

A-dec Performer Service Guide



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Overview

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Product Service

Product service is available through your local authorized A-dec dealer. For service information, or to locate an authorized dealer, contact A-dec at 1.800.547.1883 in the USA and Canada or 1.503.538.7478 worldwide, or visit www.a-dec.com.

Regulatory Information

Regulatory information mandated by agency requirements is provided in the *Regulatory Information, Specifications, and Warranty* document (p/n 86.0221.00), which is available in the Document Library at www.a-dec.com.

Product Models and Versions Covered in This Document

A-dec uses product versions to indicate significant changes to a product model. Modifications identified by a change to the product version include, but are not limited to, significant changes to features and options, and product compatibility.

Models	Versions	Description
Performer 8000	B	Assistant's Instrumentation
Performer 8000	B	Chair
Performer 8000	B	Delivery System
Performer 8000	A	Dental Light
Performer 8000	B	Support Center

Customer Service Information

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Other Sources of Information

A-dec Service Documents

Service Reference documents contain illustrated parts breakdown content and are companions to Service Guides, which contain information for product service, maintenance, and troubleshooting including circuit board components and flow diagrams. Related service documents include:

- *A-dec Performer Service Reference* (p/n 86.0610.00)
- *A-dec Dental Lights and Monitor Mounts Service Guide* (p/n 86.0326.00)
- *A-dec Dental Lights and Monitor Mounts Service Reference* (p/n 86.0328.00)

Genuine A-dec Parts Catalog

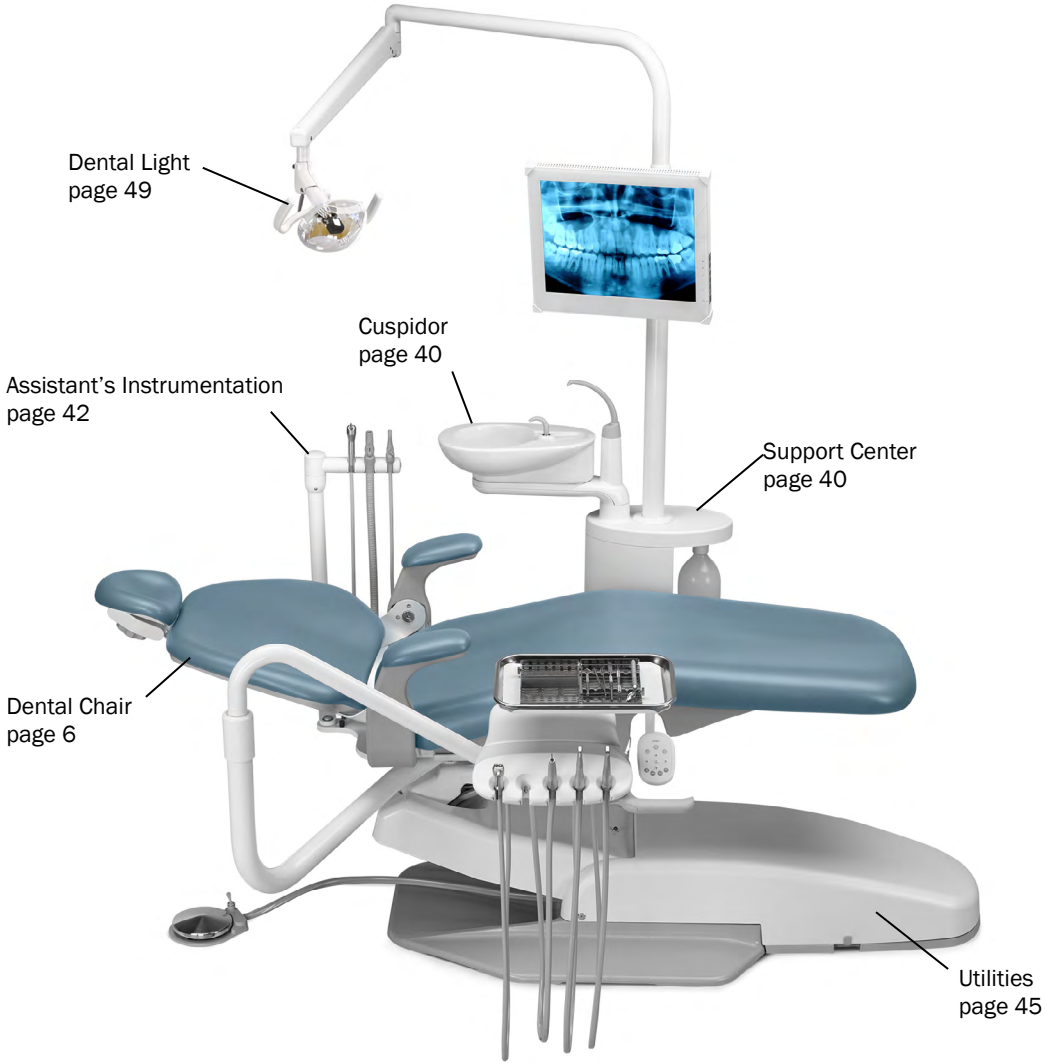
The *Genuine A-dec Service Parts Catalog*, p/n 85.5000.00, provides part number and ordering information for A-dec service parts. This catalog details parts for current products and products which are no longer manufactured but are still supported. Refer to this catalog for additional details on parts found in the service document.

Electronic Documentation

The latest versions of A-dec documents are available as electronic documents on the A-dec website (www.a-dec.com). On the website, select Document Library in the upper-right corner of the page. Check this location for the most current technical information about A-dec products.

A-dec Performer System Map

A-dec Performer's basic system comes configured as shown below:



Dental Chair

This section provides detailed information related to service, maintenance, and adjustment of the A-dec Performer dental chair.

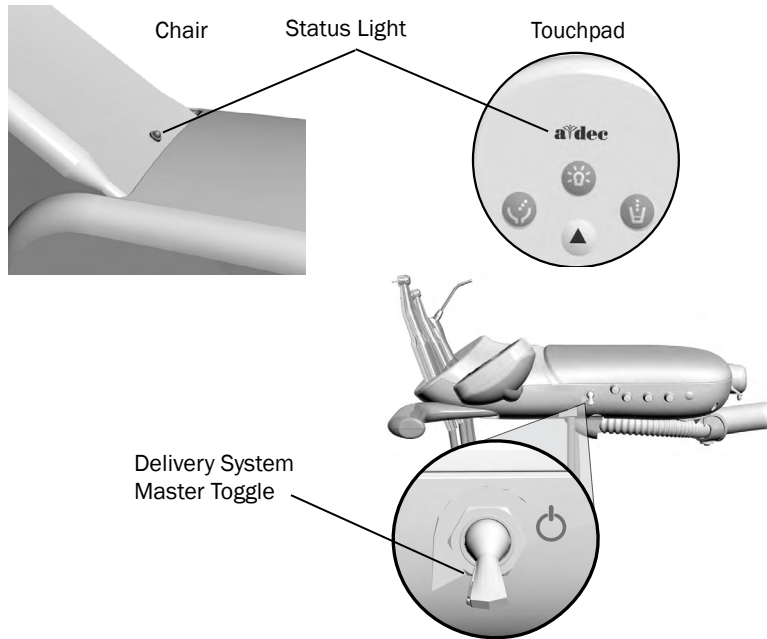
Contents

- Dental Chair Product Overview, page 7.
- Dental Chair Service, Maintenance, and Adjustments, page 9



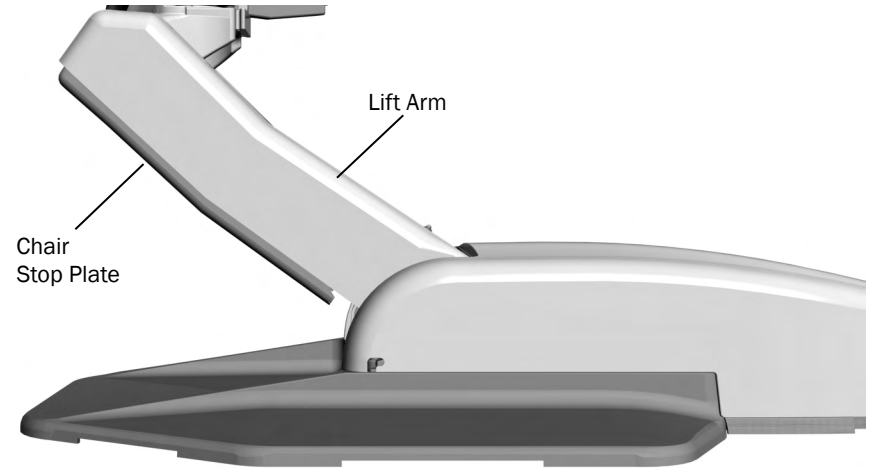
Dental Chair Product Overview

Power and System Status



The chair and system are controlled by the master toggle on the delivery system. The power should always be turned off for service. When the A-dec logo on the touchpad or the status light on the chair lift arm are illuminated, the system is on and ready for use. If the status light blinks, the limit switch has been activated.

Chair Safety Features



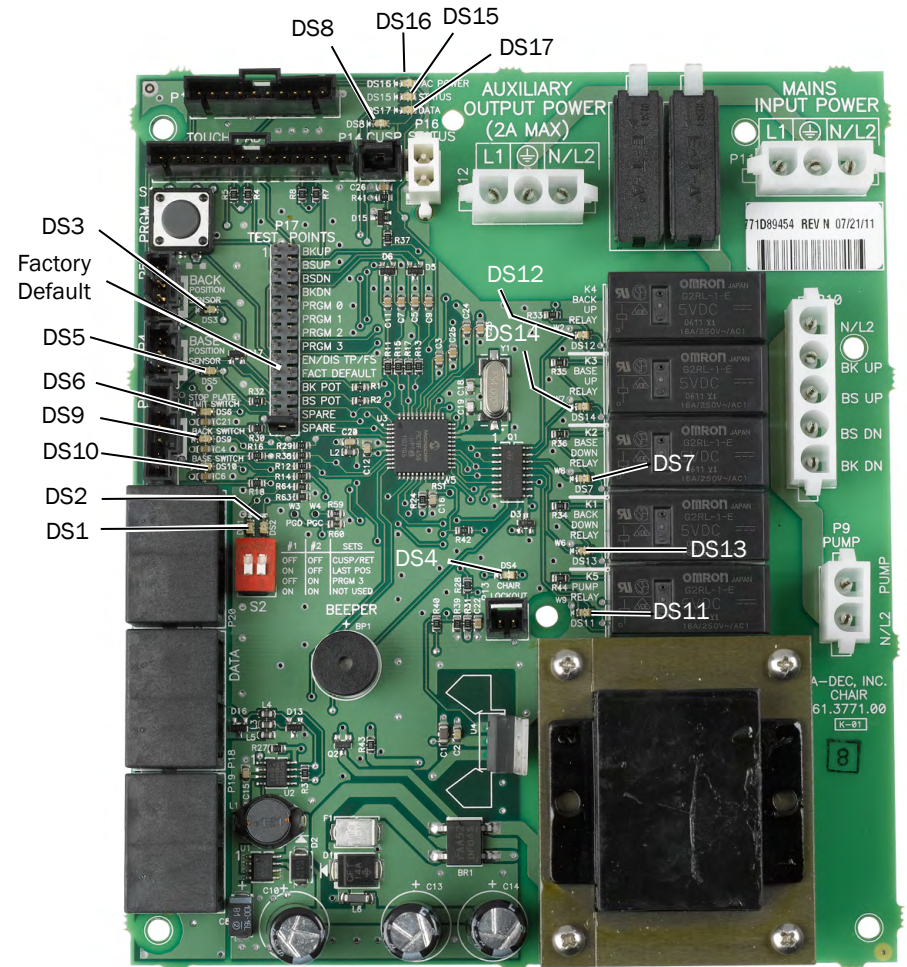
If anything becomes lodged under the chair lift arm or assistant's arm, a limit switch stops the downward motion of the chair. Pressing the chair stop plate activates the limit switches. Use the footswitch or touchpad to raise the chair, then remove the object.

If the deluxe touchpad or optional lockout kit is present, the operation of the dental chair is inhibited when a handpiece is removed from its holder and the foot control pressed. When this happens, the chair status light blinks rapidly. To resume, replace the handpiece and use the footswitch or touchpad to move the chair.

Dental Chair Circuit Board Components

LED Identification

LED	Status	Description
DS16 - AC POWER	Off	No 24 VAC power, tripped circuit breaker, power supply turned off, no line voltage
	Green, steady	24 VAC at the terminal strip
DS15 - STATUS	Off	System is not functioning, no power or circuit board has failed
	Green, steady	Normal operation
DS17 - DATA	Off	No DCS communication, not connected to the DCS, or DCS has failed
	Green, steady	Detects active DCS
	Green, blinking	Valid DCS Message
DS6 STOP PLATE LIMIT SWITCH	Off	Closed, (normal)
	Red	Open, (activated)
DS4 - CHAIR LOCKOUT	Off	Open, (normal)
	Red	Closed, (activated)
DS3 Base and DS5 Back-Position sensors	Off	Position sensor is idle
	Yellow, steady	Position sensor is moving correctly
	Yellow, fast blink	Upper end of travel
DS7, DS13, DS12, DS14 - Chair relay LEDs	Off	Relay is off
	On	Relay is on
DS8 - Cuspidor Limit Switch	Off	Limit switch is off (inactive)
	Yellow, steady	Limit switch is on (active) (Hard wired or via DCS)
DS9 - Back and DS10 Base - Limit switch	Off	Limit switch is off (inactive)
	Yellow, steady	Limit switch is on (active)
DS11 - Pump Motor Relay	Off	Pump motor relay is off (inactive)
	Yellow, steady	Pump motor relay is on (active)
DS1, DS2	UP	A switch in UP is on (active)
	DN	A switch in the DN position is off (inactive)



CAUTION: Circuit boards are sensitive to static electricity. Electrostatic Discharge (ESD) precautions are required when touching a circuit board or making connections to or from the circuit board. Circuit boards should be installed only by an electrician or qualified service person.

Dental Chair Service, Maintenance, and Adjustments

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- Factory Default Routine, page 11
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Upholstery Removal

Back Upholstery

1. Use a Phillips head screwdriver to remove the four screws on the chair back.



2. Remove the back upholstery.

Headrest Upholstery

1. Lift the gliderest bar from the chair back.
2. Use a Phillips head screwdriver to remove three screws on from the headrest.



Arm Cap Covers

1. Use a Phillips head screwdriver to remove two screws from the armrest, and remove the armrest cover.



Seat Upholstery

1. Remove the four screws from under the seat, and lift the seat upholstery from the chair.



Factory Default Routine

When a new circuit board is installed in the chair, factory default routine needs to be run to learn the range of motion of the chair. The routine:

- Sets the base and back upper limits
- Calculates new presets based on actual range of motion of the chair
- Verifies that the potentiometers work

To start the factory default routine, place the spare jumper in the factory default position on the P17 test points of the chair circuit board (see “Dental Chair Circuit Board Components” on page 8 for reference).

When running the factory default routine, the chair:

1. Moves base down
2. Moves base up
3. Moves back down
4. Moves back up
5. Moves base and back to Position 0
6. Successful factory default beeps three times/failed factory default beeps one time.



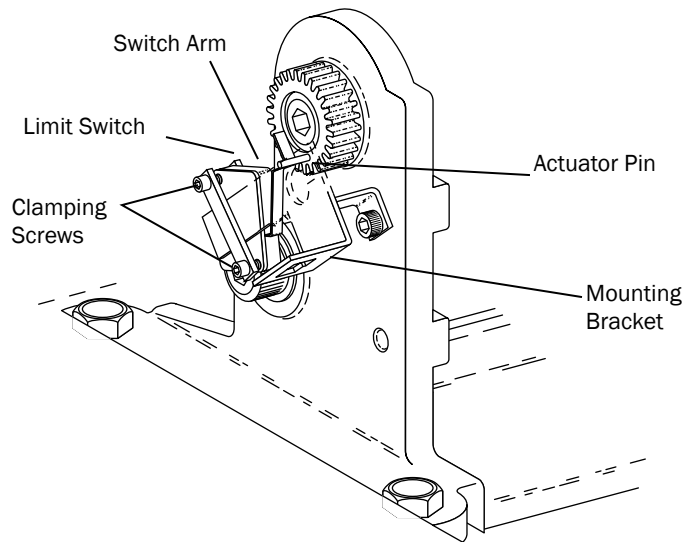
NOTE The jumper must remain in the factory default position to complete the factory default routine. The status LEDs on the touchpad and the chair circuit board double blink while the factory default routine is running and after the routine is complete.

Potentiometers

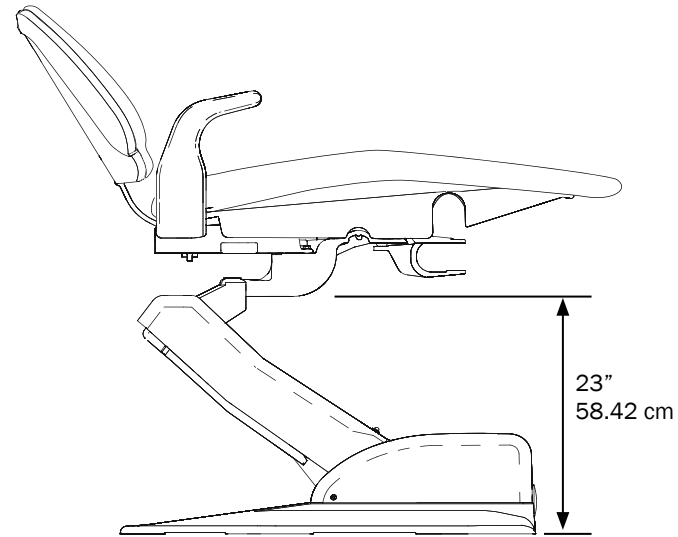
Potentiometers provide the controller with the chair base and back position values. The controller saves the chair values with current position values for the pre-position and auto-return functions.

Base Up Limit Switch Adjustment

1. Remove the motor pump cover.
2. Loosen the two screws clamping the limit switch to the mounting bracket.



3. Position the chair as shown.



4. Push the limit switch against the actuator on the drive gear until the switch opens (clicks), then tighten the clamping screws.
5. Position the chair base down until the limit switch has closed, then position the chair full base up. Check the distance between the top of the base plate to the flat area around the threaded stud the chair adapter mounts to. If the distance is incorrect, repeat steps 2 through 4.

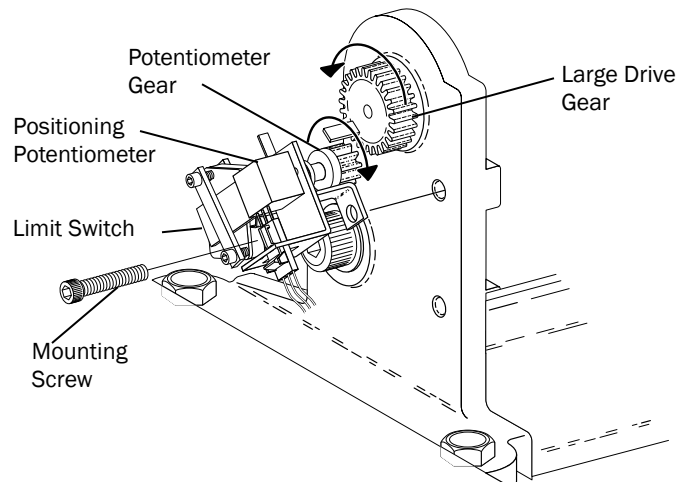
Base Positioning Potentiometer Adjustment

1. Remove the motor pump cover and position the chair base down.
2. Use a 3/16" hex key to remove the limit switch and potentiometer assembly mounting screw.
3. Turn the potentiometer gear counterclockwise until it stops.
4. Align the potentiometer assembly, then turn the potentiometer gear clockwise two teeth.
5. Reinstall the limit switch and potentiometer assembly. Make sure the potentiometer gear does not turn and the two gears mesh properly.
6. Ensure that the electrical connections to the limit switch and positioning potentiometer are property set.
7. While observing the two gears for binding, lower the chair base.



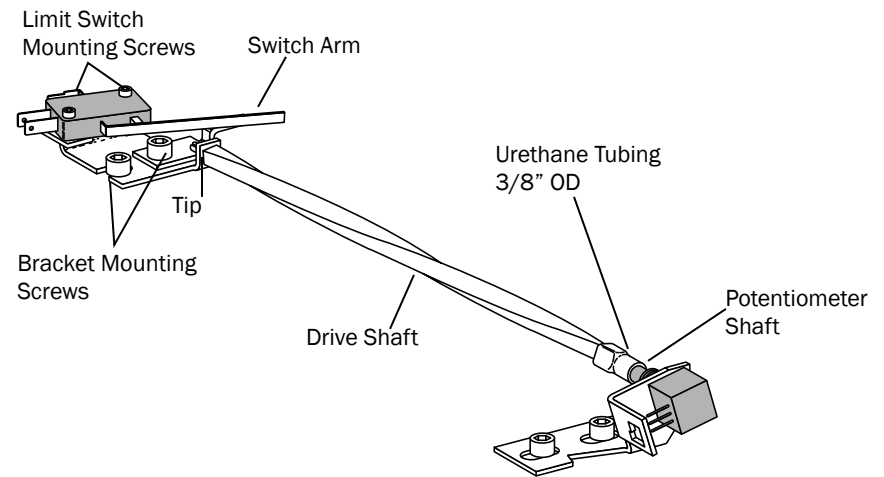
CAUTION Do not raise to the full base up position until after you have checked the base up limit switch for proper adjustment. The chair may go into hydraulic lock if not adjusted properly.

8. Reinstall the cover, and program the auto-positioning functions.

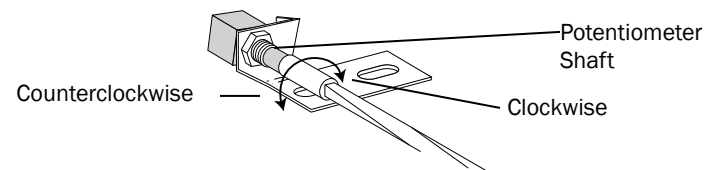


Back Potentiometer Adjustment

1. Position the chair back to its full up position.
2. Disconnect the limit switch wiring harness from the limit switch.
3. Remove the limit switch mounting screws and limit switch from the bracket. Do not bend the switch arm.
4. Remove the bracket mounting screws.
5. Remove the drive shaft from the potentiometer shaft.
6. Remove the drive shaft from the chair by moving it toward the chair backrest, and slightly to the side to dislodge it from the holder.

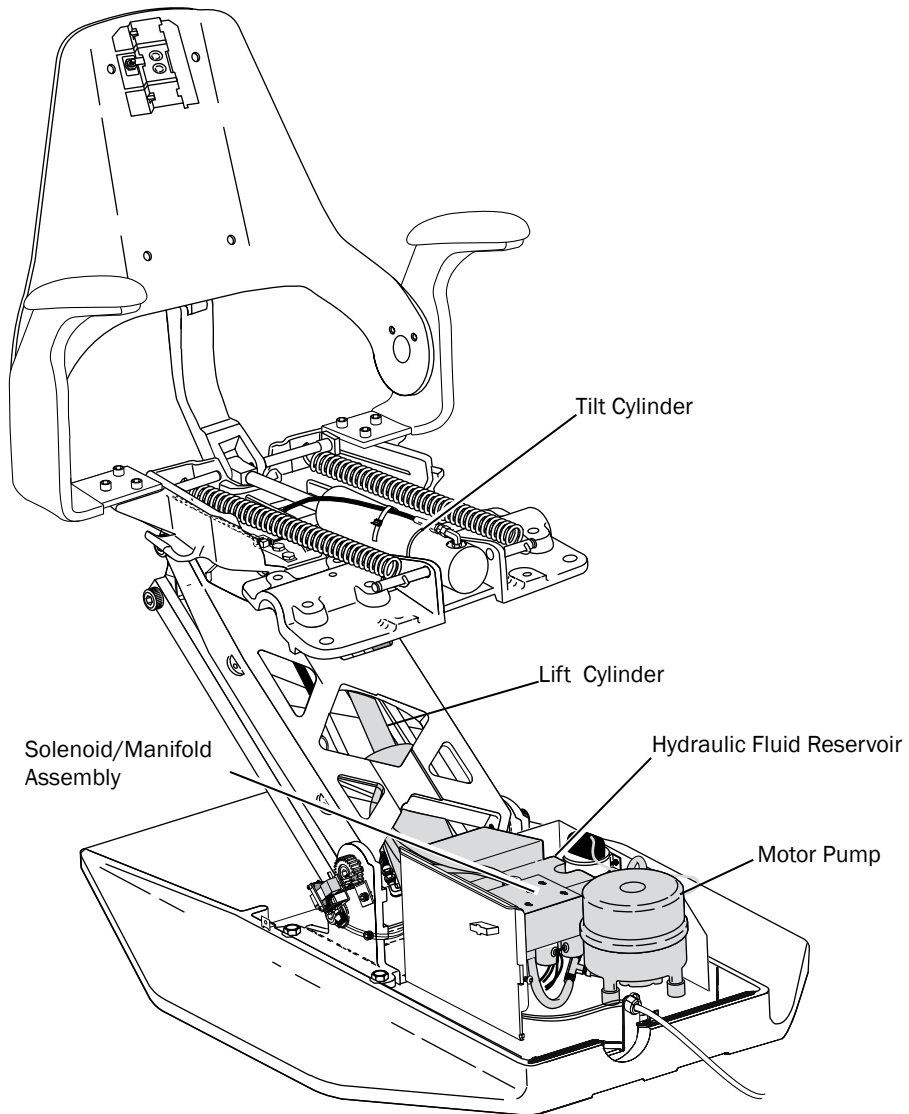


7. Turn the potentiometer shaft clockwise until it no longer turns, then turn the shaft counterclockwise 1/8" of a turn.



8. Reinstall the shaft.

Hydraulic System

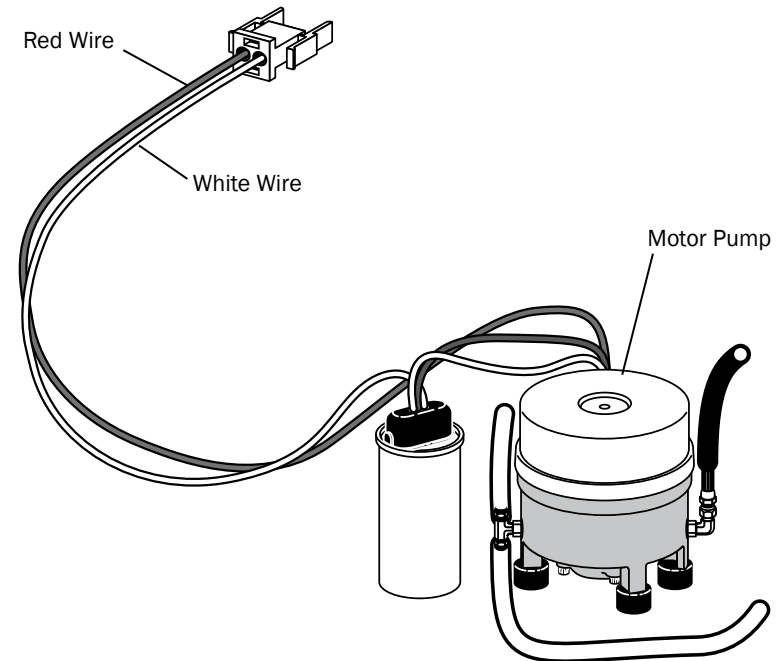


Motor Pump Testing

This test requires the use of a AC Current Probe.

- Clip the probe onto the red wire going to the motor pump.
- Use the footswitch or touchpad to raise the chair.

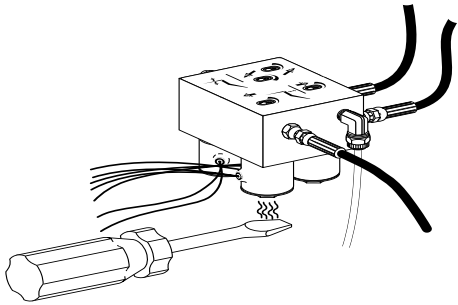
You should read 5 Amps (maximum) of current for 120 V motor pump, or 2.5 Amps (maximum) of current for 240 V motor pump.



Solenoids

Solenoid Testing

To test the magnetic pull of the solenoid hold the tip of screwdriver near a solenoid and activate the appropriate chair function. You should feel the tug of the magnetic field generated around the solenoid.



Solenoid Removal and Replacement

1. Lower the chair base and back to the full down position. Remove the motor pump cover, then unplug the chair.



WARNING The solenoid coils are powered by line voltage (100, 120, or 240 V). Failure to unplug the chair may result in serious injury from electrical shock.

2. Use a pair of wire cutters, cut the wiring to the faulty solenoid at about mid point between the solenoid and connector P10.
3. Use a 9/16" wrench, remove the solenoid retaining nut and slide the coil off the poppet sleeve.



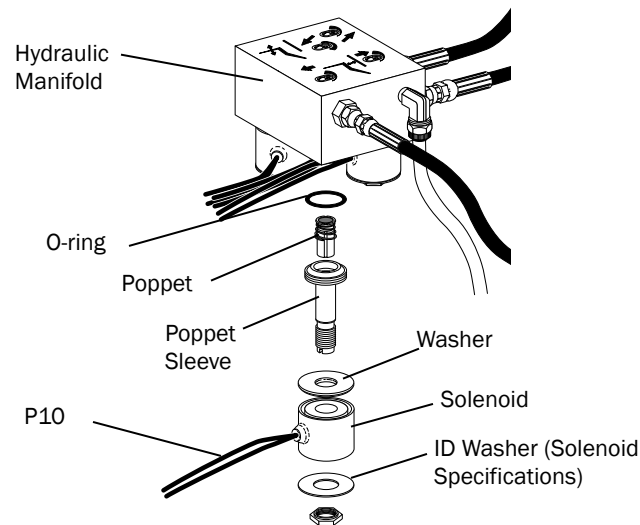
CAUTION Use caution when removing and replacing the coil. The poppet sleeve is easily bent. Even slight bending of the sleeve will result in the malfunction of the solenoid valve.

4. Use a flat-tipped screwdriver, loosen and then remove the sleeve and poppet from the manifold assembly poppet from the manifold assembly.



CAUTION To prevent the possibility of over-heating and failure, replace the entire solenoid assembly.

5. Remove the O-ring from inside the manifold, and install a new O-ring. Wipe any excess off from the manifold.
6. Install a new sleeve and poppet; tighten the poppet sleeve using a flat-tipped screwdriver.
7. Install a new coil on the plunger. Do not overtighten the retaining nut.
8. Strip approximately 1/4" of insulation from the wires cut in step 2, and install a crimp-on butt-type connector on each wire.
9. On the new solenoid, cut the wiring to length allowing enough to reach the crimped-on connectors. Strip approximately 1/4" of insulation from the wires and crimp each wire into a connector.



Chair Adjustments

Headrest Positioning

Use the glide bar to adjust for patient heights. Pull up or push down on the headrest until it is in the desired position. The gliding headrest cushion provides additional height adjustment.



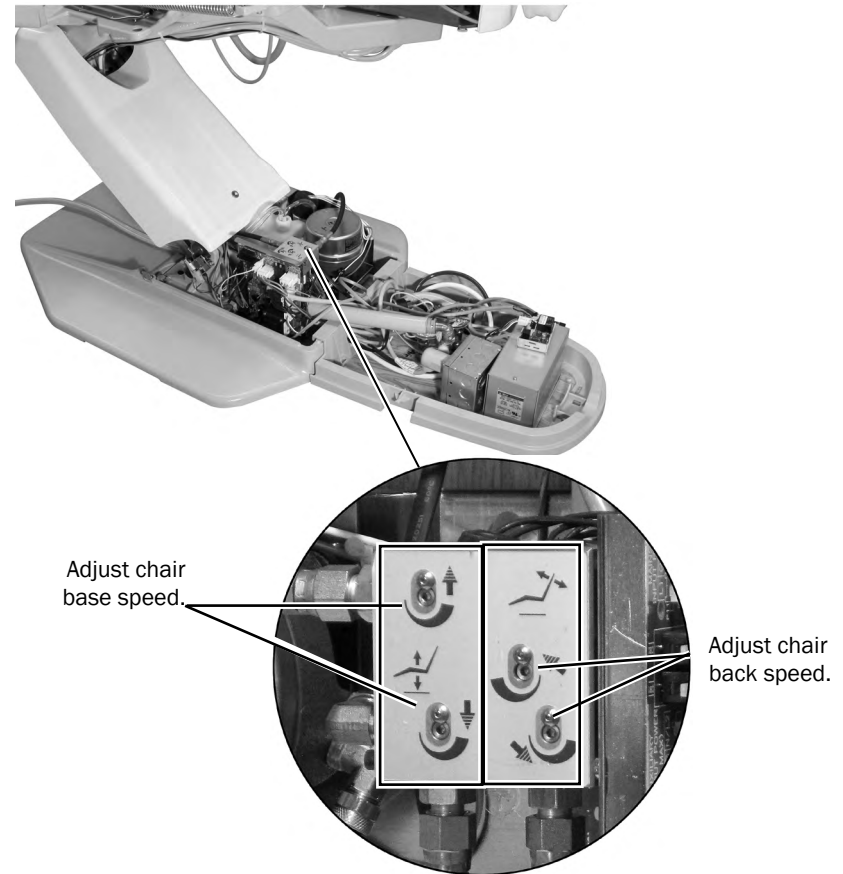
CAUTION If the glide bar has exceeded its maximum recommended working height, a warning line will be visible on the patient's side of the glide bar. Do not use the headrest in a position where this warning line is visible.

The locking knob allows you to adjust the headrest for a full range of positions. Release the headrest by turning the locking knob counterclockwise, then adjust the headrest for a proper fit. Lock the headrest in the desired position by turning the knob clockwise.



Chair Speed Adjustments

The speed for moving the chair seat and back can be adjusted. Use a 3/32" hex key to adjust the chair base speed and back speed on the manifold.



NOTE If cable ties are present in the product and you need to remove them for servicing, make sure to replace the ties after service is completed.

Programming

Dental Chair and Light Settings

Use the touchpad to program commonly used settings for the system.


Program the Chair Positions

To program the chair presets Entry/Exit, Treatment 1, and Treatment 2 buttons:

1. Move the chair to the desired position.
2. Press and release the Program button and you will hear a beep indicating program mode.
3. Press the preset button you want to program and you hear three beeps confirming the button has been set.

Customize the X-Ray/Rinse Button

The X-ray/Rinse button functions as either x-ray/rinse or as another fully programmable preset position (Treatment 3). To change the function:

1. Press and hold **P** and  at the same time for three seconds. One beep indicates the button has been configured as Treatment 3. Three beeps indicate that the X-ray/Rinse button has been configured as the x-ray/rinse function (alternates between the x-ray/rinse and the previous position).
2. Program the preset position as instructed in the previous section, "Program the Chair Positions."







TIP If X-ray/Rinse is changed to a fully programmable preset position, it operates the same as Treatment buttons 1 and 2.

Standard and Deluxe Touchpads



NOTE Touchpad symbols are proprietary to A-dec Inc.

Chair Preset Buttons

Footswitch/Touchpad	Description and Action
	Entry/Exit: Positions chair for patient entry/exit; also turns the dental light off.
	Treatment 1: Positions the chair base and back down; also turns the dental light on.
	Treatment 2: Positions the chair base down and back up; also turns the dental light on.
	X-ray/Rinse: Moves the chair for either x-ray or rinse position. Press again to move the chair to the previous position; also turns the dental light off or back on.

Program Chair Preset Buttons

Use the program button to assign and save chair preset positions. To program the chair presets Entry/Exit, Treatment 1, and Treatment 2:

1. Move the chair to the desired position.
2. Press and release the Program button. One beep indicates programming mode is ready.
3. Within five seconds, press the preset button you want to program and you hear three beeps confirming the button has been set.




NOTE To stop the chair at any point, push any chair position button on the footswitch or touchpad.


Dental Light

To turn the light on from the touchpad, press the dental light button. Press and hold the button for one second to turn the light off.



The dental light features two intensities: high and composite (low):



Performer Dental Light: Press  to toggle between high and low.

500 Halogen Dental Lights: Press  to toggle between high and composite or medium and composite. When the dental light is in composite mode, the indicator light blinks.

LED Dental Light: Press and release  to choose the desired intensity mode. When the dental light is in cure-safe mode, the indicator light blinks.

Dental Light Auto On/Off Feature

When you use a programmed chair position, the dental light turns on when the chair back reaches operating position. Press  or  and the dental light automatically turns off.

To deactivate the auto light feature, press and hold  and  at the same time for three seconds. One beep confirms the auto light feature is off.

To re-activate the auto light feature, press and hold  and  at the same time for three seconds. Three beeps confirm the dental light auto feature is on.



TIP If X-ray/Rinse is changed to a preset position, the dental light auto feature operates the same as the Treatment buttons 1 and 2.

Cuspidor Cupfill and Bowl Rinse

The cuspidor cupfill and bowl rinse functions depend on your system's configuration.



Standard Cuspidor (no touchpad)

Press and hold the cupfill button on the cuspidor for the desired amount of water. Water will continue to flow until the button is released.

Press the bowl rinse button on the cuspidor once for a 15 second rinse. For continuous rinse, hold the button down. When the button is released, the water will continue to flow for 15 additional seconds.

Cuspidor with Optional Touchpad



If your system includes a touchpad, you can use the buttons on the touchpad or the cuspidor to operate and program bowl rinse and cupfill functions.

Button	Description
	<p>Cupfill Button:</p> <ul style="list-style-type: none"> Press the Cupfill button for a timed operation. The factory preset is a 2.5 second fill. Press and hold the Cupfill button for manual operation.
	<p>Bowl Rinse Button:</p> <ul style="list-style-type: none"> Press the Bowl Rinse button for a timed operation. The factory preset is a 30 second rinse. Press and hold the Bowl Rinse button for manual operation.

Customize Cupfill and Bowl Rinse Functions

The cupfill button controls water flow from the water bottle into a cup. The bowl rinse button provides rinse water for the cuspidor.

To change the timing for cupfill or bowl rinse:

1. Press **P** on the touchpad or press and hold both the cupfill and bowl rinse button the cuspidor. Release them when you hear one beep.
2. Press and hold the Cupfill () or Bowl Rinse () button for the desired amount of time.
3. Release the button. Three beeps confirm the setting.



NOTE You can also enter the cuspidor programming mode by pressing and holding both the Cupfill and Bowl Rinse buttons located near the spout. One beep indicates the programming mode is ready.

Technician Touchpad Setup

The deluxe touchpad allows service technician access to adjust handpiece and touchpad settings for user preferences.

Navigate with Touchpad Buttons

Chair button functions become navigation buttons while you are in setup mode. You will use the back up (▶), back down (◀), and + or - buttons to navigate the setup screens.

A-dec 300 Deluxe Touchpad Setup Screen Example



Holder Setup

You can set up how handpieces are configured for each handpiece holder. Handpiece types include Electric, Ultrasonic, Vacuum, Other, and Turbine. To set up handpiece holders:

1. From the deluxe touchpad main screen, press and hold **m** and **e** at the same time for three seconds; and press ▶ to position.
2. From the System Setup screen, press + or - to highlight Handpieces and press ▶.
3. From the Handpiece Setup screen, press + or - to highlight Holder Setup and press ▶.
4. Lift the desired handpiece from the holder.
5. From the Holder Setup screen, press + or - to select the handpiece type.
6. Press ▶. Three beeps confirm the setup for the handpiece is complete.
7. Return the handpiece to the holder.
8. Repeat steps 4 through 7 to set up each handpiece.
9. When you are finished setting up handpieces, press ◀ until you see the A-dec logo.

Light Source Setup

With the A-dec 300 Deluxe Touchpad, you can set up various intraoral light source settings if a quad voltage intraoral light source (QVIOLS) or electric motor controller with built-in IOLS control is installed.

The following settings are available:

- On When Selected: Specify whether the intraoral light source turns on or remains off when the handpiece is removed from the holder.
- Auto Off Delay: Determine how long the light remains on when the foot control is released. This time is reset when you use the drive air again.
- On in Endo: Specify whether the intraoral light source turns on or off when in Endodontics mode. Because most Endodontics handpieces do not have light pipes, it is recommended that Off is selected to reduce heat and to extend bulb life.

To set up the light source:

1. From the deluxe touchpad main screen, press and hold **m** and **e** at the same time for three seconds and press u to begin.
2. From the System Setup screen, press + or - to highlight Handpieces and press ▶.
3. From the Handpiece Setup screen, press + or - to highlight Intraoral Lt Source and press ▶.
4. Lift the desired handpiece from the holder.
5. From the Light Source Setup screen, press + or - to display the desired setting and press ▶.
6. Specify settings for the handpiece by pressing + or - and ▶ to move through the screens. Once the setup is complete, three beeps confirm the setting.
7. Repeat steps 5 and 6 for each setting.
8. Return the handpiece to the holder.
9. Repeat steps 3 through 8 to configure each handpiece.
10. When you are finished setting up the handpieces, press ◀ until you see the A-dec logo.

Ultrasonic Setup

Specify whether to turn the ultrasonic colors on or off.

To set up the ultrasonic:

1. From the deluxe touchpad main screen, press and hold **m** and **e** at the same time for three seconds, and press **▶** to begin.
2. From the System Setup screen, press **+** or **-** to select Handpieces and press **▶**.
3. From the Handpiece Setup screen, press **+** or **-** to select Ultrasonic Setup and press **▶**.
4. Press **+** or **-** to display On or Off, and press **▶**. Three beeps confirm the setting.
5. Press **◀** until you see the A-dec logo.

Electric Setup

You can change display information and electric functions. The following settings are available: Torque Units, Torque Warning Beep, Auto Reverse Beep, and Auto Mode. See “Endodontics Mode Touchpad Screen Icons” on page 25.

To set up electric options:

1. From the deluxe touchpad main screen, press and hold **m** and **e** at the same time for three seconds and press **u** to begin.
2. From the System Setup screen, press **+** or **-** to select Handpieces and press **▶**.
3. From the Handpiece Setup screen, press **+** or **-** to highlight Electric Setup and press **▶**.
4. From the Electric Setup screen, press **+** or **-** to display the desired setting and press **▶** to select the setting.
5. Specify options for the setting by pressing **+** or **-** and **▶** to move through the screens. Once the setup is complete, three beeps confirm the setting.
6. Repeat steps 4 and 5 for each setting.
7. When all settings are complete, press **◀** until you see the A-dec logo.

Touchpad Setup

Use the touchpad setup to change the contrast of the touchpad display and specify whether to display help messages. To set up touchpad settings:

1. From the deluxe touchpad main screen, press and hold **m** and **e** at the same time for three seconds, and press **▶** to begin.
2. From the System Setup screen, press **+** or **-** to select Touchpad and press **>** to begin.
3. From the Touchpad Setup screen, press **o** to highlight Contrast Adjust or Help Messages:
 - Contrast Adjust: press **+** or **-** to adjust the contrast. Press **u** to save the setting; three beeps confirm the setting.
 - Help Messages: press **+** or **-** to turn On or Off the help messages. Press **u** to save the setting; three beeps confirm the setting.
4. When settings are complete, press **◀** until you see the A-dec logo.



NOTE For a listing of help messages, see the Regulatory Information, Specifications, and Warranty document (p/n 86.0221.00) in the Document Library at www.a-dec.com.

Electric Handpiece Operation

You can program handpieces in standard or endodontics mode.

- Standard mode: Handpieces are always 100% torqued for electric handpieces.
- Endodontics mode: If you have a motor controller that supports endodontics, you can program handpieces in this mode. Endodontics mode allows you to control torque and ratio settings.

Program the Electric Handpieces in Standard Mode

You can program memory settings on the deluxe touchpad for specific rpms. To program the handpiece setting:

1. Lift the handpiece from the holder.
2. If the touchpad screen does not display standard mode, press and hold **e**.
3. To adjust the rpm setting, press **+** or **-**. You see the rpm values on the screen (see Standard Mode Touchpad Screen).
4. To place the setting into memory, press and hold **p**. One beep sounds.
5. Select the desired memory setting (m1 through m4). To toggle through memory settings, press **m**.
6. When the desired memory location is selected, press and hold **p**. Three beeps confirm the setting.

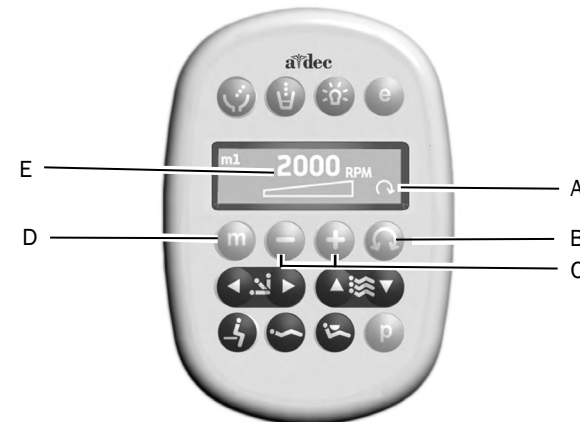
Forward/Reverse Button

Use the Forward/Reverse button to change the electric motor's direction. The system defaults to the forward position when you return the motor to the holder or turn off the power. In reverse mode, the Forward/Reverse Indicator icon flashes continuously.

Electric Motor Presets (Standard Mode)

Memory Settings	Preset Speed
m1	2,000 rpm
m2	10,000 rpm
m3	20,000 rpm
m4	36,000 rpm

Standard Mode Touchpad Screen



Item	Description
A	Forward/Reverse Indicator (forward is shown)
B	Forward/Reverse Button
C	Minus and Plus Buttons
D	Memory Button
E	RPM Value

Program the Electric Handpieces in Endodontics Mode

In addition to handpiece speed adjustments, the Endodontics mode allows you to change a number of settings based on the specific file and desired handpiece behavior. Icons on the touchpad screen reflect the settings.

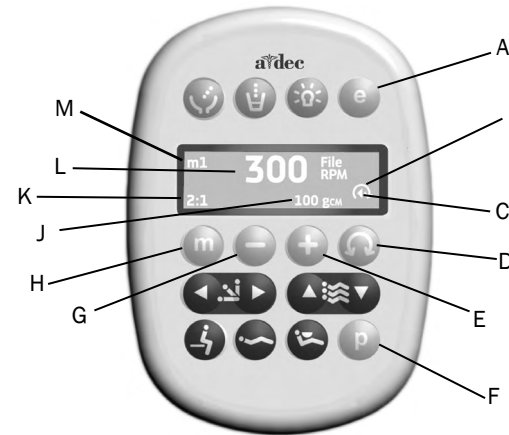


NOTE For more information regarding speed and torque limits for a specific file, consult the file manufacturer.

To program the handpiece setting:








1. Lift the handpiece from the holder.
2. If the touchpad screen does not display Endodontics mode, press **e**.
3. To change settings in Endodontics mode, press **+** or **-** to. A white reverse video box is displayed on the touchpad screen.
4. Use the chair positioning buttons to move from setting to setting on the touchpad screen.
5. Press **+** or **-** to change the setting as desired.
6. To set the speed limit, torque limit, or ratio into memory, press and hold **p**. One beep sounds.
7. Select the desired memory setting (m1 through m4). To toggle through memory settings, press **m**.
8. When the desired memory location is selected, press and hold **p**. Three beeps confirm the setting.

Endodontics Mode Touchpad Screen



Item	Description	Item	Description
A	Endodontics Mode Button	G	Minus Button
B	Forward/Reverse Indicator	H	Memory Button
C	Auto Mode Indicator	J	Torque Value Indicator
D	Forward/Reverse Button	K	Handpiece Ratio Setting
E	Plus Button	L	File Speed Indicator
F	Program Button	M	Memory Setting Indicator

Endodontics Mode Touchpad Screen Icons

Icon	Setting	Description
	Speed	Setpoint for file speed limit. For more information, consult the file manufacturer.
	Torque	Setpoint for file torque limit. For more information, consult the file manufacturer.
	Torque Units	Torque Units Toggles between N-cm (Newton centimeters) and g-cm (Gram centimeters). Adjusting this setting for one handpiece changes it for all handpiece settings. Note: 1 N-cm = 102 g-cm.
	Ratio	Sets the handpiece ratio. For more information, consult your handpiece manufacturer.
	Auto Modes	Adjusting this setting for one handpiece changes it for all handpiece settings. The auto mode indicator displays inside of the forward/reverse indicator.
	Auto Stop	When the file reaches the torque limit, The motor shuts off.
	Auto Reverse	When the file reaches the torque limit, the motor stops and reverses direction.
	Auto Forward	When the file reaches the torque limit, the motor stops, reverses direction 3 turns, then changes back to forward again. Note: If the file is stuck, this cycle repeats three times before the motor stops.

Delivery System

This section provides information related to service, maintenance, and adjustments of the A-dec Performer delivery system.

Contents

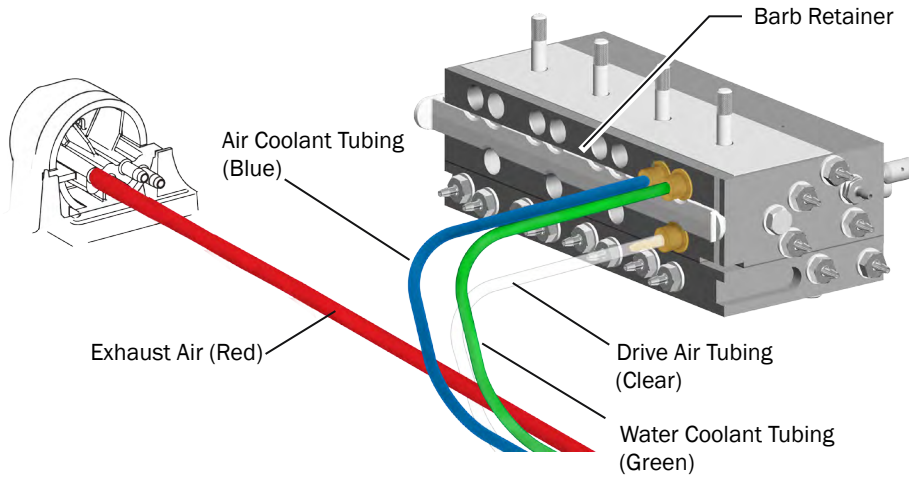
- Handpiece Tubing, page 27
- Delivery System Service, Maintenance, and Adjustments, page 28



Handpiece Tubing

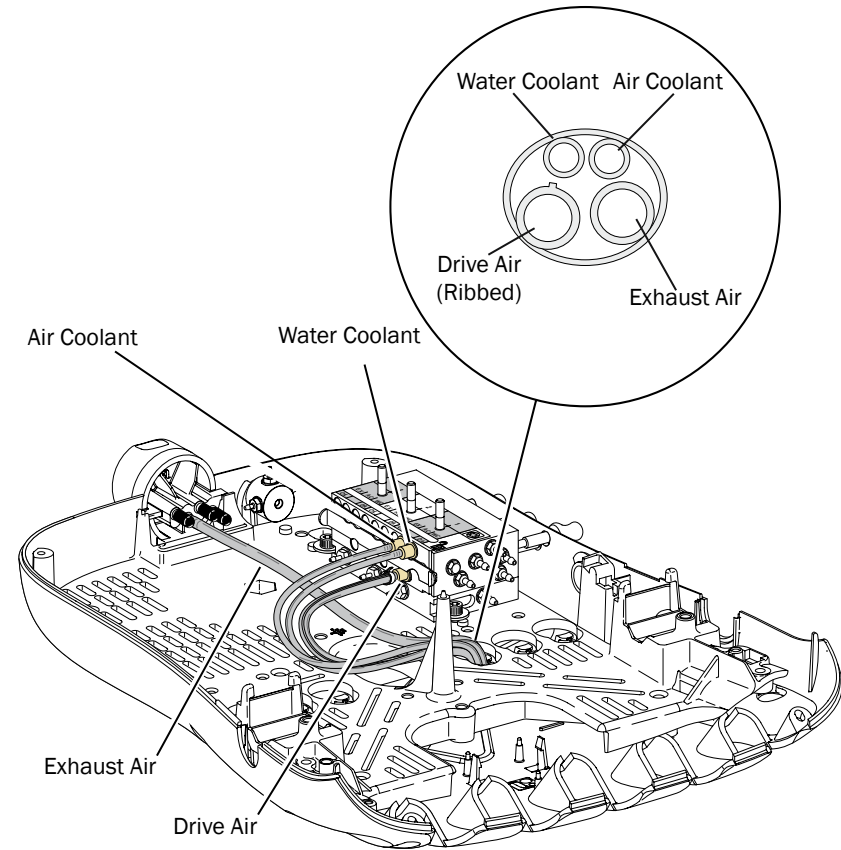
Silicone Handpiece Tubing

Silicone handpiece tubing uses a European color code for air (blue) and water (green) that differs from the current U.S. standard.



Vinyl Handpiece Tubing

Vinyl handpiece tubing is not color coded. Tubing purpose can be determined by the rib on the drive air and relative location of the other tubing.



Delivery System Service, Maintenance, and Adjustments

Contents

- Control Head Positioning, page 29
- Delivery System Adjustments, page 30
- Control Block Removal, page 32
- Handpiece Coolant Adjustments, page 33
- Handpiece Drive Air Adjustments, page 34
- Control Head Rotational Adjustment, page 35
- Oil Collector Servicing, page 36
- Quad Voltage Intraoral Light Source (QVIOLS), page 37
- Intraoral Light Source Adjustments, page 38
- Intraoral Light Source Length and Voltage, page 39

Control Head Positioning

Control Head Height Adjustment

1. Lift the control arm.

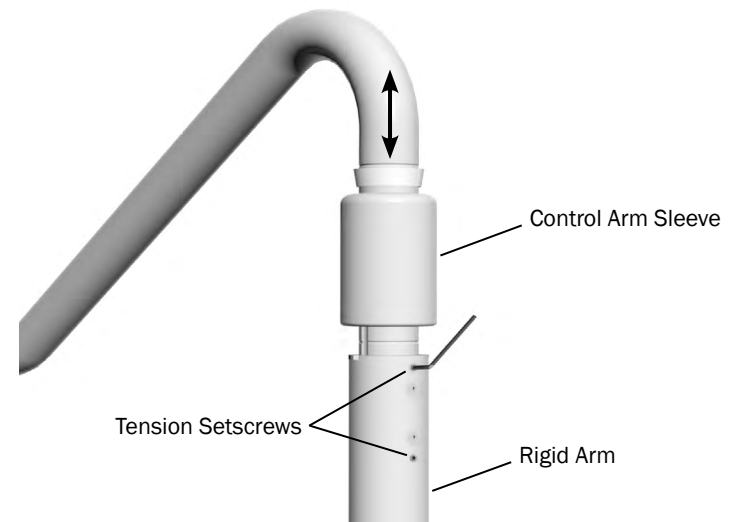
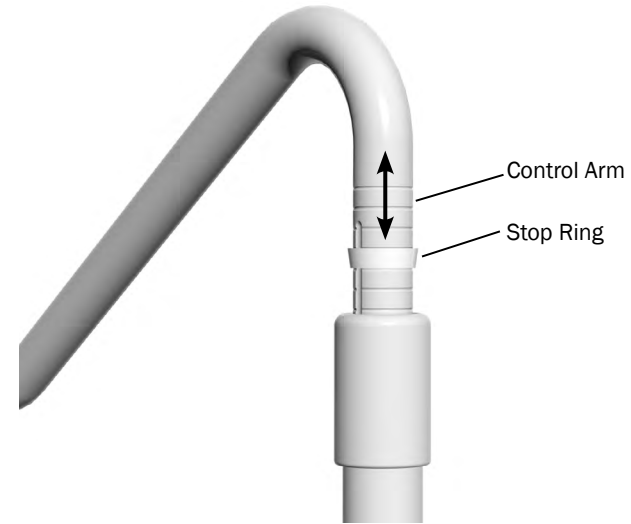


NOTE The height adjustment range for the control arm is 5" (127 mm).

2. Slide the stop ring to the desired height groove.
3. Lower the control arm until it stops.

If the control arm is difficult to rotate, or rotates too freely, you should adjust the tension setscrews on the rigid arm. To adjust the control arm tension:

1. Lift the control arm.
2. Note the position of the stop ring and then lift it to the top height groove.
3. Lift the control arm sleeve to reveal the tension setscrews on the rigid arm.
4. Use a 3/32" hex key to loosen or tighten the two tension setscrews the same amount.
5. Lower the control arm sleeve and set the stop ring to its original position.
6. Lower the control arm.



Delivery System Adjustments

Pivot Point Tension Adjustments

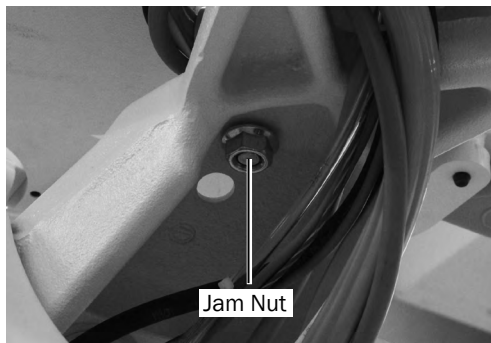
If the delivery system drifts, you can adjust the tension on the delivery system rigid arm.

Adjust the Back-Mount Delivery System or Dental Light Tension

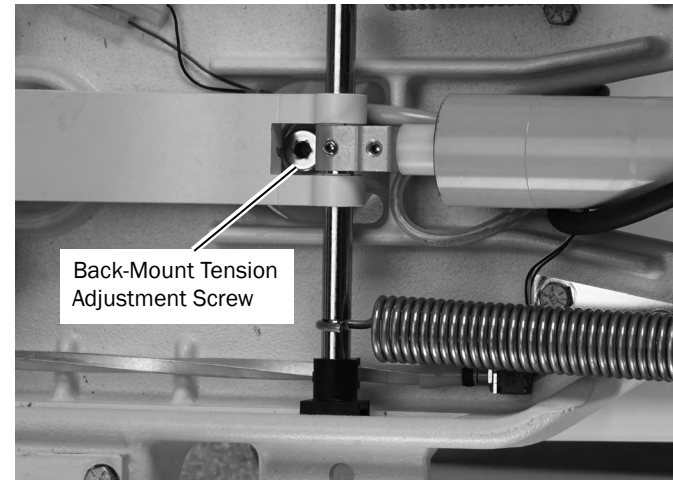
1. Use a 5/32" hex key to remove the four screws that secure the seat upholstery to the chair casting and remove the upholstery.
2. Lower the seat back all the way down. This provides access to the back-mount tension adjustment screw.



3. On the underside of the chair casting, use a 3/4" wrench to loosen the jam nut on the end of the tension adjustment screw.



4. Use a 1/4" hex key to adjust the tension of the screw. Adjust the screw until the arm rotates easily but does not drift.
5. On the underside of the chair casting, tighten the jam nut on the end of the tension adjustment screw.
6. Reinstall the seat upholstery and secure it with the four screws removed earlier.



Adjust the Front-Mounted Delivery System or Dental Light Tension

The front-mount tension adjustment is accessed below the seat upholstery at the front of the chair.

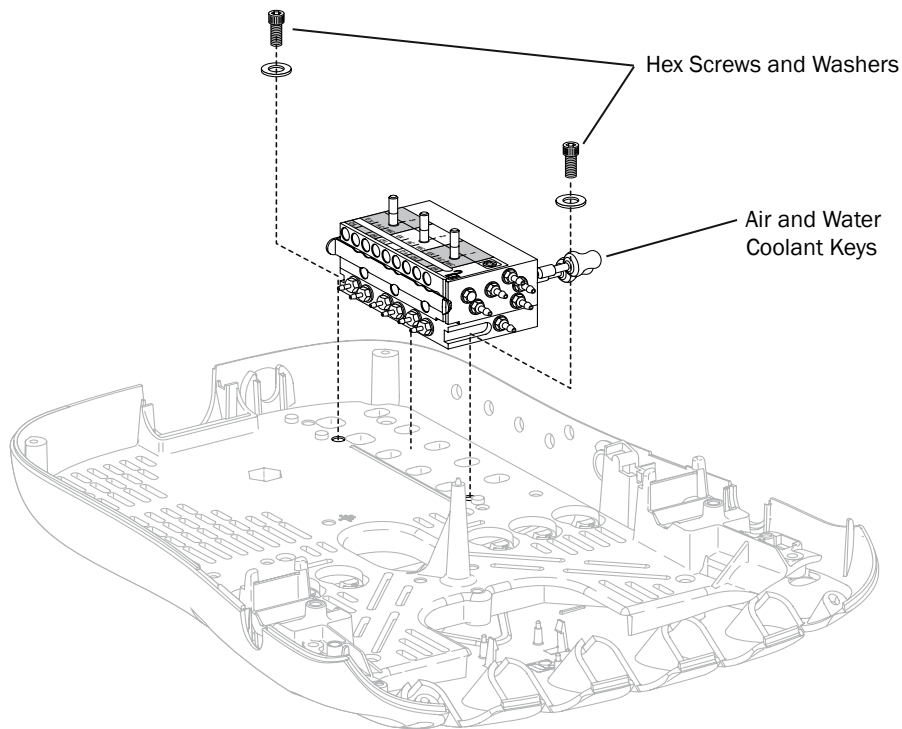
1. Loosen the jam nut on the bottom of the tension adjustment screw.
2. Use a 1/4" hex key to adjust the tension of the screw. Adjust the screw until the arm rotates easily but does not drift.
3. Use a 3/4" wrench to tighten the jam nut on the bottom of the tension adjustment screw.



Control Block Removal

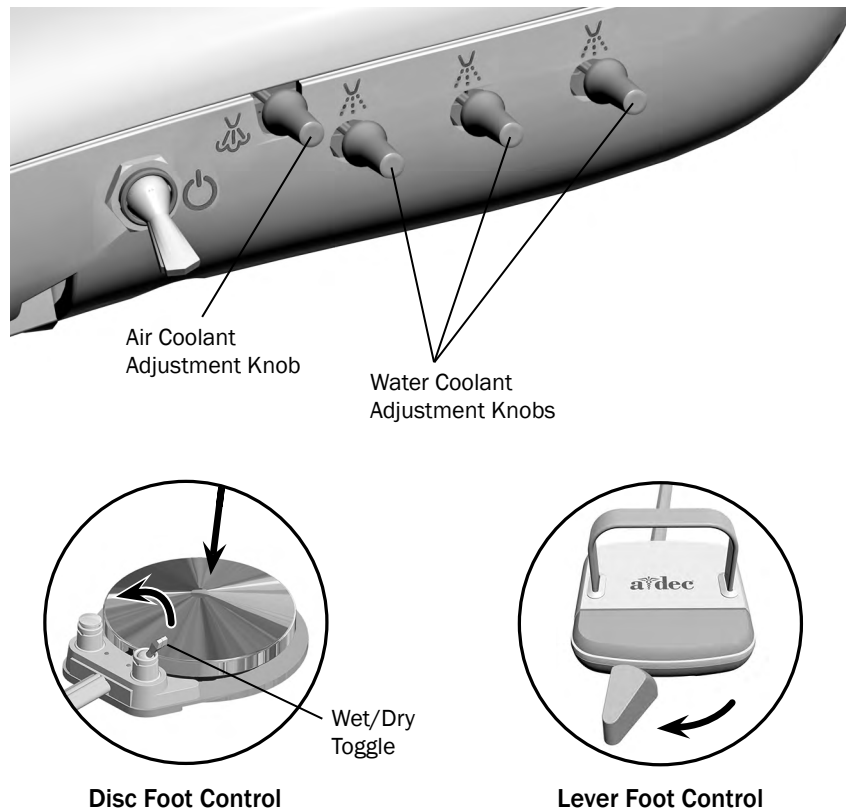
The control block may need to be removed for service, for example to change a diaphragm, a cartridge, or to service O-rings.

1. Remove the back cover.
2. Remove the air and water coolant keys.
3. Loosen and remove the two hex screws and washers that secure the control block to the control center frame.
4. Remove the two screws at the back lower corners.
5. Lift the control block up from the base of the control center.



Handpiece Coolant Adjustments

The air coolant knob on your delivery system simultaneously adjusts air flow to all handpiece positions. Each water coolant knob adjusts water flow to a single position. Use the following process to adjust for the desired handpiece coolant atomization:



1. Insert burs into the handpieces you are adjusting.



CAUTION When performing this procedure, do not attempt to completely shut off the water or air flow. The adjustment knobs are not designed to completely shut off flow and can damage the control block if you apply too much force.

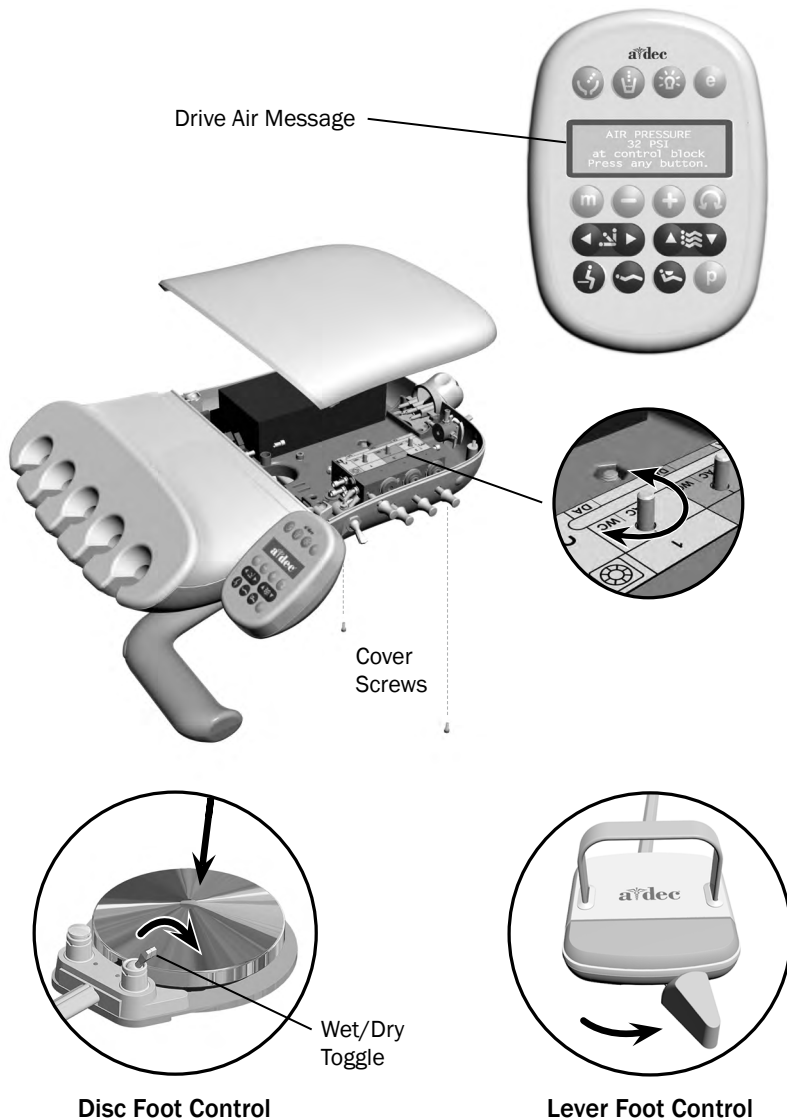
2. Turn the air coolant adjustment knob clockwise until coolant flow stops.
3. Lift the handpiece from the holder, or pull the whip forward, and do one of the following:
 - On a disc foot control: flip the wet/dry toggle to water (toward the blue dot) and press the disc all the way down.
 - On a lever foot control: move the lever all the way to the left. (The default is set for the left side, but it may have been reversed to the right side.)
4. Locate the water coolant adjustment knob for the handpiece position you are adjusting and turn it clockwise until coolant flow stops.
5. Slowly turn the water coolant adjustment knob counterclockwise until water droplets are expelled from every water port on the handpiece head. Return the handpiece to the holder.
6. Repeat steps 3 through 5 for each handpiece.
7. To set the air coolant for the system, lift a handpiece from the holder or pull the whip forward.
8. Turn the air coolant adjustment knob counterclockwise until you achieve the desired atomization at the cutting surface of the bur.



CAUTION Do not continue turning the air coolant adjustment knob counterclockwise after the air coolant stops increasing. The stem may come out of the control block.

9. If you require more water coolant, increase the water output in step 5 as needed.

Handpiece Drive Air Adjustments



You can check drive air pressure on the deluxe touchpad screen by pressing the plus (+) and minus (-) buttons at the same time. For systems with a standard touchpad, and for the most accurate drive air measurement, use a handpiece pressure gauge (A-dec p/n 50.0271.00) attached to the handpiece tubing.



NOTE A handpiece pressure gauge can be attached to the handpiece tubing for exact drive air measurement, or if you do not have a deluxe touchpad. One bar equals 14.5 psi.

To adjust the pressure for each handpiece:

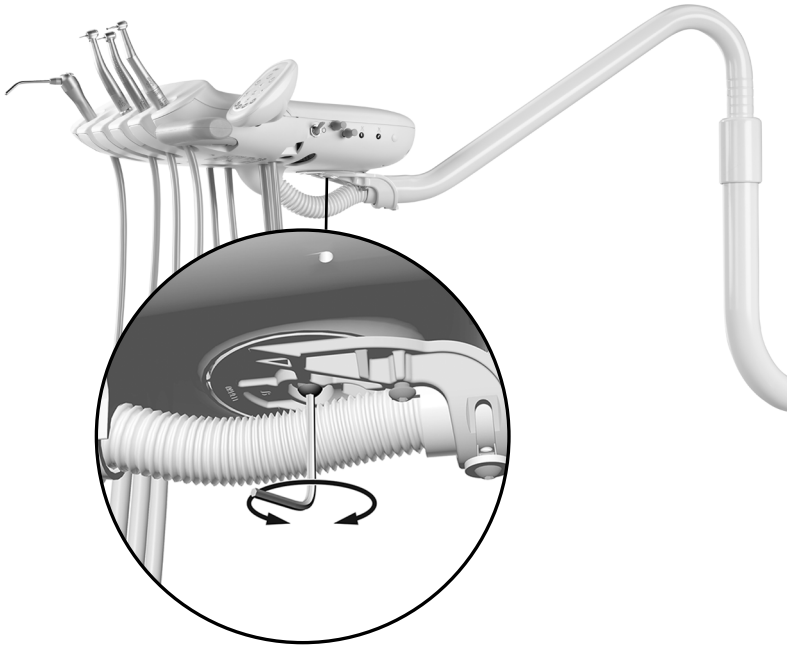
1. Remove the control head cover screws. Remove the cover and locate the drive air pressure controls inside.
2. Lift the handpiece from the holder or pull the whip forward.
3. Do one of the following:
 - On a disc foot control: flip the wet/dry toggle to water (toward the blue dot) and press the disc all the way down.
 - On a lever foot control: move the lever all the way to the right. (The default is set for the right side, but it may have been reversed to the left side.)
4. With the handpiece running, watch the deluxe touchpad readout or handpiece pressure gauge.
5. Adjust the handpiece drive air pressure to meet manufacturer's specifications. Turn the control stem clockwise to decrease flow and counterclockwise to increase flow.



CAUTION See your handpiece documentation for the drive air pressure specification. Exceeding manufacturer's recommendations increases the risk of damage and may significantly decrease the life of your handpiece components.

Control Head Rotational Adjustment

If the control head is too loose or difficult to rotate, use a 5/32" hex key to adjust the tension screw under the control head.

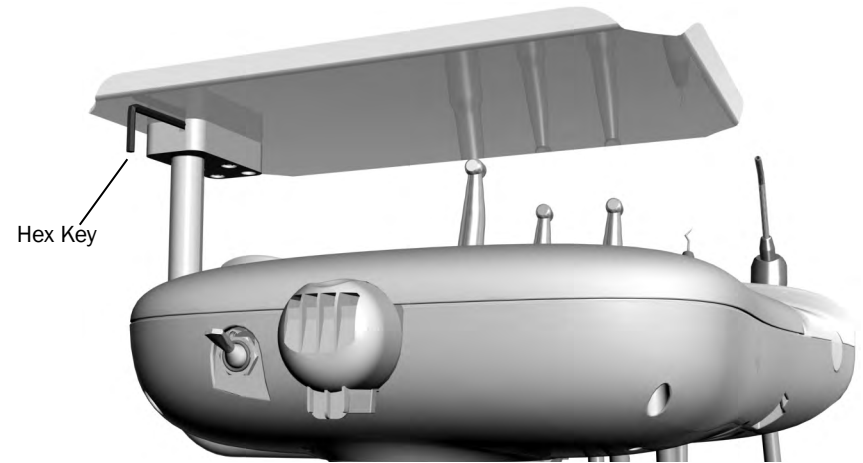


If the tray holder rotation is too tight or too loose, use a 9/64" hex key to adjust the tension:

1. Insert the hex key through the mounting bracket. If necessary, rotate the holder or arm until the key slides completely into the mounting bracket.
2. While holding the bracket stationary, turn the tray holder clockwise to increase the tension or counterclockwise to reduce the tension.

If the tray holder rotation is too tight or too loose, use a 9/64" hex key to adjust the tension:

1. Insert the hex key through the mounting bracket. If necessary, rotate the holder or arm until the key slides completely into the mounting bracket.
2. While holding the bracket stationary, turn the tray holder clockwise to increase the tension or counterclockwise to reduce the tension.



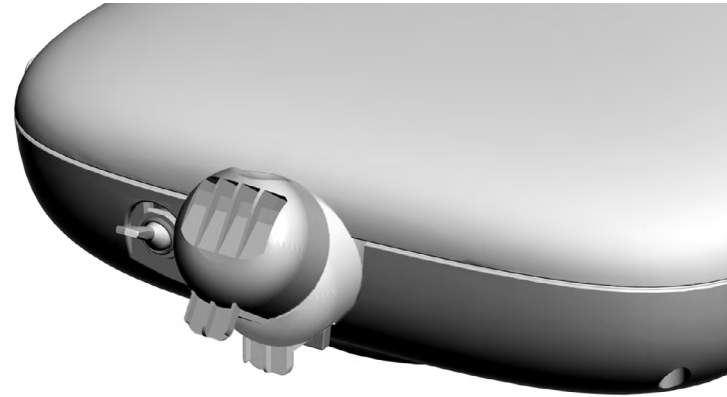
Oil Collector Servicing

Service the oil collector on the delivery system once a week for normal usage and more often for heavier use. To service:

1. Unsnap the oil collector cover from the control head and discard the old gauze. Do not remove the foam muffler.
2. Fold a new gauze pad (2" x 2" [51 mm x 51 mm]) into quarters and place it inside the cover.
3. Snap the oil collector cover closed.

Service the oil collector on the delivery system once a week for normal usage and more often for heavier use. To service:

1. Unsnap the oil collector cover from the control head and discard the old gauze. Do not remove the foam muffler.
2. Fold a new gauze pad (2" x 2" [51 mm x 51 mm]) into quarters and place it inside the cover.
3. Snap the oil collector cover closed.



Quad Voltage Intraoral Light Source (QVIOLS)

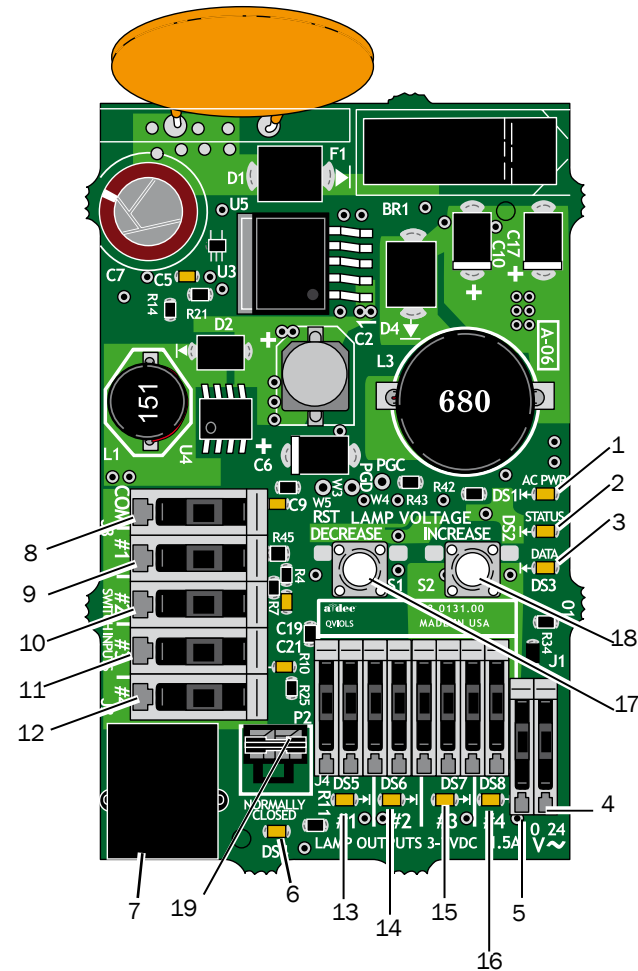
Part Number: 90.1168.00

The quad voltage intraoral light source (QVIOLS) provides four independent fiber optic voltage outputs. Each output is adjustable from 3 VDC to 7 VDC at 1.5 Amps. Only one output can be on at a time. Activating an input on the QVIOLS turns on its respective output.

Item	Description
1	DS1 AC Power LED
2	DS2 Status LED
3	DS3 Data LED
4	J1 - 24 VAC Input
5	J1 - 0 VAC Input
6	DS4 - normally closed LED (displays as yellow when P2 jumper is installed)
7	P1 Data Port
8	J3 Switch input Common
9	J3 Switch Input #1
10	J2 Switch Input #2
11	J2 Switch Input #3
12	J2 Switch Input #4
13	J4 Light Source Output #1
14	J4 Light Source Output #2
15	J5 Light Source Output #3
16	J5 Light Source Output #4
17	S1 Decrease Lamp Output
18	S2 Increase Lamp Output
19	P2 normally closed jumper



NOTE A jumper should always be located within P2, and DS4 should be on.



CAUTION: Circuit boards are sensitive to static electricity. Electrostatic Discharge (ESD) precautions are required when touching a circuit board or making connections to or from the circuit board. Circuit boards should be installed only by an electrician or qualified service person.

Intraoral Light Source Adjustments

The intraoral light source (IOLS) voltage adjustment on the doctor's delivery system is located on the QVIOLS circuit board. Each output voltage is preset to 3.2 VDC at the lamp terminals when the lamp is on.



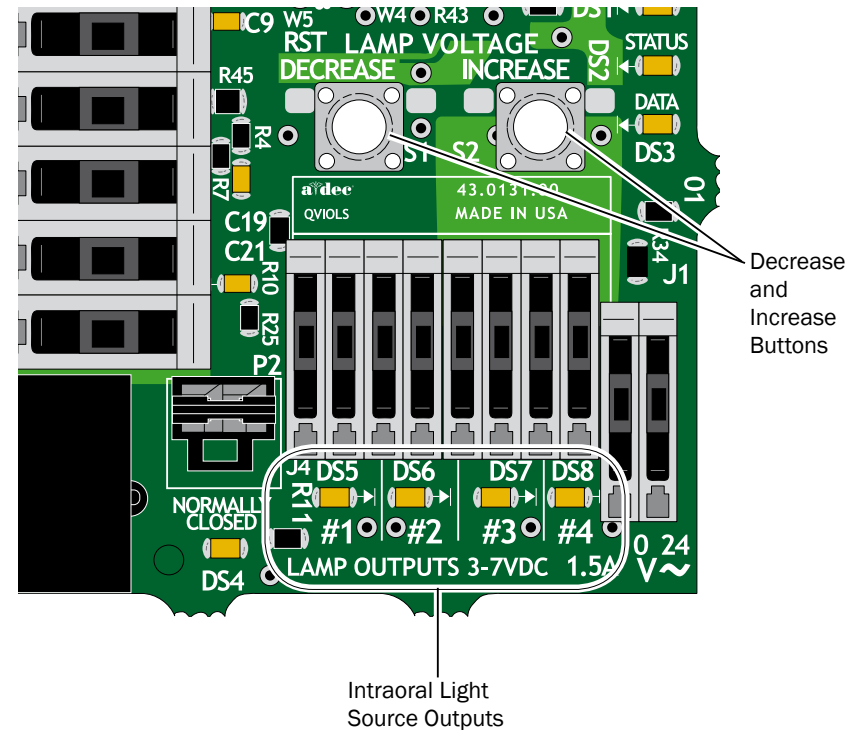
CAUTION The length and voltage (shown in the table on page 39) is only valid for devices rated for 3.5 VDC and 0.75 Amp 26 AWG wires. For devices drawing a different amount of current, requiring a different voltage, or with a different wire gauge, contact A-dec Customer Service.

1. Use a 7/64" hex key to remove the control head cover.
2. Set the voltmeter to DC voltage and place its probes on the IOLS output terminals for the handpiece you are adjusting.
3. Lift the handpiece from its holder.



NOTE When the intraoral light source output is on, its respective LED is illuminated. For example, LED DS6 is illuminated when handpiece #2's intraoral light source is activated.

4. Use the buttons behind the terminal to adjust the voltage according to the Intraoral Light Source Length and Voltage, page 39.



CAUTION: Circuit boards are sensitive to static electricity. Electrostatic Discharge (ESD) precautions are required when touching a circuit board or making connections to or from the circuit board. Circuit boards should be installed only by an electrician or qualified service person.

Intraoral Light Source Length and Voltage



CAUTION The values in the following table are valid only for fiber optics with 26 AWG wires, 750 mA loads, and the recommended 3.2 VDC at the bulb. For fiber optics powered with 26 AWG wires and other ratings, use the equation $T = (Z \times 0.006 \times Y) + X$ where:

T: Terminal strip voltage (VDC)

X: Desired voltage at bulb (VDC)

Y: Rated lamp/load current (in Amps)

Z: Length of 26 AWG wire (inches) from terminal trip to bulb

For devices with a wire gauge other than 26 AWG, please contact A-dec Customer Service.

Length and Voltage Table for A-dec | W&H, Bien Air, or Other Bulbs Rated at 3.2 V

Wire Length in A-dec Tubing		Voltage at terminal strip resulting in recommended 3.2 V at the bulb	Wire Length in A-dec Tubing		Voltage at terminal strip resulting in recommended 3.2 V at the bulb
(in)	(cm)	VDC +/- .02	(in)	(cm)	VDC +/- .02
48	122	3.40	108	274	3.69
54	137	3.43	114	290	3.72
60	152	3.46	120	305	3.75
66	168	3.49	126	320	3.78
72	183	3.52	132	335	3.81
78	198	3.55	138	351	3.84
84	213	3.58	144	366	3.87
90	229	3.61	150	381	3.90
96	244	3.64	156	396	3.93
102	259	3.67			

Cuspidor and Support Center

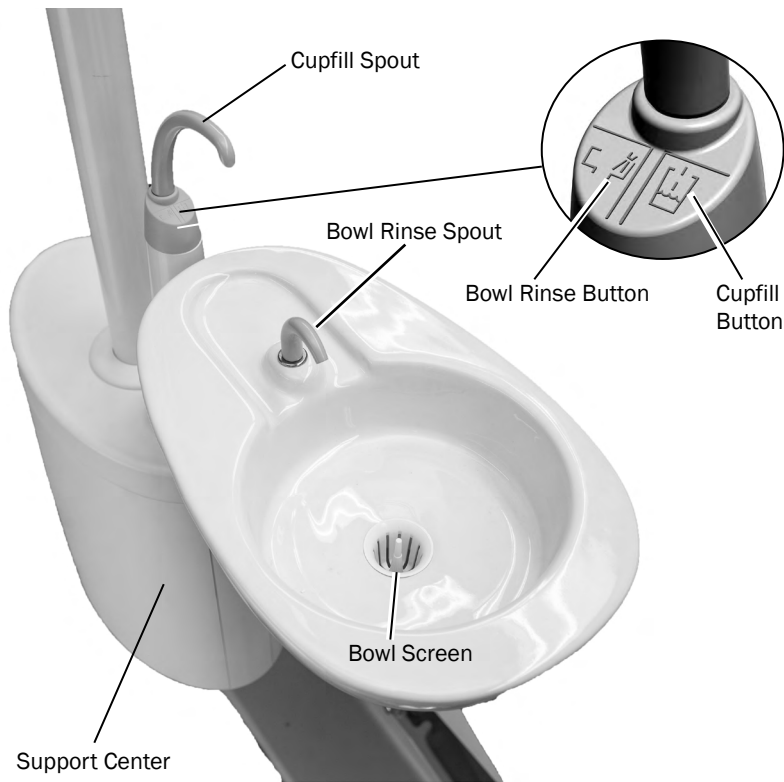
This section provides detailed information related to service, maintenance, and adjustment of the A-dec Performer cuspidor and support center.

Contents

- Cuspidor and Support Center Service, Maintenance, and Adjustments, page 41
- Bowl Rinse Flow Adjustment, page 41.
- Self-Contained Water Bottle Adjustment, page 41

The cuspidor cupfill and bowl rinse functions can be controlled from the cuspidor or the touchpad.

For adjustment information, see “Customize Cupfill and Bowl Rinse Functions” on page 20.

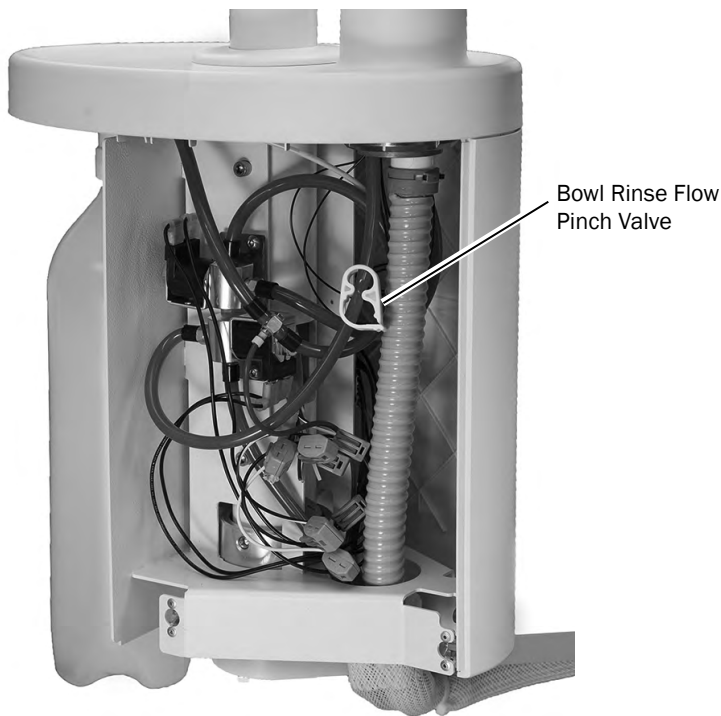


Cuspidor and Support Center Service, Maintenance, and Adjustments

Bowl Rinse Flow Adjustment

Adjustments to the cuspidor bowl rinse flow are made inside the support center. To adjust the flow:

1. Carefully pull the bottom edge of the cover out and remove the cover.
2. With the cuspidor bowl rinse on, tighten or loosen the pinch valve to adjust the flow.
3. For the best rinsing action, adjust the flow pattern by rotating the bowl rinse.



Adjusting the Cuspidor Cupfill and Bowl Rinse

For adjustment information, see “Customize Cupfill and Bowl Rinse Functions” on page 20.

Self-Contained Water Bottle Adjustment

The A-dec self-contained water system is a closed system, which isolates treatment water from the municipal water supply.

To remove the bottle: Turn the bottle counterclockwise.

To install the bottle:

1. Insert the water bottle into the mount so the A-dec logo is in front, facing away from the chair.
2. Rotate the bottle to the right 1-1/2 turns. Do not overtighten.



CAUTION Do not over tighten the water bottle or you may damage the components.



3. Turn on the master toggle. A pressurization sound may be heard up to 2 minutes after the system is turned on.



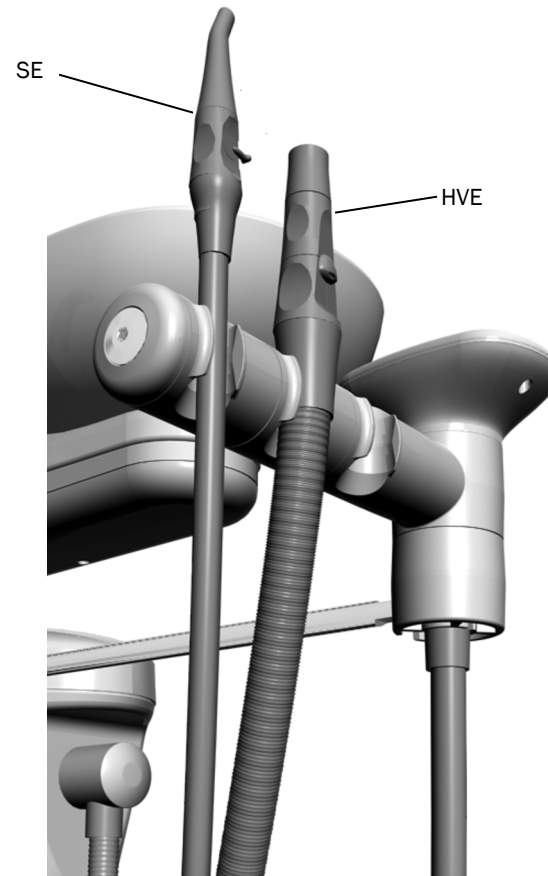
WARNING Use only A-dec self-contained water bottles. Do not use other bottles, including glass or plastic beverage bottles. Do not use damaged bottles. These can pose a serious safety hazard while pressurized. A-dec plastic water bottles cannot withstand heat sterilization. Attempting to do so will damage the bottle and your sterilizer.

Assistant's Instrumentation

This section provides detailed information related to service, maintenance, and adjustment of the A-dec assistant's instrumentation.

Contents

- Assistant's Instrumentation Service, Maintenance, and Adjustments, page 43
- Instrument Holders, page 43
- Air Vacuum System (AVS), page 43
- HVE and Saliva Ejector Right/Left Conversion, page 44
- Solids Collector, page 44



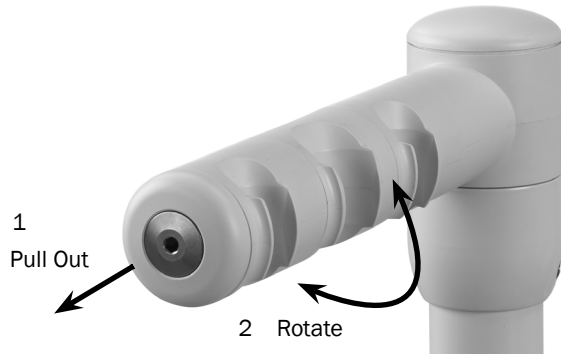
Assistant's Instrumentation Service, Maintenance, and Adjustments

Instrument Holders

The instrument holders rotate independently to allow customized positioning for each instrument (with the auto-air holder option, the holders rotate only as a set). Pull the holder slightly away from the adjacent one, rotate to the desired position, and then release. To adjust as a complete set, pull from the holder closest to the touchpad.



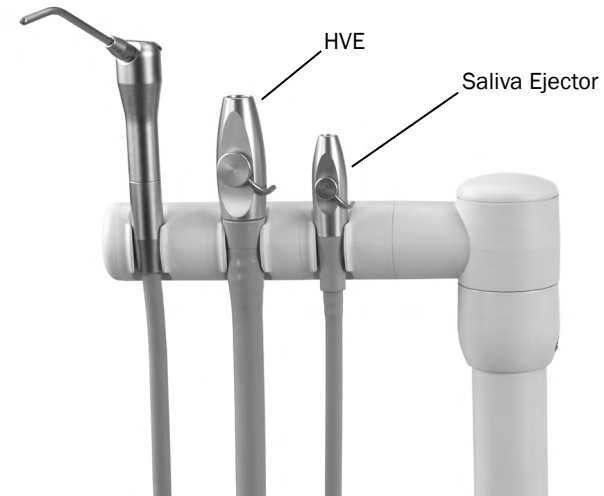
CAUTION Twisting the holder without pulling it away from the adjacent one will damage the mechanism.



Air Vacuum System (AVS)

The optional Air Vacuum System (AVS) generates a vacuum using an air supply at 70 psi (483 kPa) minimum when a central vacuum system is not available. It also separates moisture and air that flows through the system and discharges them through a drain and air outlet.

On AVS-equipped systems, the assistant's instrumentation includes a feature called auto-air switching. Auto-air switching activates the air vacuum generator when the instruments are removed from the holder. Lift the instrument and open the valve for normal operation. Return the instrument to its holder to turn off the vacuum.

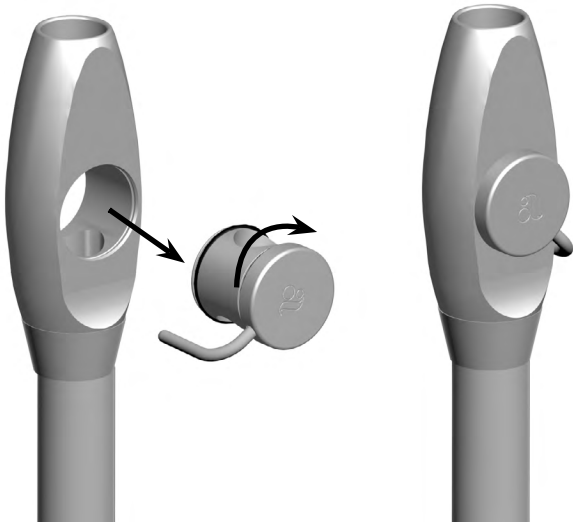


HVE and Saliva Ejector Right/Left Conversion

The A-dec HVE and saliva ejector can be converted for right- or left-handed operation. Push the control valve out of the HVE or saliva ejector valve body by pressing on the small diameter side. While holding the HVE or saliva ejector in its original position, rotate the control valve 180° and push it back into place.



NOTE Be sure to reinstall the valve on the same side of the valve body. Otherwise, the HVE or saliva ejector will not operate properly.



Solids Collector

The solids collector helps prevent solids from entering the central vacuum system. To ensure proper suction from the central vacuum and maintain proper treatment room asepsis, discard and replace the solids collector screen at least twice a week.



TIP To obtain replacement solids collector screens, contact your authorized A-dec dealer and reference Pinnacle p/n 5500.



Danger

BIOHAZARD Biohazard from dental equipment can result in life threatening disease to patients and staff. Use appropriate precautions including PPE (Personal Protective Equipment), barriers, disinfectant, and sterilization to minimize exposure hazard.

To replace the solids collector screen:

1. Turn off the vacuum or open the HVE control valve.
2. Remove the solids collector cap.
3. Remove the solids collector screen.
4. Discard the screen according to your local regulations.

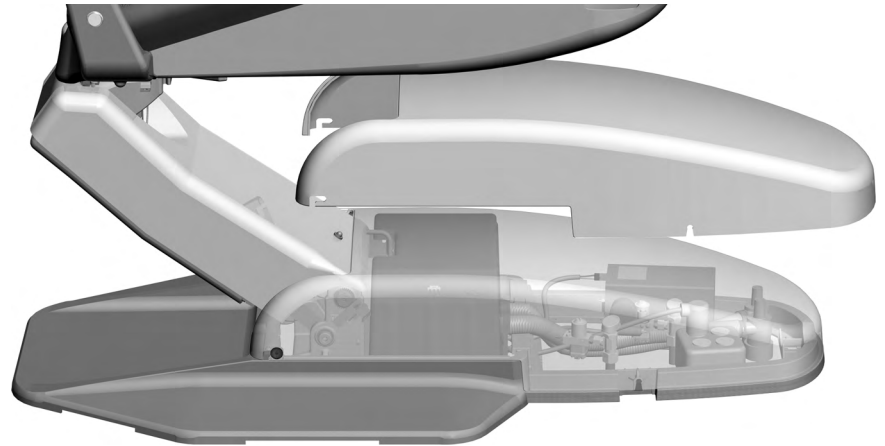


Utilities

This section provides detailed information related to service, maintenance, and adjustment of the A-dec Performer utility area.

Contents

- Utilities and Shutoff Valves, page 46
- Tubing Connections, page 47
- Floor Box Utility Connections, page 48



Utilities and Shutoff Valves

The utilities for A-dec chair-mounted delivery systems are located in the contoured floor box under the chair. To access, lift the cover up and off the floor box frame.

Air and water pass through separate filters before entering the regulators. Replace these filters when they become clogged and restrict flow.

To check for a clogged water filter:

1. Turn on the master toggle.
2. While watching the cuspidor, press the bowl rinse button. If the bowl rinse water pressure fades or if the water flow stops, replace the water filter.

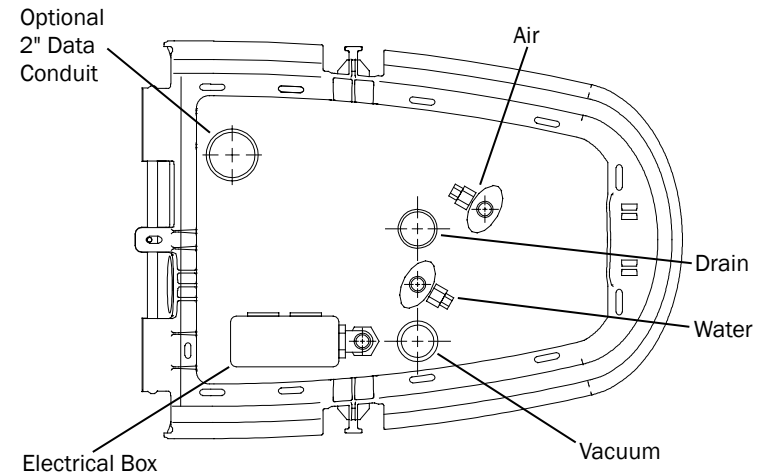
To replace the filter:

1. Turn off the master toggle and close the shutoff valves (turn clockwise).
2. Bleed the system of air and water pressure by operating the syringe buttons until air and water no longer flow.
3. Using a standard screwdriver, remove the filter housing from the water pre-regulator assembly and remove the filter.
4. Replace the filter if it is clogged or discolored. Install the filter with the beveled edge facing the manifold.

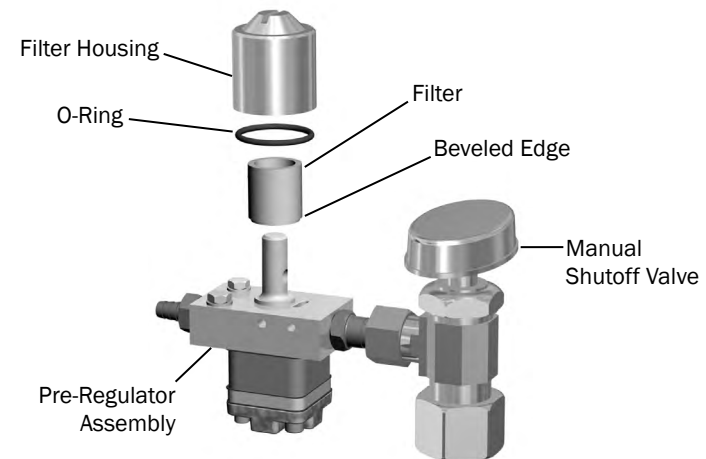


CAUTION To ensure proper operation, install the filter with the beveled edge facing the manifold.

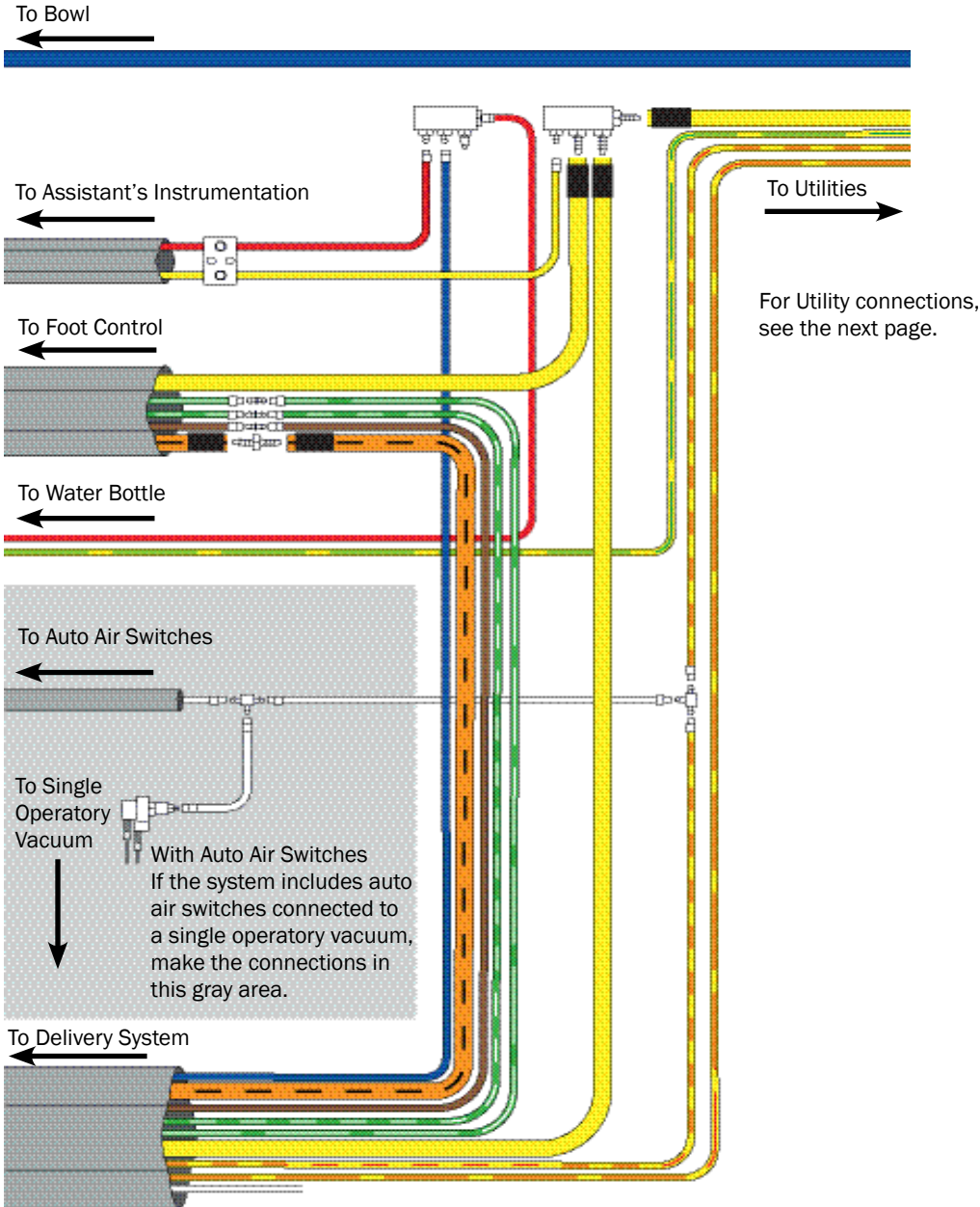
5. Open the shutoff valves, turn on the master toggle, and operate the bowl rinse to remove air from the waterline.



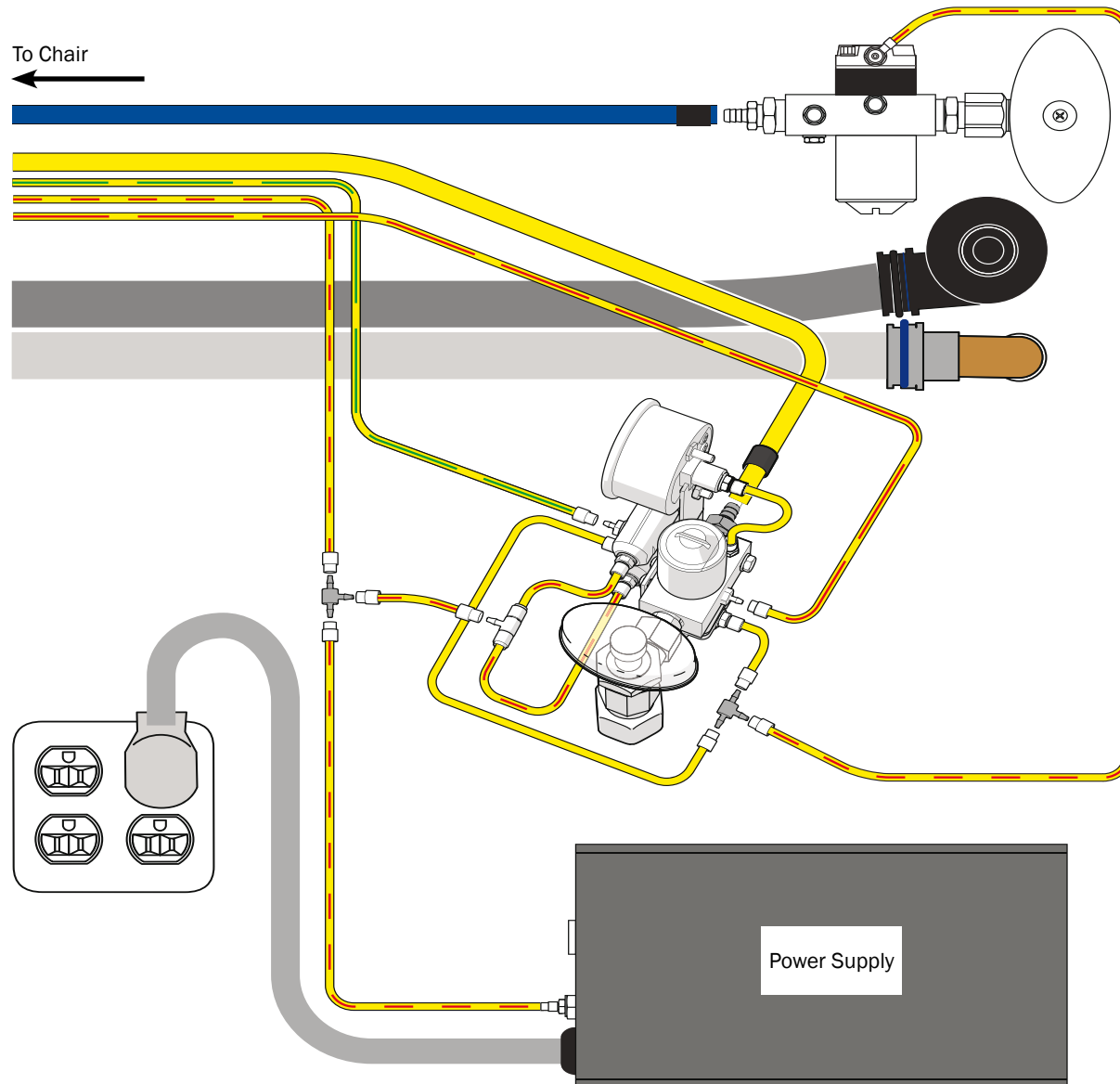
CAUTION When removing or replacing covers, take care not to damage any wiring or tubing. Verify that the covers are secure after replacing them.



Tubing Connections



Floor Box Utility Connections



Performer Dental Light

This section provides detailed information related to service, maintenance, and adjustments of the A-dec Performer Dental Light.

Contents

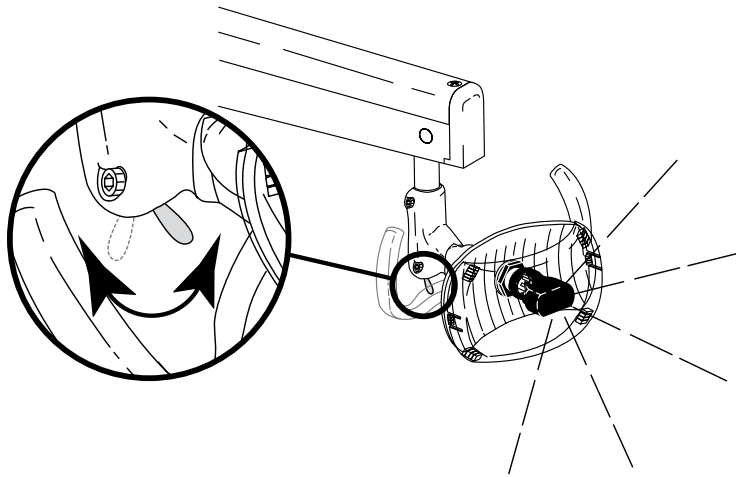
- Dental Light On/Off Toggle, page 50
- Light Head Positioning, page 50
- Performer Dental Light Service, Maintenance, and Adjustments, page 51



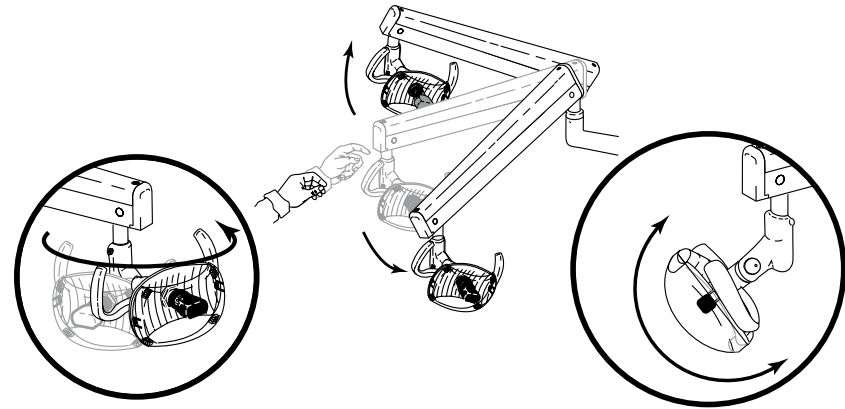
NOTE If an A-dec light other than the Performer Dental Light is installed, refer to the *A-dec Dental Lights and Monitor Mounts Service Guide* (p/n 86.0326.00) for service information.

Dental Light On/Off Toggle

To turn on the dental light, flip the toggle switch on the bottom of the light. The light turns on in high intensity mode. Use the touchpad to change the intensity.



Light Head Positioning



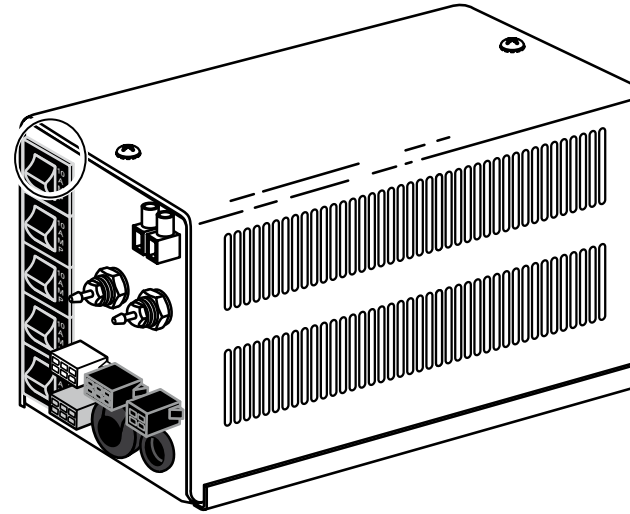
For information on touchpad controls, see "Dental Light" on page 19.

Performer Dental Light Service, Maintenance, and Adjustments

Contents

- Circuit Breaker Location, page 51
- Performer Dental Light Adjustments, page 52
- Dental Light Bulb Replacement, page 53
- Performer Dental Light Wiring Diagram, page 54
- Dental Light Relay Circuit Board, page 55

Circuit Breaker Location



Under abnormal conditions, the dental light circuit breaker interrupts the flow of electricity. If the circuit breaker should trip, inspect the wiring to ensure there are no shorts, and reset by pushing the circuit breaker. The circuit breaker for the dental light is located on the power supply.

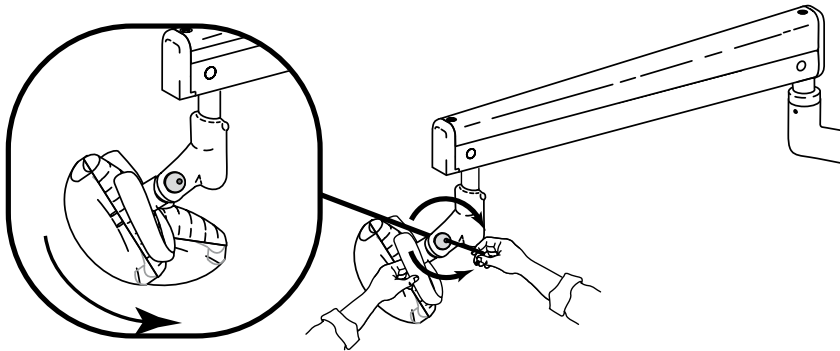
Performer Dental Light Adjustments



NOTE If your system has a different dental light, refer to the *Instructions for Use* that shipped with the light for adjustment instructions.

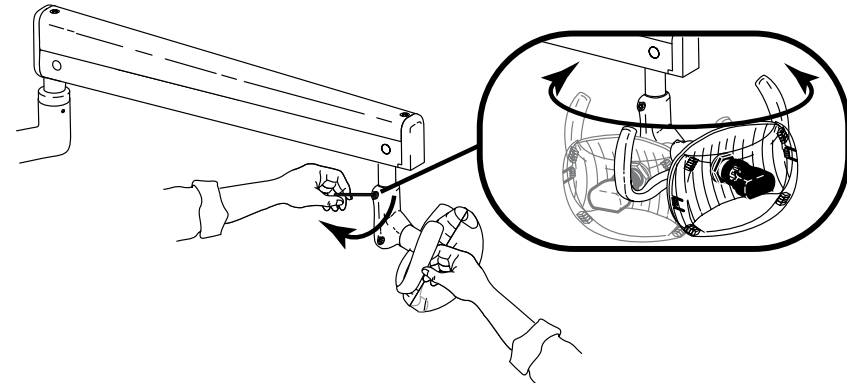
Adjust the Vertical Tension

Adjust the screw closest to the light head to change the vertical tension. Turning the screw clockwise increases the tension.



Adjust the Horizontal Tension

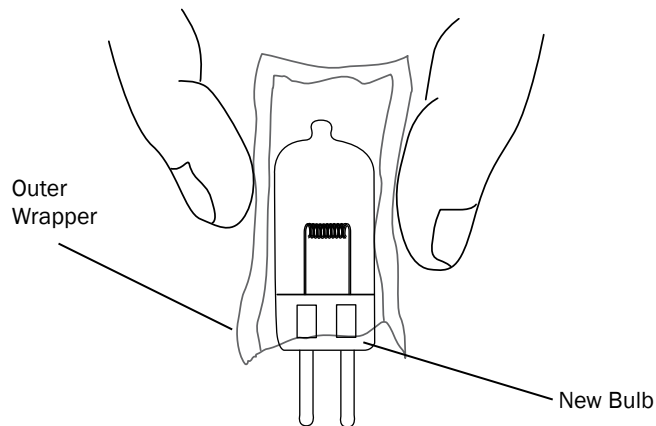
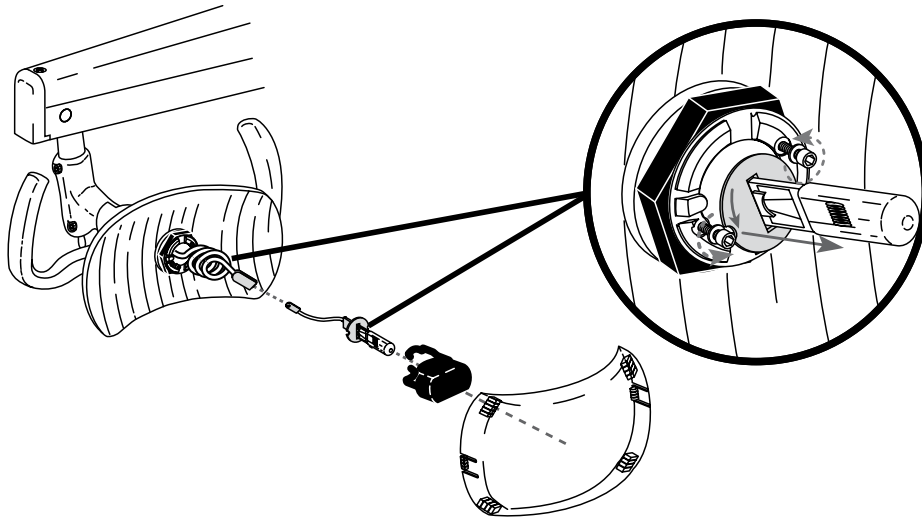
Adjust the screw closest to the flexarm to change the horizontal tension.



Adjust the Pivot Point Tension

If the dental light drifts, adjust the pivot point tension on the rigid arm. See “Adjust the Back-Mount Delivery System or Dental Light Tension” on page 30 or “Adjust the Front-Mounted Delivery System or Dental Light Tension” on page 31.

Dental Light Bulb Replacement



Follow these steps when replacing the dental light bulb:

1. Turn the light off and allow it to cool.



WARNING To avoid burning your fingers, allow the bulb to cool before removing. Never operate the dental light with the light shield removed. The clear shield contains UV blocking additives and is also your protection in the unlikely event that the bulb shatters.

2. Hold the light shield and gently pull on one shield tab while pulling the shield away from the reflector. Set the light shield aside.
3. Carefully grasp the legs of the black lamp shield and pull it away from the dental light.
4. Using a gauze pad or cloth to protect your fingers, carefully pull the old bulb from its socket. Discard the bulb.
5. Holding the new bulb in its outer wrapper, carefully insert the bulb pins into the socket. A small section of each pin is still visible when the bulb is fully seated.



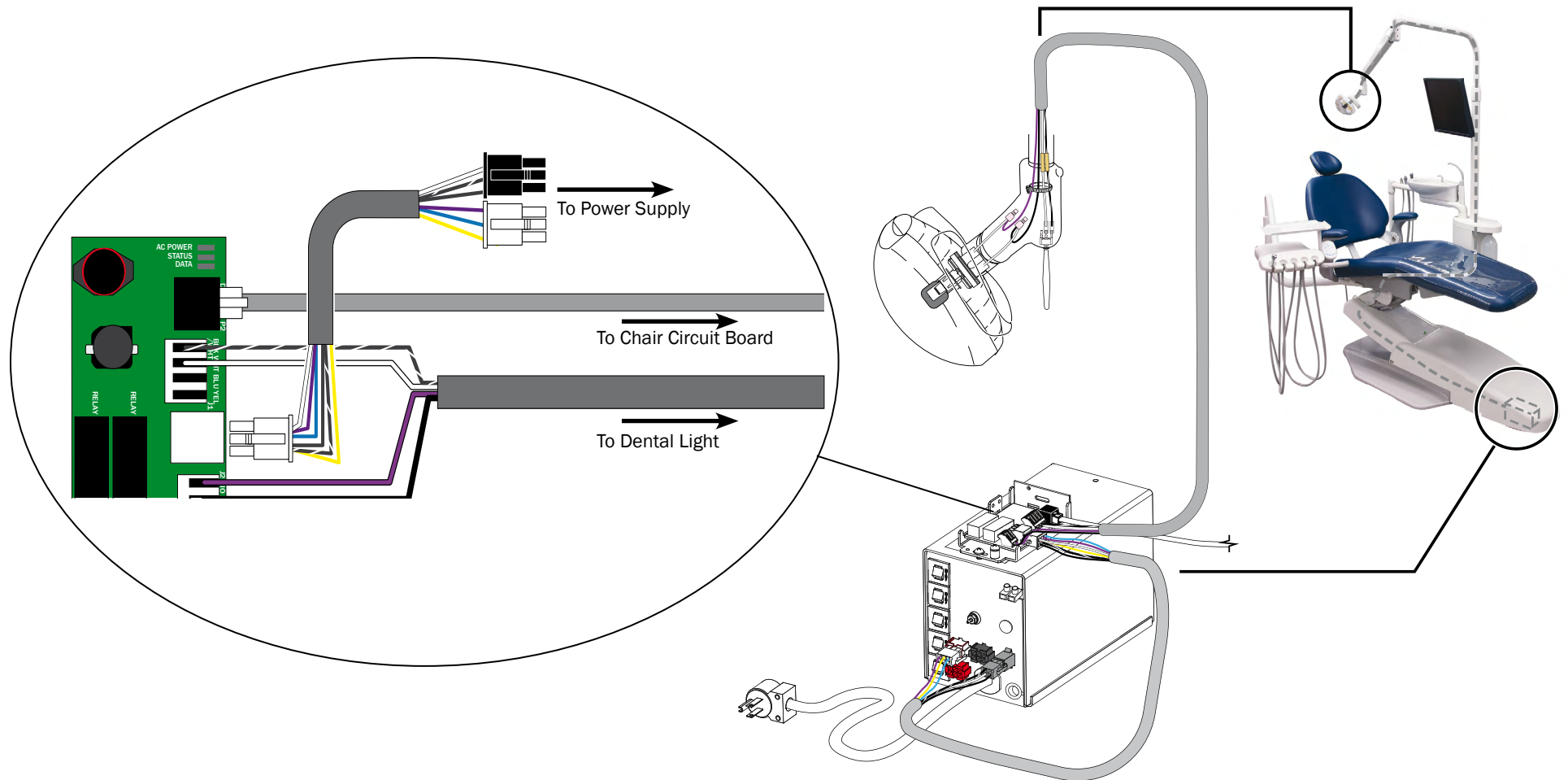
CAUTION Take care when handling the bulb. The bulb base is fragile and can break under excessive pressure. Do not remove the outer wrapper when handling the new bulb. Finger oils can affect light performance and severely limit bulb life. If you should inadvertently touch the bulb, gently clean it with cotton dampened with isopropyl or ethyl alcohol.



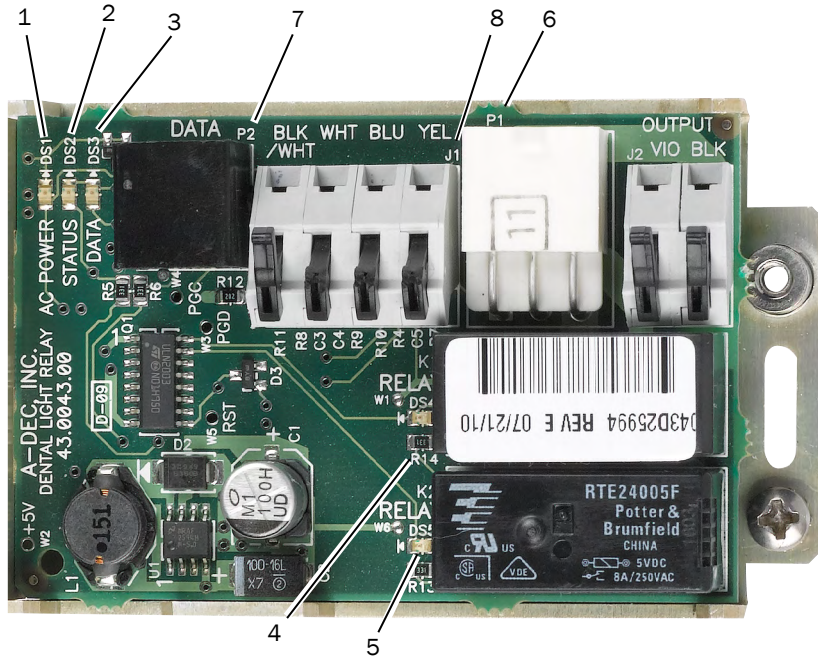
CAUTION Do not attempt to install the light shield if it has a broken tab. Contact your authorized A-dec dealer for a replacement shield and install it before operating the light.

6. Remove and discard the outer wrapper.
7. Reinstall the black lamp shield. Reinstall the light shield.
8. Verify the operation of the light by turning it on and operating it at each intensity setting.

Performer Dental Light Wiring Diagram



Dental Light Relay Circuit Board



Dental Light Relay Circuit Board Descriptions

Item	Description
1	DS1 - AC POWER
2	DS2 - STATUS
3	DS3 - DATA
4	DS4 - RELAY
5	DS5 - RELAY
6	P1 - Input Power
7	P2 - DATA
8	J1 - Toggle Switch Inputs

Dental Light Output Settings

Function	K1 (DS4)	K2 (DS5)	Output
Off	Off	Off	0 VAC
High intensity	On	Off	17 VAC
Composite intensity	Off	On	12 VAC
Medium Intensity	On	On	16 VAC

LED Identification

LED Status and Descriptions

LED	Status	Description
DS1 - AC POWER	Off	No 24 VAC power, tripped circuit breaker, power supply turned off, no line voltage
	Green, steady	24 VAC at the terminal strip
DS2 - STATUS	Off	System is not functioning, no power or circuit board has failed
	Green, steady	Normal operation
DS3 - DATA	Off	No DCS communication, not connected to the DCS, or DCS has failed
	Green, steady	Detects active DCS
	Green, blinking	Valid DCS message
DS4, DS5 - Dental Light Relay	Off, Off	Dental light off
	On, Off	High intensity
	Off, On	Composite intensity
	On, On	Medium intensity



CAUTION: Circuit boards are sensitive to static electricity. Electrostatic Discharge (ESD) precautions are required when touching a circuit board or making connections to or from the circuit board. Circuit boards should be installed only by an electrician or qualified service person.

Troubleshooting

The troubleshooting tables contain some common tips and troubleshooting information to assist in diagnosing problems.

Dental Chair Troubleshooting

Problem	Possible Cause	Action
Factory default test halts during the Base Up test, and the circuit board beeps one time	Input voltage could be low or outside the required range.	Verify that the input voltage and voltage selection resistors (100 - 120 VAC = R72) and R74 (220 - 240 VAC = R 73). If Base limit switch is activated, verify switch operation. If the motor thermal limiter is open, and the motor is hot, wait for the motor to cool off.
	Motor capacitor or Base Up solenoid are defective	Replace the motor capacitor or Base Up solenoid.
	Potentiometer is not changing voltage.	Verify the potentiometer LED illuminates when the base is moving. Check the potentiometer mechanical drive and electrical connections.
Chair base or back is stuck in full up position	The limit switch is not activated, or Down solenoid poppet is unable to open based on excess hydraulic pressure. Hydraulic lock has occurred	Correct Hydraulic Lock <ol style="list-style-type: none"> 1. Remove the motor/pump cover from the chair. 2. Fit a 9/16" open end wrench to the high pressure outlet port (either lift or tilt, whichever is in hydrostatic lock) of the hydraulic manifold. 3. Wrap a rag around both the fitting and the end of the wrench. The rag will absorb the small amount of fluid vented from the fitting. 4. Carefully loosen the fitting about one-half turn, counterclockwise, and re-tighten. 5. Cycle the chair a couple of times to verify it is no longer in hydraulic lock.
Factory default test halts during the Back Down test, and the circuit board beeps one time	Stop plate limit switch is activated	Verify switch operation.
	Stop plate is jammed	Remove and reinstall the stop plate.
	Back Down solenoid is defective	Test the solenoid and replace if needed.
	Back is in hydrostatic lock	See Correct Hydraulic Lock, above.
	Potentiometer is not changing voltage	Verify that the potentiometer LED is illuminated when the back is moving. Check the potentiometer mechanical drive and electrical connections.

Dental Chair Troubleshooting, continued

Problem	Possible Cause	Action
Factory default test halts during the Back Up test	Back up limit switch is activated	Verify switch operation.
	Back Up solenoid is defective	Test solenoid and replace if needed.
	Back is in hydrostatic lock	See Correct Hydraulic Lock above.
	Potentiometer is not changing voltage.	Verify potentiometer LED is illuminated when base is moving. Check potentiometer mechanical drive and electrical connections.
Factory default test halts during the Base Down test	Stop plate limit switch is activated	Verify switch operation.
	Base Down solenoid is defective	Test solenoid and replace if needed.
	Base is in hydrostatic lock	Correct Hydraulic Lock <ol style="list-style-type: none"> 1. Remove the motor/pump cover from the chair. 2. Fit a 9/16" open end wrench to the high pressure outlet port (either lift or tilt, whichever is in hydrostatic lock) of the hydraulic manifold. 3. Wrap a rag around both the fitting and the end of the wrench. The rag will absorb the small amount of fluid vented from the fitting. 4. Carefully loosen the fitting about one-half turn, counterclockwise, and re-tighten. 5. Cycle the chair a couple of times to verify it is no longer in hydraulic lock.
	Potentiometer is not changing voltage	Verify that the potentiometer LED is illuminated when the back is moving. Check the potentiometer mechanical drive and electrical connections.
Chair moves by itself when power is turned on	The jumper is in FACT DEFAULT position	Verify that the jumper is in the SPARE position.
	Short circuit in the touchpad or footswitch	Unplug the touchpad and footswitch; reset the circuit breaker. If the problem isn't repeated, the touchpad or footswitch may have shorted.
	Short circuit on the circuit board	Replace the circuit board.

Dental Chair Troubleshooting, continued

Problem	Possible Cause	Action
No power to chair or unit. Office still has power.	The chair is unplugged.	<ol style="list-style-type: none"> 1. Verify power is available at the outlet. 2. Plug chair in to power source.
	The Mains on/off button is in the off position.	Press the Mains On/Off button.
	Power supply circuit breakers CB1, CB2, CB3, CB4, CB5, or CB6 have tripped.	Refer to Dental Chair Circuit Board Components, page 8, for component identification. DS14 and DS15 on the chair circuit board indicate that 24 VAC power is present for distributed power. The AC Power LED, DS1, on the chair board indicates 24 VAC is present for the chair board and back motor. If DS1, DS14, or DS15 are off, verify that the respective circuit breaker is not tripped and reset if it is tripped.
No base up function. The motor relay clicks. Base LED (DS11) turns on. The chair back functions work.	Disconnected capacitor.	<ol style="list-style-type: none"> 1. Verify the base up relay clicks and the LED (DS11) on the chair circuit board is illuminated. 2. Turn power off if connected. 3. Check capacitor connections. 4. Reconnect cables.
	Chair base thermal limiter has been tripped.	The chair base motor should be limited to a 5 percent duty cycle. If the duty cycle is exceeded for a period of time, a thermal limiter will trip. The thermal limiter is located inside the base pump motor and will auto-reset after a few minutes.
	Chair base motor is disconnected.	Verify the motor is connected into the base motor connection (P11 on the circuit board). When base up is activated, the base motor relay should click and DS11 should be on. Verify that P12 is connected to the chair board (mains power from the power supply).
	Failed capacitor.	Replace the capacitor with one of correct voltage.
No base down. Relay clicks and DS12 LED illuminates	Failed base down solenoid coil.	<ol style="list-style-type: none"> 1. Check for magnetic pull while operating base down function. 2. Check for correct resistance value at solenoid connector: 38 Ohms (Ω) \pm 4 Ohms (Ω). 3. Replace solenoid. <p>WARNING The hydraulic system must be depressurized before removing the solenoid. To depressurize the hydraulic system, lower the chair base and back, and then move the failed solenoid coil and replace with the operating solenoid coil.</p> <p>NOTE When replacing a solenoid, wipe up any oil, and replace existing O-rings on the solenoid base.</p>
No chair movement from a touchpad, and the touchpad status A-dec logo icon and chair circuit board status LED (DS2) are illuminated, and the footswitch operates the chair	Touchpad DCS is interrupted.	<ul style="list-style-type: none"> • Connect a known good data line between the touchpad and the chair circuit board. • If the chair circuit board data LED comes on and the chair operates normally with the touchpad, check each data line in the system with the known good line until the bad DCS line is found. • If the chair circuit board data LED stays off, call customer service. <p>NOTE The data and power to the control head mounted touchpad are routed via the control head. Power is supplied using black/gray wires.</p>

Delivery System Troubleshooting

Symptom	Check	Possible Solution
Sputtering water from syringe and handpieces	The pickup tube.	If damaged, replace the pickup tube.
Intermittent water coolant to handpieces	The O-rings in the handpiece coupler.	If faulty, replace the O-rings.
	The water air coolant pressure.	If necessary, adjust the water or air coolant. See "Handpiece Coolant Adjustments" on page 33.
	The length of the water bottle pickup tube.	If too long, use diagonal cutters to shorten the tube.
	The pickup tube.	If damaged, replace the pickup tube.
Water leaks from a vent hole in the control block when a wet handpiece is in use.	The water coolant cartridge.	If damaged, replace the cartridge.
A handpiece drips water while in its holder.	The handpiece or coupler.	Remove the handpiece and coupler and retest the water coolant flow. If the dripping stops, replace the coupler O-ring or handpiece.
	The water coolant cartridge.	If faulty, replace the coolant cartridge.
Water stops when a handpiece is in use.	The control block diaphragm.	If faulty, replace the diaphragm.
Water leaks from the water coolant stem.	The O-ring on the water coolant stem.	If faulty, replace the stem.

Performer Dental Light Troubleshooting

Problem	Possible Cause	Description
Light does not work (light connected to chair circuit board).	The bulb has failed.	Check for voltage at the bulb socket, if voltage is present, replace the bulb. Check the color of the bulb, replace if discolored.
	The dental light circuit breaker, CB5, has been tripped or the power supply has failed.	<ul style="list-style-type: none"> If CB5 on the 300 W power supply is tripped, disconnect the dental light and reset the circuit breaker. If CB5 trips again, replace the power supply. Connect the dental light to the power supply and if CB5 trips, the dental light wiring harness or a switch is faulty. The dental light circuit breaker is near the power transformer. If the breaker is tripped, disconnect the dental light wiring harness from the transformer and reset the breaker. If the breaker does not trip, the dental wiring harness or a switch is faulty.
	The bulb socket is faulty (non-LED dental lights).	Replace the socket.
Light works from the touchpad(s) but not from the dental light switches.	Loose connection in the dental light wiring harness.	Verify that the wiring is connected properly. Check the connections at the dental light switches and terminals H5 and H6 on the circuit board.
Light head is loose or difficult to position.	Rotation tension screws are too loose or tight.	Adjust the appropriate axis tension.
Flexarm drifts.	Tension adjustment nut inside the flexarm is too loose or tight.	Adjust the flexarm counterbalance.
Light intensity is dim, inconsistent, or the color is distorted.	Reflector or light shield may be damaged (non-LED dental light).	Inspect the dental light shield and reflector for damage or contamination. Replace or clean as necessary. CAUTION: Abrasives, disinfectants or chlorine damage the shield and reflector. Refer to the Instructions for Use for cleaning instructions.
	The mains voltage is low.	Verify the mains voltage is within specifications: 100/110-120/220-240 VAC
Unsatisfactory light pattern.	Light is out of focus, reflector or light shield may be damaged.	<ol style="list-style-type: none"> 1. Focus the light. 2. Check the light shield for severe abrasions, and replace if necessary. 3. Clean the reflector and light shield.



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