

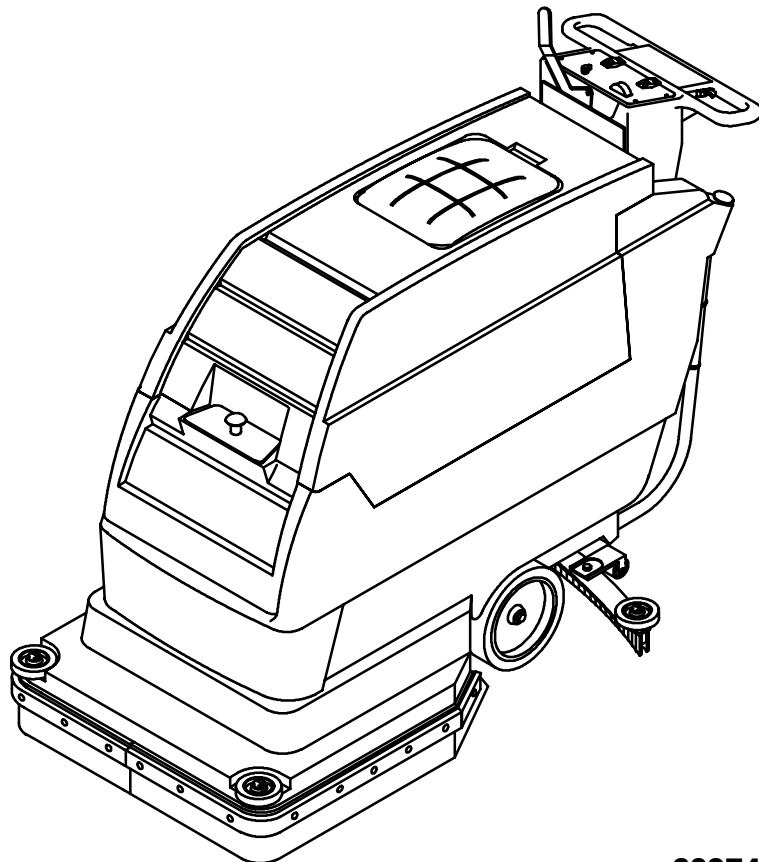
Castex®

BA-2000

Battery Automatic Scrubber

Model No.:
609740
609741 - Pac

Operator and Parts Manual



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609747
Rev. 01 (05-04)

OPERATION

This manual is furnished with each new model. It provides necessary operation and maintenance instructions and a parts list.

Read this manual completely to understand the machine before operating or servicing it.

Use the illustrated Parts Lists to order parts. Before ordering parts or supplies, be sure to have your machine model number and serial number handy. Parts and supplies may be ordered by phone or mail from any authorized parts and service center, distributor or from any of the manufacturer's subsidiaries.

This machine will provide excellent service. However, the best results will be obtained at minimum costs if:

- The machine is operated with reasonable care.
- The machine is maintained regularly - per the maintenance instructions provided.
- The machine is maintained with manufacturer supplied or equivalent parts.

MACHINE DATA

Please fill out at time of installation for future reference.

Model No.- _____

Install. Date - _____

Serial No.- _____

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Castex is a registered United States trademark of Tennant Company. 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. Use only recommended pads, brushes and commercially available floor cleaners intended for machine application.

All operators must read, understand and practice the following safety precautions.

The following warning alert symbol and the "FOR SAFETY" heading are used throughout this manual as indicated in their description:

 **WARNING:** To warn of hazards or unsafe practices which could result in severe personal injury or death.

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

Failure to follow these warnings may result in personal injury, electrical shock, fire or explosion.

 **WARNING:** Fire Or Explosion Hazard:

- **Never Use Flammable Liquids Or Operate Machine in Or Near Flammable Liquids, Vapors Or Combustible Dusts.**

This machine is not equipped with explosion proof motors. The electric motors will spark upon start up and during operation which could cause a flash fire or explosion if machine is used in an area where flammable vapors/liquids or combustible dusts are present.

- **Do Not Pick Up Flammable Materials Or Reactive Metals.**
- **Batteries Emit Hydrogen Gas. Keep Sparks And Open Flame Away. Keep Battery Compartment Open When Charging.**

 **WARNING:** Electrical Hazard. Disconnect Battery Cables Before Servicing Machine.

The following information signals potentially dangerous conditions to the operator or equipment:

FOR SAFETY:

1. **Do not operate machine:**
 - With flammable liquids or near flammable vapors as an explosion or flash fire may occur.
 - Unless trained and authorized.
 - Unless operation manual is read and understood.
 - If not in proper operating condition.
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.
 - Wear no-slip shoes.
 - Use care when reversing machine.
 - Report machine damage or faulty operation immediately.
 - Never allow children to play on or around.
 - Follow mixing and handling instructions on chemical containers.
4. **Before leaving or servicing machine:**
 - Stop on level surface.
 - Turn off machine.
5. **When servicing machine:**
 - Avoid moving parts. Do not wear loose jackets, shirts, or sleeves.
 - Block machine tires before jacking up.
 - Use hoist or jack that will support the weight of the machine.
 - Do not power spray or hose off machine. Electrical malfunction may occur.
 - Disconnect battery connections before working on machine.
 - Wear protective gloves and eye protection when handling batteries and battery cables.
 - Avoid contact with battery acid.
 - Use manufacturer supplied or approved replacement parts.
 - All repairs must be performed by a qualified service person.
 - Do not modify the machine from its original design.

OPERATION

6. When transporting machine:

- Turn machine off.
- Get assistance when lifting machine.
- Do not lift machine when batteries are installed.
- Use a recommended ramp when loading/unloading into/off truck or trailer.
- Use tie-down straps to secure machine to truck or trailer.

SAFETY LABELS

The safety labels appear on the machine in the locations indicated. Replace labels if they become damaged or illegible.

WARNING LABEL - LOCATED ON THE RECOVERY TANK COVER.

WARNING FOR SAFETY: READ THE OWNER'S MANUAL BEFORE USING MACHINE.

FAILURE TO FOLLOW THESE WARNINGS MAY RESULT IN: PERSONAL INJURY, ELECTROCUTION, ELECTRICAL SHOCK, FIRE OR EXPLOSION.

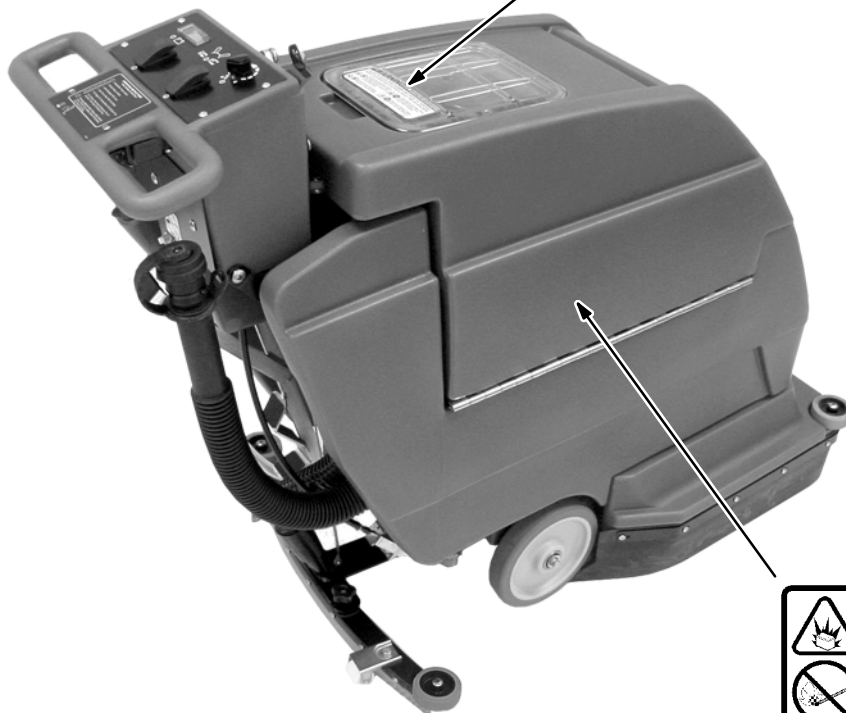
Do Not Use Flammable Liquids Or Operate Machine In Or Near Flammable Liquids, Vapors Or Combustible Dusts.

Do Not Pick Up Flammable Materials Or Reactive Metals.

Keep Sparks And Open Flame Away. Keep Battery Hood Open When Charging.

Disconnect Battery Cables Before Servicing Machine.

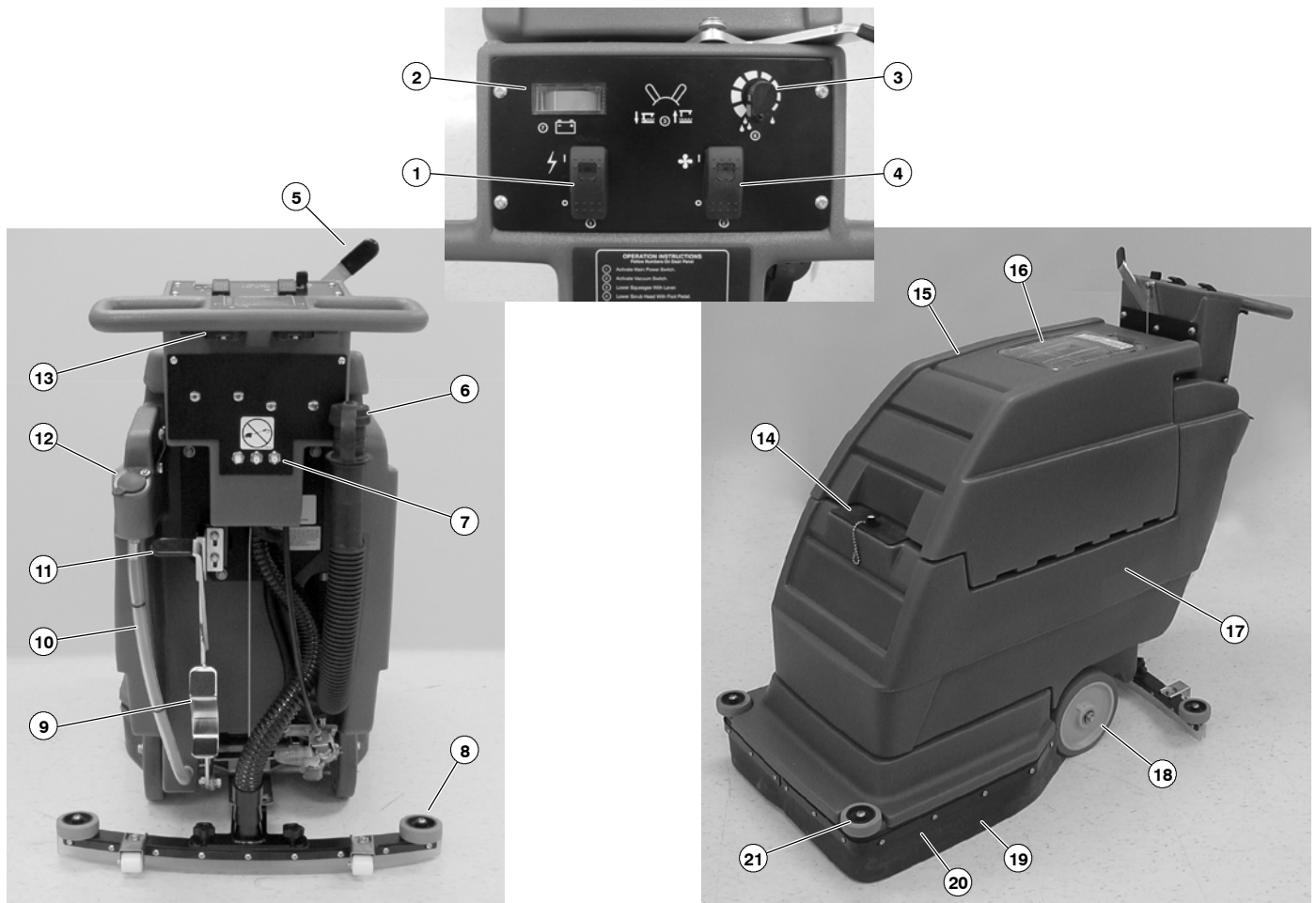
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BATTERY CHARGE LABEL -
LOCATED INSIDE BATTERY
COMPARTMENT.

WARNING: Keep sparks and open
flame away. Keep battery hood
open when charging.

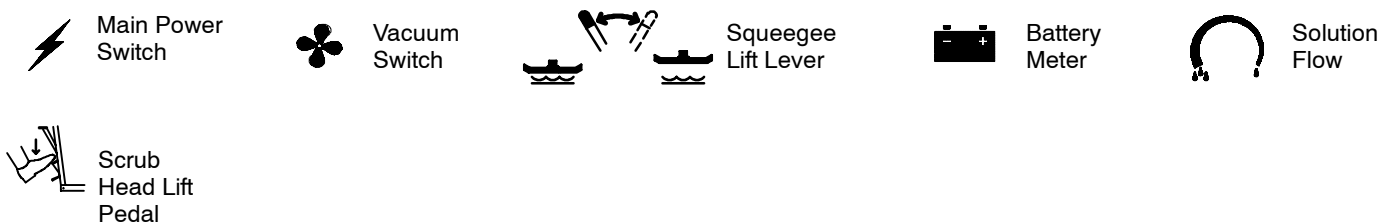
MACHINE COMPONENTS



- 1. Main Power Switch
- 2. Battery Meter
- 3. Solution Flow Knob
- 4. Vacuum Switch
- 5. Squeegee Lift Lever
- 6. Recovery Tank Drain Hose
- 7. Circuit Breakers
- 8. Squeegee Assembly
- 9. Brush Lift Foot Pedal
- 10. Solution Tank Drain Hose
- 11. Brush Pressure Lever

- 12. Rear Solution Tank Fill Port
- 13. Trigger Switches
- 14. Front Solution Tank Fill Port
- 15. Recovery Tank
- 16. Recovery Tank Lid
- 17. Battery Compartment
- 18. Rear Wheels
- 19. Scrub Head Skirt
- 20. Front Casters (Behind Skirt)
- 21. Wall Rollers

CONTROL PANEL SYMBOLS



OPERATION

MACHINE INSTALLATION

UNCRATING MACHINE

1. Carefully check carton for signs of damage. Report damages at once to carrier.
2. Remove shipping straps, raise scrub head and carefully lift machine with assistance or use a ramp to remove from pallet.

ATTENTION: Do not roll machine off pallet, damage may occur.

ATTENTION: To prevent possible machine damage, install batteries after removing machine from shipping pallet.

3. Check machine contents, contact distributor for missing items.

Machine Contents:

- Battery Tray
- Battery Cable
- Battery Tube Spacer
- Squeegee Assembly

Batteries, battery charger, pad drivers are included with specific machine pacs or must be purchased separately (See PARTS LIST section).

INSTALLING BATTERIES

⚠ WARNING: Fire Or Explosion Hazard. Batteries Emit Hydrogen Gas. Keep Sparks And Open Flame Away. Keep Battery Hood Open When Charging.

FOR SAFETY: When servicing machine, wear protective gloves and eye protection when handling batteries and battery cables. Avoid contact with battery acid.

Recommended Battery Specifications:

Two 12 volt, deep cycle, 130 amp. hour batteries. Part Number #130869. Maximum battery dimensions are 178mm (7.13 in) W x 308mm (13 in) L x 356mm (10 in) H.

1. Turn all switches to the off (O) position.
2. Carefully hinge open recovery tank to access battery compartment. Remove loose battery cable and PVC spacer from compartment (Figure 1).

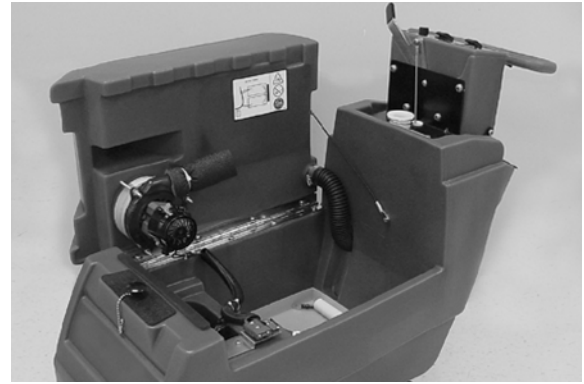


FIG. 1

3. Carefully install batteries into compartment and arrange battery posts as shown (Figure 2).

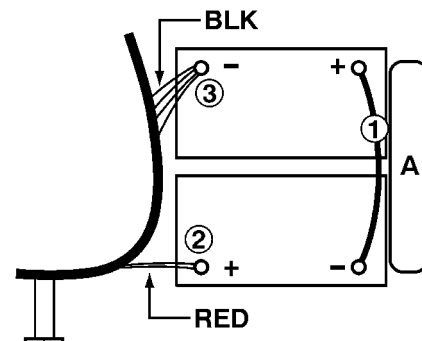


FIG. 2

ATTENTION: Do not drop batteries into compartment! Battery and machine housing damage may result.

4. To secure batteries, place white PVC tube spacer "A" behind batteries in compartment (Figure 2).
5. Connect cables to battery posts in numerical order as labeled (RED to POSITIVE and BLACK to NEGATIVE) (Figure 2).
6. Apply a light coating of non-metallic grease or protective spray on the cable connections to prevent battery corrosion.

MACHINE SETUP

PRE-OPERATION CHECKS

1. Sweep and dust mop floor.
2. Check battery meter charge level to ensure batteries are fully charged (See CHARGING BATTERIES).
3. Check that a pad/brush is installed.
4. Check that squeegee is installed.

ATTACHING SQUEEGEE ASSEMBLY

1. Slide squeegee lift lever to the right to raise squeegee mount bracket (Figure 3).



FIG. 3

2. Loosen two thumb knobs on squeegee and slide squeegee into slots at rear of squeegee mount bracket. Be certain that squeegee roller wheels are toward the rear (Figure 4).

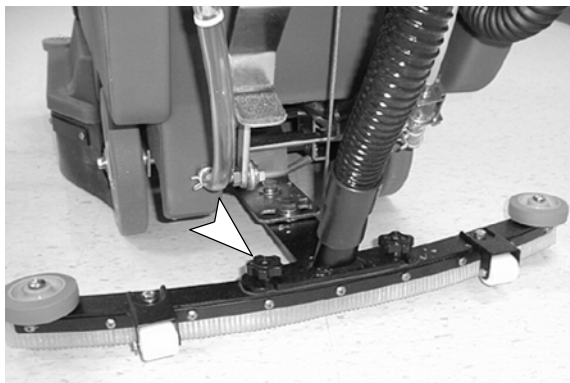


FIG. 4

3. Tighten thumb knobs securely.

INSTALLING BRUSH OR PAD DRIVER

1. Turn machine off.

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

2. Lower brush head. Step down firmly on top pedal and push pedal forward to lower (Figure 5).

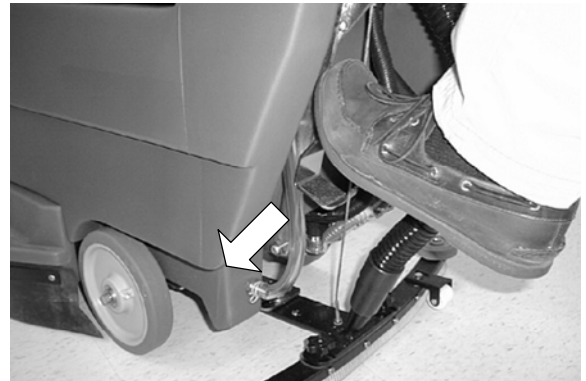


FIG. 5

3. Position squeegee swivel mechanism so it's centered behind machine.
4. Tilt machine back to access motor hub.

ATTENTION: Do not leave machine tilted back for an extended time. Battery acid may leak.

5. Select a recommended pad or brush that best meets your cleaning needs.

NOTE: Consult your authorized distributor for pad and brush recommendations.

6. **(For Pad Installation)** Attach pad to pad driver before installing driver to motor hub. To attach pad, remove plastic centerlock from pad driver and position pad centered on driver, replace centerlock securely (Figure 6).



FIG. 6

OPERATION

7. Tilt machine back. Align brush/pad driver studs into motor hub slots and give the driver a quick turn toward the spring clip. Be certain that spring clip locks into a stud before operating machine (Figure 7).

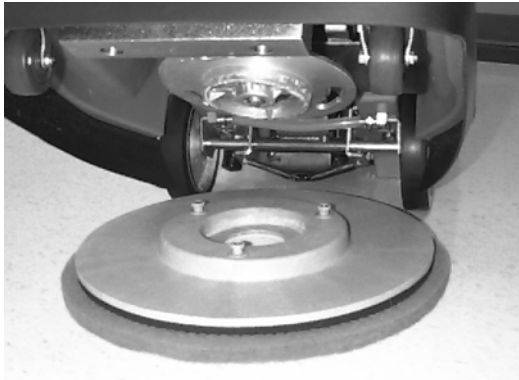


FIG. 7

NOTE: Make sure pad driver and motor hub surfaces are clean before installing driver. Clean surfaces will allow for easy pad driver removal.

ATTENTION: Do not leave machine tilted back for an extended time. Battery acid may leak.

8. Carefully lower machine to floor and raise scrub head (Figure 8).



FIG. 8

FILLING SOLUTION TANK

1. Push machine to fill station. Raise squeegee and scrub head when transporting.
2. Remove solution fill cover at front of machine and fill solution tank with 38 liters (10 gal) of hot water, 60°C (140°F) maximum temperature. Use rear fill-port if desired. Rear fill-port hose has 19 and 38 L markers to indicate amount of water in solution tank (Figure 9).



FIG. 9

NOTE: The water must **not** be hotter than 60°C (140°F) or tank damage may occur.

NOTE: If filling with a bucket be certain that bucket is clean. This will prevent possible solution line clogs.

3. Add cleaning chemical. See proper dilution ratio instructions on bottle.

FOR SAFETY: When using machine, follow mixing and handling instructions on chemical containers.

ATTENTION: Use only recommended detergents. Machine damage due to improper detergent usage will void the manufacturer's warranty. Contact your sales representative for detergent recommendations.

WARNING: Fire Or Explosion Hazard. Never Use Flammable Liquids Or Operate Machine In Or Near Flammable Liquids, Vapors Or Combustible Dusts.

MACHINE OPERATION

FOR SAFETY: Do not operate machine unless operator manual is read and understood.

1. Lower squeegee by moving the squeegee lift lever to the left (Figure 10).

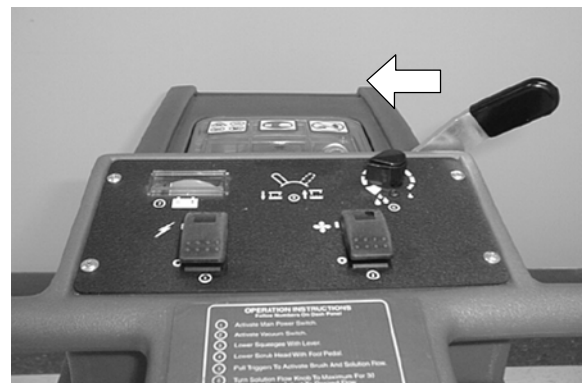


FIG. 10

- Lower scrub head. Step down firmly on top brush lift pedal and push pedal forward to lower (Figure 11).



FIG. 11

- Turn main power and vacuum switches to the on position.
- Turn solution flow control knob to desired flow rate. Solution will immediately begin to flow once triggers are activated (Figure 12).

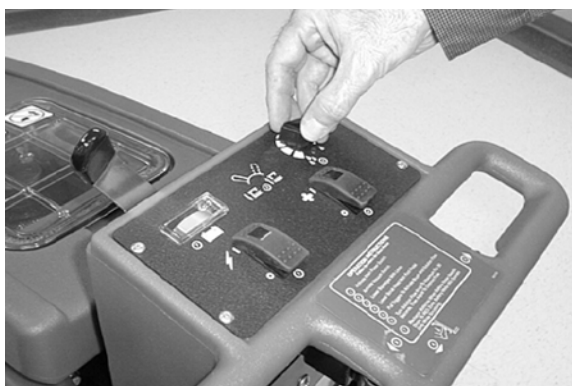


FIG. 12

ATTENTION: To prevent floor finish damage, DO NOT keep machine at a stand still once brush begins to spin.

- Pull triggers and begin scrubbing by pushing machine forward.

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

WHILE OPERATING MACHINE

⚠ WARNING: Fire Or Explosion Hazard. Never Operate Machine In Or Near Flammable Liquids, Vapors Or Combustible Dusts.

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

- Periodically check for excessive foam in recovery tank (look through clear lid). If excessive foam appears, pour a foam control solution into the recovery tank.

ATTENTION: Do not allow foam or water to enter recovery tank float shut-off screen, vacuum motor damage will result; not covered by warranty. Foam will not activate float shut-off screen.

- If more scrubbing pressure is needed for small heavily soiled areas, simply pull brush lift lever upward while operating (Figure 13).



FIG. 13

- If squeegee leaves streaks, raise squeegee and wipe both blades with a cloth.
- When stopping or turning machine around, simply release trigger switches to shut off solution flow.
- Periodically observe clear tube at rear of machine for remaining cleaning solution.
- Periodically check battery meter's discharge level. When needle drops to the red zone, recharge batteries.

ATTENTION: Do not operate machine with battery meter in red zone, battery damage will result.

- When the solution tank runs dry, release trigger switches and continue to vacuum until all dirty water is consumed into the recovery tank. Raise the squeegee and scrub head and drain recovery tank (See DRAINING TANKS).

BRUSH MOTOR CIRCUIT BREAKER

The machine is equipped with three resettable circuit breakers to protect machine from damage. If a circuit breaker should trip during operation, determine cause, allow motor to cool and then manually reset breaker. Brush circuit breaker (35A) may trip due to motor overload. Clean or replace pad if breaker should trip. Circuit breaker panel is located at rear of machine.

- 10A Main Circuit Breaker
- 30A Vacuum Motor Circuit Breaker
- 35A Brush Motor Circuit Breaker

OPERATION

DRAINING TANKS

The recovery tank should be drained and cleaned out after every use. The solution tank should be cleaned out periodically to remove any corrosion.

Transport the machine to a draining site, turn the machine off and follow the draining instructions below:

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

DRAINING RECOVERY TANK

1. Remove the recovery tank drain hose cap by turning it counter-clockwise and drain the tank. To completely drain recovery tank, hinge open tank and flip up tank support stand to rest the tank on (Figure 14).

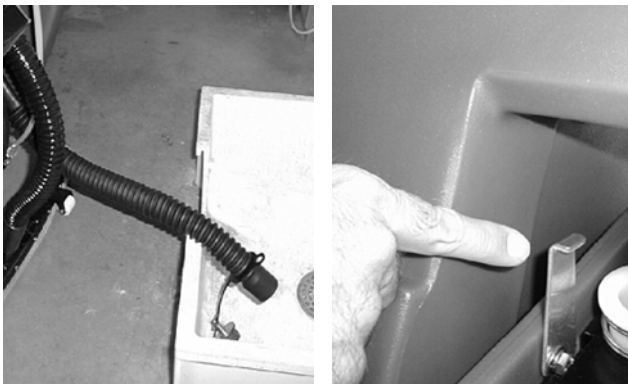


FIG. 14

NOTE: When using a bucket to drain the machine, do not use the same bucket to fill the solution tank.

2. Rinse out recovery tank with a garden hose. Be careful not to spray water into float shut-off screen.
3. Remove and clean float shut-off screen located in the recovery tank (Figure 15).



FIG. 15

DRAINING SOLUTION TANK

1. To drain any remaining water from the solution tank, pull the solution tank level hose off the hose fitting, as shown, and drain (Figure 16).

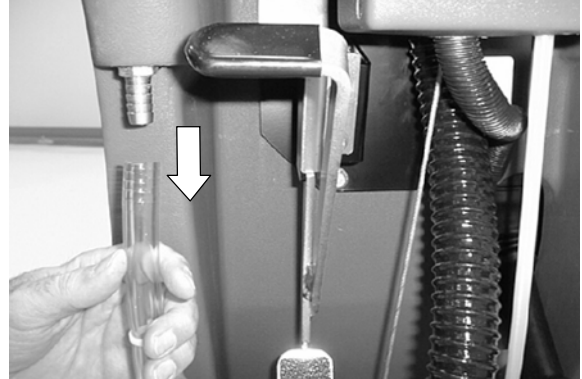


FIG. 16

2. Reconnect the clear hose. Be certain it is completely pushed back on to the hose barb.

CHARGING BATTERIES

ATTENTION: To prolong the life of the batteries and to provide optimum machine performance, ONLY recharge the batteries after a total of 30 minutes of use or more. Do not leave batteries discharged for lengthy periods.

The following charging instructions are intended for battery chargers supplied with the machine. Only use a battery charger with the following specifications to prevent battery damage.

CHARGER SPECIFICATIONS:

- OUTPUT VOLTAGE - 24 VOLTS
- OUTPUT CURRENT - 10 TO 20 AMPS
- AUTOMATIC SHUTOFF CIRCUIT
- FOR DEEP CYCLE BATTERY CHARGING

1. Transport the machine to a well ventilated area for charging.

⚠ WARNING: Fire Or Explosion Hazard. Batteries Emit Hydrogen Gas. Keep Sparks And Open Flame Away. Keep Battery Compartment Open When Charging.

2. Park the machine on a level surface and turn the machine off.

- Lead Acid Batteries: Before charging the batteries, check the electrolyte level in each battery cell (Figure 17)



FIG. 17

FOR SAFETY: When servicing machine, wear protective gloves and eye protection when handling batteries and battery cables. Avoid contact with battery acid.

The electrolyte level (A) should slightly cover the battery plates (B). Add distilled water if needed. DO NOT OVERFILL, the fluid will expand and overflow while charging. Replace cell caps before charging (Figure 18).

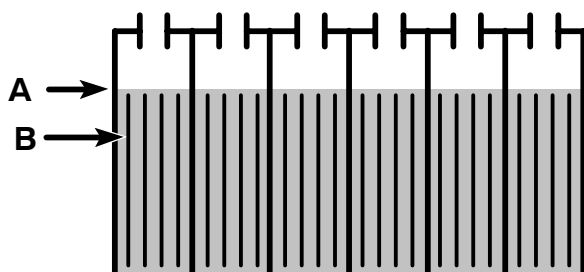


FIG. 18

- Connect the charger's AC power supply cord to a properly grounded receptacle (Figure 19).

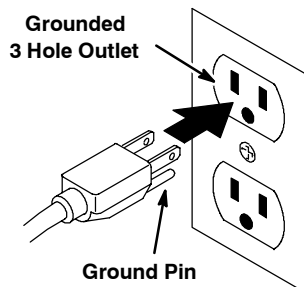


FIG. 19

- Connect battery charger into machine as shown. Flip up hood support stand and rest hood on stand to promote ventilation (Figure 20).

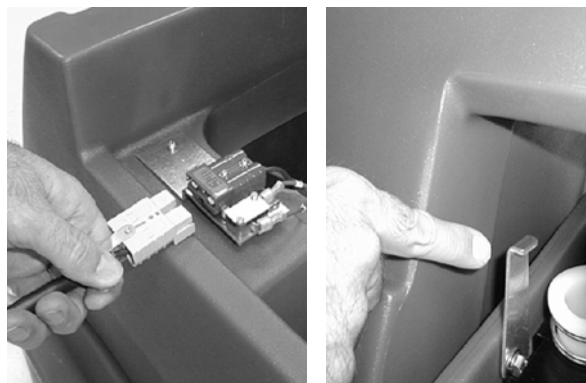


FIG. 20

- The charger will automatically begin charging and shut off when fully charged.

NOTE: The machine will not operate once the battery charger is connected.

ATTENTION: Do not disconnect the charger's DC cord from the machine's receptacle when the charger is operating. Arcing may result. If the charger must be interrupted during charging, disconnect the AC power supply cord first.

⚠ WARNING: Fire Or Explosion Hazard. Batteries Emit Hydrogen Gas. Keep Sparks And Open Flame Away. Keep Battery Compartment Open When Charging.

- Lead Acid Batteries: After charging, check the electrolyte level (A) again. The level should be approximately 1 cm from the bottom of the fill-port (B) (Figure 21). Add distilled water if needed. DO NOT OVERFILL.

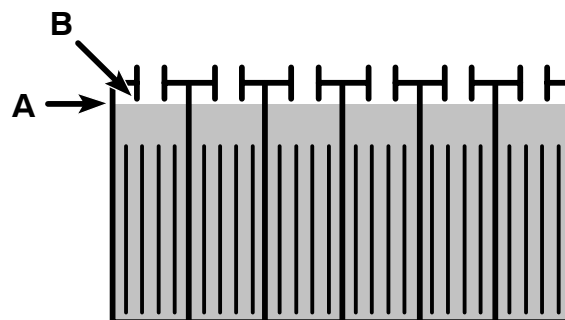


FIG. 21

OPERATION

MACHINE MAINTENANCE

To keep the machine in good working condition, simply follow the machines daily and monthly maintenance procedures.

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

⚠ WARNING: Electrical Hazard. Disconnect Battery Cables Before Servicing Machine.

DAILY MAINTENANCE (Every 4 Hours of Use)

1. Drain and rinse tanks thoroughly. After draining tanks, hinge recovery tank until you can see vacuum intake hole at rear of tank. Remove any debris in hole if necessary.
2. Remove and clean float shut-off screen located in recovery tank (Figure 22).



FIG. 22

3. Remove and clean pad/brush.
4. Raise squeegee and wipe it down with a dry cloth. Store squeegee in the up position to prevent squeegee damage.
5. Clean machine with an all purpose cleaner and damp cloth.

ATTENTION: Do not power spray or hose off machine. Electrical malfunction may result.

6. Recharge batteries if needed (See CHARGING BATTERIES).

MONTHLY MAINTENANCE (Every 80 Hours of Use)

1. Lead Acid Batteries: Clean the battery tops to prevent corrosion (See BATTERY MAINTENANCE).
2. Check for loose battery cable connections.
3. Lubricate grease fittings as shown with a water resistant grease (Figure 23).

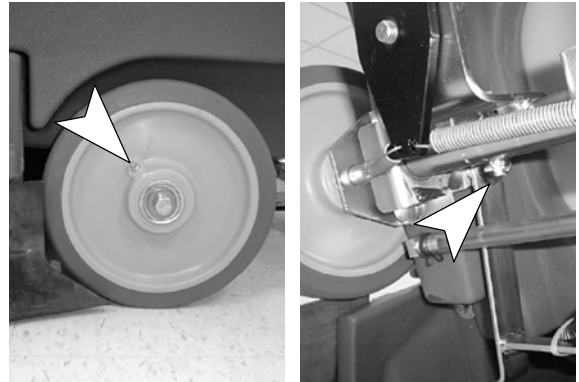


FIG. 23

4. Lubricate all pivot points and rollers with silicone spray then coat with a water resistant grease to maintain smooth operation.
5. Check the machine for loose nuts and bolts.
6. Check the machine for leaks.

QUARTERLY MAINTENANCE (Every 250 Hours of Use)

Inspect motors for carbon brush wear. Replace brushes when worn to a length of 10mm (0.38 in.) or less. Contact an Authorized Service Center for carbon brush inspection.

ATTENTION: Contact an Authorized Service Center for machine repairs. Machine repairs performed by other than an authorized person will void the warranty.

BATTERY MAINTENANCE (Lead Acid Batteries)

⚠ WARNING: Fire Or Explosion Hazard. Batteries Emit Hydrogen Gas. Keep Sparks And Open Flame Away. Keep Battery Compartment Open When Charging.

FOR SAFETY: When servicing machine, wear protective gloves and eye protection when handling batteries and battery cables. Avoid contact with battery acid.

1. Check the specific gravity using a hydrometer to determine the charge level and the condition of the batteries (Figure 24). If one or more of the battery cells read lower than the other battery cells (0.050 or more), the cell is damaged, shorted, or is about to fail. Check the hydrometer readings against the following chart to determine the remaining battery charge level.

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

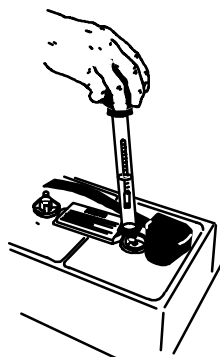


FIG. 24

SPECIFIC GRAVITY at 27°C (80°F)	BATTERY CHARGE
1.265	100% CHARGED
1.223	75% CHARGED
1.185	50% CHARGED
1.148	25% CHARGED
1.110	DISCHARGED

NOTE: If the readings are taken when the battery electrolyte is any temperature other than 27°C, the reading must be temperature corrected. Add or subtract to the specific gravity reading 0.004, 4 points, for each 6°C above or below 27°C.

2. Always follow proper charging instructions (see CHARGING BATTERIES).

3. Check the electrolyte level (A) in each battery cell **after charging batteries**. The level should be approximately 1 cm from the bottom of the fill-port (B). Add distilled water if needed (Figure 25). **DO NOT OVERFILL.**

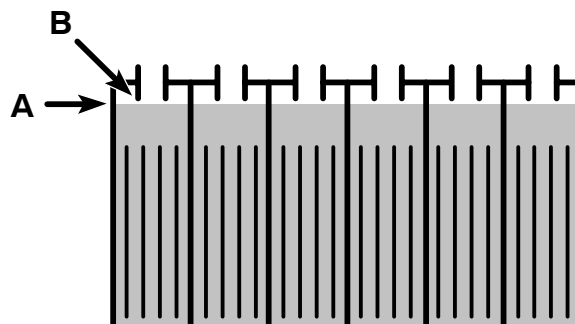


FIG. 25

4. Keep the battery tops clean to prevent battery corrosion.

To clean batteries:

FOR SAFETY: When servicing machine, wear protective gloves and eye protection when handling batteries and battery cables. Avoid contact with battery acid.

- a. Mix a strong solution of baking soda and water (Figure 26).



FIG. 26

- b. Brush the solution sparingly over the battery tops and cable connectors.

NOTE: Do not allow baking soda solution to enter battery cells.

- c. Use a wire brush to clean the battery terminals and cable connectors.
 - d. After cleaning, apply a coating of clear battery post protectant to the terminals and cable connectors.
5. Check for loose or worn cables. Replace if worn.

OPERATION

TRANSPORTING MACHINE

When transporting machine by use of trailer or truck, be certain to follow tie-down procedures below:

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

1. Raise the squeegee and scrub head.
2. Load machine using a recommended loading ramp.
3. Position front of machine up against front of trailer or truck. Once machine is positioned, lower scrub head and squeegee.
4. Place a block behind the drive wheel and the rear casters.
5. Place tie-down straps over top of machine and secure straps to floor. It may be necessary to install tie-down brackets to the floor of your trailer or truck.

FOR SAFETY: When transporting machine, use a recommended ramp when loading/unloading into/off truck or trailer, use tie-down straps to secure machine to truck or trailer.

STORING MACHINE


1. Charge batteries before storing. Never store machine with discharged batteries.
2. Drain and rinse tanks thoroughly.
3. Store machine in a dry area with squeegee and scrub head in the raised position.
4. Remove recovery tank lid to promote air circulation.

ATTENTION If storing machine in freezing temperatures, be certain to drain machine of all water. Damage due to freezing temperatures is not covered by warranty.

ATTENTION: Do not expose machine to rain; store indoors.

RECOMMENDED STOCK ITEMS

Refer to Parts List section for recommended stock items. Stock Items are clearly identified with a bullet preceding the parts description. See example below:



Ref.	Part No.	Description	Qty.
1	701100	ASSEMBLY, STANDPIPE	1
2	180613	● FLOAT, SHUTOFF	1
3	230197	NIPPLE	1
4	101714	● GASKET	1
5	210240	NUT, FLANGED	1

TROUBLE SHOOTING

PROBLEM	CAUSE	SOLUTION
Machine does not operate.	Batteries need charging.	See CHARGING BATTERIES.
	Faulty battery(s).	Replace battery(s).
	Loose battery cable.	Tighten loose cable.
	Improper battery connection.	See INSTALLING BATTERIES.
	Faulty main power switch	Contact Service Center.
	Main circuit breaker has tripped.	Determine cause and reset circuit breaker button.
	Faulty trigger switch.	Contact Service Center.
Brush motor does not operate.	Brush circuit breaker has tripped.	Clean or change to a less aggressive pad. Also, release pad pressure lever if it's in the up position. Reset breaker button.
	Loose wire connection.	Contact Service Center.
	Triggers not pulled.	Pull triggers to activate brushes.
	Faulty brush motor or wiring.	Contact Service Center.
	Worn carbon brushes.	Contact Service Center.
	Faulty solenoid.	Contact Service Center.
Vacuum motor does not operate.	Vacuum circuit breaker has tripped.	Remove obstruction and reset breaker.
	Faulty vacuum switch.	Contact Service Center.
	Faulty wiring.	Contact Service Center.
	Faulty vacuum motor.	Contact Service Center.
	Faulty solenoid.	Contact Service Center.
	Worn carbon brushes.	Contact Service Center.
Short run time.	Batteries not fully charged.	Charge batteries.
	Bad cell in one or more batteries.	Replace battery.
	Batteries need maintenance.	See BATTERY MAINTENANCE.
	Faulty charger.	Replace battery charger.
Poor squeegee pick up.	Full recovery tank.	Empty recovery tank.
	Clogged float shutoff screen.	Remove screen and clean.
	Clogged squeegee.	Clean squeegee.
	Worn squeegee blades.	Replace squeegee blades.
	Loose squeegee thumbscrews.	Tighten thumbscrews.
	Loose vacuum hose connections or hole in hose.	Push hose cuffs firmly on connections. Replace hose if damaged.
	Clogged vacuum hose.	Remove clogged debris.
	Worn recovery tank lid gasket.	Replace gasket.

OPERATION

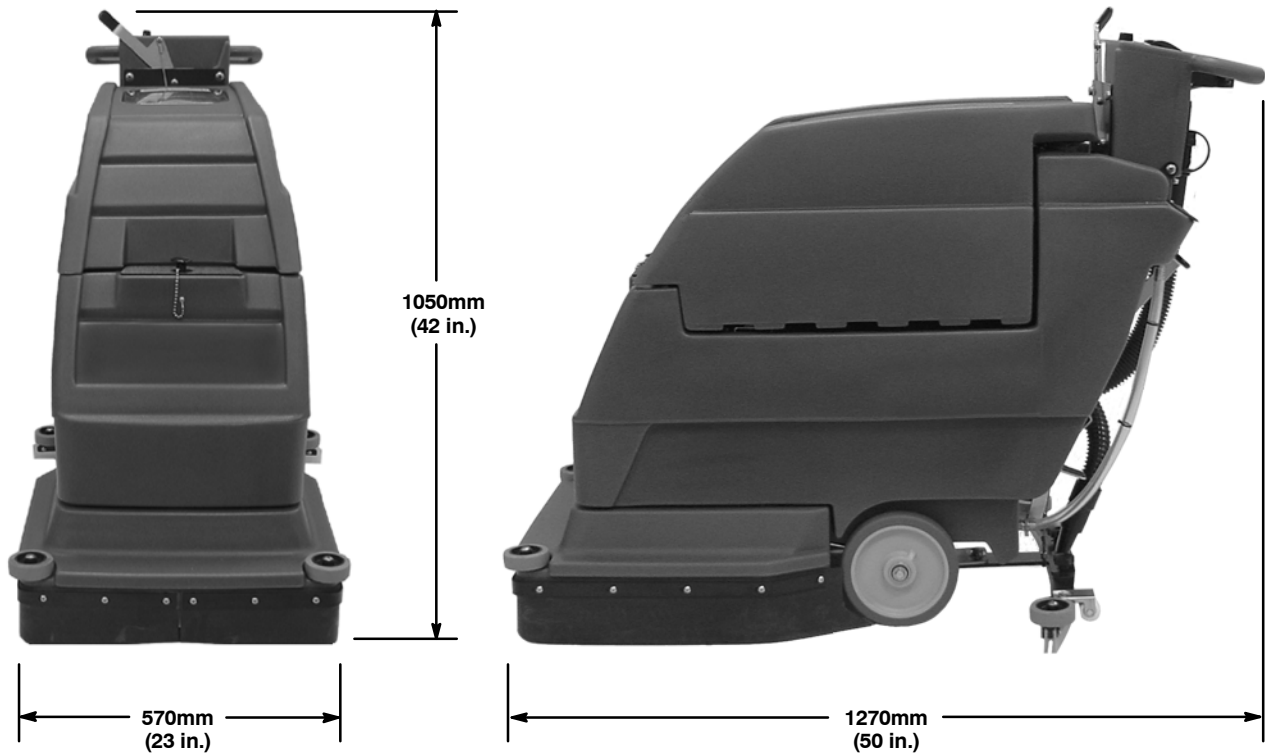
TROUBLE SHOOTING -continued

PROBLEM	CAUSE	SOLUTION
Poor squeegee pick up.	Drain hose plug is loose.	Tighten drain plug.
	Vacuum motor is loose.	Contact Service Center.
	Battery charge is low.	Charge batteries. Do not run machine when battery meter is in the red zone.
	Faulty vacuum motor.	Contact Service Center.
Drive motor does not operate.	Main circuit breaker has tripped.	Determine cause and reset circuit breaker.
	Faulty main power switch.	Contact Service Center.
	Faulty solenoid.	Contact Service Center.
	Faulty wiring.	Contact Service Center.
	Faulty drive motor.	Contact Service Center.
	Worn carbon brushes.	Contact Service Center.
	Faulty resistor.	Contact Service Center.
Little or no solution flow.	Solution flow knob not activated.	Turn knob to desired flow.
	Solution tank level is low.	Refill solution tank.
	Clogged solution line or filter.	Remove hose and blow compressed air through it. Flush solution tank after each use.
	Clogged solenoid valve.	Remove valve and clean. Do not scratch or damage inside of valve.
	Faulty solenoid valve.	Contact Service Center.
	Loose set screw on solution knob.	Recalibrate solution flow and tighten knob set screw.

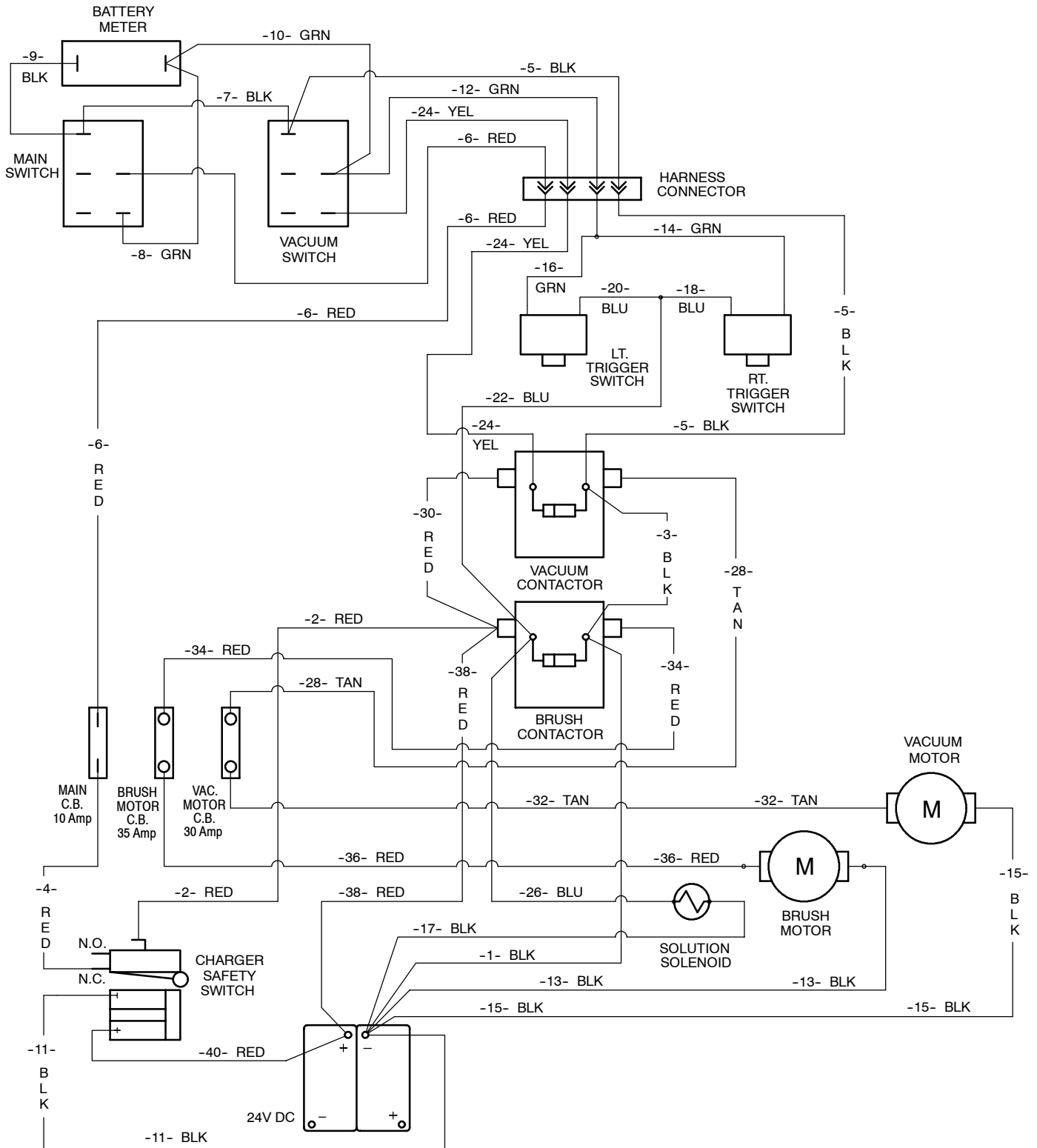
SPECIFICATIONS

Model	BA-2000
LENGTH	1270 mm (50 in.)
WIDTH	570 mm (23 in.)
HEIGHT	1050 mm (42 in.)
WEIGHT	146 Kg (315 lb)
SOLUTION TANK CAPACITY	38 L (10 gal)
RECOVERY TANK CAPACITY	40 L (10.5 gal)
CLEANING PATH WIDTH	508 mm (20 in.)
SQUEEGEE WIDTH	686 mm (27 in.)
BRUSH MOTOR	.75hp, 220 rpm, 24v, 20A, 560w
VACUUM MOTOR	.5hp, 2 stage, 353w, 14A, 24v
WATER LIFT	1118 mm (44 in.)
BATTERIES	2-130A/hr, 12v deep cycle
RUN TIME on full charge	2.47 hours
DECIBEL RATING AT OPERATOR'S EAR, INDOORS ON TILE	70dB(A)

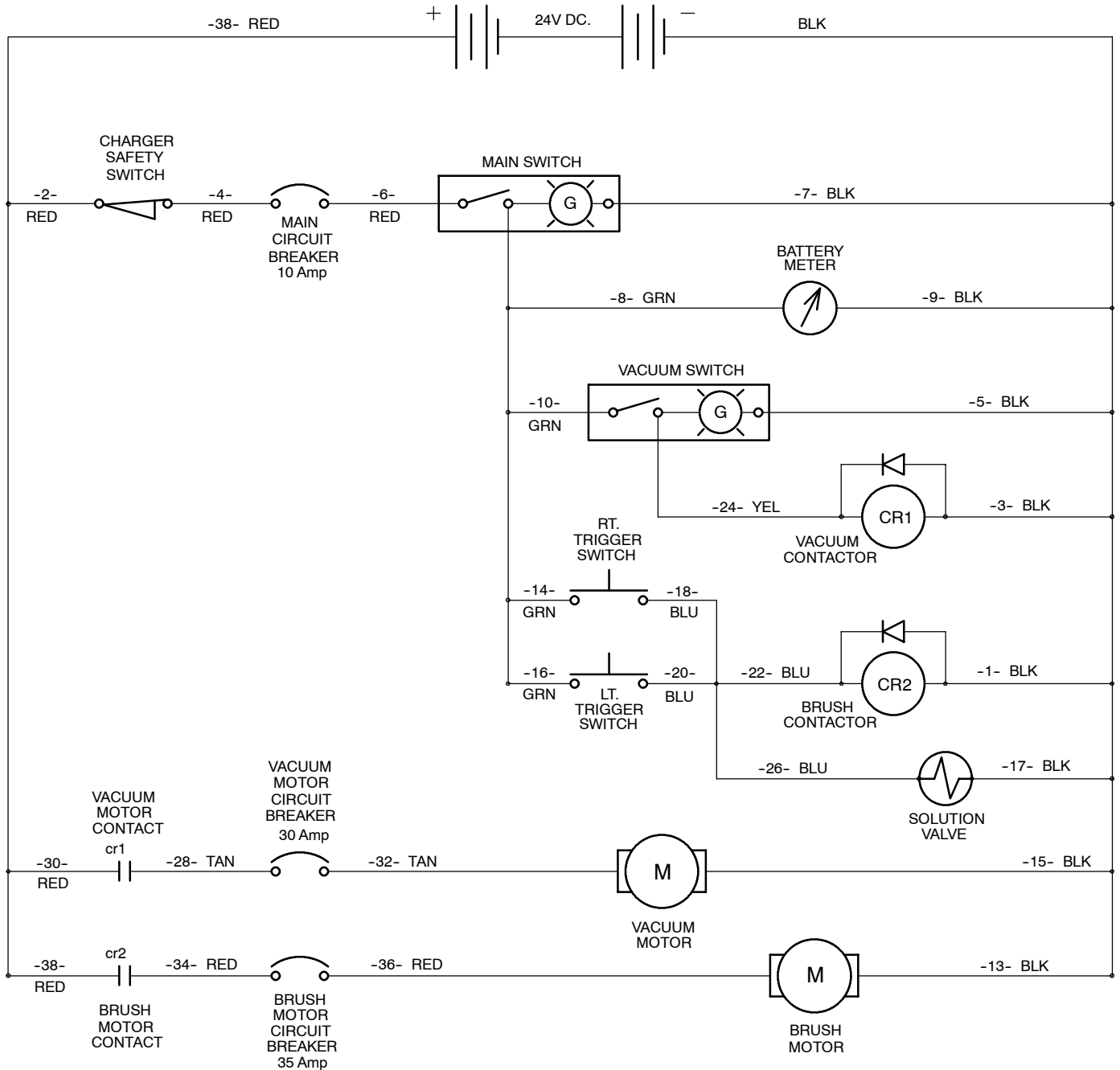
MACHINE DIMENSIONS



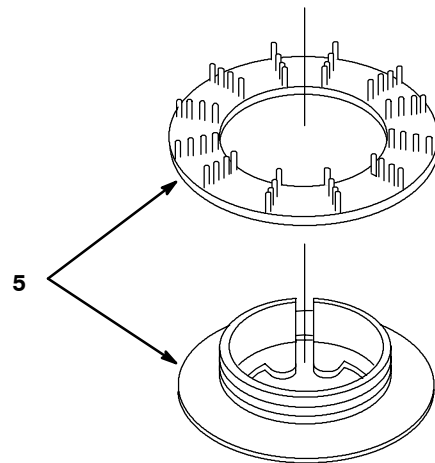
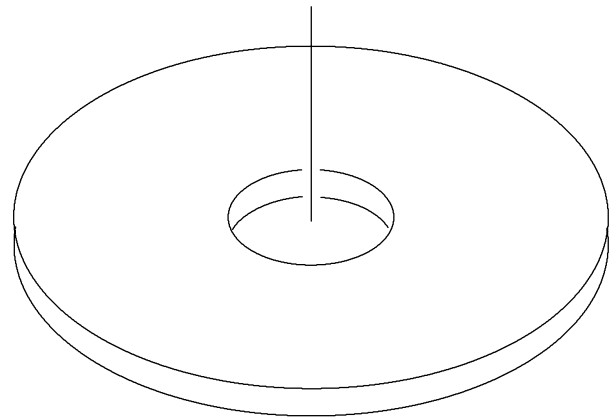
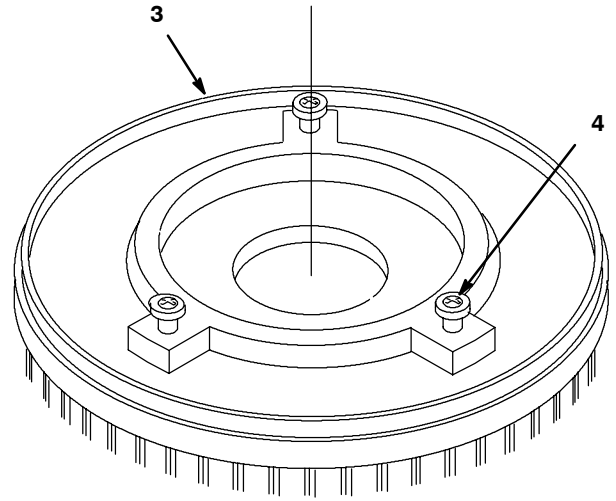
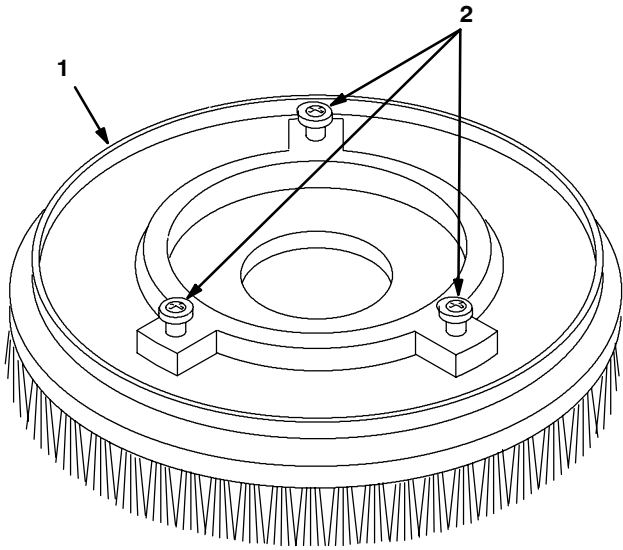
WIRE DIAGRAM



LADDER DIAGRAM



REPLACEMENT BRUSHES AND PAD DRIVER GROUP



REPLACEMENT BRUSHES AND PAD DRIVER GROUP

REF	PART #	DESCRIPTION	QTY.
▽ 1	240250	●BRUSH, POLY-SCRUB 508MM (20")	1
	240251	●BRUSH, DYNA-SCRUB 508MM (20")	1
	240252	●BRUSH, NYLON SCRUB/STRIP 508MM (20")	1
	240253	●BRUSH, STRATA SCRUB/STRIP 508MM (20")	1
▲ 2	240238	●LUGS, W/SCREWS (SET OF 3)	1

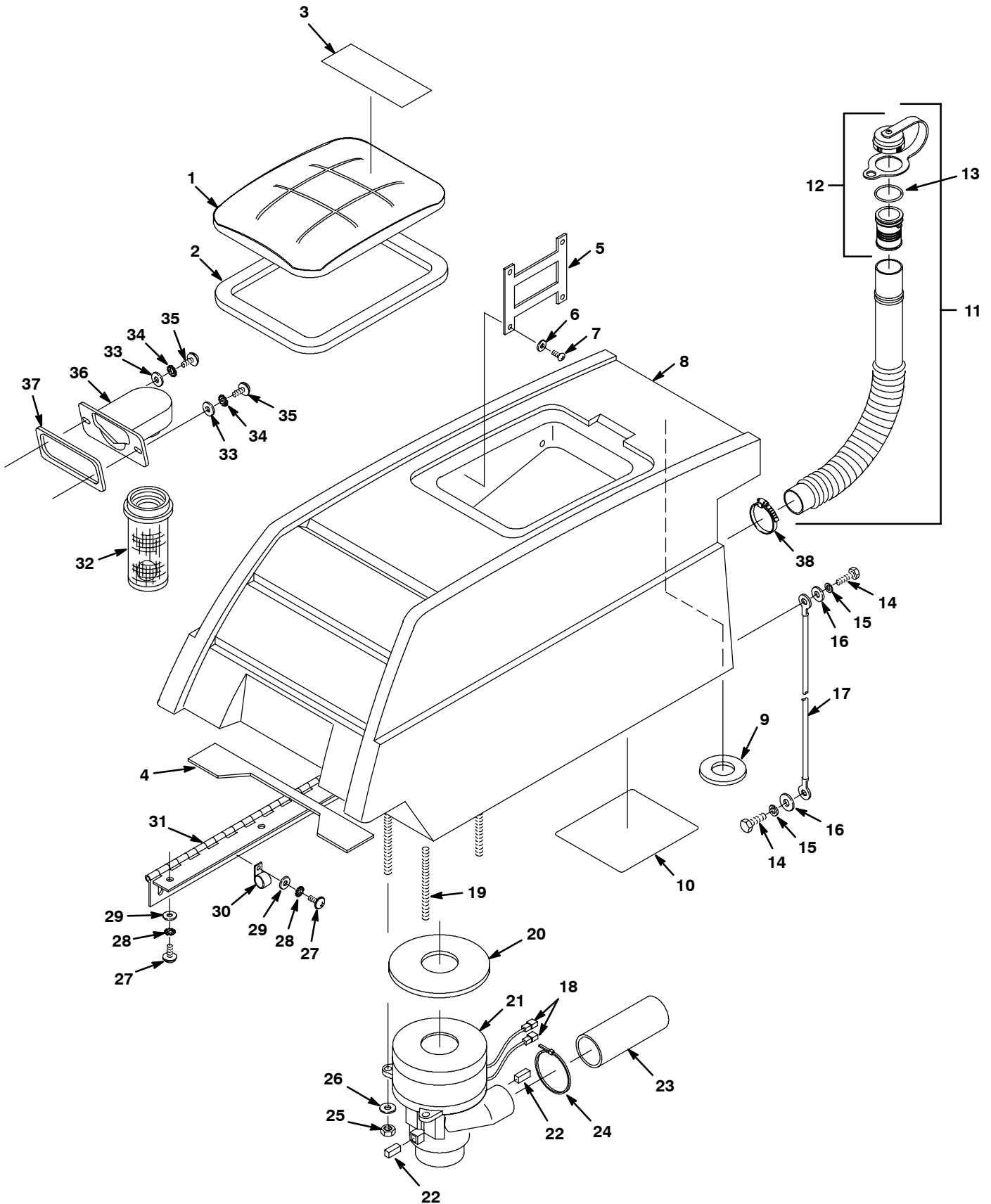
REF	PART #	DESCRIPTION	QTY.
▽ 3	240249	●PAD DRIVER ASM 508MM (20")	1
▲ 4	240254	●LUGS, W/SCREWS (SET OF 3)	1
▲ 5	25707	●LOCK, UNIVERSAL CENTER	1

▽ ASSEMBLY

▲ INCLUDED IN ASSEMBLY

● RECOMMENDED STOCK ITEMS

RECOVERY TANK GROUP



RECOVERY TANK GROUP

REF	PART #	DESCRIPTION	QTY.
▽ 1	613716	●ASM., LID & LABEL	1
▲ 2	630367	●GASKET, 1/2 X 1/2	1
▲ 3	613287	LABEL, WARNING 6" X 2.25"	1
4	608857	●GASKET, FILL PORT SEALING	1
5	630056	●STRAP, TANK COVER RETAINING	1
6	1009168	WASHER, FLAT, 0.17B 0.75D .04 SS	4
7	140872	SCREW, #6X3/8	4
8	608878	REC. TANK, BLUE	1
9	100151	●GASKET, TUBE-ADAPTER	1
10	120588	DECAL, BATTERY RECHARGING	1
▽ 11	1010143	●ASM., DRAIN HOSE	1
▲▽ 12	1008639	●ASM., CAP DRAIN HOSE	1
▲ 13	1008637	●O-RING	1
14	01697	SCREW, HEX .25-20 X .62	2
15	140016	WASHER, LOCK 0.25	2
16	140000	WASHER, 1/4 FLAT	2
17	140960	●CABLE, REC. TANK SUPPORT	1
18	130096	TERMINAL, MALE .25	2
19	606923	STUD, 1/4-20X4	3

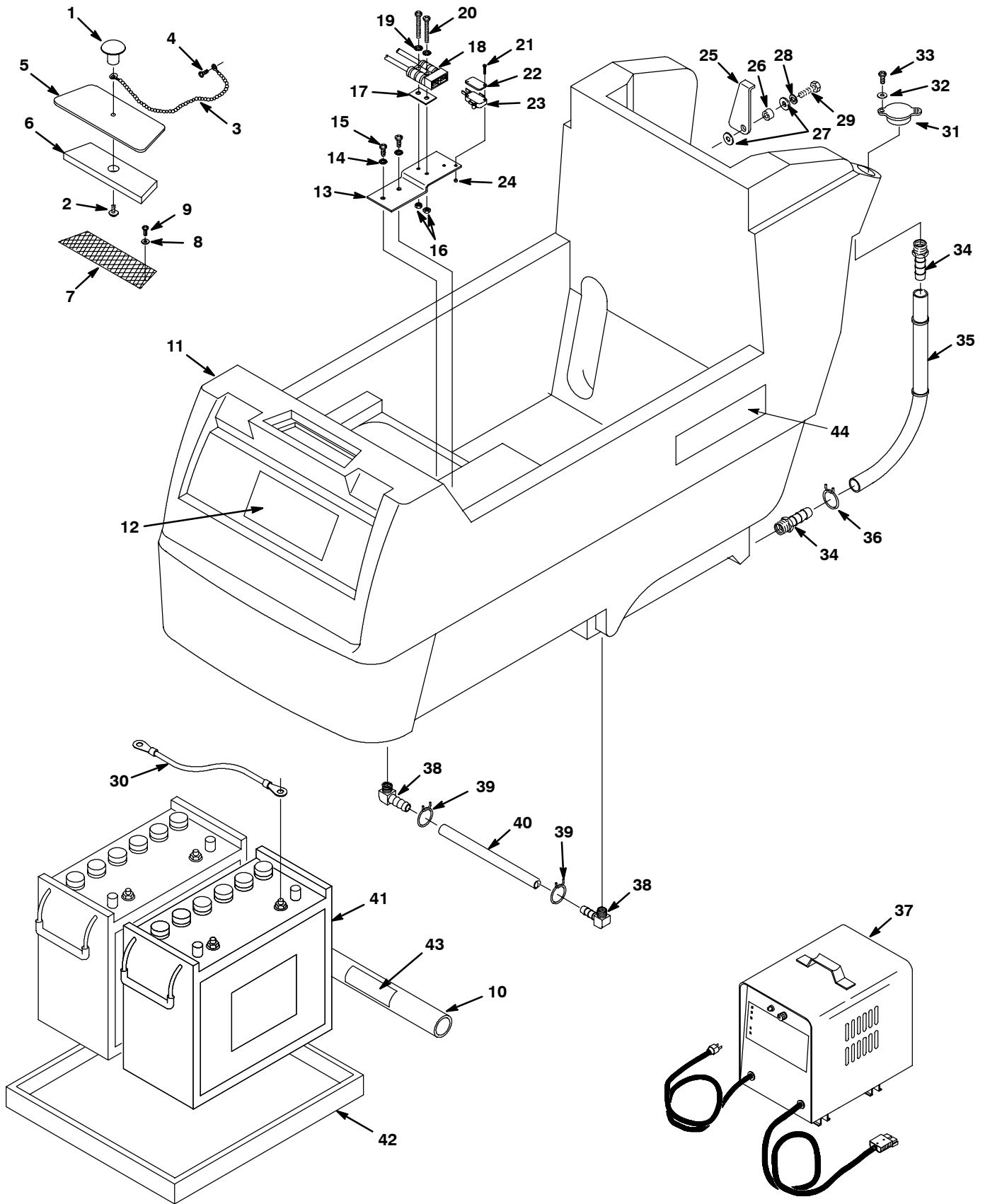
REF	PART #	DESCRIPTION	QTY.
20	626092	●GASKET, VAC FAN	1
▽ 21	605357	●FAN, VACUUM 5.7D 2S 24V	1
▲ 22	190163	●BRUSH, CARBON (PKG OF 2)	1
23	600009	●MUFFLER, VAC EXHAUST	1
24	130041	WIRE TIE, NYLON	1
25	41169	NUT, HEX LOCK .25-20 NY	3
26	140000	WASHER, 1/4 FLAT	3
27	140885	SCREW, TRS .25-20 X 0.50 PHL	9
28	140052	WASHER, LOCK EXT 0.25	9
29	140000	WASHER, 1/4 FLAT	9
30	140300	CLAMP, INSULATED 1/2"ID	1
31	605244	●HINGE, RECOVERY TANK	1
32	609531	●FLOAT, VAC SHUT-OFF (1) BALL	1
33	140000	WASHER, 1/4 FLAT	2
34	140052	WASHER, 1/4 EXT	2
35	140824	SCREW, TRS .25-20 X 0.62 PHL	2
36	630053	●MOUNT, FLOAT-CAGE	1
37	630255	●GASKET, FLOAT MOUNT	1
38	140308	CLAMP, HOSE 1.31 TO 2.25	1

▽ ASSEMBLY

▲ INCLUDED IN ASSEMBLY

● RECOMMENDED STOCK ITEMS

SOLUTION TANK GROUP



SOLUTION TANK GROUP

REF	PART #	DESCRIPTION	QTY.
▽	609972	●ASM, SOLUTION FILL COVER	1
▲ 1	578301	KNOB, RND #10-32 FILL-COVER	1
▲ 2	578201000	SCREW, #10-32X.5 PAN PHL	1
▲ 3	621443	CHAIN, BALL, #10 X 157L SS	1
▲ 4	3701.6	SCREW, PAN #6-32 X 0.38 PHL	1
▲ 5	609419	COVER, FRONT FILL	1
▲ 6	609362	COVER, SEAL	1
7	609106	●FILTER, SCREEN SOL FILL	1
8	140032	WASHER, #6 FLAT	2
9	3701.6	SCREW, PAN #6-32 X 0.38 PHL	2
10	602592	SUPPORT, TUBE BATTERY	1
11	608879	SOL. TANK, BLUE	1
12	603083	DECAL, "CASTEX" 7" WHITE	1
13	600325	BRACKET, CHRGR PLUG SWITCH	1
14	07514	WASHER, LOCK, INT. #10	2
15	140892	SCREW, #10-24X1/2 RND PHL	2
16	140539	NUT, #6-32 KEP	2
17	603331	SPACER, CHARGER PLUG	1
18	605387	●CONNECTOR, RED 50A	1
19	140019	WASHER, LOCK #6 EXT	2
20	140829	SCREW, #6-32X1 PAN PHL	2
21	578403000	SCREW, M3X.5X20 PAN PHL	2

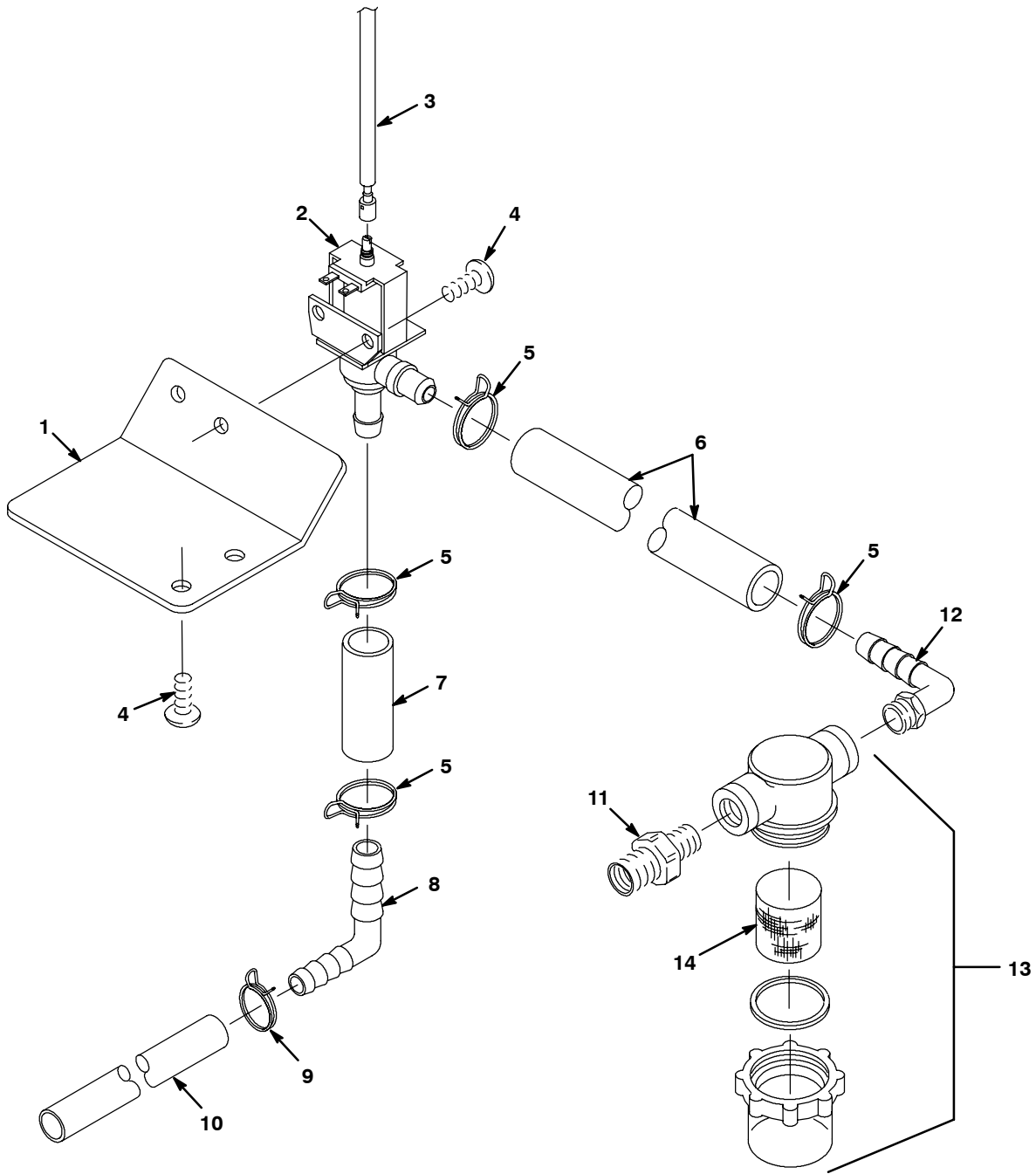
▽ ASSEMBLY

▲ INCLUDED IN ASSEMBLY

● RECOMMENDED STOCK ITEMS

REF	PART #	DESCRIPTION	QTY.
22	601359	PLATE, SWITCH BACKING	1
23	600437	●SWITCH, SNAP ACTION 250V 16A	1
24	579211	NUT, M3 HEXLOCK	2
25	230925	SUPPORT, RECOVERY TANK	1
26	611418	SLEEVE, 0.437D 0.315B 0.14L	1
27	140027	WASHER, FLAT 0.31	2
28	140015	WASHER, LOCK SPLIT 0.31	1
29	140226	SCREW, HEX .31-18 X 0.62	1
30	130364	●CABLE, BATTERY 6 BLK X 15"	1
31	621324	●PLUG, EXPANDABLE 1.5D	1
32	140011	WASHER, FLAT 0.18	1
33	140350	SCREW, #10X1/2 PAN PHL	1
34	14884	FITTING, BRS STR BM08/PM06	2
35	700420	ASM, HOSE W/SOL. INDICATOR	1
36	607776	CLAMP, HOSE .73-.77 WIRE BLK	1
37	603553	CHARGER, 24DC/12A 120V (OPTION)	1
38	150419	FITTING, 1/4MX3/8H ELB 90° BRS	2
39	607775	CLAMP, HOSE .63-.66 2-WIRE BLK	2
40	606240	HOSE 3/8ID X 5/8OD X 10.25	1
41	130869	BATTERY, 12V 130AH (OPTION)	2
42	602927	TRAY, BATTERY	1
43	120589	DECAL, BATTERY PLACEMENT	1
44	608873	DECAL, "BA-2000"	2

SOLUTION CONTROL GROUP



SOLUTION CONTROL GROUP

REF	PART #	DESCRIPTION	QTY.
1	608835	BRACKET, SOLUTION VALVE MNT	1
2	630022	●VALVE, WATER SOL 24VDC	1
3	609108	CABLE, SOLUTION FLOW CNTRL	1
4	140832	SCREW, RND .25-20X0.38 PHL	4
5	607776	CLAMP, HOSE .73-.77 WIRE BLK	4
6	609926	HOSE, 1/2"IDX3/4"OD X 5"	1
7	609925	HOSE, 1/2"IDX3/4"OD X 1.75"	1
8	621217000	FITTING, 3/8HX1/2H ELBOW	1

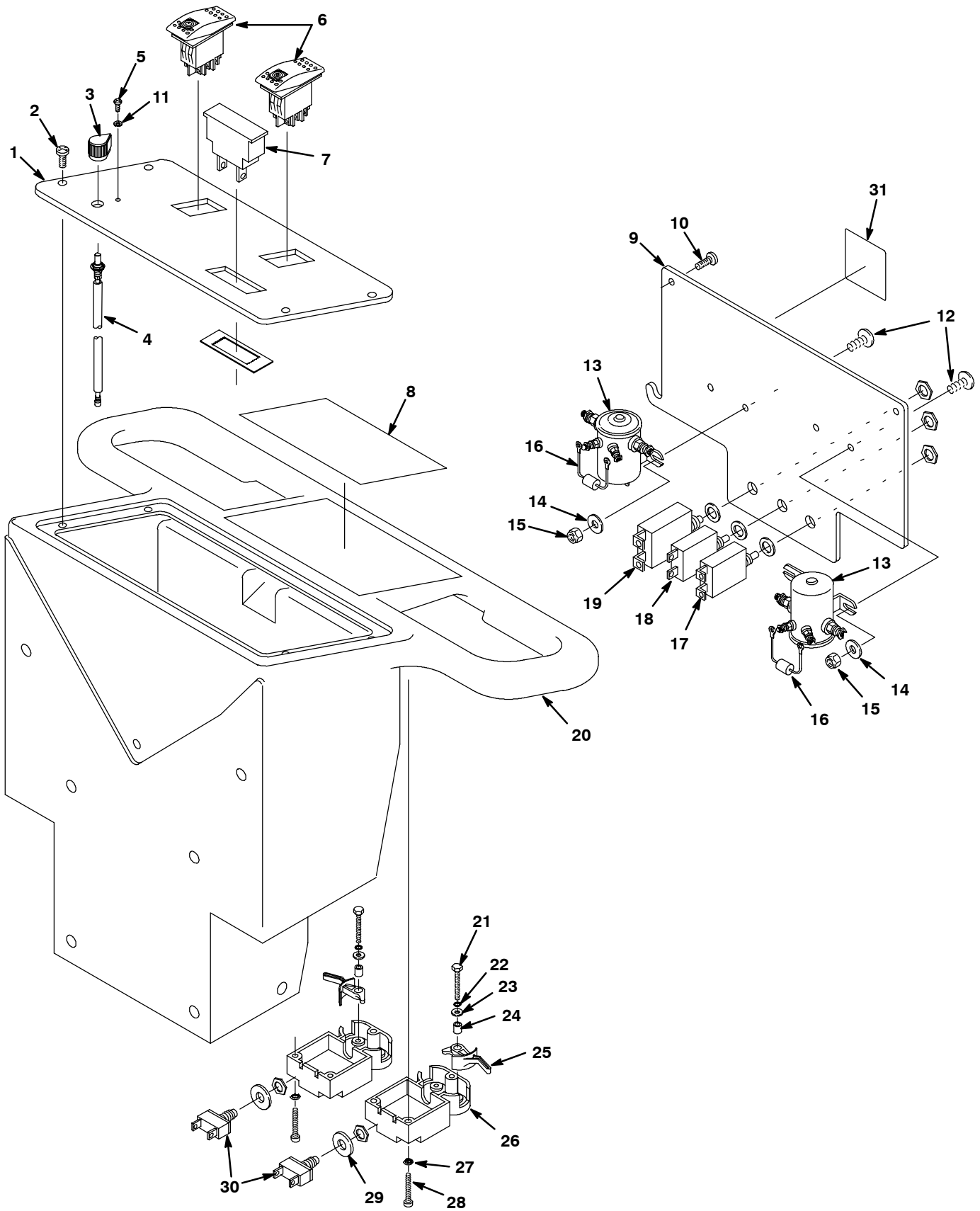
REF	PART #	DESCRIPTION	QTY.
9	607775	CLAMP, HOSE .63-.66 2 WIRE BLK	1
10	609924	HOSE, 3/8"IDX5/8"OD X 19"	1
11	608856	FITTING, BRS, STR, PM08/PM06	1
12	150425	FITTING, E90, PM06/BM08 NY	1
▽ 13	1005302	●FILTER, INLINE PF06/PF06 80 MESH	1
▲ 14	1005304	●SCREEN, FILTER	1

▽ ASSEMBLY

▲ INCLUDED IN ASSEMBLY

● RECOMMENDED STOCK ITEMS

CONTROL CONSOLE GROUP



CONTROL CONSOLE GROUP

REF	PART #	DESCRIPTION	QTY.
1	607350	PANEL, SWITCH	1
2	606694	SCREW, TRS M4X0.7X8 PHL	4
3	626121	●KNOB, RND 0.7ID 0.75L PLSTC	1
4	609108	●CABLE, SOLUTION FLOW CNTRL	1
5	140756	SCREW, #6-32X1/4 PANPHL	1
6	601107	●SWITCH, ROCKER LIGHTED 24V	2
7	606020	●METER, BATTERY VOLTAGE 24V	1
8	609109	DECAL, INSTRUCTIONS	1
9	607351	PANEL, CONTROL HSG REAR	1
10	606694	SCREW, TRS M4X0.7X8 PHL	2
11	069764054	WASHER, #6 LOCK	1
12	140885	SCREW, 1/4-20X1/2	4
13	605905	SOLENOID, 24VDC 125A	2
14	140000	WASHER, 1/4 FLAT	4
15	41169	NUT, HEX LOCK 1/4-20 NL	4
16	606404	●ASM, DIODE W/RING TERMINALS	2
17	606780	●CIRCUITBREAKER, 30A RESETABLE	1
18	130737	●CIRCUITBREAKER, 10A	1

REF	PART #	DESCRIPTION	QTY.
19	602951	●CIRCUITBREAKER, 35A	1
20	608880	CONTROL HSG., BLUE	1
▽	611470	●ASM., TRIGGER CONSOLE LEFT	1
▽	611471	●ASM., TRIGGER CONSOLE RIGHT	1
▲ 21	069764190	SCREW, M3X.5X16 HXHDCP	2
▲ 22	200662012	WASHER, M3 INT	2
▲ 23	578186000	WASHER, M4.3X12X1.0 FLAT	2
▲ 24	578082000	SPACER, .14X.31X.44 NY	2
▲ 25	578002000	●ARM, TRIGGER	2
▲ 26	601429	●CONSOLE, TRIGGER	2
27	02938	WASHER, LOCK #8 INT	6
28	200070354	SCREW, PAN M4X0.7X30 PHL	6
29	578430	WASHER, 1/2 SPRING-DISC	2
30	130712	●SWITCH, MOMENTARY PULSE	2
31	606105	LABEL, HZRD DO NOT SPRAY	1
N/S	609192	HARNES, WIRE	1

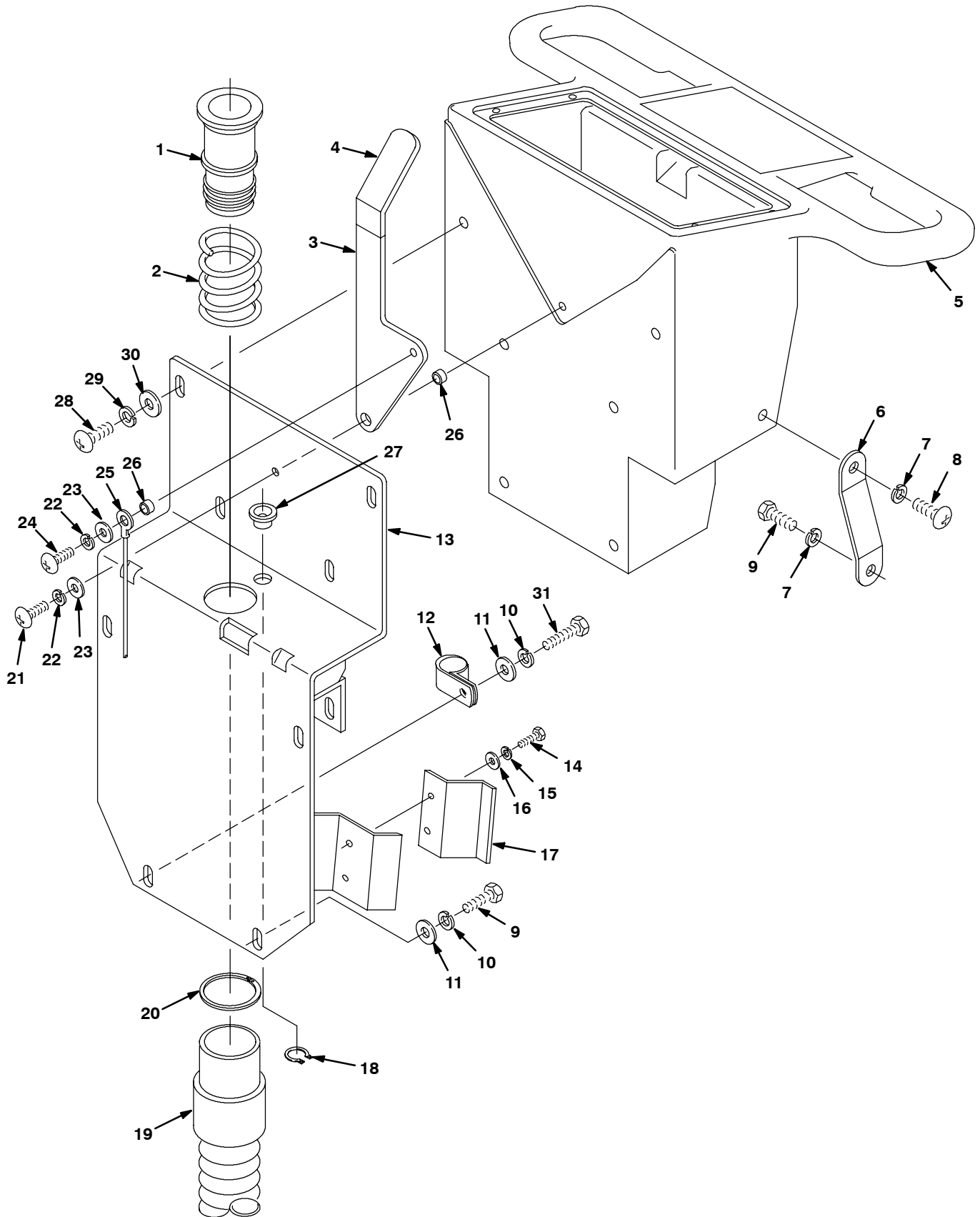
▽ ASSEMBLY

▲ INCLUDED IN ASSEMBLY

● RECOMMENDED STOCK ITEMS

N/S = NOT SHOWN

CONSOLE MOUNTING GROUP



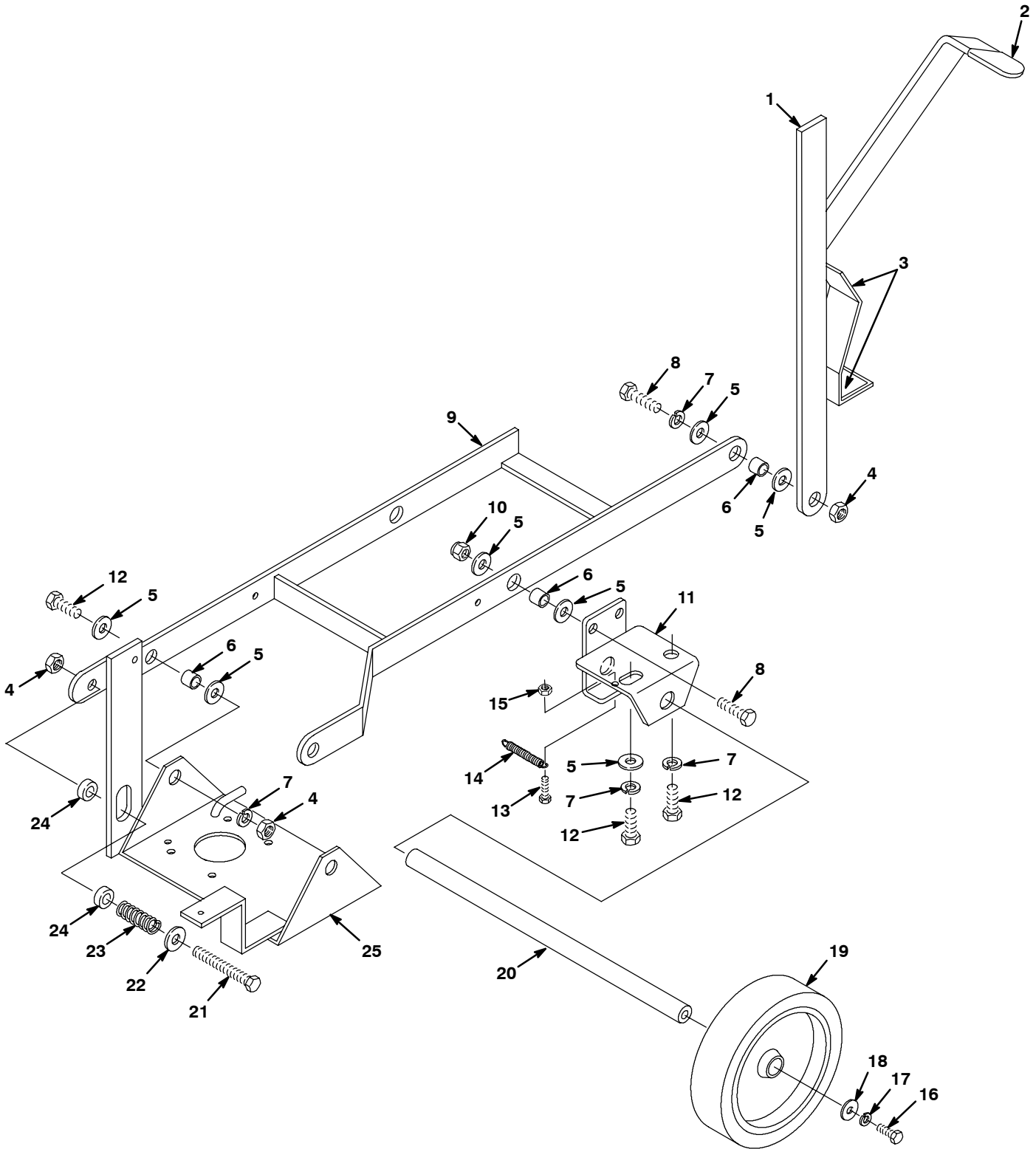
CONSOLE MOUNTING GROUP

REF	PART #	DESCRIPTION	QTY.
1	630011	TUBE, VAC TRANS FLANGE AND BARB	1
2	630267	SPRING, CMPR 59.9D 3.0W 50.8L	1
3	604947	HANDLE, SQUEEGEE LIFT	1
4	200816	GRIP, HANDLE 1/4 X 1 X 2-1/4	1
5	608880	CTRL. HSG., BLUE	1
6	609107	BRACKET, HOUSING SUPPORT	2
7	140015	WASHER, LOCK SPLIT 0.31	4
8	610010	SCREW, TRS .31-18 X 0.62	2
9	140226	SCREW, HEX .31-18 X 0.62	7
10	140015	WASHER, LOCK SPLIT 0.31	6
11	140027	WASHER, FLAT 0.31	6
12	140314	CLAMP, CABLE INSULATED 3/4ID	1
13	606725	BRACKET, CONTROL HSG MNT	1
14	01697	SCREW, HEX .25-20 X .62	2
15	140016	WASHER, LOCK 0.25	2

● RECOMMENDED STOCK ITEMS

REF	PART #	DESCRIPTION	QTY.
16	140000	WASHER, 1/4 FLAT	2
17	230872	LATCH PLATE, BRUSH LIFT	1
18	621236000	RING, RETAINING .810 DIA	1
19	608859	●HOSE, VAC 1-1/2X29" W/CUFFS	1
20	630016	RING, RETAINING EXT 1.82 DIA	1
21	140824	SCREW, TRS .25-20 X 0.62 PHL	1
22	140016	WASHER, LOCK 0.25	2
23	140000	WASHER, 1/4 FLAT	2
24	140864	SCREW, TRS .25-20 X 0.75 PHL	1
25	608858	●CABLE, SQUEEGEE LIFT	1
26	140134	SLEEVE, 0.376D 0.253B 0.28L	2
27	1009363	●BUSHING, CABLE	1
28	610010	SCREW, TRS .31-18 X 0.62	4
29	140015	WASHER, LOCK SPLIT 0.31	4
30	140027	WASHER, FLAT 0.31	4
31	02991	SCREW, HEX .31-18 X 0.75	1

SCRUB HEAD LIFT GROUP



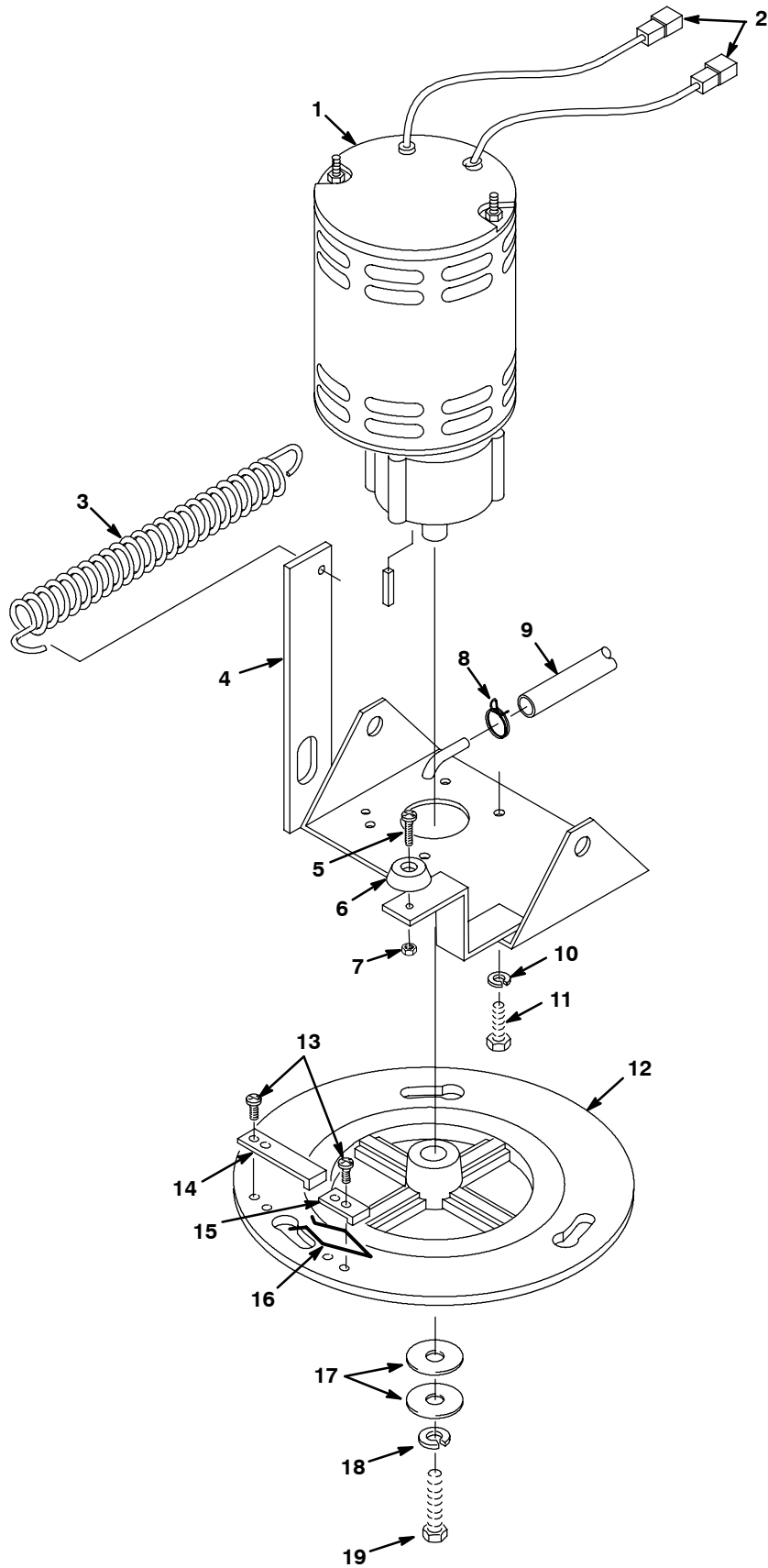
SCRUB HEAD LIFT GROUP

REF	PART #	DESCRIPTION	QTY.
1	230874	LEVER, BRUSH LIFT FOOT	1
2	200816	GRIP, HANDLE 1/4 X 1 X 2-1/4	1
3	102560	PAD, NON-SLIP 1.62 SQ.	2
4	140509	NUT, 1/2-13 HEX.JAM	4
5	140045	WASHER, FLAT .51B 1.25D .06	12
6	140139	SLEEVE, 0.625D 0.50B 0.25L	5
7	140024	WASHER, LOCK 0.50 SS	7
8	140236	SCREW, HEX .50-13 X 1.25	3
9	230870	WELDMENT, LIFT BRACKET	1
10	02931	NUT, HEX LOCK .50-13 NL	2
11	230869	BRACKET, AXLE & SQ PIVOT MNT	2
12	140237	SCREW, HEX .50-13 X 1.00	6
13	02991	SCREW, HEX .31-18 X 0.75	2

REF	PART #	DESCRIPTION	QTY.
14	140433	SPRING, EXT .50 X 3.00	2
15	140506	NUT, HEX .31-18	2
16	02994	SCREW, HEX .38-16 X 0.75	2
17	140017	WASHER, LOCK SPLIT 0.38	2
18	140028	WASHER, FLAT 0.38	2
19	1012022	●WHEEL, 8.0D 1.50W POLYOLEFIN	2
20	230743	SHAFT, AXLE .75D 166L	1
21	140234	SCREW, HEX .50-13 X 2.50	1
22	3148.816	WASHER, 0.52B 0.88D .06	1
23	140430	SPRING, HANDLE LOCK	1
24	140127	BEARING, THRUST .51X1X1/8 BRZ	2
25	230871	BRACKET, MOTOR MOUNT	1

● RECOMMENDED STOCK ITEMS

SCRUB BRUSH DRIVE GROUP



SCRUB BRUSH DRIVE GROUP

REF	PART #	DESCRIPTION	QTY.
1	130491	●MOTOR, ELE 24VDC 0.75HP W/GEARBOX IMP	1
	190970	●BRUSH, CARBON (1 PER PKG)	4
2	130192	TERMINAL, MALE .25	2
3	140431	SPRING, EXT 1.0 X 5.00 X .095	1
4	230871	BRACKET, MOTOR MOUNT	1
5	140823	SCREW, TRS #10-24X 0.62 PHL	1
6	100091	BUMPER, RECESSED	1
7	140552	NUT, HEX #10-24 NL	1
8	607775	CLAMP, HOSE .63-.66 2-WIRE BLK	1
9	609924	HOSE, 3/8IDX5/8ODX19" CLEAR	1

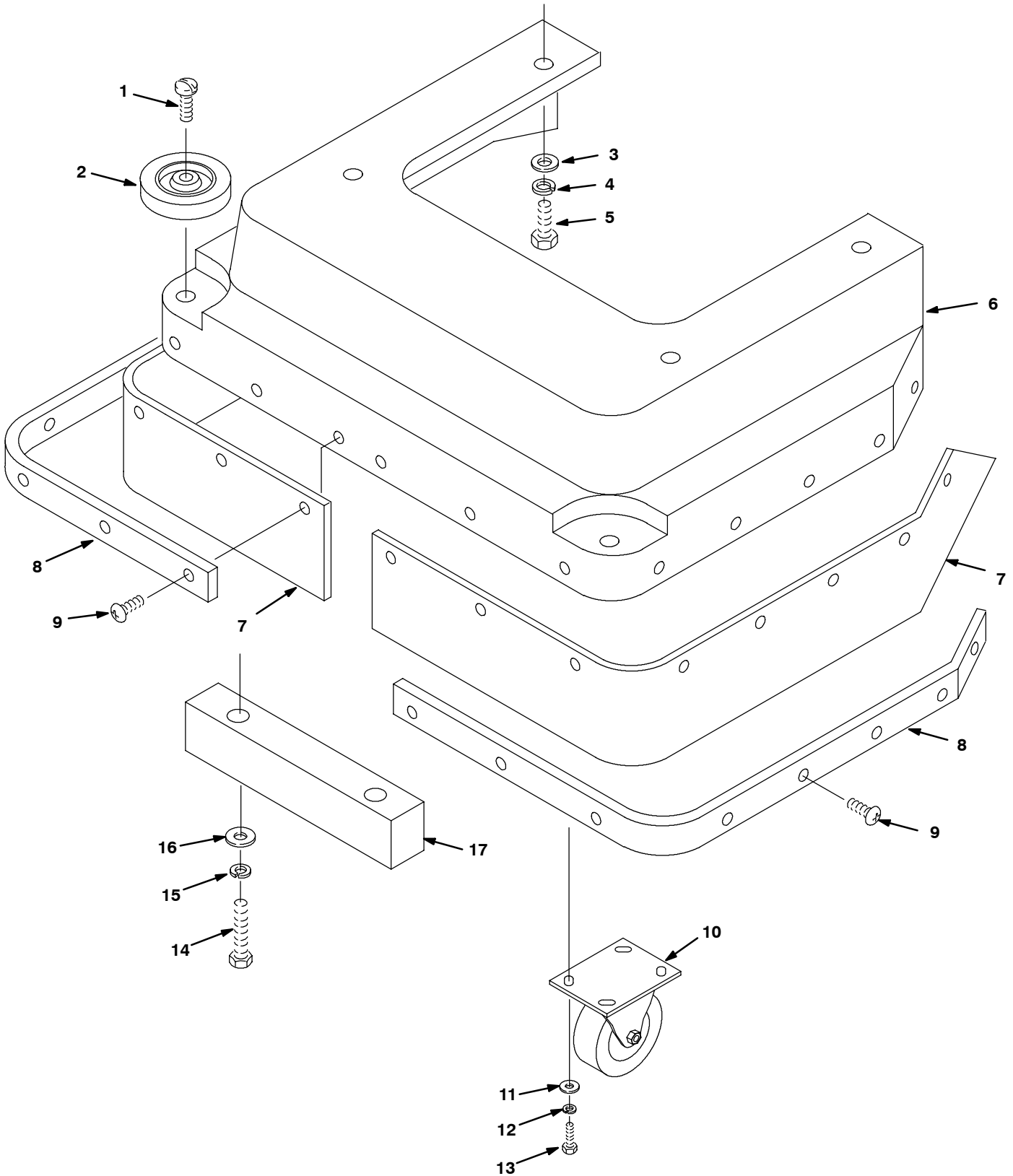
REF	PART #	DESCRIPTION	QTY.
10	140017	WASHER, LOCK SPLIT 0.38	4
11	140202	SCREW, HEX .38-16 X 1.00	4
12	606335	PLATE, DRIVE MOLDED	1
13	606915	SCREW, HIGH-LOW 10-16X3/8	4
14	230697	●STOP, DRIVER RELEASE	1
15	230651	●CLAMP, BRUSH PLATE	1
16	140417	●CLIP, SPRING	1
17	25732	WASHER, 0.36B 1.25D .093 FLAT	2
18	140015	WASHER, LOCK SPLIT 0.31	1
19	140219	SCREW, HEX .31-18 X 1.00	1

▽ ASSEMBLY

▲ INCLUDED IN ASSEMBLY

● RECOMMENDED STOCK ITEMS

SCRUB HEAD SKIRT GROUP



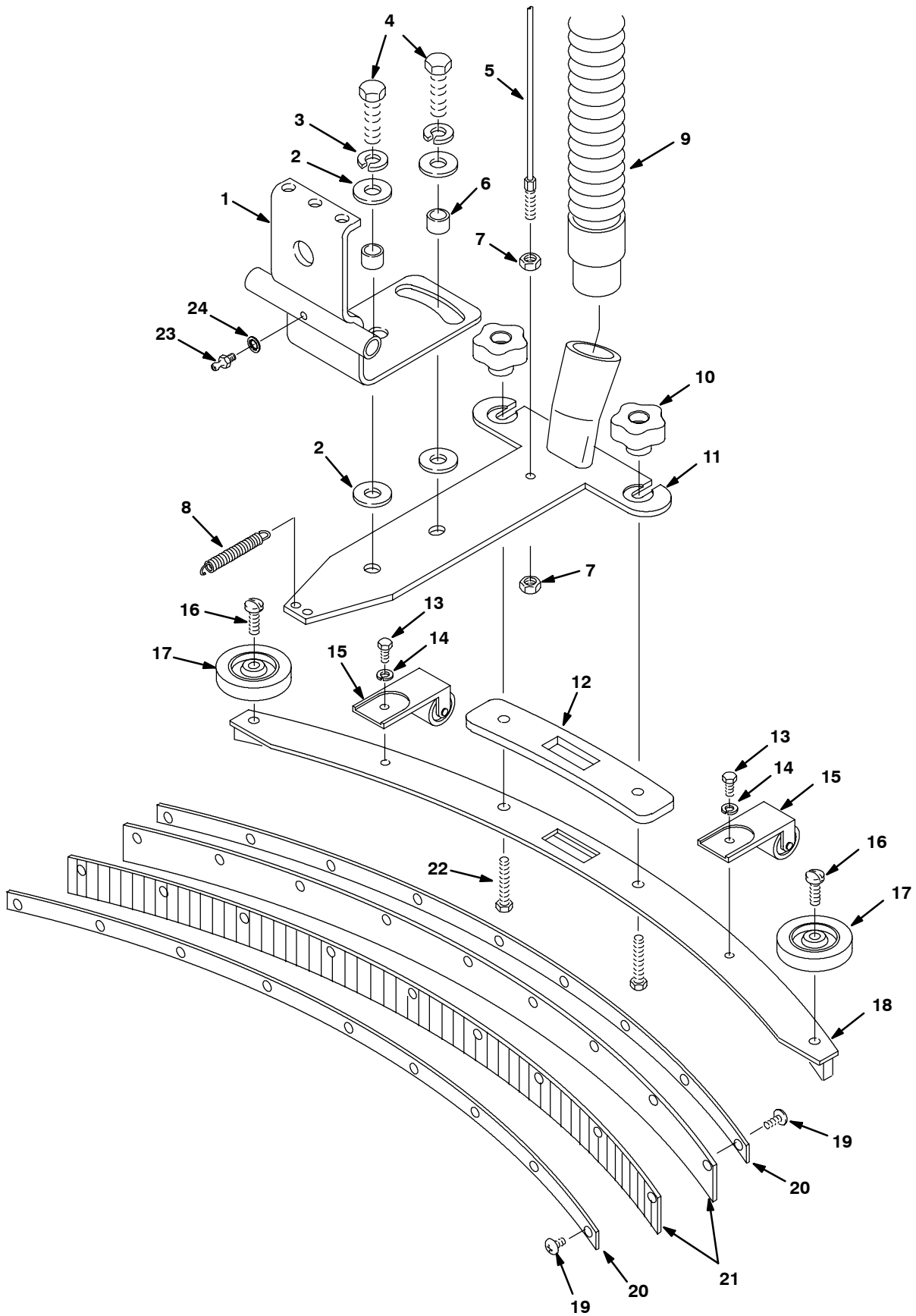
SCRUB HEAD SKIRT GROUP

REF	PART #	DESCRIPTION	QTY.
1	140799	●SCREW, TRS .31-18 X 1.50 PHL	2
2	1014918	●WHEEL, RUBBER W/BUSHINGS	2
3	140055	WASHER, .343 X 1.25 X .051	4
4	140015	WASHER, SPLIT LOCK 0.31	4
5	140216	SCREW, HEX .31-18 X 1.50	4
6	606972	SKIRT, HSG. BLUE	1
7	605958	●SPLASH GUARD	2
8	605959	STRAP, SPLASH GUARD	2
9	605975	SCREW, TRS 10-24X0.50 PHL SEM	16

● RECOMMENDED STOCK ITEMS

REF	PART #	DESCRIPTION	QTY.
10	606986	●CASTER, SWIVEL 3"X1.25"	2
11	140000	WASHER, 1/4 FLAT	8
12	140016	WASHER, LOCK 0.25	8
13	01697	SCREW, HEX .25-20 X .62	8
14	140220	SCREW, 5/16-18X2-1/2 TAP	2
15	140015	WASHER, LOCK SPLIT 0.31	2
16	140027	WASHER, FLAT 0.31	2
17	230875	WEIGHT, 2X2.5X9.5	1

SQUEEGEE GROUP



SQUEEGEE GROUP

REF	PART #	DESCRIPTION	QTY.
1	608834	MOUNT, SQUEEGEE PIVOT	1
2	140045	WASHER, FLAT .51B 1.25D .06	4
3	140024	WASHER, LOCK 0.50 SS	2
4	140237	SCREW, HEX .50-13 X 1.00	2
5	608858	CABLE, SQUEEGEE LIFT	1
6	140139	SLEEVE, 0.625D 0.50B 0.25L	2
7	140524	NUT, 1/4-20 KEP	2
8	140433	SPRING, EXT .50 X 3.00	2
9	608859	HOSE, VAC 1-1/2X29" W/CUFFS	1
10	1011094	●KNOB, STAR 1.50IN DIA 5 EAR	2
11	230730.BK	BRACKET, SQUEEGEE MNT BLK	1
∇	603261	●ASM, SQUEEGEE CURVED	1
▲	603260	●GASKET, SQUEEGEE CURVED	1
▲	140226	SCREW, HEX .31-18 X 0.62	2
▲	140015	WASHER, LOCK SPLIT 0.31	2

REF	PART #	DESCRIPTION	QTY.
▲ 15	700844	●ASM, SQUEEGEE ROLLER	2
▲ 16	140799	SCREW, TRS .31-18 X 1.50 PHL	2
▲ 17	1014918	●WHEEL, RUBBER W/BUSHINGS	2
▲ 18	602959	WELDMENT, SQUEEGEE 20"	1
▲ 19	605975	SCREW, TRS 10-24X0.50 PHL SEM	18
▲ 20	602964	●PLATE, SQUEEGEE RETAINING	2
▲ 21	603659	●BLADE, SQUEEGEE STANDARD (FORWARD/REVERSE)	2
OPTIONAL REAR BLADES			
	606676	●BLADE, SQUEEGEE REAR, GUM RUBBER	1
	607465	●BLADE, SQUEEGEE REAR, LINATEX	1
▲ 22	140221	SCREW, HEX .31-18 X 1.25	2
23	150015	FITTING, GREASE 1/4-28	1
24	578244000	WASHER, M6.4 X 10 LOCK	1

∇ ASSEMBLY

▲ INCLUDED IN ASSEMBLY

● RECOMMENDED STOCK ITEMS