

Replacing the A-dec 500™ Chair PCB Board Installation Guide

About this Install

This install explains how to replace the PCB board on an A-dec 511 dental chair.

You Will Need

- Needle nose pliers

Before You Begin

Turn power OFF to the system.

How to Remove the Old Chair PCB Board

1. Remove the P4 and P11 wires and connectors, see Figure 1.



Figure 1 P4 and P11 locations on the circuit board.

2. Disconnect any 24VAC accessories plugged into J2, see Figure 2.

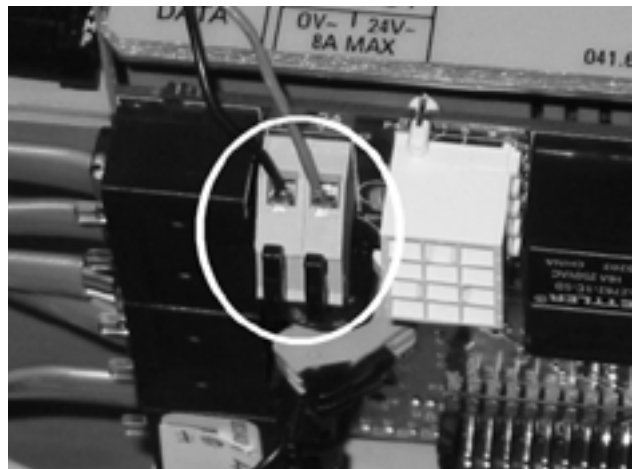


Figure 2 J2 location on the circuit board.

3. Remove connectors P10 (limit switch), P1 (back), and P2 (base potentiometer). Note the position of each connector with a label or mark on the connector, see Figure 3.



Figure 3 P10, P1 and P2 locations.

4. Disconnect the data lines connected from P7, P8, and P9, see Figure 4.



Figure 4 P7, P8, and P9 data line locations.

5. Carefully pull the board off the four standoffs. You may need needle nose pliers to pinch the standoffs, see Figure 5.

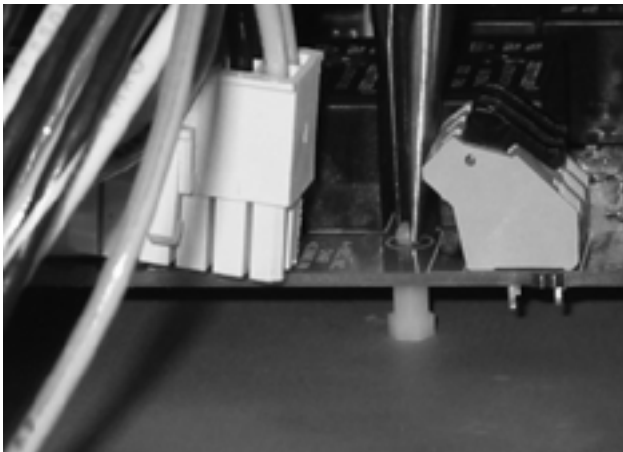


Figure 5 Removing board from cover.

6. Replace any worn or broken standoffs. Standoffs are threaded and twist on and off. If one is broken, just push the plastic piece through the other side. Insert the new standoff, screw it in hand tight, see Figure 6.

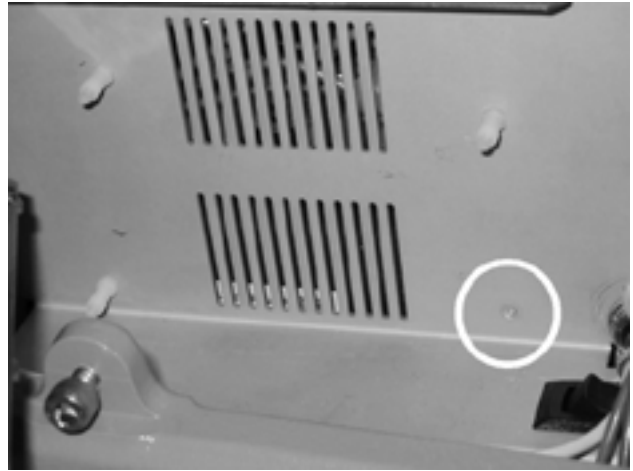


Figure 6 Replacing worn standoffs.

How to Install the New Chair PCB Board

1. Snap the new board onto the standoffs.
2. Reinstall the P4 and P11 connectors, see Figure 1.
3. Reinstall any 24VAC accessories into J2, see Figure 2.
4. Connect the P10, P1, and P2 connectors into their noted positions, see Figure 3. If these connectors are not plugged in correctly, the chair will not function properly.
5. Connect the P7, P8, and P9 data lines, see Figure 4.

How to Test the New Chair PCB Board

1. Turn power ON.
2. Verify that the AC power, Status, and Data LEDs are lit.
3. Verify that P1 and P2 are connected properly. Move the chair up and down. Watch the back position sensor and base position sensor LEDs on the chair circuit board. Both LEDs should stay on while the chair is moving. If the LEDs turn off or the chair stops reverse the position of the P1 and P2 data lines.

NOTE: Always run the factory default routine when replacing position sensor or circuit board assemblies.

4. Run factory default routine by moving the jumper to the Factory Default position. If there is a problem at any time, the program will stop and you will hear one beep. See *LED Diagnostic Chart* for troubleshooting information.
5. When program completes successfully, you will hear three beeps. After hearing the beeps, move the jumper back to the spare position.
6. Verify all manual chair functions and dental light functions.
7. Notify the doctor and staff that all functions are reset to the factory default settings. Any programming changes will have to be made again. These include programming changes made to the chair preset positions, and the Auto On dental light function.

LED Diagnostic Chart

Use the following chart to troubleshoot the chair PCB board.










After troubleshooting go to *How to Test the New Chair PCB Board*.

LED	Indication	Diagnosis
AC power LED, DS1	OFF = No 24VAC power	Tripped circuit breaker Power supply turned off No line voltage Terminal strip may be clamped on insulation instead of metal wires.
	Green steady = 24VAC at terminal strip	
Status LED, DS2	OFF = System is not functioning	No power to device Defective touchpad board
	Blue steady = Normal condition (ready for action)	
	Blue double blink = Jumper is in factory default position on the chair circuit board	
	Blue slow blink = Chair, cuspidor, or lower support arm limit switch is activated	
Data LED, DS3	OFF = No DATA bus communication	Not connected to the DATA bus 4-wire line used instead of the required 6-wire line Defective data line
	Green steady = Detects active DATA bus	
	Green blinking = Valid DATA bus message	
Limit switch, DS4 (chair or lower support arm)	OFF = Closed (normal)	Limit switch activated Broken wire Bad connection
	Red = Open (active)	
Back position sensor DS5, Base position sensor DS6	OFF = Position sensor is not connected	Bad connection Moving in wrong direction Limited range of motion Cable not on the wheel
	Yellow steady = Normal operation	
	Yellow fast blink = Upper end of travel	
Dental light relays DS7, DS8	<u>DS8 DS7 Function</u>	
	OFF OFF off	
	ON OFF high intensity	
	OFF ON composite intensity	
Base and back relays DS9, DS10, DS11, and DS12	OFF = Relay is off	
	Yellow = Relay is on	
Chair lockout DS13	OFF = Open (normal) Red = Closed (activated)	When a control head PCB is connected to the chair PCB, depressing the foot control sends a lockout command to the chair
Vacuum relay DS14	OFF = Vacuum relay is off Yellow = Vacuum relay is on	

Before Leaving

Instruct the dental team on the operation and maintenance of the equipment.

Agency Information

Identification of Symbols			
	Recognized by Underwriters Laboratories Inc.® with respect to electric shock, fire and mechanical hazards only in accordance with UL 2601-1. Recognized with respect to electric shock, fire, mechanical and other specified hazards only in accordance with CAN/CSA C22.2, No. 601.1		Conforms to European Directives (refer to Declaration Statement)
			Protective earth (ground)
	UL listed to US (UL 544) and Canadian (CAN/CSA C22.2, No. 125) safety standards		Functional earth (ground)
			Attention, consult accompanying documents
	Classified by Underwriters Laboratories Inc. with respect to electric shock, fire and mechanical hazards only in accordance with UL 2601-1. Classified with respect to electric shock, fire, mechanical and other specified hazards only in accordance with CAN/CSA C22.2, No. 601.1		Type B applied part
			Class II equipment

Classification of Equipment (EN 60601-1)

Types of shock protection:

- Class I Equipment
(Dental Chairs, Dental Lights, & Power Supplies)
- Class II Equipment
(Chair, Wall, & Cart-Mounted Delivery Systems)

Degree of shock protection:

- Type B Applied Part
(Delivery Systems Only)

Degree of protection against water ingress:

- Ordinary Equipment
(All products)

Mode of operation:

- Continuous Operation
(All models except Dental Chairs)
- Continuous Operation with Intermittent Loading
(Dental Chairs -5% duty cycle)

Environmental

Storage	Temperature:	-40°C to 70°C (-40°F to 158°F)
	Relative Humidity:	95% maximum
Operating	Temperature:	10°C to 40°C (50°F to 104°F)
	Relative Humidity:	95% maximum

Electromagnetic Compatibility

This equipment has been tested and found to comply with the limits for medical devices in EN60601-1-2. These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. Contact A-dec Customer Service, if you have any questions.

Flammable Gasses

Not suitable for use in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide, where such gasses may accumulate in concentration (closed space).