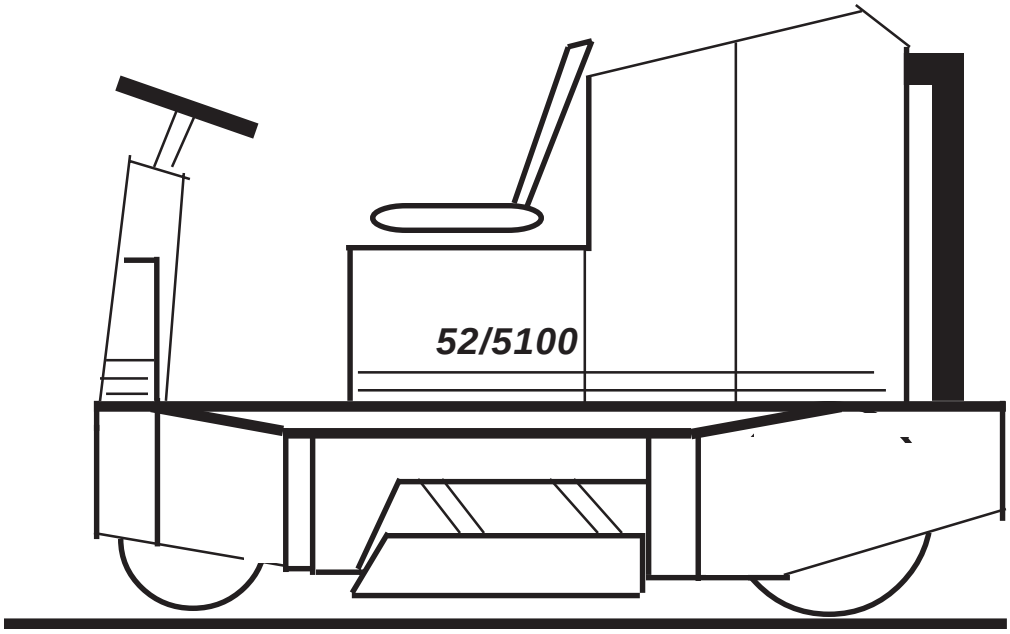
FACTORY CAT

TOMCAT

FACTORY CAT MODEL 52

TOMCAT Model 5100

Industrial Rider Scrubber



Operator's Manual
Parts & Service Book

PS-52-ENG

TOMCAT MODEL 5100 RIDER SCRUBBER

Operator's Manual & Parts Book

TABLE OF CONTENTS

SAFETY WARNINGS!

THESE WARNINGS ARE NOT MEANT TO BE A COMPLETE LIST AND ONLY THE OPERATOR'S INTELLIGENCE, GOOD SENSE AND CARE OF UNIT WILL ASSURE

THAT MOST HAZARDS WILL BE AVOIDED.

1. **READ THIS MANUAL CAREFULLY AND COMPLETELY BEFORE OPERATING, ADJUSTING OR REPAIRING THIS MACHINE.**
   If you have a question concerning the machine or its operation, or would like extra copies of this book, you may call the Factory at 1-(800)-450-9824, or Fax your questions to us at 1-(262)- 632-6961.

2. **CHARGING THE BATTERIES WILL PRODUCE EXPLOSIVE HYDROGEN GAS.**
   Do not smoke or allow open flame near a charging battery. Do not smoke while working around the machine. Do not charge battery with the hood (lid) of the machine closed or hydrogen gas may accumulate within.

3. **TO AVOID ACCIDENTALLY STARTING UP THE MACHINE, ALWAYS TURN OFF THE KEY SWITCH BEFORE GETTING ON OR OFF UNIT. OTHERWISE BUMP ING THE FOOT CONTROL COULD CAUSE UNIT TO START UP.**
   A green warn ing light on the right-hand control panel shows when power is on.

4. **WHEN YOU LEAVE THE MACHINE UNATTENDED, ALWAYS SHUT OFF THE UNIT AND TAKE THE KEY.**

5. **DRESS SAFELY**
   Do not wear rings or metal wrist watches while working on this machine. They can cause an electrical short, which, in turn, can cause burns.

   Do not work on this machine while wearing a tie, scarf or other dangling neckware. These can tangle in the rotating brooms, belts and pulleys and cause serious injury or even death.

6. **DO NOT USE THE MACHINE AS A STEP LADDER OR CHAIR.**

7. **IF YOU MUST LIFT UNIT OFF OF GROUND, DO NOT WORK ON UNDERSIDE OF MACHINE WITHOUT PROPERLY SUPPORTING UNIT.**

8. **NO RIDERS!** Model 5100 was meant to carry only the operator.

9. **NO TIGHT, FAST TURNS!** While negotiating turns, reduce speed, steering in a smooth motion. ***Do not turn around while on a ramp!***

10. **NOT INTENDED FOR USE ON STREETS OR SIDEWALKS.** Common sense dictates that driving in traffic is dangerous to the operator of a slow vehicle, while operation on sidewalks can endanger pedestrians.

11. **WARNING: USING FLAMMABLE CLEANING CHEMICALS, OR VACUUMING UP FLAMMABLE CHEMICAL FROM THE FLOOR CAN CAUSE AN EXPLOSION.**
    The vacuum motors can create sparks that will set off volatile chemicals.

SAFETY WARNINGS! *(Continued)*

12. **WARNING: 24 VOLT POWER CAN CAUSE BURNS. DO NOT DROP TOOLS ON LIVE CONNECTIONS. DO NOT WEAR JEWELRY WHILE WORKING ON ELECTRICALS.** Your machine is equipped with rubber covers over the battery terminals. Be sure these stay in good condition and continue to cover the terminals.

13. **BEFORE WORKING ON THE MACHINE, TURN THE KEY OFF, REMOVE KEY, AND DISCONNECT THE BATTERY.** Be aware that the brush and vacuum motors can start if someone else pushes on the foot pedal while the key is turned on, even though the machine makes no noise, and appears "off". **Do not work on machine while someone else is sitting in operator's seat. They could accidentally turn on the power while you work.**

14. **ALWAYS UNPLUG CENTRAL COMMAND FROM BATTERIES BEFORE USING AN EXTERNAL CHARGER.** A power surge from a "dumb" charger could damage Central Command's electronics. This could destroy Central Command's ability to control traction motor speed, and could lead to a "runaway" machine. ***We do not recommend the use of a "dumb" (non-electronic) charger!*** **If you must use one, you must be sure the battery back is disconnected from the Central Command module before connecting the charger.**

15. **STOPPING: UNDERSTAND THE AUTOMATIC BRAKING SYSTEM BEFORE YOU OPERATE THE MACHINE ON SLICK RAMPS.** Machine does not coast. Releasing pedal applies braking force. You control the amount of braking by the suddenness (or smoothness) with which you release the foot pedal. After you stop, the parking brake will set automatically.

16. **PARKING: MAKE SURE THE PARKING BRAKE IS WORKING PROPERLY BEFORE PARKING MACHINE. WE DO NOT RECOMMEND PARKING MACHINE ON RAMPS OR SLOPES.**

17. **TO AVOID TIPOVER, DO NOT MAKE TIGHT TURNS SIDEWAYS ON A RAMP. TURN AROUND ON FLAT GROUND OR FLOOR ONLY. DO NOT MAKE SHARP TURNS AT HIGH SPEED.**

18. **WHILE WORKING ON THE SQUEEGEE SYSTEM, BE SURE KEY IS REMOVED FROM KEYSWITCH.** Inadvertent operation by another person of the powerful squeegee lift mechanism while hands or fingers are in the way could pinch.

18. **DO NOT OPERATE THE MACHINE IF ANY PARTS HAVE BEEN REMOVED FROM IT.** Do not remove or paint over Warning decals. If Warning decals are damaged, they must be replaced.

19. **AUTHORIZED , TRAINED OPERATORS ONLY.** This machine should only be operated by a trained operator. As part of his training, he/she must read this manual thoroughly. If extra copies are needed, contact your local dealer, or the Factory directly at **1-800-450-9824**.

20. **DO NOT OPERATE MACHINE IF IT IS IN UNSAFE CONDITION.**
If the machine is in need of repair or is in any way unsafe or contributes to an unsafe condition, the matter should be reported immediately to the shift supervisor.

Model 5100: SHORT LIST OF DO'S AND DONT'S

1. **AUTOMATIC OPERATION:** Key Switch must be on. When the "Vac" switch is in off ("0") mode, stepping on foot pedal will automatically:

    1. Release parking brake.
    2. Turn on brush motors (if brush head is down)
    3. Turn on vacuum blowers (if vacuum squeegee is down)
    4. Turn on the solution flow.
    5. Accelerate you forward.

2. **TO GO:** Step on the foot pedal. **Go Easy!** As with any electric vehicle, hard acceleration wastes power, and will run the batteries down sooner.

    TO STOP: Let go of the foot pedal. The faster you release the pedal, the faster you will stop. Practice stopping smoothly.

    When machine comes to a complete stop, parking brake will automatically set. **Go slow until you get accustomed to the automatic braking. Allow at least one machine length to come to a stop on level ground, more on hills.**

3. **DO NOT "SLAM-SHIFT" OR "PLUG".** This machine has dynamic braking. Always come to a full stop before shifting from forward to reverse, or from reverse to for ward. *Otherwise, you could damage the transaxle's drive coupling.*

4. **TO SCRUB**: The brushhead has to be lowered, and the brushes on the ground. Brushes will start and stop with the foot pedal (in automatic mode). You can build pressure on the brushes with the brushhead switch. ***REMEMBER THAT EXCESS BRUSH PRESSURE WASTES BATTERY POWER AND WILL GREATLY LOWER RUN TIME ON A CHARGE.***

5. **TO SQUEEGEE** Lower the squeegee. Vacuum will start when you step on the foot pedal (in automatic mode), and will stop 15 seconds after you release the pedal. Squeegee will automatically lift when you select reverse.

6. **DON'T RUN BATTERIES ALL THE WAY DOWN!** Machine will begin to slow down--a lot--as batteries near the end of their charge. It is a bad idea to run the battery this far down. Watch the battery gauge on the left side of the operator's seat. Stop before "Empty".

7. **TO RECHARGE:** To recharge battery, be sure the key switch is off. Open the hood, and plug in the external charger supplied with the machine. A green light will come on. When the light goes out, battery is charged. **LEAVE THE BATTERY BOX COVER OPEN WHILE THE BATTERY IS CHARGING.**

8. **CLEAN OUT THE MACHINE AT END OF DAY.** You can inspect the recovery (pick-up) tank's condition by opening the door on top and looking in. If after you flush it out there is still dirt on the bottom, open the clean-out door and clean out using water and/or the cleanout tool provided with the machine.

9. **NEVER USE FLAMMABLE OR EXPLOSIVE CHEMICALS IN THE MACHINE.** Sparks from the vacuum motor will ignite flammable fluids kept in the tank. This could cause an explosion. Such chemicals include, but are not limited to cleaning fluid, gasoline, kerosene or other petroleum-based products. If in doubt about flammability, refer to the chemical product's M.S.D.S. sheet before using.

10. **DO NOT DRIVE MACHINE OVER BUMPS MORE THAN 2" HIGH UNDER ANY CIRCUMSTANCES.** If in doubt, get off the machine to check clearance with the brushhead of the unit.

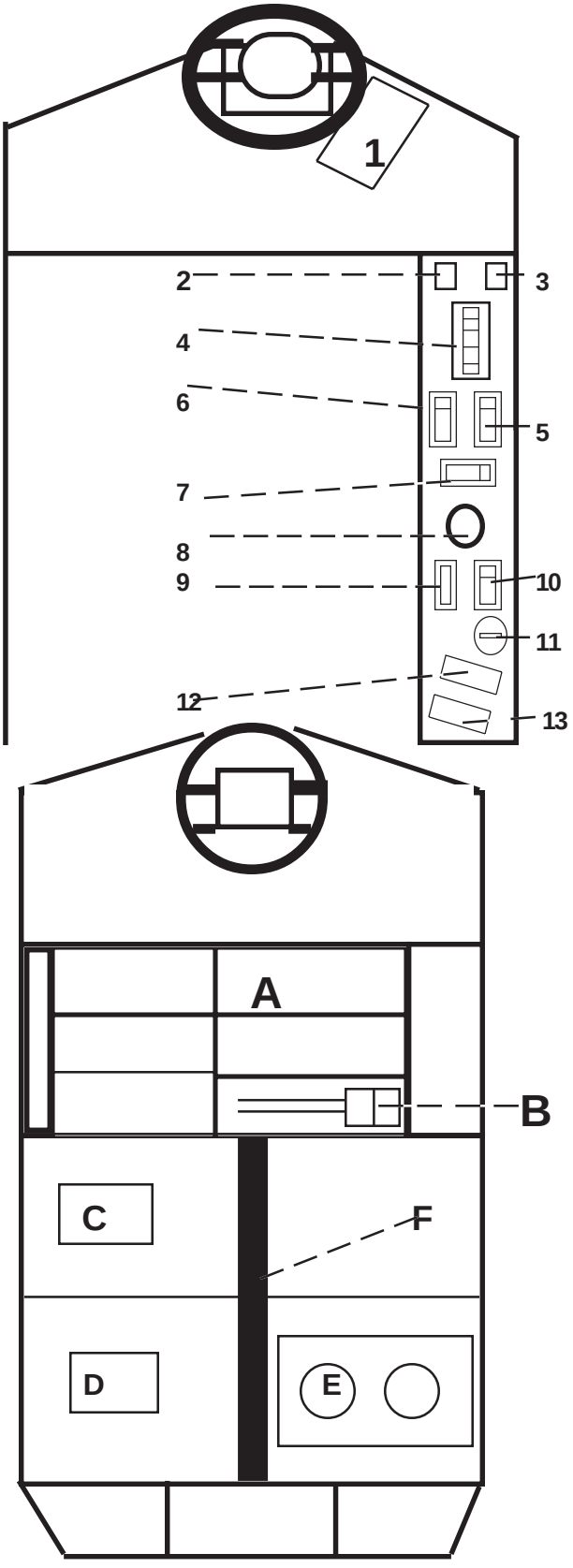
11. **MUST SCRUB GREAT.** Simply working "OK" isn't good enough. If your scrubber isn't scrubbing or vacuuming up really well, or seems hard to use, or is making strange noises, something is wrong. Here's what to do:

    A. Read this book.
    B. Then call your dealer for info or service.
    Or you can call us at the Factory toll free: **1-800-450-9824**.
    We'll talk you through the problem.

OPERATING YOUR MACHINE

CONTROLS & FUNCTIONS

1. **Foot Pedal:** Controls Forward speed and braking. Also turns on and shuts off solution, brushes, and vacuum .
2. **Yellow "Low Solution" Light**: Glows when Solution tank is nearly empty.
3. **Red "Recovery Tank Full" Light**. Glows when Recovery Tank is full.
4. **Brush Downpressure Indicator.** Shows relative pressure on the brushes by vertical LED readout.
5. **Squeegee Lift Switch.** Lifts and lowers squeegee and turns the recovery tank's vacuum on and off automatically.
6. **Brush Downpressure Switch.** Pushing on the front edge of this switch lowers the brushes, and, when they reach the floor, increases pressure. Pushing on the back reduces pressure and then raises the brushes off the floor.
7. **Auto-Manual Switch.** In "Auto" mode, the solution, brush rotation and vacuum will automatically stop when the operator releases the foot pedal. In manual mode, these items will keep running until the operator stops them manually.
8. **Solution Flow Control.** Varies the amount of solution that is laid down on the brushes. Pull up on the knob to increase solution flow.
9. **Power-On Light.** Glows green when the key is on and battery power is available.
10. **Forward-Reverse Switch.** Push the forward edge of the switch to go for ward, and the back to reverse. In reverse mode the squeegee will automatically lift. ***Do not shift from forward to reverse unless you are stopped!!!***
11. **Key Switch.** Insert key and turn either direction to turn power on.
12. **Battery Indicator.** Shows relative battery strength with an LED readout--like a fuel gauge. Note that this gauge will reset to "full" whenever you unplug the batteries, whether or not the batteries are recharged. ***When light flashes, you must stop to recharge!***
13. **Hour Meter.** Runs when keyswitch is on.



COMPONENT LOCATIONS

A. **Batteries.** (Under the Operator's Seat. Check water every two weeks. Read battery section of this book.

B. **Battery Connector** (Red 175 Connec tor). Disconnect this from the Central Command control panel, and connect to the charger to recharge batteries. ***Leave the battery box door open during recharging!***

C. **Solution Tank Door.** Add detergent and water here.

D. **Recovery Air-Out Door.** Used for daily clean-up and flushing out of the Recovery Tank.

E. **Vac Motor Housing.** Vacuum motors for recovery are kept here. Open the box for access.

F. **Tank Retaining Strap.** This black polypropylene strap keeps the solution and recovery tanks (which are removable) in place. The strap tensioner, which is at the base of the rear bumper, is adjustable.

G. **Recovery Drain Hose.** Drain and flush out the recovery tank every evening. If necessary, clean out the tank using **H.** Recovery Cleanout Door.

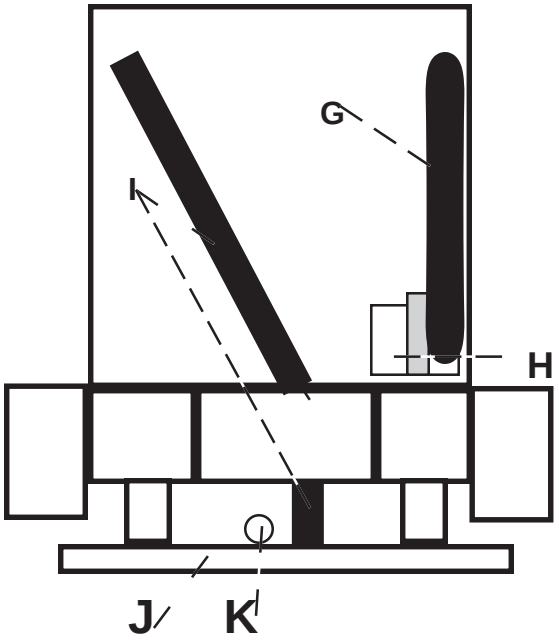
H. **Recovery Cleanout Door.** Gives access to tank interior. Do not open until tank is first drained. Be sure you clean the sealing surface before clamping the door back on or door may leak.

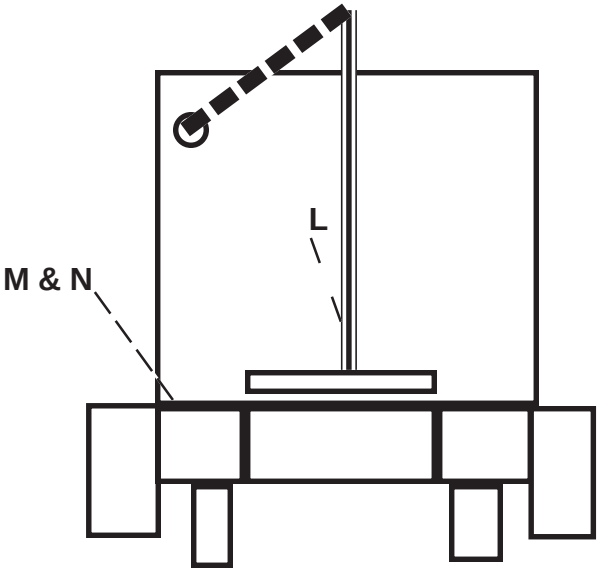
I. **Recovery Hose.** Connects between squeegee and recovery tank. Hose is easily removed if clog occurs. Clog will generally occur at the squeegee.

J. **Squeegee.**

K. **Squeegee Pitch Adjustment.** Adjust for maximum effectiveness. Moves front of squeegee up and down.

In general, back blades of squeegee must touch the floor in the corners. If squeegee trails in the middle--it is pitched too far forward. If it trails at the edges, it is pitched too far back.





L. **Optional Vac Wand.** Unplug (I.) Recovery Hose, and plug in this wand for remote cleaning. Stores as shown on bumper-mounted bracket.

M. **Optional Vac Wand Solution Tap.** Blue solution flow hose for wand plugs Behind left corner of bumper.

N. **Pump Switch for Optional Vac Wand.** Turn on for solution flow. Found behind left corner of bumper. ***Be sure to turn the pump off when it is no longer needed!***

HOW IT WORKS

1. **Three Scrub brushes**, under ma chine, rotate under pressure on the floor. Pressure is applied to them by the operator downpressure control.

2. **Solution** (detergent and water) flows from the solution tank just behind the operator, via plumbing to the brushes.

3. The solution and brushing clean the floor.

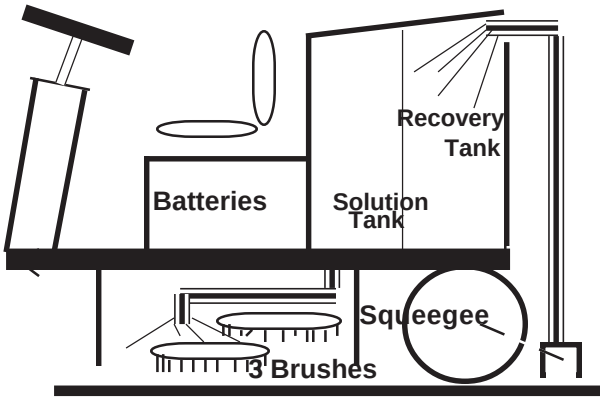
4. **The squeegee**, at rear of machine, picks up the dirty water from the floor.

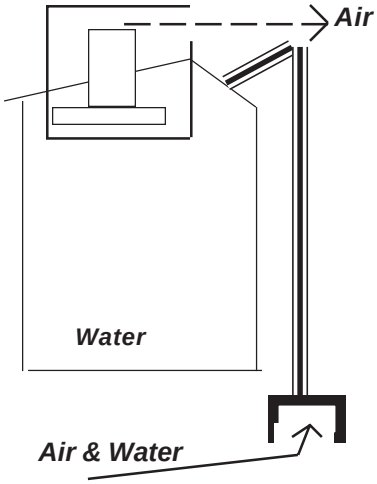
5. **The recovery tank** stores the dirty water for later dumping.

6. **The rear wheel drive system** uses a variable speed motor. The motor drives a transaxle, and through it, the two rear tires. The motor's speed, rate of acceleration and decelaration are controlled through the "Central Command" system located in the control panel on the operator's right-hand side.

7. When the operator lets up on the foot pedal, ***Central Command*** brings the machine to a smooth stop, and then automatically sets the parking brake on the transaxle.

8. Power for the brushes and vacuum impelers come from individ-ual motors.





Motors in the top of the tank create vacuum, which pulls through the squeegee.

9. ***Central Command*** turns these motors on whenever the foot pedal is depressed, and turns them off after the sweeper comes to a stop (in "Auto" mode only).

10. All motors take their energy from a 24-Volt deep-cycle battery set.

OPERATING INSTRUCTIONS

1. PLEASE READ WARNINGS ON PAGE TWO OF THIS MANUAL CAREFULLY.

Refer to Page 4 for Location of Controls.

2. To make the machine move under its own power--without scrubbing

--Turn on Key Switch.
--Make sure brush head is off ground.
(See Steps 5 & 6 Below)
--Gently step on foot pedal.

3. To stop: Let go of foot pedal.

Machine will automatically come to a stop. At this time, the parking brake will be automatically set by the machine's Central Command unit.

4. Solution:
Pull out the solution flow knob until you have the desired amount. To save expense, use the least amount of solution that will do the job.

5. To scrub:
Be sure you have solution in the solution tank. While driving forward slowly, push on the brush up/down control until you read the desired brush pressure on the LED readout.

SPECIAL NOTE: The more downpressure you use, the faster you will consume battery power. Use the LEAST AMOUNT of pressure that will do the job.

6. To vacuum up the solution:
Turn on the squeegee and vacuum with the squeegee switch.
Note that when you turn this switch off, the squeegee will quickly raise, but the vacuum will continue to operate for about 15 seconds. This is to clear the pickup hose of solution.

SCRUBBING TIP 1:
Save Battery Power!

The main consumer of power on your scrubber is the scrub brushes. The more pressure you use in scrubbing the faster the batteries will wear down. Use *the least amount of scrub pressure* that will do your job, and you will be able to scrub more on a charge.

SCRUBBING TIP 2:
Save the Juice!

The solution that flows through your scrubber costs a good deal more than the scrubber itself. Do not overmix it--don't use more detergent than necessary. Often, using too little water with your detergent will lower the effectiveness of its cleaning.

Limit the solution flow to the minimum needed.

Generally speaking, the less solution you use, the faster the vac system can pick up what's on the floor.

SCRUBBING TIP No. 3:
Save the Brushes

The brushes used for scrubbing are plenty tough, but plenty expensive as well. The less pressure you use, and the less aggressive the solution, the longer the brushes will last.

Rotate the brushes daily! Move the Right brush to the left, the left to the middle and the middle brush to the right.

It is a good idea to rinse off the brushes at the end of the day, and to remove accumulated wire and thread that may be caught in them. They are easy to remove.

OPERATING INSTRUCTIONS

6. To Double Scrub

When you first start using your new scrubber, you may find the floor of your building espe cially dirty. It may be necessary to "double scrub" to really clean the floor. To double scrub, simply turn off the vacuum system (raise the squeegee), and slowly scrub back-and-forth over the same area several times. Once you have laid down solution, you can shut off the solution flow with the black knob. All you need is "enough" solution. Too much just wastes money.

7. Watch Out For Low Battery.

NOTE: The Central Command unit will cut power back when battery voltage gets too low. Low voltage could otherwise damage the motors.

Don't let this happen to you. Return back to base for a recharge as soon as the battery gauge shows you nearing empty. Depending upon the batteries your machine has on board, and how hard you work the machine, you should have between three and eight hours of run time on a charge.

8. Reverse the Brushes

To get the maximum life out of your brushes, exchange the left brush with the right brush each day. Then flip the switch at the rear of the panel. This switch reverses the center brush.

By reversing the brushes in this fashion, you re-sharpen the tips of the fiber, so they clean more aggressively. You also about double the life of the brush.

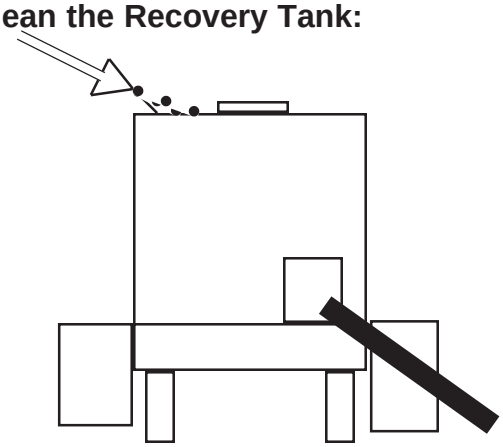
9. Safety Motor Stop

The Central Command will turn off the brush motors momentarily if one of them is overloaded. The brushes will turn on by themselves if you raise the brush head, and wait 30 seconds before continuing to scrub.

This Safety Stop is most likely to occur if you start scrubbing on a dry floor with too much downpressure.

The central brush will stop by itself if over loaded. The outer two brushes will stop together if either of them is overloaded.

To Clean the Recovery Tank:



Use the drain hose at the rear of the machine to empty the tank, then, with the drain hose still in place, use the "flush-out" door on top of the tank to rinse out the tank. Inspect the tank through the airout door. If necessary, you can scrape out the tank through the cleanout door.

RECHARGING: SAFETY TIP

1. To charge the batteries, you must turn the Key Switch off and disconnect the Batteries from the machine. Otherwise you could damage the Central Command.

2. Always Leave the Hood (Lid) open when recharging. Otherwise, explosive hydrogen gas could build up inside the battery box.

Battery Condition Meter

See Page 4, Item 3.

This meter shows *relative* charge. If you unplug the batteries while the batteries are low, and then replug them into Central Command, you will "fool" the battery gauge into thinking they are fully charged.

To correct the gauge, recharge the batteries, then unplug and replug the battery set's Grey 50 connector.

OPERATING INSTRUCTIONS

10. Recharging Battery

Using the Factory Cat Supplied Console-Type Charger:

*Turn off the machine
*Open the battery box.
*Unplug the Red 175 connector between Central Command and the batteries.
*Plug the charger's Red 175 terminal into the battery pack.
*Leave the battery box lid open during charging.
*Plug in the charger to a wall outlet with the correct voltage.
*The charger's charge gauge will show a positive reading.

In North America, our chargers are usually equipped for single-phase 110 Volt, 60 Hz. operation, the same power as used in houses. The three prong-plug requires a grounded outlet. Do not use without grounding. This Factory Cat charger is completely automatic. Its electronic circuitry will tell it when the battery is charged, and to shut itself off.

***NOTE**, however, that if the batteries are allowed to run down to below 18 volts, the automatic charger will not start its charge cycle. You must then bring the battery voltage back by charging the batteries twice--that is letting it run through two automatic cycles. (In this case, the first charge, which takes three hours, will bring the battery voltage past 18 volts. The second charge will put "real power" back into the battery, and will take about ten hours.*

USING AN EXTERNAL BATTERY CHARGER:
If , for some reason, you use an external charger, **always disconnect the batteries** using the "Red 175" connector provided. **Otherwise you can seriously damage the Central Command module and void the warranty.**
NOTE: Some battery chargers are not automatic, and will not shut off when the battery is charged. You can seriously damage a battery by overcharging it.

BATTERY CONDITION METER
(See page 4 for location). This gauge shows the relative condition of the battery, and reads like a fuel gauge in a car. Stay above empty!!!

NOTE: This gauge will reset itself everytime you disconnect the batteries. To avoid incorrect readings, recharge the batteries, then disconnect and reconnect when the batteries are fully charged.

BATTERY SAFETY WARNING!

Charging a battery produces explosive hydrogen gas.

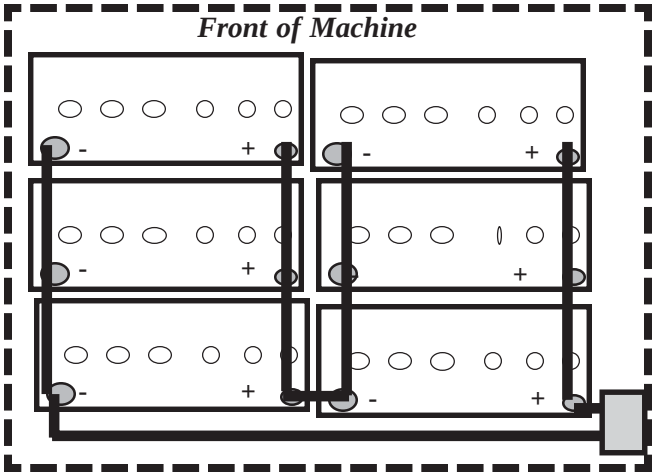
Leave the battery box lid open while the battery is charging to avoid buildup of gas inside machine.

Do not smoke or expose open flame or spark to area around battery during charging.

Follow the instructions that came with your charger. *Tomcat* chargers are automatic, However many chargers are not automatic and can over-heat the battery if not properly set. *Such overcharging will void the warranty on the batteries.*

Watch for battery acid! If acid gets in the eye, wash out with water for twenty minutes and call a physician.

Battery Layouts: Battery posts must face as shown. System is 24 Volts.



OPERATING INSTRUCTIONS

Brake System:

Model 5100 has two separate braking systems:

For Normal Stopping:

Model 5100 stops quickly and smoothly when the operator lifts his foot from the foot pedal. The faster he lifts his foot, the faster the machine stops.

For Emergency Stops and Parking:

In addition an automatic emergency & parking brake is provided. This brake operates directly on the transmission, and affects both the rear wheels. The emergency/parking brake will engage automatically under any of these three conditions:

1. About two seconds after the operator releases the foot pedal and the machine comes to a stop.
2. About two seconds after the key switch is turned off.
3. If a power failure occurs.

This automatic emergency & parking brake is spring-engaged. It is released by an electric solenoid. The solenoid is operated by the *Central Command* energy management system.

To Check the Brake System:

Never park on a ramp without being absolutely certain that the automatic parking brake works properly. You can check the emergency parking brake by trying to push the machine on level ground when the key is off. If you can push it, then the brake system needs checking.

Releasing the Automatic Brake

Since the parking brake is automatic, Model 5100 cannot and should not be pushed by hand.

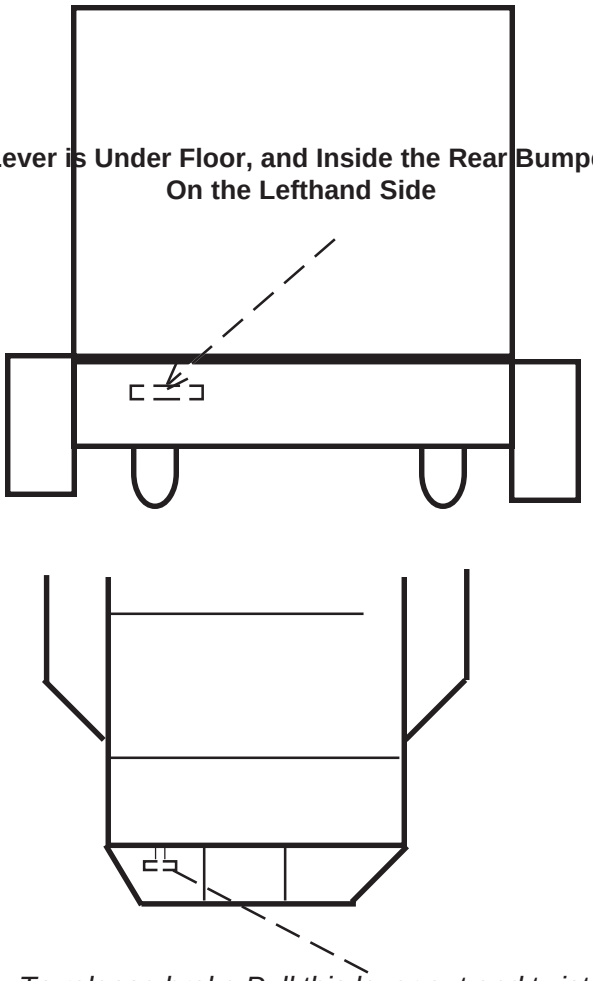
If you need to move the machine, and it cannot move under its own power, you must first release the parking brake. This is done by pulling on the handle inside the rear bumper as shown in the right column.

DO NOT push the machine without first releasing the brake. Do not drive the machine under power with the emergency/parking brake disengaged.

TO RELEASE THE AUTOMATIC EMERGENCY & PARKING BRAKE:

Pull the Brake Release Handle outward as shown.

Lever is Under Floor, and Inside the Rear Bumper On the Lefthand Side



To release brake Pull this lever out and twist to right to lock.

SPRAY JET & VAC WAND

Model 52 is available with the ***Spray Jet***--a pump powered system that permits spraying solution into remote areas--and a ***Vac Wand*** that permits pickup in remote areas--or both together.

Both systems are options.

SPRAY JET: System comes with 12 foot hose, and an automatic pump that responds to pressure in the system. It pulls solution from Model 52's solution tank. Pulling on the "trigger" on the spray nozzle will automatically turn on the pump--when the pump switch is on.

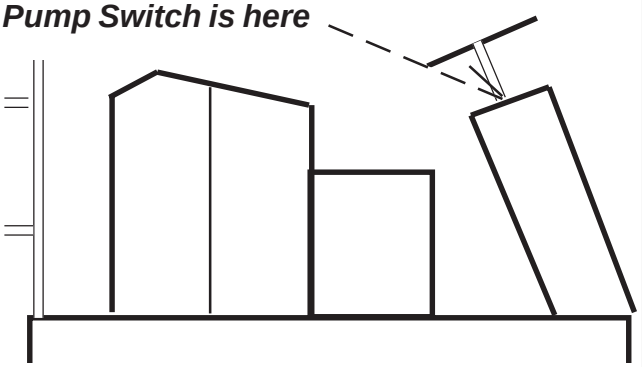
To operate:

1. Turn pump switch on. It is located under the steering wheel.
2. Pull the black solution flow knob up all the way.
3. Aim carefully.
4. Pull the trigger.
5. Be sure to turn steering column switch off after you are done.
6. ***Never run system dry!*** You could destroy the pump!
7. ***Never let water in pump freeze!*** If machine must be stored in freezing temperature, add antifreeze to solution tank and let flow through system.

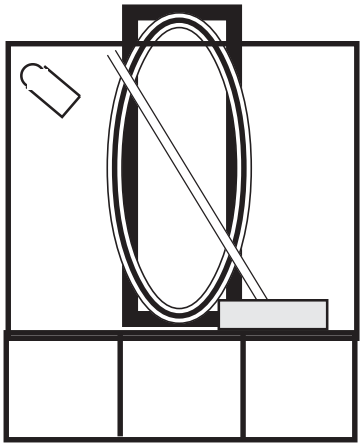
Problem with Freezing? Call 800 450-9824

SAFETY WARNING: Never spray at or near co-workers. The solution in your Model 52's solution tank could be harmful to people.

Pump Switch is here



RACK STORAGE:



Vac hose and/or spray jet hose store on same rack. A nylon strap at the top holds items in place.

Clamps are supplied to hold the vac wand in place. Its nozzle mounts toward bumper.

VAC HOSE

The vac hose plugs into the recovery tank and uses system vacuum. The tool furnished with the system squeegees up water efficiently.

The first time you use the wand, you must adjust the squeegee wheels. Use the knob on the base of the vac nozzle. Set properly, wheels are set a bit below base of squeegee blade. Try it and adjust. Should vacuum perfectly both pushing and pulling the wand.

To operate vac wand:

1. Unplug Model 52's red vac hose where it plugs into recovery tank.

2. Plug in the black vac hose to the tank--and the other end to the wand.

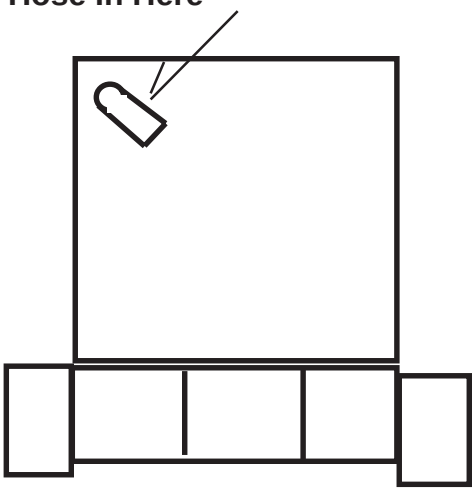
3. Auto manual switch must be in manual mode.

4. Squeegee must be lowered (to turn on vac motors).

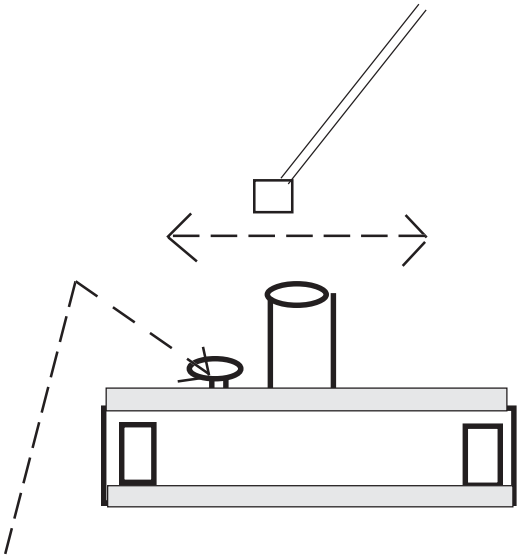
5. Put tools back neatly after use. Tie hose at top with nylon buckle and belt provided. Clamp wand securely into its two clamps.

6. Plug red hose back into tank.

Plug Vac Hose In Here



Adjust Nozzle Wheels so Squeegee works efficiently both pushing and pulling.



Knob at rear of nozzle tool adjusts tool wheels so squeegee rubbers touch floor properly.

RECYCLING SYSTEM

This system is optional on Model 5100. It can be field installed as well as factory installed.

WHAT IT IS

The recycling system is intended to extend the time the machine can operate on a tank fill by reusing solution.

This system is intended for use in relatively clean environments. Dirty water is not as effective a cleaning agent as clean water.

HOW IT WORKS

When switched on, it pumps solution from the recovery tank, and adds it to the solution tank. A filter inside the recovery tank removes most of the grit in the water.

An automatic switch in the recovery tank switches on the pump when the tank is about three-fourths full. An automatic switch in the solution tank switches the pump off when the solution tank is about three-quarters full.

TO OPERATE THE SYSTEM

Fill solution tank as you normally would. The recycling system's cover acts as the door to both tanks. Unscrew clamps and raise the lid.

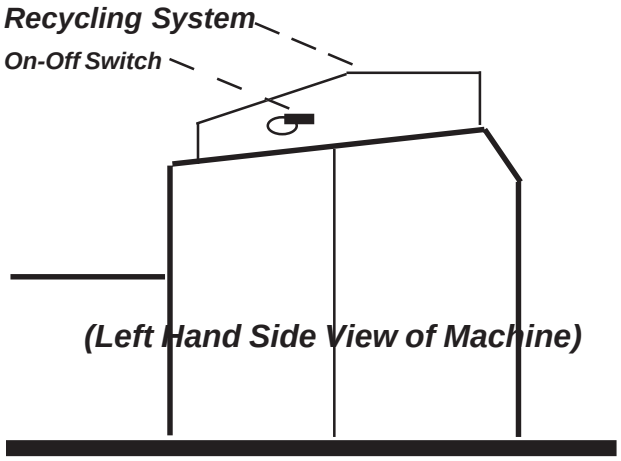
You can also, at your option, fill the recovery tank no more than half full.

Switch on the switch on the outside of the housing.

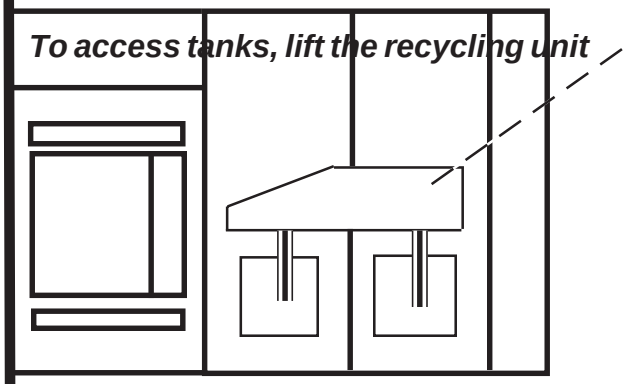
When you notice that the machine no longer cleans satisfactorily, change the water in both tanks.

TO MAINTAIN THE SYSTEM

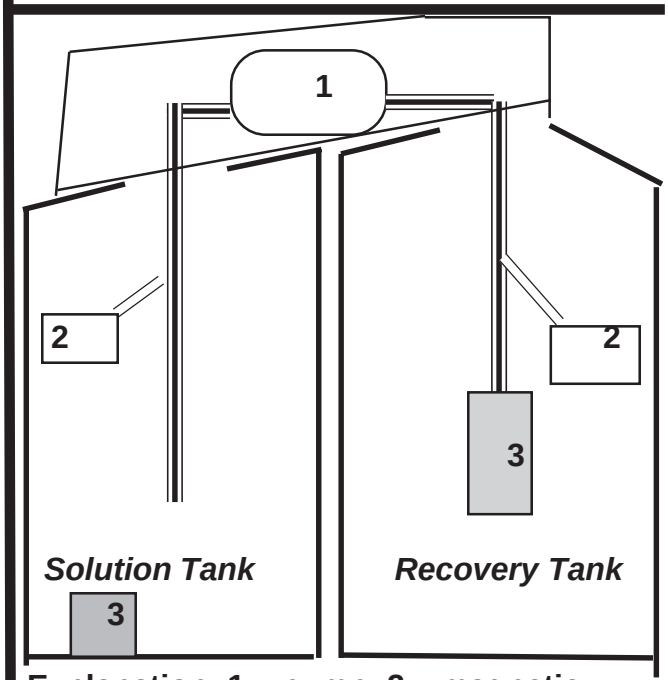
Very important: The filter in the recovery tank must be cleaned after every day of use. ***You must never operate the recycling system with the filter missing.***



(Left Hand Side View of Machine)



(Top View of Machine)



Explanation: 1 = pump; 2 = magnetic float switches; 3 = filter

RECYCLING ***(Continued)***

To remove filter for cleaning:

1. Push the button in the recovery tank hose mount in to release the lower hose.

2. Lower Hose can now be withdrawn from top of tank.

3. At your option, you can also unscrew the filter from the hose.

4. Filter is to be washed with clean water. If necessary, brush filter screen with light brush, such as a tooth brush.

5. Never use a filter that is visibly damaged!

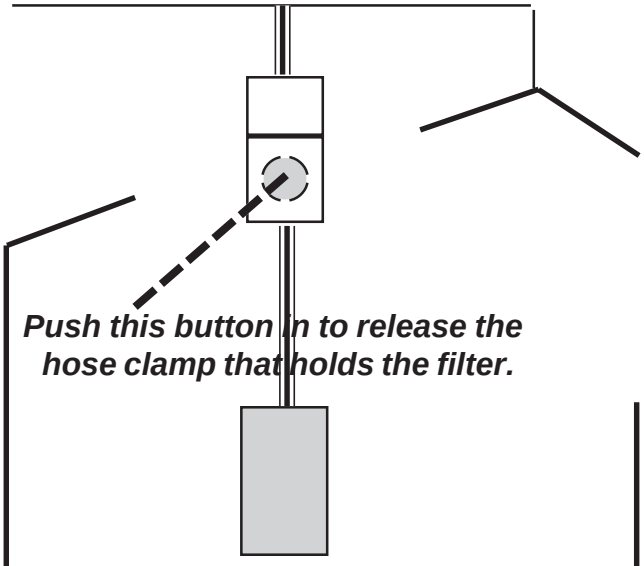
CLEANING OUT THE SOLUTION TANK

What goes in must come out. The grit that is fed into the solution tank will eventually build up.

The solution tank's filter is arranged so that about an inch of grit can build up in the bottom of the tank before the filter is affected.

Before the grit reaches this filter, you should clean out the tank as follows:

1. Remove the solution tank filter.
2. Open the solution tank dump valve (directly underneath the tank on the lefthand side).
3. Flush out the tank with a hose.

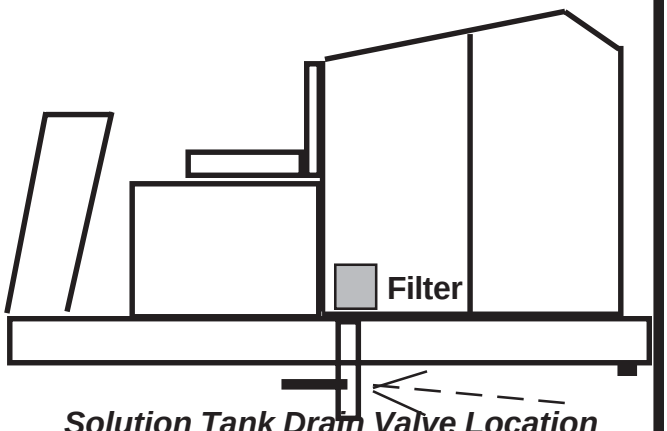


(Side View of Recovery Tank)

OPERATING SYSTEM WITH FILTER OFF COULD VOID YOUR WARRANTY

Never operate recycling system with filter off. Doing so will clog all downstream plumbing, and possibly damage the machine's flow valves.

Take care of the filter, and the system will work well for you. Don't take care of it, and you'll have problems.



Solution Tank Drain Valve Location

SPECIAL OPERATING TIPS

HOW TO SCRUB

Good Scrubbing Requires:

1. **Knowledge of your floor surface.** What is it sensitive to? Be careful not to use chemicals that will hurt the floor surface, or to apply too much brush pressure or use the wrong kind of brush on your floor.

2. **The right chemical.** The chemical does most of the work. There are chemical formulas made specially for General Cleaning, Emulsification & Removal of Oil, Polishing, Removal of Tire Marks and others.

   U.S. law requires that you maintain the "M.S.D.S." sheet that comes with the chemical you use in a specific place in your plant.

   For safety's sake, you must never use flammable chemicals in the scrubber. Arcing inside the vacuum motors could create an explosion.

   For safety's sake, you should not use chemicals with potassium hydroxide in the formulas if you will be picking up aluminum particles. This material mixes with aluminum to form hydrogen, an explosive gas.

3. **The right brushes.** ***Tomcat*** can supply you with many different brush types to suit your application. Four of the most popular brushes are:

   1. Nylon. Soft, and long lasting, but can't scrub hard.
   2. Poly. Scrubs harder than nylon. Still pretty soft.
   3. Nylogrit. Flexible bristles combined with grit.
   4. Stratogrit. Tough, non-flexing bristles, combined with grit. Recommended for tough, industrial applications. Best for removing build-up.

   Brushes are very expensive, but, treated right can have a long service life. We strongly recommend that you remove your brushes from the machine after each day's work. Clean them off with cold water. Remove entangled wire, and etc, from them. Then install them on the opposite side to reverse the wear pattern on the bristles. This greatly extends brush life, while improving scrubber performance.

4. **Brush pressure.** You can vary the pressure on Model 52 with the dash board button. Use as little pressure as will do the job. Excessive pressure will shorten the machine's run time on a battery charge, can shorten the life of your brushes, and could even damage some floors.

5. **Chemical Residence Time on the Floor.** Scrubbing slowly may improve the scrubbing job you do. By scrubbing slowly, the brushes stay longer over each square yard of surface, and so scrub more, and the chemical stays longer on the floor before being picked up by the squeegee.

   For especially bad spots, you can "double-scrub". To double-scrub, leave the vacuum squeegee up and off. Scrub back-and-forth several times until the grit and grime on the floor has been loosened. Then vacuum it and the solution up.

6. **Adjust that Squeegee!** When your machine was new, it scrubbed and picked up perfectly--the best in the business. How's it picking up now? Not so hot? Then you should check the following:

   A. **Blades in good shape?** The rear blade on the squeegee is especially impor tant. It can be reversed front to back and from top to bottom, and so can be rotated four times. Look at the condition of the rear rubber's leading edge. If still sharp, it should work well for you. If worn flat, it will smear like an old windshield wiper blade. (See squeegee section of this manual for info on how to rotate the blades).

   B. **Pitch angle?** The rear corners of the back blade of the squeegee must both touch the floor. Otherwise, the squeegee will only pick up in the middle of its path. To adjust, turn the knob. (See Squeegee Section of this manual).

   C. **All Clear?** Scrubbers pick up strange stuff, and lots of it. Is your recovery tank cleaned out? Is the path clear inside the squeegee? In the hose? In the inlet to the tank? Remove the vac motors and check the foam filters under them.

7. **STILL NEED HELP? Please call your dealer for advice.**

MAINTAINING YOUR MACHINE

DAILY CLEAN-UP

After you're done for the day, please lift the brush head with the dashboard switch, lift the squeegee with the vacuum switch, and push the solution control button all the way down. Drive to your service area and stop.

Before you turn off the key, lower the brush head a half inch from the top. Turn off and remove the key. Lift the side wiper on one side of the machine. While lifting it, open the side door. Once the door opens, then turn the brush on that side until you see the "scissors handles" control. Push the scissors together to release the brush.

Remove the drain hose from its bracket. Carefully lower the hose to the drain. WATCH OUT--MOVE TOO FAST AND YOU'LL GET WET. You can squeeze the hose shut with your hand until you position it where you want it.

Drain the tank. Open the door on top of the recovery tank (the back one), and using cold water and a spray nozzle, wash the dirt that has accumulated in the tank out toward the drain hose. If you succeed in cleaning the tank well enough, you do not need to use the cleanout door.

If the machine is still full of debris, open the cleanout door after the tank has drained its water. You can use the tool provided with the machine to help scoop out debris. Rinse again with the hose if necessary.

Rinse off the brushes. Remove any debris that may have gotten caught in them. Remember to reverse the brushes daily.

Rinse squeegee with water. Wipe off the edges of the blades with a cloth.

If machine needs washing, use a regular garden hose to wash it, not a pressure washer. Do not spray the dashboard or the batteries. Wipe dry with a soft towel. Do not use paper towels or dirty shop towels, or you will scratch the powder paint finish. We recommend you wipe down your machine each day with a dry cloth and a liberal dose of Johnson Wax ***Pledge*** furniture wax (or an equivalent product). This will keep the "paint", (it's really a thin plastic coating that encases the steel structure to prevent rust), lustrous and scratch free for years.

Store the machine in a clean dry place.

To recharge batteries, leave the box open, and unplug the machine from the batteries. Plug the red connector from the batteries into the charger provided with the machine. **Use only the charger provided or an equivalent "smart" charger. Do not use a "dial type".**

DAILY PRE-CHECK AND INSPECTION

Before each shift (every eight hours of operation), It is the operator's responsibility to carry out the following checks and inspections before beginning operation of the sweeper:

* **WARNING DEVICES:** Battery condition gauge. Green "ignition-on" light. And on units so equipped: backup alarm, horn, rotating beacon, headlight.

* **BATTERIES**: Visually inspect connections. Look for spills & Wipe Them Up. Use baking soda to neutralize spilled acid.

* **AUTOMATIC PARKING BRAKE:** This machine has "dynamic braking" which slows the machine until it stops. After it stops, a separate parking brake is set by a spring. This parking brake will automatically set, as well, if there is a power failure.

  If you can push machine when it is stopped, the parking brake needs adjustment. If machine lacks pep, and appears to drag, the parking brake may not be releasing. Check manual for inspection procedure, in this case.

  If brake fails to release, automatic release mechanism may have an object jammed in it, or may need repair or adjustment. A dragging brake will result in :

  A. Damage to brake linings.
  B. Possible damage to traction motor.

* **STEERING:** Should have no play, and should turn freely without binding.

* **CLEAN THE RECOVERY TANK.** Drain it completely every day through the drain hose. Hose out and check condition by looking in the flush-out door on top of the tank. If still full of debris, open the cleanout door (at back of the tank) and clean out the floor of the tank.

* **CLEAN OFF MACHINE**: If dusty, clean machine with compressed air. To maintain paint, use S.C. Johnson's "Pledge" furniture polish and soft cloth, or an equivalent product. **We do not recommend washing, and especially do not recommend pressure washing this machine as misdirected water could damage electricals.**

IF THE MACHINE IS IN NEED OF REPAIR OR IN ANY WAY UNSAFE OR CONTRIBUTES TO AN UNSAFE CONDITION, THE MATTER MUST BE REPORTED IMMEDIATELY TO THE SHIFT SUPERVISOR. DO NOT OPERATE THE MACHINE UNTIL IT IS RESTORED TO PROPER OPERATING CONDITION.

MONTHLY INSPECTION

In addition to shift inspections, perform the following each month:

* Check battery charge with an external volt meter. If "fully-charged battery does not attain at least 24 volts, further investigation is required.

* Grease front wheel; two "zerk" fittings are provided for this.

SQUEEGEE AND VAC SYSTEM

The vacuumized squeegee drags on the floor constantly while in use, and so is the most sensitive part of an automatic scrubber. Lucky for you, Tomcat 5100's 's squeegee and vacuum system are simple, straight-forward and easy to access.

GENERAL MAINTENANCE: Squeegees pick up all kinds of stuff. When the rubber blades are dirty, they streak. If you have a wad of newspaper stuck in the squeegee, it may not work at all. If the squeegee isn't performing right, raise the squeegee (while going forward slowly), and drop it on the floor again. This may dislodge whatever is stuck in it, and may help clean off the blade. Still streaking? Inspect the blade. If it is coated with tar or some other industrial goo, you may have to wash it off or replace it.

ADJUSTMENT: Model 5100's squeegee is self-adjusting except for the "pitch" the angle the squeegee's blades make with the floor. This pitch adjustment is very sensitive. One eighth turn left or right can make a difference. Your machine's squeegee should be adjusted to your floor at delivery. Thereafter, readjustment is seldom necessary. To adjust properly,:

Loosen the two locknuts at back of squeegee adjusting screw.
Drop squeegee to floor.
With vacuum running, drive machine forward so rubber of squeegee flares out.
Turn the Adjustment Knob until the rear squeegee blade touches the floor evenly across the entire width. At this point the wheels at rear should just start to touch floor.
Test results on floor.
From this point, adjust squeegee knob clockwise to improve performance on squeegee edges, and counterclockwise to improve performance in middle.

If squeegee is properly adjusted from a pickup standpoint, but your squeegee fishtails left to right, try changing the squeegee's trailing wheels. Normally these are changed when blade rubbers are changed.

REVERSING OR CHANGING THE BLADES: Bad blades don't work. Inspect the blade edge where it touches the floor. Is it still sharp, or is it blunt and frayed. If worn, you'll have to change it. Both blades are important. You can reposition Model 52's squeegee blades four times. The back one is easy: just undo the buckle on the steel strap, and remove the two wing nuts. Turn the blade upside down for the first change out. For the second one, flip it around front-to-back. For the third change out, turn it upside down again. For the front blade, there are some nuts to undo. Better to remove the squeegee from the machine for this one. When the time comes to replace the blades, order Tomcat's "Blade Kit" for Model 5100. This includes the two blades, and two replacement wheels for the back of the squeegee.

Squeegees are normally supplied with ***Gum Rubber***, a tan-colored material. If your application requires that the machine run in oil, you might want to try ***Neoprene*** seals instead. Neoprene does not wipe as well as Gum, to our experience, but it is much more oil resistant than Gum. For speciality applications, we can supply **Linatex** rubber seals. Linatex is super abrasion-resistant, and squeegees well too, but is about as sensitive as gum rubber to oil.

ABOUT BATTERIES:

We do not recommend use of anything but deep-cycle batteries, made to run a long time between recharging. Automotive batteries, designed to be recharged (by the car's alternator) right after short use, will give poor service.

Your unit came with a "smart" electronic external charger. If for some reason you use another charger, do not use a "dumb" or dial-type charger. Do not use an external charger of any type without first disconnecting the batteries from the Central Command unit!

Always leave the battery box open when recharging. Otherwise hydrogen gas could build up inside the battery box.

GENERAL RULES FOR BATTERY CARE:

1. KEEP THE BATTERY CLEAN. Dirt on the battery transmits electricity and can cause quicker discharge.

2. KEEP THE BATTERY WATER AT THE CORRECT LEVEL. The correct level is above the plates, just to the bottom of the "ring" found inside each of the six cell caps.

   A low water level can ruin the battery very quickly. Water should always cover the plates inside the battery. (You see the tops of them when you remove the cap). Many batteries have "rings" that are visible inside the cell holes. In these batteries, fill to ring. We recommend you use only distilled water. The minerals in ordinary water can coat the lead plates, shortening battery life.

3. CHARGE THE BATTERY WITH THE CAPS IN PLACE. Do not remove the caps for a normal charge. These caps include proper venting, and will keep the charging process from projecting a thin layer of acid on surrounding machine parts.

   EXCEPTION: Quick-Charging. Follow the instructions that came with the quick charger. You may be asked to remove the battery caps. Note that quick-charging is not a good idea; it can lower battery life.

4. ACID! Batteries contain corrosive sulfuric acid. As mentioned above, leave the vented caps in place when charging, so acid will not bubble out of the battery. Take care that acid does not fall on the steel surfaces of the machine; eventually it will cause the machine to rust.

   Treat acid spills with water to dilute the acid. To clean up: use solution of water and baking soda, applied with a small brush. Keep using the solution until the fizzing stops. This will neutralize the acid.

5. MAKE SURE CONNECTIONS TO THE BATTERY ARE TIGHT. Loose connections will cause arcing, which will eat into and destroy the battery terminals.

6. WATCH THE GREASE. Never put grease on the **inside** of the connector. The grease will cause arcing and deterioration of the connector. You can put grease on the **outside** of the terminal after it is mounted to the battery.

7. DO NOT HAMMER ON THE BATTERY OR ITS CONNECTORS: Batteries are heavy but fragile. Hammering on the posts on the battery can break the connectors inside. Use a puller to remove connectors, not a hammer or a screwdriver.

GENERAL
MACHINE MAINTENANCE

BATTERIES: The highest maintenance item on your machine will be its storage batteries. Please read the "About Batteries" section of this book.

BRUSHES: Replace the brushes when they stop scrubbing to your standards. Note that choice of the proper brush fiber is very important to good scrubbing. There are several different fibers available. Rotate brushes often (every 8 hours of use).

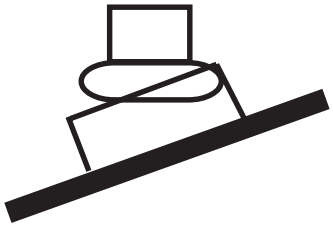
Fibers include: polypropylene, nylon, Strato-Grit, Nylo-Grit, and Scrub-Grit. Please ask your dealer for his brush recommendation.

We recommend Tomcat brushes. (Obviously!, you say. But there are reasons). They are designed specifically for our machine and have the right amount of bristle to maximize performance. Their solution feed holes are located in the right spot. They are concentric (oval brushes, and most will-fits are oval, damage the motor drive gears). Their fiber is high quality and long-lasting, and use plastic cores with integral clutch plates that are tougher than the wood cores + bolt-on clutch plates most "will-fit" makers provide. The clips that hold them on have the proper spring tension and don't fall off. Finally, we believe you will find them reasonably priced.

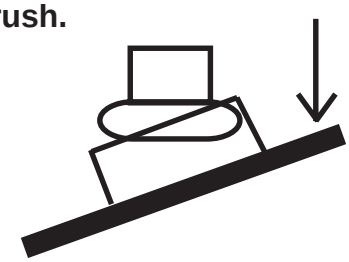
INSTALLING BRUSHES: The Easy Way

Clip one side of brush mount to the "driver" (the part on the machine). Then push up the opposite side.

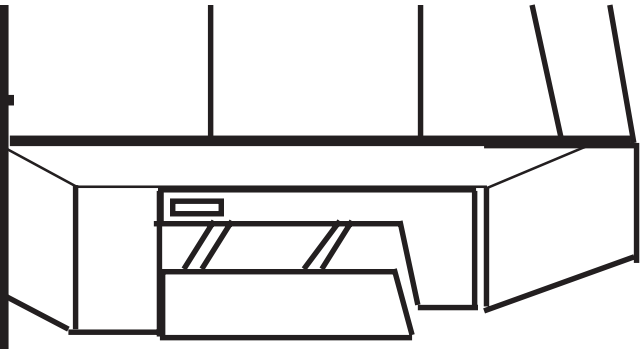
1. Clip on one side of brush to driver.



2. Then, push down on that same side of the brush.



3. Brush will swing up and latch on!



TO OPEN THE BRUSH ACCESS DOORS

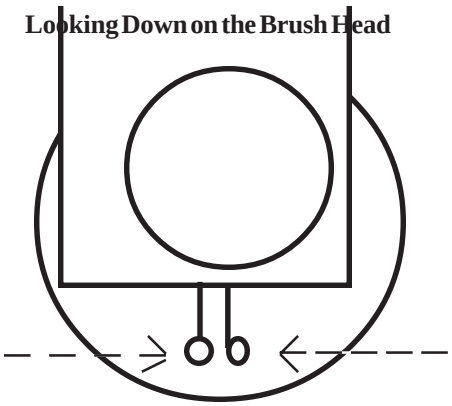
Be sure the brush-head is mid-point off the floor.

Then open the latch on the door.

Then raise the Wiper off the floor so it unhooks from the scrubhead.

Then open the door.

Looking Down on the Brush Head



Push "Scissors" Together to Release

REMOVING BRUSHES:
Turn the brush until you see the "scissors handles".

Then push the scissors handles together, and brush will fall to floor.

SCRUB BRUSH DRIVE SYSTEM

The scrub brush drive system has three electric motors, each coupled to a worm-gear drive box.

The motor brushes should be changed every 2,000 hours.

The gear drive box oil should also be changed every 2,000 hours.

Your authorized dealer can perform this maintenance for you.

If you have lost contact with your dealer, or if you wish advice on how to perform this service yourself, you can call the Factory Service Tollfree Hotline (800 634-4060) for advice.

GEARBOX NOTE: The gearboxes will run hot for their first few hours of operation, as their gearsets break in. During this time, the gearboxes will soak up extra motor energy as well.

You should notice considerably less generation of heat after the first 8-10 hours of operation, and better scrubbing performance.

Gearbox Oil: Use only Worm-gear lubricants.

Recommended:

Shell Omala 460
Mobil Extra Hecla Super
Texaco Meropa 680

Fill to halfway point by using the half-way plug

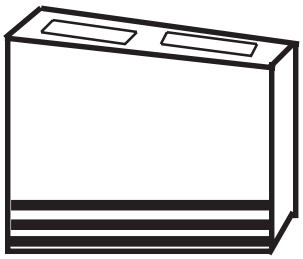
TROUBLESHOOTING GUIDE

CENTRAL COMMAND

Model 5100 Rider Scrubber is very simple mechanically. This simplicity is possible in large part, because of the sophisticated "***Central Command***" control unit. This unit, which forms the righthand control panel, directly controls the brushes, the recovery vacuum blowers, the traction motor, and the dynamic and parking brakes. To conserve battery reserve power, ***Central Command*** turns motors off when they are not needed, and controls them so as to minimize strain and maximize component life.

Do not attempt to service the *Central Command* unit during the warranty period without written permission of the Factory or of your Authorized Tomcat Dealer. Doing so will void the warranty.

When Servicing Central Command, Always Disconnect the Battery Cable *(Item 4)* First, and Reconnect It Last



Wiring Connections for Central Command:

In replacing Central command, the installer will have to match harnesses. To simplify troubleshooting, the system uses 10 independent number-coded harnesses, each with color-coded wires. These harnesses are as follows:

CODE: **FUNCTION & WIRES:**

1. **To Traction Motor**
   Red 50 Connector. 6 Gauge cables.
2. **To Scrub Motors**
   Red 50 Connector. 6 Gauge cables.
3. **To Vacuum Motors**
   Grey 50 connectors. 6 Ga. Cables.
4. **From Batteries**
   Red 175 Connector, large (I/O) cables.
5. **Auxiliary Harness**
   4 Thin Wires Together; 4 prong "Molex" Connector. This is for accessories. Your machine may not use this harness. Wire colors are blue, red, black and white.
6. **Foot Pedal Harness**
   3 Wires with black outer insulation; 3 prong Molex. Colors, green, white and black.
7. **Brake Solenoid and Cooling Motor Harness**
   4-Pin Molex. Colors are blue, black, red, black.
8. **Solution Valve & Overflow Switch Harness.**
   Four-pin Molex with Green, Yellow, black and orange wires.
9. **Squeegee Harness:**
   4-pin Molex. Colors: pink, orange, green and white.
10. **Scrub Head Actuator Harness**.
    Four pin molex, wires colored yellow, blue, white, pink.

ACCESS TO EXTERNAL WIRE CONNECTIONS

If a wiring fault occurs, chances are greater it is in the wiring leading to the ***Central Command*** unit than in the Central Command itself.

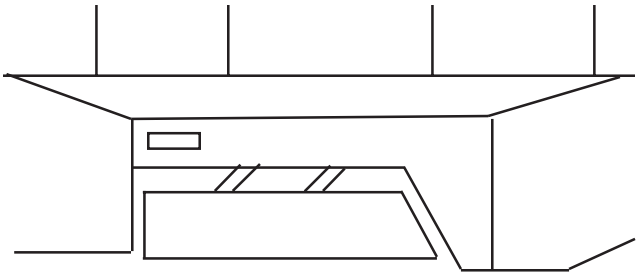
To make your ***Central Command*** unit easy to service, we have made all harnesses that lead to the ***Central Command*** so they are easy to disconnect.

But scrubbers do their work in dirt and water and corrosive chemicals, all of which are harmful to electrical connections.

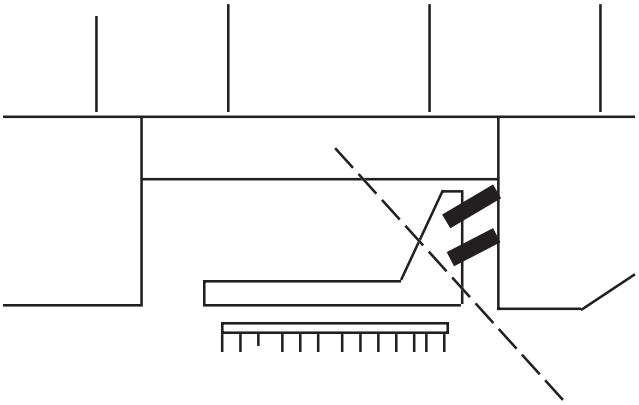
These connections are therefore housed in a "trough" found directly under the ***Central Command*** unit, and protected by a frame rail and the floor on two sides, and by a cover on the other two sides.

Should you need to, you can access the connections in the trough by removing the cover. **Be careful when reinstalling this cover that you do not cut any wires.** Each harness inside is numbered as shown on the previous page.

The connections are coated with ***Conformal Coating***, a modern version of Cosmoline, designed to keep the connections dry, and to keep any detergent solution from corroding the metal terminals. If you service a connection, you should re-coat it with *Conformal Coating,* which sprays on. This can be obtained through any electronics supply house, or through the Tomcat Parts System (**Conformal Coating Part No. 5-299**).

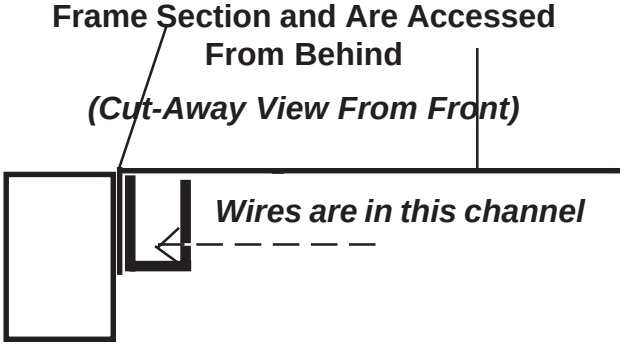


To Access the Wire Trough Open the Right-Hand Brush Access Door



Wire Connections are Behind This Frame Section and Are Accessed From Behind

(Cut-Away View From Front)



Trough is held in place with two nuts

MODEL 5100: BASIC Troubleshooting Guide

GENERAL: Model 5100 is mechanically simple, but has a sophisticated "brain" to operate it in the form of the ***Central Command*** unit. This unit should be as reliable as the microprosessor for a modern automobile.

In most cases, the big question is to determine if the problem is :

A. Mechanical, or
B. Electrical, but in the wires or devices.
C. Electrical, inside the Central Command.

If your problem is not easily solvable, please call us at **1-800-450-9824**. We can put you in touch with your local dealer.

ELECTRICAL PROBLEMS

1. Key On, But Nothing Happens: No Noise, No Action--Nothing!

A. Operator is familiar with machine and knows that you have to step on the foot pedal before anything will operate.

B. Battery Set is properly connected, and puts out **at least 24 Volts**. (24 volts is dis charged; 25.6 is fully charged; deep cycle batteries provide most of their run time between these two voltages).

C. Battery is load checked. Battery **must not drop below 20 volts** under load.

NOTE: Central Command is extremely fussy about wire connections from the battery into it. A half-loose connection is sensed by the electronics and will not allow the machine to operate. Check and double check the battery connections!

D. All Following Wires are Connected, Unbroken and Tight.
   1. Wires From Central Command to Traction Motor. (Inside wire trough)
   2. Battery Cables To Central Command. (Inside battery box).
   3. Foot Pedal Three Wire Cable to Central Command. (Inside wire trough).

E. Unplug the Battery Pack (Red 175 connector inside battery box).Then, carefully remove Sidel Panel from Central Command. Reconnect battery box. Check for voltage to and from the keyswitch.

F. Call Dealer

Electrical Problems

2. Key On Gets "Click", and Green Light Comes On, But Stepping on Pedal gets No Action.

A. **Check the batteries.** Central Command will shut down the traction system com pletely if voltage is at 16 volts or below, and will slow the machine to 20% power at 20 volts or below. The system reads the voltage under load, and so should you to test it.

B. Be sure pedal wiring is tight and unbroken. This is the three-wire set going into the Central Command. The wire is integral with the foot pedal. (Connection is in the wire trough).

If you think the pedal is defective, please call your dealer for test procedure to verify its condition.

C. Most likely problem inside Central Command is one of the the relays, rather than the brain box. Call your dealer to have him check them.

3. Machine Runs Fine in Forward, But Cannot Be Shifted Into Reverse.

A. Remove Rear Control Panel from Central Command and Check Connection to Forward-Reverse Switch. This switch receives power from the key switch, and sends it back to Central Command's microprocessor. No power = forward; power on = reverse.

B. Check Switch Output.

C. Call Dealer.

Electrical Problems

4. Traction Circuit Runs Fine, And one or more, but not all of the Following Work Properly: Vacuum Motors; Brush Motors; Parking Brake Release.

Check each defective circuit as follows:

A. Vacuum Motors.

1. **MicroSwitches.** The vac motors shut off when the squeegee is raised. The squeegee actuator unit has two microswitches on it, one (on the lefthand side) serves to turn the vac on while it and the switch on the right side serve as well to turn the actuator off at each end ofstroke.

2. **Wiring from Central Command.** Check continuity between the motors and the Central Command's output to the vac motors.

   Connection is made inside the Wire Trough. Wires then go through the air duct inside the solution tank to the vac motor housing atop the solution tank.

B. Brush Motors.

Check first to be sure the problem is electrical. It is possible the plastic "clutchplate' on the brush is damaged.

Note too that if there is too much pressure applied to the brushhead on an abrasive or dry surface, the motors will not have enough power to start, and so will kick off the circuit breaker inside Central Command. This will reset itself when power to the brushes is turned off for more than 30 seconds. Just raise the brushhead.

Microswitch. There is a microswitch on the brushhead that turns the motors on. It must be checked out. It is situated on the brushhead on the right hand side. Access it through the brush access door.

C. Parking Brake Solenoid

This solenoid, accessed by removal of the machine's lefthand rear side panel, is mounted to the transmission. The transmission's disk brake is spring applied; the solenoid pulls the brake lever against the spring into released position--straight up and down.

The solenoid has two wires coming to it--a plus and a minus. Both wires come from Central Command.

1. Check that the wires to the solenoid provide 24 Volt power when the key is on and the pedal is depressed. (To do this, you will need to jack up one of the rear wheels off the ground and remove the righthand rear side panel).

2. If power is OK, check the solenoid.

3. If power is not OK, the problem is most likely in the 6 amp breaker inside the Central Command. Call dealer for advice.

Electrical Problems

5. Machine Works Well Otherwise, But Insufficient Tractive Power.

A. Is operator used to the machine? Is it developing its normal power?

B. Machine has lost most of its power--power loss came on very suddenly.

Batteries are down. Central Command will automatically reduce available power when battery voltage drops below 18 to 20 volts. Recharge Immediately..

6. Charger Does Not Charge

The automatic, electronic, console-type charger responds to the battery's condition. It rarely fails.

We note that: If the battery is already charged, the charger will switch on for only a few minutes before stopping the charging cycle. If the battery is very discharged (below **18 volts** at time the charger is turned on) the charger will not "see" that batteries are connected, and will not give the batteries a real charge.

However, every time you turn on the charger, the charge cycle finishes with a three-hour "de-gassing" cycle, in which dissonant wave frequency current is introduced at high voltage (about 29 volts) and low amperage . The degassing cycle does not add "charge" to the battery, and should not be confused with charging.

If you have too low a voltage at the batteries for the charger to charge properly, charge the batteries two times. The first "de-gas" charge (which lasts three hours) will bring voltage up to 18 or so, while the second charge (which can take 10 hours), will bring voltage up to full charge.

Preliminary System Checkouts:

1. Are batteries full of distilled water? Water should be halfway between plates and ring.
2. Are all connections tight?
3. Check system voltage: Above 18 volts?
4. Remove harness from batteries. Check voltage. Do all batteries have voltage above 9 volts?
5. Are batteries two years old or newer? If not, then check out with resistance check.
6.. Do you have proper electricity to the charger? Is this power source uninterrupted, or is it shut off accidentally at night when the lights are shut off?

Please Call Your Dealer For Further Info

SPARE PARTS SECTION FOR
Factory Cat Model 52
Tomcat Model 5100

Factory Cat & Tomcat spare parts are sold through franchised dealers. If you have forgotten your dealer's name, or have moved the machine to a new location, please call us at **1-(800) 450-9824, or FAX us at 1(262) 632-6961**, and we will re-establish dealer contact for you.

TO ORDER PARTS:
Please give Machine Serial Number with your order. Normally, ordinary parts orders are shipped out the same day received.

EMERGENCY ORDERS:
Within the Continental United States, we can supply any part that weighs under 70 pounds within 3 workdays, not counting weekends or National Holidays.

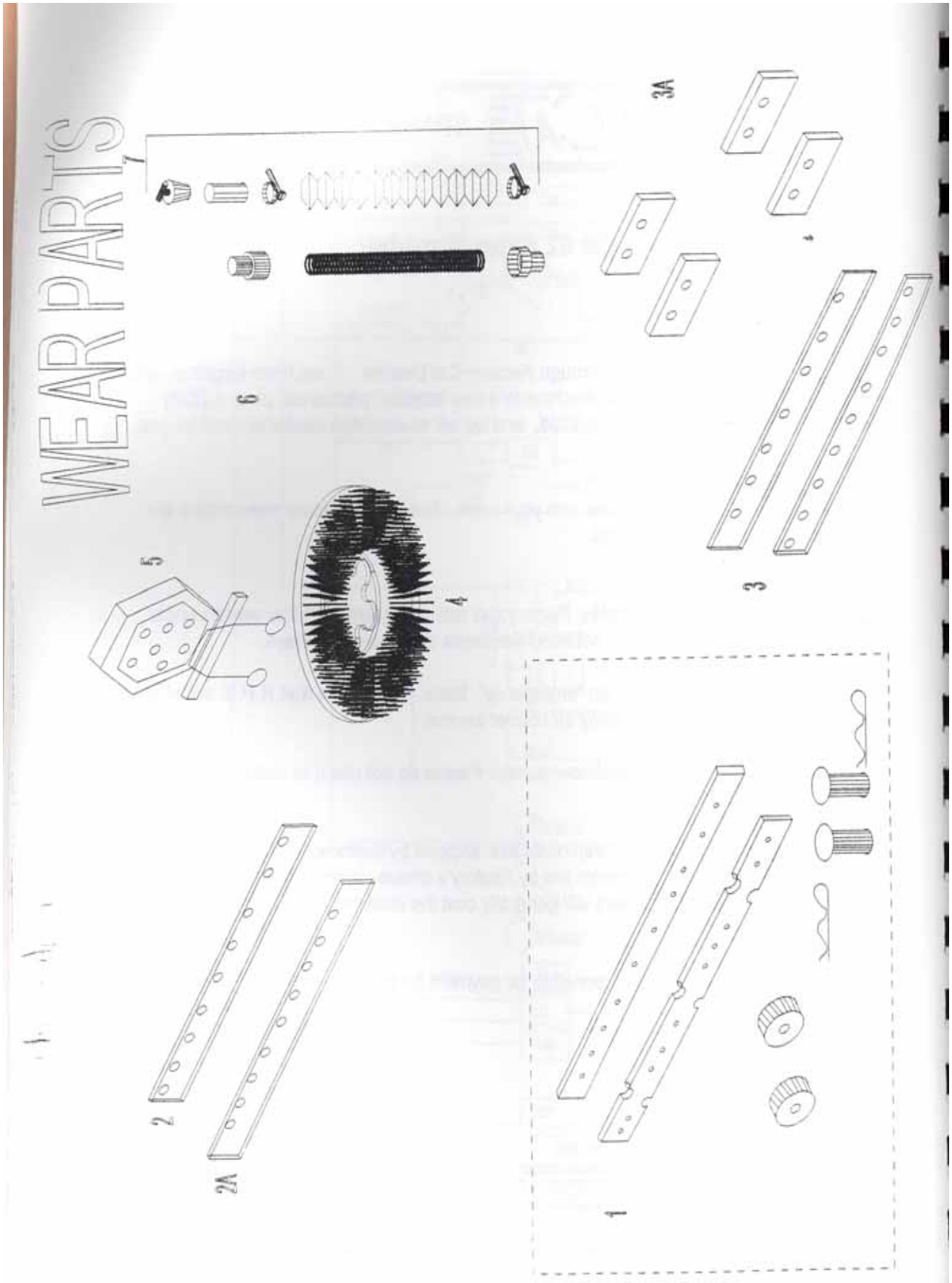
However, if parts are ordered on an "emergency" basis, this means that the Factory will ship them by fastest means, generally by air courier service.

The emergency service is for breakdowns only. Please do not use it to order stock items.

FREIGHT:
Within the United States, normal shipments are shipped by customer choice of shipment method, while emergency shipments are by Factory's choice--normally by fastest means. This means that emergency orders will generally cost the customer more than normal ones.

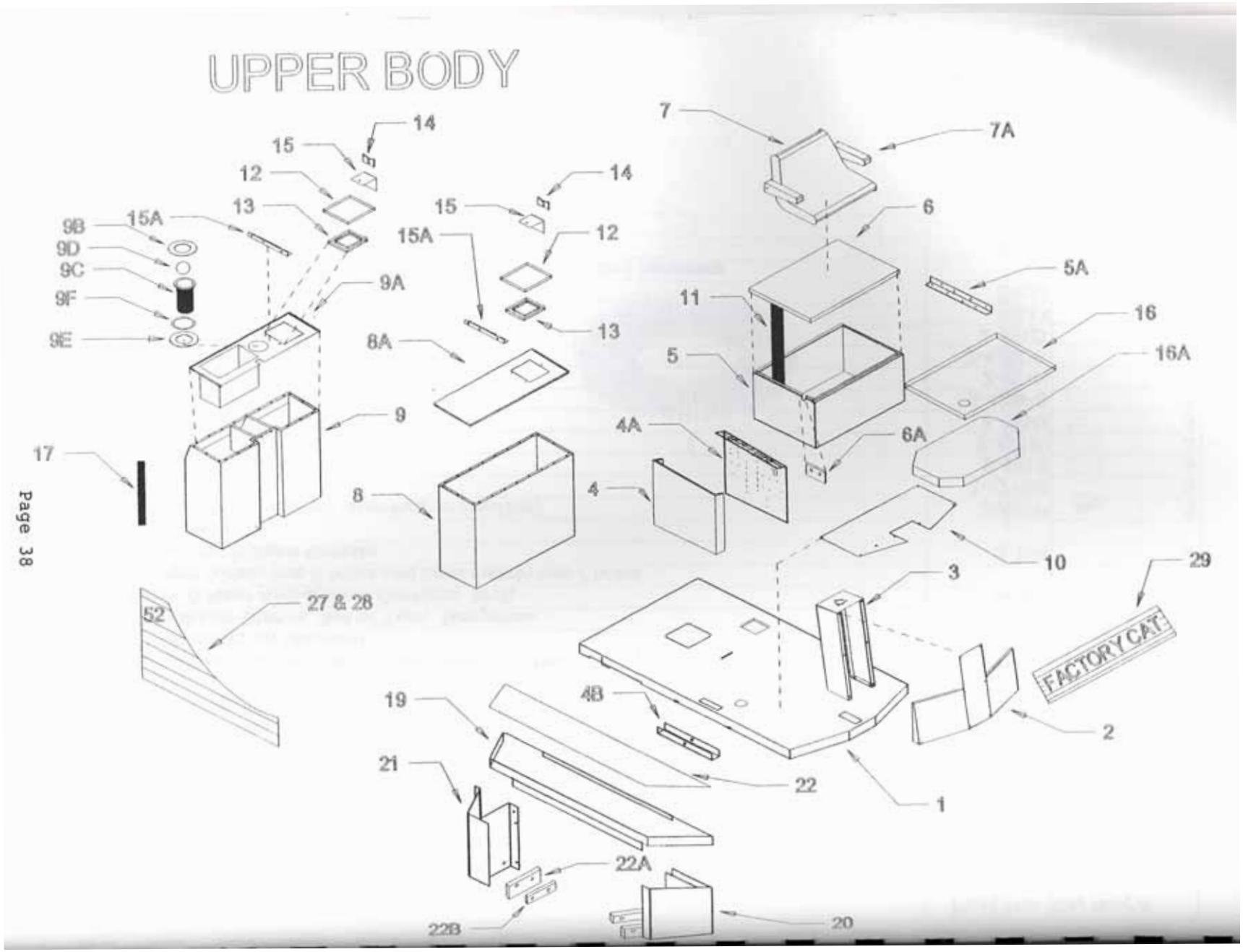
In both cases, the customer is responsible for payment for freight.

WEAR PARTS



Reference	DESCRIPTION	Part No.	Qty Req'd.
Popular Wear Items			
1	**Squeegee Rebuild Kit: Standard Gum Rubber**	2-770G	1
	Front Squeegee Blade	2-755G	1
	Rear Squeegee Blade	2-754G	1
	Squeegee Backup Wheels with axles & lockpins (set of two)	5-757	1 set
1A	**Squeegee Rebuild Kit: Optional Neoprene Rubber (not shown)**	2-770N	optional
	Front Squeegee Blade	2-755N	optional
	Rear Squeegee Blade	2-754N	optional
	Squeegee Backup Wheels with axles & lockpins (set of two)	5-757	1 set
2	**Side Wiper Blades, Set of Two: Gum Rubber**	5-402G	1 set
	(Standard on Machine)		
2A	**Side Wiper Blades, Set of Two: Neoprene**	5-402N	optional
3	**Front & Rear Anti-Splash Curtains (set)**	5-127	1 set
	front curtain has 9 holes and back curtain has 7 holes		
3A	**Extension Splash Curtain**	2-154	4
4	**BRUSHES**		
	Poly-Smooth Brush (standard on machine)	2-421P	3
	Supra-Grit Brush	2-421SS	3
	Tuff-Grit Brush	2-421S	3
	Wyr Brush	2-421W	3
	Midi-Grit Brush	2-421G	3
	Lyt-Grit Brush	2-421PS	3
	Nylo-Soft Brush	2-421N	3
	Dynascrub	2-421DS	3
	Pad Drivers	2-421D	3
	Pad Holders (holds pad to driver)	5-433	optional
5	**Brush Repair Kit**	5-423	optional
	includes "scissor" handle, clutch plate, and mounting hardware		1 per brush
6	**Vacuum Hose: complete with cuffs**	5-705	1
7	**Drain Hose: complete**	5-730	1

UPPER BODY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16A
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FACTORY CAT
4B
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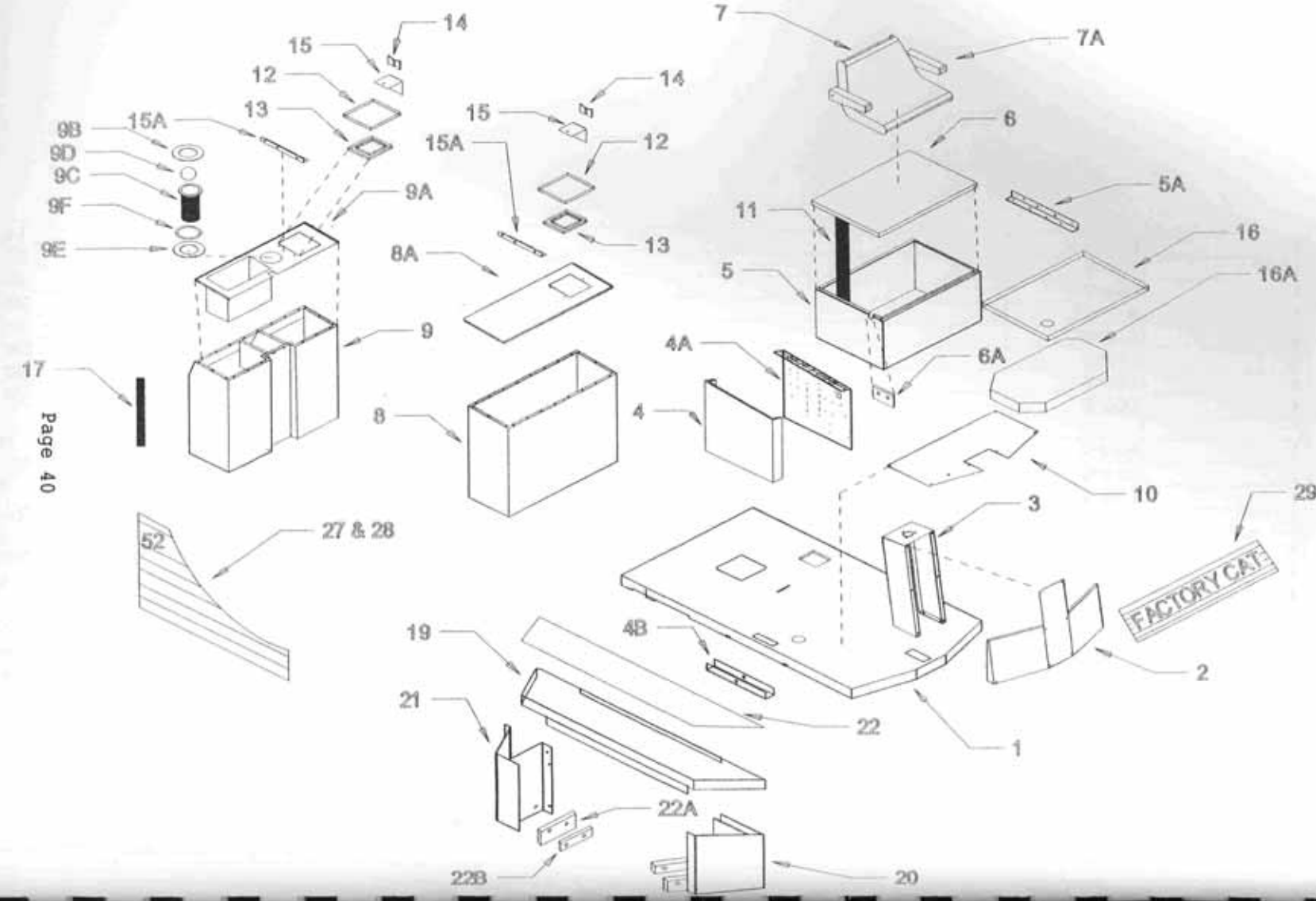
Reference	DESCRIPTION	Part No.	Qty Req'd.
Upper Body Parts			
1	**Mainframe**	5-110	1
2	**Front Apron**	8-118	1
3	**Steering Pedestal**	8-117	1
4	**Central Command Box, housing only**	5-112	1
	see break down on central command picture page		
4A	**Bolt On Plate**	5-292	1
4B	**Wiring Channel**	5-147	1
5	**Battery Box (removable)**	5-160	1
5A	**Battery Box Hinge**	5-128	1
6	**Battery Box Lid**	5-146	1
6A	**Cable Protector**	5-129A	1
7	**Adjustable Seat**	8-142	1
7A	**Armrest Set for seat**	8-143A	1
8	**Solution Tank, complete**	5-401	1
8A	**Solution Tank Lid**	5-410	1
9	**Recovery Tank, complete**	5-699	1
	see break down on recovery picture page		
9A	**Recovery Tank Lid**	5-700	1
9B	**Vac Cover Gasket**	5-691	1
9C	**Filter Screen**	8-911	1
9D	**Overfill Shut Off Ball**	38-712	1
9E	**Filter Screen Gasket**	38-738	1
9F	**Filter Screen O-Ring**	5-690	1
10	**Floor Anti-Slip Panel, polished aluminum**	8-161	1
11	**Polypropylene Lid Strap**	5-133	1

UPPER BODY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52
FACTORY CAT
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22A
22B
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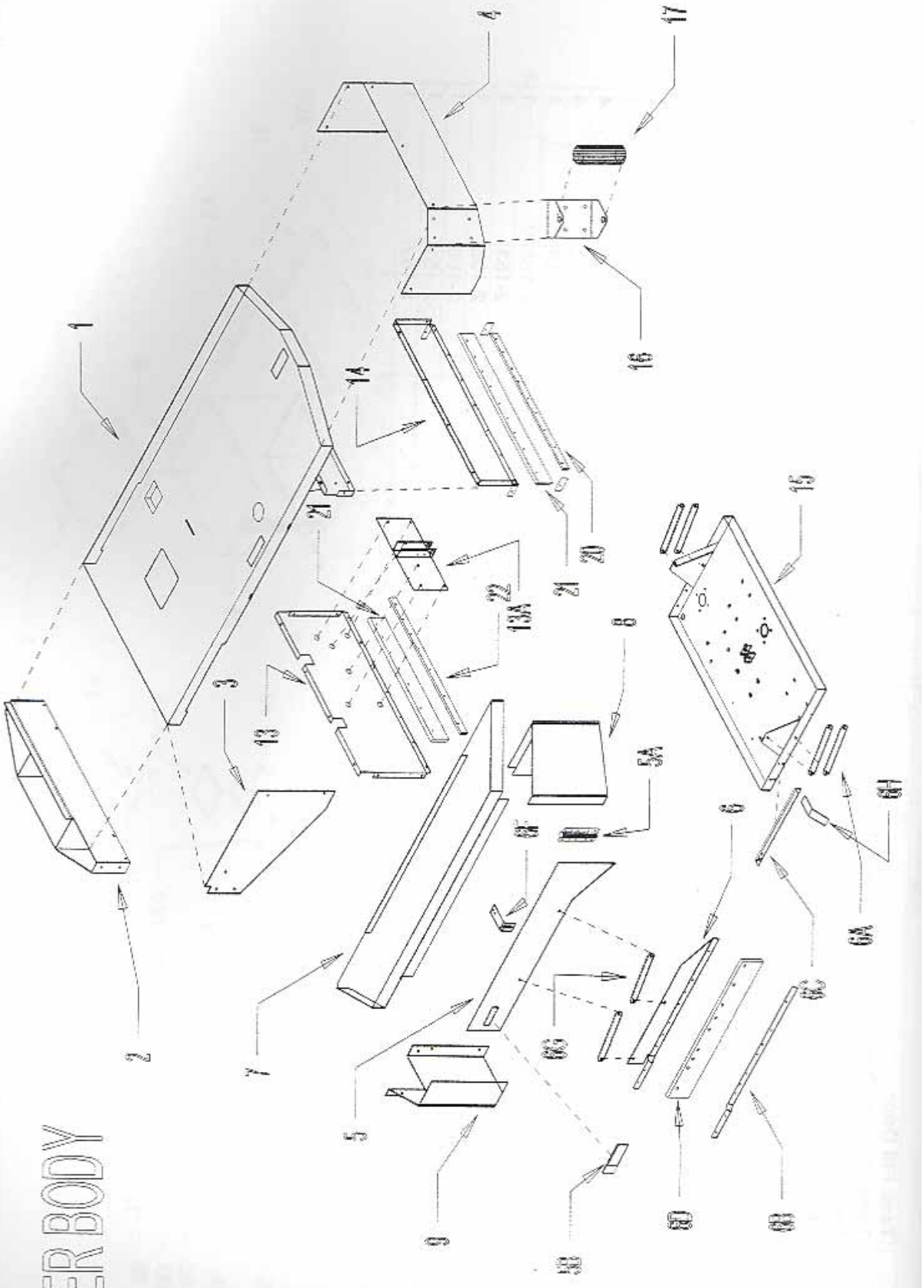
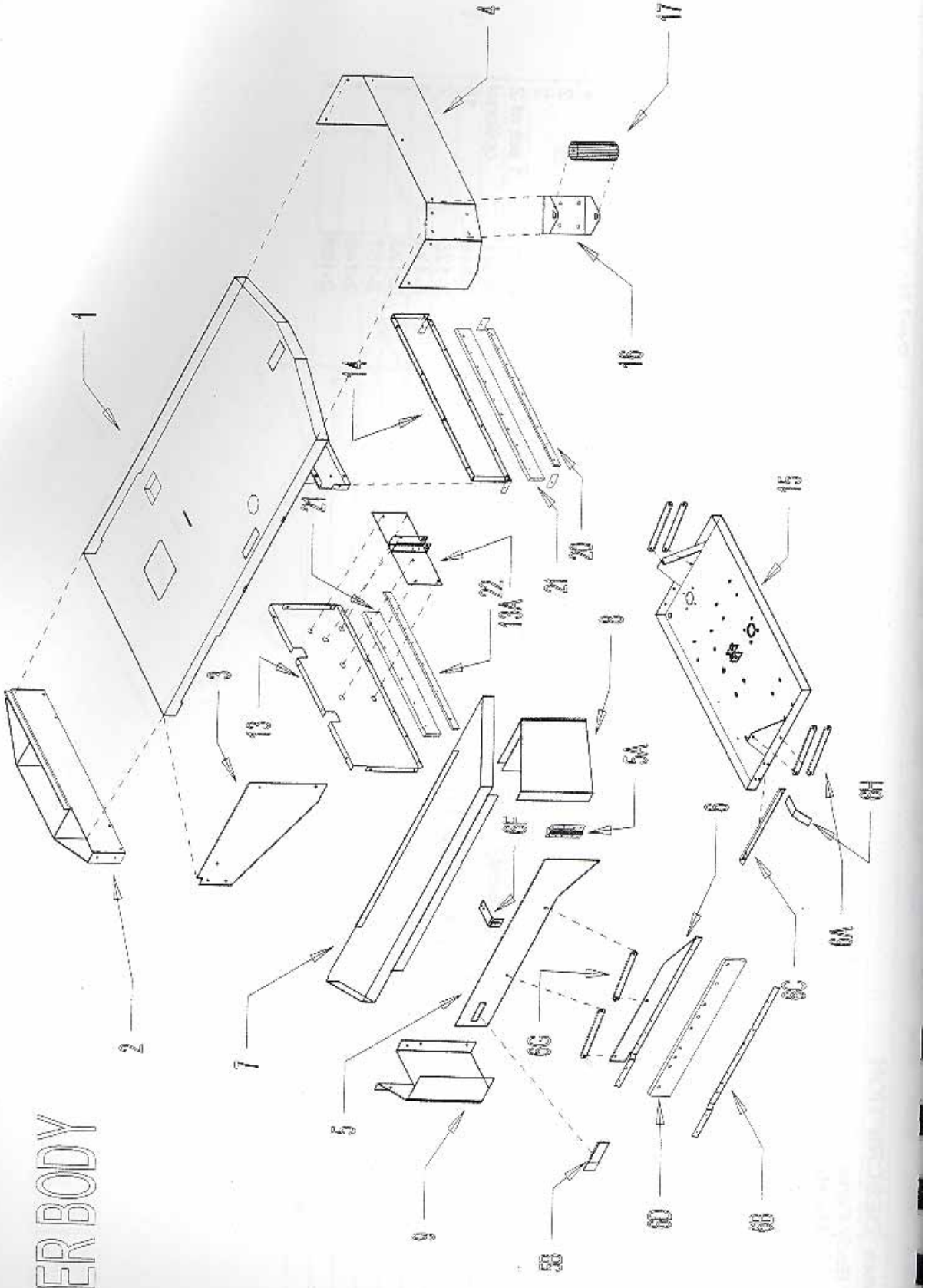
12	Tank Fill Door	5-411	1
13	Tank Fill Door Gasket (windlace style; fits all machines)	5-412N	2
14	Tank Fill Door Knob	5-418	2
15	Tank Fill Door Clip	5-417	2
15A	Tank Door Hinge	5-413	2
16	Battery Tray (plastic)	5-134	1
16A	Plywood Battery Underlayment	5-148	1
17	Drain Hose	5-721	1
18	Floor Seal Clamp Set (not shown) set of 3 [1 5-131L & 2 5-131S]	5-131	1
19	Body Extension Top Right	2-157	1
20	Front Right Body Extension	2-148	1
21	Rear Right Body Extension	2-156	1
22	Aluminum Diamond Plate Cover Right	2-152	1
22A	Extension Splash Curtain	2-154	4
22B	Extention Splash Curtian Holddown Bar	2-165	4
23	Front Left Body Extension (not shown)	2-149	1
24	Body Extension Top Left (not shown)	2-158	1
25	Aluminum Diamond Plate Cover Left (not shown)	2-153	1
26	Rear Left Body Extension (not shown)	2-155	1
27	Right-hand "52" Decal	2-150	1
28	Left-hand "52" Decal (not shown)	2-151	1
29	Front "Factory Cat" Decal	8-152	1


LOWER BODY

Reference	DESCRIPTION	Part No.	Qty Req'd.
Lower Body Parts			
1	**Mainframe**	5-110	1
2	**Rear Bumper**	5-119	1
3	**Rear Quarter Panel**	5-120	1
	left and right panel are the same; does not include bumper strip		
4	**Front Bumper**	5-135	1
5	**Left-hand Door**	2-121L	1
	Right-hand Door	2-121R	1
5A	**Side Door Hinge**	5-122	2
5B	**Side Door Latch**	5-130	2
6	**Left-hand Wiper**	5-123L	1
	Right-hand Wiper	5-123R	1
6A	**Lateral Arms (for scrubhead)**	2-124	4
6B	**Wiper Blade Mounting Strip**	5-403	2
6C	**Scrubhead Stabilizer Arm**	2-460	2
6D	**Wiper Blade (gum rubber, standard)**	5-402G	1 set of 2
	Wiper Blade (neoprene)	5-402N	optional
6E	**Wiper Blade Mounting Strip Bolts (not shown)**	5-419	18
6F	**Wiper Lifting Slide**	2-125	2
6G	**Door Arms**	5-124	4
6H	**Plastic Slide (attaches to 6F)**	2-123	1
7	**Body Extension Top Right**	2-157	1
8	**Front Right Body Extension**	2-148	1
9	**Rear Right Body Extension**	2-156	1


LOWER BODY
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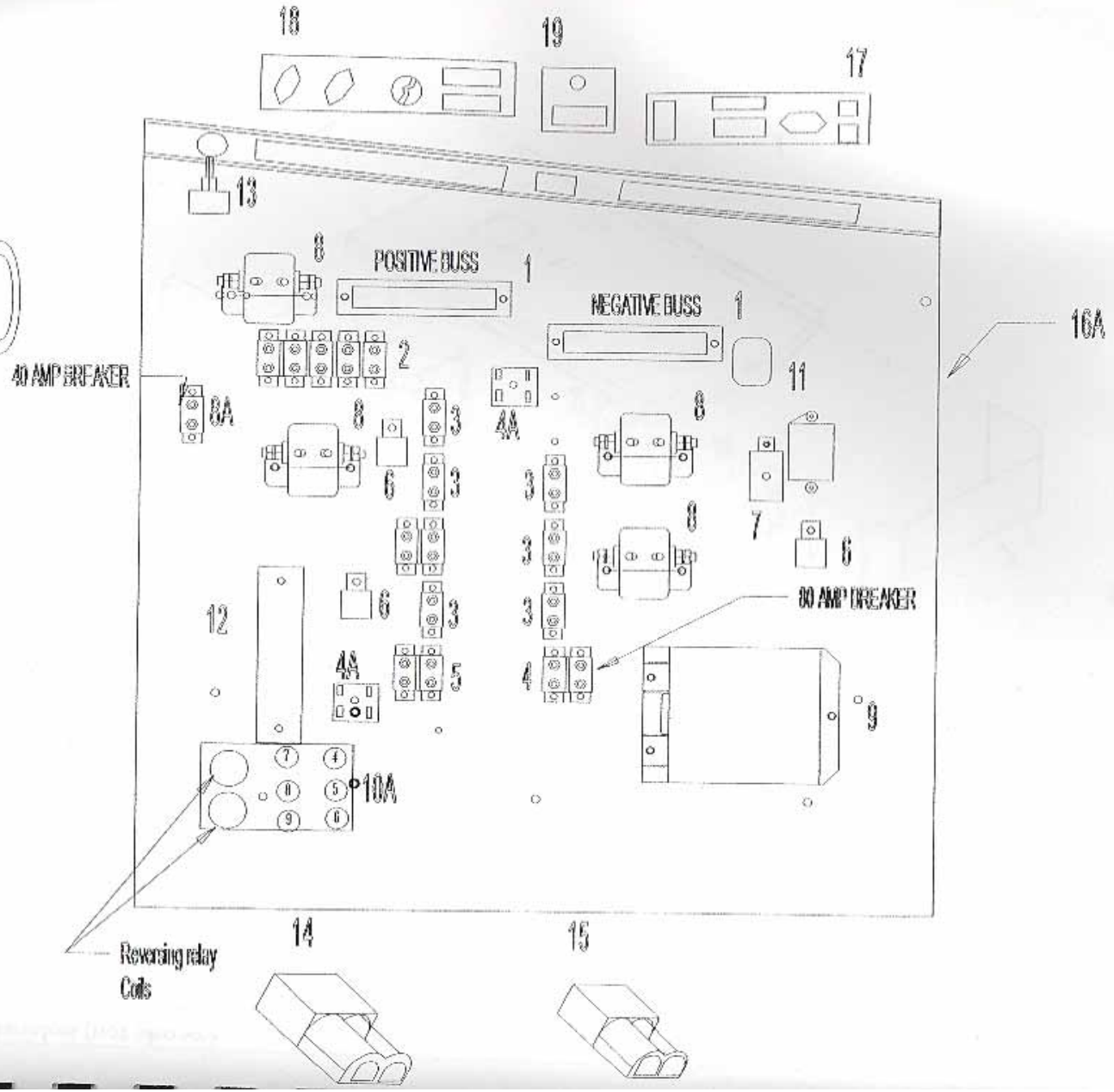
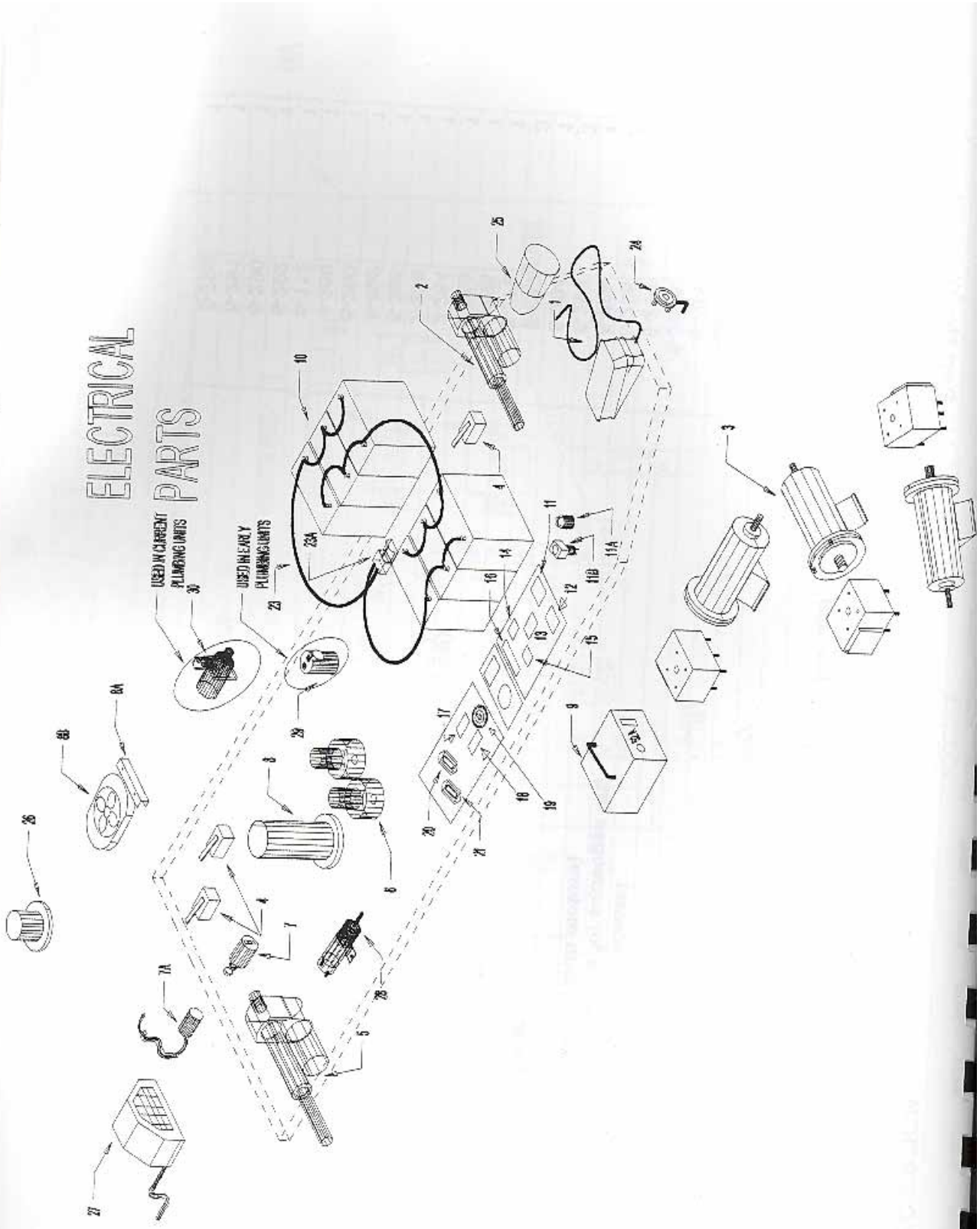
10	**Front Left Body Extension (not shown)**	2-149	1
11	**Rear Left Body Extension (not shown)**	2-155	1
12	**Body Extension Top Left (not shown)**	2-158	1
13	**Rear Splash Panel**	5-125	1
13A	**Scrubhead Actuators' Anchor**	2-221B	1
14	**Front Splash Panel**	5-126	1
15	**Scrubhead**	2-402	1
16	**Roller Bracket**	7-126	2
17	**Roller**	7-125	2
18	**1" wide Bumper Strip: sold by the foot (not shown)**	8-130	32 Feet
19	**Complete Warning and Instruction Label Set (not shown)**	5-156	1
20	**Front Splash Curtain Hold Down Bar Set (1 5-131L & 2 5-131S)**	5-131	1 Set
21	**Front & Rear Splash Curtain Set**	5-127	1 Set
22	**Rear Splash Curtain Hold down Bar**	5-132	1
23	**Extension Splash Curtains (neoprene) not shown**	2-154	1

CENTRAL COMMAND



Reference	DESCRIPTION	Part No.	Qty Req'd.
Central Command			
	Rebuilt Central Command: complete except for box	2-280R	1
	Complete Central Command Assembly		
	ready to install on machine, including all parts below, and box, and	2-280	1
	switches and gauges brand new		
	Complete Central Command Assembly	2-281	1
	same as above, but rebuilt and fully tested by factory		
1	**Bus Bar**	5-287	2
2	**250 Amp Main Breaker**	5-288A	1
3	**6 Amp Circuit Breaker**	8-284	6
3A	**12 Amp Circuit Breaker**	5-284A	2
4	**50 Amp Circuit Breaker (vac motors)**	5-289	1
4A	**Diode (one for reverse & one for squeegee lift)**	5-296	2
5	**80 Amp Circuit Breaker (scrub motors)**	5-298	1
6	**15 Amp Relay**	5-293	3
7	**Vacuum System Timer**	5-294	1
8	**80 Amp Relay**	8-283	3
8A	**20 AMP Presweep Circuit Breaker**	5-279	1
9	**Computer Control (curtis 1227)**	5-285	1
10	**Complete Wiring Harness for central command (not shown)**	2-286	1
10A	**Reversing Relay**	2-284	1
11	**Down Pressure Control Module**	2-236	1
12	**Shunt**	5-295	1
13	**Center Brush Reversing Switch**	5-892	1
14	**Red 175 Connector w/contacts**	5-260	1
15	**Gray Connector w/contacts**	4-256	1
16	**Central Command Box: housing only (not shown)**	5-112	1
16A	**Bolt On Plate**	5-292	1
17	**Front Switchpanel**	5-290	1
18	**Rear Switchpanel**	5-291	1
19	**Middle Switchpanel**	5-299	1


ELECTRICAL
PARTS
USED ON CHEROKEE
PLANTING UNITS
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USED ON EARLY
PLANTING UNITS
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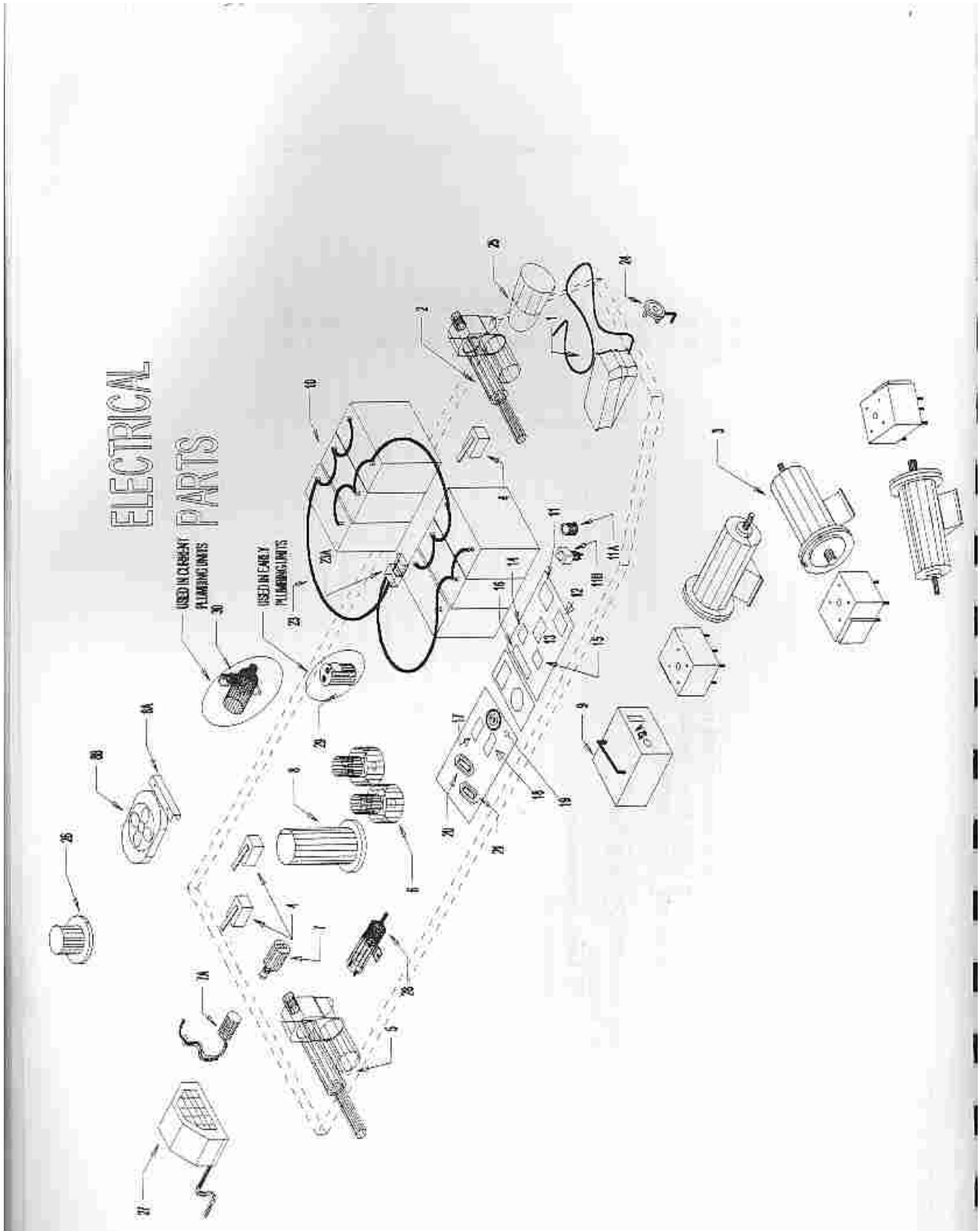
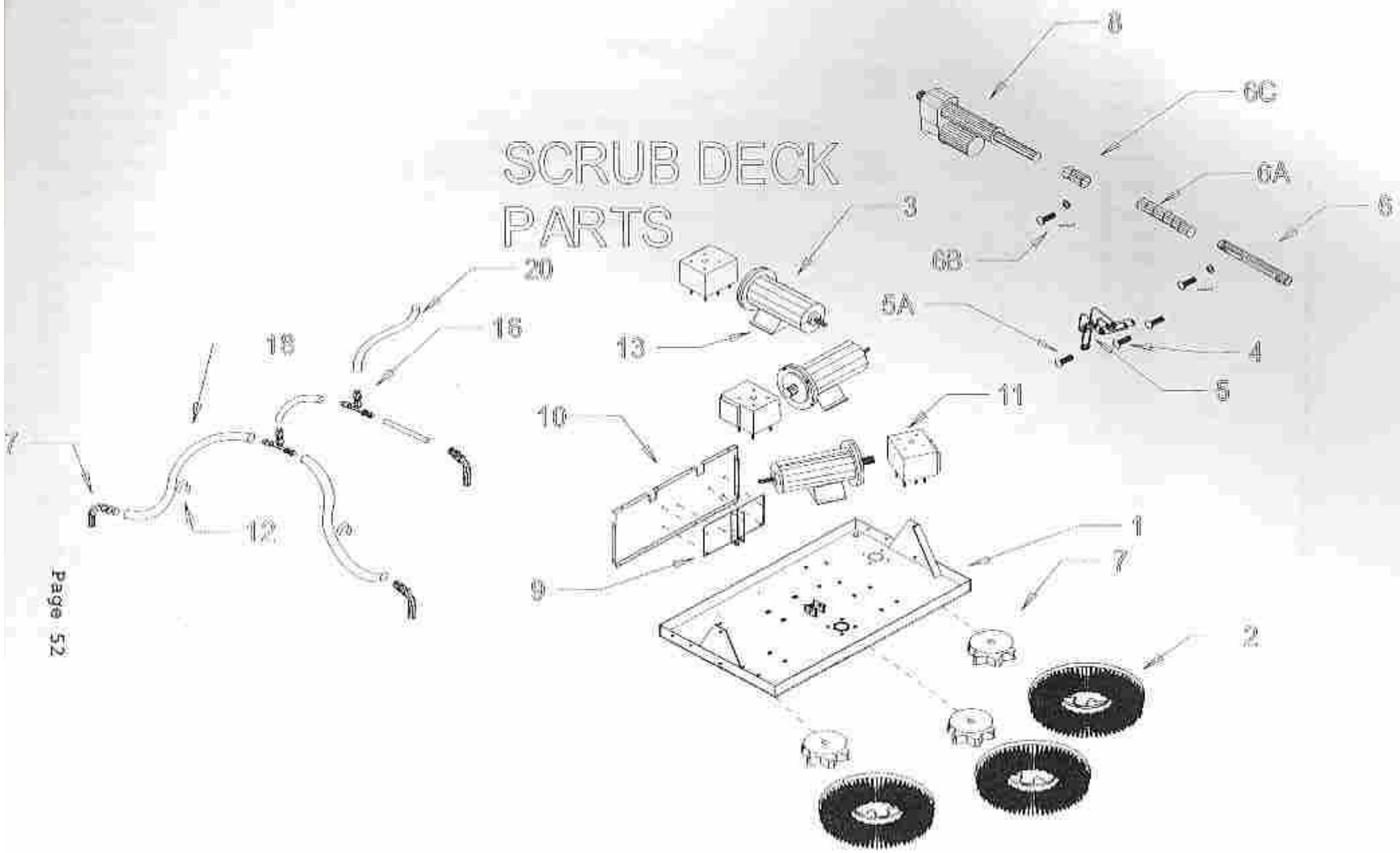
Reference	DESCRIPTION	Part No.	Qty Req'd.
Electricals			
1	Foot Pedal	5-275	1
1A	Foot Pedal Potentiometer (not shown)	8-290A	1
2	Scrubhead Electric Actuator	5-221	1
3	Scrub Motor	8-211	3
4	Scrubhead & Squeegee Lift Limit Switch	5-223	3
5	Squeegee Lift Electric Actuator	5-224	1
6	Vac Motor including gasket	5-225	2
6A	Vac Motor Cap (plastic protective top to vac motor) not shown	5-225A	1 per
7	Recovery & Solution Tank Warning Light Float Switch	5-226	2
7A	Recovery & Solution Tank Shut off Float Switch	5-227	1
8	Traction Motor	8-211	1
8A	Traction Motor's Supplemental Cooling Fan	5-214	1
8B	Traction Motor's Fan Bracket	5-217	1
9	Charger: console type, 52 Amp, automatic	5-246	2
10	12 Volt, 205 AH Battery (standard)	2-271	6
11	Solution Empty Light (yellow lens)	5-230	1
11A	Solution/Recovery Light Bulb	5-239	2
11B	Solution/Recovery Bulb Housing	5-241	2
12	Recovery Full Light (red lens)	5-231	1
13	Down Pressure Gauge including control module	2-236	1
14	Brush Switch: increases & decreases brush pressure	5-233	1
15	Squeegee Switch: up and down	5-234	1
16	Auto-Manual Switch	8-231	1
17	Green Power "On" Light	8-232	1
18	Forward/Reverse Switch	5-237	1
19	Key Switch	4-234	1
20	L.E.D Battery Condition Meter	8-261	1


ELECTRICAL PARTS
USED IN CURRENT PLUMBING UNITS
USED IN EARLY PLUMBING UNITS

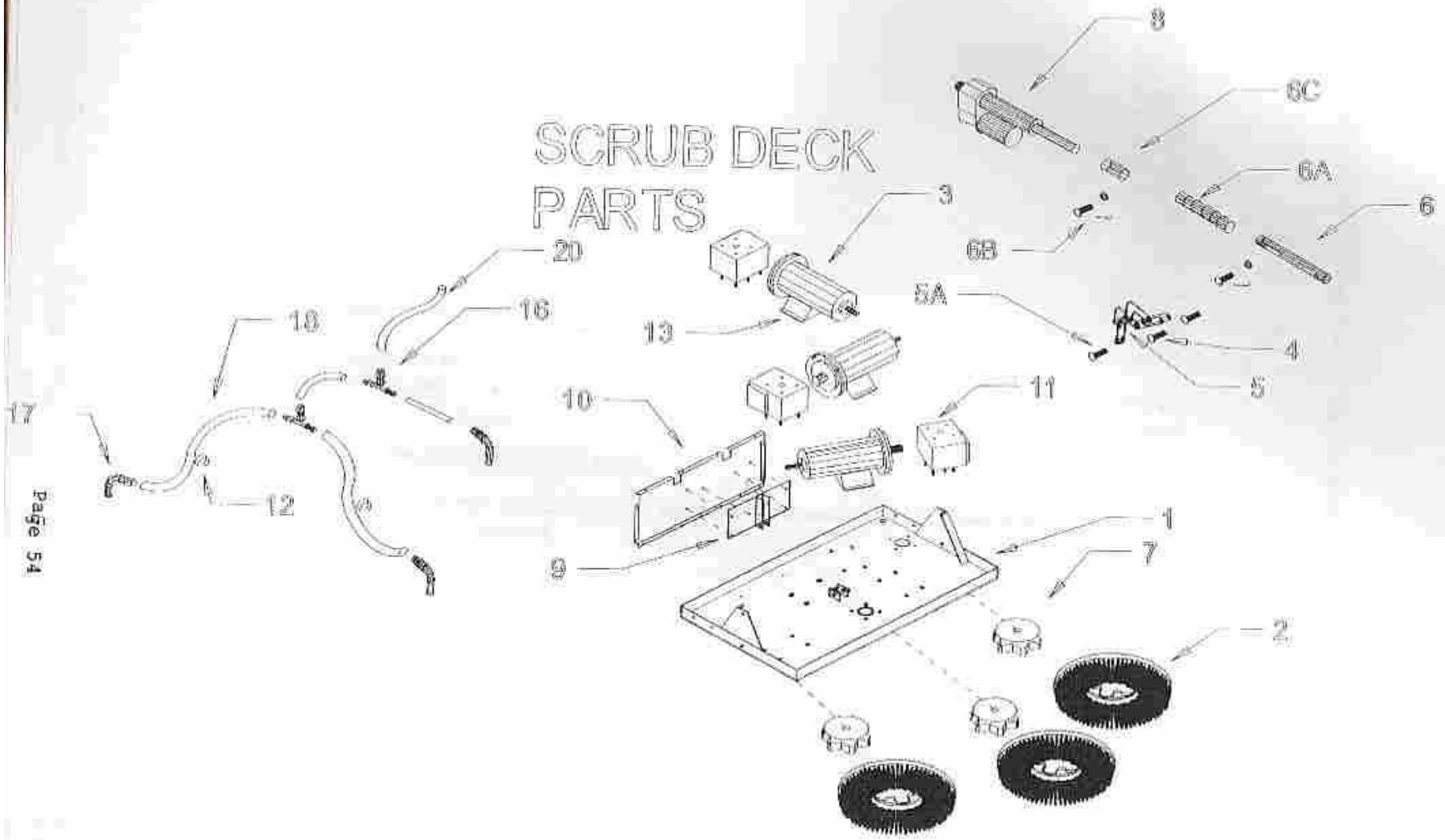
21	**L.C.D. Hour Meter**	8-262	1
22	**Label Set for Controls (not shown)**	5-156	1 Set
	includes front & rear control panels		
22A	**Label for middle switchpanel**	2-160	1
23	**Wiring Harness for Battery Set: complete (automotive style)**	5-252	1
23A	Red 175 Connector	5-260	1
23B	Set of Rubber Terminal Covers (automotive style)	5-261	Set of 12
23C	**Wiring Harness for Battery Set: complete (marine style)**	5-252N	1
23D	Set of Rubber Terminal Covers (marine style)	5-261N	Set of 12
Not Illustrated	**White 50 Conector with Contacts (vac motor connection)**	5-219	1
Not Illustrated	**White 50 Conector with Contacts (scrub motor connection)**	5-220	1
Not Illustrated	**White 60 Conector without Contacts**	4-258	1
Not Illustrated	**Red 175 Cable Clamp**	5-260A	1
Not Illustrated	**Strobe and Fuse Holder**	8-293F	1
24	**Horn**	8-294	1
24A	**Horn Switch (push-button) not shown**	8-294B	1
24B	**Circuit Breaker for headlight (6 AMP) not shown**	8-284	1
	Electro-Pack Field Installation Kit	5-305	1
	includes following items: wiring, instructions 24, 24A, 25, 26, 27		
25	**Headlight**	8-291	1
26	**Strobe Light**	8-293	1
27	**Backup Alarm**	8-292	1
28	**Parking Brake Solenoid**	8-295	1
29	**Solution Tank Electrovalve**	5-244	1
30	**Adjustable Solution Flow valve**	7-245	1
Not Illustrated	**Shunt see central command**	5-295	2
Not Illustrated	**Diode Bridge see central command**	5-296	1
	HARNESS SET: includes all of the following:	5-253	1
Not Illustrated	**Parking Brake Harness**	5-254	1
Not Illustrated	**Central Command to Brushhead**	5-255	1
Not Illustrated	**Central Command to Traction Motor**	5-256	1
Not Illustrated	**Central Command to Vacuum Motors and Tank Stop Switch**	5-257	1
Not Illustrated	**Central Command to Squeegee Contact Switches**	5-258	1
Not Illustrated	**Central Command to Horn**	5-259	1
Not Illustrated	**Central Command to Solution Tank Solenoid Valve**	5-262	1
Not Illustrated	**Central Command to Strobe**	5-263	1
Not Illustrated	**Central Command to Reverse Alarm**	5-264	1
Not Illustrated	**Central Command to Headlight**	5-265	1

SCRUB DECK PARTS

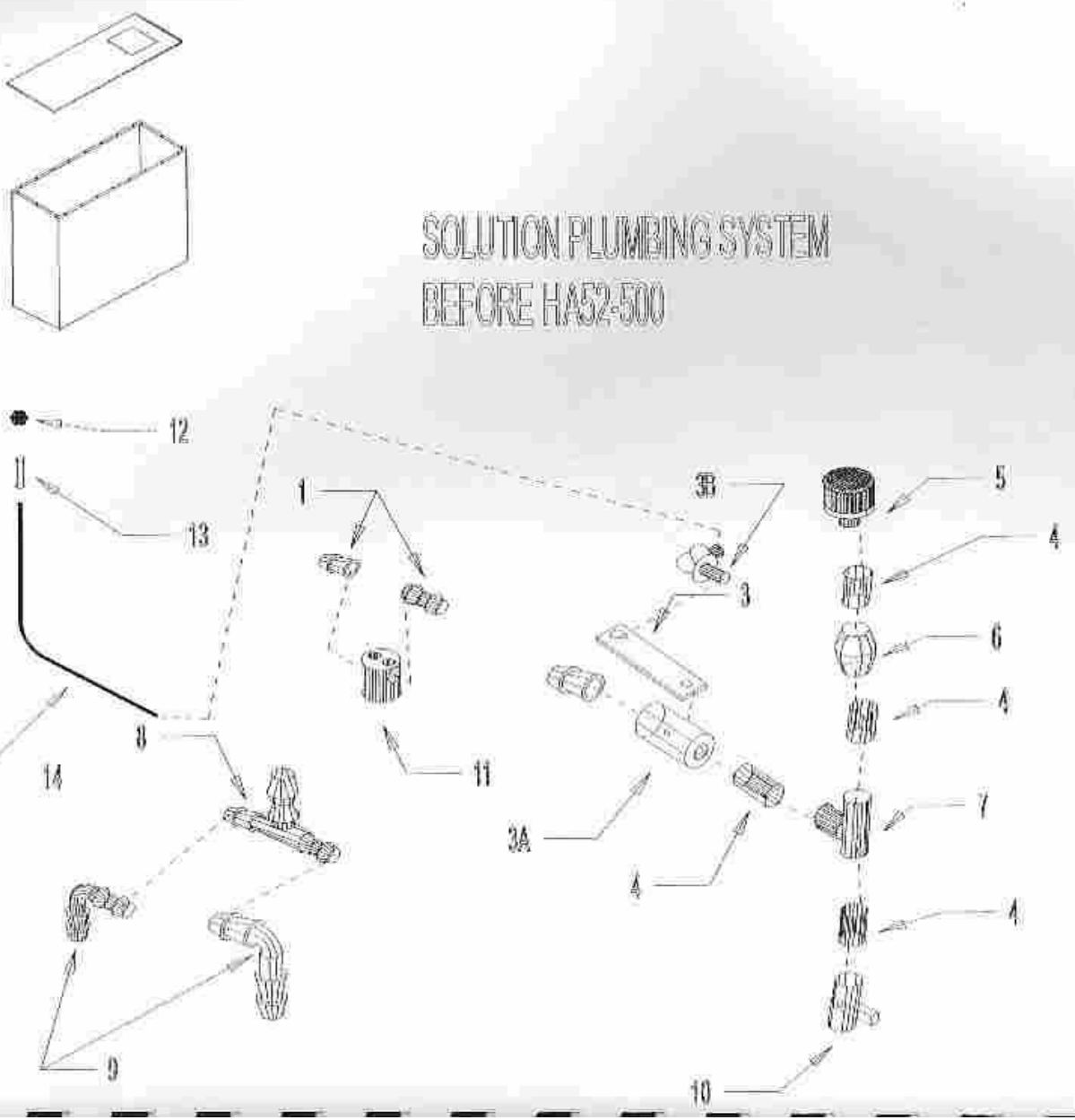


Reference	DESCRIPTION	Part No.	Qty Req'd.
SCRUB DECK PARTS			
1	**Scrubhead**	2-402	1
2	**Scrub Brush**		3
	Poly-Smooth (polypropylene) (this is standard on machine)	2-421P	3
	Supra-Grit (toughest grit brush)	2-S421SS	3
	Tuff-Grit (2nd toughest grit)	2-421S	3
	Wyr (wire brush)	2-421W	3
	Midi-Grit (medium grit brush)	2-421G	3
	Lyt-Grit (light grit brush)	2-421PS	3
	Nylo-Soft (softest brush)	2-421N	3
	Pad Driver, complete	2-421D	3
2A	pad driver's retaining ring	5-433	optional
2B	**Scrub Brush Repair Kit (not shown)**	5-423	optional
	includes "scissor" handle, clutch plate and mounting hardware also fits driver 5-412D		
3	**Scrub Motor**	8-211	3
3A	**Scrub Motor Top Underlayment (clamp belt)**	2-457	3
4	**Scissorlift Pin**	5-405	1
5	**Scissorlift**	2-404	1
5A	**Arm Mount Hardware Set**	2-145	8
	includes 1 shoulder bolt, 2 nylon washers, 1 nylock nut		
6	**Spring Tube**	2-406	1
6A	**Scrubhead Downpressure Spring (standard strength)**	2-408	1
6B	Spring Tube Pin	5-407	1
	Spring Cap (not shown)	5-409A	1
7	**Scrub Brush Driver (brush or pad driver mounts to it)**	5-430	3
7A	Brush Driver Key	5-431	1 per brush
7B	Driver Mounting Bolt and Washers	5-432	3
8	**Scubhead Electric Actuator**	5-221	1
9	**Scrubhead Actuators' Anchor**	2-221B	1
10	**Rear Anti-Splash Panel**	5-125	1
11	**Reduction Gearbox for motor drive**	2-455	3
12	**Scrub Motor Hold Down Clamp**	2-456	3
13	**Scrub Motor Cradle**	4-201	3
14	**Scrub Motor Standoff (not shown)**	2-459	18

SCRUB DECK PARTS



16	**1/2" Plastic Barbed Tee**	5-446	2
16A	**5/8" Plastic Barbed Tee**	7-247	3
17	**5/8" Barb to 1/2" NPT Elbow**	7-248	3
17A	**1/2" Barb Tee to 1/2" NPT Elbow**	5-447	1
18	**5/8" nylon reinforced hose**	5-460	sold by the foot
19	**1/2" nylon reinforced hose**	5-440	sold by the foot
20	**5/8" PVC Clear Hose**	5-465	1


SOLUTION PLUMBING SYSTEM
BEFORE HA52-500
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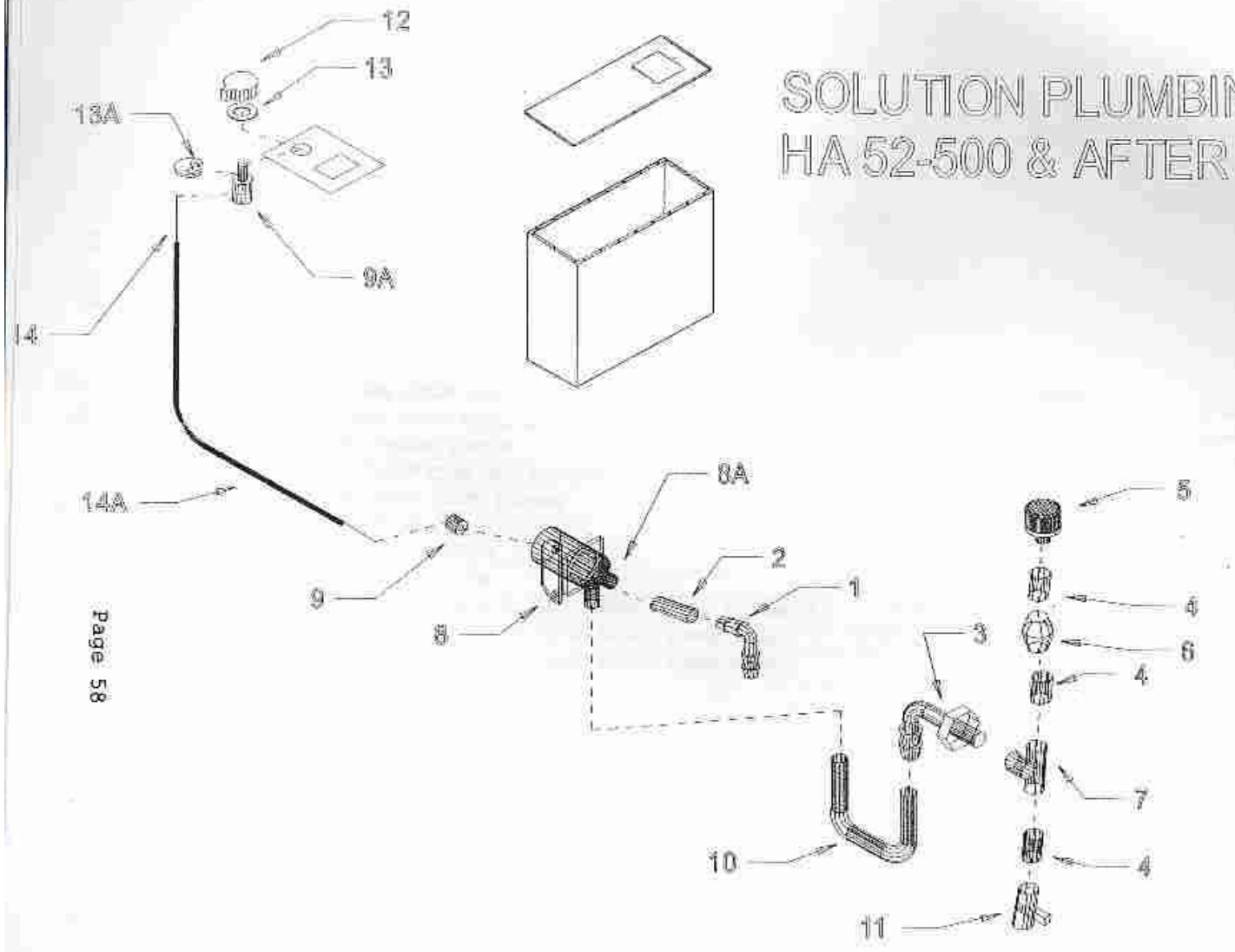
SOLUTION PLUMBING SYSTEM, BEFORE HA52-500

Reference	DESCRIPTION	Part No.	Qty Req'd
1	Plastic Barb Fitting: 3/8" NPT to 1/2" barb	5-441R	2
2	Plastic Barb Fitting: 3/4" NPT to 1/2" barb	5-441A	1
3	Flow Control Gate Lever	5-439	1
3A	Flow Control Gate Valve	5-445B	1
3B	Threaded End Fitting and Link (not shown)	8-453A	1
4	Steel Nipple	5-442	4
5	Solution Intake Screen	5-415	1
6	Steel Union	5-444	1
7	Steel Tee	5-443	1
8	1/2" Plastic Barb Tee (goes to 16 on scrub deck page)	5-446	1
8A	5/8" Plastic Barb Tee (goes to 16 on scrub deck page)	7-247	1
9	Plastic Water Jet Elbow: 1/2" NPT to 1/2" Barb Elbow	5-447	2
10	Solution Tank Dump Valve	5-445	1
11	Solution Tank Electrovalve	5-244	1
12	Solution Flow Cable Knob	5-451	1
13	Solution Flow Cable Knob Mount	5-449	1
13A	Solution Flow Cable Clip (not shown)	5-448A	1
14	Solution Flow Control Cable	5-448	1
15	Nylon-Reinforced Hose (1/2" diameter) not shown	5-440	sold by the foot
16	Nylon-Reinforced Hose (5/8" diameter) not shown	5-466	sold by the foot

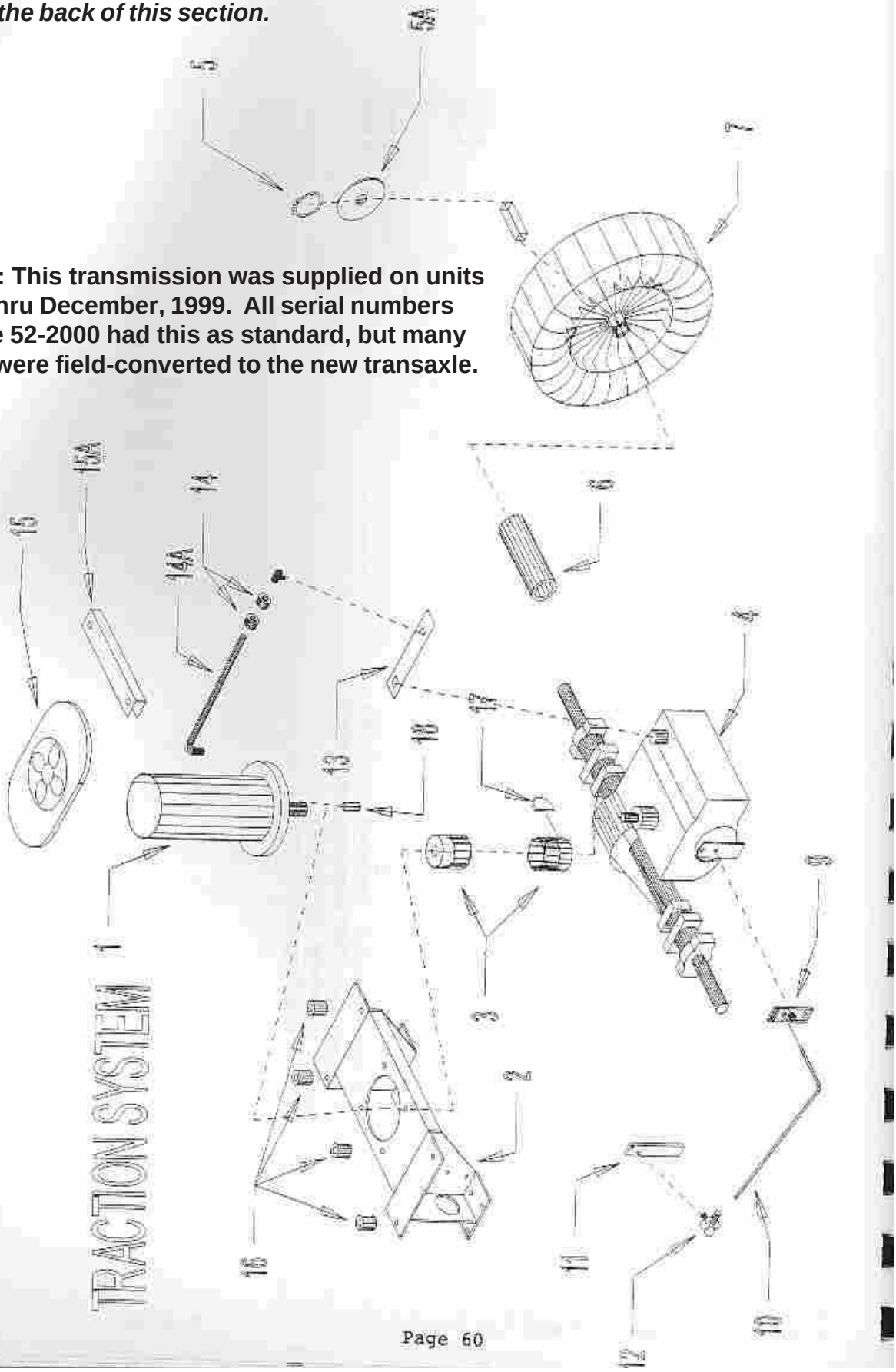
SOLUTION PLUMBING SYSTEM
HA 52-500 & AFTER



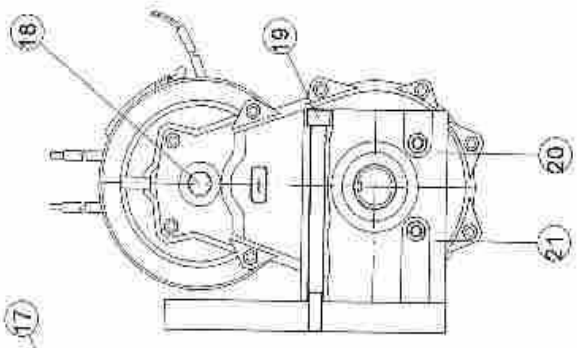
Reference	DESCRIPTION	Part No.	Qty Req'd.
SOLUTION PLUMBING SYSTEM, HA52-500 & AFTER			
1	5/8 to 5/8 Barb Elbow	5-459	1
2	5/8 Hose (valve to barb elbow)	5-460	1
3	5/8 Barb to 3/4 NPT Elbow	5-462	1
4	Steel Nipple	5-442	3
5	Solution Intake Screen	5-415	1
6	Steel Union	5-444	1
7	Steel Tee	5-443	1
8	Adjustable Solution Flow Valve	7-245	1
8A	Polysulfone Face for Deltrol valve	7-245F	1
9	Solution Flow Lower Cable Coupler	7-447	1
9A	Solution Flow Upper Cable Coupler	7-446	1
10	5/8 Hose (valve to solution tank tee)	5-461	1
11	Solution Tank Dump Valve	5-416	1
12	Solution Flow Adjustment Knob (not shown)	4-452	1
13	Washer		NSS
13A	E Clip		NSS
14	Solution Flow Control Cable (inner core)	5-467	1
14A	Solution Flow Cable (outer tubing)	5-468	1
15	Nylon-Reinforced Hose (1/2" diameter) not shown	5-440	sold by the foot
15A	Nylon-Reinforced Hose (5/8" diameter) not shown	5-466	sold by the foot
16	Side Outlet Tee (4 outlets) not shown	5-443A	
16A	Side Outlet Tee Hole Plug (not shown)	5-443B	

For a detailed list of transaxle parts within Transaxle 8-604, please refer to pages at the back of this section.

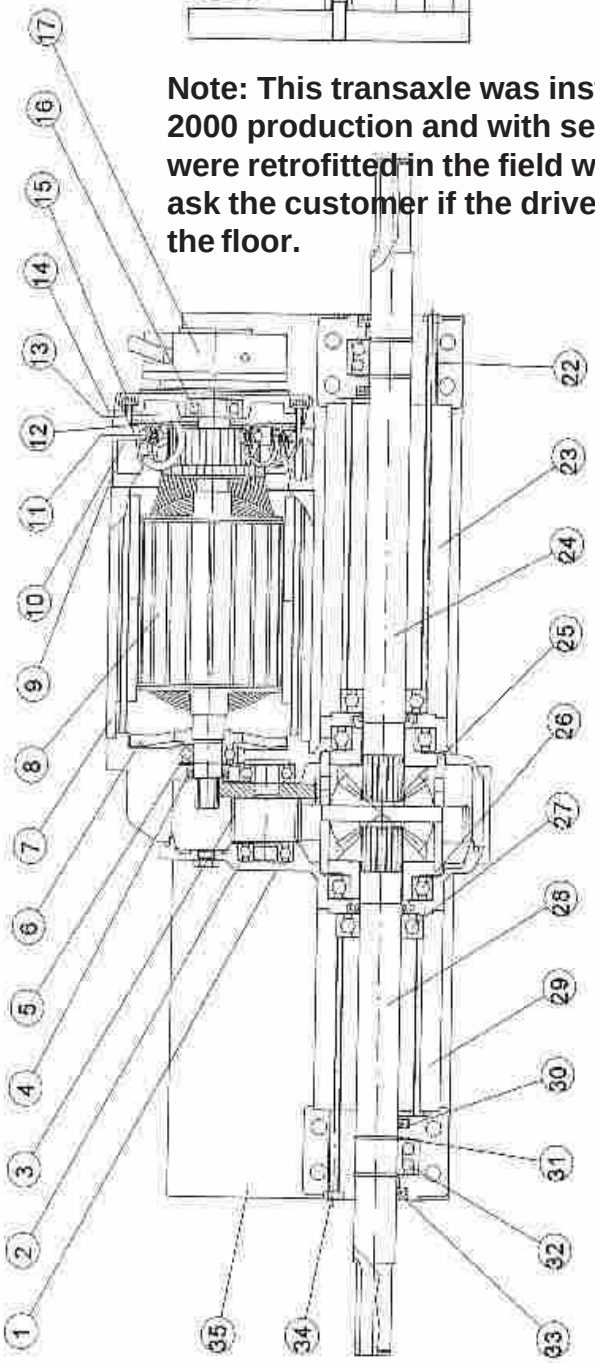
NOTE: This transmission was supplied on units built thru December, 1999. All serial numbers before 52-2000 had this as standard, but many units were field-converted to the new transaxle.

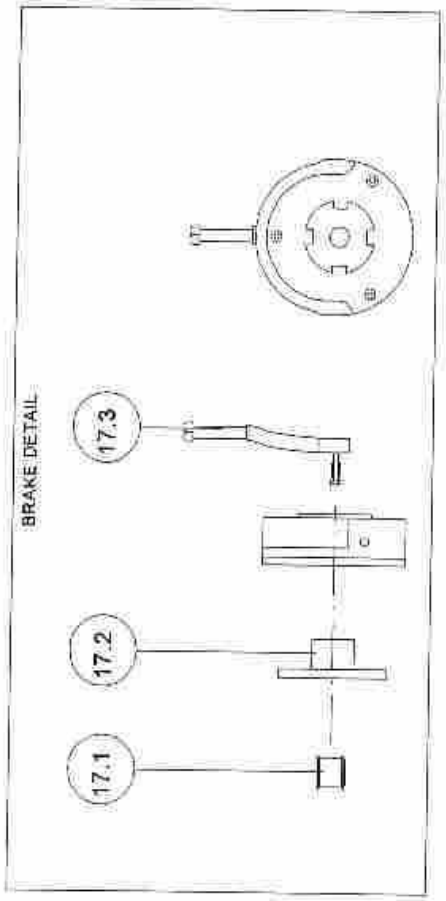


Reference	DESCRIPTION	Part No.	Qty Req'd.
TRACTION SYSTEM			
1	**Traction Motor (see also electrical page)**	8-211	1
2	**Traction Motor Cradle**	8-602	1
3	**Coupling, motor to transaxle (replaces p/n 8-603)**	8-613	1
4	**Transaxle (rebuilt units and parts may be available: consult factory)**	8-604	1
3A	**Coupling Spacer**	8-601	1
4A	**Rebuilt Transaxle (conslut factory for availiblity)**	8-604R	optional
5	**Snap Ring**	8-611	2
5A	**Washer**	7-355	2
6	**Spacer Tube**	8-612	2
7	**Rear Wheel with foam-filled tire mounted (complete assembly)**	5-617	2
	rear wheel tire: 6 ply		
	rear tires does not use innertube		
8	**Rear Axle Key 1/4" x 1/4" x 2"**	8-625	2
9	**Brake Lever Extension (attaches to transmission)**	8-630	1
10	**Brake Release Extension Rod (attaches transmission to brake release lever)**	8-631	1
11	**Brake Release Lever (manual brake release control)**	8-632	1
	bolts on to transmission brake arm		
12	**Threaded End Fitting and Link (adjusts position of brake lever)**	8-453A	1
13	**Transaxle Shift Lever**	5-630	1
14	**Transaxle Shift Lever Limiting Collars**	5-631	2
14A	**Transaxle Shift Lever Link**	5-632	1
15	**Traction Motor's Supplemental Cooling Fan**	5-214	1
15A	**Traction Motor's Cooling Fan Bracket**	5-217	1
16	**Transmission Bracket Mounting Pad**	8-618	4
17	**Transmission Key (half moon)**	8-627	1
18	**Motor Key 3/16 x 3/16 x 3/4**	8-625	1



Note: This transaxle was installed on all units beginning with January, 2000 production and with serial number 52-2000. However many units were retrofitted in the field with this transaxle design. To be certain ask the customer if the drive motor is between the tanks or under the floor.

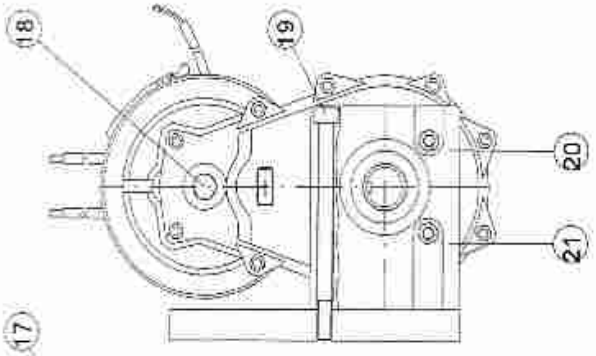




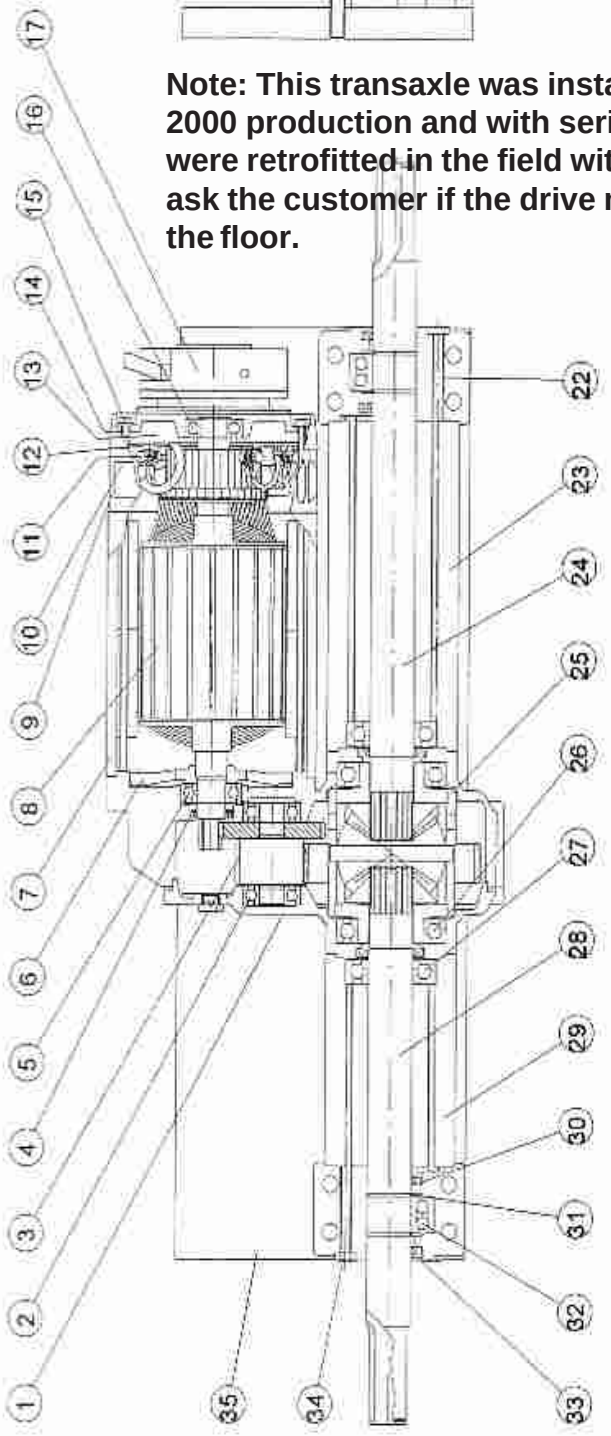
TRANSAXLE PARTS

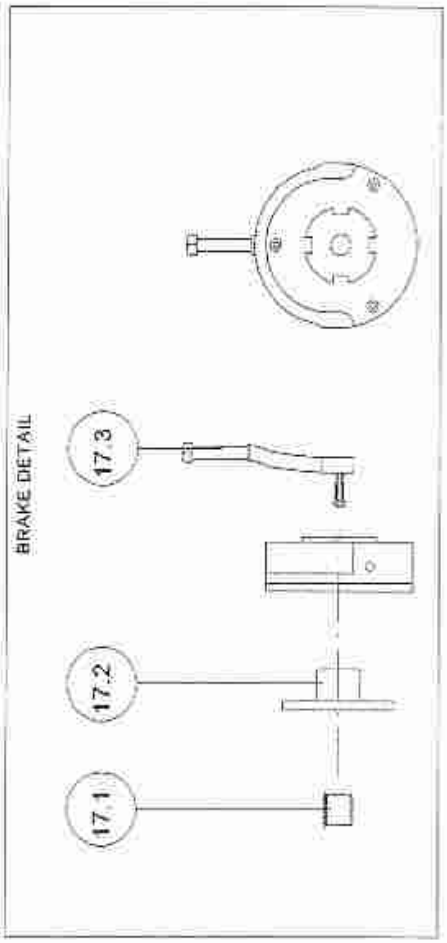
Note: This Motor/Axle Unit fitted to standard units after 4/1/2000
Also mounted on 70 Gallon tank version of HD units after 1/1/2000

Reference	DESCRIPTION	PART No.	Qty Req'd
1	Gear housing	5-934	1
	Gear housing has two parts, covers differential and reduction gears		
2	Gear reducer bearing	5-921	2
3	Reduction gearset complete (2 gears)	5-935	1
4	Motor Seal	5-962	1
Not Illustrated	Armature Assembly, includes items 5, 6, 8 & 16 below	5-964	1
5	Motor shaft bearing, output side	5-923	1
6	Motor fan	5-963	1
7	Motor housing	5-924	1
8	Motor Armature	5-922	1
Not Illustrated	Brush cover and hook assy (includes 9 & 10)	5-966	1
9	Removable brush cover	5-926	1
10	Safety Hook (holds on brush cover)	5-965	1
11	Motor brush (one brush)	5-951	4
12	Motor Brush housing complete (with 4 brushes)	5-927	1
13	Motor end cap	5-928	1
14	Motor thru bolts (set of 4)	5-969	1
15	Axle thrubolt nut (set of 4)	5-970	1
16	Motor shaft bearing, brake side	5-930	1
17	Parking brake unit (includes following)	5-931	1
17.1	Disk Drive Spline	5-961	1
17.2	Brake Disk	5-959	1
17.3	Manual Release "U" bracket & Bolt	5-968	1
18	Oil sightgauge	5-932	1
19	Thrubolt: Axle to heavy steel back plate	5-933	8
20	Outer Bearing Housing half upper	5-952	2
21	Outer Bearing Housing half lower	5-953	2
22	Axle thrubolt lefthand	5-936	4
23	Lefthand axle housing tube	5-937	1
24	Axle shaft lefthand (long side)	5-938	1



Note: This transaxle was installed on all units beginning with January, 2000 production and with serial number 52-2000. However many units were retrofitted in the field with this transaxle design. To be certain ask the customer if the drive motor is between the tanks or under the floor.





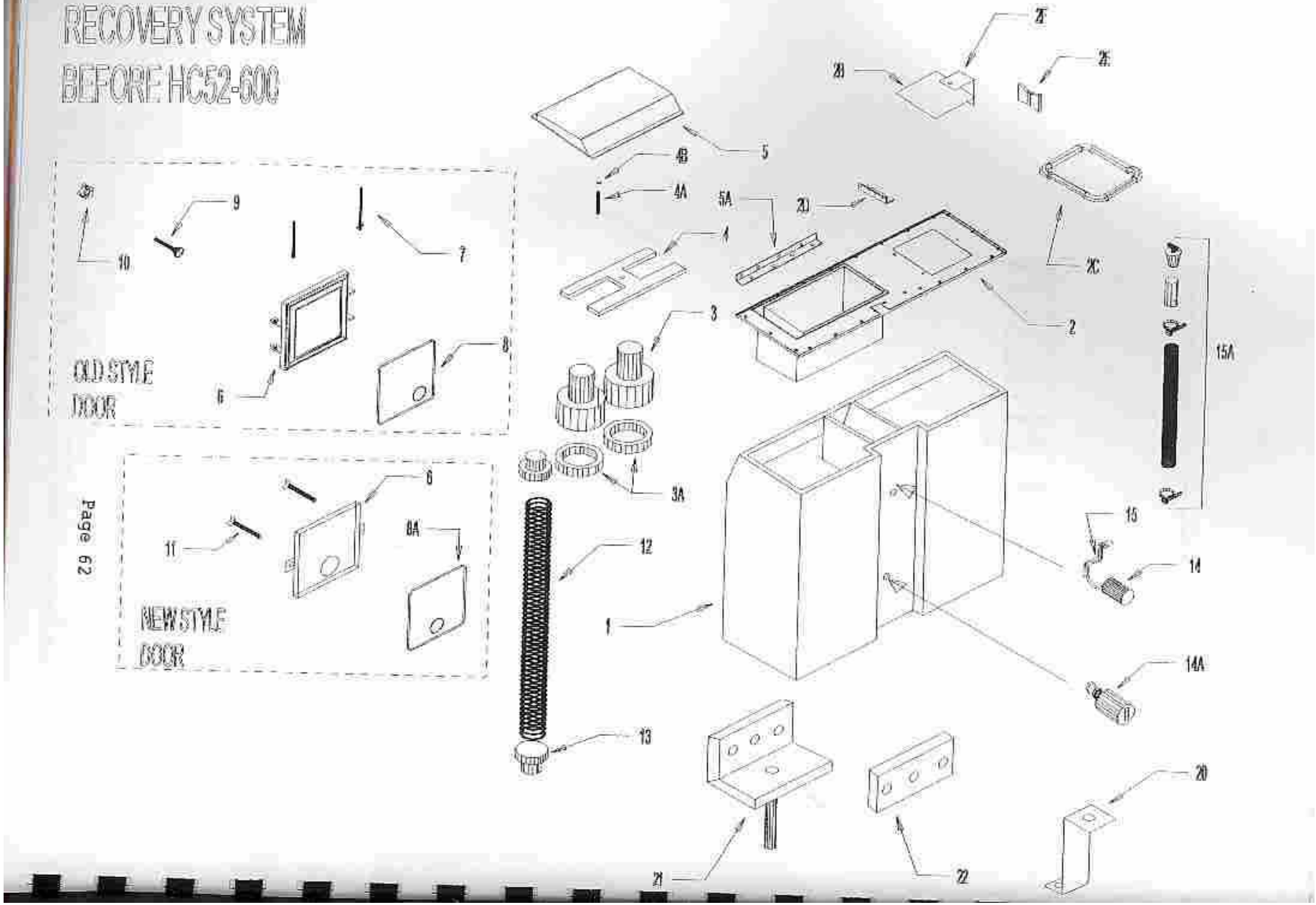
TRANSAXLE PARTS

Note: This Motor/Axle Unit fitted to standard units after 4/1/2000

Also mounted on 70 Gallon tank version of HD units after 1/1/2000

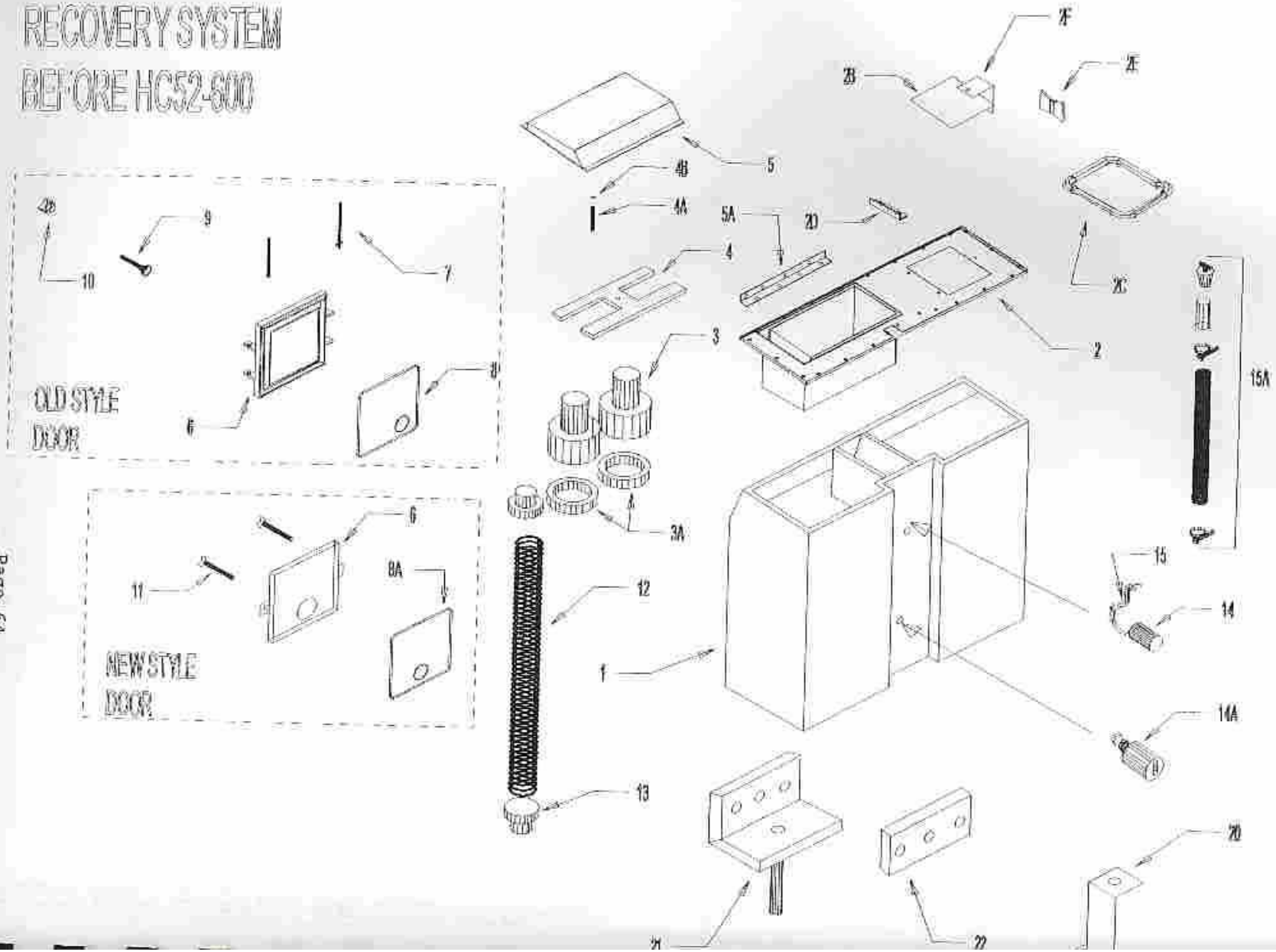
Reference	DESCRIPTION	PART No.	Qty Req'd
25	Differential assembly, complete	5-939	1
26	Differential bearing	5-954	2
27	Bearing single race ball (inside)	5-941	2
28	Axle shaft righthand (short side)	5-942	1
29	Righthand axle housing tube (short side)	5-943	1
30	Inside bearing bracket seal	5-955	4
31	Shaft stop ring (set of 4)	5-971	1
32	Bearing double race ball (outside)	5-945	2
33	Outside bearing bracket seal	5-957	2
34	Axle thrubolt righthand (short side)	5-948	4
35	Heavy steel back plate	5-949	1
Not Illustrated	Oil: Use FINA Giran 220 or equivalent 90 Wt Gearlube	5-950	1.5 lbs

RECOVERY SYSTEM
BEFORE HC52-600



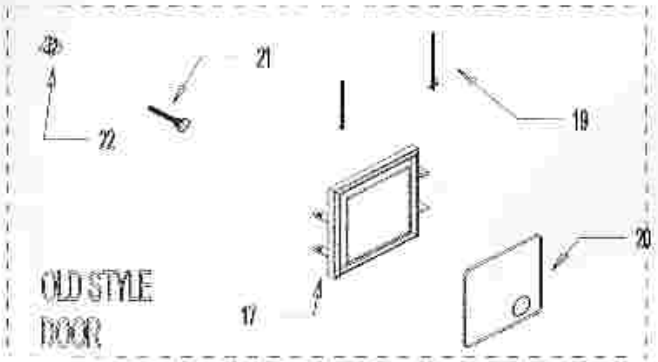
RECOVERY SYSTEM BEFORE HC52-600			
1	**Recovery Tank, stainless steel**	5-701	1
2	**Top For Recovery Tank, stainless steel**	5-707	1
2B	**Flush-Out Door**	5-411	1
2C	**Flush-Out Door Gasket (new style)**	5-412N	1
2D	**Flush-Out Door Hinge**	5-413	1
2E	**Flush-Out Door Knob**	5-418	1
2F	**Flush-Out Door Clip**	5-417	1
3	**Vac Motor, complete with gasket**	5-225	2
3A	**Vac Motor Gasket**	5-708	2
3B	**Filter for vac motor (not shown)**	5-709	optional
4	**Vac Motor Hold Down Clamp Set**	5-710	1 Set
4 A & B	**Vac Motor Hold Down Bolt Set**	5-711	1 Set
4A	Hold Down Bracket Stud	5-710A	1
4B	Wing Nut	5-752	1
5	**Vac Motor Compartment Door**	5-713	1
5A	**Vac Motor Compartment Door Hinge**	5-712	1
6	**Cleanout Door Set**	5-702	1
	includes door, rod, knob, clamping bar, release pin & hardware		
7	**Cleanout Door Release Pin**	5-702A	1
8	**Cleanout Door Gasket (old style)**	5-702B	1
8A	**Cleanout Door Gasket (new style)**	5-703	1
9	**Cleanout Door Rod**	5-704	1
10	**Cleanout Door Knob**	5-761	1
11	**5/16-18 x 3" Wing Bolts**	5-715	2

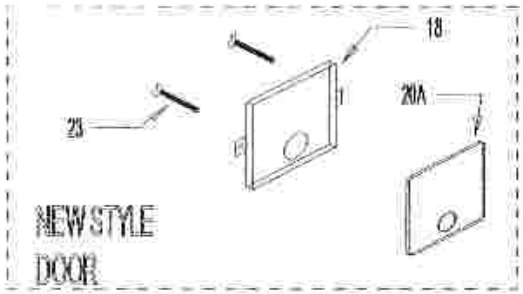
RECOVERY SYSTEM
BEFORE HC52-500

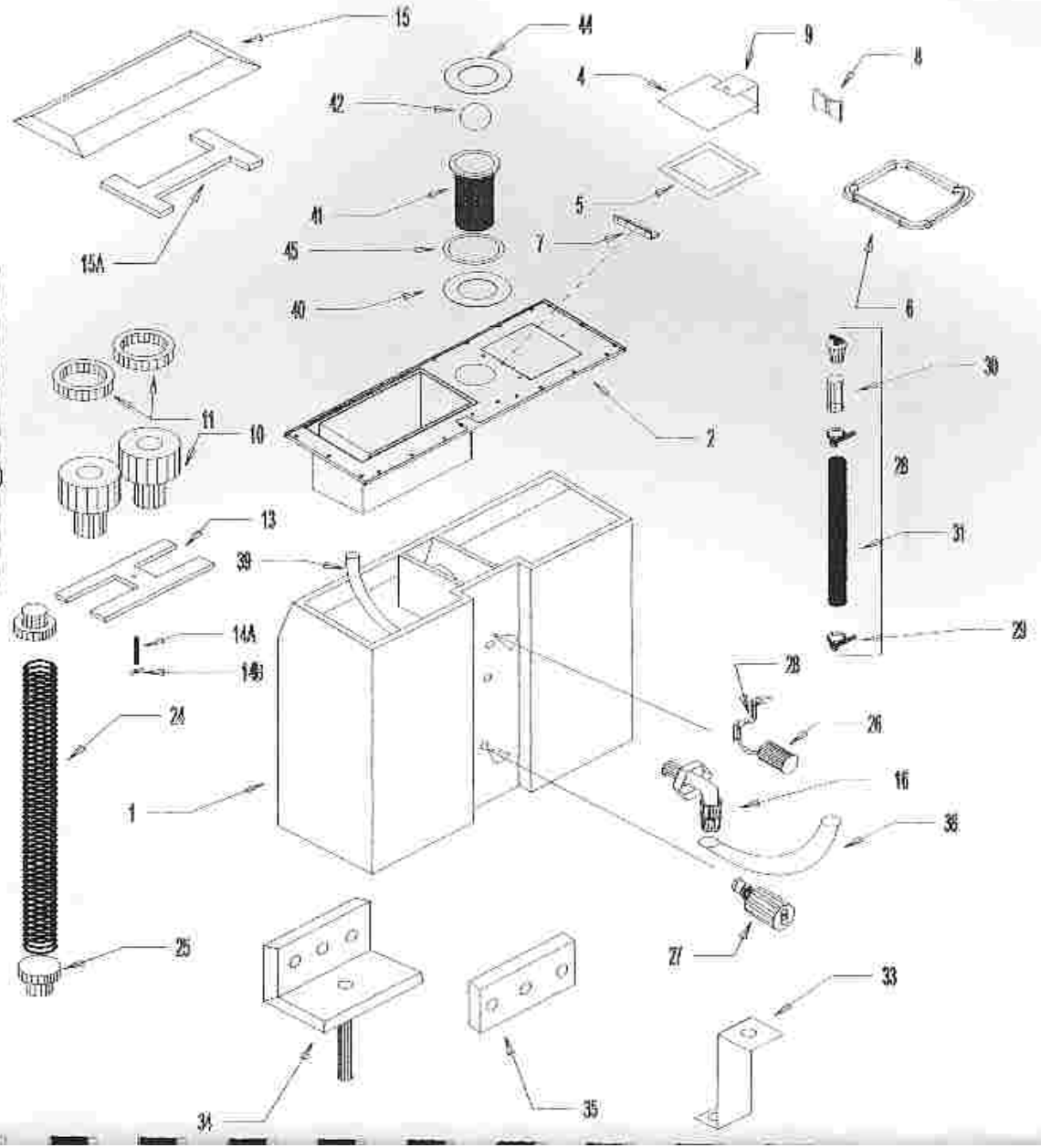


12	**Vac Hose, complete**	5-705	1
13	2 Cuff for vac hose	5-706	2
14	**Float Switch (turns vac motors off when tank is full)**	5-227	1
14A	**Float Switch (tank warning light)**	5-226	1
15	**Float Switch Mount, stainless steel**		NSS
15A	**Drain Hose Assembly: complete**	5-730	1
16	Drain Hose Clamps	5-719	2
17	Drain Hose End Tube (stainless steel)	5-720	1
18	Drain Hose	5-721	1
19	**Tank Tie Down Strap, complete (not shown)**	5-722	1
20	Tank Tie Down Strap Hook	5-723	1
21	Tank Tie-Down Strap Belt Attachment, rear	5-724	1
22	Tank Tie-Down Strap Belt Attachment, front	5-725	1
23	Tank Tie-Down Strap Belt (polypropylene weave) not shown	5-726	1
24	**Drain Hose Plug (not shown)**	5-727	1

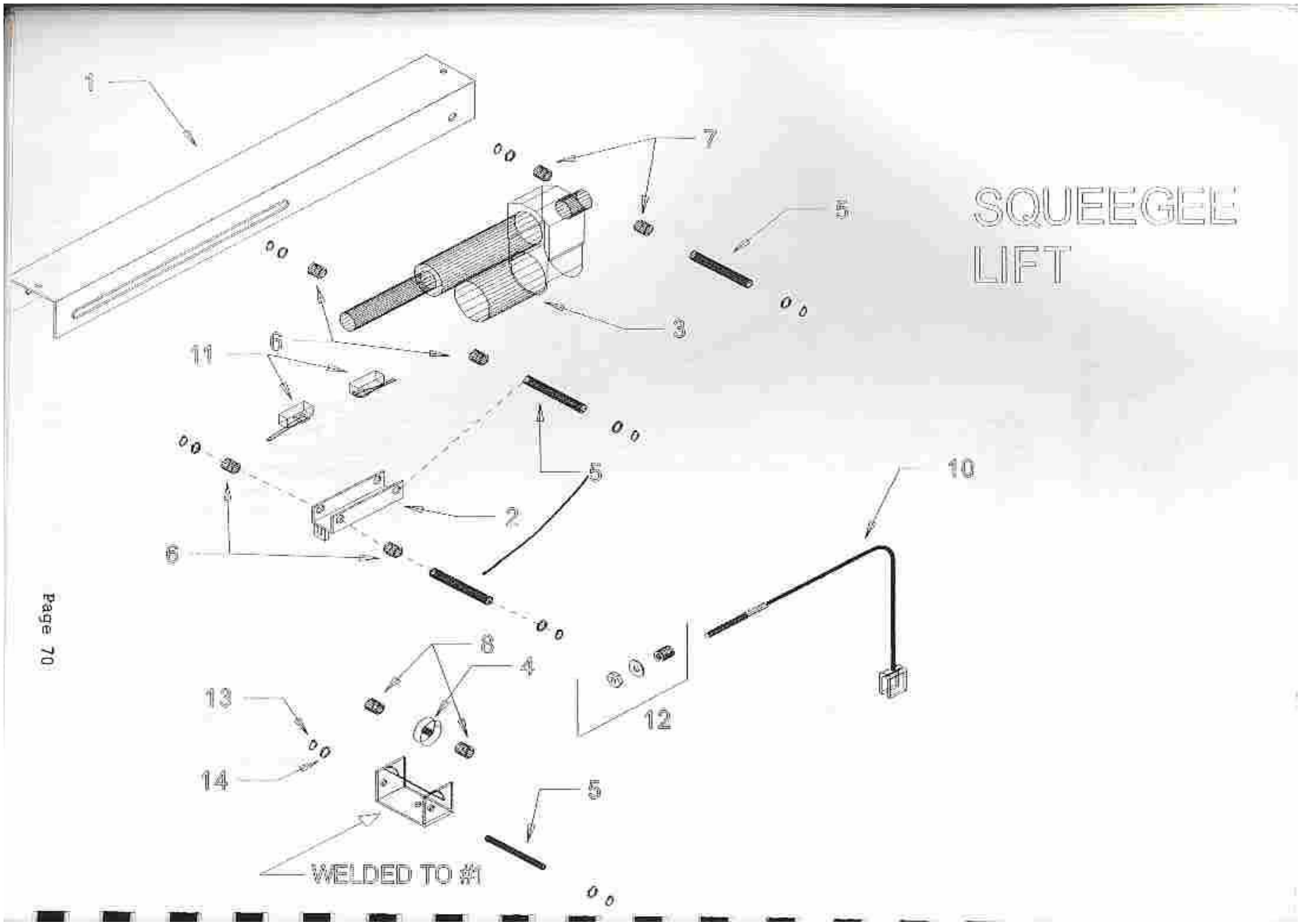
RECOVERY SYSTEM
HCS2-600 & AFTER







Reference	DESCRIPTION	Part No.	Qty Req'd.
RECOVERY SYSTEM HC52-600 & AFTER			
1	**Recovery Tank, stainless steel**	5-699	1
2	**Top For Recovery Tank, stainless steel**	5-700	1
3	**1/2" Female NPT to 1/2" Barb (not shown)**	5-695	1
4	**Flush-Out Door**	5-411	1
5	**Flush-Out Door Gasket (old style)**	5-412	1
6	**Flush-Out Door Gasket (new style)**	5-412N	1
7	**Flush-Out Door Hinge**	5-413	1
8	**Flush-Out Door Knob**	5-418	1
9	**Flush-Out Door Clip**	5-417	1
10	**Vac Motor, complete with gasket**	5-225	2
11	**Vac Motor Gasket**	5-708	2
12	**Filter for vac motor (not shown)**	5-709	optional
13	**Vac Motor Hold Down Clamp Set**	5-710	1 Set
14A&B	**Vac Motor Hold Down Bolt Set**	5-711	1 Set
14A	Hold Down Bracket Stud	5-710A	1
14B	Wing Nut	5-752	1
15	**Vac Motor Compartment Door (upper)**	5-697	1
15A	**Vac Motor Compartment Door (lower)**	5-698	1
16		5-447	1
17	**Cleanout Door Set**	5-702	1
	includes door, rod, knob, clamping bar, release pin & hardware		
18	**Cleanout Door Set**	5-702	1
19	**Cleanout Door Release Pin**	5-702A	1
20	**Cleanout Door Gasket (old style)**	5-702B	1
20A	**Cleanout Door Gasket (new style)**	5-703	1
21	**Cleanout Door Rod**	5-704	1
22	**Cleanout Door Knob**	5-761	1
23	**5/16-18 x 3" Wing Bolts**	5-715	2


SQUEEGEE LIFT
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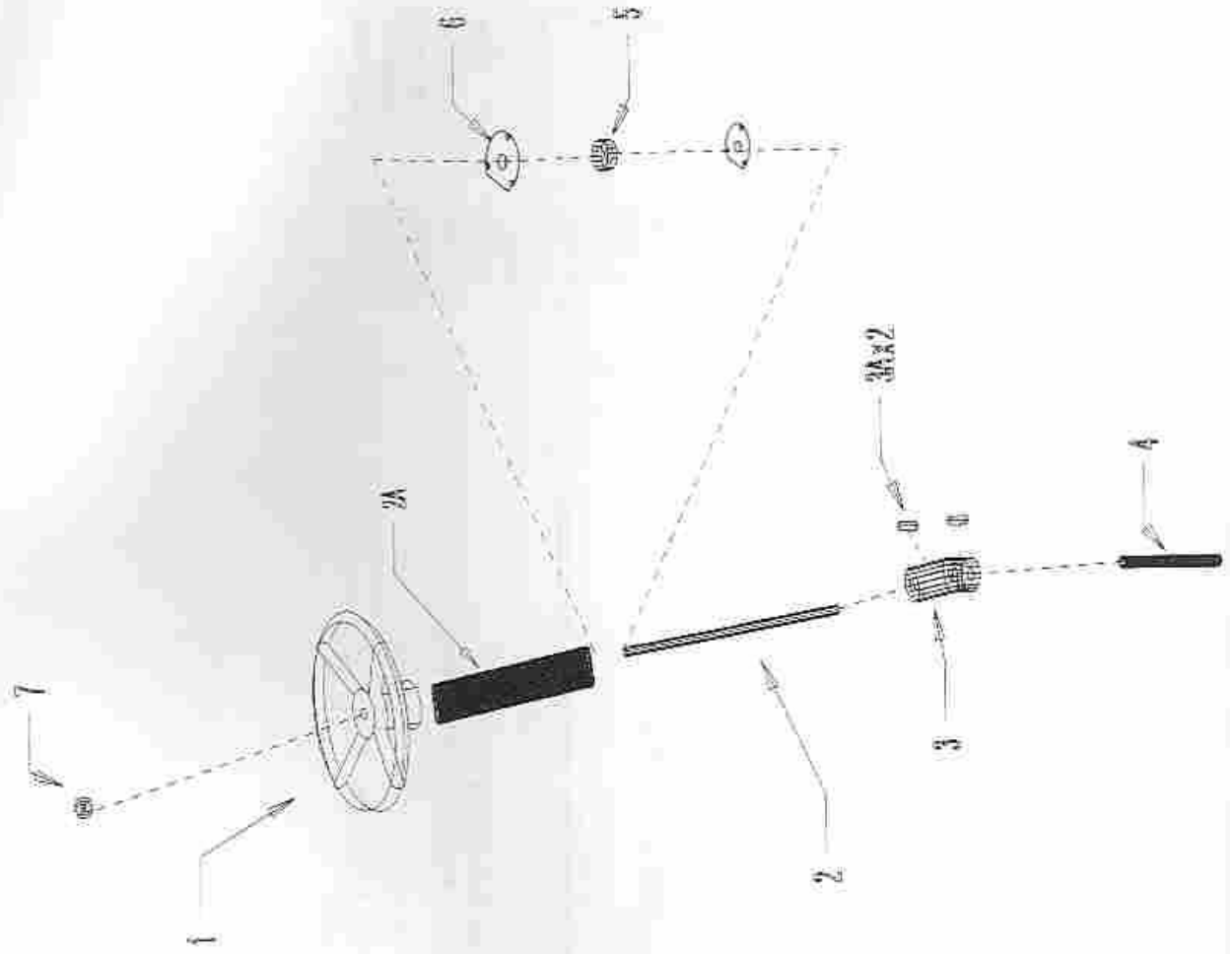
12
WELDED TO #1

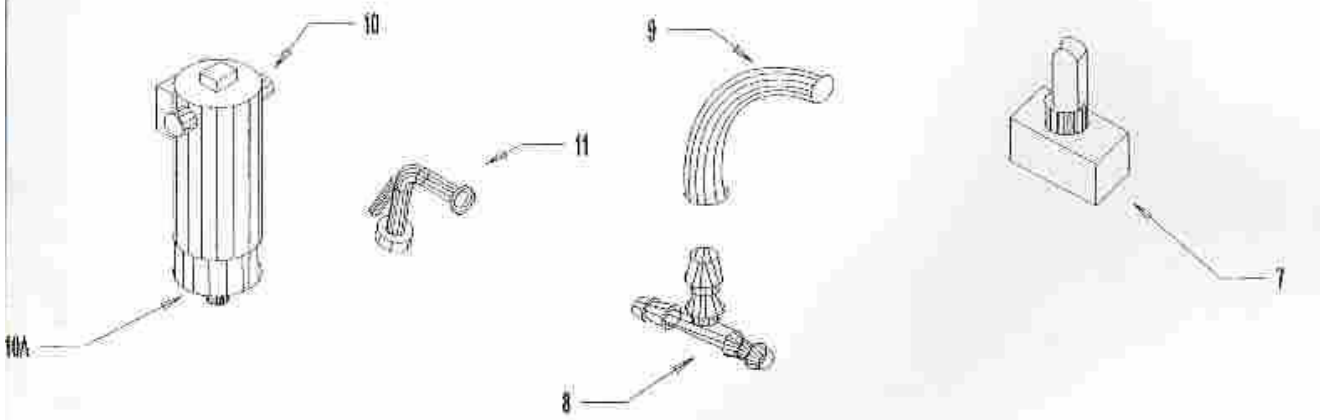
Reference	DESCRIPTION	Part No.	Qty Req'd
	SQUEEGEE LIFT SYSTEM		
1	Channel, squeegee lift	5-766	1
2	Squeegee Lift Carriage	5-771	1
3	Squeegee Lift Actuator	5-224	1
4	Pulley, nylon	5-772	1
5	Pin, squeegee lift	5-773	3
6	Bushing, squeegee actuator .844"	5-774	4
7	Bushing, squeegee actuator 1.03"	5-775	2
8	Bushing, cable pulley, 1.36"	5-776	2
10	Squeegee Lift Cable	5-769	1
11	Lift Limit Switch	5-223	2
12	Polymer Spring w/ Washer and Nuts	5-769A	1
	comes with squeegee lift cable		
13	Pin Retaining Snap Ring	8-740	8
14	Nylon Washer	H-76065	8

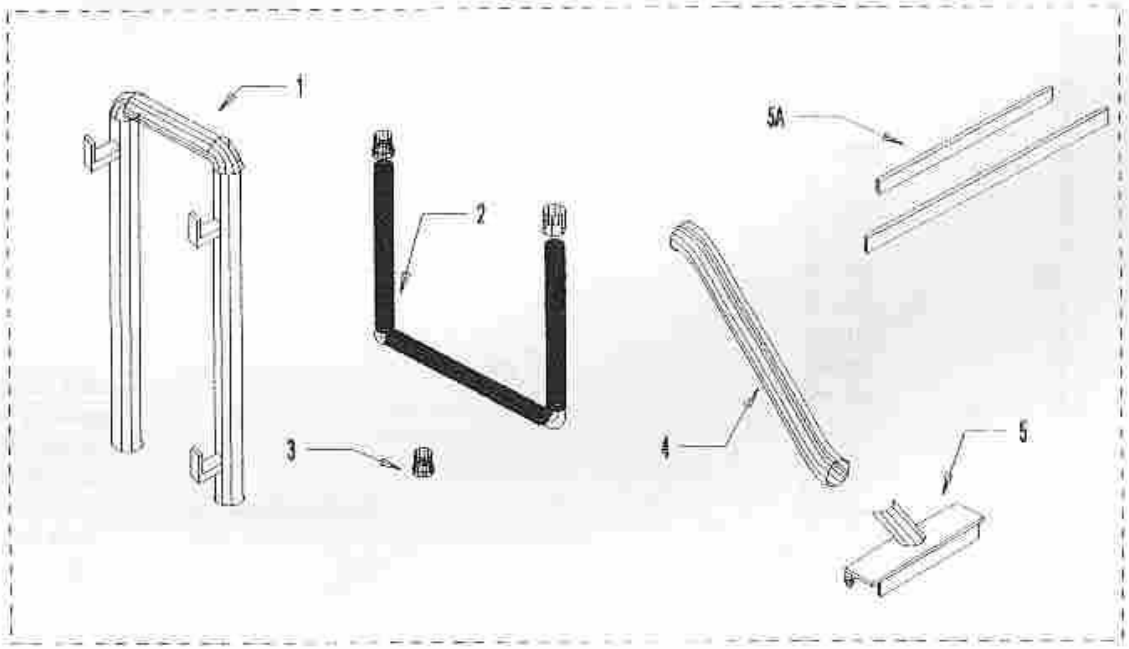


STEERING COLUMN

Reference	DESCRIPTION	Part No.	Qty Req'd.
STEERING COLUMN			
1	Steering Wheel	8-701	1
2	Steering Upper Shaft	8-710	1
2A	Steering Column Cover (black plastic)	8-710A	1
3	Steering Universal Joint	8-711	1
3A	Steering Shaft Key	4-357	2
4	Steering Lower Shaft	8-712	1
5	Bearing: upper steering	4-352	1
6	Bearing Mount Flange	4-364	2
7	Steering Wheel Nut	8-735	1

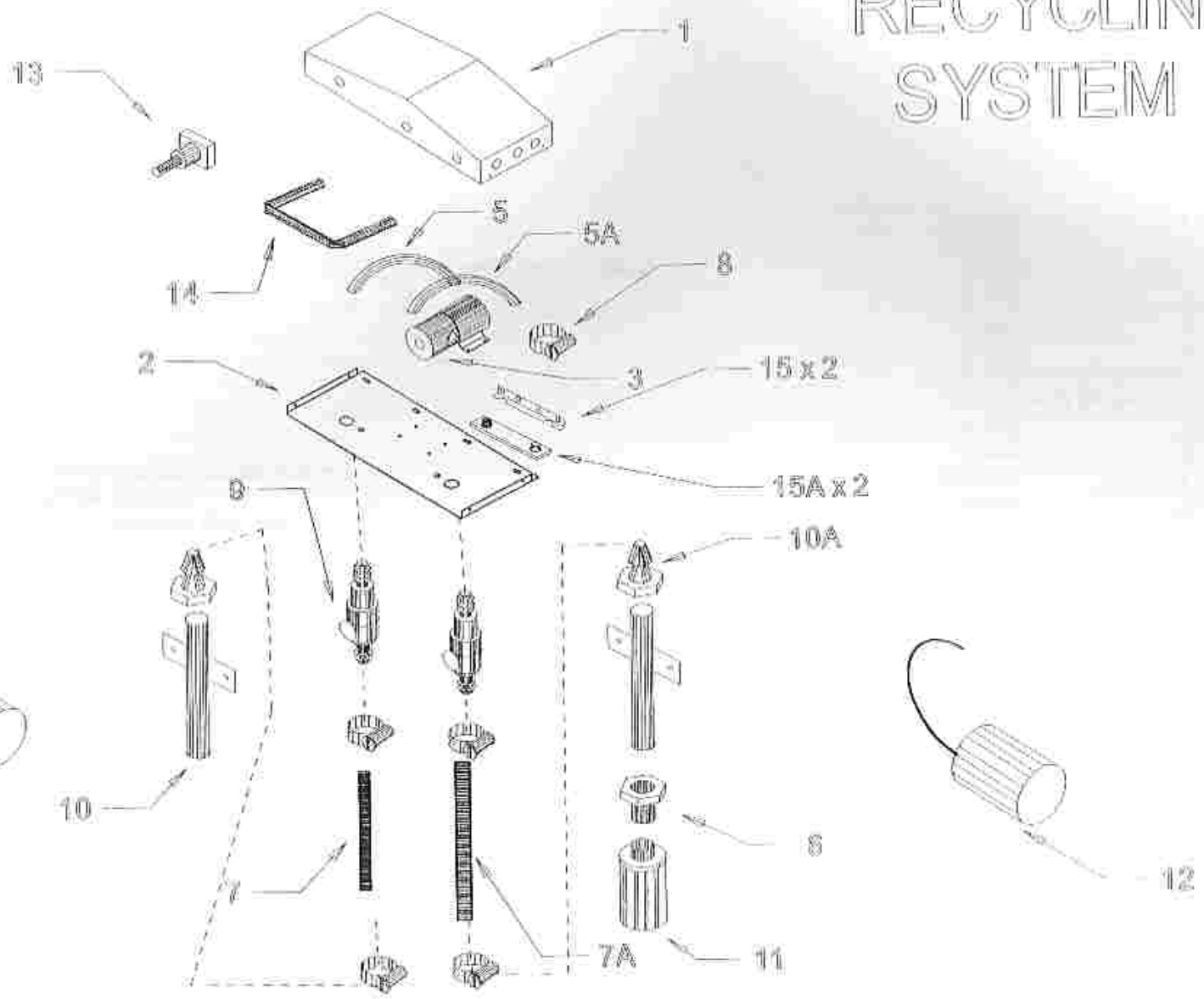
VAC WAND & WATER JET SYSTEM





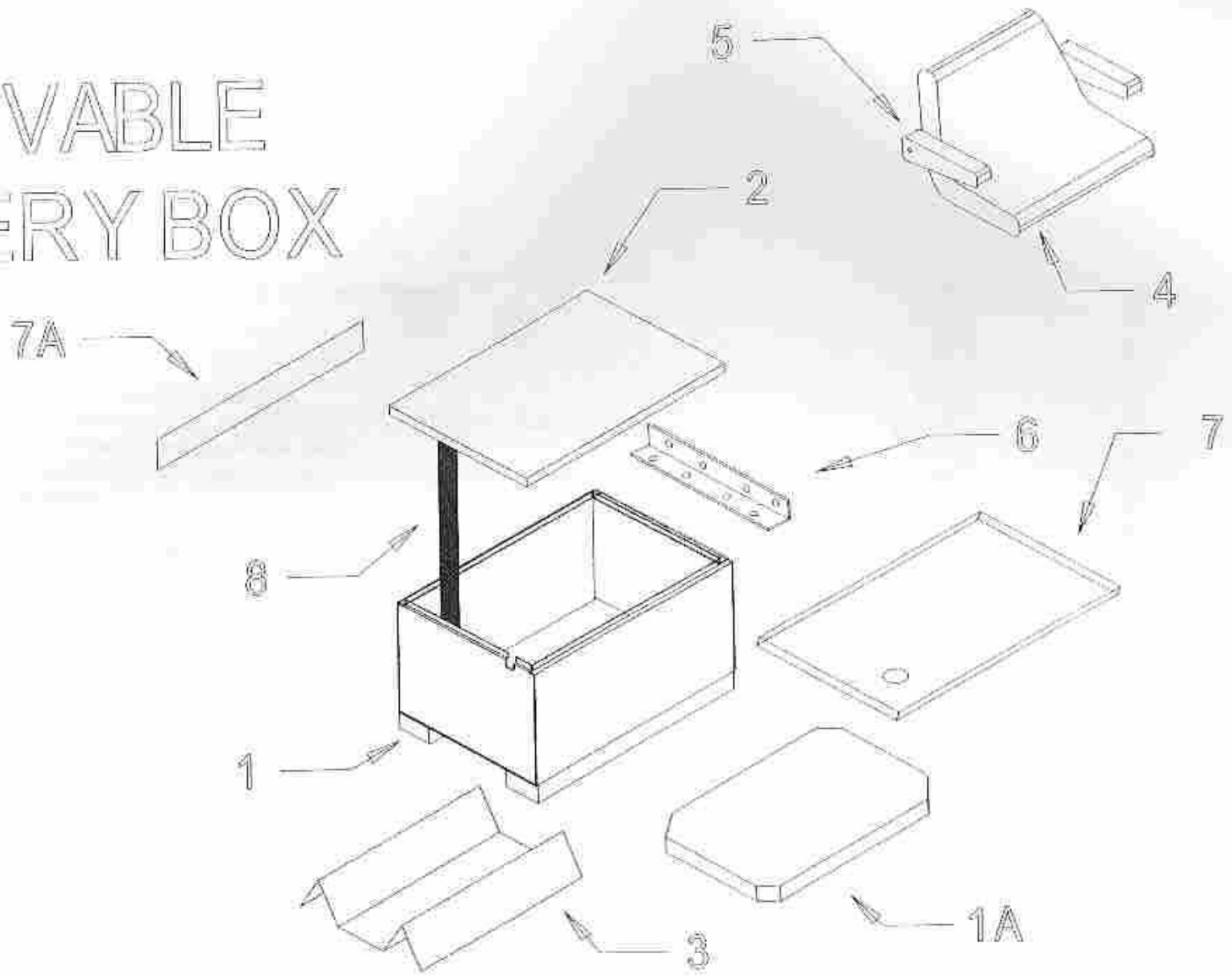
Reference	DESCRIPTION	Part No.	Qty Req'd.
VAC WAND & WATER JET SYSTEMS			
VAC WAND SYSTEM			
	Complete wander hose field installation kit	5-880	1
	includes all of following items, plus installation instructions.		
1	**Mounting Rack**	5-881	1
	includes mounting hardware		
2	**Vacuum Hose**	5-883	1
	15 feet long, 1.5" dia., includes cuffs		
3	1.5 to 2" expansion cuff	5-884	1
4	**Wand Tube: curved 54"**	5-887	1
5	**Vacuum Nozzle**	5-889	1
5A	**Vacuum Nozzle rebuild kit**	5-890	1 set
	kit includes 2 blades		
	Mounting Rack Wand Clips (not shown)	5-886	2
WATER JET SYSTEM			
6	**Pump Wiring Harness (not shown)**	5-897	1
7	**On-Off Toggle Switch**	5-892	1
7A	**On-Off Toggle Switch Protective Cover**	5-892A	1
8	**1/2" T-Barb**	5-446	1
8A	**5/8 T-Barb**	7-247	1
9	**5/8 Hose**	5-460	sold by the foot
9A	**1/2 Hose not shown**	5-440	sold by the foot
10	**Pump, 60 psi**	5-891	1
10A	**Pump Fan Shroud**	5-893	1
11	**Spray Nozzle**	5-895	1
12	**Black Rubber Hose (for spray nozzle) 15 feet long (not shown)**	5-896	1
13	**5/8 Pump Fitting (not shown)**	5-891B	1
14	**1/2 Pump Fitting (not shown)**	5-891A	1

RECYCLING SYSTEM

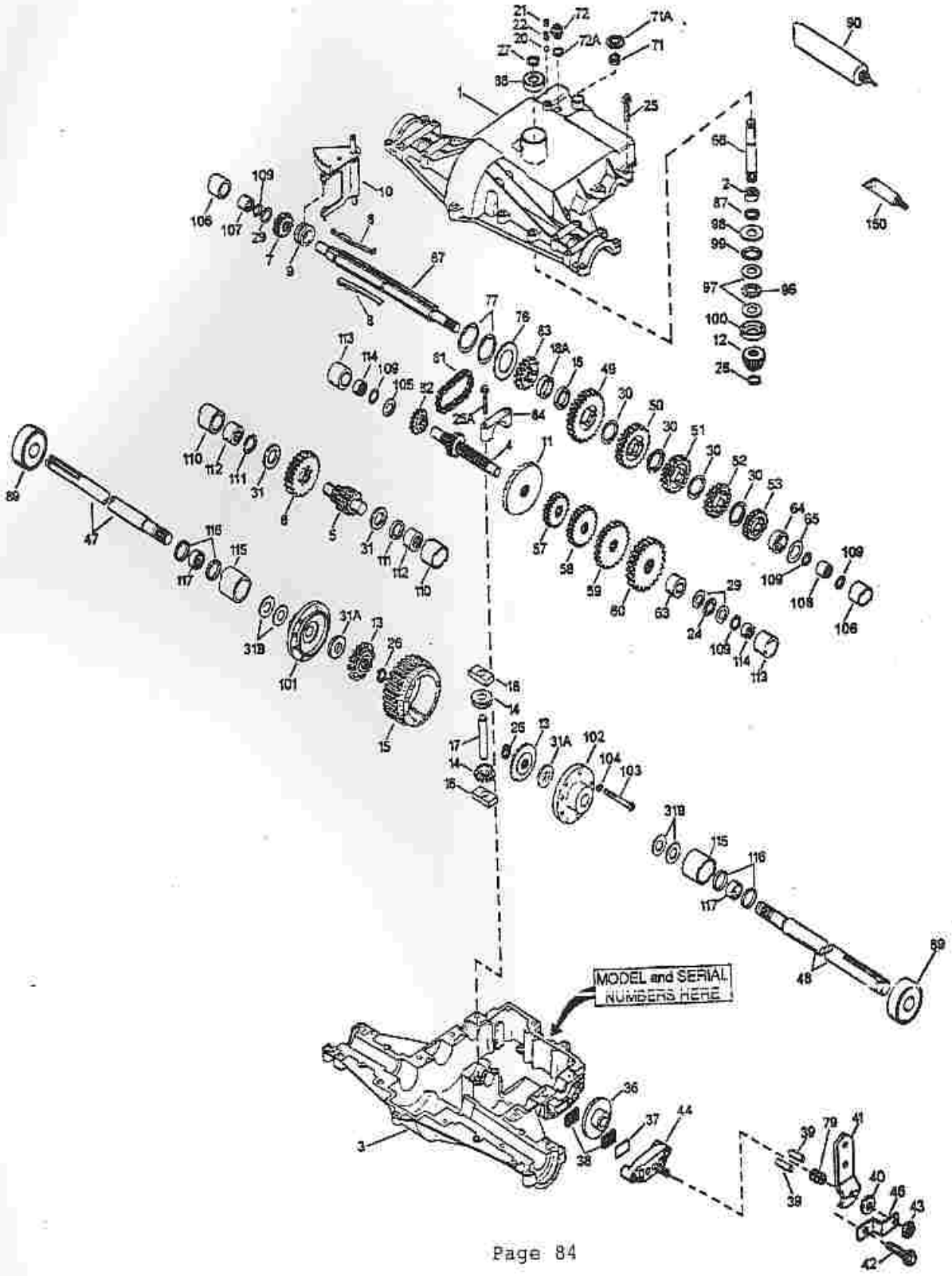


Reference	DESCRIPTION	Part No.	Qty Req'd.
RECYCLING SYSTEM			
	System is optional		
	Complete System is sold as field installation kit	5-850	1 (Opt)
1	**Recycling System Cover**	5-852	1
2	**Recycling System Base**	5-851	1
3	**Recycling Pump**	5-853	1
4	**Solution Shutoff Switch (shuts off when tank level is high)**	5-854	1
5	**Hose: Solution TankTo Pump**	5-855	1
5A	**Hose: Pump To Recovery Tank**	5-855A	1
6	**Bushing (1/2 to 3/4)**	5-862	1
7	**1/2" Hose: Solution Tank to Quick Disconnect**	5-856	1
7A	**1/2" Hose: Recovery Tank to Quick Disconnect**	5-857	1
8	**Clamp**	5-858	10
9	**Quick Disconnect**	5-859	2
10	**Stainless Tube**	5-860	2
10A	**1/2" Barb to 1/2" Female NPT**	5-865	2
10B	**Knobs (not shown)**	5-867	2
11	**Recovery Filter**	5-861	1
12	**Recovery Shutoff Switch (shuts off when tank level is low)**	5-227	1
13	**Recycling System On\Off Toggle Switch**	5-869	1
13A	**Recycling System On\Off Toggle Switch Protective Cover**	5-892A	1
14	**Handle--with mounting hardware**	5-864	1
15	**Hinge**	5-413	2
15A	**Hinge Mount**	5-868	2
16	**On/Off Decal**	5-163	1
17	**5/16 Loop Clamp (one for each pipe) not shown**	5-863	2

REMOVABLE BATTERY BOX

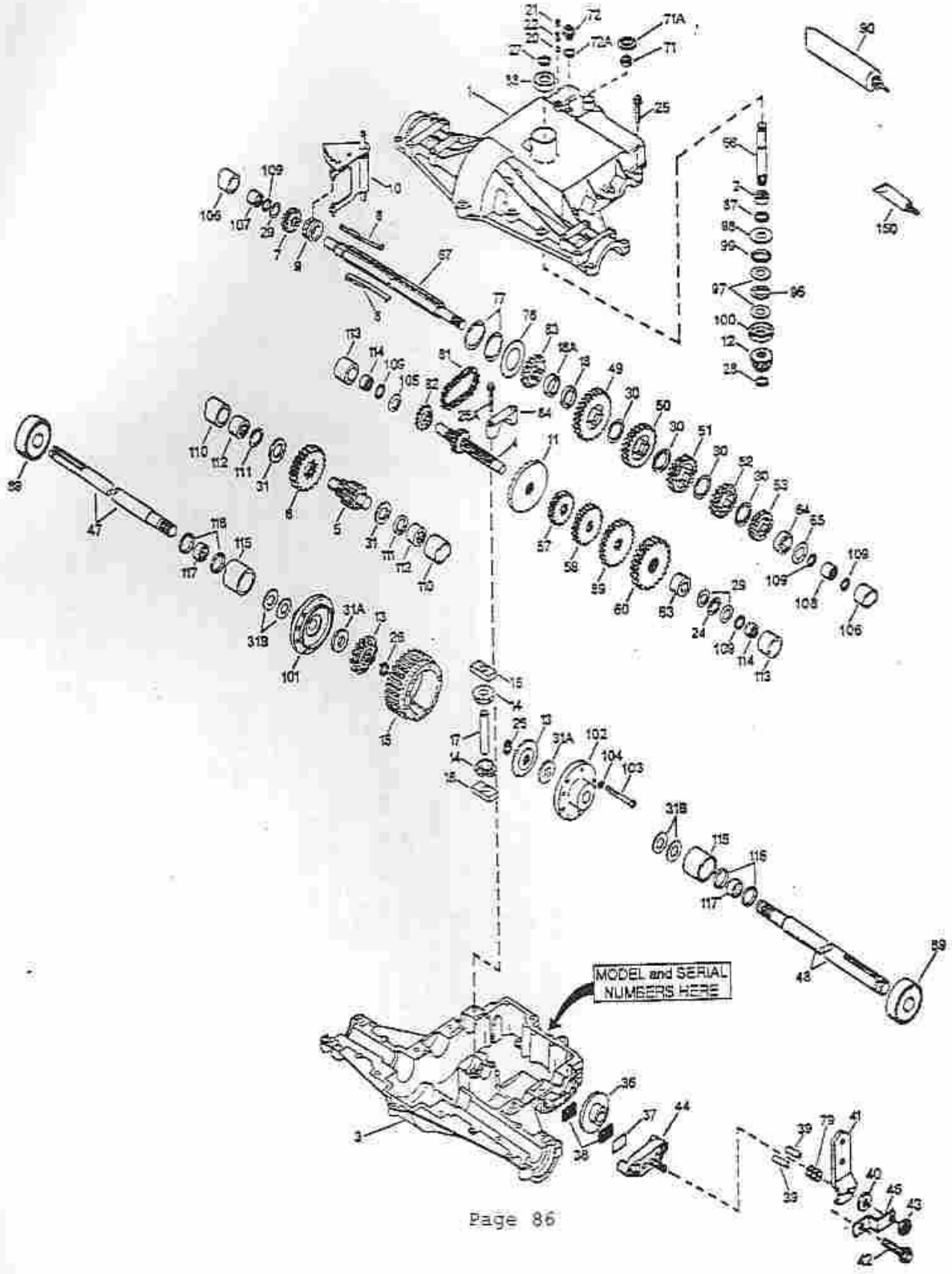


Reference	DESCRIPTION	Part No.	Qty Req'd.
STANDARD BATTERY BOX SYSTEM			
battery box system is standard			
1	**Removable Battery Box (with fork tubes)**	5-160	1
1A	**Plywood Battery Underlayment**	5-148	1
2	**Battery Box Lid**	5-146	1
3	**Battery Box Positioner (bolts to frame of machine)**	5-147	1
4	**Adjustable Seat with armrests**	8-142	1
5	**Armrest set of 2**	8-143A	1 Set
6	**Battery Box Hinge**	5-128	1
7	**Battery Tray (plastic)**	5-134	1
7A	**Anti Abrasion Rubber Strip to protect tanks (order 3 feet of material)**	4-112B	1
8	**Drain Hose**	5-137	1
8A	**Polypropylene Lid Strap (not shown)**	5-133	1
9	**Wiring Harness for Battery Set, complete (not shown)**	5-252	1
10	**Battery, 205 AH, 12 volt (not shown)**	2-271	6


MODEL and SERIAL NUMBERS HERE

NOTE: This transaxle was used on Model 52/5100 through December, 1999. Units with Serial 52-2000 and beyond have the "new style" axle shown after Page 61 of this parts manual.

Ref.	DESCRIPTION	PART NO.	Qty Req'd
	SUPPLEMENTAL PARTS LIST:		
	The following parts are available under Factory Cat's 72 hour parts delivery guarantee in the 48 U.S. States:		
	Complete Transaxle, NEW	8-604	1
	Complete Transaxle, Rebuilt	8-604R	1
	The following parts are supplied as a courtesy to our customers, but are not covered by the 72 hour parts delivery guarantee.		
1	Cover, transaxle	8-846	1
2	Bearing,needle	8-830	1
3	Case, Transaxle	8-801	1
4	Shaft, counter, w/9tooth gear	8-816	1
5	Shaft, output, 9 teeth	8-820	1
6	Gear, output, 35 teeth	8-821	1
7	Gear, Spur, 15 teeth	8-802	1
8	Key	8-823	4
9	Collar Shift	8-813	1
10	Rod & Fork Assy, shift	8-847	1
11	Gear, bevel 33 teeth	8-812	1
12	Bevel, pinion, input, 13 teeth	8-817	1
13	Gear, bevel	8-859	2
14	Pinion, differential bevel	8-858	2
15	Gear, ring (31 teeth)	8-864	1
16	Block, drive	8-861	2
17	Pin, drive	8-860	1
18	Spacer, neutral (.350/.340 thick)	8-818	1
18A	Spacer, Neutral (.276/.268 thick)	8-819	1
20	Ball, steel	8-831	1
21	Screw, set, 3/8-16 X 3/8	8-833	1
22	Spring	8-834	1
24	Bearing, thrust	8-827	1
25	Screw, Hex head, threadforming, 5/16-18X1-1/4	8-836	17
25A	Screw, flanged hex head, threadforming, 1/4-20 X 1-1/4	8-835	2
26	Ring, snap	8-867	3


MODEL and SERIAL NUMBERS HERE

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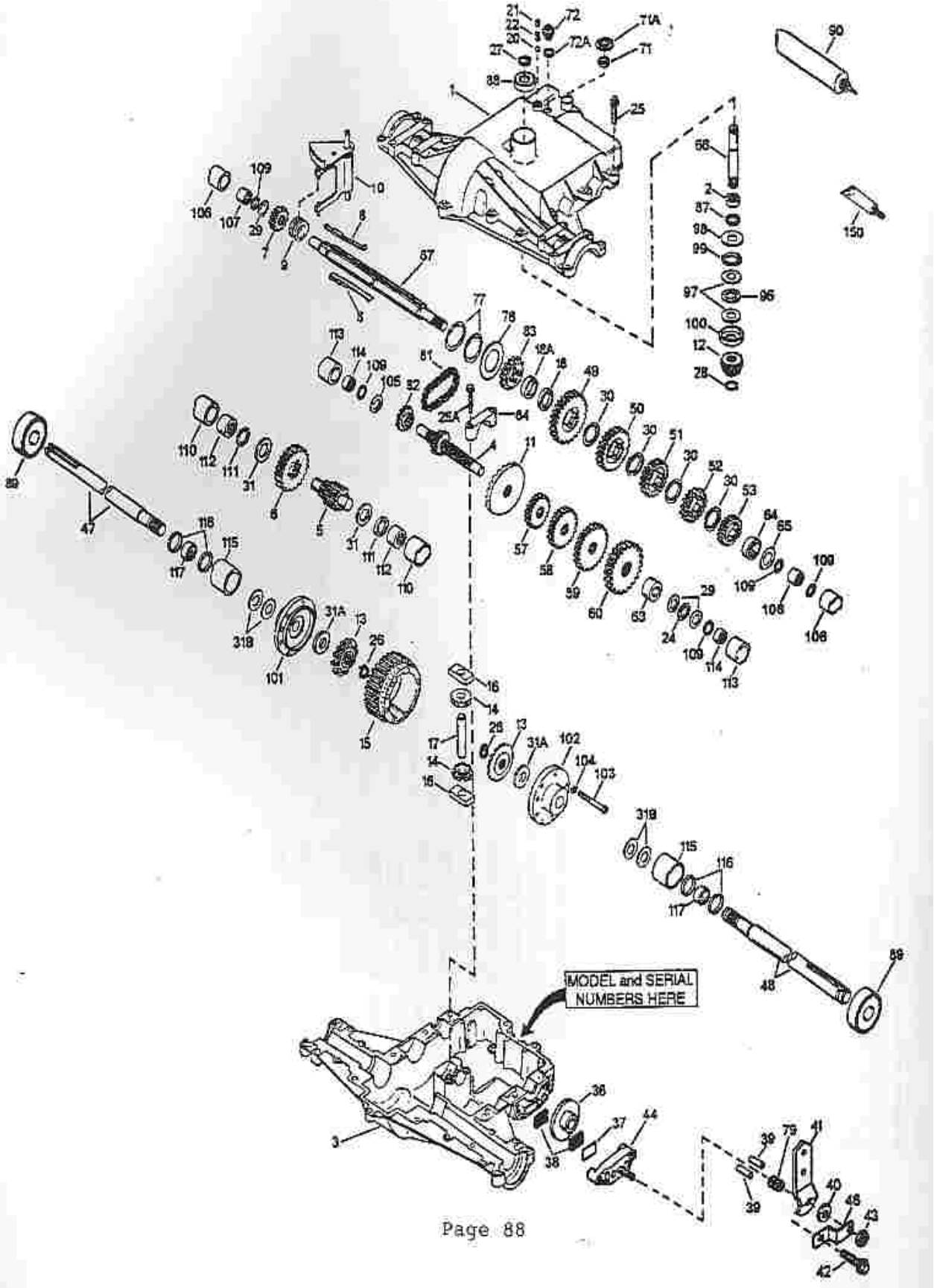
Ref.	DESCRIPTION	PART NO.	Qty Req'd
	SUPPLEMENTAL PARTS LIST:		
28	Ring, retaining	8-825	1
29	Washer, thrust	8-829	3
30	Washer, thrust	8-837	4
31	Washer, thrust	8-839	2
31A	Washer	8-865	2
31B	Washer, thrust	8-866	4
36	Disk, brake	8-822	1
37	Plate, brake pad	8-850	1
38	Pad, brake	8-851	2
39	Pin, dowel	8-852	2
40	Washer, flat	8-854	1
41	Lever, brake	8-855	1
42	Screw, flanged hex head, threadforming, 1/4-20 X 1 1/4	8-856	2
43	Locknut, 5/16-24	8-853	1
44	Holder, brake pad	8-857	1
46	Bracket, brake lever	8-875	1
47	Axle (12-5/16" long)	8-870	1
48	Axle (16-3/16" long)	8-871	1
49	Gear, spur, 41 teeth	8-811	1
50	Gear ,spur 30 teeth	8-810	1
51	Gear, spur 25 teeth	8-809	1
52	Gear, spur 22 teeth	8-808	1
53	Gear, spur, 19 teeth	8-807	1
57	Gear, spur, 20 teeth	8-803	1
58	Gear, spur, 25 teeth	8-804	1


MODEL and SERIAL NUMBERS HERE

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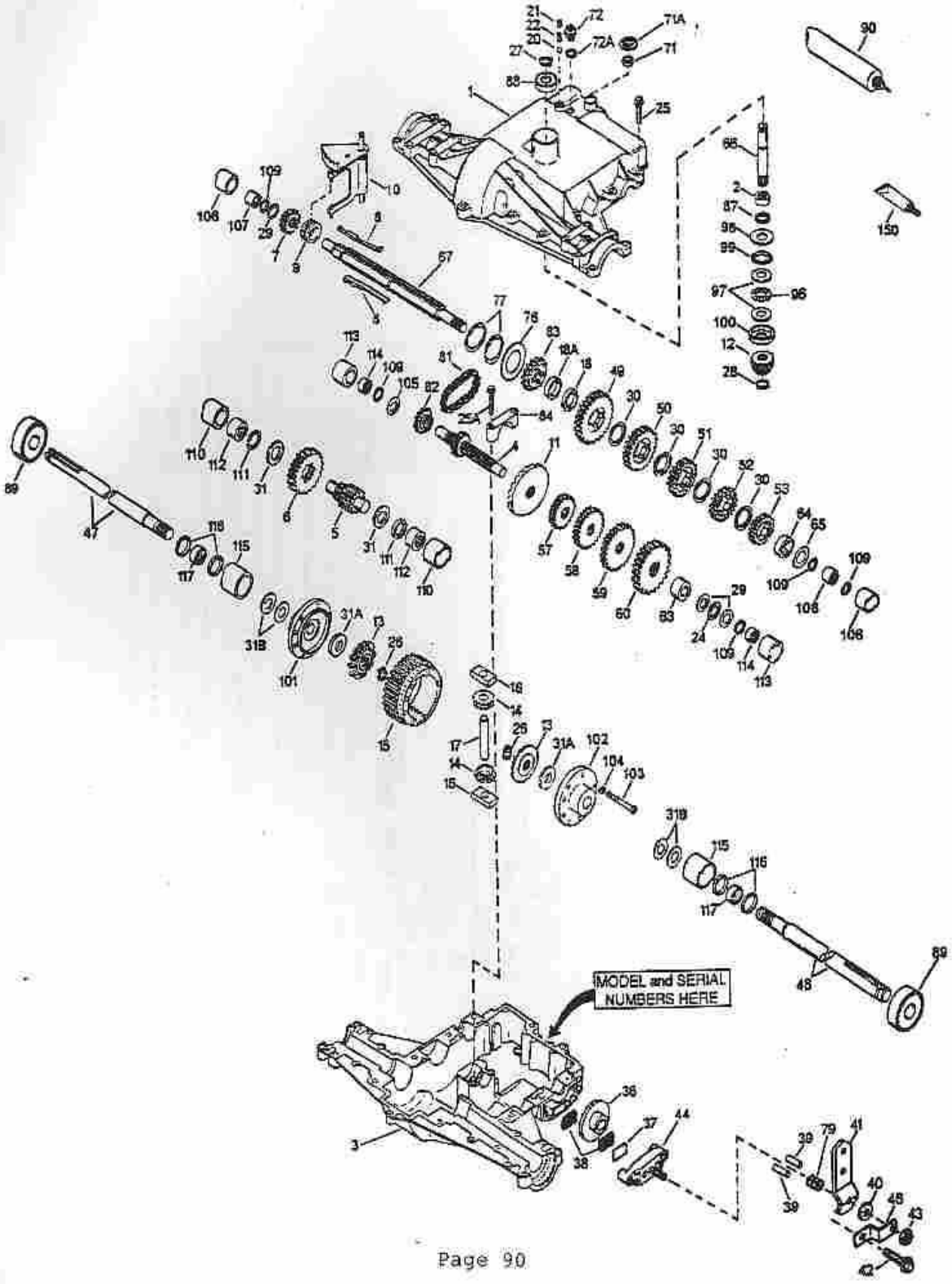
Ref.	DESCRIPTION	PART NO.	Qty Req'd
	SUPPLEMENTAL PARTS LIST:		
59	Gear, spur, 28 teeth	8-805	1
60	Gear, spur 31 teeth	8-806	1
63	Spacer	8-876	1
64	Spacer	8-877	1
65	Washer, thrust	8-832	1
66	Shaft, input	8-848	1
67	Shaft, brake (4 keyed)	8-849	1
71	Square cut seal	8-873	1
71A	Push nut	8-874	1
72	Plug, hex head, 9/16-18 thread	8-872	1
72A	O" Ring	8-892	1
76	Washer	8-893	1
77	Inverted Retaining Ring	8-894	2
79	Spring	8-895	1
81	Chain, roller (No. 41 chain w/ 22 links)	8-828	1
82	Sprocket, 10 teeth	8-815	1
83	Sprocket, 14 teeth	8-814	1
84	Cap, bearing	8-845	1
87	Seal, oil	8-843	1
88	Bearing, Ball	8-838	1
89	Bearing, ball	8-840	2
90	Grease (32 oz. bottle bentonite grease)	8-896	1
96	Bearing, thrust	8-824	1
97	Washer, thrust	8-826	2
98	Washer, flat	8-841	1
99	"O" Ring	8-842	1
100	Washer, cupped	8-844	1
101	Carrier, differential (threaded holes)	8-862	1
102	Carrier, differential	8-863	1
103	Screw, hex head 1/4-20 X 2-1/4	8-868	8
104	Lockwasher, 1/4"	8-869	8
105	Washer	8-878	1


MODEL and SERIAL NUMBERS HERE

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Ref.	DESCRIPTION	PART NO.	Qty Req'd
	SUPPLEMENTAL PARTS LIST:		
106	Sleeve (stepped)	8-879	2
107	Bearing, needle (capped)	8-881	1
108	Bearing, needle	8-880	1
109	"O" Ring	8-882	5
110	Sleeve (stepped)	8-883	2
111	Ring, square cut	8-884	2
112	Bearing, needle (capped)	8-885	2
113	Sleeve (stepped)	8-886	2
114	Bearing, needle (capped)	8-887	2
115	Sleeve (stepped)	8-888	2
116	O" ring	8-889	4
117	Bearing, needle	8-890	2
150	Gasket Elimator	8-891	1