

## **Silhouette® Chair**



**Installation, Operation and Care Manual**

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This manual contains the installation, operation and care instructions and user service information for the DentalEZ® Silhouette® Chair.

The DentalEZ Silhouette Chair is designed to provide trouble-free service when installed, operated and cared for according to the procedures set forth in this manual.

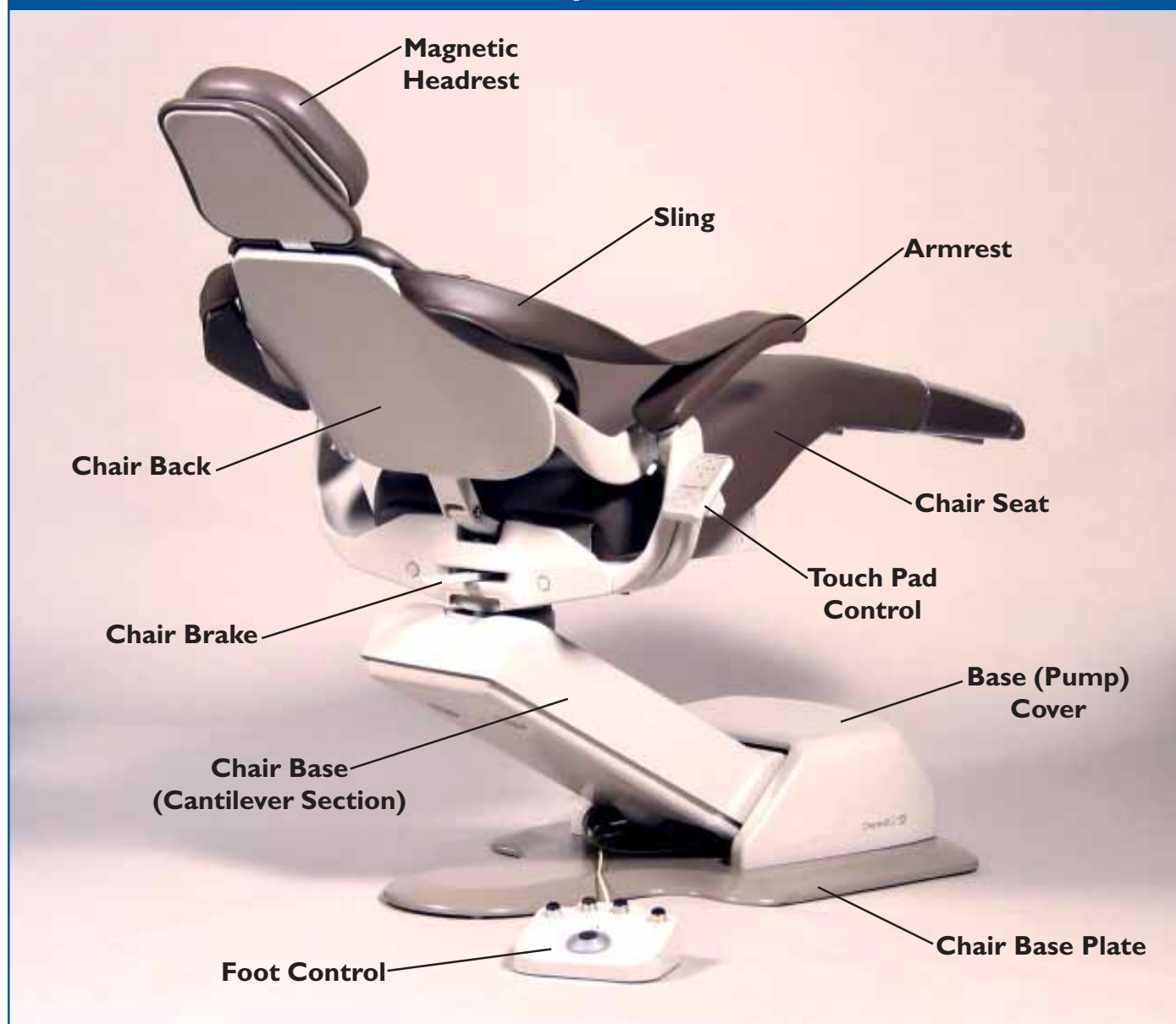
To ensure proper installation, carefully read all the instructions contained in this manual paying close

attention to all warnings, cautions and notes.

Before starting installation procedures, please review the illustration below to become familiar with the components of the DentalEZ Silhouette Chair.

After the Silhouette Chair is installed, please review the features, operation procedures and care guidelines with the doctor's staff. Then **leave this manual in the doctor's office** for the doctor's and the staff's future reference.

### Components



## Classification

### Explanation of Symbols on Equipment



= Attention, Consult Accompanying Documents



= Type B Applied Parts



= Voltage, AC Current



= Caution. Electrical Shock Hazard. Refer Servicing to Qualified Personnel



= European Certification



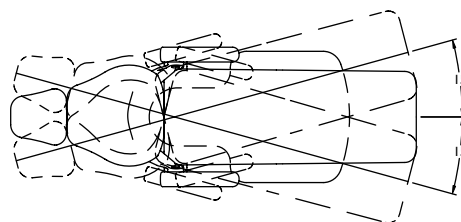
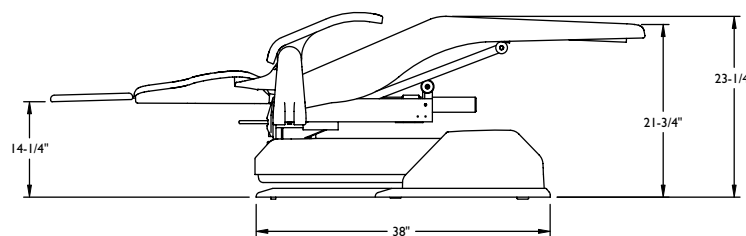
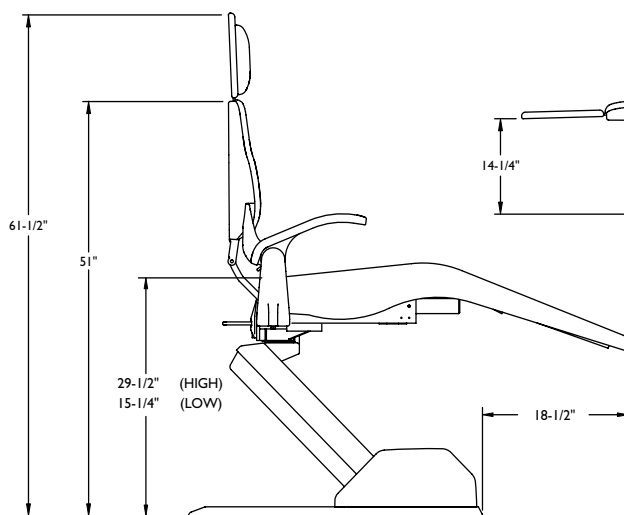
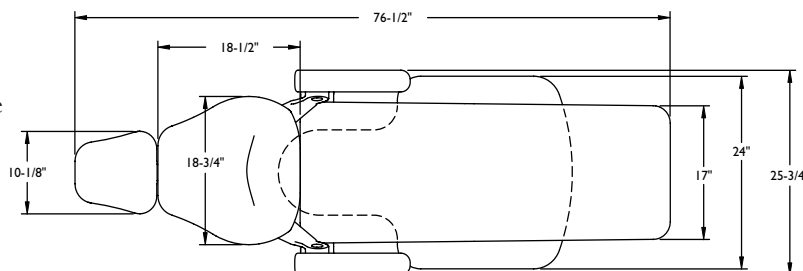
Medical Equipment with Respect to Electric Shock, Fire, Mechanical and Other Specified Hazards Only in Accordance with UL 60601-1 and CAN/CSA C22.2 No. 601.1.

- Type of protection against electric shock: Class 1 Equipment
- Degree of protection against electric shock: Type B Applied Parts
- Degree of protection against the ingress of water: Ordinary
- Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
- Mode of operation: Intermittent Duty Cycle: 3 min. ON, 5 min. OFF.
- Environmental conditions for transport and storage recommended ranges:
  - Temperature range within - 40° C to + 70° C
  - Relative humidity range within 10% to 100%
  - Atmospheric pressure range within 500 to 1050 hPa

## Specifications / Dimensions

**Electrical Power:** 15 amp fused Branch Circuit  
115 VAC, 60 Hz, as applicable  
220 VAC, 50/60 Hz, as applicable

**Shipping Weight:** Chair Carton: 356 lbs.  
Upholstery Package: 36 lbs.



The DentalEZ Silhouette Chair offers state-of-the-art design for optimum operatory performance with complete work comfort and unrestricted patient access. In order to achieve the most efficient use in the operatory and understand what the Silhouette Chair offers, here is a compilation of some standard and optional features:

### Standard

#### Ergonomic/Comfort Features

The Silhouette Chair allows total patient placement flexibility to create the most comfortable working position for the patient and dental team. Some of these ergonomic and comfort features are:

- ◆ Base plate is shaped to allow the operator's stool free movement for unrestricted access.
- ◆ The ergonomically designed headrest allows the operator closer, more comfortable access to the patient's oral cavity while comfortably supporting the patient's head and neck.
- ◆ Low profile pivot assembly makes the chair comfortable for almost any operator.
- ◆ Backrest design provides superior back support to patients.

#### Design Features

- ◆ A special (base up) installation mode raises the base to its upper limit without the use of a controller. (*See Installation Section.*)
- ◆ Self diagnostics is possible via a series of visual display signals (LED codes) and audible signals (beep codes) making each function and control condition easy to track. (*See User Service Section.*)
- ◆ The touch pad control can be programmed to offer four pre-set positions.
- ◆ Every Silhouette Chair can accommodate up to two controls. (*See Installation Section.*)

- ◆ Base plate is cast from aluminum and will not rust or corrode.
- ◆ Chair mount enclosure attractively covers and protects the chair support mechanism.
- ◆ Hydraulic, cantilever-style base provides superior stability and smooth operation.
- ◆ The virtually silent hydraulic motor eliminates distraction.
- ◆ Foot control design incorporates buttons that easily respond to operators touch.
- ◆ Sliding adjustment mechanism makes positioning the headrest simple.
- ◆ Chair-mounted and Magellan-style delivery units can be mounted.
- ◆ Durable one-piece molded chair covers provide smooth, seamless surface for easy cleaning.
- ◆ Upholstery is removable and replaceable.

#### Safety Features

- ◆ A base safety switch feature ensures nothing gets caught underneath the base as it lowers. (*See Operation Section.*)
- ◆ A positive lock chair back eliminates the possibility of the chair back slipping out of the desired operatory position. (*See Operation Section.*)

### Optional

- ◆ Air glide feature lifts the chair off the floor allowing free and easy positioning. (*See Installation/Operation Section.*)
- ◆ Light can be operated using the auxiliary light relay button on the touch pad control. (*See Installation Section.*)

### Unpacking

#### Tools Required:

- Pliers
- 1/2" Socket and Ratchet
- Large Flat-head Screwdriver

#### Chair Carton

1. Fold back the flap at the toe end of the seat pan. Then lift the toe up, pull the seat pan forward and remove the seat pan.
2. Using pliers, remove the staples that secure the shipping carton to the wooden pallet.
3. Remove the carton and packing inserts from the pallet by lifting up and over the chair base.
4. Using a 1/2" socket and ratchet, remove the two bolts that secure the chair base to the shipping pallet.
5. Using a large flat-head screw driver pry off two wood blocks from either side of the pallet.

#### — WARNING —

The Silhouette Chair is shipped with a retaining strap to secure the base mechanism. **DO NOT REMOVE** this strap until the chair is out of the carton and in its position on the floor.

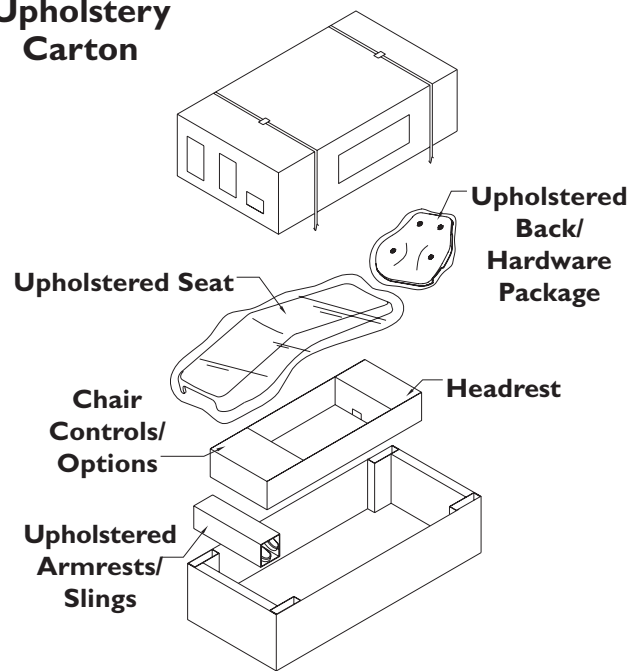
6. Grasp the chair mount casting, pull the chair to the side and carefully slide it off the pallet.

#### Upholstery Carton

Remove and set aside the following items from the Silhouette Chair upholstery assembly packaging:

- Upholstered Back
- Upholstered Seat
- Upholstered Armrests/Slings
- Headrest
- Chair Controls
- Any ordered Options
- Hardware Package

#### Upholstery Carton



#### — NOTICE —

For any questions about an order, please contact a DentalEZ Equipment customer service representative at **1-866-DTE-INFO**.

### Chair Placement

#### — CAUTION —

If the chair is equipped with the air glide option, do not slide the base across the floor. Damage to the air caster may occur.

1. Taking into consideration the Silhouette Chair's specifications (*found on Page 3*), position the chair in its permanent location on a smooth, hard and level floor making sure nothing will interfere with its movement.

**NOTE:** *If the chair is equipped with an air glide option, remove the protective cardboard cover from the rear section of the base plate.*

2. Remove the retaining strap that secured the base mechanism during shipment.



### — WARNING —

**DO NOT CONNECT** the chair **POWER** cord until all shipping hardware is removed.

### Tool Required:

- Phillips Screwdriver

### Special Installation Mode

The Silhouette Chair is shipped in a special installation mode. In this mode, just the chair base rises to its upper limit without the use of a controller.

When the chair power is connected, the chair base will automatically rise until it contacts the base upper limit switch and stop. Then, the chair base will lower itself slightly to its final resting position.

While the chair is in this special installation mode, it will emit a constant fast beep. Even after the base has stopped its motion, this beep will continue as a reminder that the chair is in its special mode.

Raising the chair base will give better access to the base cover rear screws making removal of the base cover easier. It will also provide extra work space to service the chair or install any chair-mounted units.

To take advantage of this special installation mode, perform the following six steps:

1. After all shipping hardware is removed and the chair is in its permanent location, connect the chair power cord to the required power source.
2. The chair base will automatically rise as described above.
3. After the chair releases itself from the upper limit switch, unplug the chair power cord.

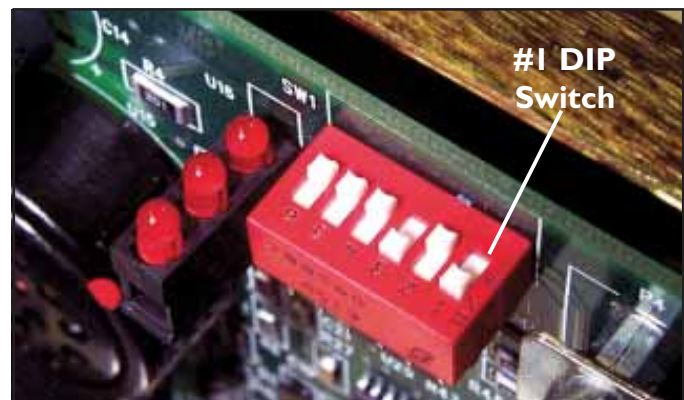
**NOTE:** To stop the base at any desired position less than its final resting position, simply disconnect the chair power cord.



4. Using a Phillips screwdriver, remove the four screws that secure the base cover. (*See photos above.*)
5. Gently lift off the base cover and set it aside.

**NOTE:** The base cover remains off the chair until installation is complete.

6. To take the chair out of its special installation mode, make sure the chair power is **disconnected** and set the #1 DIP switch located on the main control board to the **ON** position.



Preparing Chair

— CAUTION —

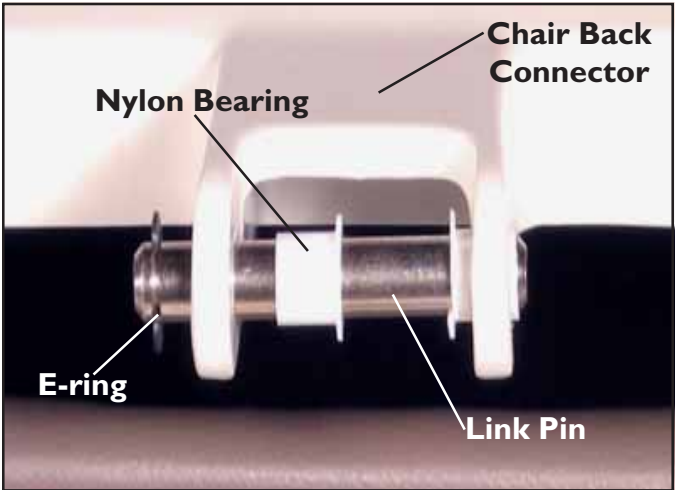
The hydraulic system is shipped with a plug in the reservoir to prevent spillage during shipment. This plug **MUST** be removed prior to operating the chair.



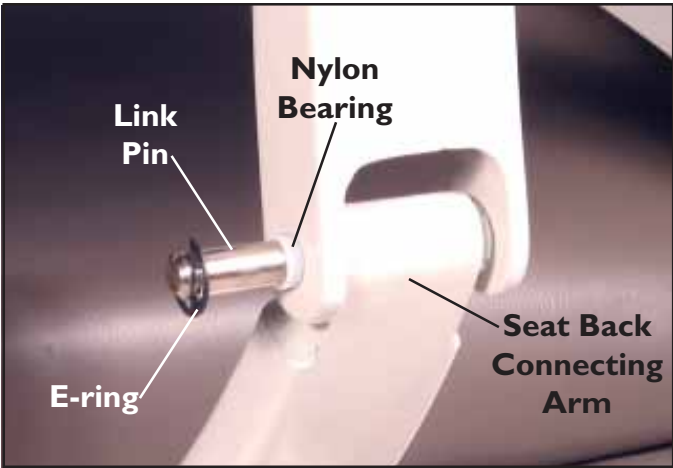
- 1. Remove the rubber shipping plug from the reservoir vent hole.
- 2. Leave the plug on top of the reservoir cap for future use.

Chair Back

- 1. Remove the link pin, nylon bearings and E-rings from the chair back connector.
- 2. Press the nylon bearings into the holes on the chair back connector.



- 3. Lift up the chair back casting to its normal, upright position and align the holes in the chair back connector with the holes in the seat back connecting arm.
- 4. Slide the link pin through the chair back connector and seat back connecting arm.
- 5. Force the E-ring into the groove of the link pin.



Connecting Controls

The Silhouette Chair can accommodate one or two separate controls. The different combinations of utilizing a Silhouette Chair touch pad control and a foot control is depicted in the table below.

Number of Controls	Location of Control(s)	Foot Control	Single Touch Pad	Second Touch Pad
One	Chair	X or	X	
	Delivery Head		X	
	Rear Asst. Arm		X	
Two	Chair	X	X X	X
	Chair & Delivery Head	X	X X	X
	Chair & Rear Asst. Arm	X	X X	X
	Delivery Head & Rear Asst. Arm		X	X



### Single Control

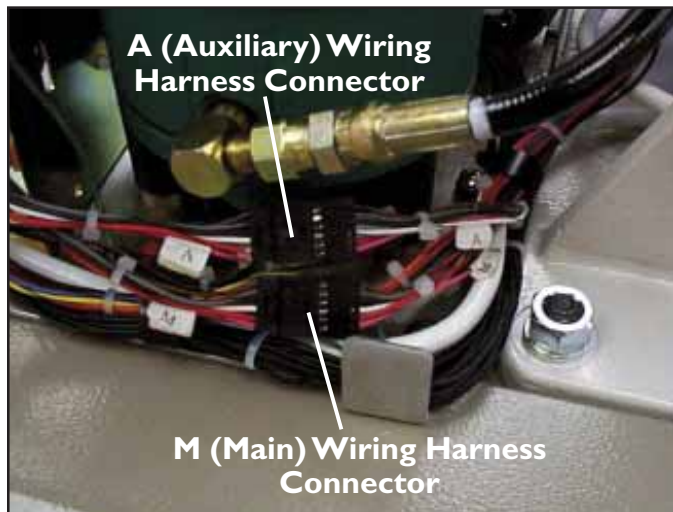
If connecting a single control, connect it to the **M** (main) wiring harness connector.

### Two Controls

If connecting two controls, connect the second control to the **A** (auxiliary) wiring harness connector.

#### — NOTICE —

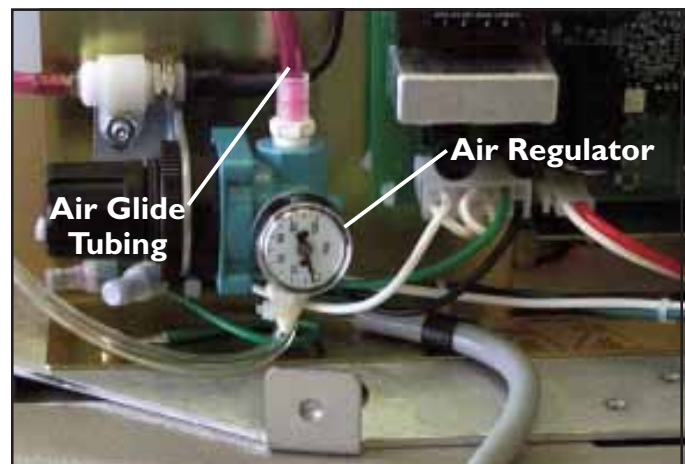
For more information about connecting controls, see the instructions supplied with the individual control package.



1. Place the Silhouette Chair on a smooth, hard and level (*vinyl, tile or terrazzo type*) floor.
2. Connect the air glide tubing to a regulated air supply source (*80 PSI on most dental units*).

#### — CAUTION —

To prevent air caster damage, **DO NOT EXCEED 20 PSI**. If bouncing should occur, reduce the air pressure as required.



3. Adjust the air regulator located on the base chassis to 15-20 PSI.
4. Actuate the air toggle switch at the rear of the chair on the base cantilever section cover.



### Options

#### Air Glide

**NOTE:** If the air glide option was ordered, the air regulator was attached to the base chassis before the chair was shipped.

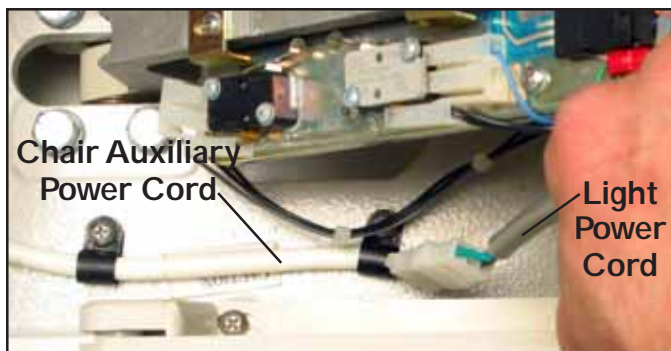
#### — IMPORTANT —

For proper air glide operation, the floor **MUST** be level and have a smooth, hard and non-obstructive surface.

### Light Connection

An AC power connector is supplied with each Silhouette Chair to accommodate a DentalEZ Lumina™ Post Mounted Light.

The AC power connector is located on the right side of the seat mount casting.

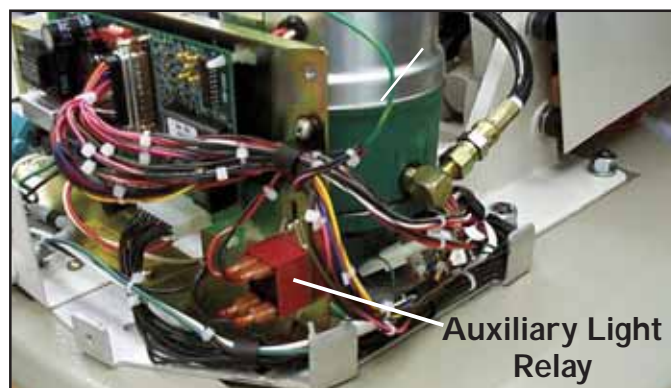


### Auxiliary Light Relay

To install the auxiliary light relay option, proceed with the following steps:

1. Make sure the chair power is **disconnected**.
2. Review the wiring schematic printed on the side of the relay. *Take note of the positions for the DC positive (+) and negative (-) connections. There are two male 3/16" spade connectors on the relay.*
3. Using the screws and nuts supplied with the auxiliary light relay, mount the relay to the main control board mounting plate.

4. Plug in the DC relay wires according to the schematic. *The red/white positive (+) and black negative (-) wires with female 3/16" spade connectors are located on the wiring harness above the relay.*



5. Locate the jumper in the black AC wiring below the relay and remove the short black jumper with the male 1/4" spade connectors.
6. Plug the two female 1/4" spade connectors into the male 1/4" spade connectors on the relay.

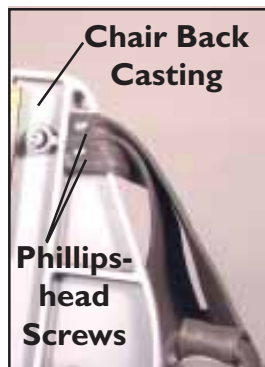
### Delivery Units

Installation of chair-mounted and Magellan-style delivery units is recommended before upholstery installation. Follow the manufacturer's instructions supplied with the delivery unit.

**NOTE:** All the upholstery installation hardware is attached to the upholstered chair back.

### Armrests/Slings

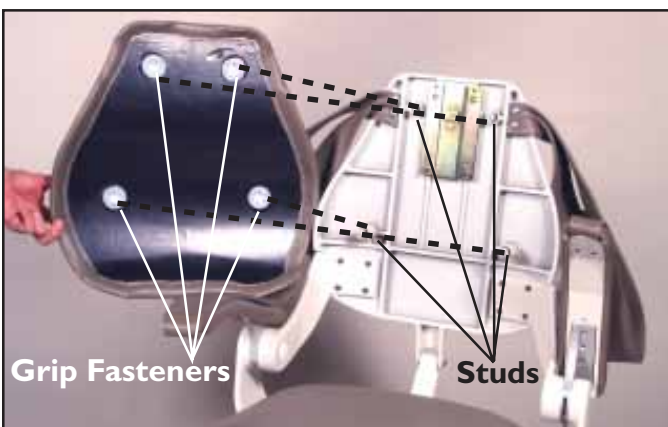
1. Place each upholstered armrest onto the arm supports.
2. From the underside of each arm using three oval Phillips-head screws, attach each upholstered arm to the arm supports.
3. Using two Philips-head screws, attach each of the slings to the chair back casting.



### Back Upholstery

**NOTE:** Make sure the blind grip fasteners are firmly secured to the back of the upholstered chair back.

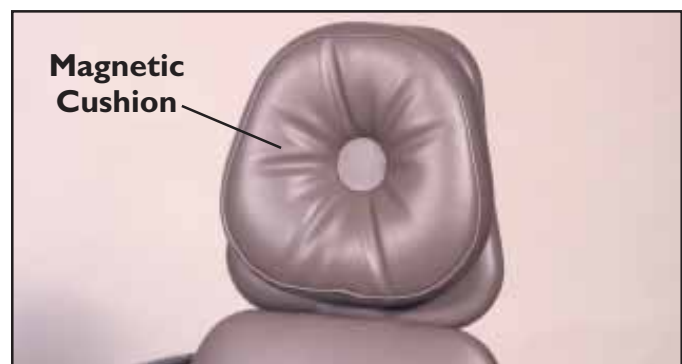
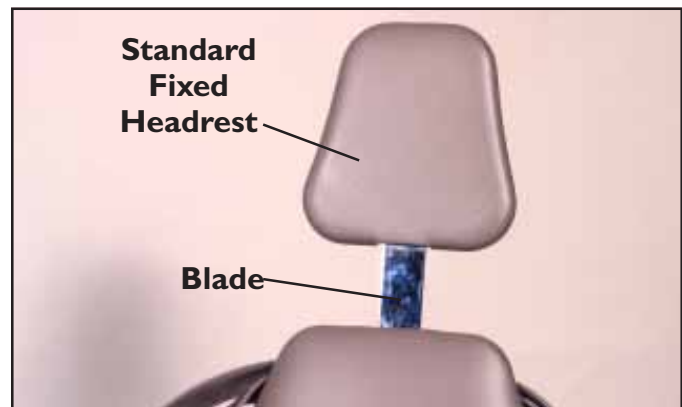
1. Align the two upper and two lower blind grip fasteners on the upholstered chair back to the studs on the chair back casting.



2. Firmly press each blind grip fastener onto its corresponding stud.
3. Tug on each stud location to ensure the upholstered chair back is secure.

### Headrest

1. Slide the blade of the standard fixed or double articulating headrest into the opening of the chair back casting.

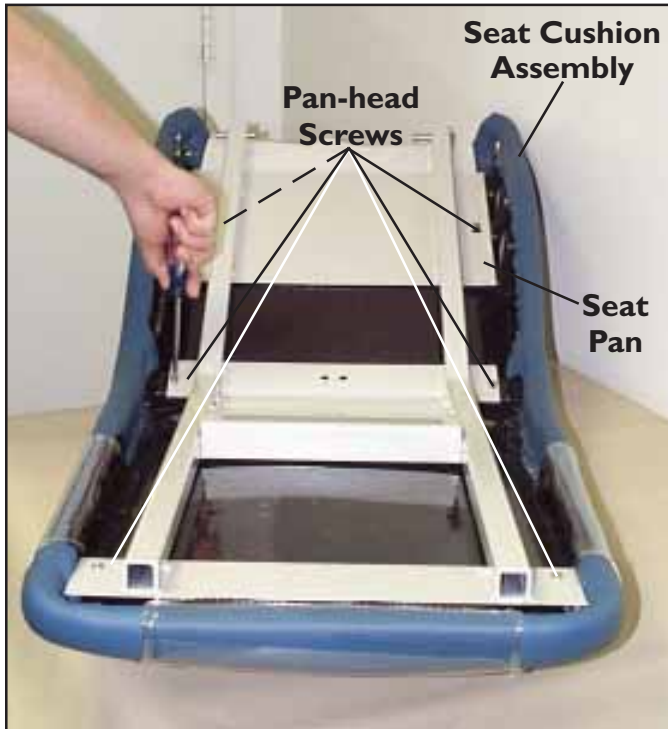


2. Place the magnetic headrest cushion on the fixed headrest.

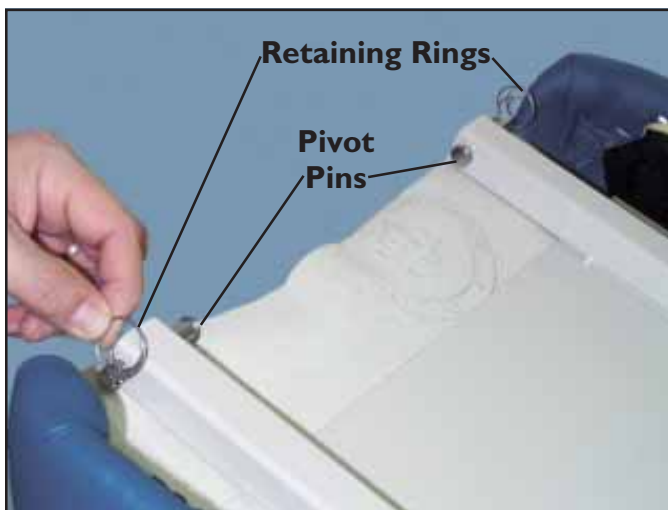


### Seat Upholstery

1. Using six pan-head screws, attach the seat cushion assembly to the seat pan.

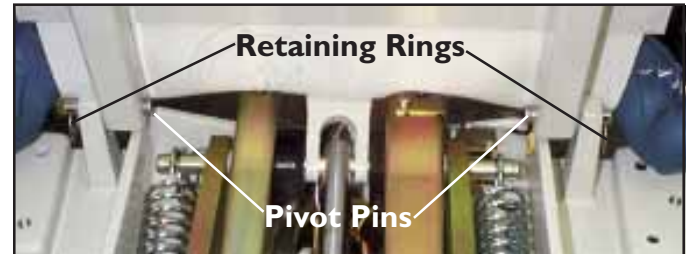


2. Remove the two retaining rings and pivot pins from the seat pan.



3. Place the seat assembly, with the cutout end toward the back of the chair, on the seat mount casting.

4. Replace the two retaining rings and pivot pins making sure the pins are inserted from the inside towards the outer ends of the seat.



5. Lower the seat so it rests on the seat casting.



6. Using two Phillips-head screws with plastic covers attach the brake cover to the chair. Then snap the covers over the screws.

### — CAUTION —

Overtightening the screw will cause the snap cover not to function properly.



### — WARNING —

To prevent possible injury because of accidental operation, do not leave young children unattended.

### Manual Positioning

Manual positioning of the Silhouette Chair is accomplished by operating a touch pad control or foot control — or using two separate controls. To operate these controls:

1. Select the direction of travel.
2. Depress and release the corresponding button and the chair will move to a factory-set travel limit. *Holding the directional button makes the chair run until the button is released.*

### Automatic Positioning

#### Programming Auto Positions

**NOTE:** Any control (touch pad or foot) can be used to program the four auto positions. Once the auto positions are programmed, any connected control can be used to execute them.

### Touch Pad Control

To establish the pre-sets using the touch pad control, refer to the Silhouette Chair touch pad control illustration and perform the following steps:

1. Situate the chair in the desired auto position.
2. Press and hold the desired auto button (1,2,3 or 4) for approximately five seconds until a second beep is heard.

**NOTE:** The chair will beep once when the auto button is first depressed and beep again after the program is accepted.

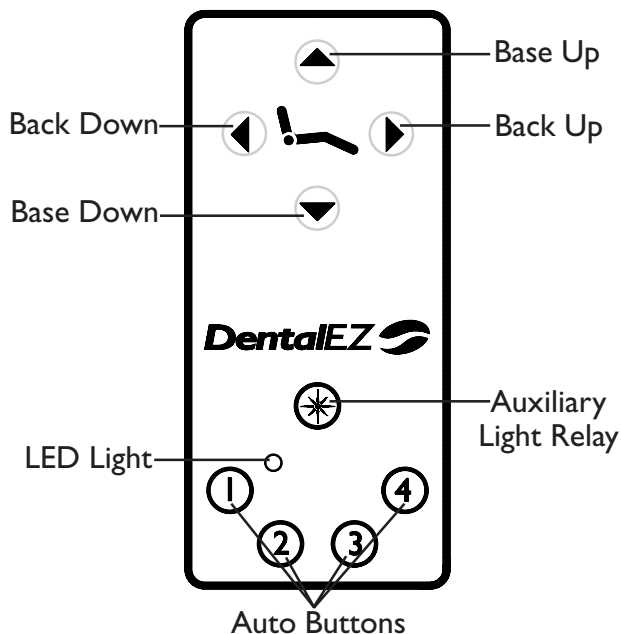
3. Repeat Steps 1-2 to program the other three positions.

### Foot Control

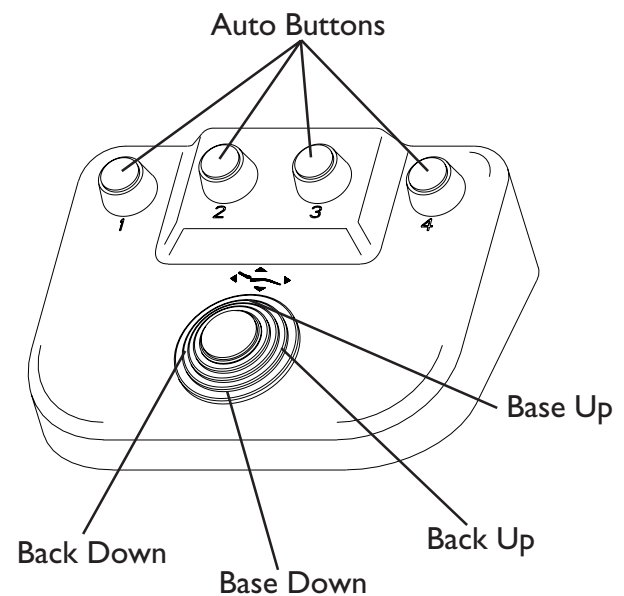
To establish the pre-sets using the foot control, refer to the foot control illustration below and perform the following steps:

1. Situate the chair in the desired auto position.
2. Press and hold the desired auto button (1, 2, 3 or 4) for approximately five seconds until a second beep is heard.

#### Silhouette Chair Touch Pad Control



#### Silhouette Chair Foot Control



### Activating Auto Positions

To activate the auto positions:

1. Depress the #1, 2, 3 or 4 button once on either the touch pad control or the foot control.
2. A beep will sound.
3. The chair will automatically stop in the programmed position selected.

**NOTE:** *Pressing any button on a chair control module while the Silhouette Chair is moving to a programmed position will immediately stop the movement of the chair, and three short beeps will sound. To continue and complete the automatic positioning of the chair, simply press the desired position button a second time.*

### Reprogramming Auto Positions

To change a programmed position, simply maneuver the Silhouette Chair to the desired position and follow the Programming Auto Positions instructions described earlier in this Section.

**NOTE:** *Reprogramming a new auto position spontaneously erases the old position.*

## Controller Functions/Modes

### Controller Self-Calibration

When power is first connected to the chair, each attached controller having its associated DIP switch set to the **ON** position is tested and calibrated.

If a controller does not pass the calibration test, its commands are ignored and an associated LED code is generated letting the user know the controller failed the calibration test.

While the chair is idle, approximately every 15 minutes, the attached controllers are tested and calibrated to ensure they are working as expected.

### Command Time-out

When a function is moved or an auto position is activated, the chair assumes movement completion will take no longer than 45 seconds.

If a function button has been held down or an auto position has not completed in this allotted time, the chair will reset itself and restart as though it were being powered up. If a button is stuck on a controller, it will fail the calibration test when the chair restarts and the original command will be ignored. If an auto position was activated and for some reason could not be completed, the chair will not continue trying completion of this command when the chair restarts.

### Silent Mode

Anytime a function position button is pressed, a short beep sounds letting the operator know a function move has started. These short beeps can be silenced by changing the #3 DIP switch to the **OFF** position. (See Section VII, Dip Switch Settings for details.)

### Potentiometer Override Mode

In the event one of the two potentiometers used to measure each function's position on the chair cannot be read, the chair will automatically switch to a manual-only mode. In this mode, the chair can only be manually positioned, and the affected function's travel limits will be its limit switch position or physical limit.

A constant fast beep will sound while an affected function is being moved to alert the operator the function requires service. When the affected function is idle, no beep signal will sound. All other functions that are operating normally will maintain their programmed travel limits without audible signals.

Auto positions cannot be set or activated in this mode because at least one of the function's positions cannot be measured. If any auto position buttons are pressed, the chair will sound three short beeps to indicate auto positioning is not available and the chair is in manual-only mode.



### Base Safety Switch

1. When the base cantilever section lowers and contacts an obstruction, the cover on the underside of the cantilever section moves up and activates safety switches.
2. Motion of the base stops immediately and the chair emits a constant short warning beep.

**NOTE:** *As long as the safety switches are activated, the base will not lower any further. All other chair functions, except auto programs, are still available. If the chair is moving to an auto position and the base cover moves up activating the safety switches, auto positioning will stop.*

3. Moving the base up and off the obstruction deactivates the safety switches and silences the warning beep.

### Chair Rotation

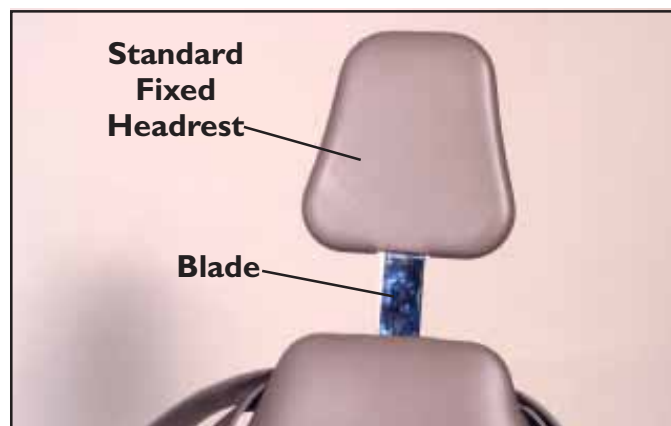
The Silhouette Chair will swivel approximately 15° to either side of its center position. To swivel the chair:

1. Release the chair brake located on the back of the chair seat casting by moving the brake handle completely to the left.
2. Swivel the chair to the desired position.
3. Lock the chair brake by moving the brake handle to the right.



### Headrest Positioning

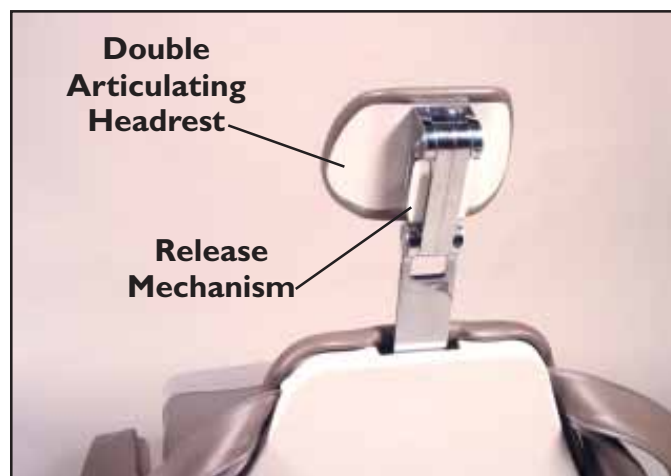
Firmly push down or pull up the blade from the chair back to change the headrest height.



### Double Articulating Headrest

To position the double articulating headrest:

1. While facing the back of the headrest, fully depress the release mechanism on the left.
2. Keep the release mechanism depressed and tilt the headrest until the desired position is reached.
3. Release the mechanism to lock it in place.



**NOTE:** *The use of disposable headrest covers is recommended to prevent soiling of the headrest. These covers may be purchased through a local dental supplier.*

### Armrests

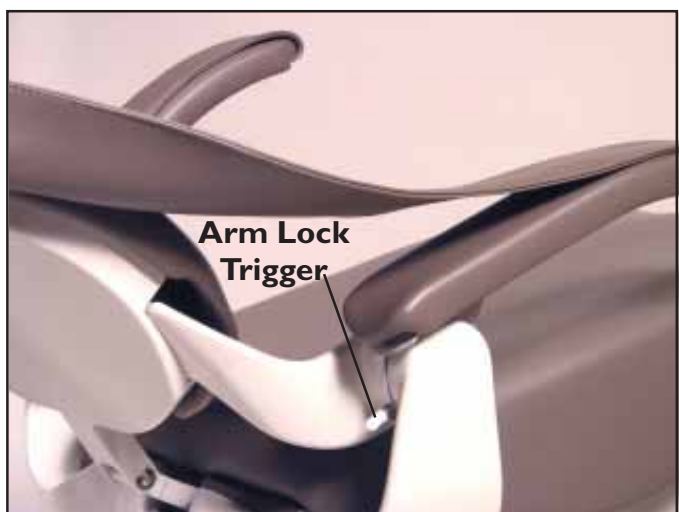
The Silhouette Chair's armrests are designed to be raised to allow patient entry and exit from either side.

#### — CAUTION —

The armrests **SHOULD NOT** be used as a means of support when entering, exiting or leaning against the chair.

To raise and lower the armrest do the following:

1. Push down the arm lock trigger located under the lower arm assembly and lift up the armrest.



2. Push down on the raised end of the armrest until the armrest stops and clicks into place locking the armrest in position.



2. Activate the air toggle switch on the base cover at the rear section of the chair.
3. The rear of the chair base is supported by an air pillow and lifts off the floor.
4. When the base rear is raised, it allows the rollers on the front of the base plate to contact the floor.
5. While the chair is supported only by the rollers and air pillow, reposition the chair as desired.

### Auxiliary Light Relay

The auxiliary light relay allows the operator to turn on an attached light and then control its on/off state using the touch pad control. To operate the auxiliary light relay option:

1. Depress the auxiliary light relay button once on the touch pad control.
2. One short beep will sound to alert the operator the light state has changed.
3. Pressing the auxiliary light relay button toggles the on/off state of the light.

### Optional Features

#### Air Glide

The air glide option aids the operator in repositioning the chair. To operate the air glide option:

1. Make sure the chair is on a smooth hard, level and non-obstructive surface.

**— WARNING —**

Improper cleaning and disinfection techniques could lead to cross-contamination. Therefore, prior to each use, properly clean and disinfect the chair's exterior in accordance with normal dental procedures.

Before attempting to clean or disinfect the Silhouette Chair, please read the following instructions carefully.

**— NOTICE —**

The upholstery cleaning/disinfecting information contained in this Section is not a guarantee but represents highly recommended procedures obtained from the upholstery manufacturers.

**Cleaning****— IMPORTANT —**

Pay strict attention to all the cleaning product manufacturer's warnings and cautions.

Because any cleaning product may be harmful or irritating:

- ✓ Use protective gloves and eye protection in a well ventilated area.
- ✓ Do not inhale or swallow any cleaning product.
- ✓ Protect surrounding surfaces and clothing from exposure.

When using strong cleaning agents, such as bleach or alcohol, it is advisable to first test them in an inconspicuous area to be certain they will not damage the upholstery, plastic or metal surfaces of the Silhouette Chair. *(Results may vary under actual conditions.)*

**— CAUTION —**

Cleaning agents, other than household bleach or rubbing alcohol, may contain harsh or unknown solvents. Also, these other cleaning agents are subject to formula changes made by the manufacturer without notice.

**Chair Upholstery**

1. **To remove light soil:**
  - a. Prepare a solution comprised of one part household dishwashing liquid and nine parts warm water.
  - b. Apply the dishwashing liquid solution to the upholstery using a sponge or soft, damp cloth. *If necessary, a soft bristle brush may be used.*
  - c. Using a soft cloth dampened in clean water, wipe away any residue and dry.
2. **To remove heavy soil:**
  - a. Dampen a soft, white cloth with lighter fluid (naphtha) and rub the area gently.
  - b. Using a soft cloth rinse thoroughly with clean water and pat surface dry.
3. **To remove stains using bleach:**
  - a. Prepare a solution comprised of one part household bleach (sodium hypochlorite) and nine parts water.
  - b. Apply the bleach solution to the stain using a dampened, soft, white cloth.
  - c. Allow the bleach solution to puddle on the affected area, or apply a bleach solution-soaked cloth to the area for approximately 30 minutes.
  - d. Using a soft cloth dampened in plain water, rinse the treated area thoroughly to remove any bleach residue.
4. **To remove stains using alcohol:**
  - a. Dampen a soft, white cloth with rubbing alcohol and rub the stain gently.
  - b. Using a soft cloth dampened in clean water, rinse the treated area thoroughly to remove any alcohol residue and pat dry.
5. **To restore luster:**
  - a. Apply a light coat of spray furniture wax containing lemon.
  - b. Wait 30 seconds and lightly buff the surface using a clean, white cloth.

### Plastic and Coated Metal Surfaces

#### — CAUTION —

**NEVER** use abrasives or petroleum-based cleaners on any plastic or coated metal surfaces unless otherwise specified.

#### 1. To remove ordinary dirt:

- Prepare a soapy solution comprised of household dishwashing liquid and water.
- Using a soft cloth or sponge, apply this soapy solution to the plastic and coated metal surfaces.

**NOTE:** To remove heavier dirt, apply *\*Formula 409®* or *Fantastik®* Spray Cleaner.

- Wipe area dry immediately using a soft cloth.

#### 2. To remove stubborn stains:

- Apply a mild abrasive such as toothpaste or liquid tooth polish using a soft, white cloth.
- Using a chamois or moist sponge, remove all traces of the mild abrasive.
- Dry the area thoroughly to prevent marking.

*\*Formula 409® is a trademark of the Clorox Company; Fantastik® Spray Cleaner is a trademark of the Texize Division of Dow Products, Inc.*

### Metal Surfaces and Chrome Parts

For ordinary dirt, fingerprints, etc., use a non-abrasive, all-purpose cleaner.

## Disinfecting

### Upholstery

The Silhouette Chair's upholstery is comprised of a sulfide stain, oil and mildew resistant material which provides outstanding protection in difficult medical and health care environments. This material contains antibacterial/antimicrobial agents that are effective against some of the following microorganisms:

#### Bacterial Species:

- ♦ *Bacillus Subtilis/Cersus/Mycoides*
- ♦ *Staphylococcus Aureus*
- ♦ *Oseydinibas Aeruginosa*
- ♦ *Aerobacter Aerogenes*
- ♦ *Proteus Vulgaris*
- ♦ *Brevibacterium Species*
- ♦ *Streptomyces Rubrircetuli*
- ♦ *Escherichia Coli*
- ♦ *Klebsiella Pneumoniae*
- ♦ *Pseudomonas Aeruginosa*

#### Fungal Species:

- ♦ *Aspergillus Niger*
- ♦ *Aspergillus Flavus*
- ♦ *Penicillium Funiculosum*
- ♦ *Penicillium Islandicum*
- ♦ *Chaetium Globosum*
- ♦ *Trichoderma Species*
- ♦ *Auerobacidium Pullulene*
- ♦ *Candida Albicans*

### High-Level Disinfection

The Silhouette Chair's upholstery material is formulated to withstand high-level disinfection, which is required in medical/dental applications. Disinfectant products that contain sodium hypochlorite (household bleach) can be used full strength or with gluteraldehydes.

### Intermediate-Level Disinfection

This level of disinfection is achieved by applying either rubbing alcohol or a solution comprised of one part household bleach (sodium hypochlorite) and nine parts water. Because sodium hypochlorite is easier to apply, its use is preferred over rubbing alcohol. To achieve intermediate-level disinfection, rubbing alcohol must remain puddled on the upholstery's surface until evaporation is complete.

### All Other Chair Surfaces

*\*Cavicide™* is recommended for disinfecting all other surfaces of the Silhouette Chair. The use of any disinfectant, other than *Cavicide™*, may cause premature staining, discoloration or damage to the Silhouette Chair's materials.

*\*Cavicide™ is a trademark of Micro Aseptic Products, Inc.*



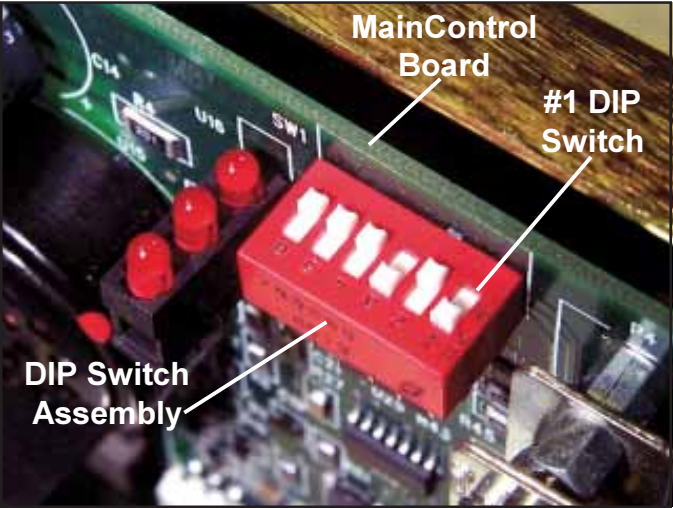
DIP Switch Settings

A DIP switch assembly, which is located at the top center of the main control board under the base cover, is used to set certain functions of the chair's electronic control package.

— **IMPORTANT** —

Change DIP switches only while the chair power is disconnected. Once the chair power is reconnected, the main control board will recognize any changes made.

**NOTE:** The main control board expects at least one controller attached to the **M** (main) wiring connector. If there is no controller attached to either the **M** or **A** (auxiliary) connectors, the board will generate a service LED code that indicates one of the controllers needs checking.



DIP Switch	State	Function
#1	ON	Controller <b>M</b> is <b>ON</b> and the board assumes a controller is connected.
	OFF	Special installation mode (base automatically rises when power is connected.)
#2	ON	Controller <b>A</b> is <b>ON</b> and the board assumes a controller is connected.
	OFF	Controller <b>A</b> is <b>OFF</b> and the board assumes no controller is connected.
#3	ON	Function command activation signal beeps are activated.
	OFF	Function command activation signal beeps are silenced.
#4	ON	Travel limits programming mode.
	OFF	Normal operation mode.
#5	ON	<b>Must be OFF for aXcs Chair. (3-function mode: base, back and seat.)</b>
	OFF	<b>aXcs Chair default setting. (2-function mode: base and back/seat.)</b>
#6	ON	Not used (for future features).
	OFF	Must be in <b>OFF</b> position.

Beep Codes

The Silhouette Chair's electronic control package is designed to sound specific beep code signals to alert the operator of certain control conditions. Understanding the beep codes enables the operator to isolate the condition and take appropriate action.

Base conditions are indicated by a constant short beep; back conditions by two constant short beeps.

Three short beeps indicate a function is not available when its button is pressed. A constant fast beep that sounds only when a function is moved indicates a potentiometer condition.

The beep code signal chart on the following page lists the audible sound, control condition and service action to take. The codes are also prioritized letting the user know that conditions listed above the indicated code are normal.

Beep Code	Condition	Action
Constant fast beep (FB)	Special installation mode (base automatically raises)	Disconnect the chair power. Move the #1 DIP switch to the <b>ON</b> position. Reconnect the chair power.
Constant short beep (SB)	Base lower safety cover contacted and moved up activating switches (LS2 & LS3)	Move the base up and remove obstruction under cover.
	Cover is jammed	Move cover around until it's free then push the cover up to make sure it's working properly.
	Base upper limit switch (LS1) activated (base exceeded its upper travel limit)	Reprogram the chair's travel limits.
Constant (SB)(SB)	Back upper limit switch (LS4) activated (back exceeded its upper travel limit)	Reprogram the chair's travel limits.
Constant (SB)(SB)(SB)	Board cannot find a seat limit switch.	The board is in its three-function mode. Make sure the #5 DIP switch is in the <b>OFF</b> position. ( <i>See DIP Switch Settings, Page 18.</i> )
Constant (SB)	Auxiliary limit switch (LS7) wire connectors unplugged	Make sure connectors are plugged in securely.
	Auxiliary limit switch activated (user installed option)	Determine where the switch is installed and why it was activated. Then appropriately deactivate switch.
(SB)(SB)(SB) When any control button is pressed (except auxiliary relay)	Handpiece safety wire connectors unplugged	Make sure connectors are plugged in securely.
	Handpiece safety switch activated (user installed option)	Determine where switch is installed and why switch is activated. Then appropriately deactivate switch.
When any control auto button is pressed	Auto position program is not activated because one or more potentiometers are disconnected or out of range	Determine which potentiometer is locking out the auto programs by checking the service LED codes or by moving each function until a constant (FB) is signaled while the function is in motion. Check the indicated potentiometer's wiring and linkage for proper function. Then check the potentiometer resistance and voltage.
While in travel limits programming mode (#4 DIP switch is <b>ON</b> ) and either auto 1 or 2 button is pressed	Cannot program travel limits because one or more potentiometers are disconnected or out of range	Determine which potentiometer is locking out the travel limits program by checking the service LED codes or by moving each function until a constant (FB) is signaled while the function is in motion. Check the indicated potentiometer's wiring and linkage for proper function. Then check the potentiometer's resistance and voltage.
Constant (FB) Only while a function is moving	The potentiometer on the activated moving function is disconnected or out of range	Verify the suspected potentiometer by checking the service LED codes. Check the potentiometer's wiring and linkage for proper function. Then check the potentiometer's resistance and voltage.

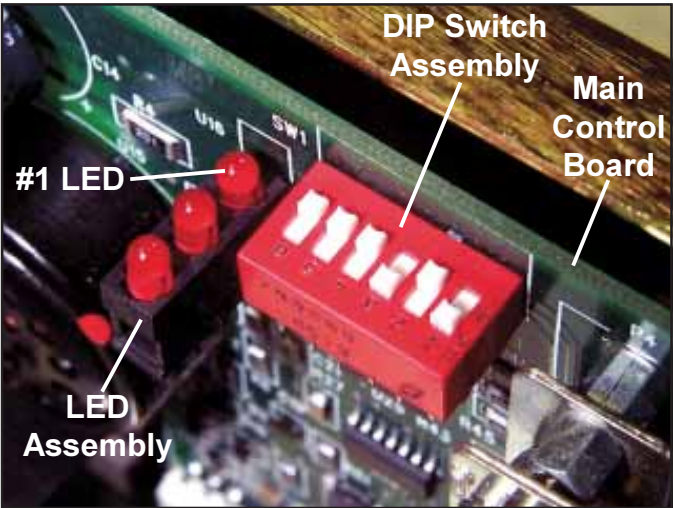


LED Codes

There is a three-light LED assembly on the main control board that indicates each power up mode and various service conditions the chair may encounter. The LED assembly is located at the top center of the main control board (left of the DIP switch assembly) under the base cover.

The power-up codes are described in the table below.

A service condition LED code chart appears on the next page. The LED codes are prioritized from top to bottom letting the user know the conditions listed above the indicated code are normal.



**LEGEND**

LED states: ● = On    ○ = Off    \* = Blinking

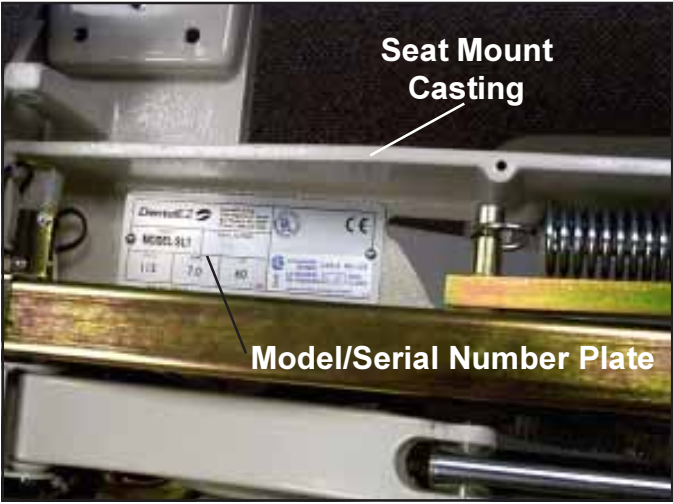
*(The LED nearest the main control board is number one.)*

	LED Code	Beep Code	DIP Switch	Mode
PC Board	● ● ● ○ ○ ● ○ ● ○ ● ○ ○ ● ● ● ○ ○ ○	(SB)	#1 On, #4 Off	Normal operating
	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ○ ○ ○	(SB)	#1 On, #4 On	Travel limits programming
	* * *	constant (FB)	#1 Off	Special installation (base automatically rises)

Service Instruction

If the area of concern is not addressed in this manual, contact your local DentalEZ full-service dealership. Please have the following product information available:

- Model Name \_\_\_\_\_
- Model Number \_\_\_\_\_  
*(found on the seat mount casting )*
- Serial Number \_\_\_\_\_
- Date of Installation \_\_\_\_\_



LED Code	Condition	Action
* * *	Special installation mode	Disconnect the chair power. Move the #1 DIP switch to <b>ON</b> . Reconnect the chair power.
○ ○ *	A/D converter failure	Replace the chair main control board.
○ * ○	EEPROM failure	Replace the chair main control board.
○ * *	Handpiece safety wire connectors unplugged	Make sure connectors are plugged in securely.
	Handpiece safety switch activated (user-installed option)	Determine where the switch is installed and why it was activated. Then appropriately deactivate the switch.
● ○ ○	Base lower safety cover contacted and moved up activating switches (LS2 & LS3)	Move base up and remove obstruction under the cover.
	Cover is jammed	Move the cover around until it's free, then push the cover up to make sure it's working properly.
	Base upper limit switch (LS1) activated (base exceeded it's upper travel limits)	Reprogram the chair's travel limits.
● ● ○	Back upper limit switch (LS4) activated (back exceeded its upper travel limit)	Reprogram the chair's travel limits.
● ○ ●	Board cannot find a seat limit switch.	The board is in its three-function mode. Make sure the #5 DIP switch is in the <b>OFF</b> position. (See <i>DIP Switch Settings, Page 18.</i> )
○ ● ○	Auxiliary limit switch (LS7) wire connectors unplugged	Make sure connectors are plugged in securely.
	Auxiliary limit switch activated (user-installed option)	Determine where the switch is installed and why it was activated. Then appropriately deactivate the switch.
○ ○ ● Only while base is moving	Base potentiometer (P1) is disconnected or out of range	Check the base potentiometer's wiring and linkage for proper function. Then check its resistance and voltage.
○ ● ● Only while back is moving	Back potentiometer (P2) is disconnected or out of range	Check the back potentiometer's wiring and linkage for proper function. Then check its resistance and voltage.
* ○ ○	Controller <b>M</b> (main) will not calibrate	Check wiring for breaks or loose connections. Check for stuck switches.  Make sure a controller is connected to the <b>M</b> wiring. If only one controller is used, it should be connected to <b>M</b> .  Disconnect and reconnect chair power forcing controller calibrations. Replace controller if it still will not calibrate.
	Controller <b>A</b> (auxiliary) will not calibrate	Check wiring for breaks or loose connections. Check for stuck switches.  If a controller is not connected to <b>A</b> , change the #2 DIP switch to <b>OFF</b> so it will not calibrate.  Disconnect and reconnect chair power forcing controller calibrations. Replace controller if it still will not calibrate.
○ ○ ● When chair is idle	Base potentiometer (P1) is disconnected or out of range	Check the base potentiometer's wiring and linkage for proper function. Then check its resistance and voltage.
○ ● ● When chair is idle	Back potentiometer (P2) is disconnected or out of range	Check the back potentiometer's wiring and linkage for proper function. Then check its resistance and voltage.
○ ○ ○	Normal	

## Programming Travel Limits

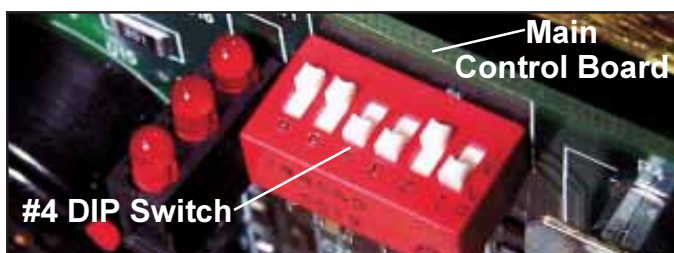
### Tools Required

- Phillips Screwdriver
- Tape Measure

### — WARNING —

Disconnect the chair power when indicated!

1. **Disconnect** the chair power.
2. If the upholstered seat was installed, remove the brake cover from the back of the seat by pulling it straight back. Then remove the two rings and pins that hold the upholstered seat to the chair.
3. Take off the base (pump) cover by removing and retaining the four Phillips-head screws that attach it to the base plate.
4. On the main control board, flip the #4 DIP switch to the **ON** position. *(This will place the chair in its travel limits programming mode when the chair's power is reconnected.)*



**NOTE:** All three LEDs on the board will light up five times, along with a short beep each time, to indicate the chair is in its travel limits programming mode.

5. **Reconnect** the chair power.

**NOTE:** The upper and lower travel limit values specified are factory settings. Values within the ranges are valid depending on specific applications. Different travel limit values may be required to achieve adequate clearance for accessories attached to or near the chair.

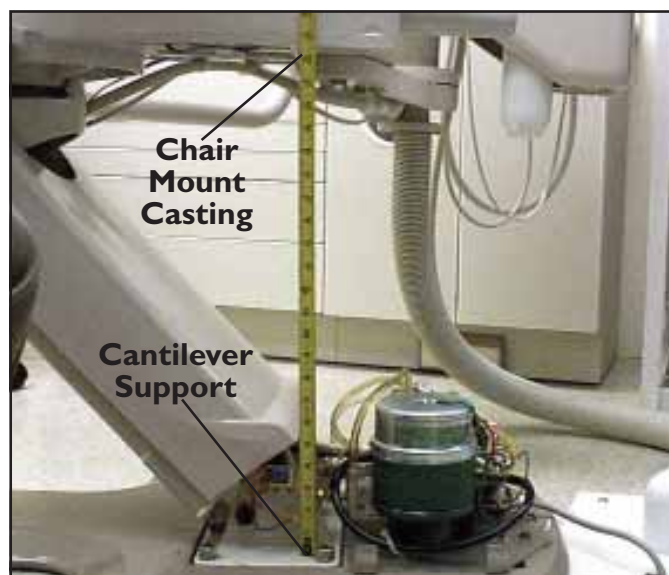
**NOTE:** Any one of the two possible controls connected to the chair can be used to set the travel limits.

6. Perform the following steps to program the **UPPER** limits:

- a. Move the back up until the distance between the back of the slide block and the front of the right guide rail measures between **11-1/4"** and **11-3/8"**.



- b. Move the base up until the distance between the bottom of the chair mount casting and the top of the cantilever support casting measures between **22-5/8"** and **22-3/4"**.



- c. On a controller, press and release the **auto #1** button.

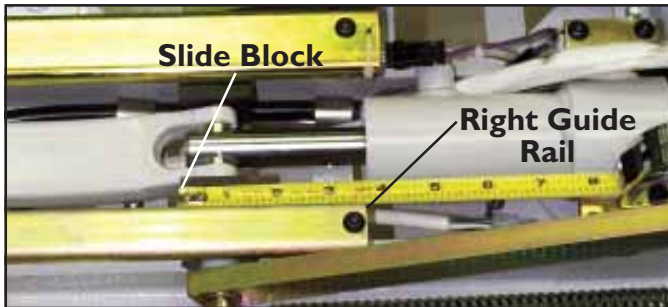
### — CAUTION —

Do not press the auto button for more than **one second**.

**NOTE:** A short beep will sound when the button is pressed, another will sound when the button is released indicating the travel limits have been stored.



7. Perform the following steps to program the **LOWER** limits:
  - a. Move the back down until the distance between the back of the slide block and the front of the right guide rail measures between 3-1/2" and 3-5/8".



- b. Move the base down until the distance between the bottom of the chair mount casting and the top of the cantilever support casting measures between 9-1/4" and 9-3/8".



- c. On a controller, press and release the **auto #2** button.

### — CAUTION —

Do not press the auto button for more than **one second**.

**NOTE:** A short beep will sound when the button is pressed, another will sound when the button is released indicating the travel limits have been stored.

8. **Disconnect** the chair power.
9. Flip the #4 DIP switch back to the **OFF** position. (This will place the chair back into its normal operating mode.)
10. Reconnect the chair power.

### — CAUTION —

Do not use the auto buttons until they have been reprogrammed.

11. Move the chair to each travel limit position and verify the program values have been properly set and stored.

**NOTE:** Each function should stop before activating a limit switch or reaching a physical stop.

**NOTE:** If the limits are not within the specified ranges or any limit switch is activated, the travel limit values may not have been stored properly or they are outside the factory values. Repeat the programming procedures if necessary.

**NOTE:** If a limit was adjusted to accommodate an accessory, make sure the resulting clearance is sufficient.

12. **Disconnect** the chair power.
13. Replace the pump cover using the four Phillips-head screws previously removed.
14. Replace the seat using the rings and pins previously removed.
15. Replace the brake cover.
16. Reprogram the auto positions. (Refer to Section V Operation, Pages 12 and 13 in this manual.)

### Upholstery and Exterior Components

- 3625-647** Upholstery set (*color & headrest specified when ordering*)
- 3801-827** Stationary headrest cushion
- 3801-826** Magnetic headrest cushion
- 3801-535** Double articulating headrest cushion
- 3802-019** Back cushion
- 3801-742** Back blind grip fasteners
- 3802-020** Upholstered arm assembly
- 3801-566** Seat cushion
- 3801-443** Seat mounting pin & retaining ring
- 3801-569** Seat rollers and screws
- 3801-447** Back link pin and E-rings
- 3801-568** Seat toe guard
- 3801-825** Brake cover
- 3801-803** Brake handle
- 3801-787** Top cantilever base cover
- 3801-756** Bottom cantilever base cover
- 3801-737** Base (pump) cover
- 3801-563** Arm hole cap

### Controls

- 3625-573** Chair mounted touchpad option
- 3625-576** Delivery head mounted touchpad option
- 3801-824** Touch pad assembly
- 3801-820** Touch pad membrane switch (chair & delivery head mounted)
- 3801-761** Touch pad circuit board
- 3801-823** Rear assistants arm membrane switch
- 3801-762** Chair mounted touch pad wire harness
- 3625-574** Foot control option
- 3801-763** Foot control circuit board
- 3801-764** Foot control cord
- 3625-562** Handpiece safety switch option

### Electrical

- 3801-765** Master circuit board (115 VAC)
- 3801-788** Master circuit board (220 VAC)
- 3801-766** Fuses (115 VAC)
- 3801-767** Fuses (220 VAC)
- 3801-779** Main wiring
- 3801-769** Power cord (115 VAC)
- 3801-770** Power cord (220 VAC)
- 3801-409** Pump motor capacitor (115 VAC)
- 3801-410** Pump motor capacitor (220 VAC)
- 3801-424** Valve solenoid (115 VAC)
- 3801-425** Valve solenoid (220 VAC)
- 3801-435** Base potentiometer
- 3801-431** Limit switch (base & safety)
- 3801-444** Back limit switch
- 3801-819** Back potentiometer

### Mechanical

- 3801-445** Spring
- 3801-680** Air glide caster
- 3801-791** Air glide regulator
- 3801-792** Air glide toggle switch
- 3801-773** Potentiometer actuator

### Hydraulic

- 3801-774** Pump (115 VAC)
- 3801-775** Pump (220 VAC)
- 3801-821** Valve (115 VAC)
- 3801-822** Valve (220 VAC)
- 3801-778** Fluid reservoir
- 3801-429** Base cylinder
- 3801-450** Back cylinder
- 3801-780** Hose (pump to valve)
- 3801-784** Hose (base cylinder)
- 3801-416** Hose (back cylinder)
- 3801-418** Base and back cylinder vent tubing
- 3801-417** Pump and reservoir tubing
- 3801-549** Hydraulic Oil (1 pt.)

## DentalEZ Group

## DentalEZ Equipment Division

### Silhouette® Chair

The DentalEZ Group and its employees are proud of the products we provide to the dental community. We stand behind these products with a warranty against defects in material and workmanship as provided below.

In the event that you experience difficulty with the application or operation of any of our products, please contact our Technical Service Department at our expense at 1-866-DTE-INFO (1-866-383-4636).

If we cannot resolve the issue by telephone, we will arrange for a representative to contact you or suggest that the product be repaired by a dealer service technician.

If product repair or return is required, we will provide you with a **Return Authorization** number and shipping instructions to return the product to the proper facility. If the product is under warranty, we will ask you to provide proof of purchase, such as a copy of your invoice. Please make sure the **Return Authorization** number on the package you are returning. **Products returned without a Return Authorization number cannot be repaired.**

Freight costs for product returns are the responsibility of the customer. Products under warranty will be repaired or replaced at our sole discretion and returned at our expense. Products outside the warranty limits will be repaired and returned with costs invoiced to the customer. We are not responsible for shipping damages. We will, however, help you file a claim with the freight carrier. Written repair estimates are available.

DentalEZ warrants the Silhouette Chair to be free from defects in material and workmanship, under normal usage, under the following terms.

The following items are covered under this warranty for a period of three (3) years from the date of installation:\*

- Structures: Base Plate, Castings, Chair Seat and Back
- Hydraulic System: Cylinders, Solenoid Valves and Pump
- Electronics: Master Circuit Board and Foot Control Circuit Board, Chair Control

The upholstery package is covered under this warranty for a period of one (1) year from the date of installation.\*

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Please note the following additional terms of our warranty and return policy:

- Warranties cover manufacturing defects only and do not cover defects resulting from abuse, improper handling, cleaning, care or maintenance, normal wear and tear or non-observance of operating, maintenance or installation instructions. **Failure to use authorized parts or an authorized repair facility voids this warranty.**
- **Liability is limited to repair or replacement of the defective product at our sole discretion. All other liabilities, in particular liability for damages, including, without limitation, consequential or incidental damages are excluded.**
- THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NO EMPLOYEE, REPRESENTATIVE OR DEALER IS AUTHORIZED TO CHANGE THIS WARRANTY IN ANY WAY OR TO GRANT ANY OTHER WARRANTY.

**WARRANTY REPAIRS:** Parts repaired or replaced on a product that is in warranty will be warranted for the duration of that product's original warranty.

**NON-WARRANTY REPAIRS:** The warranty on parts either repaired or replaced on an out-of-warranty product will cover the repaired part only and will be for the time frame of a new parts warranty period.

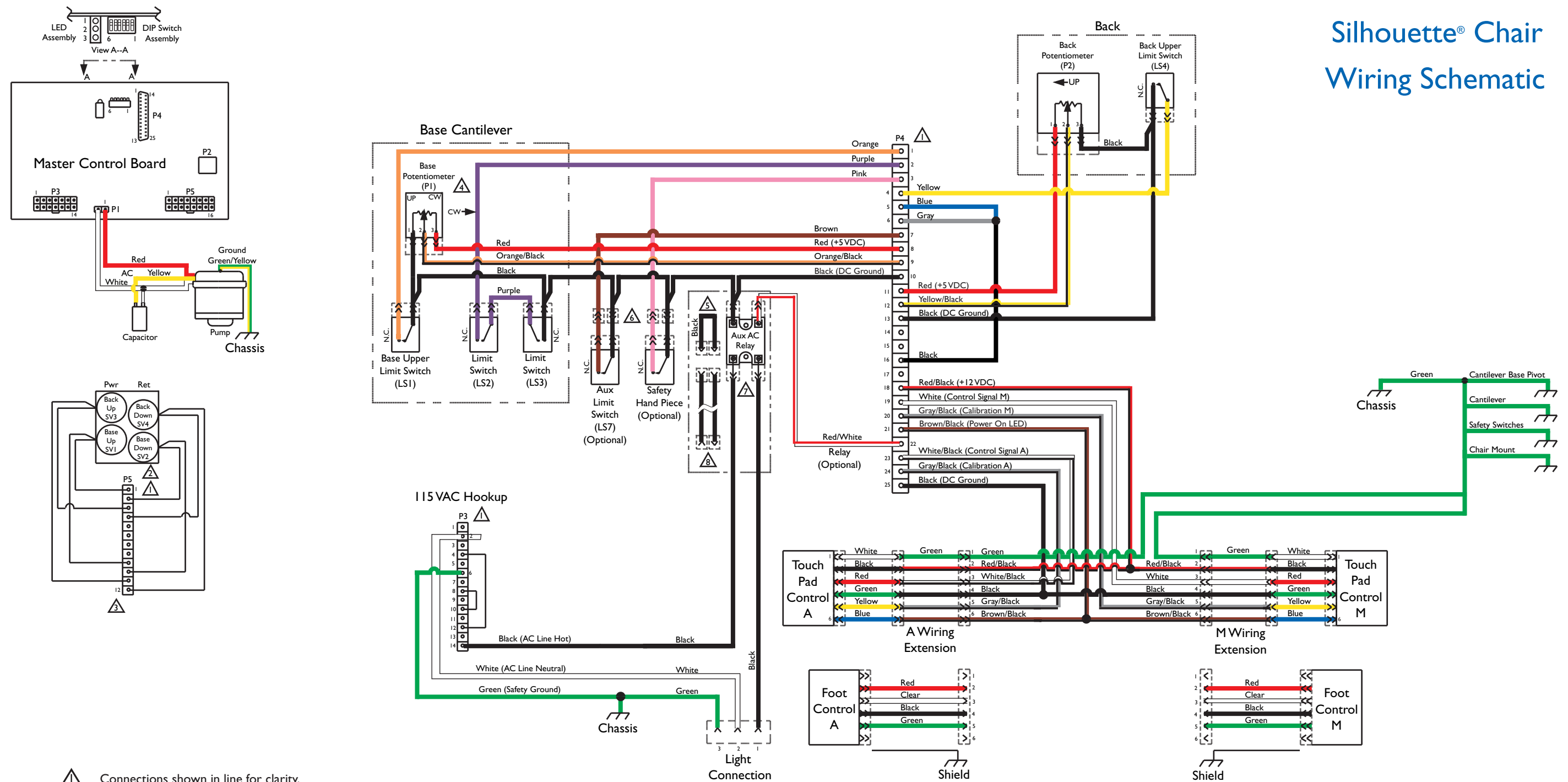
**PRODUCT RETURN:** Opened products or product returns more than a year old cannot be returned for credit. There will be a 15% (\$25.00 minimum) restocking charge on all items authorized for return.

*\* Provided conditions defined in the Installation, Operation and Care Manual are met.*

DentalEZ and Silhouette are registered trademarks and Lumina is a trademark of DentalEZ, Inc.  
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## Silhouette® Chair Wiring Schematic



- ⚠ Connections shown in line for clarity.
- ⚠ All wires are black.
- ⚠ Pins 9 through 12 are neutral.
- ⚠ As functions move up, all potentiometer pin #2 voltages increase.
- ⚠ When a relay is not used, a shielded jumper wire is placed in line on the light connection.
- ⚠ When optional switches are not installed, connectors are plugged into each other.
- ⚠ 120 & 220VAC relays connect to the chair light connection.
- ⚠ 24VAC relay connects to the CMU main wire harness through a jumper wire which controls the light common.



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