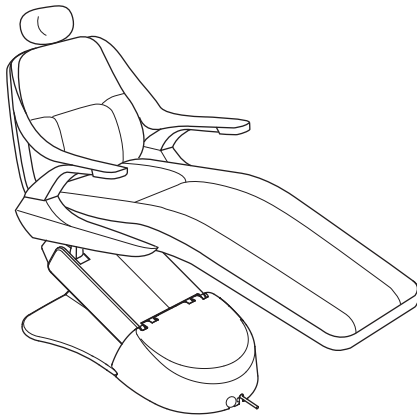


*X-CALIBUR* Series

# BEL-20+ CHAIR

(Plus)



## Installation Instructions

### IMPORTANT

This manual provides installation instructions for the BEL-20+ Chair.  
The instructions contained in this booklet should be thoroughly read and understood  
before installation of the chair.  
After the installation has been completed, keep this manual in a safe place.

 **Belmont**<sup>®</sup>

1E0079A0

## Table of Contents

1. Overview and major components -----	1
2. Dimensions and Specifications -----	2
3. Introduction -----	3
4. Installation -----	3
5. Diagrams -----	8


### Intended Use of the Product

This product is intended for the exclusive use for diagnoses, treatments and relative procedures of dentistry, and must be operated or handled by the qualified dentists or by dental staffs under the supervision of the dentist. Such dentists or dental staffs should instruct and/or assist the patients to approach to and leave from the product. Patients should not be allowed to operate or handle the product unless he/she is so instructed.

### Environmental Requirements

Operating	Ambient Temperature	41°F ~ 104°F (5°C ~ 40°C)
	Humidity	30% ~ 75%
	Atmospherical Pressure	8.7psi ~ 15.4psi (600hpa ~ 1060hpa)
Storage	Ambient Temperature	14°F ~ 122°F (-10°C ~ 50°C)
	Humidity	10% ~ 80%
	Atmospherical Pressure	8.7psi ~ 15.4psi (600hpa ~ 1060hpa)

### Classification

- Protection against electric shock : Class I Equipment, Type B Applied Parts  (Headrest, Backrest and Seat cushions)
- Protection against water ingress : Chair (IPX0), Foot control (IPX1)
- Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
- Mode of operation : Non-continuous operation. ON time :3min. OFF time : 15 min

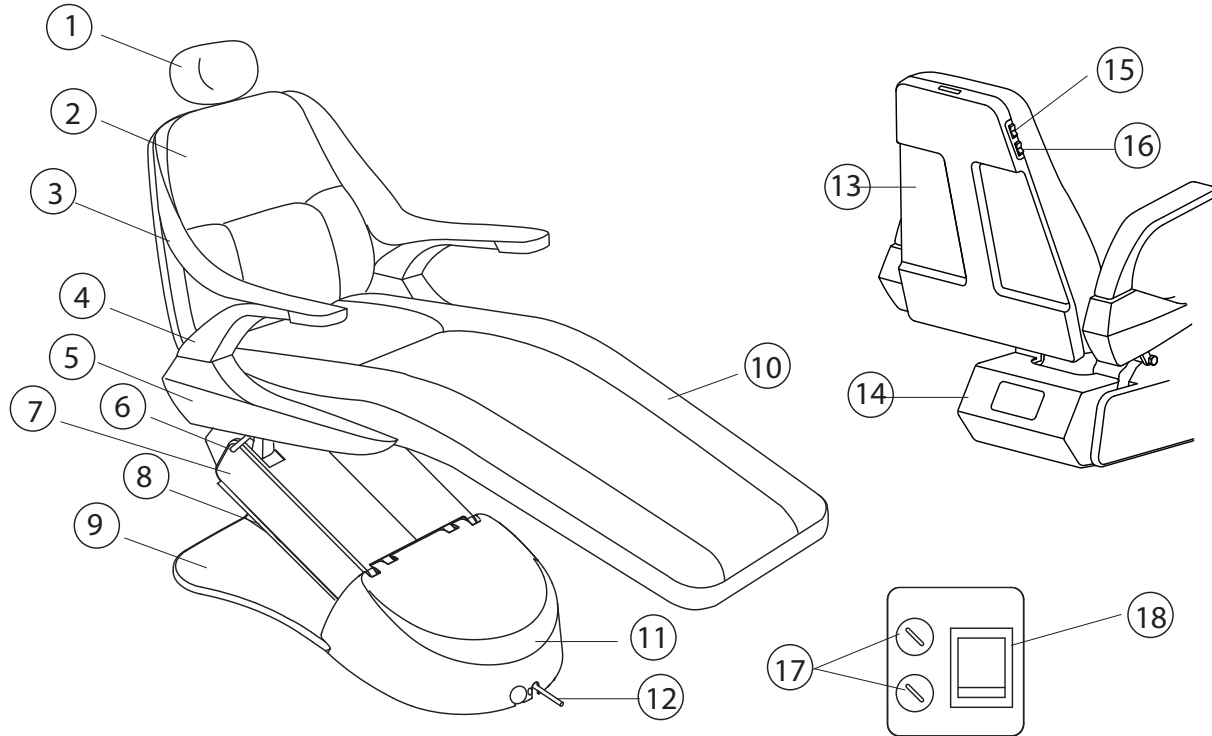
### CAUTION

This product may be affected by sources that generate excessive electromagnetic waves.  
Do not install this equipment close to such devices such as elevators or communication equipment, including cellular telephones.

Do not position this equipment so that it is difficult to access the main power supply outlet that the power plug of this chair is connected to.

# 1. OVERVIEW, MAJOR COMPONENTS AND SYMBOLS

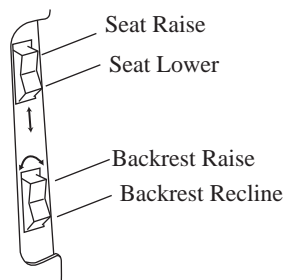
## 1-1. Overview and major components



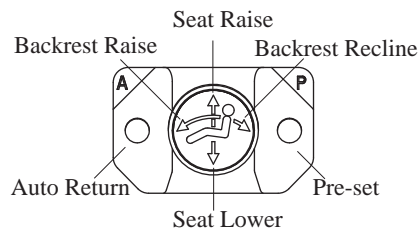
- 1. Headrest Assembly
- 2. Backrest Cushion
- 3. Sling
- 4. Armrest
- 5. Side Frame
- 6. Rotation lock lever
- 7. Main Link Cover

- 8. Safety Plate
- 9. Base Cover
- 10. Seat Cushion
- 11. Pump Cover
- 12. Power Supply Cable
- 13. Backrest Cover
- 14. Rear Flange Cover

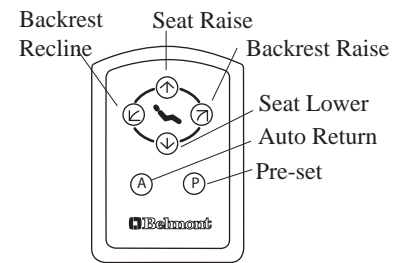
- 15. Seat height control  
(Seat Raise/lower)
- 16. Backrest control  
(Backrest Raise/recline)
- 17. Fuse holder
- 18. Main Power Switch



Seat height and Backrest Control on backrest



Foot Control



Touchpad (Optional)

## 1-2. Symbols



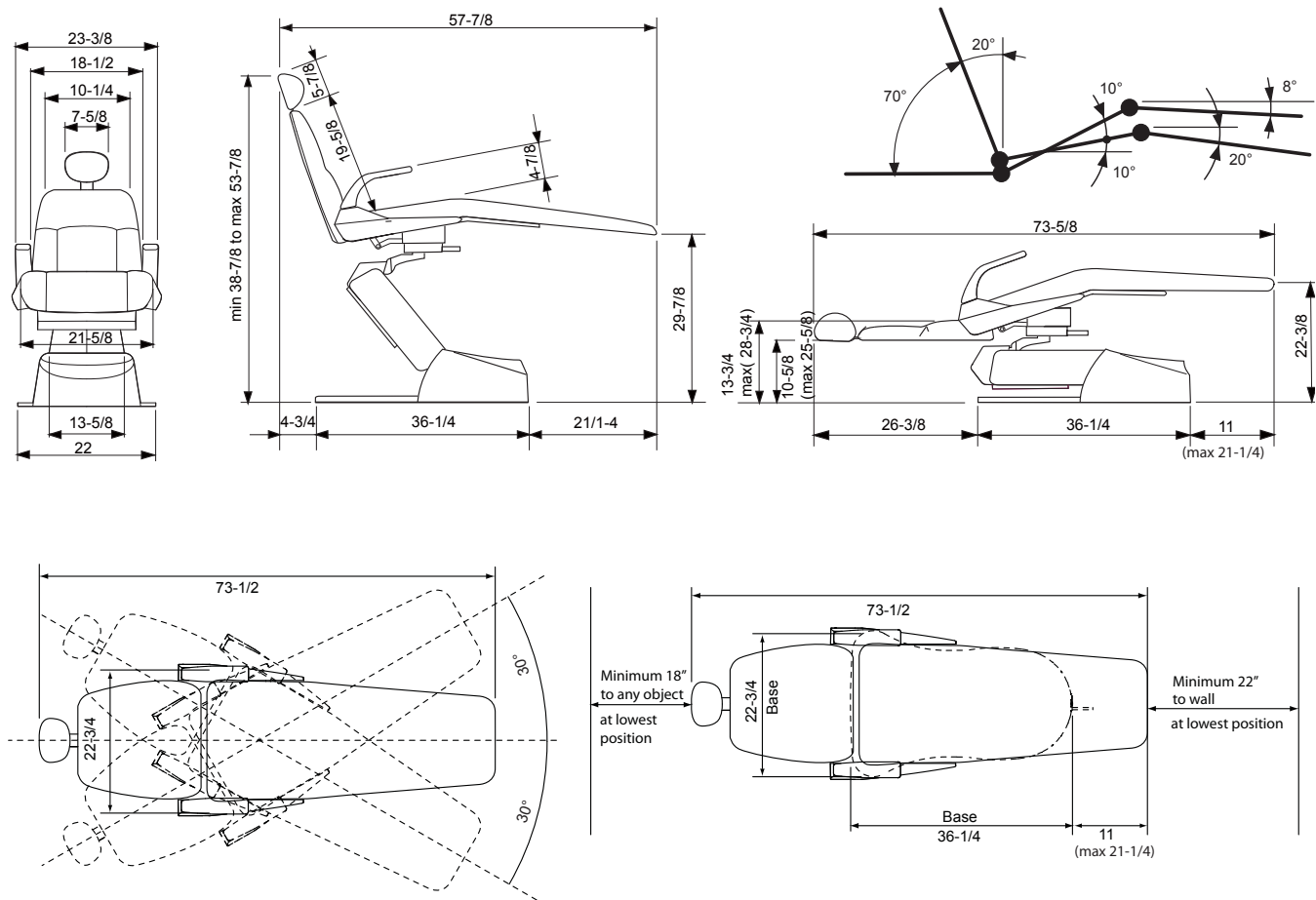
Applied part complying with the specified requirements of IEC60601-1:2005 to provide protection against electrical shock, particularly regarding allowable patient leakage current and patient auxiliary current.



Caution, warning or note

## 2. Dimensions and Specifications

### 2-1 Dimensions (Inches)



### 2-2 Specifications

Seat Initial Height	-----	13-3/4" (350 mm)
Head rest bar Initial height	-----	10-5/8" (270 mm)
Seat Lifting Stroke	-----	15" (380mm)
Backrest Movement	-----	0 to 70° (above horizontal)
Tilting Mechanism	-----	Backrest Synchronized Tilting (10 to 20°)
Seat Rotation	-----	30° Left / 30° Right of the center line
Auto Movements	-----	1 pre-set and auto return
Electrical Requirement	-----	AC120V/60Hz, 3.7A
Fuse for power supply	-----	10A/125V (Current rating : 750A at 250VAC) Fast-blow
Fuse for relays	-----	0.5A/125V (Current rating : 35A at 250VAC) Fast-blow
Mode of Control	-----	Foot switch and backrest control
Maximum Patient Load	-----	300 lbs (135 kg)
Weight	-----	333 lbs (150 kg)

### 3. Introduction

#### 3-1 Precautions for Installation

- Keep the equipment away from water.
- Keep in a circumstances safe from influence by temperature, humidity, wind, sun light, air containig salts and minerals.
- Care about stability such as inclination, vibration and impact, including handling and transportation.
- Do not keep the equipment in a place where chemicals are or where gas is emitted.
- The floor construction required to safely support the chair and delivery system is 105 lbs./ft2 ( 500kg/m2 ) at minimum.
- During lifting and unpacking of the chair, make sure to hold only the designated parts.
- Do not drop or hit the chair.
- After the chair is unloaded from the pallet and placed at the desired location, please make sure to remove the shipping bolt with the red tag. Damage to chair may occur if shipping bolt is not removed prior to chair operation.
- Do not connect to power supply other than AC120V 60HZ.
- Ground chair properly prior to turning power on.
- Chair base must be anchored to the floor for maximum stability.
- Refer to the installation manual of the chair and dental unit (if it is to be used) prior to, and during installation.
- When the installation process has been completed, verify that all the mechanical and electrical functions are working properly and that there is no evidence of oil leakage.
- Protective footwear and thick gloves are highly recommended at unpacking.
- Do not modify this equipment.
- In the case separation from any electrical poles is necessary, pull of the power plug from the power supply outlet.

#### 3-2 Required Tools

The following tools are necessary for installation of the chair.

Phillips screw driver #2

Allen key wrenches, metric size

### 4. Installation

#### 4-1-1 Unpacking the chair base

- 1) Place chair carton close to installation location. Remove all the staples fixing the carton to pallet, or cut the carton just above the stapled line, and remove the carton. (See Fig 4-1-1)

#### CAUTION

Do not connect in the power supply line before removing the red tagged shipping bolt.

- 2) Using a 10mm socket, loosen and remove two packing screws holding the chair base into pallet. (See Fig 4-1-2)

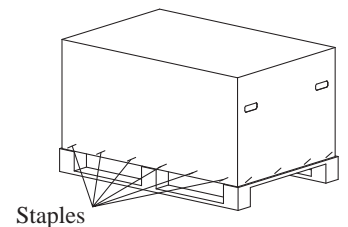


Fig 4-1-1

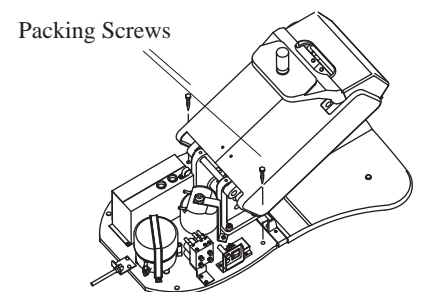


Fig 4-1-2

- 3) Lift chair base from pallet into the installation location. Be sure to lift chair under the side frame. (See Fig 4-1-3)

**⚠ CAUTION**

Do not lift chair by toeboard bar

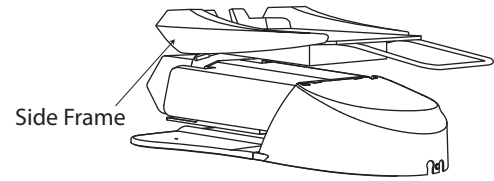


Fig 4-1-3

- 4) Place the chair on a horizontal floor. Remove the red tagged shipping bolt from the seat structure using a 13mm socket (See Fig 4-1-4)

**⚠ CAUTION**

Do not lift the chair by the upper structure after removal of the red tagged shipping bolt.

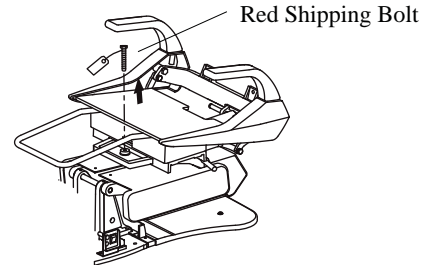


Fig 4-1-4

**4-1-2 Unpacking the other parts of chair base**

Remove the following items from chair packaging

- 1 x Backrest Assembly (Backrest plate, cover)
- 1 x Double axis articulating headrest mechanism
- 2 x Armrest
- 1 x Seat plate
- 1 x Base cover
- 1 x Pump cover
- 1 x Pump cover (rear)
- 1 x Sets of MISC items (see the right)

**MISC Items**

- 2 x Flat Washer M6 x 22mm
- 2 x Arm screw set
- 2 x Spring
- 1 x Cable tie
- 4 x Pan head screw M6 x 15mm
- 2 x Round head screw M5 x 10mm
- 2 x Round head wood screw M4 x 10mm
- 2 x Round head screw M3 x 10mm
- 5 x Flat head screw M5 x 10mm
- 5 x Plastic washers and caps
- 2 x Round head screw M5 x 10
- 4 x Socket head screw M10 x 30
- 4 x Spring Washer
- 1 x Allen key wrench

**4-1-3 Unpacking the upholsteries**

Remove following items from chair packaging

- Seat cushion
- Backrest cushion
- Headrest cushion

## 4-2 Installation

1) Remove the following items from chair packaging

- Backrest Frame Assembly
- Metal Seat
- Plastic Base Cover
- Small carton box containing Armrests, headrest mechanism and bag of hardware.

2) Plug chair into 120VAC outlet.

### CAUTION

To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth. Grounding reliability can only be achieved when the equipment is connected to an equivalent receptacle marked HOSPITAL ONLY or HOSPITAL GRADE.

3) Turn on the main power switch located on the left side of the pump cover. A green lamp will illuminate.

### CAUTION

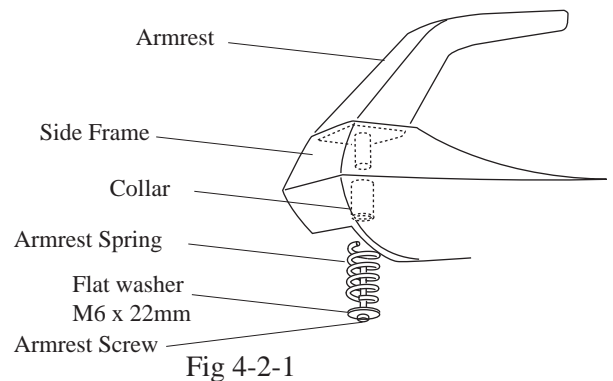
Operate the Main Power Switch by hand only. Turn off the main switch after daily operation.

### NOTE

Do not touch a switch on the foot control during the main power switch is being turned on.

4) Raise the seat by foot switch.

5) Attach the armrest to side frame as shown in Fig 4-2-1.  
It is recommended to lightly lubricate armrest shaft with silicone lube).



6) Attach the seat plate to base plate, using 4 screws.  
See Fig. 4-2-2.

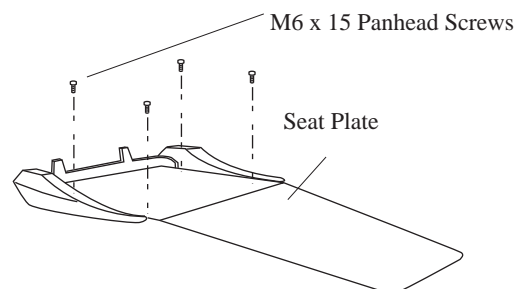


Fig 4-2-2

- 7) Remove 4 screws securing backrest cover to backrest frame. Attach backrest frame using 4 large screws. Connect backrest quick connect plug to chair. Tie up any excess wire. See Fig 4-2-3

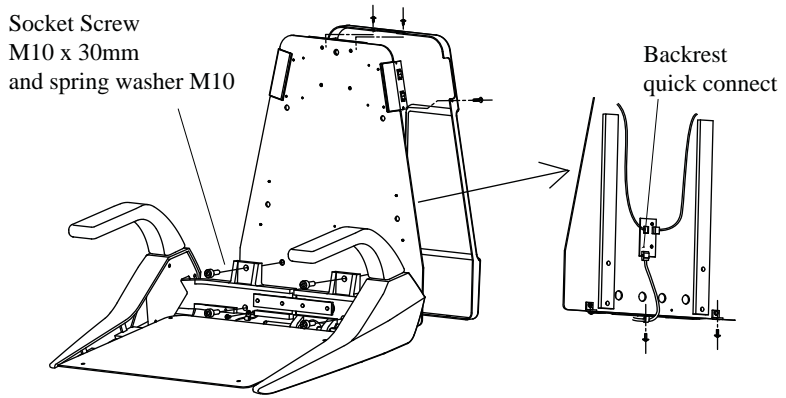


Fig 4-2-3

- 8) Snap on backrest and seat cushion with snaps provided. Velcro is also used to keep upholstery secure to chair. Reattach backrest cover to backrest frame using 6 screws. See Fig 4-2-4.

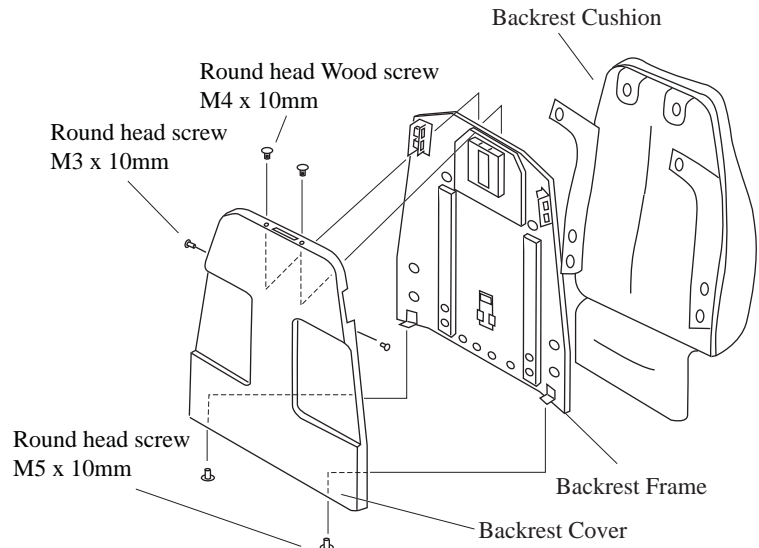


Fig 4-2-4

- 9) Attach headrest cushion to headrest mechanism and slide headrest bar into opening in top of backrest. See Fig 4-2-5.

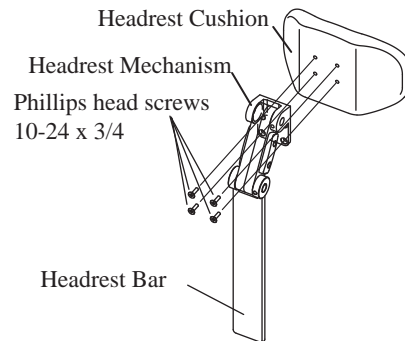


Fig 4-2-5

- 10) Locate the red warning tag which is attached by a string to the rubber air vent plug in the pump reservoir. See Fig 4-2-6.

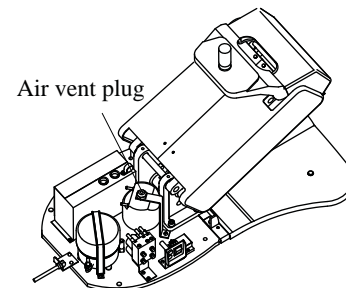


Fig 4-2-6



11) Attach plastic base cover and pump covers to the base plate. Also, securely hold the chair to the floor with anchor bolts or large wood screws.

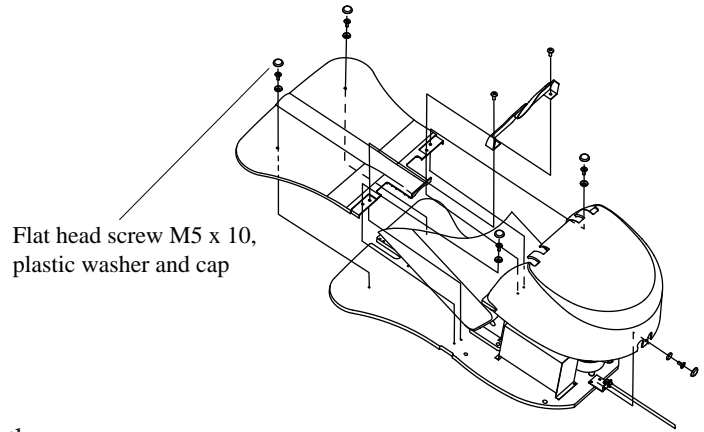


Fig 4-2-7

12) After the installation has been completed, check all the chair functions as per operation manual.

### 4-3 Adjustment

#### 4-3-1 Speed control

Seat and backrest motion speeds are preset at the factory, but can be changed if desired.

**Increasing speed** - Using a slotted screwdriver or wrench, turn seat or backrest adjustment screw counterclockwise.

**Decreasing speed** - Using a slotted screwdriver or wrench, turn seat or backrest adjustment screw clockwise.

See Fig. 4-3-1

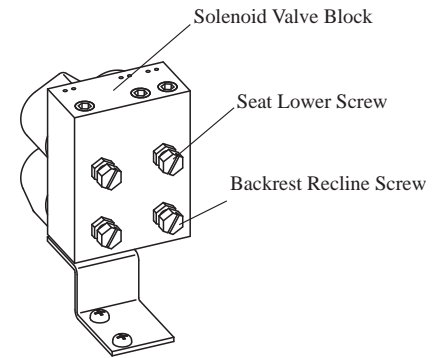


Fig 4-3-1

#### ⚠ NOTE

Adjustment of the other screws (for seat raising and backrest raise) is not recommended.

#### 4-3-2 Limit position setting

1) Raise the seat half way up. Turn off the power. Remove the pump cover for access to the chair control PCB. Remove the PCB enclosure cover by unscrewing two screws. Turn on power.

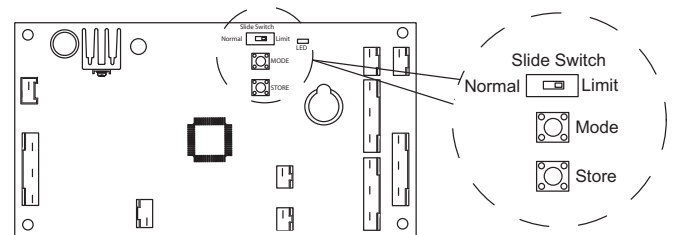


Fig 4-3-2

#### ⚠ CAUTION

To avoid a malfunction when setting lower limit, make sure that there is clearance between the safety plate and the chair base.

If a swing mounted delivery system is attached to the chair, set lower travel limit so delivery system components do not contact chair pump and cantilever lift arm covers.

Using the foot control, backrest controls or optional touchpad, move the seat to the desired position (seat low, seat high, backrest recline and backrest up).

Press and release orange button located on the PCB marked “Store”, then using the foot control, backrest controls or optional touchpad press and release the desired limit you wish to set. Beeper will sound.

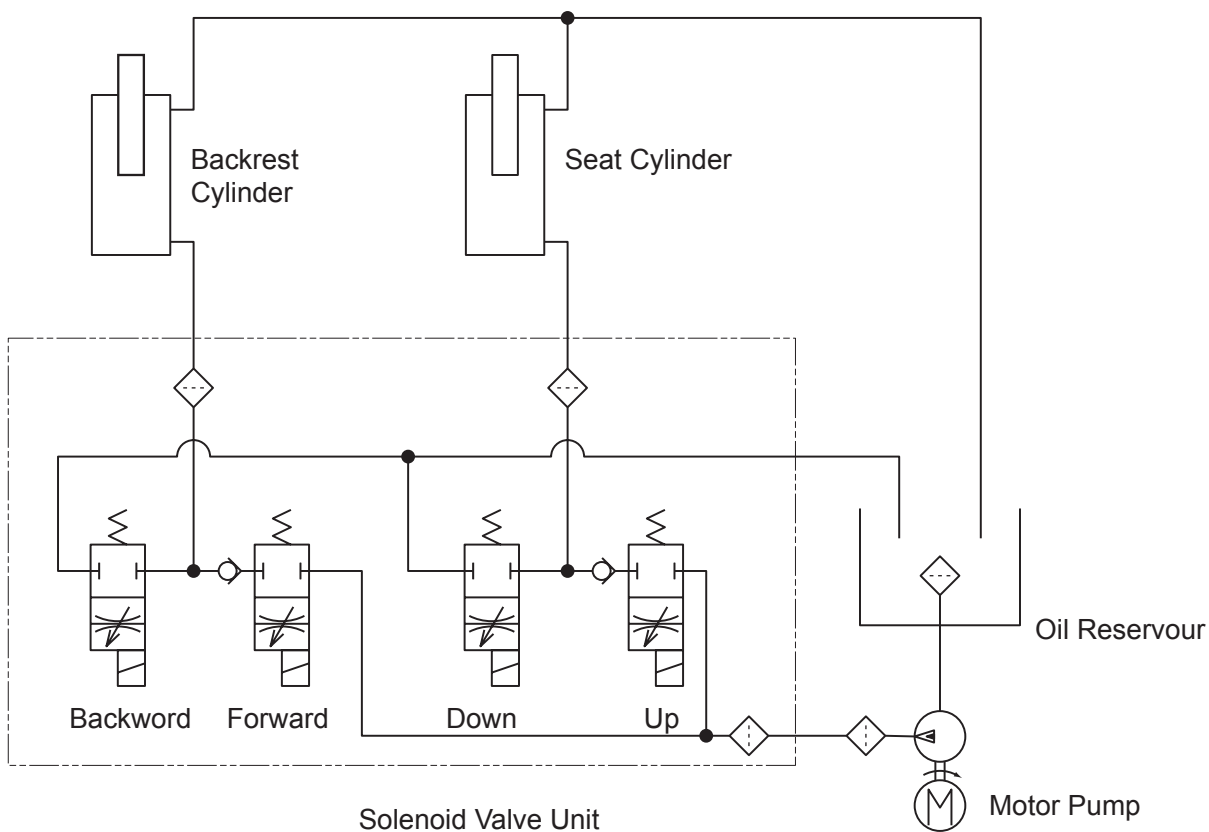
Move slide switch to position marked “Normal” and test stored limit function(s).

Example: Setting the Lower Seat Limit

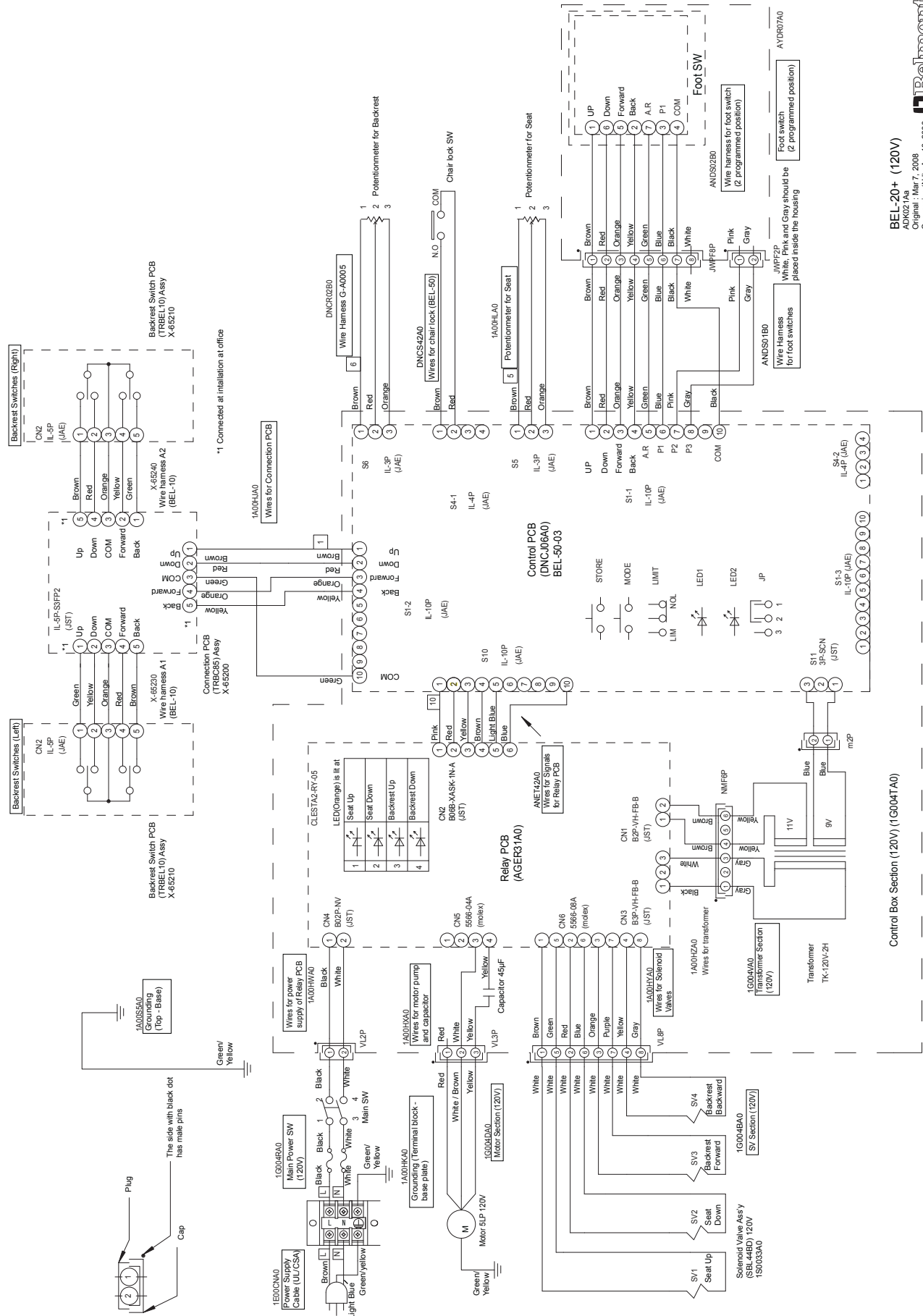
- 1) Slide the Normal-Limit switch to the Limit position
- 2) Move the seat base to the desired lowest position. (See Important box on above)
- 3) Press and release the “Store” button on the PCB
- 4) Press and release the seat base down switch using the foot control, backrest controls or optional touchpad. A beeper will sound.
- 5) Slide the Normal-Limit switch to the “Normal” position.
- 6) Raise the seat base using the foot control, backrest controls or optional touchpad and then lower it to be sure it stops at the desired position.

## 5. Diagrams

### 5-1 Flow diagram



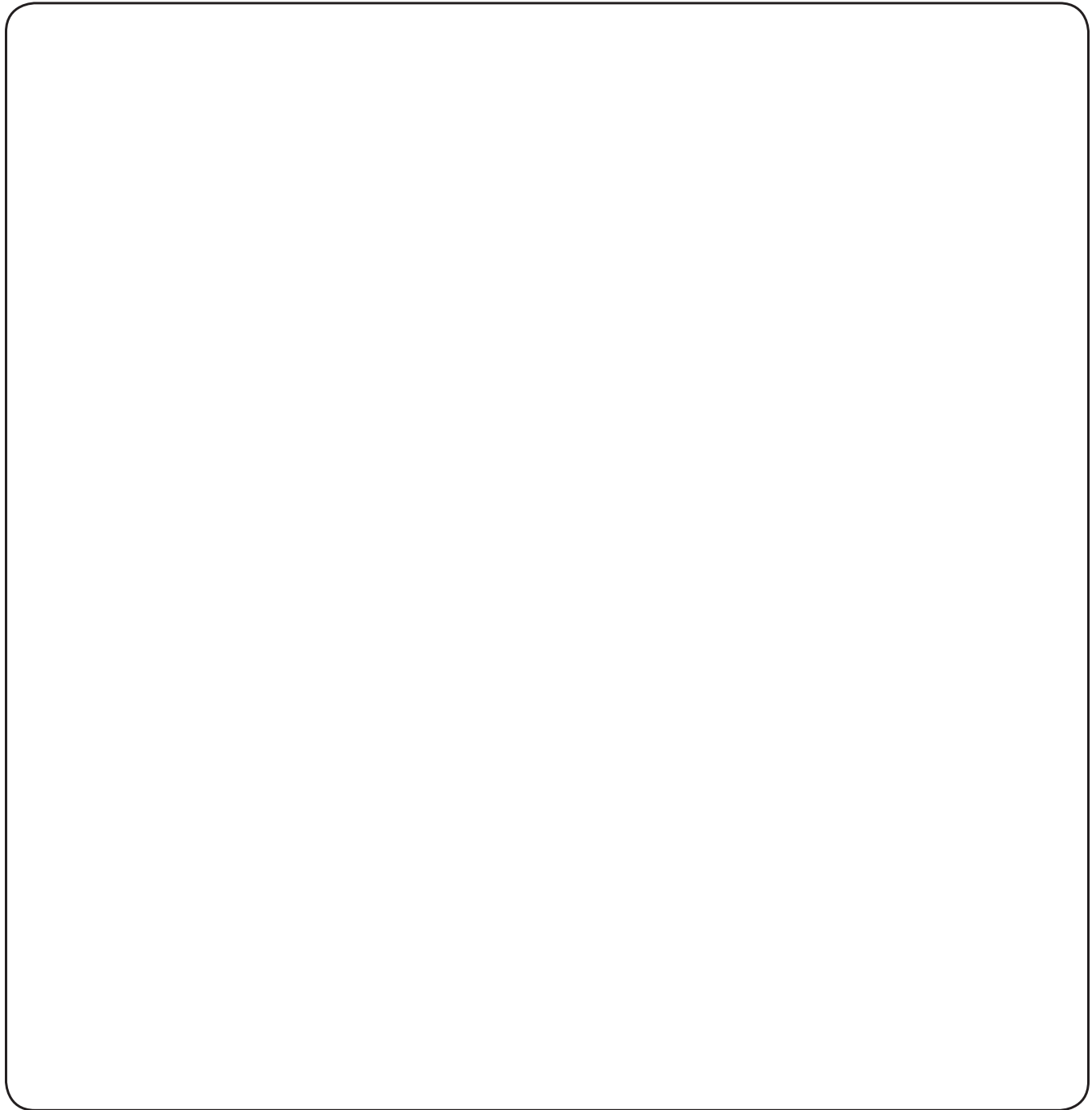
# 5-2 Electric diagram



BEL-20+ (120V)  
 ACK02 Rev  
 Original : Mar 7, 2008  
 Conversion (NJ) : Apr 18, 2008



# NOTE



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