INSTRUCTION MANUAL AND PARTS LIST

INSPECTION
Carefully unpack and inspect your extractor cabinet for shipping damage. Each unit is operated and thoroughly inspected before shipment, and any damage is the responsibility of the delivering carrier, who should be notified immediately.

ELECTRICAL
The COMANDER hot water soil extraction machine is designed to operate on a standard 15 amp, 115 volt, 60 hertz A.C., household current. Voltages below 105 volts or above 125 volts will cause potential damage to a vacuum motor and pump motor. A 25' electric cable of 14/3 SJTO wire with 3-prong plug is supplied as the power connection to the machine. *220 volt, 50 hz model available.

GROUNDING INSTRUCTIONS
To protect the operator from electric shock, this machine must be grounded while in use. The machine is equipped with an approved three-conductor power cord and three-prong grounding type plug to fit the proper grounding type receptacle. 

WARNING: To avoid electric shock do not expose to rain or store indoors.

EXTENSION CORDS
If an extension cord is used, the wire size must be at least one size larger than the power cord from the machine and should be limited to 75 feet in length. Extension cord must be three-wire grounded.

EQUIPMENT SETUP
1. Install vac dome in place, centered on locating pins to insure a good seal.
2. Plug power cable from machine into properly grounded wall outlet.
3. Turn vacuum motor switch on and off to make sure you have electric power at machine.
4. Connect vac hose to hose outlet on dome. Connect solution hose to outlet nipple on machine by sliding back knurled collar on female coupler and installing coupler over nipple. Re-lease collar to lock them together. Make sure coupler is secured to avoid leaks.
5. Using a clean container, fill solution tank with hot water. The maximum capacity of COMANDER is 18 gallons. Mix in a nonfoaming concentrate for use in hot water extraction machines at the proportions as noted on the container for various carpet soil conditions. NOTE: When using a spotter in clean container before adding to solution tank.

OPERATING INSTRUCTIONS FOR AUTO FILL AND PUMP OUT SYSTEM
The accessory kit includes two 3/8" x 50' hose assemblies, one for auto fill and the other for the auto pump out. A faucet adapter kit is included to allow the auto fill hose to be connected to most bathroom/kitchen sinks and water heater faucets.

To fill solution tank, connect the quick-disconnect coupler on the auto fill to the nipple on the proportioning valve. Connect other end of hose to water source. Use faucet adapter kit as required. Liquid chemical can be induced from any size container and mixed in solution tank with hot water at the desired mixture. (Refer to enclosed valve manual for flow rate adjustment.) Turn on water source valve. When the solution level reaches one inch below the top of the float (tank will be approximately three-quarters full) proportioning valve will shut off. When solution lever drops approximately six inches, the valve will open and fill solution tank.

For auto pump out, attach waste-water hose to pump out hose outlet adapter on machine. Discharge end of hose should be secured to slop sink, kitchen sink or other source where waste-water is to be discharged to eliminate hose being moved and dirty water being spilled outside the dumping area. Turn on auto pump out switch when pump and vac switches are switched on for operation.

With the power unit and floor tool in operation, the solution flow and waste-water discharged will be automatically controlled with the auto fill and pump out accessory kit.

CARPET INSPECTION
Determine precisely what areas you are going to clean. Note problem areas in the carpet or tack strip. Look for loose carpet, heavily damaged areas, discolored stains, or grease spots that will require spotting. Note the carpet type. Check the availability of hot water, drains, suitable electrical outlets. If the carpet is loose or torn, have it repaired before you start to clean it.

Plan your cleaning route, working from the most remote area toward the exit. Try not to travel over the cleaned areas for water or to dump waste. Furniture should be moved out away from walls before cleaning. If replaced on damp carpet, use foil or plastic protectors under the legs to prevent possible carpet staining. If possible, open all windows and doors to speed carpet drying.

OPERATION
1. Connect vacuum and solution hoses to wand, floor tool, or powered brush floor tool.
2. Turn on pump and vacuum switches.
3. Start in one corner, depress solution valve lever fully and move backward at a steady pace; 25 to 30 feet per minute, cleaning a path at least half the length of the room. Release solution valve lever approximately six inches before reaching the end of the pass to allow for setting that cleaning solution is extracted from carpet.
4. Make the next cleaning pass beside the first, overlapping about 1 inch. Continue cleaning until entire width of area has been cleaned.
5. Reverse direction and clean balance of room. On heavily soiled carpets or on areas of high foot traffic, it may be necessary to use a prespray. If necessary, use a vacuum traffic lane cleaner applied with a separate sprayer. Do not add presprays to the machine solution tank. If you use a spotter, follow label directions exactly. Remove the spotter from the floor tool when done. Never leave any spotter on a carpet — it may bleach or brown it permanently.

Shag carpets may require several passes from different directions, but be careful not to oversaturate. In these cases, make several vacuum passes without spray to extract as much moisture as possible.

As you work, check to see if there is foam buildup in the recovery tank. If there is, remove the vacuum hose from the tool and add a little defoaming compound while the vacuum is running. Defoamer can be added to the recovery tank, but never to the solution tank.

WARNING: An overflow of foam into the vacuum motor can cause it to fail. Constantly monitor the level of waste water in the recovery tank. When about three-quarters full, shut off the machine and empty recovery tank, using a 5 gallon bucket, or dump directly into slop sink, floor drain, etc.

PROTECT FROM FREEZING
If it becomes necessary to store in temperatures that could drop below 45°F, the pumping system, hoses and valves must be protected from freezing with a methyl hydrate window washer antifreeze solution. Do not use ethylene glycol or cooling system antifreeze.

1. Add a gallon or two of window washer anti-freeze to the supply tank, hook up hoses to the machine and floor tool and turn the power switch ON. Spray until the antifreeze solution fills the solution lines.
2. Disconnect solution supply hoses and vacuum lines from the supply tank. Always allow the unit to reach room temperatures before filling with hot water or operating.

DAILY MAINTENANCE
1. Vacuum surplus solution from solution tank into recovery tank.
2. At the end of every working day, flush entire pumping system, including floor tool, hand tool, etc. with 1 to 3 gallons of clean hot water.
3. Check vac intake screen in recovery tank well. Remove any lint buildup.
4. Inspect solution filter in solution tank. Filter screen can be cleaned by washing with hot water faucet.
5. Check bypass valve (located in solution tank). Bypass solution spray should be evident when pump is running. If valve becomes plugged, remove and clean thoroughly with hot water or white vinegar. Blow dry and reinstall. NOTE: Bypass valve is preset at factory. DO NOT CHANGE SETTING.
6. Lubricate quick disconnect hose fitting with silicone lubricant. Do not use petroleum based lubricants as they will cause damage to the "O" rings.
7. Check spray nozzles frequently. If they become clogged, remove them, wash thoroughly (continued on back page)
and blow dry. Do not use pins, wire, etc. to clean nozzles as this could destroy spray pattern or injectors.

8. Periodically inspect hoses, electrical cables, filters and connections on your machine. Frayed or cracked hoses should be repaired or replaced to eliminate vacuum or solution pressure loss. Because the electrical cable will lie insulated on wet carpet at times, the cable must be well insulated and electrical connector screws kept tight. If the cable insulation is broken or frayed, repair or replace it immediately. Don’t take chances with an electrical fire or shock.

6 MONTHS OR 750 OPERATING HOURS

Removing Cabinet Assembly From Base:

CAUTION: Always disconnect the machine from power source before attempting any maintenance or repairs to the electrical system.

1. Remove dome and turn machine upside down. Remove four screws located on extreme lower part of cabinet that secure caster base to cabinet.

2. Lift up caster base to expose hoses and electrical plug connector to pump motor. Disconnect hoses at solution cabinet (quick disconnect fittings) and electrical motor plug connector. NOTE: Solution hose connections are color coded. Make sure colors are matched when reinstalling hose, quick disconnect couplers.

VACUUM MOTOR

1. Remove three hex nuts holding vac motor down.

2. Lift vac motor from mounting studs.

3. Pull off exhaust hose.

4. To inspect brushes, remove metal wraparound from the vac motor (one screw). Remove brush hold-downs. New brush length is 1 1/2. Brushes should be replaced when they reach 3/8" length, or after 750 operating hours.

5. Inspect vacuum Intake opening for lint. If the cable insulation is broken or frayed, repair or replace it immediately. Don’t take chances with an electrical fire or shock.

PUMP MOTOR

1. Determine vacuum tank is empty.

2. Verify tank is not plugged (See listings under "Common Problems").

3. Connect solution hose connections

4. Turn the Vacuum adjustment fully to the left (counterclockwise) - minimum sensitivity.

5. Turn the Pump switch to the right (clockwise) — maximum sensitivity.

6. Turn the Pump adjustment fully to the right (clockwise) — maximum sensitivity.

7. Turn the Pump switch off. The pump motor should now operate.

8. Place a rag dampened with cleaning solution on top of the two metallic sensors in the well at the bottom of the vacuum tank. Slowly turn the vacuum adjustment to the right just to the point where the sensor operates (pump shuts off). Then turn back approximately 1/4 turn to the right (clockwise) with the pump running.

9. Place a rag dampened with cleaning solution on top of the two metallic sensors in the well at the bottom of the vacuum tank. Slowly turn the vacuum adjustment to the right just to the point where the sensor operates (pump shuts off).

10. The Pump and Vacuum sensors are now adjusted.

In actual operation you may wish to increase or decrease the sensitivity of the system, particularly in the vacuum chamber. Make the adjustments in increments no greater that 1/4 turn in order to maintain adequate operation.

Operation of the Sensor System is dependent on low voltage electricity being conducted through water. Because the conductivity of local water and detergent can vary widely, adjustment of sensitivity is provided to enable you to adjust to your own local conditions and chemicals. The pump adjustment screws are located to the left of the pump and vacuum switches.

The Sensor System is sensitive to two conditions:

PUMP

Two metallic probes are present in the bottom of the solution tank. When approximately one inch or more of cleaning solution is present in the tank, a low voltage current passes between the two probes. If the level of solution drops below this point the current between the probes is interrupted and, as a result, the machine will shut off. The red indicator light under the adjusting screw will also light up indicating that lack of cleaning solution has caused the sensor to operate.

VACUUM

Two metallic probes are located in the bottom of vacuum tank well. In normal machine operation, these probes are dry and no current flows. However, if moisture is present from excess foam or bucket overflow, low voltage current will flow causing the sensor to shut the machine off.

If the Sensor System shuts off the machine as described above, both Pump and Vacuum are shut down, not just one or the other.

The sensor switch allows the machine to be used to vacuum out the solution tank at the end of a cleaning job. However, care must be exercised to maintain an adequate supply of cleaning solution and not to over-flow the waste-water bucket.

SENSOR SYSTEM ADJUSTMENT PROCEDURE

Clockwise rotation of either adjustment screw increases sensitivity. However, remember that for normal operation the Pump Sensor must sense solution and that the Vacuum must not sense water. Also, clear water is not a good electrical conductor. Therefore, always adjust your machine with normal cleaning solution, not plain water.

Step 1. Fill the solution tank with normal cleaning solution. Turn the sensor switch ON.

Step 2. Turn the Pump adjustment fully to the right (clockwise) — maximum sensitivity. Turn the Vacuum adjustment fully to the left (counterclockwise) — minimum sensitivity.

Step 3. Turn the Pump switch off. The pump motor should now operate.

Step 4. Place a rag dampened with cleaning solution on top of the two metallic sensors in the well at the bottom of the vacuum tank. Slowly turn the vacuum adjustment to the right just to the point where the sensor operates (pump shuts off).

The Pump and Vacuum sensors are now adjusted.

SENSIBLE CHEMICALS

The ABS plastic used in the tank is suitable for use with most carpet cleaning chemicals. But it is susceptible to chemical attack from some cleaning substances, such as hydrocarbon solvents and chlorinated bleaches. These noncompatible materials are not of the type normally used for carpet cleaning.

The following is a guide to chemicals which are satisfactory and those which must be avoided. Use of unsuitable compounds in the above equipment is, of course, an abuse of the equipment and resulting damage is not covered by warranty.

SUITEABLE CHEMICALS

Alkalis

Clorox II Bleach

Deterging Agents

Detergents

Ethylene Glycol

Hydroxides

Oxygen Bleaches

Solups

Sta-Puf Fabric Softener

Vinegar

White Monday Bleach

Registered Trademark

NONCOMPATIBLE CHEMICALS

Aldehydes

Aromatic Hydrocarbons

Butyls

Carbon Tetrachloride

Clorox

Chlorinated Bleaches

Chlorinated Hydrocarbons

Lysol

Methyls (MEK)

Perchloroethylene (perc)

Phenols

Trichlorethylene

TROUBLE SHOOTING CHART

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low power to machine</td>
<td>Lack electrical circuit</td>
<td>Check building circuit breaker or fuse box</td>
</tr>
<tr>
<td>-</td>
<td>Power failure</td>
<td>Replace</td>
</tr>
<tr>
<td>-</td>
<td>Faulty electrical cable</td>
<td>Replace</td>
</tr>
<tr>
<td>-</td>
<td>Equipment not grounded</td>
<td>Test 3 pronged adapter. Be sure ground wire is secured</td>
</tr>
<tr>
<td>-</td>
<td>Motor worn out</td>
<td>Replace</td>
</tr>
<tr>
<td>Motor</td>
<td>Loose vacuum hose</td>
<td>Replace</td>
</tr>
<tr>
<td>-</td>
<td>Crack in dome or dome connection</td>
<td>Inspect vacuum dome</td>
</tr>
<tr>
<td>-</td>
<td>Defective electrical plug</td>
<td>Replace</td>
</tr>
<tr>
<td>-</td>
<td>Loose coilings of vacuum screen</td>
<td>Inspect vacuum hose</td>
</tr>
<tr>
<td>-</td>
<td>Loose volunteer of vacuum motor seals</td>
<td>Check vacuum motor seals</td>
</tr>
<tr>
<td>-</td>
<td>Water in vacuum chamber</td>
<td>Replace</td>
</tr>
<tr>
<td>-</td>
<td>Broken vacuum hose</td>
<td>Replace</td>
</tr>
<tr>
<td>-</td>
<td>Damaged dome gasket</td>
<td>Replace</td>
</tr>
<tr>
<td>-</td>
<td>Worn out motor</td>
<td>Replace</td>
</tr>
<tr>
<td>-</td>
<td>Corrosion of fittings</td>
<td>Replace</td>
</tr>
<tr>
<td>-</td>
<td>Severe soil Conditions</td>
<td>Clean with a suitable solution</td>
</tr>
<tr>
<td>-</td>
<td>Dusty carpet</td>
<td>Deep cleaning with a suitable solution</td>
</tr>
<tr>
<td>-</td>
<td>Broken dome</td>
<td>Deep cleaning with a suitable solution</td>
</tr>
<tr>
<td>-</td>
<td>Damaged dome gasket</td>
<td>Replace dome gasket</td>
</tr>
<tr>
<td>-</td>
<td>Worn out motor</td>
<td>Replace motor</td>
</tr>
<tr>
<td>-</td>
<td>Corrosion of fittings</td>
<td>Replace fittings</td>
</tr>
<tr>
<td>-</td>
<td>Soapy solution</td>
<td>Check solution valve</td>
</tr>
<tr>
<td>-</td>
<td>Severe soil Conditions</td>
<td>Deep cleaning with a suitable solution</td>
</tr>
<tr>
<td>-</td>
<td>Dusty carpet</td>
<td>Deep cleaning with a suitable solution</td>
</tr>
</tbody>
</table>

With a hose, a blower or a wire brush, clean out the nozzle area and replace or reseal fitting as necessary. Make sure loss. Because the electrical cable will lie insulated on wet carpet at times, the cable must be well insulated and electrical connector screws kept tight. If the cable insulation is broken or frayed, repair or replace it immediately. Don’t take chances with an electrical fire or shock.
LIMITED WARRANTY

WINDSOR warrants to the original user/purchaser that this product is free from defects in workmanship and materials under normal use within the specified period of time from the date of purchase. WINDSOR will, at its option, repair or replace, without charge, except for transportation costs, parts that fail within normal wear or that are damaged or destroyed during transportation, alteration by unauthorized persons, misuse or abuse of the equipment, use of non-compatible chemicals, or damage to the equipment or loss of income due to malfunctioning of the product. WINDSOR is not responsible for costs for repairs performed by persons other than those specifically authorized by WINDSOR. This warranty does not apply to damage from transportation, alterations by unauthorized persons, misuse or abuse of the equipment, use of non-compatible chemicals, or damage to the equipment or loss of income due to malfunctioning of the product. If a difficulty develops with this machine, you should contact the dealer from whom it was purchased.

IN ADDITION to the above warranty, for a period of 5 YEARS WINDSOR will, without charge, either replace or return to working order, at its option, any solution tank that fails as a result of defects in materials or workmanship during normal service and usage, except for transportation costs. This limited warranty is in lieu of all other warranties expressed or implied and releases WINDSOR from all other obligations and liabilities. It is applicable only in the U.S.A. and is extended only to the original user/purchaser of the product. WINDSOR is not responsible for costs of repaired parts performed by persons other than those specifically authorized by WINDSOR. This warranty does not apply to damage from transportation, alterations by unauthorized persons, misuse or abuse of the equipment, use of non-compatible chemicals, or damage to the equipment or loss of income due to malfunctioning of the product.

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FORM 110