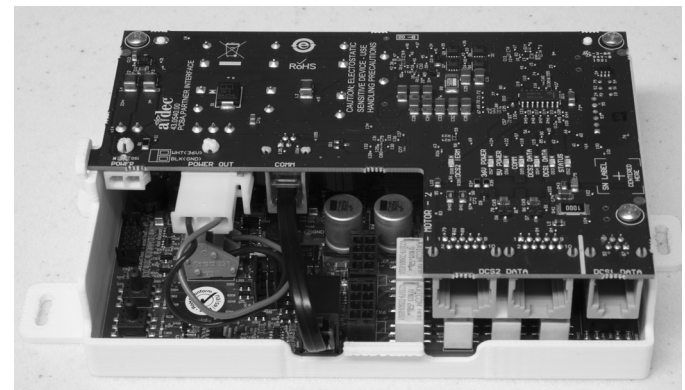
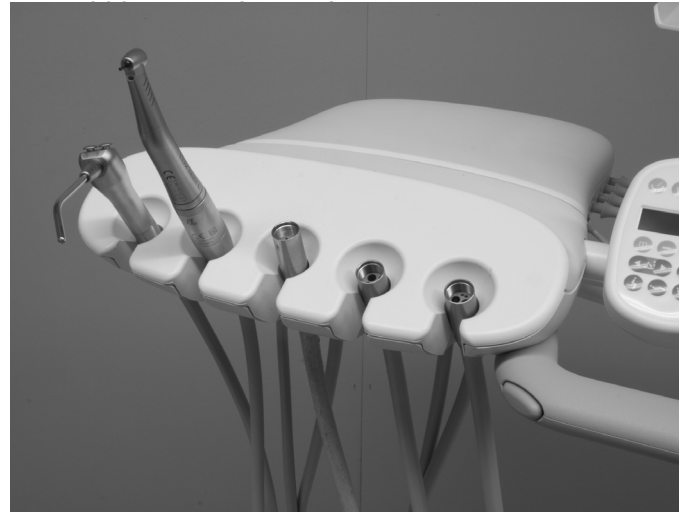


KaVo Electric Motor System

Contents

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A-dec 332/333/334 /335/336/342/ Performer B	2
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Product Models and Versions Covered in This Document

Models	Versions	Description
332/333/336/342	A	Delivery System
334/335	A/B	Delivery System
532/533/541	A/B	Delivery System
542	A	Delivery System
Performer®	B	Delivery System

Before You Begin

Important Information



NOTE KaVo electric motors are compatible only with the following revisions of A-dec touchpads:

- 300 deluxe touchpad Rev G or newer
- 500 deluxe plus touchpad

Recommended Tools

- Phillips head screwdriver
- Hex key set
- Anti-static wrist strap
- Diagonal cutters
- Hemostats

Installation Instructions by Delivery System Family

Go to the section for your type of system:

- A-dec 332/333/334/ 335/336/342/Performer B . . . 2**
- A-dec 532B/533B/541B 8**

A-dec 332/333/334/335/ 336/342/Performer B

Remove the Covers



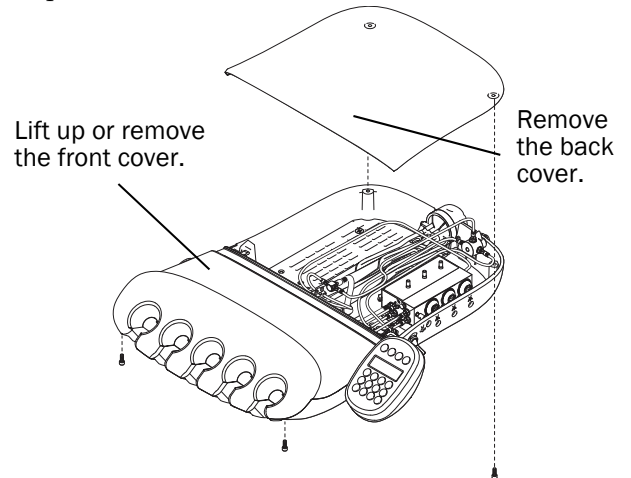
CAUTION Failure to turn off or disconnect the power before you begin this procedure can lead to electrical shock.

1. Turn off the power to the system.



CAUTION When you remove or replace the cover, take care not to damage any wiring or tubing. Verify that the cover is secure after you replace it.

2. Remove the delivery system covers.
 - (1) Use a 7/64" hex key to remove the screw securing the back cover.
 - (2) Remove the back cover.
 - (3) Use a 7/64" hex key to loosen the screws securing the front cover.
 - Traditional: Remove the front cover.
 - Continental®: Lift up the front cover.
3. If necessary, install the deluxe touchpad and Continental whip assembly. Follow the instructions provided in the kits that came with those components.

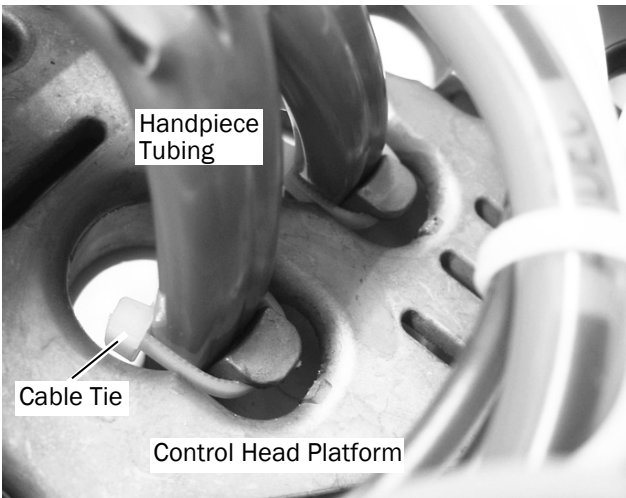


Install the Handpiece Tubing

332/334/336/342/Performer B 3
 333/335 3

332/334/336/342/Performer B

1. Route the tubing up through the bottom of the control head platform and into the control head.
2. Install a cable tie to serve as a strain relief, allowing enough slack to make adjustments in the tubing position.
3. Adjust the tubing length so it drapes evenly with the syringe tubing.
4. Tighten the cable tie to secure the tubing in place.

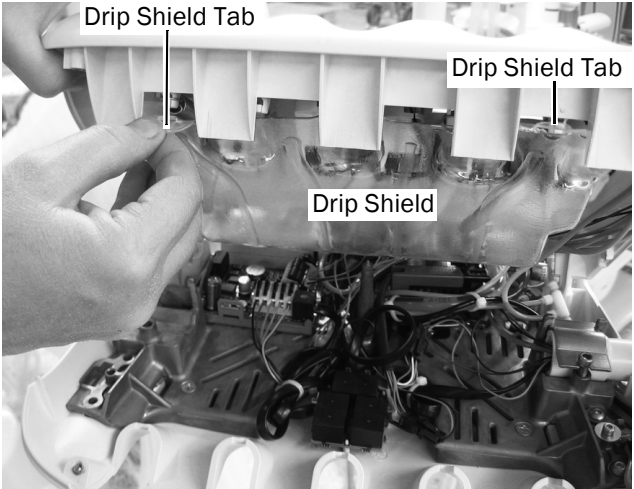


NOTE Do not over-tighten the cable ties around the handpiece tubing as this can restrict air and water flow.

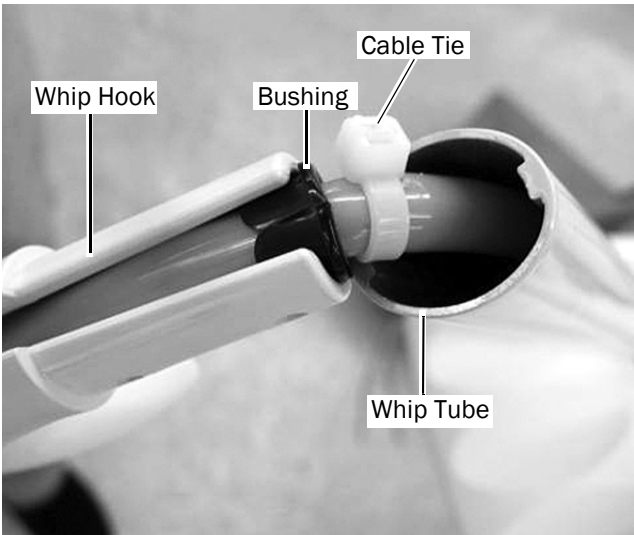
Next Step Continue with “Connect the Handpiece Tubing to the Control Block” on page 5.

333/335

1. Pull the drip shield down from the front cover to access the tubing.



2. Remove the whip hook. Insert the handpiece tubing into the whip tube and route it into the control head.
3. Squeeze the handpiece tubing into the whip hook. Adjust the length until it drapes evenly with the syringe tubing.
4. Install the black cable bushing and the cable tie.
5. Pull the tubing until the cable tie touches the cable bushing.
6. Reinstall the whip hook.

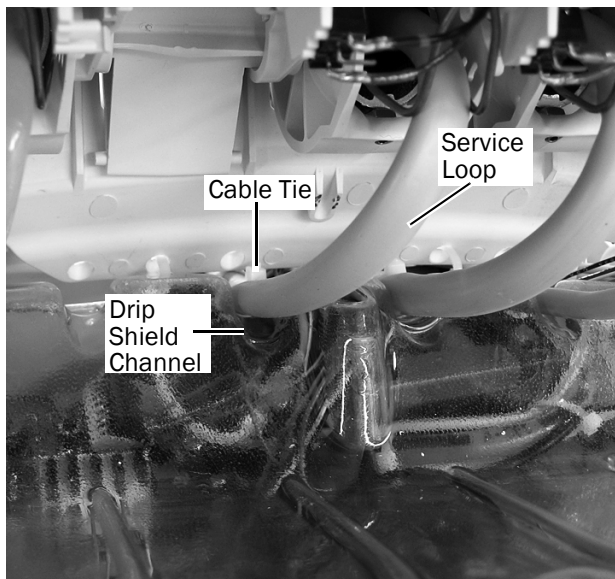


7. Use a cable tie to secure the tubing to the drip shield channel. Make sure to leave a service loop so the tubing does not kink. Trim the cable tie when finished.



NOTE Do not over-tighten the cable ties around the handpiece tubing as this can restrict air and water flow.

8. Reinstall the drip shield on the front cover.



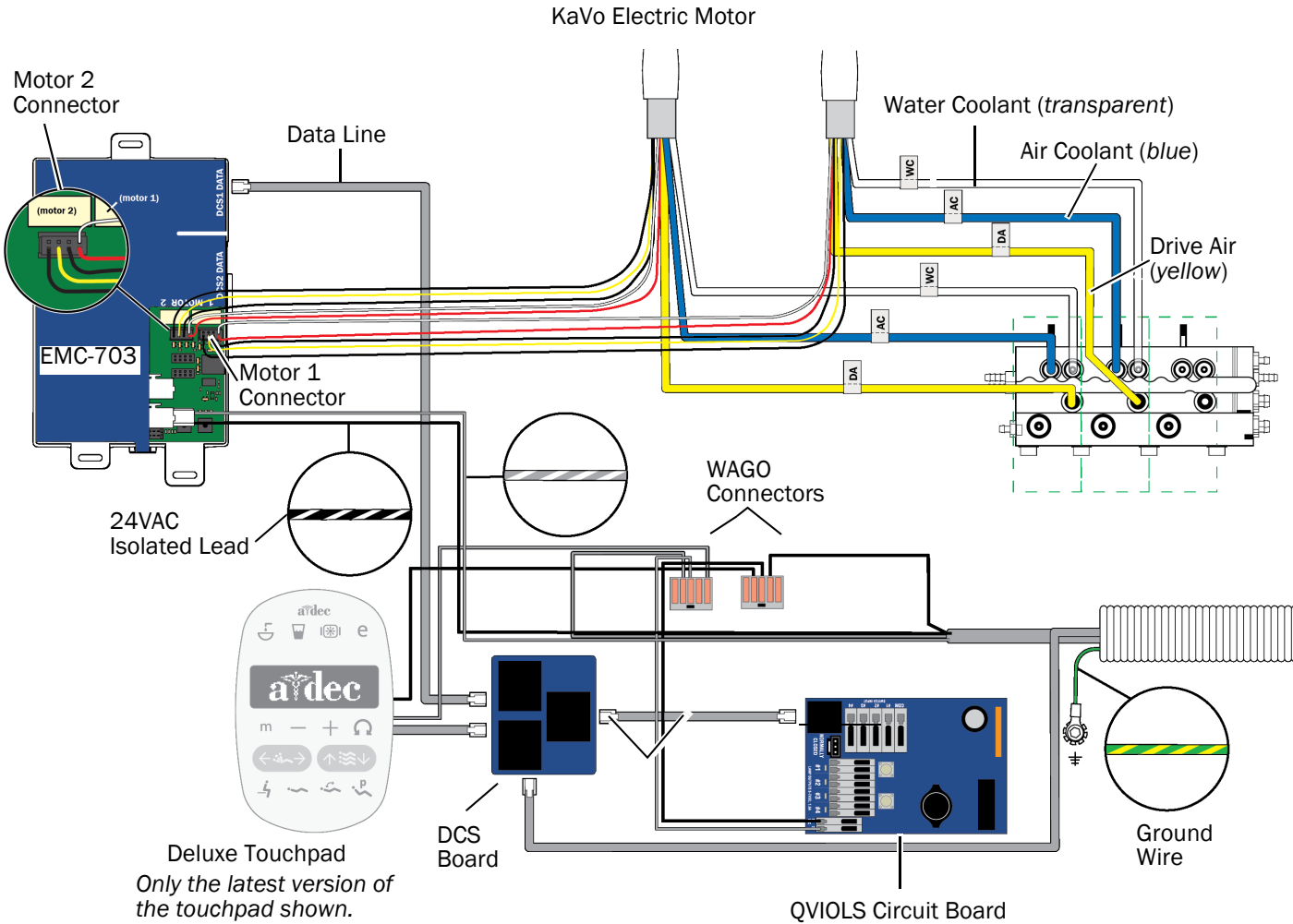
Next Step Continue with "Connect the Handpiece Tubing to the Control Block" on page 5.

Connect the Handpiece Tubing to the Control Block



CAUTION Ensure that no metal components cross over the control module when routing tubing and wires to it. Damage to the circuit board and electrical components may occur if metal components contact the control module.

Use the flow diagram below to study the tubing and wire connections before connecting the handpiece.
EMC-703 on A-dec 332/333/334/335/336/342/Performer B Flow Diagram





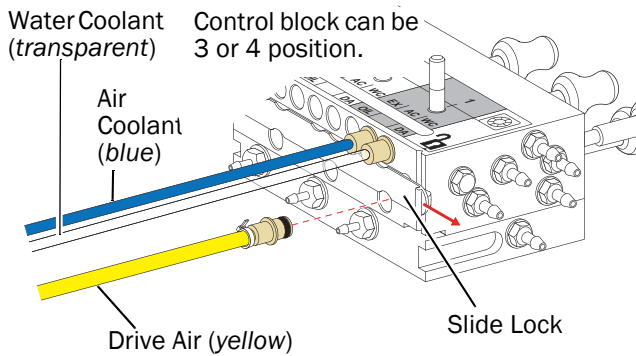
ATTENTION Circuit boards are sensitive to static electricity. Electrostatic Discharge (ESD) precautions are required when touching a circuit board or making connections to or from the circuit board. Circuit boards should be installed only by an electrician or qualified service person.

1. Secure a grounding strap to your wrist and the other end to a grounding location in the control head.
2. Open the slide lock and connect the handpiece tubing to the appropriate position on the control block.
 - Yellow tubing to drive air port.
 - Blue tubing to air coolant port.
 - Transparent tubing to the water coolant port.



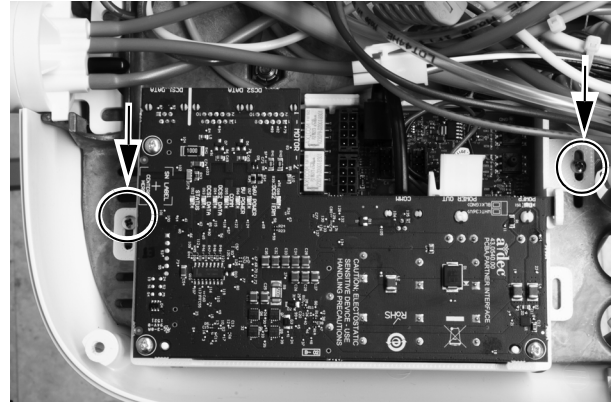
NOTE Do not trim the handpiece tubing. Carefully coil the tubing in the control head for future use and servicing.

3. Close the slide lock.

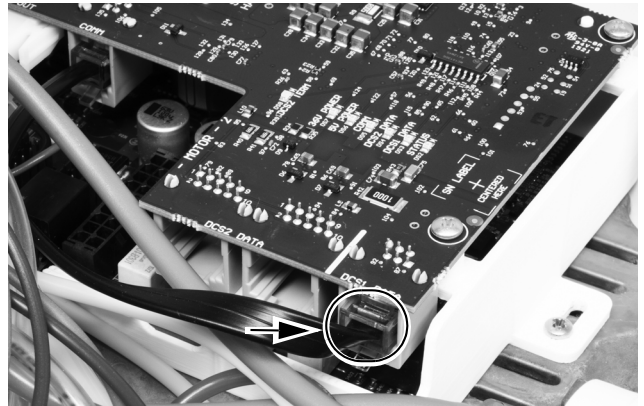


Install the Control Module and Connect the Wires

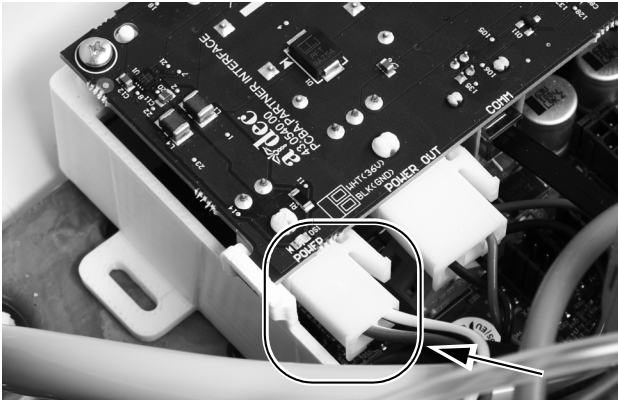
1. Position the control module in the rear of the control head.
2. Use two self tapping screws to mount the control module to the control head.



3. Plug the data line into the control module and into the DCS board.

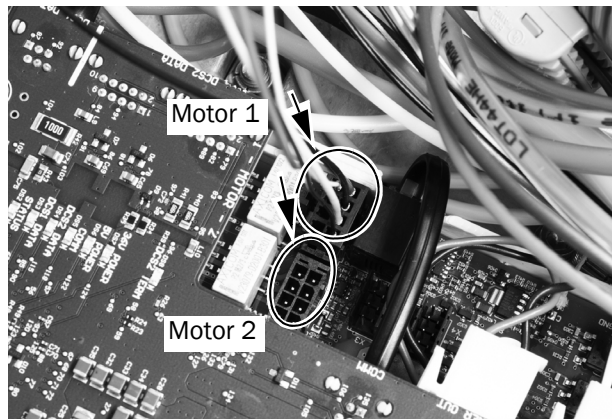


4. Plug in the AC power.



5. Plug in the electric motor's wire connectors into their positions on the control module.

NOTE For a single motor on the KaVo control module, use the Motor 1 connectors. If installing two motors, use the Motor 1 connectors for the first motor and the Motor 2 connectors for the second motor.



6. Use the designated screw to secure the strain relief.



Program the A-dec 300 Deluxe Touchpad



1. Turn on the power to the system.
2. To enter **System Setup**, press the **m** and **e** buttons at the same time for three seconds and then press **→**.

NOTE Use the minus **—** or plus **+** buttons to change menu options. Press **→** to make a selection.

3. In the **System Setup** menu, select **Handpieces**.
4. Select **Holder Setup**.
5. On Traditional systems, lift the motor. On Continental systems, pull the whip forward.
6. Select **Electric**.
7. Select **Motor Number 1** (position 1 on the control module).
8. Select the motor type.
9. Set the installed cable length and save the settings. You should hear three beeps. Move the whip back or return the motor to its holder.
10. For systems with two electric motors, repeat steps 3 through 9 and select motor number 2.
11. Press **←** until the A-dec logo appears, indicating that you are no longer in the **System Setup** menu.

Next Step Continue with "Adjust and Test" on page 33.

A-dec 532B/533B/541B

Turn off the Power



CAUTION Failure to turn off or disconnect the power before you begin this procedure can lead to electrical shock.

1. Use the master toggle to turn off the power to the system.



NOTE The master toggle for the 541 is located under the work surface.



Prepare the System

532B	8
533B	11
541B	15

532B

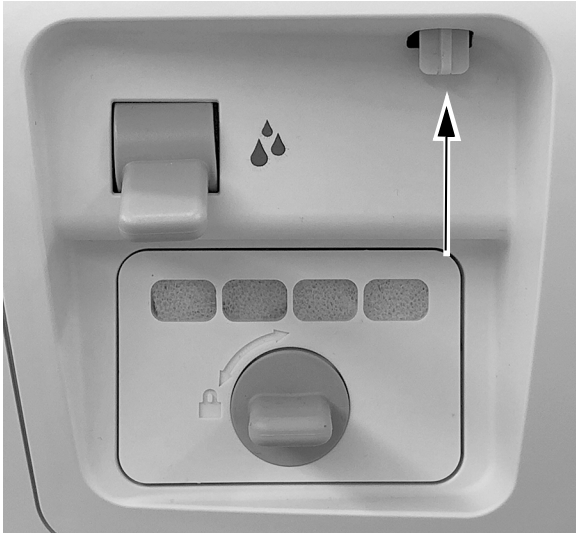
1. Swivel the touchpad to the side.





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

2. Push up on the cover release at the back of the control head.

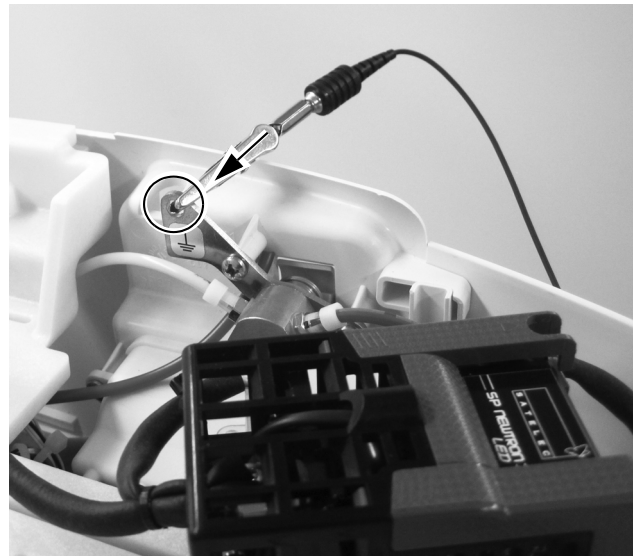


3. Lift the top cover off the control head.

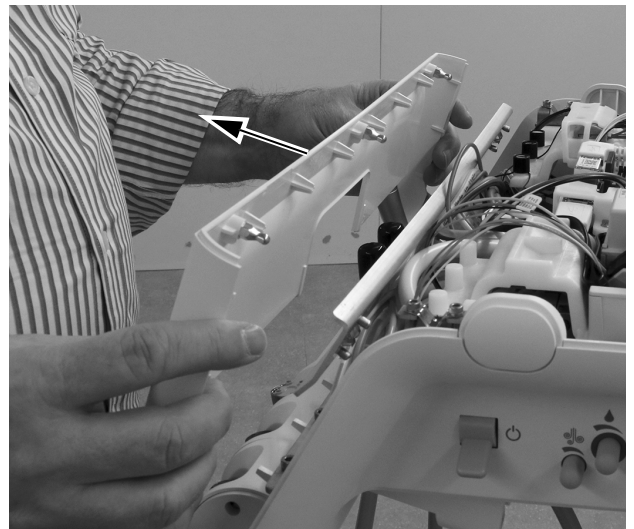


ATTENTION Circuit boards are sensitive to static electricity. Electrostatic Discharge (ESD) precautions are required when touching a circuit board or making connections to or from the circuit board. Circuit boards should be installed only by an electrician or qualified service person.

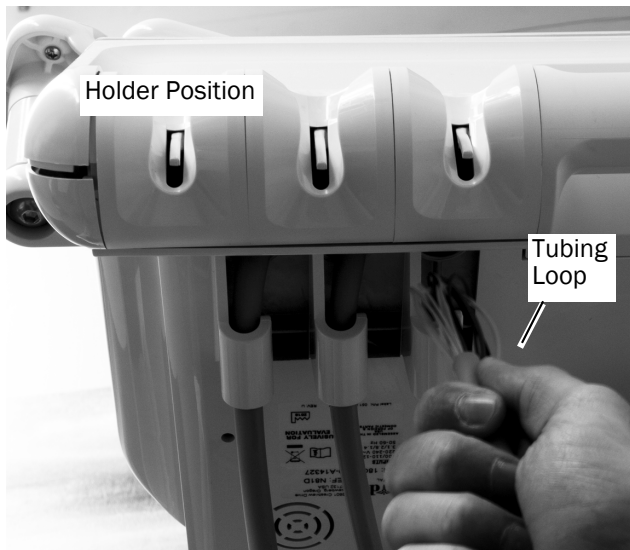
4. Secure a grounding strap to your wrist and connect the other end to the grounding lug mounted on the flush toggle at the back of the control head.



5. Pull the front cover off the control head.



6. Place the tubing in the appropriate holder.
7. Create a loop at the wire-end of the tubing so the sheath can be used to pull the tubing through the control head.



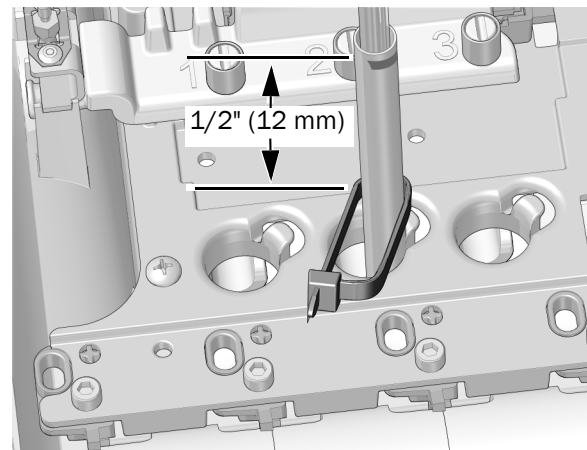
8. Adjust the drape of the tubing to match the drape of the other tubing on the control head and mark the tubing sheath about 1/2" (12 mm) above the chassis.



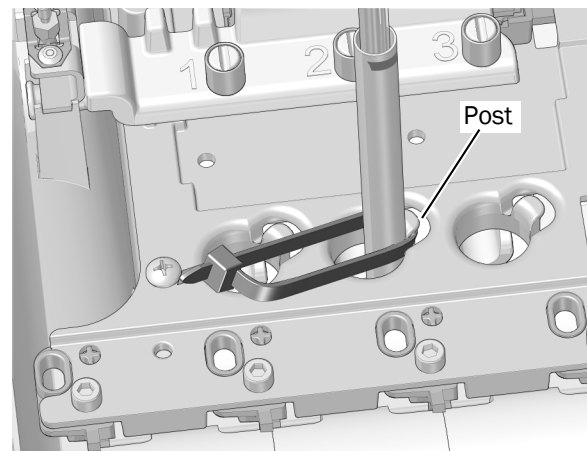
9. Cut off the tubing sheath at the mark.



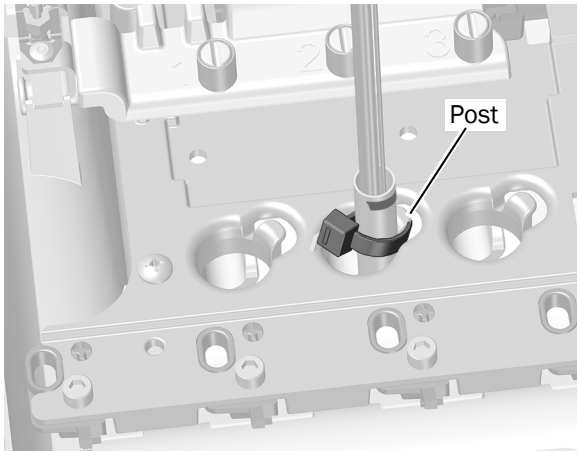
10. Insert the tubing up through the chassis. Place a cable tie around the tubing about 1/2" (12 mm) below the mark on the tubing. Do not tighten the cable tie until instructed. Leave a large loop as shown.



11. Position the cable tie loop around the post at the edge of the tubing hole in the chassis. Be sure the loop in the cable tie is behind the post.



12. Push the cable tie down so it is below the top of the post. Tighten the cable tie, ensuring the cable tie remains around the post. Cut off the excess cable tie.

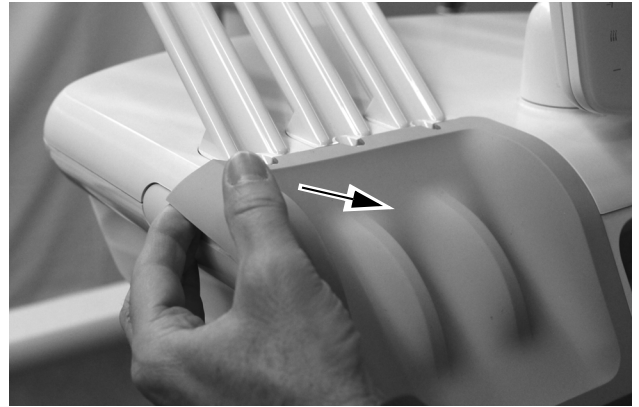


Next Step

Continue with "Route the Tubing and Wires" on page 16.

533B

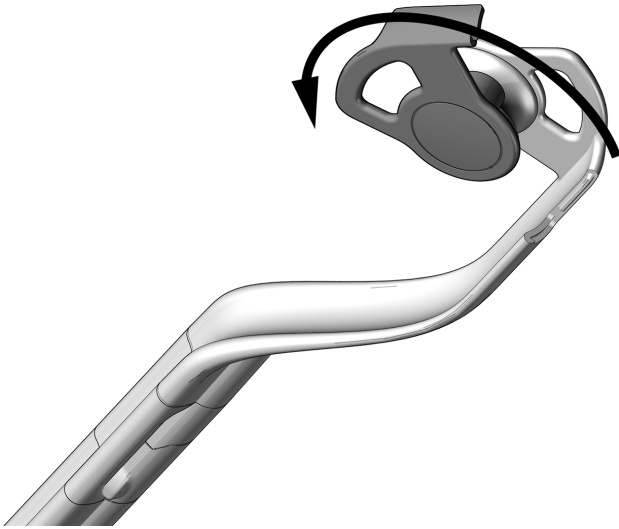
1. Lift the corner of the instrument pad on the side of the delivery system on which you are going to install the electric motor.



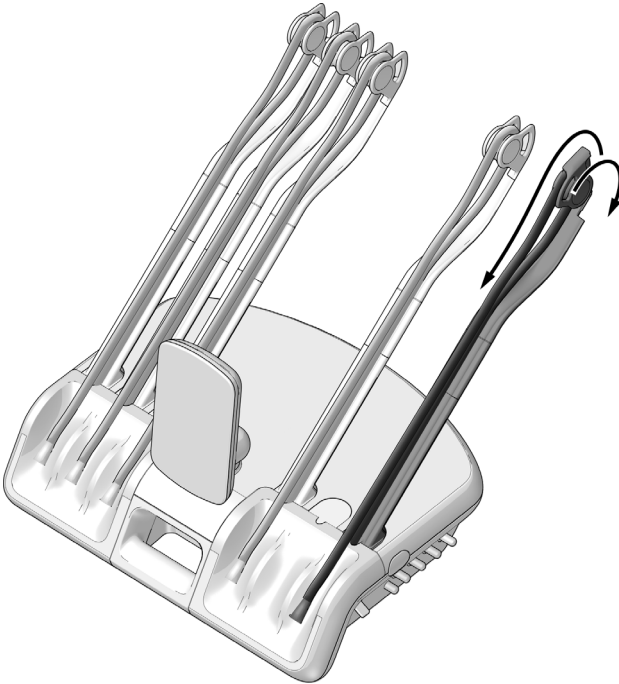
2. Carefully pull the instrument pad away from the control head.



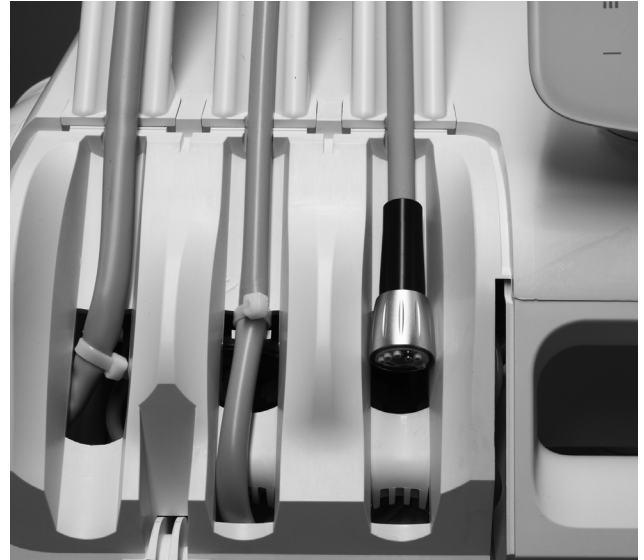
3. Rotate the side of the tubing guide forward.



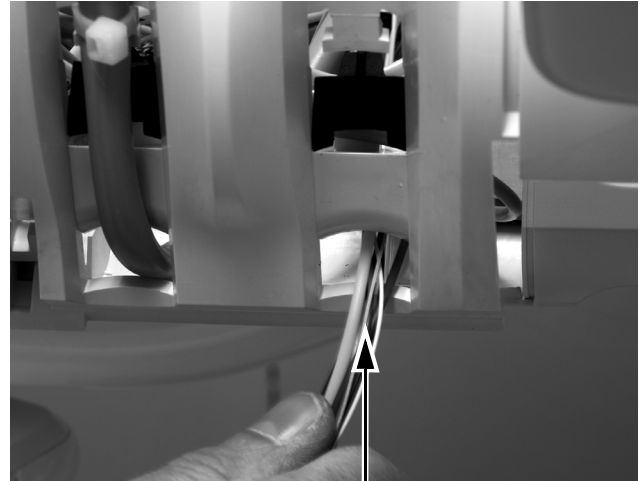
4. Route the tubing through the whip assemblies.
5. Close the tubing guide and make sure it snaps shut.

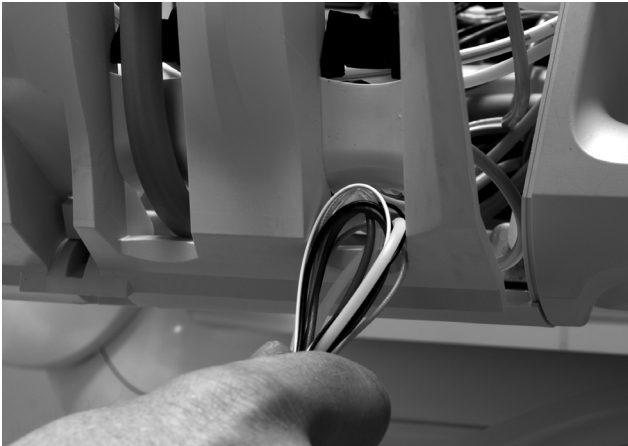


6. Place the handpiece and tubing onto the control head, adjusting the position of the handpiece tubing nut as shown.
7. Use a cable tie to secure the tubing as shown in the tubing in the middle position.



8. Insert the wires and tubing from the handpiece tubing into the bottom opening in the control head.



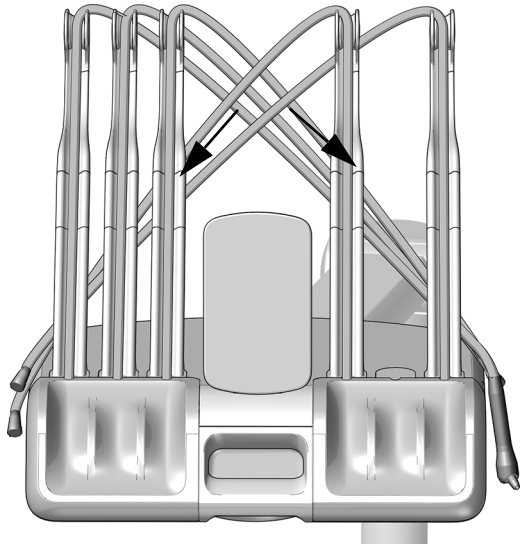


TIP Create a loop in the bundle to enable easier routing.



CAUTION To avoid damaging the syringe or other installed handpieces, be careful to lay each handpiece tubing behind the whips on the opposite side of the control head before you lift the top of the control head.

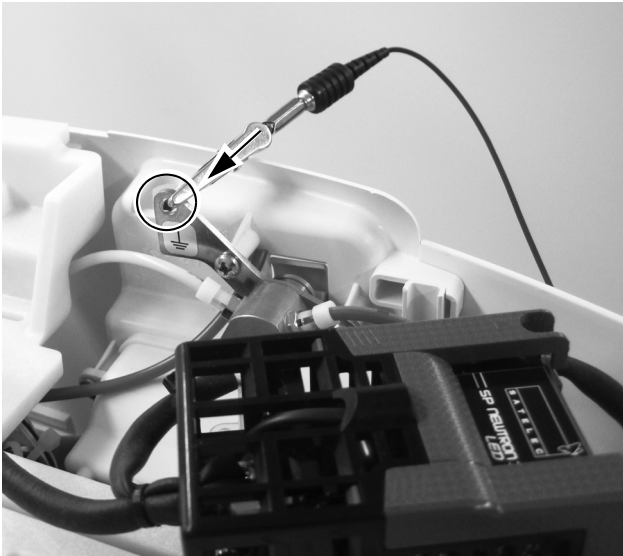
- 9. Push up on the cover release at the back of the control head and lift the top cover up from the control head and rotate the cover all the way forward.





ATTENTION 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.

10. Secure a grounding strap to your wrist and connect the other end to the grounding lug mounted on the flush toggle at the back of the control head.



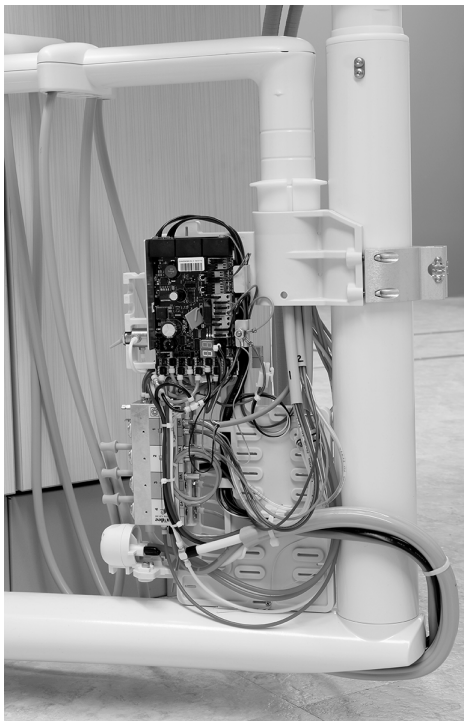
11. From the backside of the top cover, pull the handpiece tubing through the hole in the top cover.



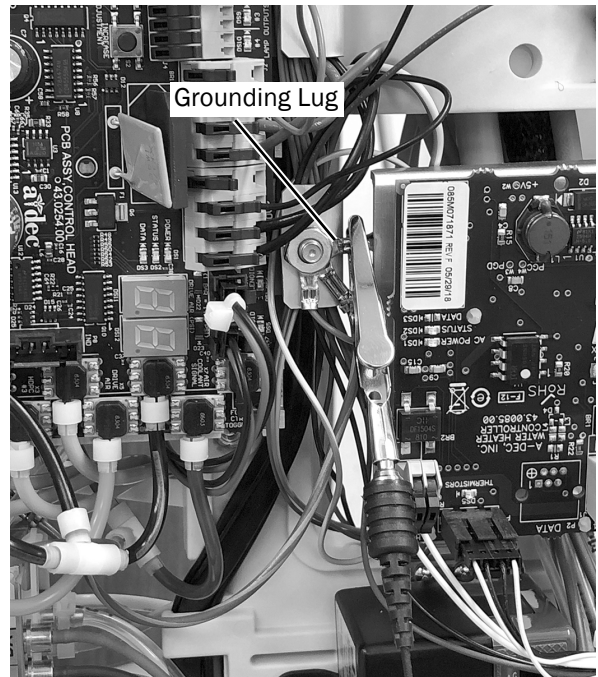
Next Step Continue with "Route the Tubing and Wires" on page 16.

541B

1. Pull the side covers out at the bottom and pull them away from the delivery system.



2. Place a grounding strap snugly on one wrist and connect the other end of the grounding strap to the grounding lug located near the edge of the control head circuit board.



Next Step

Continue with "Route the Tubing and Wires" on page 16.

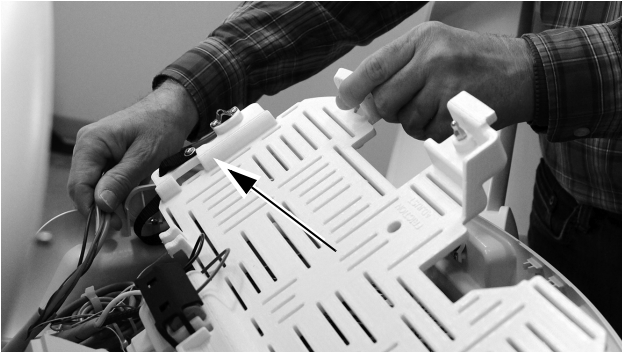
Route the Tubing and Wires

See the section for your delivery system:

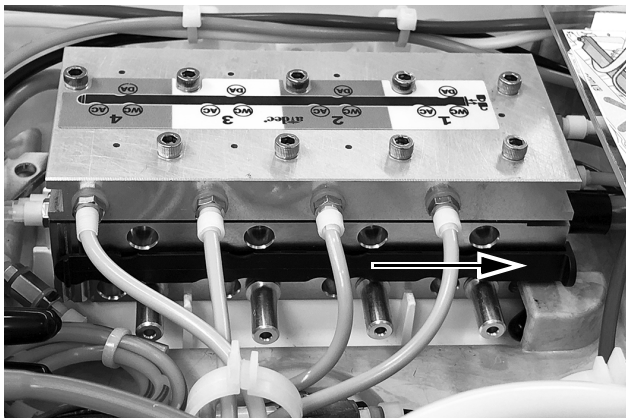
- 532B/533B** 16
- 541B** 17

532B/533B

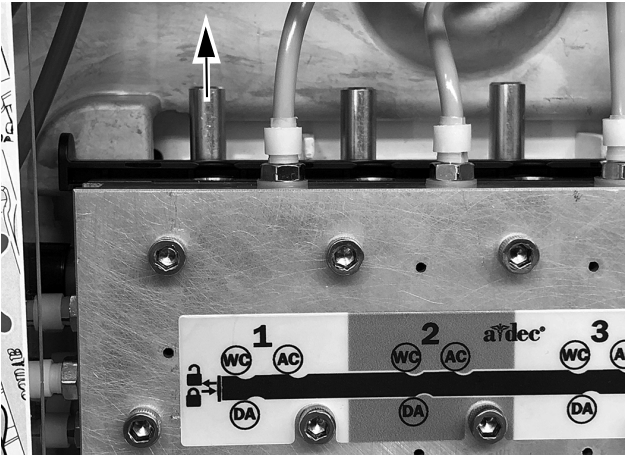
1. Rotate the module shelf all the way up.



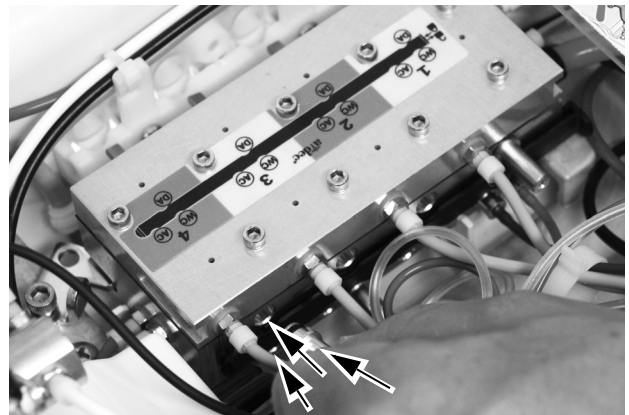
2. Route the tubing and wires from the handpiece tubing through the control head:
 - Air-coolant, water, and drive air tubing goes under the shelf. Use the loops as a guide for routing.
 - The wires go above the shelf.
3. Move the slide lock to the open position. In the open position, cutouts in the slide lock align with the ports in the control block.



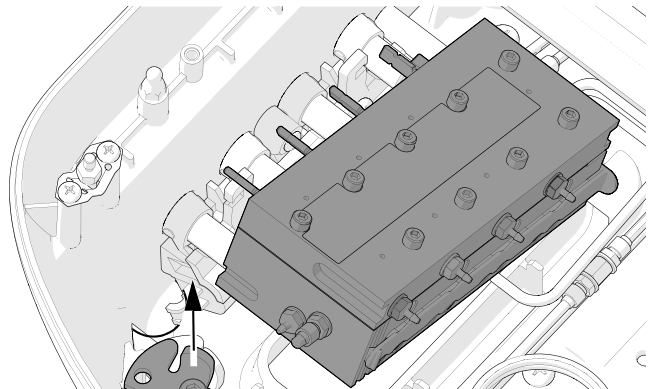
4. Remove the plug from the water coolant (WC) port on the control block at the desired location.



5. Connect the quick disconnect tubing to the appropriate positions on the control block for water coolant, air coolant, and drive air.



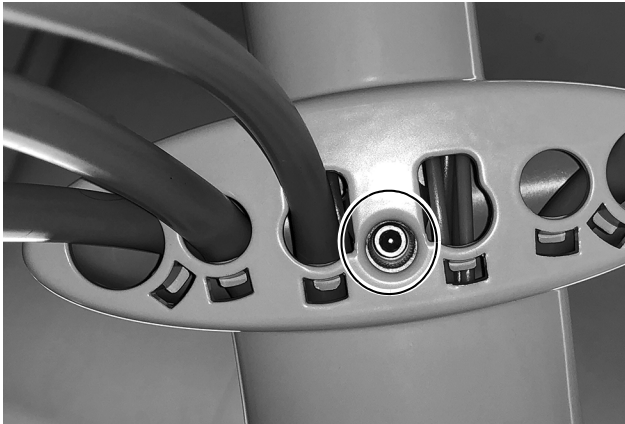
TIP Loosen the screw securing the lock to turn the control block on its side. To do this you must first remove the adjustment knobs from the side of the control head.



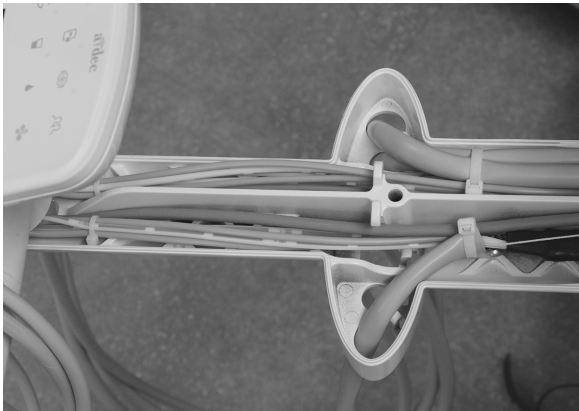
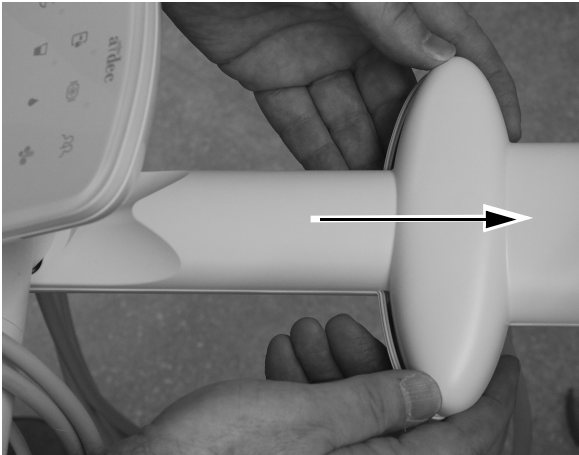
Next Step Continue with “Connect the Handpiece Tubing to the Control Block” on page 20.

541B

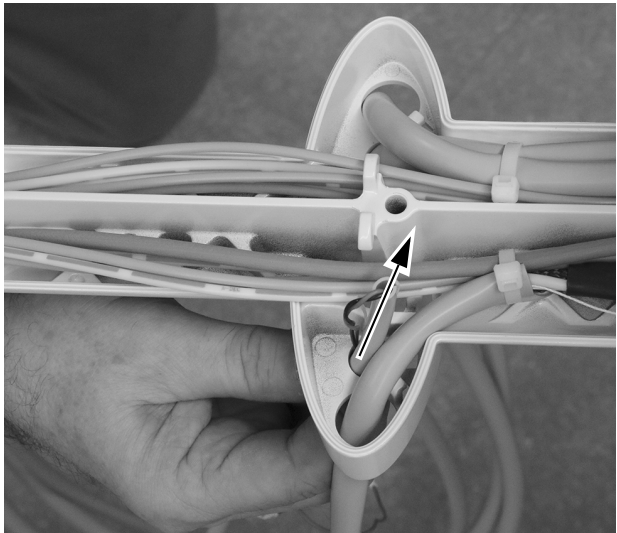
- 1. On the underside of the instrumentation arm, use a 5/32" hex key to remove the screw that secures the top cover on the instrumentation arm.



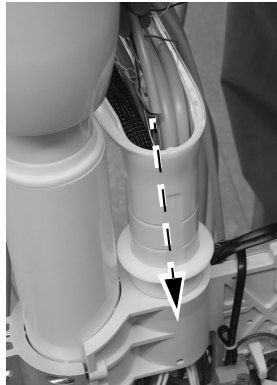
- 2. Slide the top cover away from the touchpad and remove the top cover.



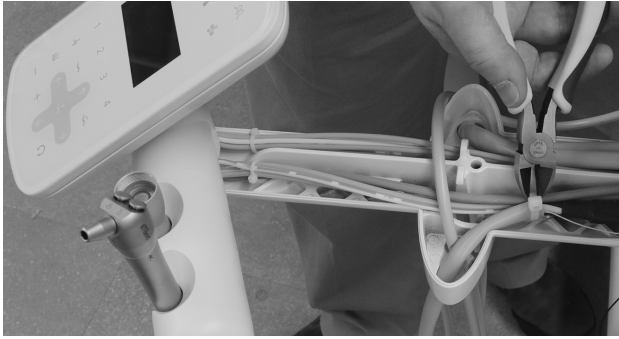
- 3. Identify an open hole in the instrumentation arm that will accommodate the tubing connector and insert the handpiece tubing up through the hole while pulling it through the arm.



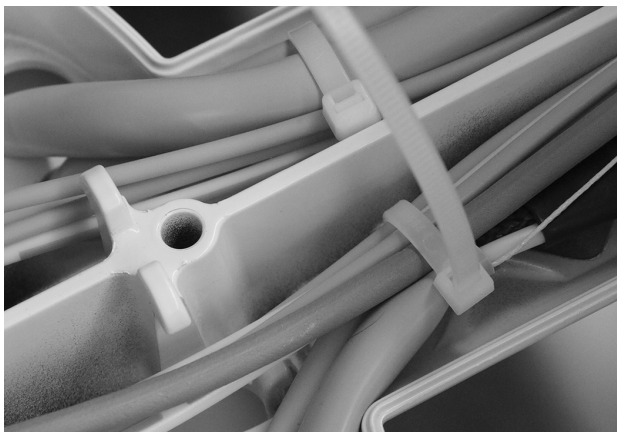
- 4. Pull the handpiece tubing up through the instrumentation arm and route it down through the vertical post of the arm.



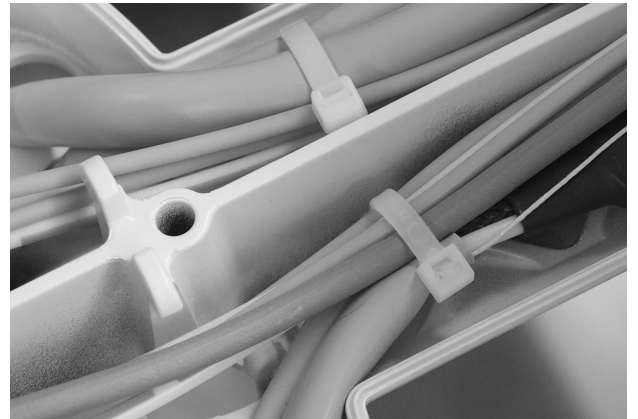
5. Use a pair of diagonal cutters to cut the cable tie that secures the handpiece tubing on the same side of the holder assembly as the handpiece will be installed.



6. Pull the handpiece tubing up through the instrumentation arm so that it matches the drape of other handpieces. Secure the tubing to the instrumentation arm by passing a cable tie through the cable tie hold down and wrapping it around the tubing.

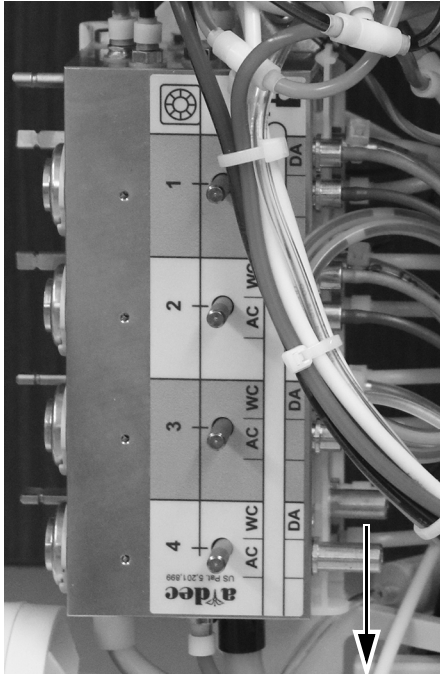


7. Tighten the cable tie so it is snug. Use diagonal cutters to trim the excess cable tie.

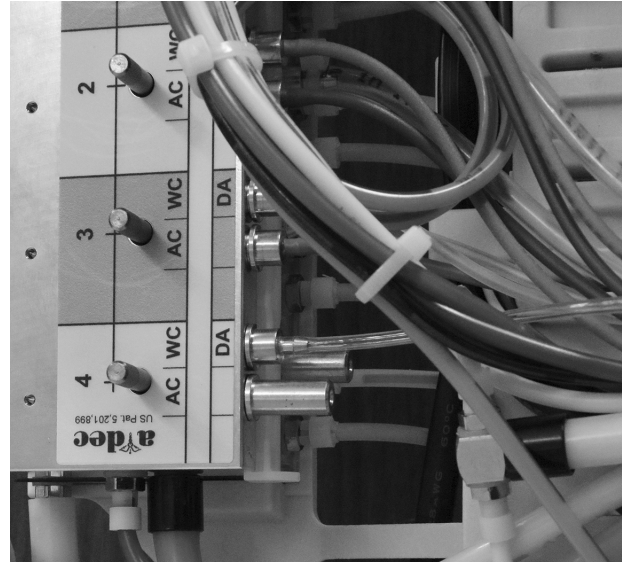


8. Route the tubing and wires from the handpiece tubing through the delivery system.

9. Move the slide lock to the open position. In the open position, cutouts in the slide lock align with the ports in the control block.



10. Remove the plug from the water coolant (WC) port on the control block at the desired location.



Next Step Continue with “Connect the Handpiece Tubing to the Control Block” on page 20.

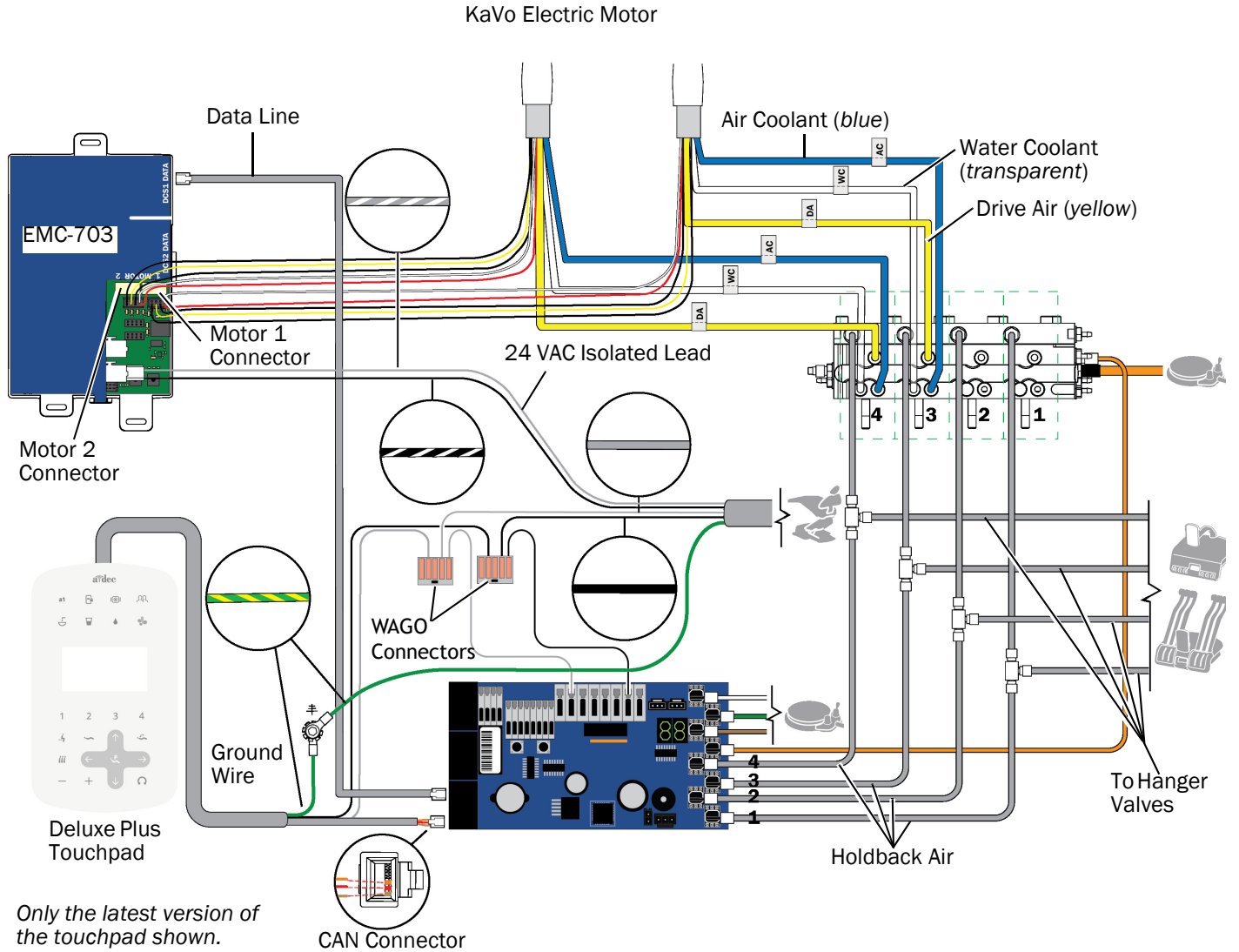
Connect the Handpiece Tubing to the Control Block



CAUTION Ensure that no metal components cross over the control module when routing tubing and wires to it. Damage to the circuit board and electrical components may occur if metal components contact the control module.

Use the flow diagram below to study the tubing and wire connections before connecting the handpiece.

EMC-703 on A-dec 532B/533B/541B Flow Diagram



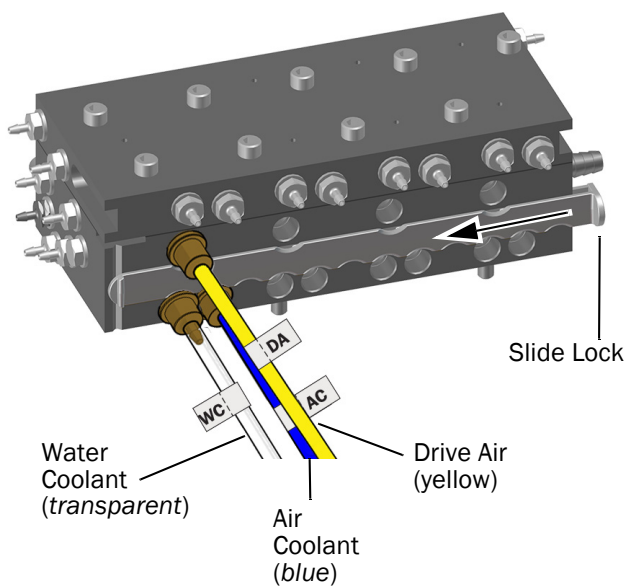
1. Use the labels on the tubing and the control block to connect the handpiece tubing to the appropriate positions on the control block.
 - Blue tubing to air coolant port.
 - Yellow tubing to drive air port.
 - Transparent tubing to the water coolant port.



NOTE Do not trim the handpiece tubing. Carefully coil the tubing in the control head for future use and servicing.

2. Close the slide lock.

Control Block for the 532B/533B Shown



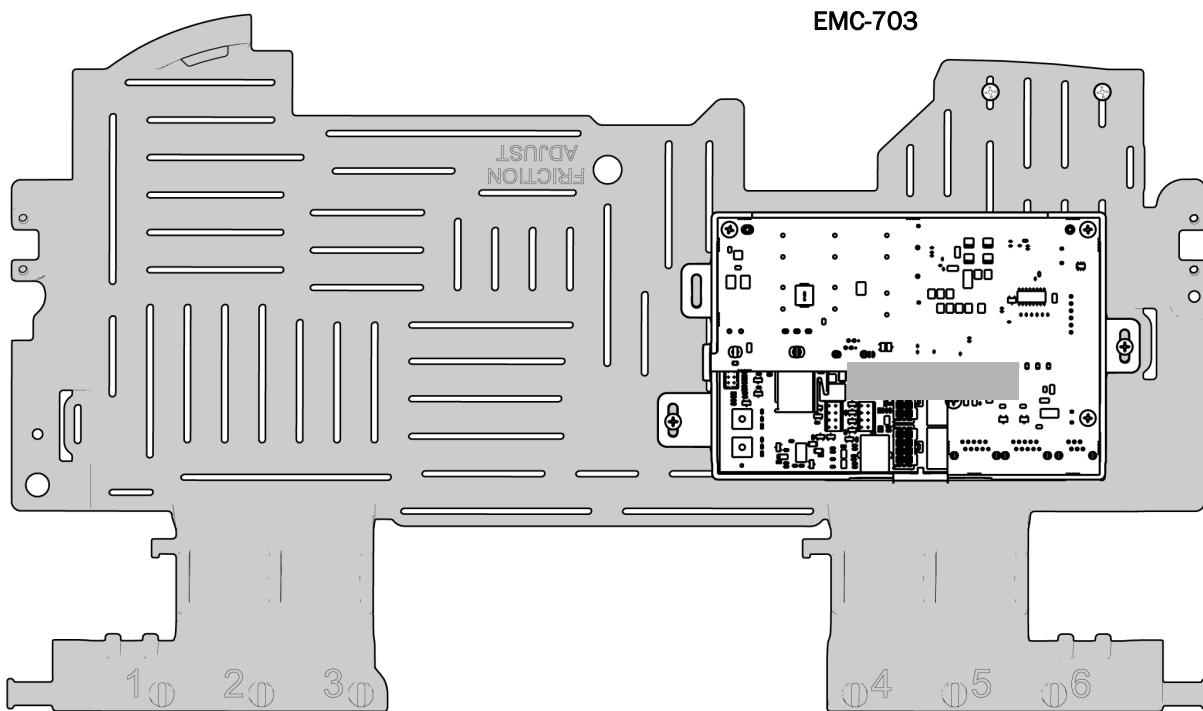
3. If necessary, secure the control block to the control head.
4. Lower the module shelf.

Next Step Continue with “Position the Control Module” on page 22.

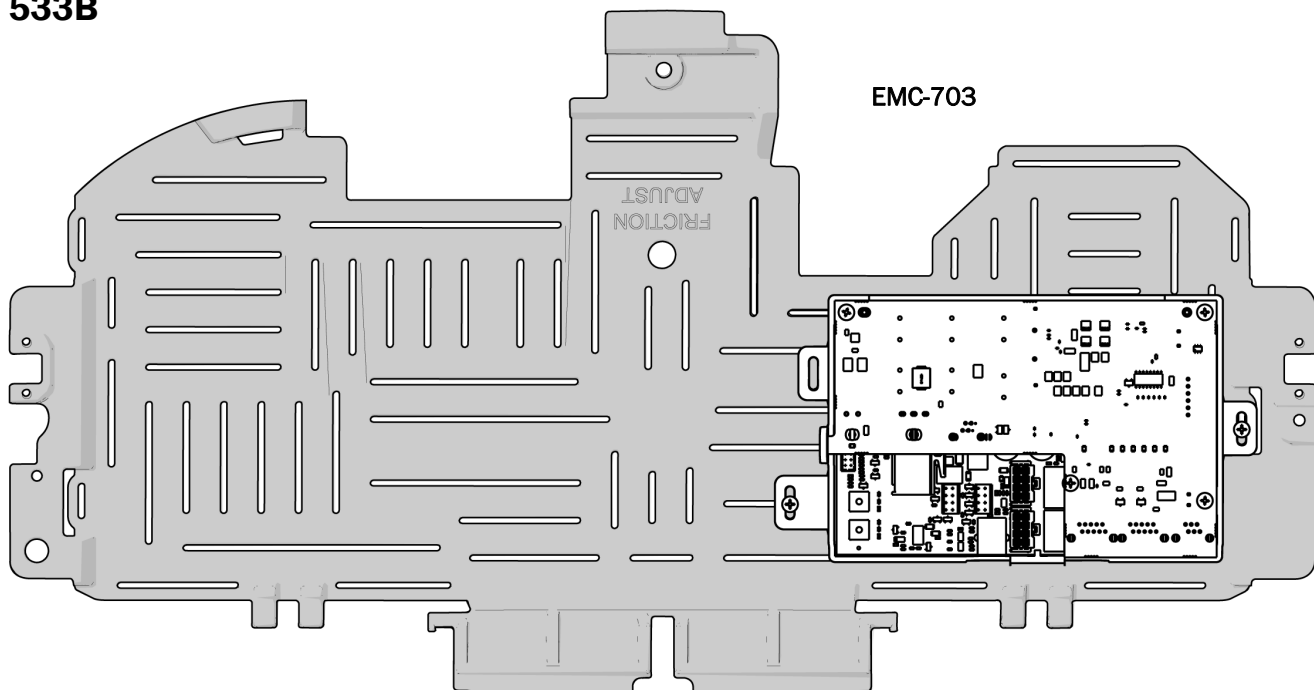
Position the Control Module

To ensure maximum flexibility for future installations, place the control module on the module shelf as shown below.

532B



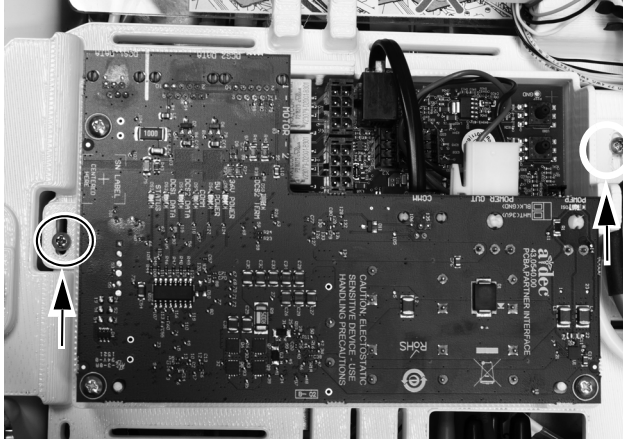
533B



Mount the Control Module

532B/533B

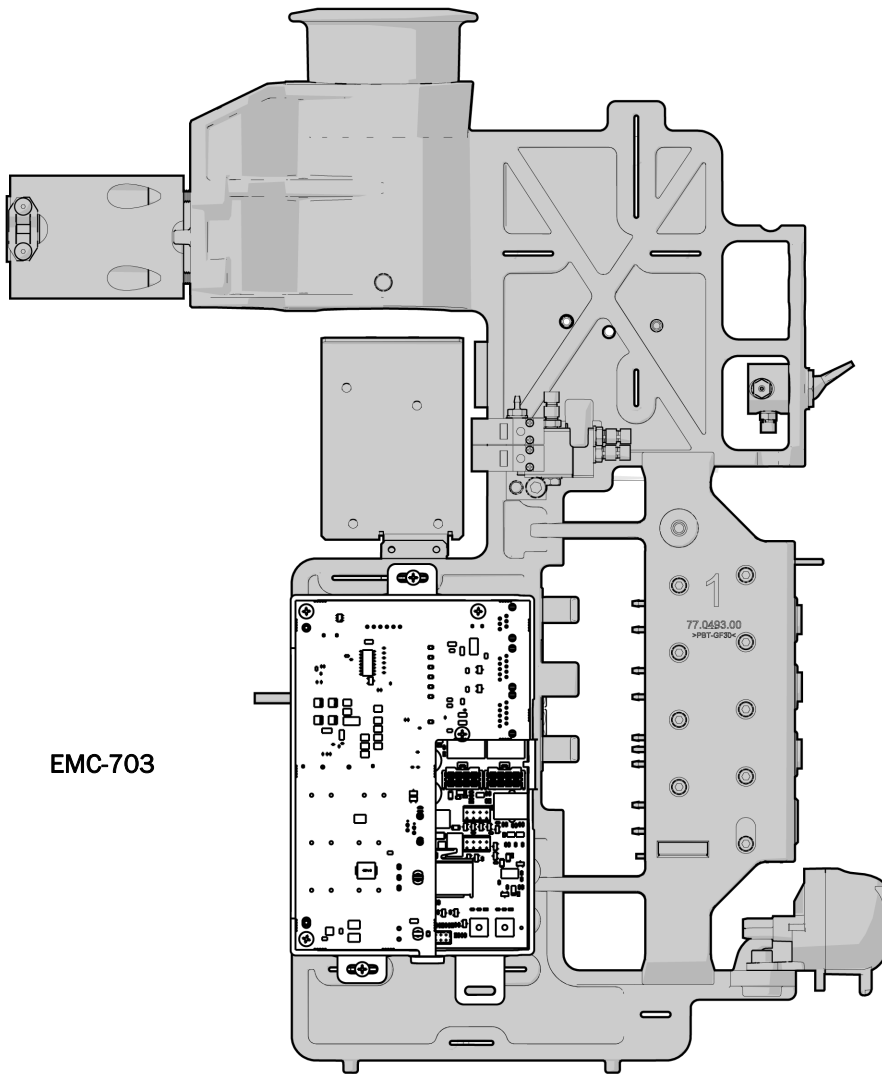
1. Position the control module in the rear of the control head.
2. Use two self-tapping screws to mount the control module to the control head.



Next Step Continue with “Connect the Wires” on page 25.

541B

1. Use the diagram below to determine the best placement for the control module; then use a stainless steel screw and the cutout at the top of the control module to secure it to the 12 o'clock frame. Ensure the left edge of the cutout is aligned with the right edge of the slot in the mounting frame.
2. Use a second stainless steel screw to secure the bottom part of the control module to the mounting frame. Ensure the left edge of the cutout is aligned with the left edge of the slot in the mounting frame.

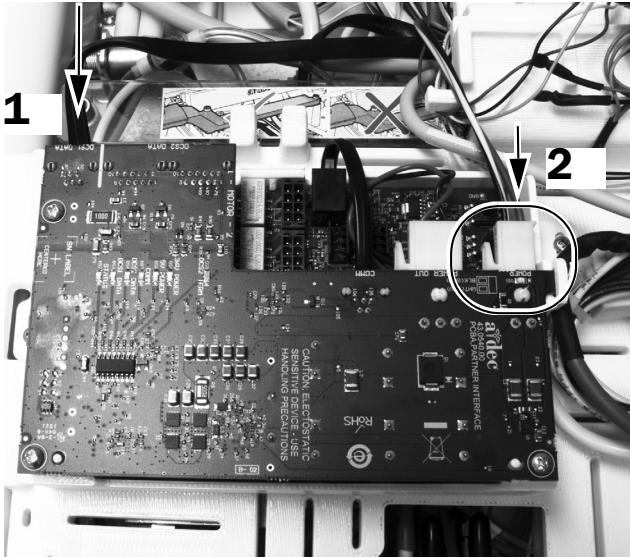


Next Step Continue with “Connect the Wires” on page 25.

Connect the Wires

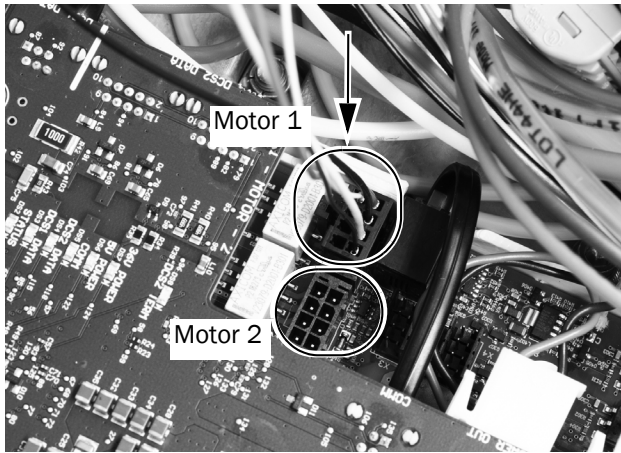
The pictures in this section show a 533B but the steps for the 532B/541B are the same.

- 1. Plug in the data line to the port on the control module and into the DCS board.
- 2. Plug in the AC power.



- 3. Plug in the electric motor’s connectors to their positions on the control module.

NOTE For a single motor on the EMC-703 control module, use the Motor 1 connector. If installing two motors, use the Motor 1 connector for the first motor and the Motor 2 connector for the second motor.



Next Step Continue with “Adjust and Test” on page 33.

A-dec 532A/533A/541A/542A

Turn off the Power



CAUTION Failure to turn off or disconnect the power before you begin this procedure can lead to electrical shock.

1. Use the master toggle to turn off the power to the system.

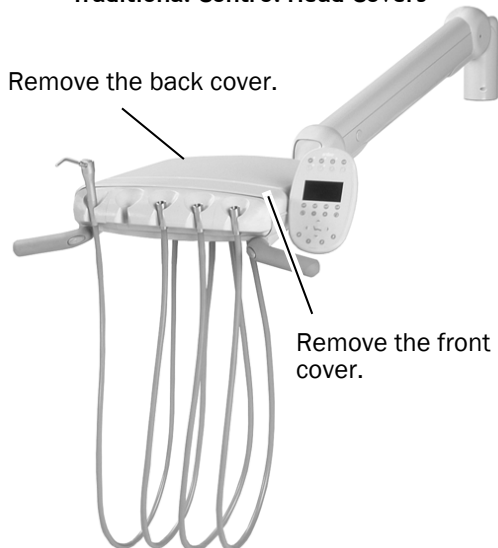
Remove the Covers



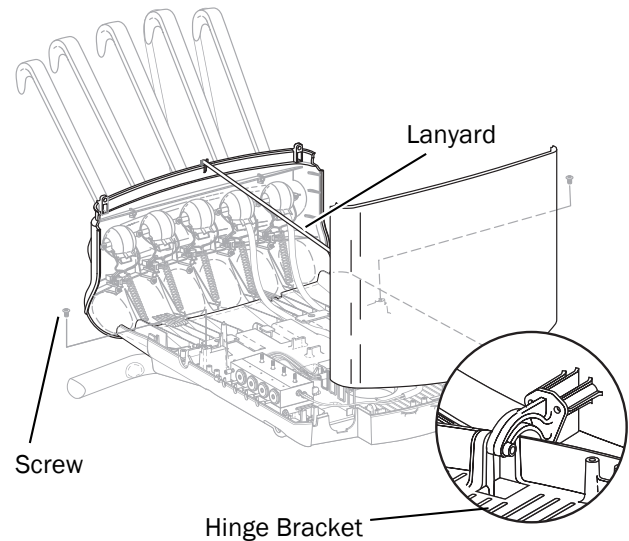
CAUTION When removing or replacing covers, take care not to damage any wiring or tubing. Verify that the covers are secure after replacing them.

1. Lift the control head cover up and back.
2. Pinch the hinge bracket to remove the cover.
3. Remove the two hex screws and:
 - For Traditional: Pull forward and up to remove the control head top cover.
 - For Continental: Pivot the cover forward, ensuring the lanyard is connected to the cover and control head to prevent strain on the cover hinges.

Traditional Control Head Covers



Continental Control Head Covers



4. If necessary, install the deluxe touchpad and Continental whip assembly. Follow the instructions provided in the kits that came with those components.

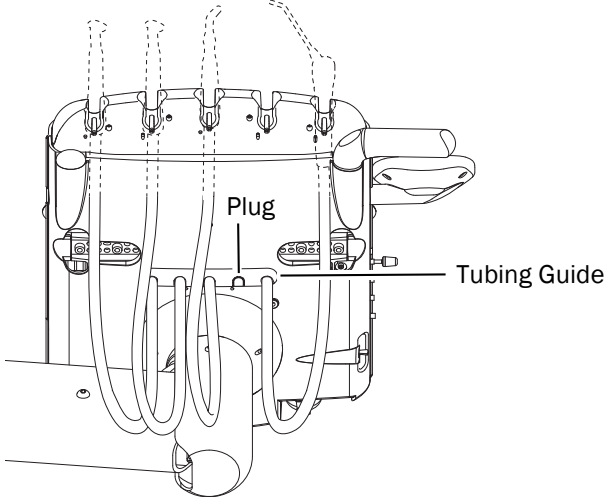
Install the Handpiece Tubing

Continue with the section for your type of delivery system:

532A/541A/542A	27
533A	28

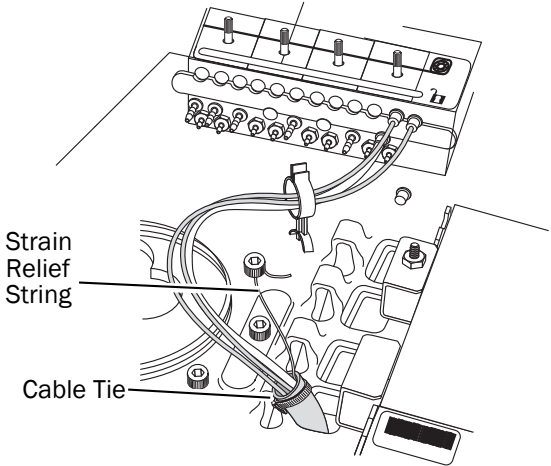
532A/541A/542A

1. Remove the tubing guide from the underside of the control head.
2. Twist and remove the plug from the guide.
3. Insert the handpiece tubing into the guide.
4. Replace the guide in the control head.
5. Adjust the length of the tubing so it drapes evenly with the syringe tubing.



6. Use a cable tie to secure the tubing to the control head structural platform.
7. Use the screw from the kit to secure the strain relief string to the structural platform.

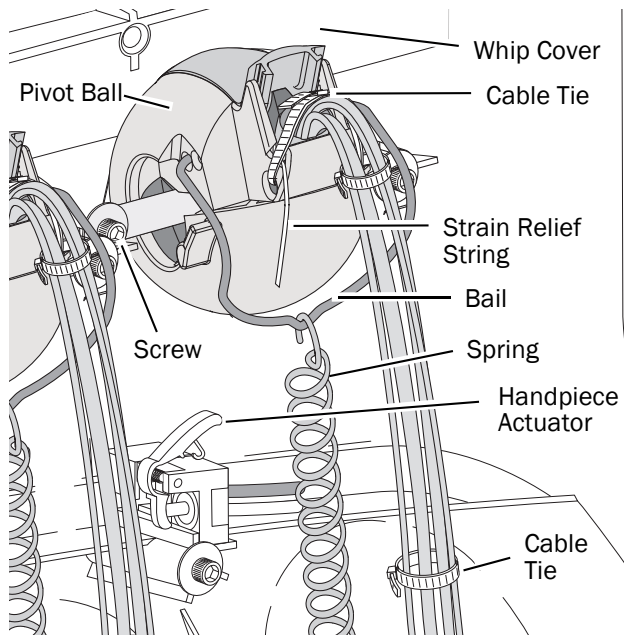
8. Ensure the handpiece actuator lever on the holder is released.



Next Step Continue with “Connect the Handpiece Tubing to the Control Block” on page 29.

533A

1. Remove the spring from the bail.
2. Use a 7/16" hex key to remove one screw and loosen the other on each side of the whip pivot.
3. Remove the whip cover.
4. Insert the handpiece tubing into the whip.
5. Route the handpiece tubing through the pivot toward the control head.
6. Install the whip back, starting at the pivot end of the whip.
7. Route the tubing to the slot right of the whip and then under the control head circuit board.
8. Use a cable tie to secure the tubing to the control head structural platform.
9. Adjust the length of the tubing so it drapes evenly with the syringe tubing.
10. Use a cable tie to secure the tubing at the base of the whip.
11. Secure the strain relief string to the whip assembly.
12. Ensure the handpiece actuator lever on the holder is released.



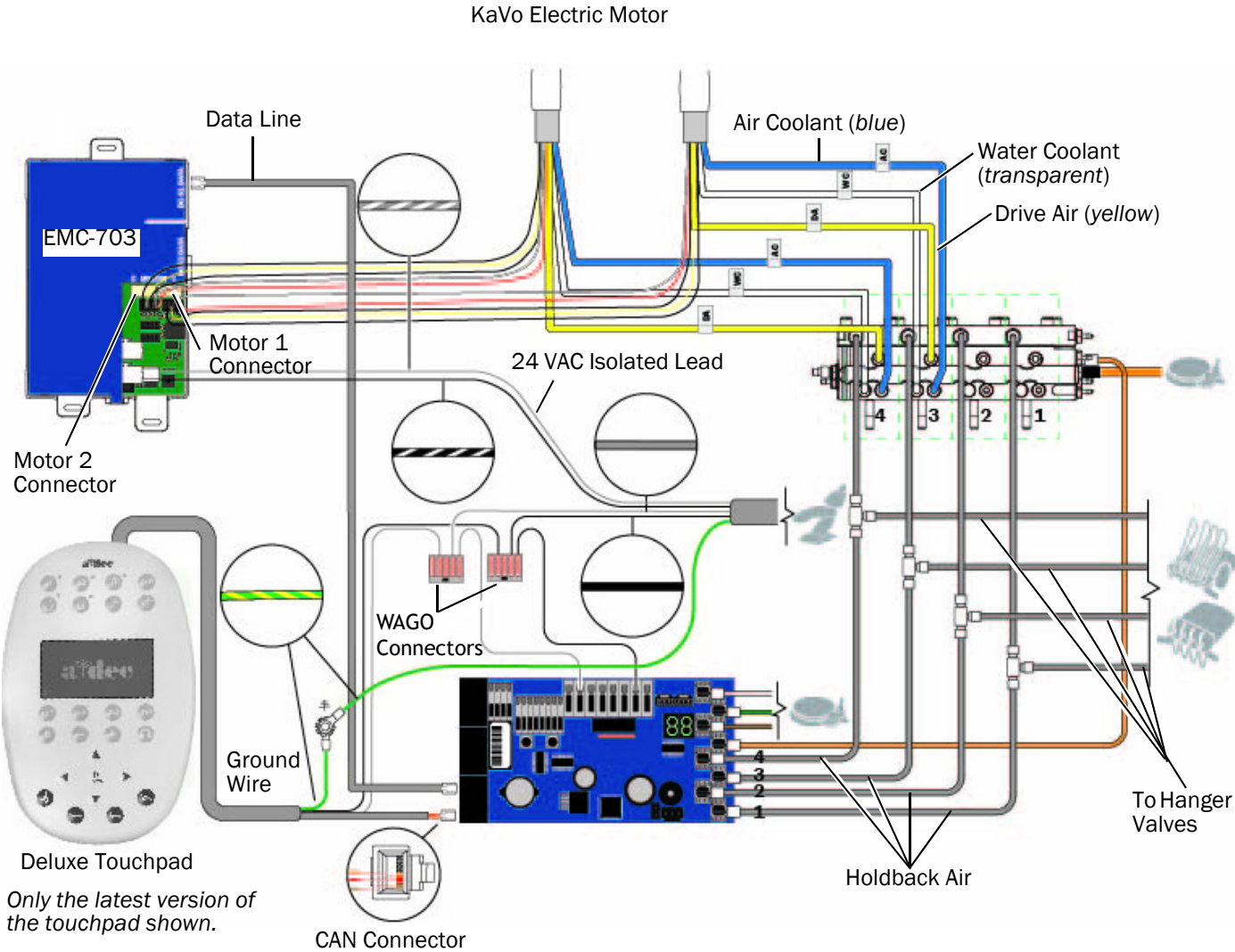
Next Step

Continue with "Connect the Handpiece Tubing to the Control Block" on page 29.

Connect the Handpiece Tubing to the Control Block

Use the flow diagram below to study the tubing and wire connections before connecting the handpiece.

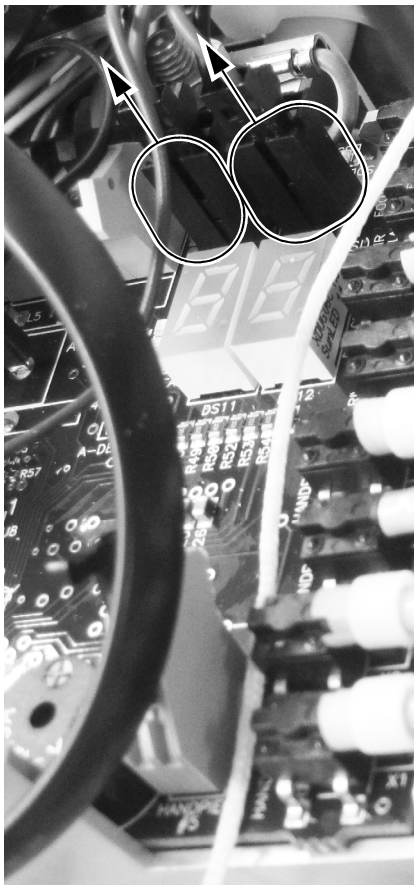
EMC-703 on A-dec 532A/533A/541A/542A Flow Diagram



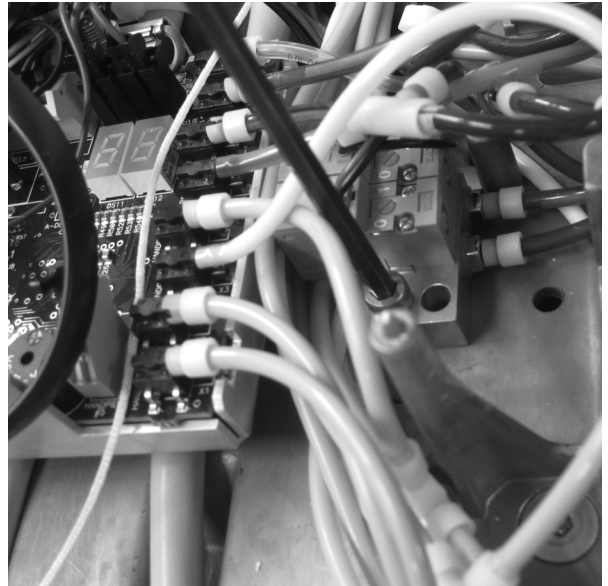


ATTENTION Circuit boards are sensitive to static electricity. Electrostatic Discharge (ESD) precautions are required when touching a circuit board or making connections to or from the circuit board. Circuit boards should be installed only by an electrician or qualified service person.

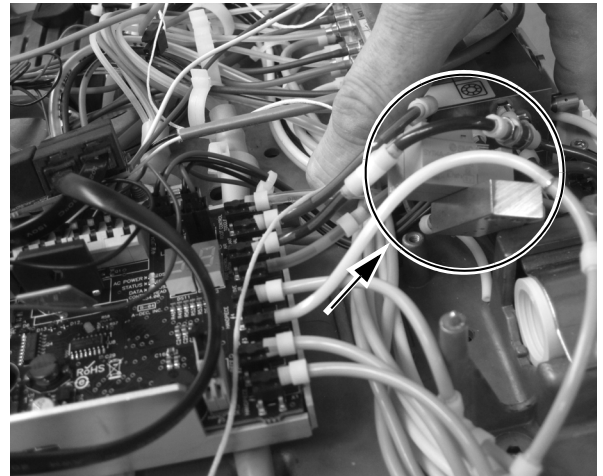
1. Secure a grounding strap to your wrist and the other end to a grounding location in the control head.
2. When routing the tubing to the control block:
 - (1) Disconnect the P4 water solenoid and the P5 air solenoid connectors.



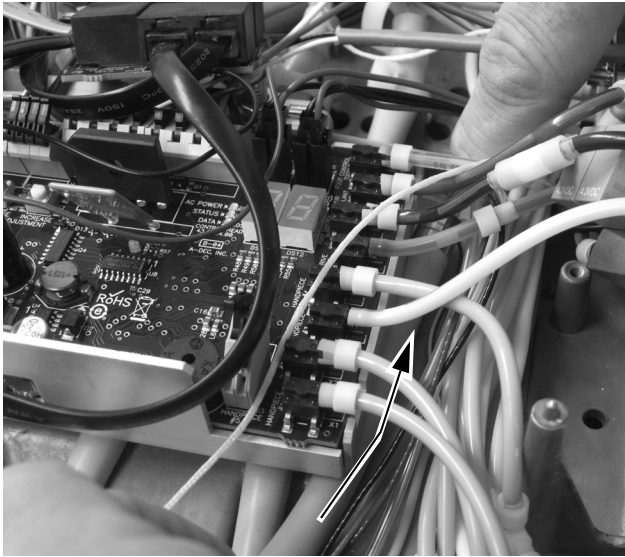
- (2) Use a 9/64" hex key to remove the screw securing the solenoid to the control head.



- (3) Move the solenoid to the side to create space for routing the tubing.



3. Route the tubing under the control module.

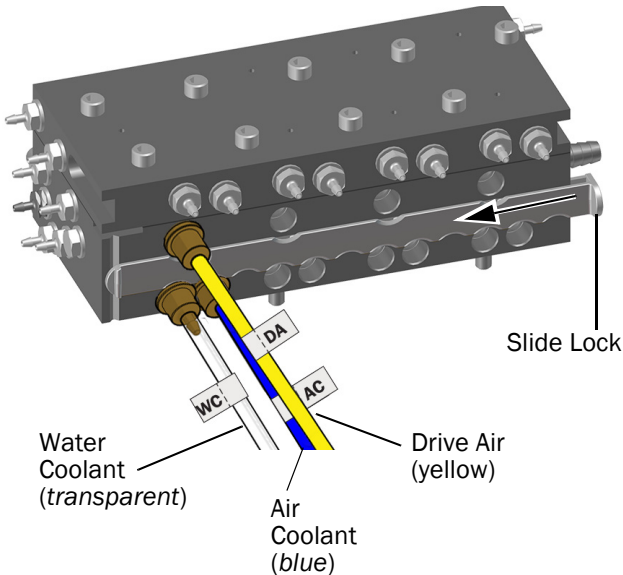


4. Open the slide lock and connect the handpiece tubing to the appropriate position on the control block.
- o Blue tubing to air coolant port.
 - o Yellow tubing to drive air port.
 - o Transparent tubing to the water coolant port.



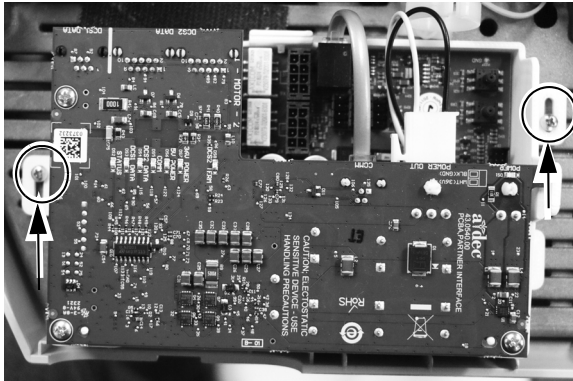
NOTE Do not trim the handpiece tubing. Carefully coil the tubing in the control head for future use and servicing.

5. Close the slide lock.

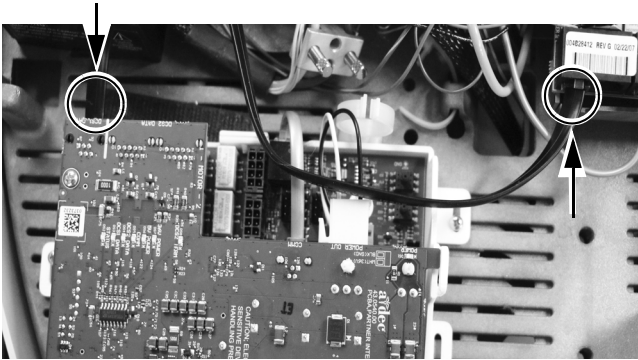


Install the Control Module and Connect the Wires

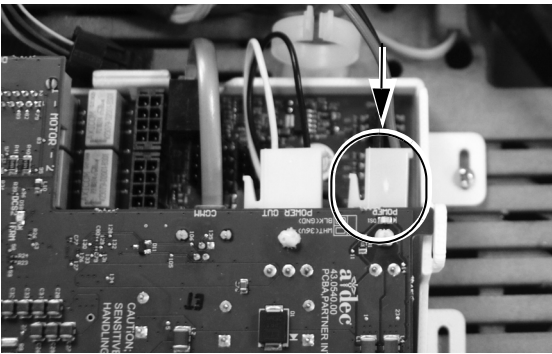
1. Position the control module in the rear of the control head.
2. Use two self-tapping screws to mount the control module to the control head.



3. Plug in the data line to the port on the control module and into the DCS board.



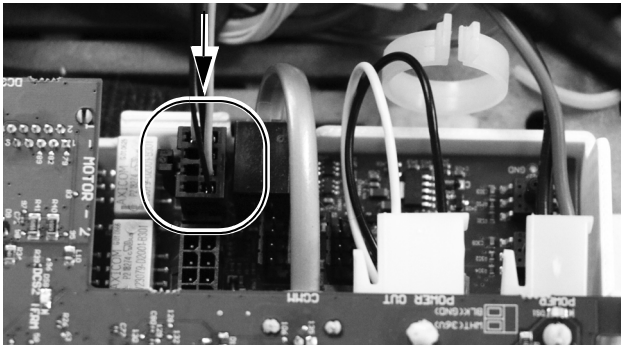
4. Plug in the AC power.



5. Plug in the electric motor's wire connectors to their positions on the control module.



NOTE For a single motor on the EMC-703 control module, use the Motor 1 connector. If installing two motors, use the Motor 1 connector for the first motor and the Motor 2 connector for the second motor.



Program the A-dec 500 Deluxe/Deluxe Plus Touchpads



Deluxe Plus Touchpad Shown

1. Turn on the power to the system using the master toggle.
2. On the deluxe plus touchpad main screen, press and hold and at the same until a **System Setup** screen appears.
On the deluxe touchpad main screen, press and hold and (or with a blue circle) at the same time until a **System Setup** screen appears.
3. Press .
4. Press again to select **Handpieces**.
5. Press to select **Holder Setup**.
6. On Traditional systems, lift the motor. On Continental systems, pull the whip forward.
7. Select **Electric**.
8. Select **Motor Number 1** (position 1 on the control module).
9. Select the motor type.
10. Set the installed cable length and save the settings.
You should hear three beeps. Move the whip back or return the motor to its holder.
11. For systems with two electric motors, repeat steps 3 through 9 and select motor number 2.
12. Press until you see the A-dec logo.

Next Step Continue with “Adjust and Test” on page 33.

Adjust and Test

Adjust the Drive Air Pressure

1. Fully depress the foot control.
2. Adjust the drive air flow (controls are on the control block) to 70 PSI.



NOTE Use the digital pressure readout on the delivery system circuit board (A-dec 500 only) to accurately adjust the drive air for the handpiece tubings. For the 300 deluxe touchpad, you can also display the pressure on the deluxe touchpad by pressing minus — and the plus + buttons at the same time. Adjust to 68-73 PSI for proper operation.

Test the Handpiece



CAUTION Check the motor for damage and loose parts before each use. Do not use the motor if it is damaged.

1. Select the handpiece.
2. Use the touchpad to verify that the motor functions with all of the motor option settings. These include:
 - Motor speed
 - Motor direction



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

3. Replace the covers.

EMC-703 Status Lights

LED	Description
Top Board (Blue)	
DS1	On when power is applied
DS2	Blinks when processor is functioning properly
DS3	On indicates the CAN bus is active
DS4	Not used
DS5	On indicates inter-board communication
DS6	5V power is functioning properly
DS7	36V power is functioning properly
DS8	Not used
Bottom Board (Green)	
D204	On when power is applied
D1, D2	Alternating when processor is functioning properly

Regulatory Information and Warranty

For required regulatory information and the A-dec warranty, see the *Regulatory Information, Specifications, and Warranty* document (p/n 86.0221.00) available in the Resource Center at www.a-dec.com.

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