, item #4), the machine will be braked and then stop. Reset the emergency stop button, turn on the machine, and then pull the control handle bail, the machine will be restart.

**NOTE:** *The machine can not be moved unless the Main Power and the Control Handle bail be turned on.*



**WARNING: Do Not Change the Default Settings of the Electromagnetic Brake Mechanism unless Authorized, otherwise it may cause Machine Damage or Personal Injury. Contact the Authorized Service center for machine repairs.**

## **TANK DRAINING**

1. Turn the machine off.
2. With the squeegee and scrub head in their "up" position, transport machine to approved area for draining tank(s).

### **DRAINING THE RECOVERY TANK**

Any time scrubbing is completed, or when refilling solution tank, the recovery tank should be drained and cleaned.



**WARNING: If the recovery tank is not drained when the solution tank has been refilled, foam or water may enter the float shut-off screen and cause damage to the vacuum motor.**

1. While holding the drain hose (Machine components, item #3) upward, remove the cap and lower hose to drain.
2. Open the recovery tank cover and rinse out the tank. Use a rag to remove any excess dirt.
3. Clean the float shut-off screen and debris tray located in the recovery tank .

### **DRAINING THE SOLUTION TANK**

Any time scrubbing operation is completed, the solution tank should be drained and cleaned.

1. Pull the solution tank level hose(Machine components, item #12) off the hose fitting, this will allow the solution to flow freely into a bucket or floor drain.
2. Remove the cover of the filter assembly (Machine components, item #10) to drain the solution tank, check the filter screen and clean up it if necessary.
3. Rinse the solution tank with clean water after every use. This will help prevent chemical buildup and clogging of the solution lines.
4. After rinsing out the tank, securely reconnect the tank level hose to the hose fitting, replace the filter assembly cover and be sure the filter screen and the "O" ring is in the correct position.

## PARTS LIST

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### BATTERY CHARGING



**WARNING: Fire Or Explosion Hazard. Keep Sparks and Open Flame Away. Keep Battery Compartment Propped Open When Charging.**

**Only use ICE supplied or approved batteries charger, use unapproved charger may cause damage to the batteries and machine.**

*Batteries chargers specifications:*

- **Applicable to charging Lithium-ion batteries**
- **Automatic shut off circuit**
- **Output current of 30 Amps**
- **Output voltage of 24 volts**

1. Place machine in a well ventilated area.
2. Turn the machine off.
3. Connect the charger's AC power supply cord to a properly grounded receptable.
4. Prop up the recovery tank by the support stand (Machine components, item #20) for ventilation when charging.
5. The charger will automatically begin to charge and will automatically shut off once the batteries are fully charged.
6. Upon completion of charging, disconnect the AC power supply cord.

### PREVENTATIVE MAINTENANCE



**WARNING: Before performing any maintenance on the machine, be sure that the power is turned off, or the batteries are disconnected!**



**WARNING: Repairs are to be completed by Authorized service centers only. Any repairs completed by unauthorized persons will void the warrenty.**

#### DAILY MAINTENANCE

1. Remove pad driver/ brush and clean with approved cleaner.
2. Drain recovery and solution tanks completely and rinse out with clean water. Visually check the recovery tank for debris and clean out as necessary.

3. Raise the squeegee assembly off floor and wipe it down with a damp towel. Be sure to store the squeegee in the up position.
4. Remove the float shut-off assembly and rinse it out with clean water.
5. Clean machine with an approved cleaner and a damp towel.
6. Recharge the batteries.
7. Check the condition of the squeegee blade wiping edge, rotate blade if worn.

#### MONTHLY MAINTENANCE

1. Clean the battery tops to prevent corrosion.
2. Check for loose battery cable connections.
3. Inspect and clean the recovery tank cover seal. Replce it if damaged.
4. Lubricate all grease points and pivot points with silicon spray and approved grease.
5. Check the machine for loose nuts and bolts.
6. Check the machine for leaks.

#### MACHINE STORAGE

1. Always store the machine indoors.
2. Always store the machine in a dry area.
3. Always store the machine in its upright position.
4. Always store the machine with the pad driver/ brush raised off the floor.
5. Always store the machine with the squeegee assembly raised off the floor.
6. If storing in an area which may reach freezing temperatures, be sure to drain all fluids from the machine prior to storage. Any damage caused by freezing temperatures will not be covered by the warranty.
7. Drain the recovery tank.
8. Drain the solution tank of all fluid.

## PARTS LIST

### FAULT CODE & SOLUTION

The machine is equipped with a LED display screen (Panel components, item # 4), the LED screen will display the operating hours (Panel components, item # 17) and the battery level status (see Panel components, item # 2).

When the machine detects a fault, there will be a Fault code (Panel components, item #18) & Fault message (Panel components, item #11) display on the LED screen, and the Fault indicator (Panel components, item #1) will flash continuously, accompany an audible alarm Occasionally.

Once fault occurring, please DO NOT continue operate the machine unless the fault are eliminated. Turn off the machine, then to solve the fault, the fault code & message will be eliminated when machine restart.

If the fault is occurred frequently, or the fault can't be eliminated, please contact ICE service center.

Please refer to the below table to determine the fault cause and the solution.

FAULT CODE	FAULT MESSAGE	FAULT CAUSE	SOLUTION
F03	Bru Actt O.L. RESTART!	Scrub head lifting actuator is overload	Turn off the machine,after a moment, RE-START machine.
F04	Vac Mtr O.L. RE-START!	Vacuum motor overload	
F05	Left Bru Mtr O.L. RE-START!	Left brush motor is overload	
F06	Right Bru Mtr O.L. RE-START!	Right brush motor is overload	
F07	Propel Mtr O.L. RE-START!	Propel motor overload	
F08	RecTank Full	Recovery tank is full	Drain the Recovery tank
F10	Batt Low Charge Batt	Battery is low	Charge the battery
F11	Batt Empty Charge Batt NOW	Battery is empty	Charge the battery NOW
F12	Brake Wiring Error	Bad Brake wiring	Check the brake wiring
F14	Replace Brake Assy	Bad Brake assembly	Replace the brake assembly
F16	Control Unit Overheat! Wait	Control Unit Overheat	Turn off the machine,after a moment, RE-START machine
F17	Replace Control Unit	Control Unit Fault	Replace the control unit
F20	Check Left Brush motor	Bad left brush motor	Check left brush motor/ wiring
F21	Check Vac Mtr	Bad Vacuum motor or wiring	Check the vacuum motor / Wiring
F22	Check Soln Solenoid	Solution solenoid wiring fault	Check the wiring & Contactors
F23	Replace Soln solenoid	Bad Solution solenoid	Replace the solution solenoid
F24	Check Propel Motor	Bad propel motor	Check the propel motor / Wiring
F25	Check Right Brush motor	Bad right brush motor	Check right brush motor/ wiring
F40	Check Proximity Sw	Proximity switch fault	Check the Proximity switch
F41	Release Handle	Operation mistake	Release the control handle bail
F42	Replace Control Unit	Bad Control Unit	Replace the control unit
F43	Turn Dead Sw Off RE-START!	Emergency stop button activated	Release emergency stop button and restart machine
F44	Replace Control Unit	Bad Control Unit	Contact service center, Replace the Control Unit
F45	Return Control Unit		
F46	Return Control Unit		
F47	Return Control Unit		
F48	Return Control Unit		

**BASIC TROUBLESHOOTING**

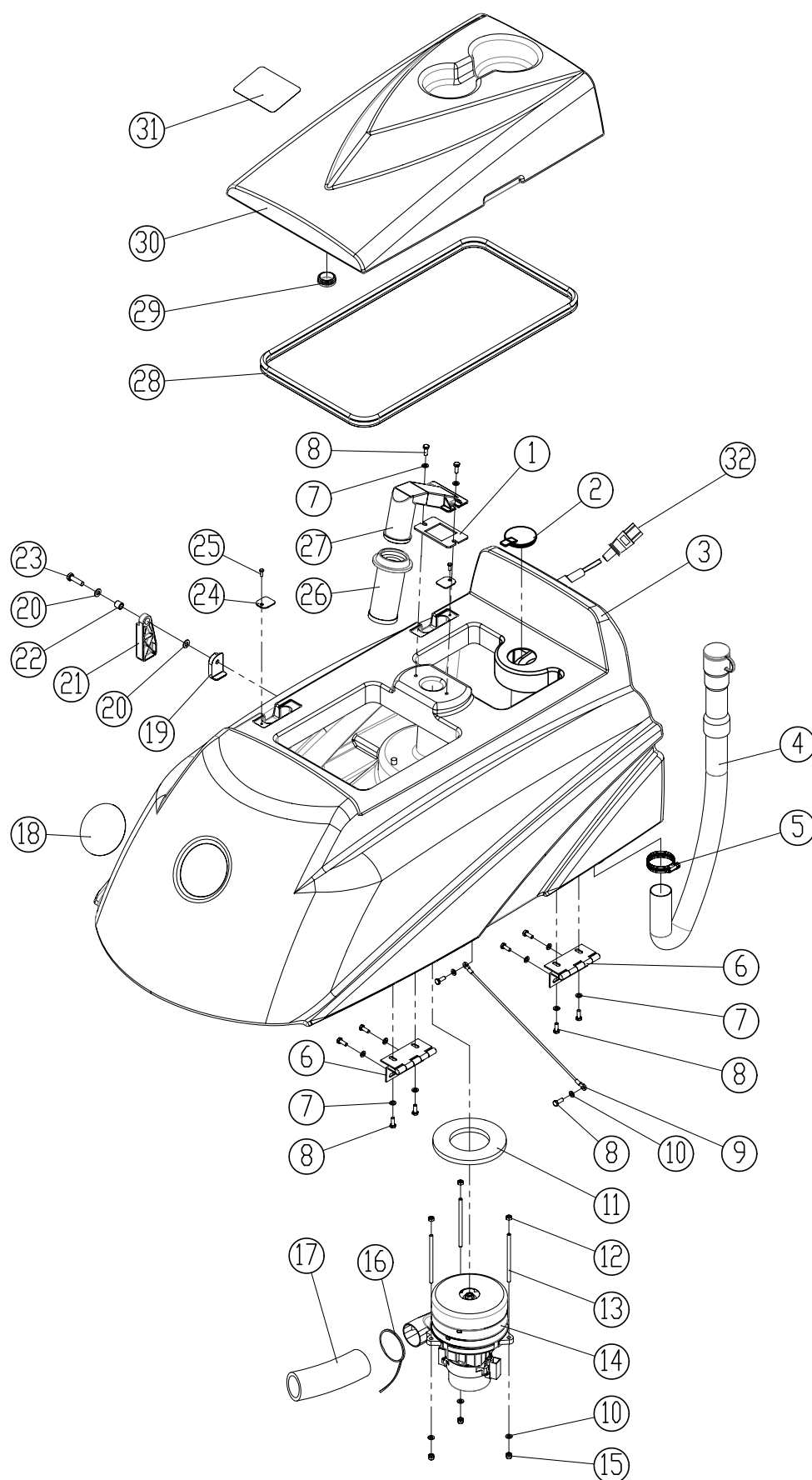
PROBLEM	CAUSE	SOLUTION
Machine will not operate	Control handle bail not pulled	Pull control handle bail
	Batteries need to be charged	Charge batteries
	Bad lithium-ion batteries	Replace batteries
	Emergency stop button activated	Reset Emergency stop button
	Main PCB fuse blown	Contact ICE service center
	Faulty i-synergy™ module	Contact ICE service center
Brush motor will not operate	1-STEP scrub head up/down switch is off	Turn on the 1-STEP switch
	Battery meter lockout activated	Recharge batteries
	Faulty control handle bail switch	Contact ICE service center
	Faulty brush motor or wiring	Contact ICE service center
	Worn Motor carbon brushes	Contact ICE service center
Machine does not propel	the Control handle bail not pulled	Pull the control handle bail
	Faulty transaxle motor or wiring	Contact ICE service center
	Worn Motor carbon brushes	Contact ICE service center
Vacuum motor will not operate	Faulty vacuum motor or wiring	Contact ICE service center
	Worn Motor carbon brushes	Contact ICE service center
Little or no solution flow	Ball valve set too low or shut off	Turn on the ball valve
	Solution flow control knob set too low or shut off	Adjust solution control flow knob
	Clogged solution tank filter or solution hose	Clean solution tank filter or flush out solution hose
	Clogged solution Solenoid valve	Remove valve and clean
Poor water pick up	Recovery tank is full	Drain recovery tank
	Loose drain hose cap	Tighten cap
	Clogged float shut-off screen located in recovery tank	clean screen
	Clogged squeegee assembly	Clean squeegee assembly
	Worn squeegee blades	Replace or rotate squeegee blades
	Incorrect squeegee blade deflection	Adjust squeegee blade height
	Loose vacuum hose connections	Secure hose connections
	Clogged vacuum hose	Remove clogged debris
	Damaged vacuum hose	Replace vacuum hose
	Recovery tank cover not in place	Properly position cover
	Damaged recovery tank cover seal	Replace seal
	Faulty vacuum motor	Contact ICE service center
	Low battery charge	Recharge batteries
Short run time	Low battery charge	Fully recharge batteries
	Defective batteries	Replace batteries
	Batteries need maintenance	See BATTERY MAINTENANCE
	Faulty battery charger	Repair or replace battery charger
	Down pressure lever is set for extra scrub head pressure	Lower down pressure lever

## PARTS LIST

### TECHNICAL SPECIFICATIONS

MODEL	i28BTL+-CY	i28BTL+	i32BTL+
DIMENSIONS - L	61.02 in / 1,550 mm		62.21 in / 1,580 mm
DIMENSIONS - W	30.51 in / 775 mm		34.06 in / 865 mm
DIMENSIONS - H	44.49 in / 1,130 mm		44.49 in / 1,130 mm
WEIGHT	352.74 lbs / 160 Kg		374.79 lbs / 170 Kg
WEIGHT WITH BATTERIES	661.39 lbs / 300 Kg		683.43 lbs / 310 Kg
SOLUTION TANK CAPACITY	26.42 Gal / 100 L		
RECOVERY TANK CAPACITY	31.7 Gal / 120 L		
SQUEEGEE WIDTH	Standard: 40.5 in / 1,030 mm Option: 44.5 in / 1,130 mm		Standard: 46.5 in/1,185 mm Option: 44.5 in / 1,130 mm
CLEANING PATH WIDTH	28 in / 700 mm		32 in / 800 mm
PRODUCTIVITY RATE	30,667 ft <sup>2</sup> / 2,850 m <sup>2</sup> h		34,983 ft <sup>2</sup> / 3,250 m <sup>2</sup> h
DRIVE SYSTEM	Transaxle, 24VDC, 0.27 hp / 200 W		
TRAVEL SPEED, MAXIMUM	Cleaning: 65 m/Min      Transporting: 72 m/Min 213.25 ft/min      236.22 ft/Min		
MINIMUM AISLE TURN	63 in / 1600 mm		
PAD/BRUSH PRESSURE	0 ~ 79.37 lbs 0 ~ 36 kg	39.68 lbs / 18 kg 79.37 lbs / 36 kg 119.05 lbs / 54 kg	
SOLUTION FLOW RATE	0 ~ 0.66 Gal / Min 0 ~ 2.5 L/Min		
BRUSH / CYLINDRICAL MOTORS	0.75 hp / 560W × 2, 750 RPM	0.75 hp / 550W × 2, 210 RPM	
BRUSH / CYLINDRICAL DIMENSIONS (x2)	Dia: 150 mm / 6 in Length: 700 mm / 28 in	Diameter: 355.6 mm / 14 in	Diameter: 406.4 mm / 16 in
VACUUM MOTOR	0.8 hp / 600 W		
WATER LIFT - AIR FLOW	65 in / 1650 mm		
BATTERIES	Lithium-ion Batteries, 240 AH		
RUN TIME PER CHARGE	3.5~4 Hours		
VOLTAGE DC	24 V		
DECIBEL RATING AT OPERATOR'S EAR, INDOORS	68 dB(A)		
GRADE LEVEL, MAX	5% (3°)		

## RECOVERY TANK GROUP

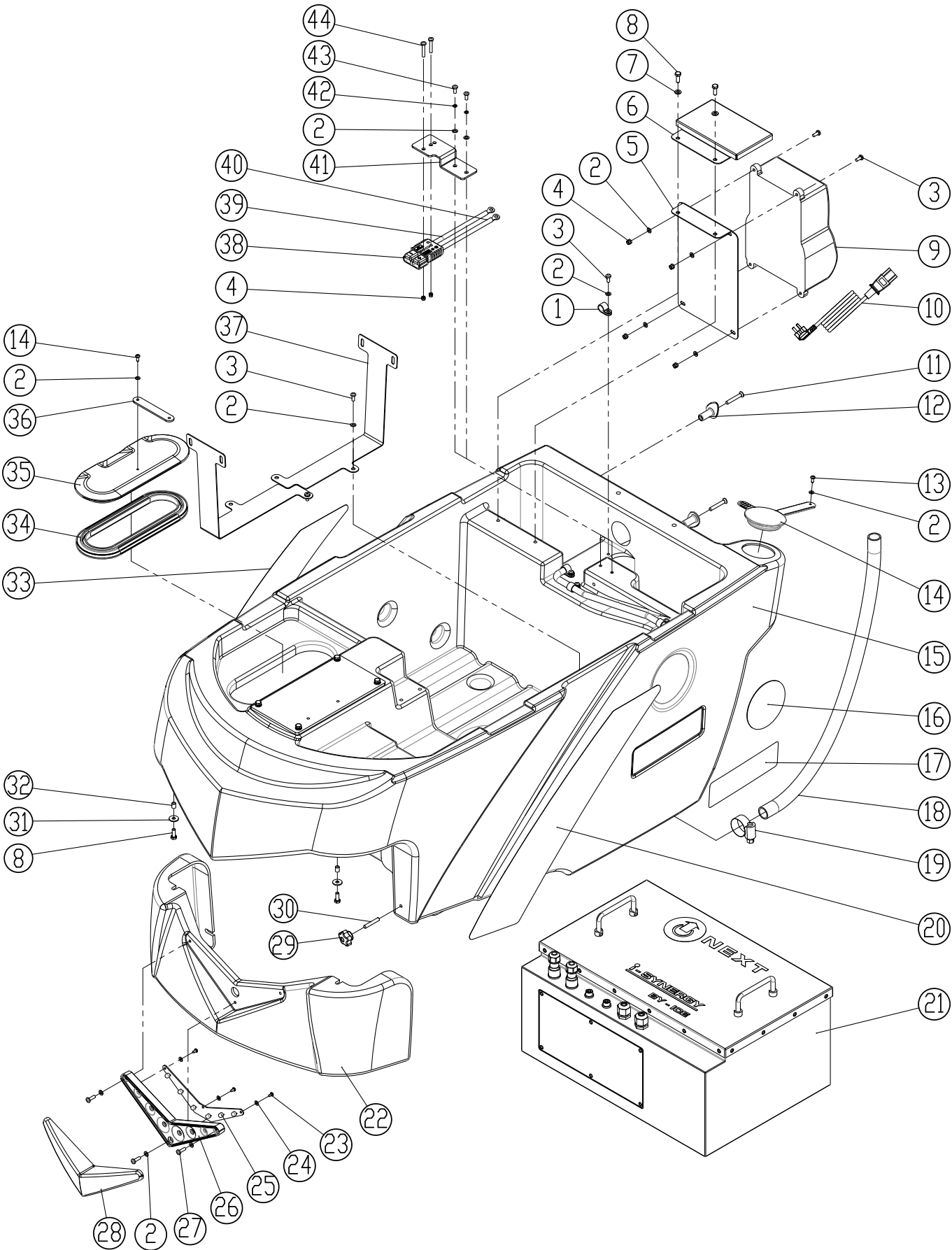




**RECOVERY TANK GROUP**

<b>DIA NO.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>NO REQ'D</b>
1	8111001	GASKET	1
2	8131003	CAP	1
3	8210102	RECOVERY TANK	1
4	8131010	DRAIN HOSE	1
5	1962050	CLAMP	1
6	8111300	HINGE ASSEMBLY	2
7	1421618	FLAT WASHER M6×18×1.6	10
8	1021616	HEX BOLT M6 X 16	12
9	8210207	CABLE	1
10	1421612	FLAT WASHER M6×12×1.6	5
11	8112005	GASKET, VACUUM MOTOR	1
12	1121605	HEX NUT M6	3
13	8210209	STUD M6×110	3
14	8210260	AMETEK VACUUM MOTOR 24VDC, KIT	1
	8132006	CARBON BRUSH, VACUUM MOTOR	2
15	1123608	LOCK NUT M6	3
16	1914300	TIE, NYLON, 5X300	1
17	8132007	MUFFLER, VACUUM MOTOR	1
18	4010316	ICE LOGO	1
19	8111008	BRACKET	1
20	1421816	FLAT WASHER M8×16×1.6	2
21	8111007	RECOVERY TANK SUPPORT	1
22	8115404	SLEEVE, P/M	1
23	1021830	HEX BOLT M8×30	1
24	8111016	PLATE	2
25	1221512	SCREW M5×12	2
26	8111015	FLOAT, SHUT-OFF	1
27	8111014	FLOAT ADAPTER	1
28	8210201	RECOVERY TANK COVER SEAL	1
29	8011005	CAP	1
30	8210103	RECOVERY TANK COVER	1
31	8111022	WARNING LABEL	1
32	8310238	SENSOR, SOLUTION LEVEL	1

SOLUTION TANK GROUP



**SOLUTION TANK GROUP**

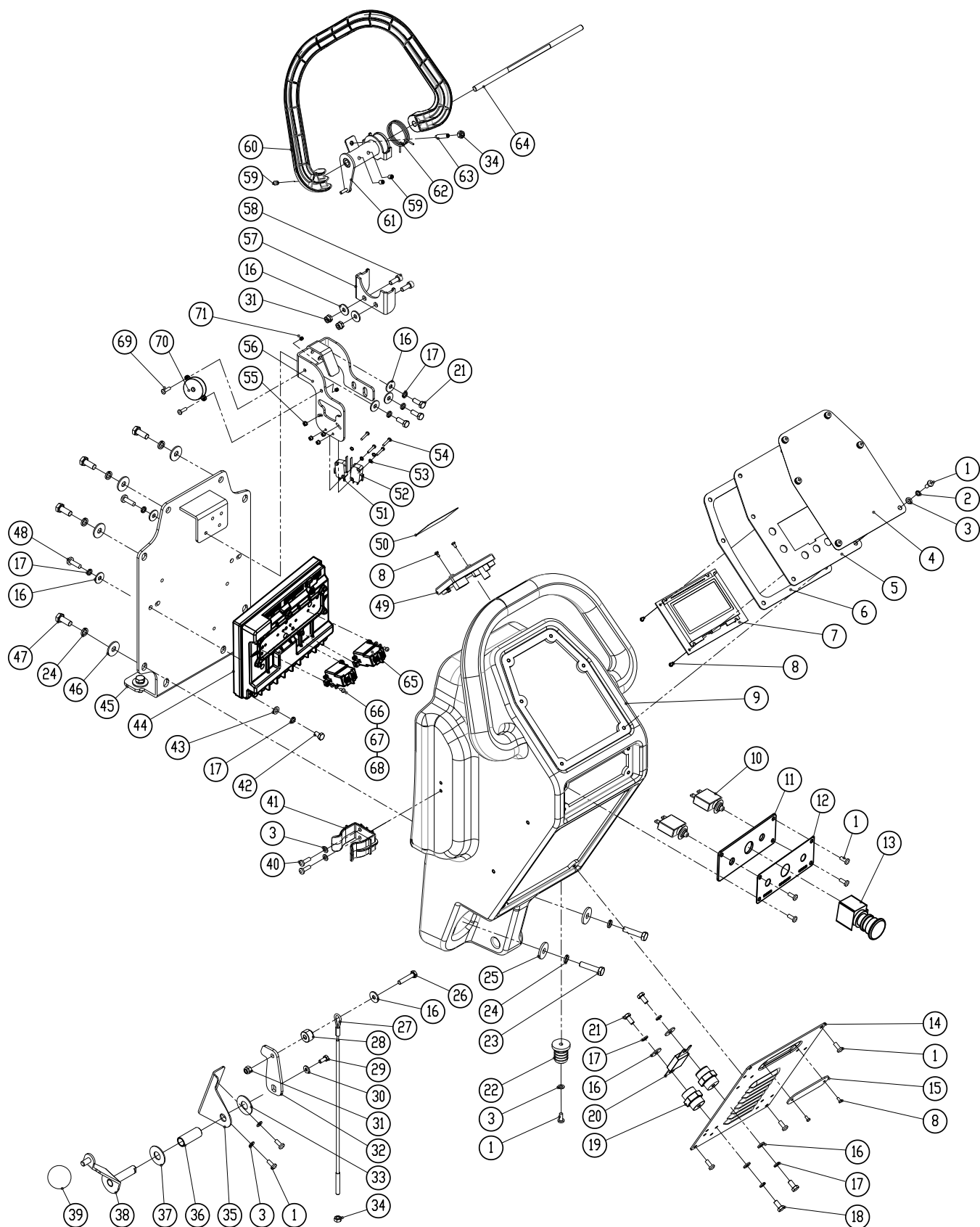
<b>DIA NO.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>NO REQ'D</b>
1	6210131	NYLON, CLAMP	12
2	1421510	FLAT WASHER M5x10x1	32
3	1221512	SCREW M5x12	24
4	1123507	LOCK NUT M5	6
5	8210111	BRACKET, BATTERY CHARGER MNTG	1
6	8210117	CAP, CHARGER	1
7	1421612	FLAT WASHER M6x12x1.6	12
8	1021616	HEX BOLT M6 X 16	10
9	8311720	ON BOARD LI-ION BATTERY CHARGER	1
10	8112030	POWER CORD, BATTERY CHARGER, US	1
11	1222641	SCREW M6 X 40	2
12	8210112	HOOK, CORD	2
13	1321213	SELF-TAPPING SCREW ST4.2X13	2
14	8210113	CAP, SOLUTION FILL	1
15	8210101	SOLUTION TANK	1
16	4010316	ICE LOGO	2
17	8130099	I-SYNERGY LOGO	2
18	8210145	CLEAN TUBING	1
19	1962025	CLAMP 16-25mm	1
20	8210151	LABEL, LEFT SIDE	1
21	N240570	LITHIUM-ION BATTERY, 240AH	1
22	8210104	COVER, FRONT	1
23	1321110	SELF-TAPPING SCREW ST3.5 x10	3
24	1421409	FLAT WASHER M4x9x0.8	5
25	8133610	LED LIGHT KIT	1
26	8133601	LED LIGHT MNTG BASE	1
27	1221520	SCREW M5X20	3
28	8133602	LED LIGHT COVER	1
29	8210531	KNOB, M6	2
30	1535630	SET SCREW M6 x30	2

## PARTS LIST

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### SOLUTION TANK GROUP

DIA NO.	PART NUMBER	DESCRIPTION	NO REQ'D
31	1421618	PLAIN WASHER 6×18×1.6,SS	4
32	8113112	BUSHING	2
33	8210152	LABEL, RIGHT SIDE	1
34	8113030	SEAL	1
35	8113002	COVER	1
36	8113007	STRAP	1
37	8210168	PLATE	2
38	8210163	CONNECTOR HOUSING	1
39	8210723	BATTERY CONNECT CABLE, RED	1
40	8210724	BATTERY CONNECT CABLE, BLACK	1
41	8210164	BRACKET, CONNECTOR	1
42	1422515	SPRING WASHER,M5	2
43	1021512	HEX HEAD SCREW, M5X12	2
44	1221525	PAN HEAD SCREW, M5X25	2

**CONTROL CONSOLE GROUP**

## PARTS LIST

### CONTROL CONSOLE GROUP

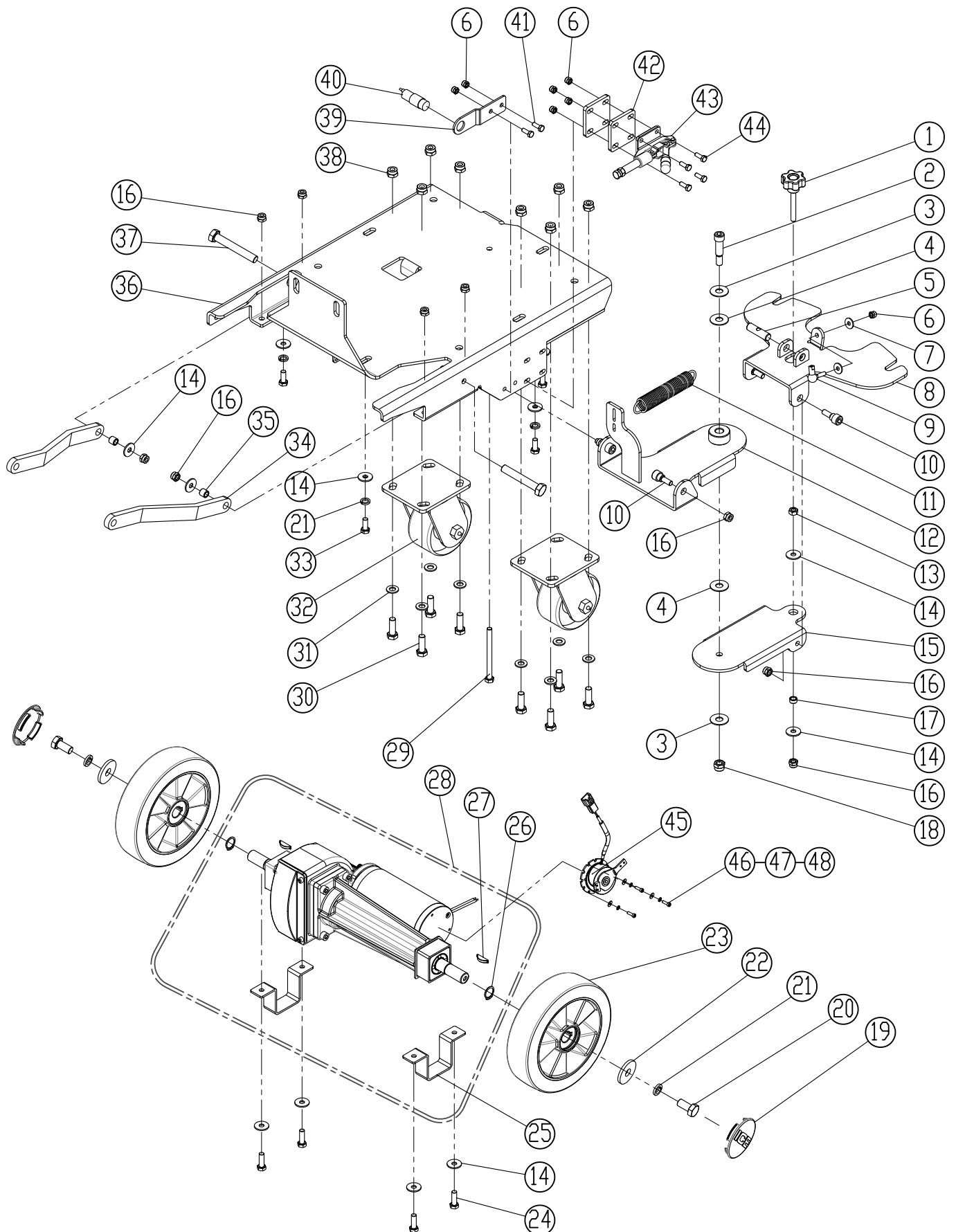
DIA NO.	PART NUMBER	DESCRIPTION	NO REQ'D
1	1221512	SCREW M5x12	17
2	1422513	LOCK WASHER M5	6
3	1421510	FLAT WASHER M5x10x1.0	13
4	8210535	CONTROL PANEL DECAL, i28BTL+	1
	8210536	CONTROL PANEL DECAL, i32BTL+	1
5	8210481	CONTROL PANEL	1
6	8134015	GASKET	1
7	8134905	5" ANDROID LCD SCREEN	1
8	1221306	SCREW M3x6	6
9	8134005B	CONTROL HOUSING,i32BTL	1
10	8310740	CIRCUIT BREAKER, 5A	2
11	8134008	PLATE, EMERGENCY STOP MNTG	1
12	8144029	DECAL, EMERGENCY STOP	1
13	8310707	EMERGENCY STOP BUTTON	1
14	8134060	PLATE, ON BOARD BATTERY CHARGER	1
15	8134061	CLEAR COVER	1
16	1421618	PLAIN WASHER M6x $\phi$ 18x1.6,SS	12
17	1422616	LOCK WASHER, M6	20
18	1021616	HEX BOLT M6 X 10	2
19	8114705	STAND-OFF, M6	2
20	8310480	FUSE,150A	1
21	1021616	HEX BOLT M6 X 16	5
22	8114005	CONNECTOR	1
23	1021840	HEX BOLT M8x40	2
24	1422821	LOCK WASHER M8	12
25	1421828	FLAT WASHER M8x $\phi$ 28x3	2
26	1021630	HEX HEAD BOLT M6x30,SS	1
27	8210475	CABLE, SQGE LIFT	1
28	8014101	LIFTING ROPE SPACER	1
29	1021512	HEX HEAD BOLT M5x12,SS	2
30	1421515	FLAT WASHER M5x15x1.0	1
31	1123608	LOCK NUT M6	3
32	8014012	BAFFLE	1



**CONTROL CONSOLE GROUP**

<b>DIA NO.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>NO REQ'D</b>
33	8113111	NYLON FLAT WASHER $\phi 12.9 \times \phi 25.4 \times 0.8$	1
34	1121605	HEX NUT M6	2
35	8134501	BRACKET	1
36	8134508	SLEEVE	1
37	1421132	FLAT WASHER 12x32x1.5	1
38	8134080	SQUEEGEE LIFTING HANDLE	1
39	8113104	BALL KNOB M8	1
40	1221515	PH SCREW M5x15,SS	2
41	6210111	CLAMP, DRAIN HOSE	1
42	1023612	HEX BOLT M6 X 12, COPPER	10
43	1423612	FLAT WASHER M6x $\phi 12 \times 1$ , COPPER	10
44	8210550	MAIN CONTROLLER FOR i28BTL+/i32BTL+	1
45	8134070	REAR PLATE, CONTROL CONSOLE	1
46	1421824	FLAT WASHER M8x $\phi 24 \times 2$	10
47	1021820	HEX BOLT M8x20	10
48	1221620	PH SCREW M6x20	2
49	8134768	RFID BOARD	1
50	8134035	LABEL, i-SYNERGY™ CARD SCANNING	1
51	8114712	MICRO SWITCH	1
52	8124743	MICRO SWITCH	1
53	1434300	LOCK WASHER, TOOTH, M3	4
54	1021320	SCREW M3 X 20	4
55	1123305	LOCK NUT M3	4
56	8134022	BRACKET, SWITCH	1
57	8114402	BRACKET, SPRING	1
58	1521616	SCREW M6X16, HEX SCOKET	2
59	1534608	SET SCREW M6 x8	4
60	8134300	LEVER, BAIL	1
61	8114300	ACTUATOR	1
62	8114306	SPRING	1
63	1535630	SET SCREW M6 x30	1
64	8114101	SHAFT	1
65	8313420	RELAY, 24VDC, 120A	2
66	1221412	SCREW, HEX HEAD, M4X12	4
67	1411409	WASHER , PLAIN , M4X9X0.8	4
68	1422411	LOCK WASHER M4	4
69	8310708	HORN, 24VDC	1
70	1221312	SCREW, HEX HEAD, M3X12	2
71	1111302	NUT , M3	2

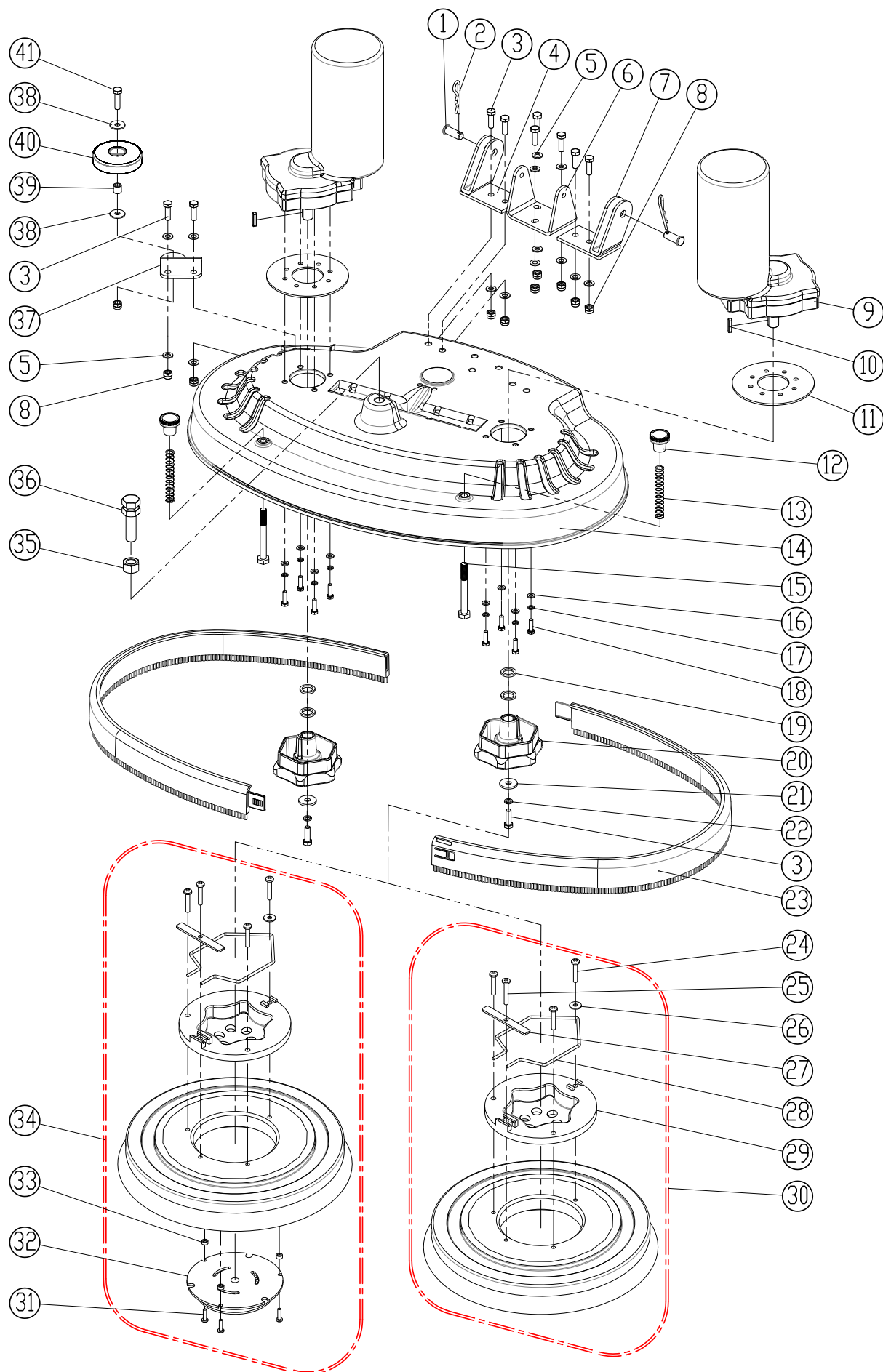
**FRAME & TRANSAXLE GROUP**



**FRAME & TRANSAXLE GROUP**

<b>DIA NO.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>NO REQ'D</b>
1	8211507	KNOB M8 x60	1
2	8211505	SHOULDER SCREW,M12	1
3	1421132	FLAT WASHER 12x32x1.5	2
4	8135001	PLASTIC THRUST WASHER M12x $\phi$ 30x1.5	2
5	8211506	SHAFT	1
6	1123608	LOCK NUT M6	7
7	1421618	FLAT WASHER M6x18x1.6	2
8	8211503	BRACKET, SQUEEGEE	1
9	8114511	BALL JOINT M6	1
10	8211504	SHOULDER SCREW,M8	4
11	8210508	SPIRNG	1
12	8211501	BRACKET, SQGE LIFT	1
13	1121807	NUT, M8	2
14	1421824	FLAT WASHER M8x24x2	12
15	8211502	BRACKET,SQGE SWING	1
16	1123810	LOCK NUT M8	11
17	8211508	BUSHING	1
18	1123115	LOCK NUT M12	1
19	8115203	COVER, WHEEL	2
20	1021816	HEX BOLT M8 x 16	2
21	1422821	LOCK WASHER M8	7
22	1421828	FLAT WASHER M8x28x2	2
23	8225210	FOAM FILLED WHEEL, 8INCH, KIT	2
	8225200	AIR FILLED WHEEL, 8 INCH, KIT (OPTION)	2
	8125212	WHEEL, ANTI-SKID,8 INCH,KIT(OPTION)	2
24	1021825	HEX BOLT M8 x 25	4
25	8210123	BRACKET, TRANSAXLE MNTG	2
26	1436019	RETAINING RING 19	2
27	8125403	WOODRUFF KEY	2
28	8210120A	TRANSAXLE, 24VDC	1
29	1022800	HEX BOLT M8 X 100	1
30	1021030	HEX BOLT M10 X 30	8
31	1421020	FLAT WASHER 10x20x2.0	8
32	8210109	4" CASTER	2
33	1021820	HEX BOLT M8x20	5
34	8210115	ARM, SCRUB HEAD LIFTING	2
35	8210116	BUSHING	2
36	8210130	FRAME	1
37	1021855	HEX BOLT M8 x 55	2
38	1123012	LOCK NUT M10	8
39	8210186	BRACKET, PROXIMITY SENSOR	1
40	8134709A	PROXIMITY SENSOR, KIT	1
41	1021616	HEX BOLT M6 x 16	2
42	8210138	SPACER (OPTION)	2
43	8210137	TOGGLE CLAMP, BRAKE (OPTION)	1
44	1021630	HEX BOLT M6 X 30	4
45	8210122	ELECTRONIC BRAKE KIT	1
46	1521512	SOCKET HEAD, M5 X 12	3
47	1421510	FLAT WASHER , M5x10x1	3
48	1422513	LOCK WASHER , M5	3

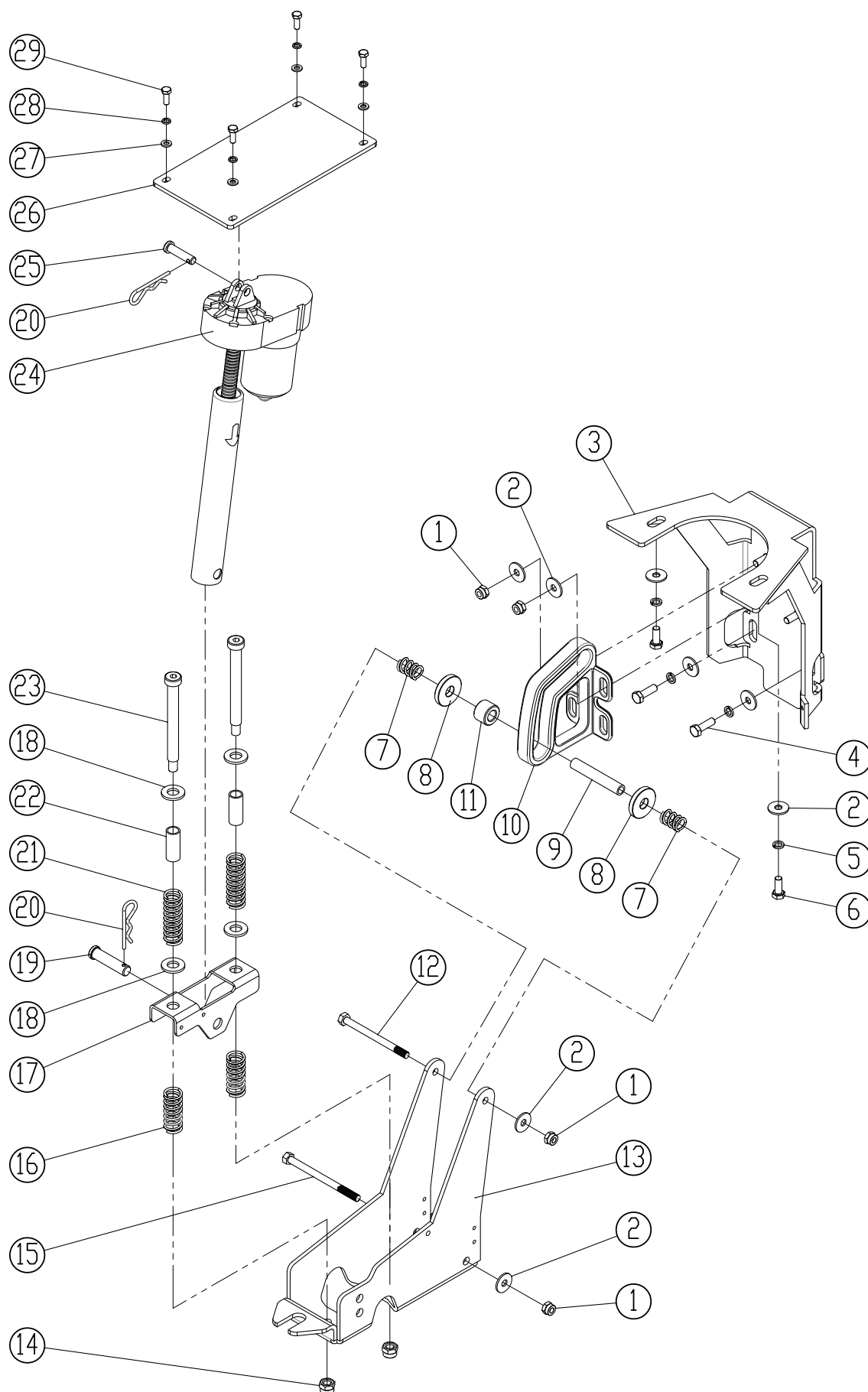
SCRUB HEAD GROUP



**SCRUB HEAD GROUP**

<b>DIA NO.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>NO REQ'D</b>
1	8210812	PIN	2
2	8210309	PIN, COTTER	2
3	1021825	HEX BOLT M8 x 25	11
4	8210831	BRACKET, SCRUB HEAD LIFT, RIGHT	1
5	1421816	FLAT WASHER M8x16x1.6	14
6	8210806	BRACKET, ACTUATOR MNTG	1
7	8210832	BRACKET, SCRUB HEAD LIFT, LEFT	1
8	1123810	LOCK NUT M8	10
9	8210899	BRUSH MOTOR, 24VDC, 550W, KIT	2
	8210850	CARBON BRUSH	2
10	1655025	KEY, 5X5X25	2
11	8210803	SPACER, RUBBER	2
12	8210808	KNOB, M10	2
13	8210809	SPRING	2
14	8220801	HOUSING, SCRUB HEAD, i28BTL	1
	8210801	HOUSING, SCRUB HEAD, i32BTL	1
15	1022090	HEX BOLT M10 x 90	2
16	1421612	FLAT WASHER M6x12x1.6	8
17	1422616	LOCK WASHER, M6	8
18	1021620	HEX BOLT M6 x 20	8
19	8210804	SPACER	4
20	8210805	HUB, BRUSH DRIVE	2
21	1421828	FLAT WASHER M8x28x3.0	2
22	1422821	LOCK WASHER M8	2
23	8220810	BUMPER, SCRUB HEAD, i28BTL	2
	8218050	BUMPER, SCRUB HEAD, i32BTL	2
24	1221635	SCREW, M6 x 35	12
25	1221640	SCREW, M6 x 40	4
26	1421618	FLAT WASHER M6x18x1.6	4
27	8210861	RETAINER BAR	4
28	8210862	SPRING, G-400S	4
29	9000004	CLUTCH, G-400S	4
30	9050014	BRUSH ASSEMBLY, 14 INCH, i28BTL (OPTION)	2
	9050016	BRUSH ASSEMBLY, 16 INCH, i32BTL (OPTION)	2
31	1321325	SELF-TAPPING SCREW, ST5 X 25	6
32	9000003	CENTER LOCK, #3	2
33	8116040	SPACER, 6.5x14.5x7.0	6
34	9040014	PAD DRIVER, 14INCH, i28BTL	2
	9040016	PAD DRIVER, 14INCH, i32BTL	2
35	1111215	HEX NUT, M16	1
36	8210811	ADJUSTMENT STUD, M16	1
37	8210810	BRACKET, ROLLER MNTG	1
38	1421824	FLAT WASHER M8x24x2	2
39	8115404	SLEEVE, P/M	1
40	8116009	PROTECTIVE WHEEL	1
41	1021830	HEX BOLT M8 x 30	1

# SCRUB HEAD LIFT GROUP

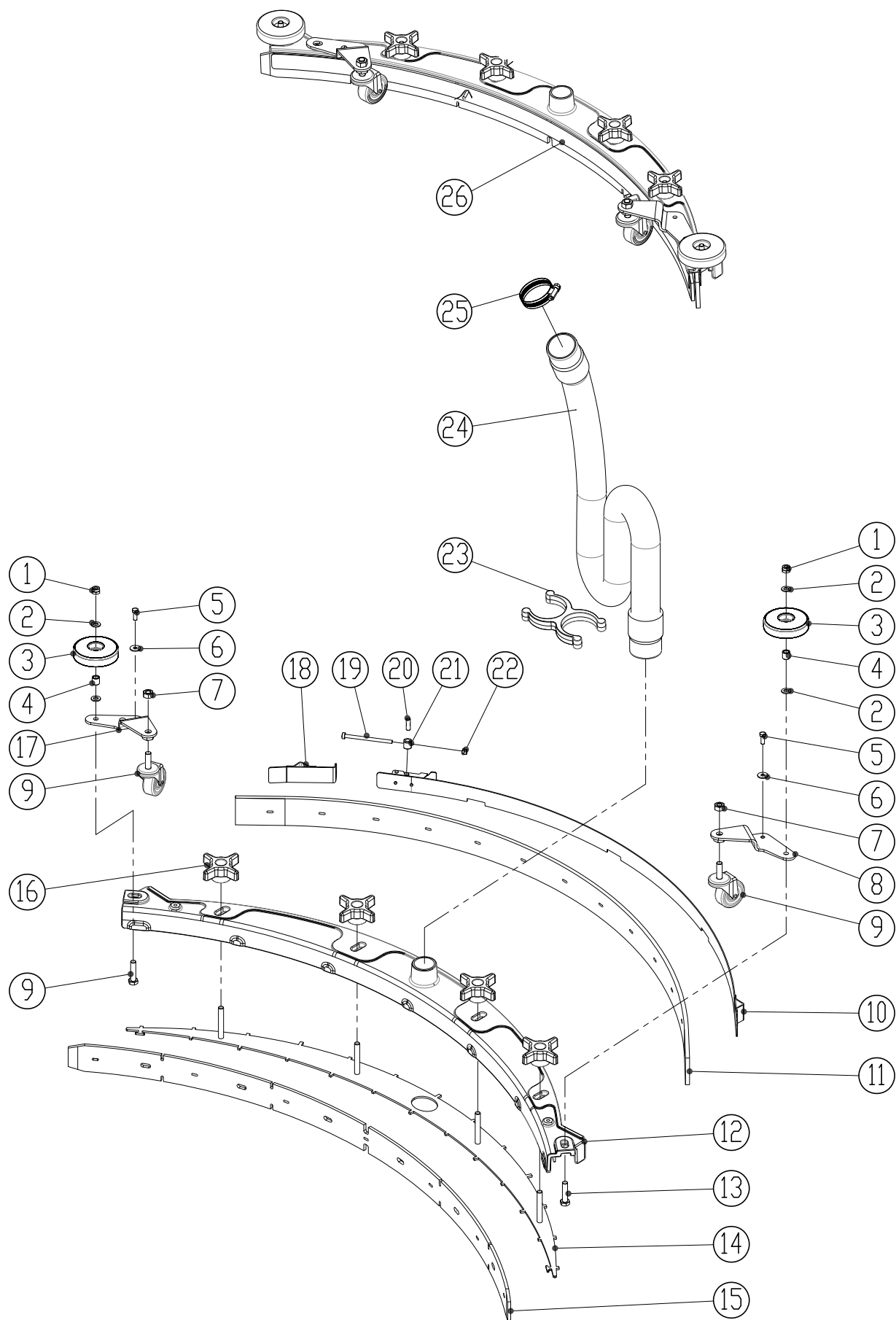




**SCRUB HEAD LIFT GROUP**

<b>DIA NO.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>NO REQ'D</b>
1	1123810	LOCK NUT M8	6
2	1421824	FLAT WASHER M8x24x2	10
3	8210306	BRACKET, GUIDE MNTG	1
4	1021825	HEX BOLT M8x25	2
5	1422821	LOCK WASHER M8	4
6	1021820	HEX BOLT M8x20	2
7	8210311	SPRING	2
8	8210312	WASHER, PM	2
9	8210314	BUSHING	1
10	8210310	GUIDE, ROLLER	1
11	8210313	ROLLER	1
12	1022800	HEX BOLT M8 X 100	1
13	8210316	BRACKET, SCRUB LIFT	1
14	1123008	LOCK NUT 3/8	2
15	1022811	HEX BOLT M8 X 110	1
16	8210319	SPRING	2
17	8210317	BRACKET, SPRING	1
18	1421132	FLAT WASHER 12x32x1.5	4
19	8210322	PIN	1
20	8210309	PIN, COTTER	2
21	8210318	SPRING	2
22	8210320	SLEEVE	2
23	8210321	BOLT, SHOULDER, 3/8	2
24	8210302	ACTUATOR, 24VDC	1
25	8210301	PIN	1
26	8210303	BRACKET, ACTUATOR MNTG	1
27	1421612	FLAT WASHER M6x12x1.6	4
28	1422616	LOCK WASHER M6	4
29	1021616	HEX BOLT M6 X 16	4

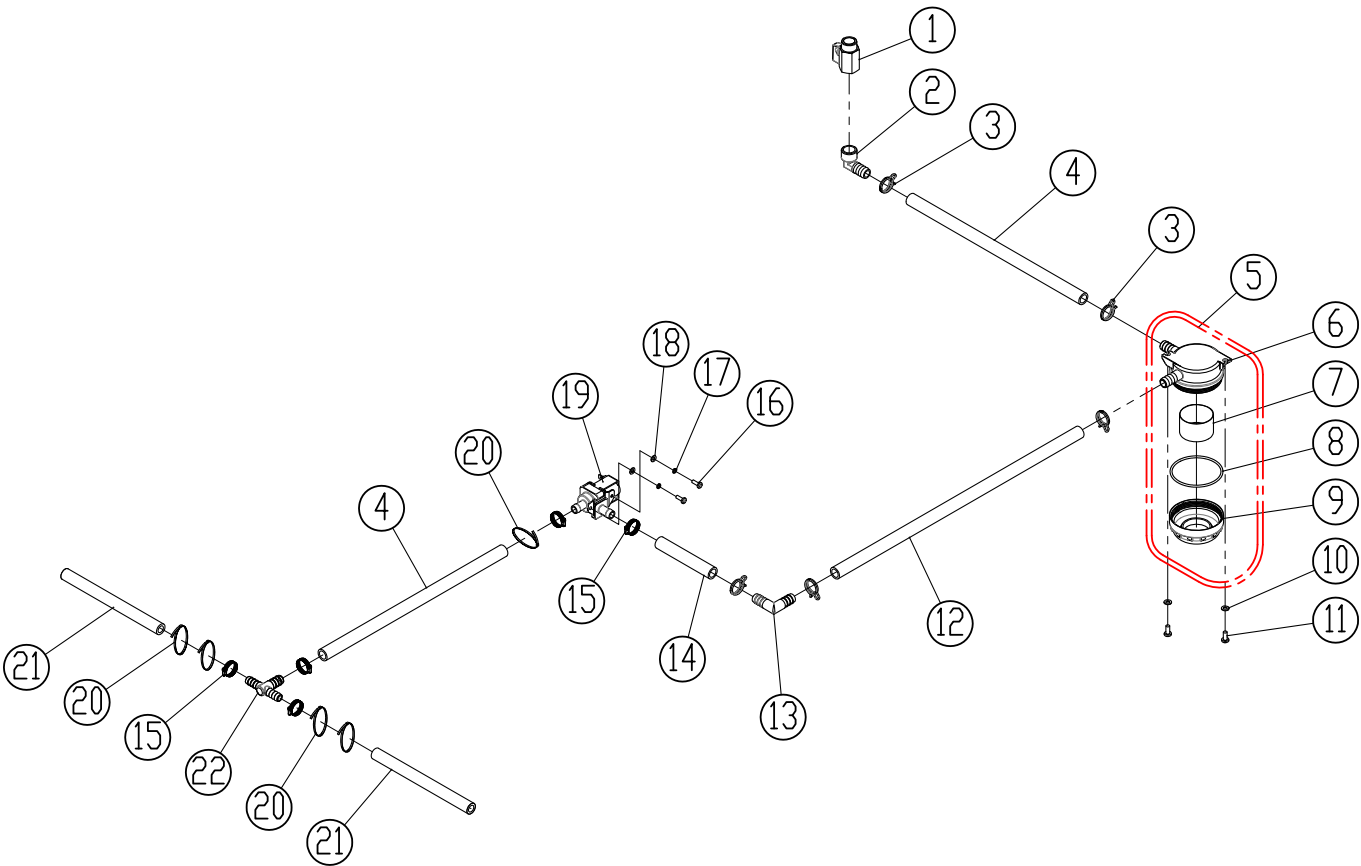
**SQUEEGEE GROUP, 40.5 INCH , i28BTL STANDARD**



**SQUEEGEE GROUP, 40.5 INCH , i28BTL STANDARD**

<b>DIA NO.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>NO REQ'D</b>
1	1123810	LOCK NUT M8	2
2	1421824	FLAT WASHER M8x $\phi$ 24x2.0	4
3	8116009	PROTECTIVE WHEEL	2
4	8115404	BEARING, JOURNAL	2
5	1021616	HEX BOLT M6x16	2
6	1421612	FLAT WASHER M6x $\phi$ 12x1.6	2
7	1121008	HEX NUT M10	2
8	8118300	RIGHT BRACKET	1
9	8310550	CASTER, 2 INCH	2
10	8310514	CLAMP ASSEMBLY	1
11	8310536	SQUEEGEE BLADE, REAR, LINATEX	1
	8310546	SQUEEGEE BLADE, REAR, PU (OPTION)	1
12	8310561	SQUEEGEE HOSING	1
13	1021835	BOLT, HEX HEAD, M8x35	2
14	8310512	RETAINER, SQUEEGEE	1
15	8310535	SQUEEGEE BLADE, FRONT, LINATEX	1
	8310545	SQUEEGEE BLADE, FRONT, PU (OPTION)	1
16	8210518	STAR KNOB M8	2
17	8118200	LEFT BRACKET	1
18	8210525	SHORT CLAMP ASSEMBLY	1
19	1221575	SCREW M5x75	1
20	8118624	SHAFT	1
21	8118623	SPACER	1
22	1123507	LOCK NUT M5	1
23	8118109	HOLDER VACUUM HOSE	1
24	8131030	VACUUM HOSE	1
25	1962050	CLAMP	1
26	8310570	SQUEEGEE ASSEMBLY FOR i28BTL, 40.5 INCH, STANDARD	1

SOLUTION GROUP



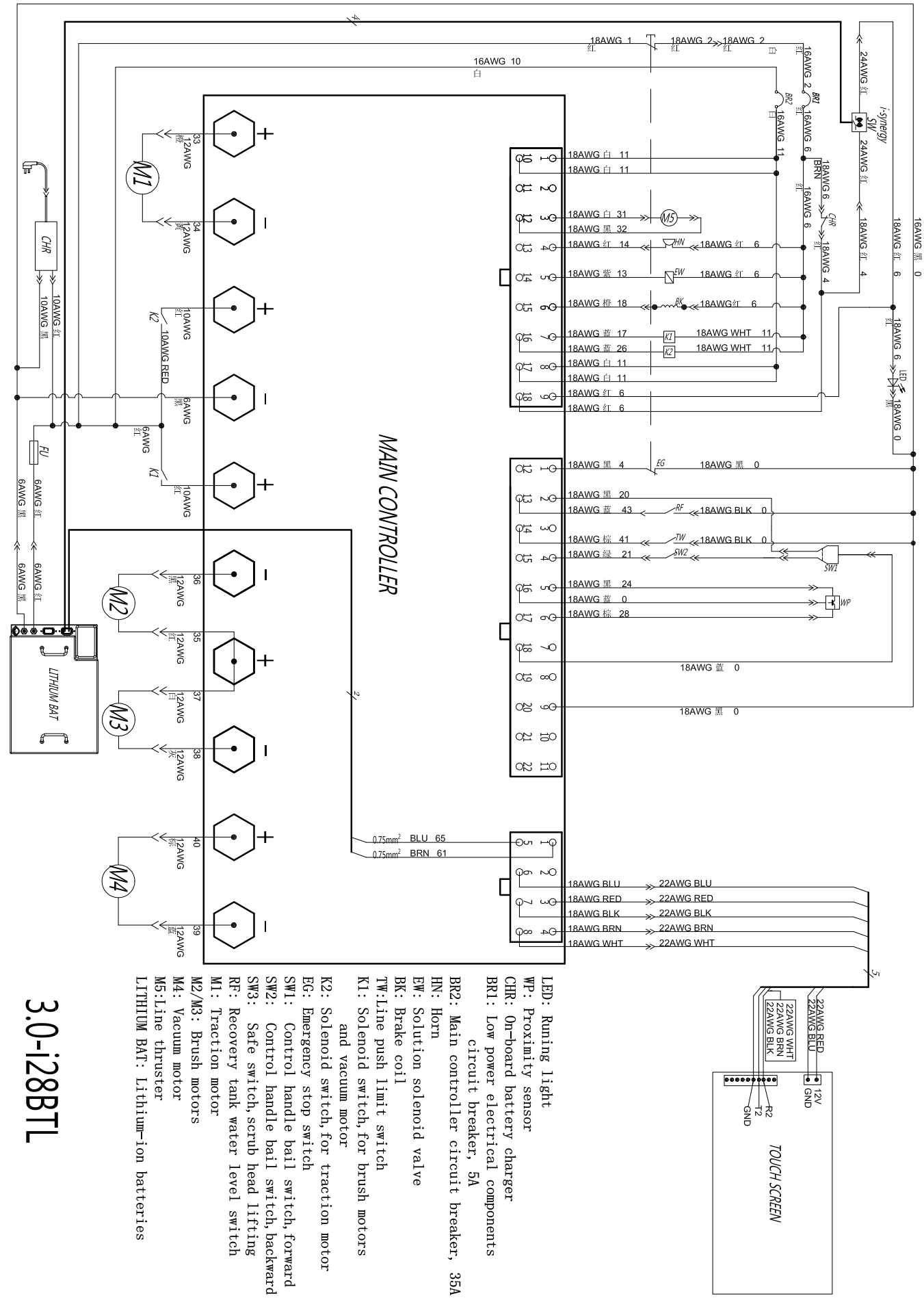
**SOLUTION GROUP**

<b>DIA NO.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>NO REQ'D</b>
1	8119005	BALL VALVE, G1/2	1
2	8119007	ELBOW G1/2	1
3	8119006	CLAMP	5
4	8210901	TUBING ID=12MM L=330MM	2
5	8119100	FILTER ASSEMBLY	1
6	8119101	BASE, FILTER ASSEMBLY	1
7	8119103	SCREEN, FILTER, 70 MESH	1
	8119105	SCREEN, FILTER, 40 MESH (OPTION)	1
8	1622063	O RING	1
9	8119102	CAP, FILTER ASSEMBLY	1
10	1421510	FLAT WASHER M5×10×1	2
11	1221512	SCREW M5×12	2
12	8210902	TUBING ID=12MM L=480MM	1
13	8119002	ELBOW, TUBING BARB	1
14	8210903	TUBING ID=12MM L=120MM	1
15	1962016	CLAMP, 10-16mm	5
16	1221412	SCREW M4×12	2
17	1422411	LOCK WASHER M4	2
18	1421409	FLAT WASHER M4×9×0.8	2
19	8119003	SOLENOID VALVE, 24VDC	1
20	1914300	TIE, NYLON, 5X300	5
21	8210904	TUBING ID=10MM L=180MM	2
22	8119008	FITTING, PLASTIC, TEE	1

**WEAR AND TEAR PARTS**

<b>DIA NO.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>NO REQ'D</b>
<b>1</b>	8125200	WHEEL, 8 INCH	2
	8225200	AIR FILLED WHEEL, 8 INCH, KIT (OPTION)	2
	8225210	FOAM FILLED WHEEL, 8INCH, KIT (OPTION)	2
<b>2</b>	8116009	PROTECTIVE WHEEL	3
<b>3</b>	8230503	SQUEEGEE BLADE, FRONT, LINATEX	1
	8230513	SQUEEGEE BLADE, FRONT, PU (OPTION)	1
	8210513	SQUEEGEE BLADE, FRONT, LINATEX (OPTION)	1
	8210516	SQUEEGEE BLADE, FRONT, PU (OPTION)	1
	8220514	SQUEEGEE BLADE, FRONT, LINATEX (OPTION)	1
	8220524	SQUEEGEE BLADE, FRONT, PU (OPTION)	1
	8310535	SQUEEGEE BLADE, FRONT, LINATEX	1
	8310545	SQUEEGEE BLADE, FRONT, PU (OPTION)	1
<b>4</b>	8230504	SQUEEGEE BLADE, REAR, LINATEX	1
	8230534	SQUEEGEE BLADE, REAR, PU (OPTION)	1
	8210514	SQUEEGEE BLADE, REAR, LINATEX (OPTION)	1
	8210517	SQUEEGEE BLADE, REAR, PU (OPTION)	1
	8220513	SQUEEGEE BLADE, REAR, LINATEX (OPTION)	1
	8220523	SQUEEGEE BLADE, REAR, PU (OPTION)	1
	8310536	SQUEEGEE BLADE, REAR, LINATEX	1
	8310546	SQUEEGEE BLADE, REAR, PU (OPTION)	1
<b>5</b>	9050014	14" BRUSH , i28BTL (OPTION)	2
	9050016	16" BRUSH , i32BTL (OPTION)	2
<b>6</b>	9040014	14" PAD HOLDER, i28BTL	2
	9040016	16" PAD HOLDER, i32BTL	2
<b>7</b>	8216105	BRUSH, CYLINDRICAL, 28"	2





3.0-i28BTL