CARVEWRIGHT
WOODWORKING SYSTEM

Replacing the Cover Micro-Switch

To remove and replace the Cover Micro-Switch you will need the following tools:

- #2 Phillips screwdriver (magnetic tip preferred)
- #1 Phillips screwdriver (magnetic tip preferred)

Removing the Cover

1. **Ready the machine** by unplugging it from the power outlet and placing it on a stable work platform. Raise the head up several inches and move the Y-truck to the center of the machine for best access.

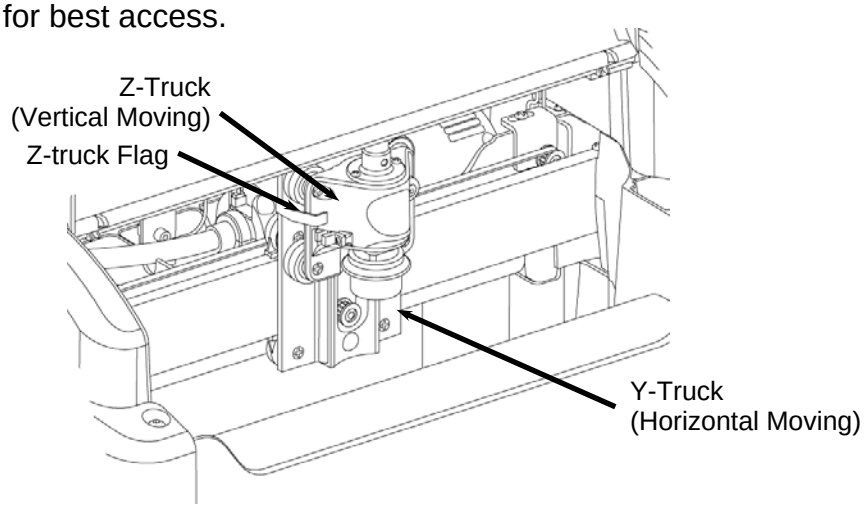

FIGURE 1: VIEW OF THE Z-TRUCK

2. **Ready the flexshaft for removal from the Z-truck.** Move the Z-truck to the very top of its travel (until it reaches the hard stop) so that the flexshaft support tube protrudes from the head cover (See Figure 2).

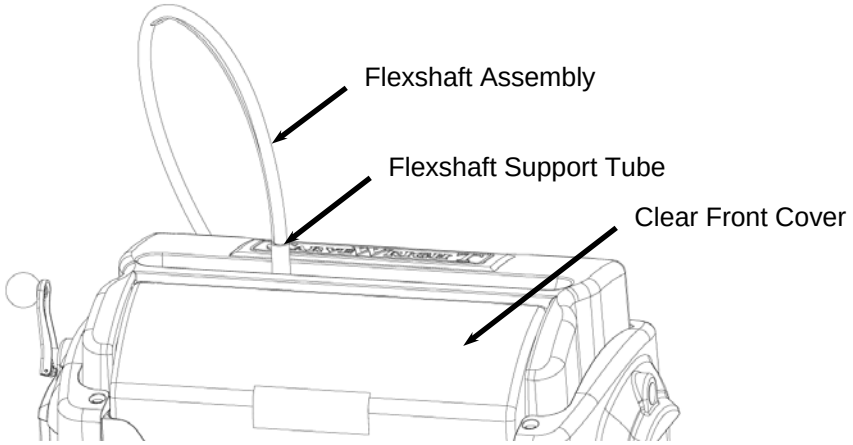

FIGURE 2: EXTERIOR VIEW OF THE FLEXSHAFT AND HEAD COVERS

3. **Detach the flexshaft from the top of the Z-truck.** The flexshaft assembly is retained by a ball detent located in the flexshaft receptacle (See Figure 3). Firmly grasp the flexshaft support tube while reaching under the clear front cover with your other hand to grab the Z-truck. Pull up firmly on the flexshaft support tube and twist slightly while bracing the Z-truck. **DO NOT PULL ON THE SHEATH.** The flexshaft will pop out of the detent. Wrap the end of the flexshaft in tape so that the core will not fall out and lay the detached flexshaft end to the side.

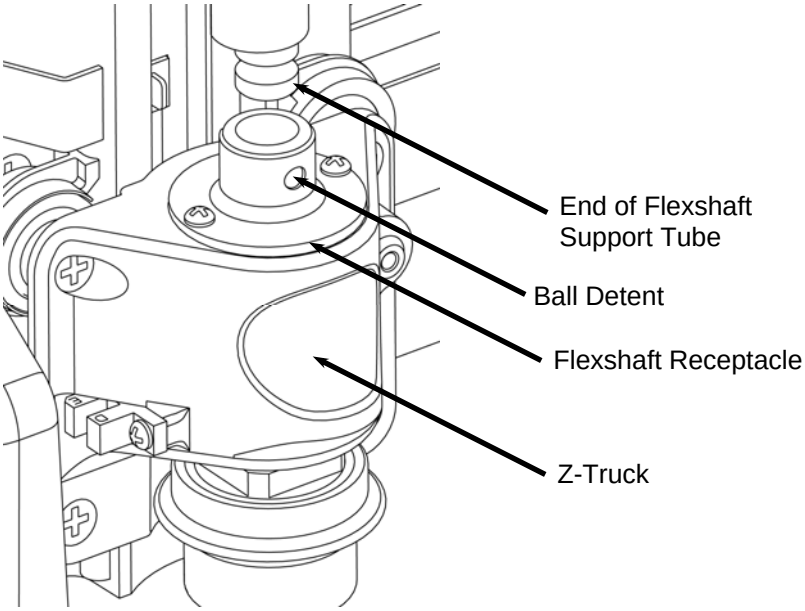

FIGURE 3: VIEW OF THE FLEXSHAFT CONNECTION TO THE Z-TRUCK

4. **Remove the screws securing the cover.** Remove the four cover screws as shown in Figure 4 with the #2 Phillips screwdriver. Use a magnetic tipped screwdriver if possible to avoid dropping the screws into the machine.

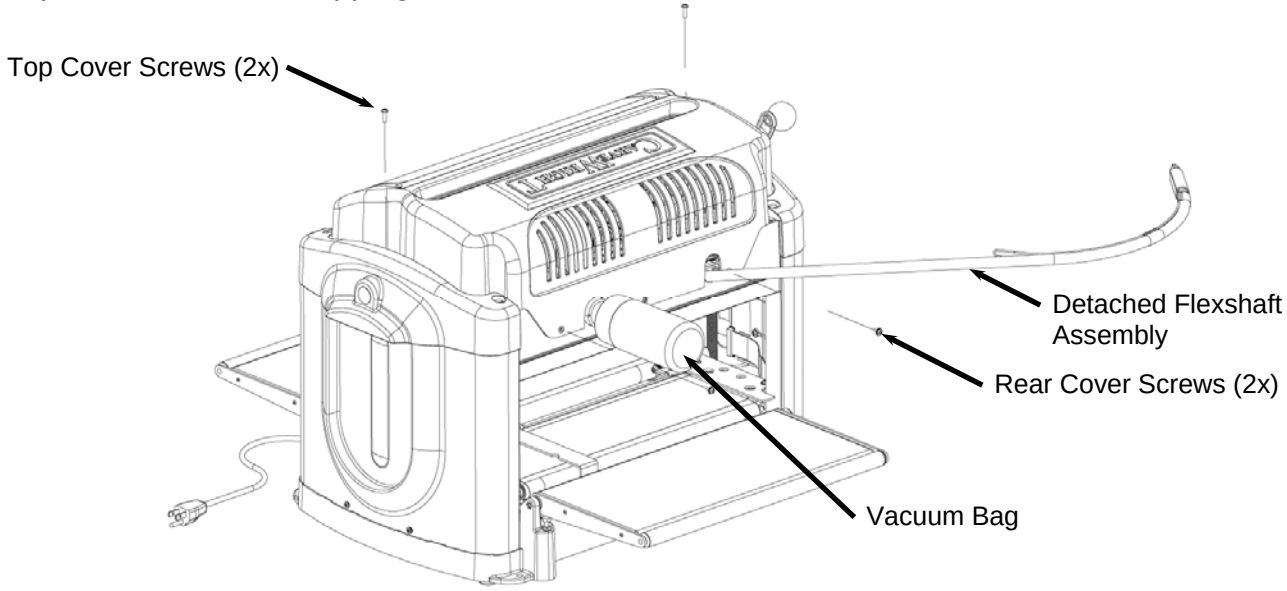

FIGURE 4: EXPLODED VIEW OF THE COVER SCREWS

5. **Detach the AC interrupt switch cable.** Lift the cover straight up and locate the two cables still connecting it to the head. On the side nearest the AC cut motor you will see the cable that connects the cover interrupt switch. Disconnect the two bullet connectors at the back of the AC motor. In most machines you will need to remove the screw in the small plastic enclosure to access the two bullet connectors.

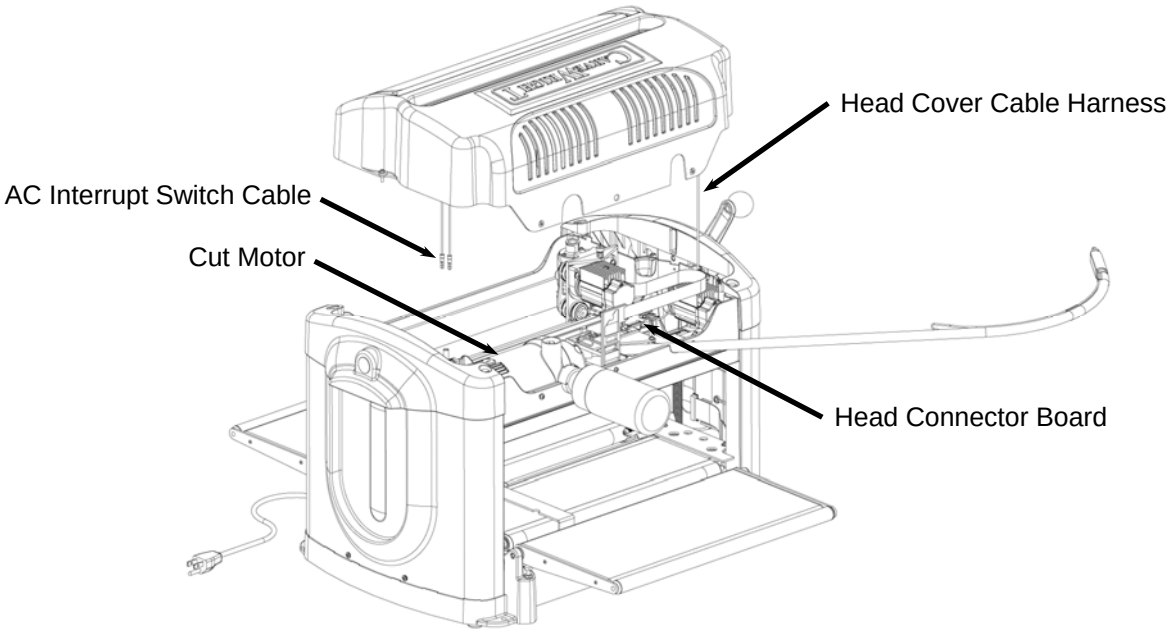

FIGURE 5: EXPLODED VIEW OF THE LIFTED COVER

6. **Unplug the head cover cable.** The head cover cable is located on the head connector board attached just to the left of the Y-drive motor (side opposite the AC motor). This cable has 8 wires and is terminated with a 10-pin connector. The location of this connector on the head connector board will vary depending on the machine's production date (See Figure 7). You may have to reach underneath the head to unplug the cable. Notice how the cable is routed alongside and under the Y-truck motor pack. This routing is important to remember when re-assembling the cover.

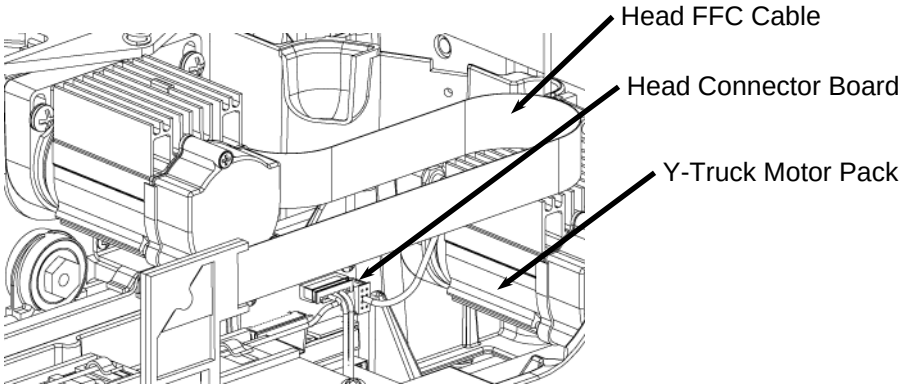

FIGURE 6: LOCATING THE HEAD CONNECTOR BOARD

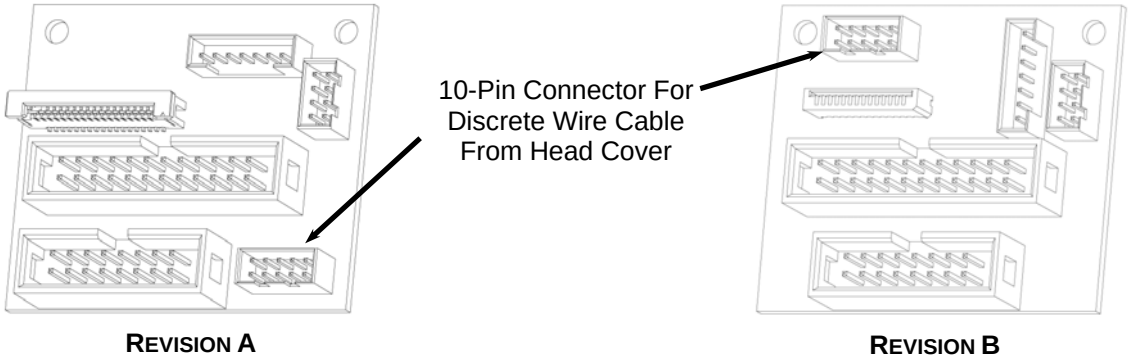

FIGURE 7: LOCATION OF CONNECTOR FOR HEAD COVER CABLE FOR THE EARLIER REVISION A AND LATER REVISION B MACHINES

7. **Remove the cover.** Carefully lift the cover straight up and off. Make sure to avoid snagging or pulling any of the cables as you remove the cover. Take special care to avoid damaging the white FFC cable that is now exposed in the machine. There are two safety kill switches within the head cover; the AC Motor Cut-off Switch and the Controller Cut-off Micro-switch. When the front safety cover is lifted, the AC motor switch will mechanically cut power to the AC cutting motor and the controller switch sends a signal to the on board computer instructing it to cease all motion. Both switches are located beneath plastic guards.

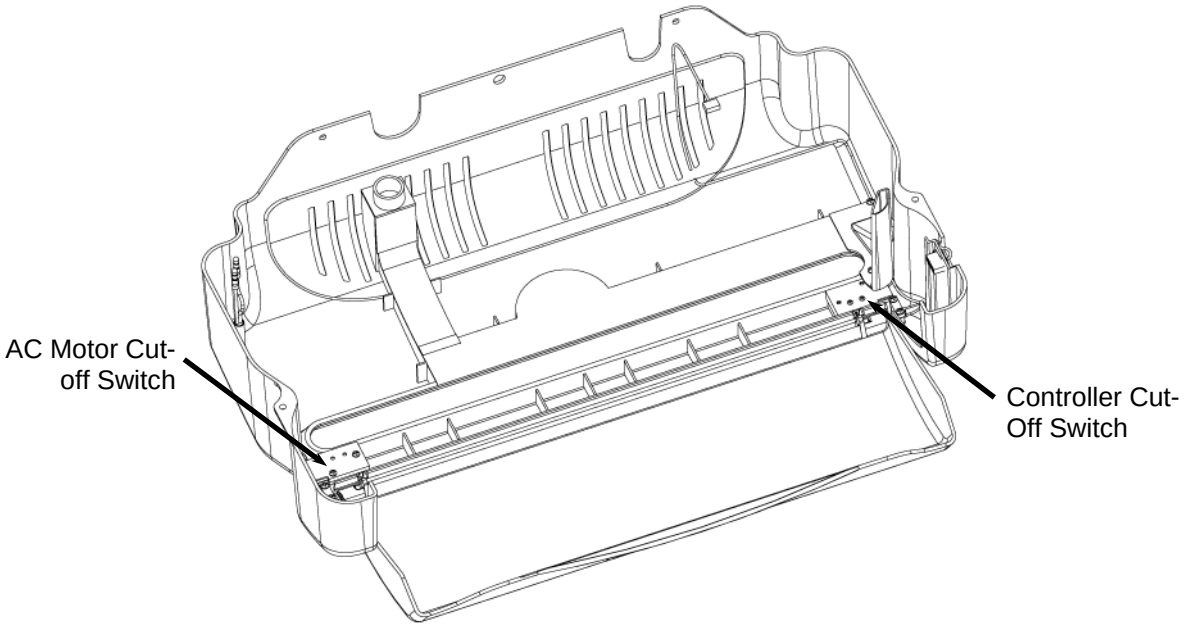

FIGURE 8: VIEW OF THE TWO SAFETY SWITCH LOCATIONS

If you are replacing the AC motor cut-off switch please proceed to Step 8. If you are replacing the controller cut-off switch please skip to Step 9.

8. **Remove and replace the defective AC motor cut-off switch.** Remove the plastic guard over the switch by removing its 2 screws with a #1 Phillips screwdriver. Disconnect the two female blade connectors from the terminals of the switch. Replace the switch by reconnecting the two blade connectors to their respective terminals. Align the new switch over the screw bosses and replace the plastic guard with the two screws.

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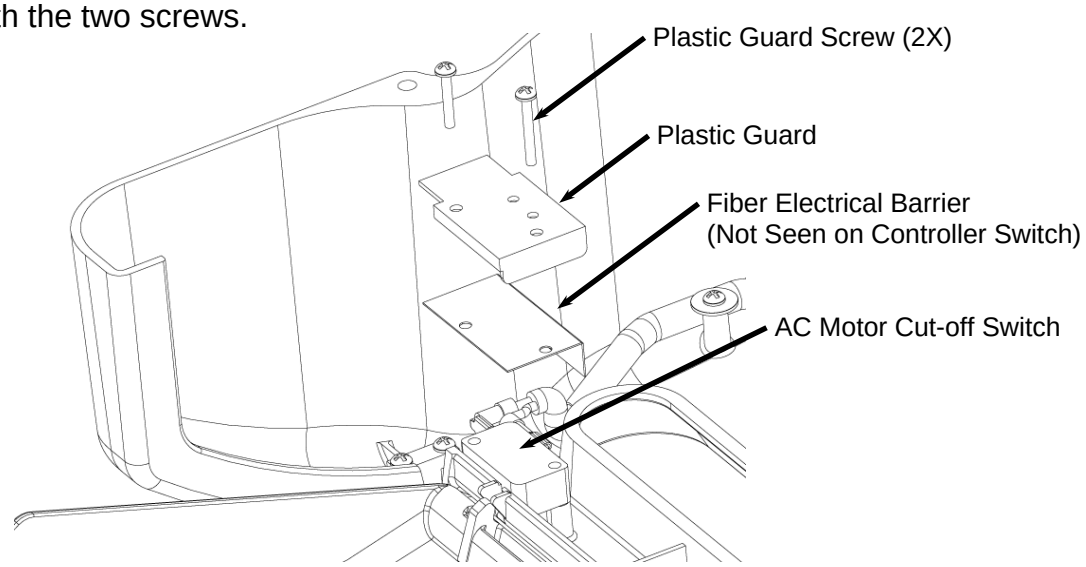


FIGURE 9: VIEW OF THE AC MOTOR CUT-OFF SWITCH REMOVAL

9. **Remove and replace the defective controller cut-off switch.** Start by removing the two screws holding the vacuum blow tube. Remove the tube (note that there may be some silicone sealer on the bottom side that makes pulling it off harder). Next, remove the plastic and fiber guards over the switch by removing its 2 screws with a #1 Phillips screwdriver. If your machine has quick-connect terminals on this switch, disconnect them from the switch and replace the switch and guards. Otherwise, they are soldered in place and you will be required to replace the entire cable as described in Step 10.

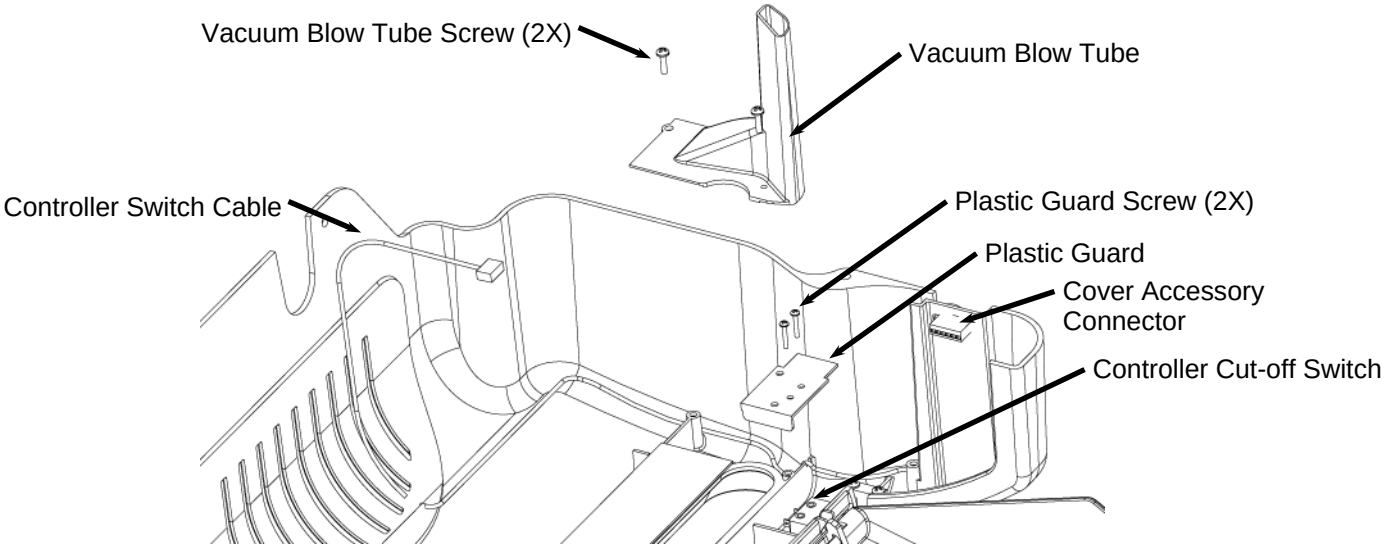


FIGURE 10: VIEW OF THE CONTROLLER CUT-OFF SWITCH REMOVAL

10. **Remove the cover accessory connector.** Start by snapping out the cover accessory connector (the connector that the probe plugs into). Compress the two retainer wings on either side of the protruding connector and push it back through the slot.

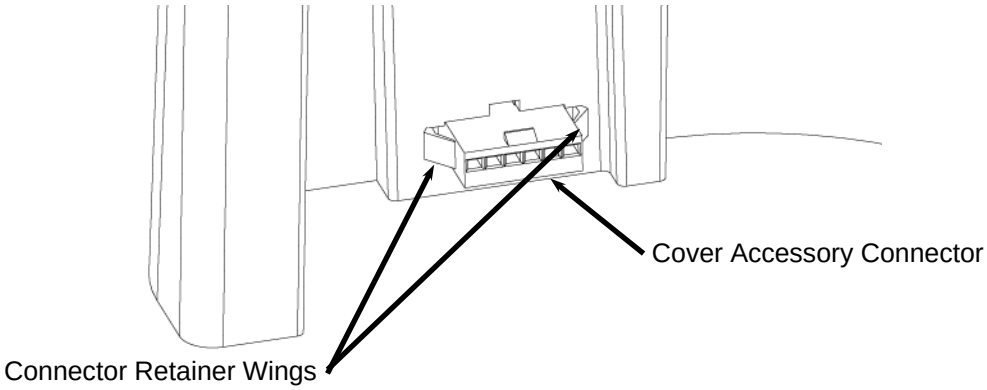


FIGURE 11: VIEW OF THE COVER ACCESSORY CONNECTOR

11. **Remove the controller switch cable.** Once the accessory connector is snapped out of the cover, remove the cable from the cover. The cable is held into the cover with hot glue in two locations. Pull the cable out of the glue in these two spots and remove the remaining glue if possible.

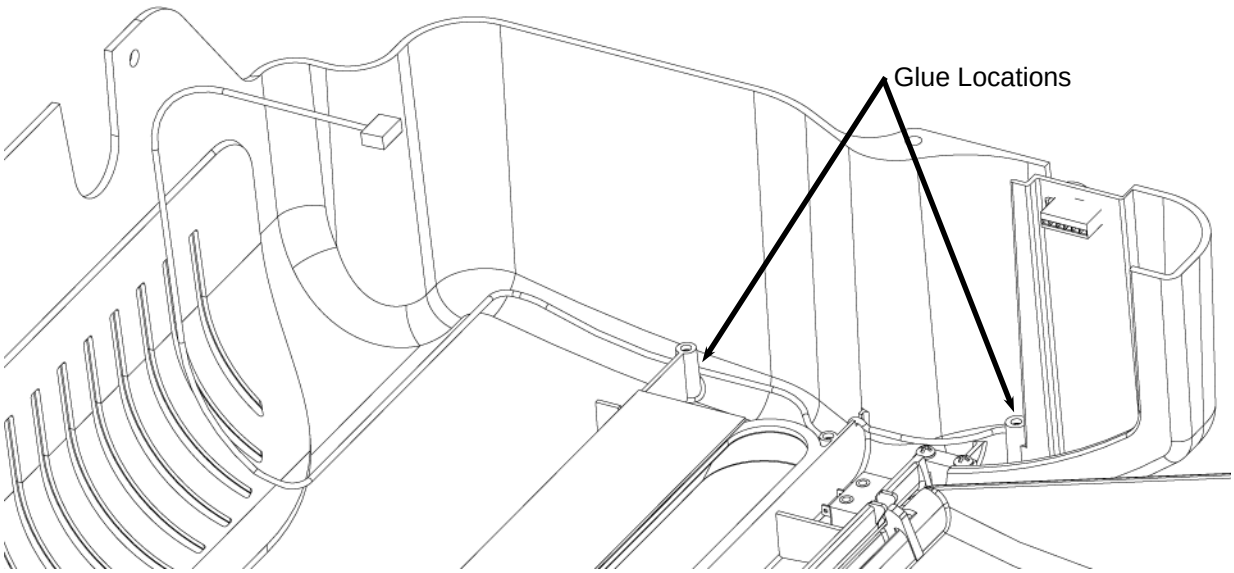


FIGURE 12: VIEW OF THE CONTROLLER SWITCH CABLE

Reassembling the Machine

If you replaced the controller cut-off switch and cable proceed to Step 1. If you replaced the AC motor cut-off switch please proceed to Step 3.

1. **Reseat the cover accessory connector.** Snap the cover accessory connector into the head cover. Make sure that the orientation key on the connector is facing up into the cover.

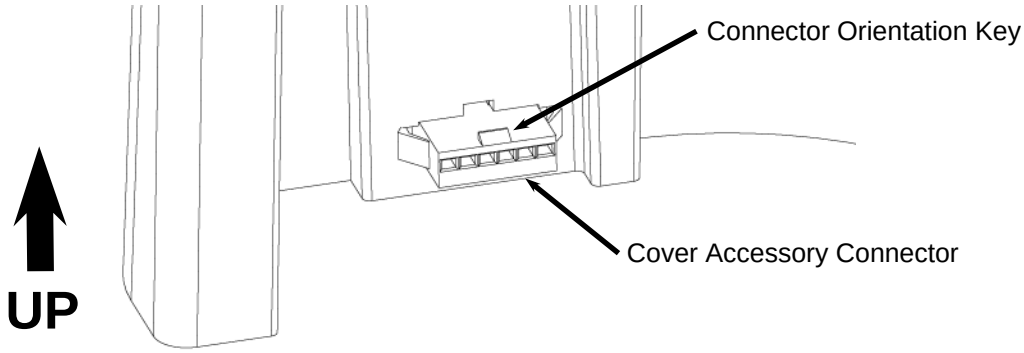


FIGURE 13: COVER ACCESSORY CONNECTOR ORIENTATION

2. **Replace the controller switch cable**. Route the new controller switch cable into the channel from which the old cable was removed. Make sure the wires are pulled taught and re-glue them with a dab of hot glue (or silicone and let harden) in the same locations. Orient the switch and replace the plastic guard with the two screws.
3. **Reconnect the AC motor wires.** Locate the two wires exiting the back of the AC cut motor and connect the black wire to the black wire from the supply line coming up from the base. Connect the white wire to the head cover AC switch.
4. **Replace the AC motor wire bay cover.** Locate the two remaining loose wires with bullet connectors and set them into the slot in the AC motor wire bay cover before tightening the screw.
5. **Replace the head cover.** There are several important steps and checks needed as you replace the head cover.

    a. Move the Y-truck all the way to the left side of the machine and make sure that the FFC cable does not drag on the Y-truck heatsink. If the FFC cable is dragging bend it upwards so that it consistently clears the heatsink.

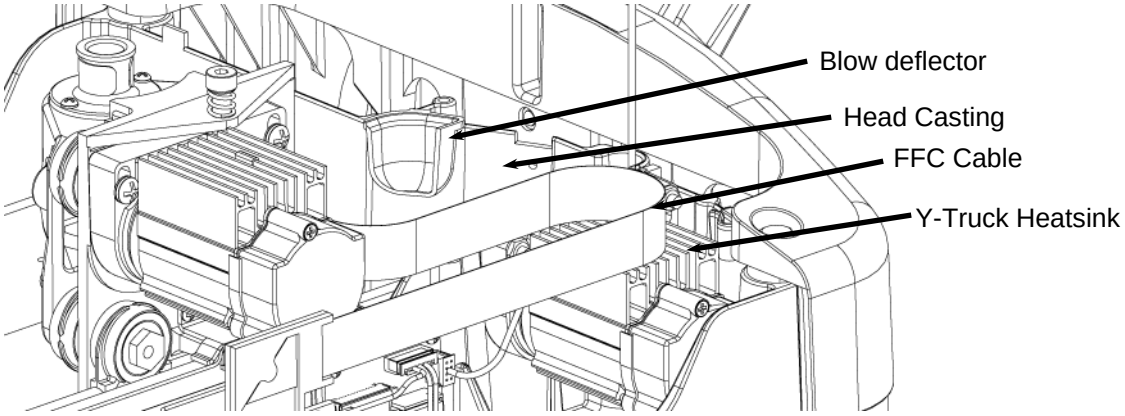


FIGURE 14: PLACEMENT OF THE BLOW DEFLECTOR

b. Make sure that the blow deflector is correctly placed. If it is out of place the board sensor can quickly become covered in dust and inoperable and/or the Z-truck will hit the blow deflector and stall. The deflector sits over the edge of the head casting and lines up with the air tube in the cover when assembled. Also see **Picture 2** in Appendix A.

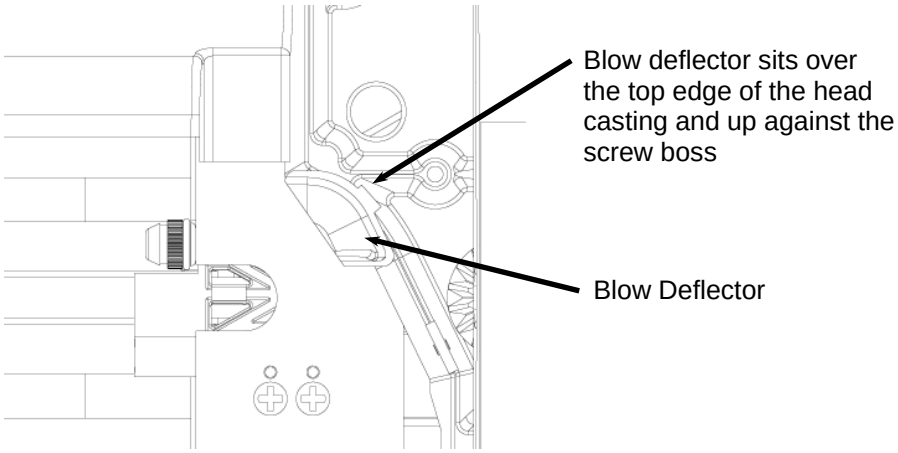


FIGURE 15: PLACEMENT OF THE BLOW DEFLECTOR - TOP

c. Route the Head Cable Harness down between the wall of the head casting and the side of the Y-motor pack, under the Y-motor pack and plug it into the connector board as shown in Figure 16. Make sure that the connector is oriented correctly using the keying ribs and slots before plugging it in. Note that the white wire will be oriented toward the non-keypad side of the machine.

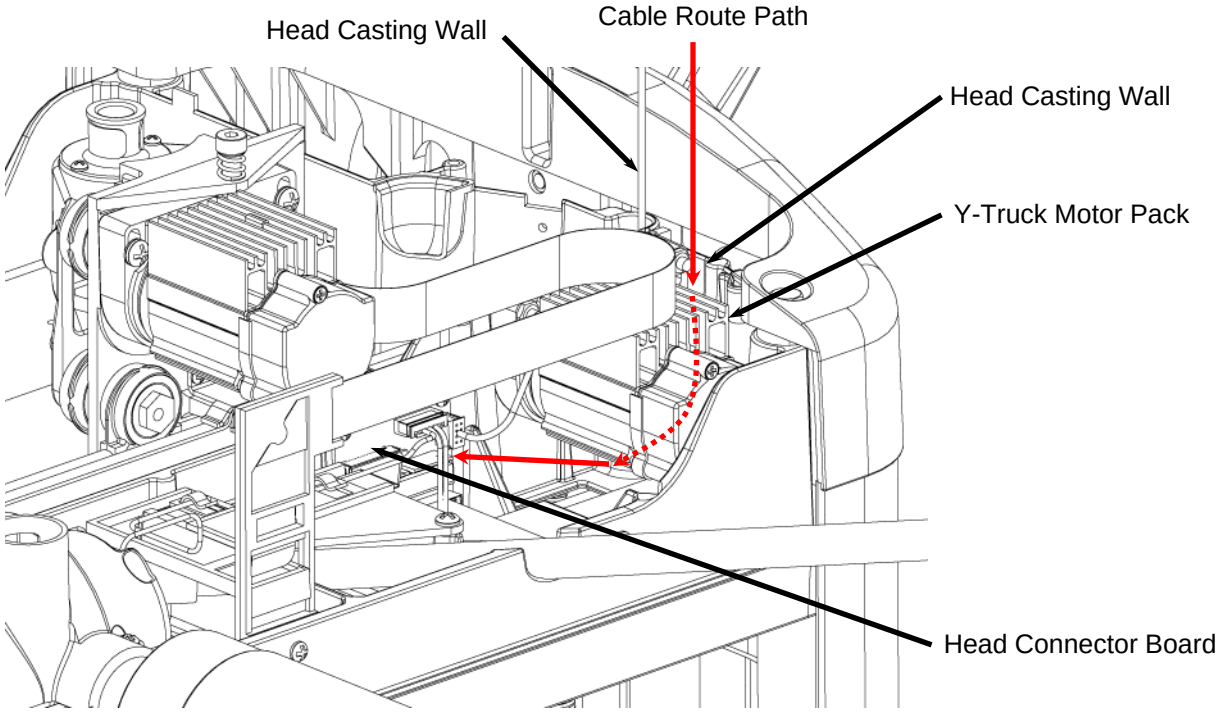


FIGURE 16: ROUTING THE HEAD CABLE HARNESS

d. Gently lift and replace the head cover onto the head making sure that the FFC cable, the AC Interrupt Switch Cable, and the Head Cable Harness are not pinched.

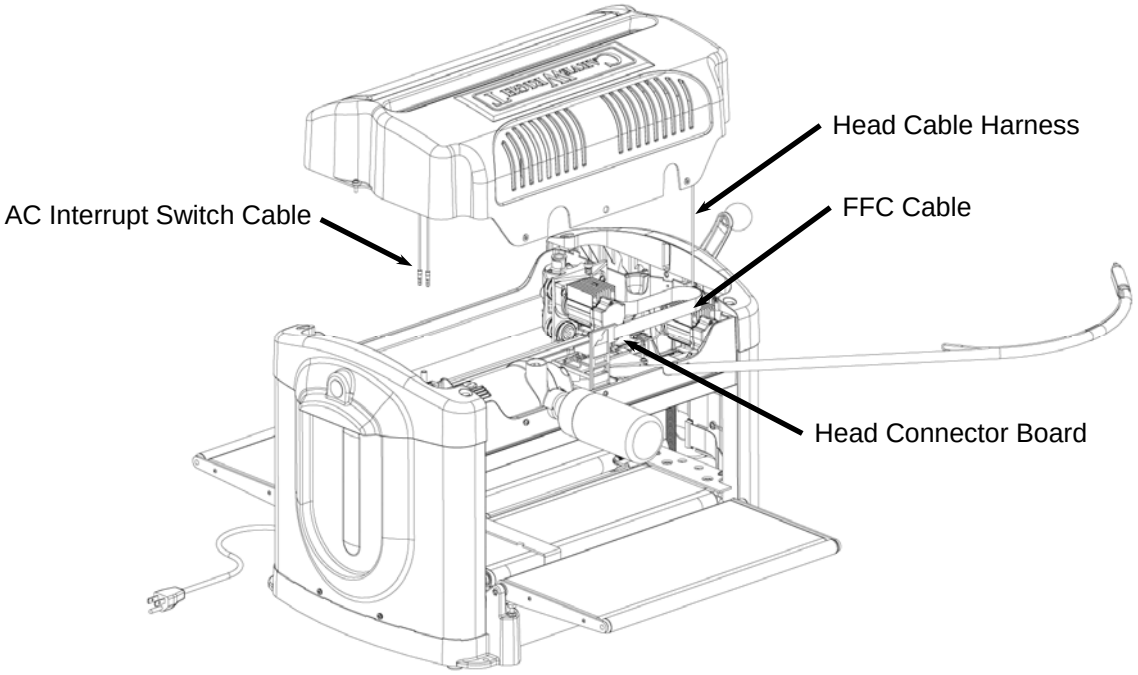


FIGURE 17: RESEATING THE HEAD COVER

e. Once the head cover is placed back onto the head you will need to reseat the wire harness retainers in the correct locations before replacing the screws. These retainers should be attached to the cables themselves and keep the cables confined to certain areas. In some machines there will be one on both cables, but on most machines you will only find one on the Head Cable Harness. You will have to reach in from the front of the machine to access them. Make sure that the retainers are placed over the edge of the head casting and under the edge of the cover. Make sure that they do not prevent the head cover from setting flat. See **Picture 3** and **Picture 4** in Appendix A for further clarification.

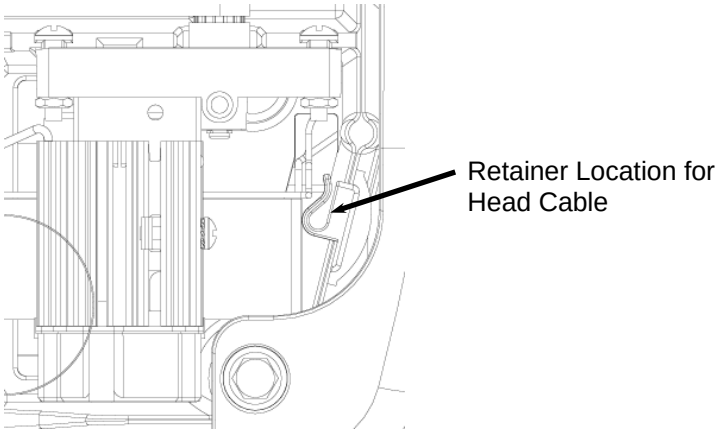


FIGURE 20: LOCATING THE HEAD CABLE HARNESS RETAINER

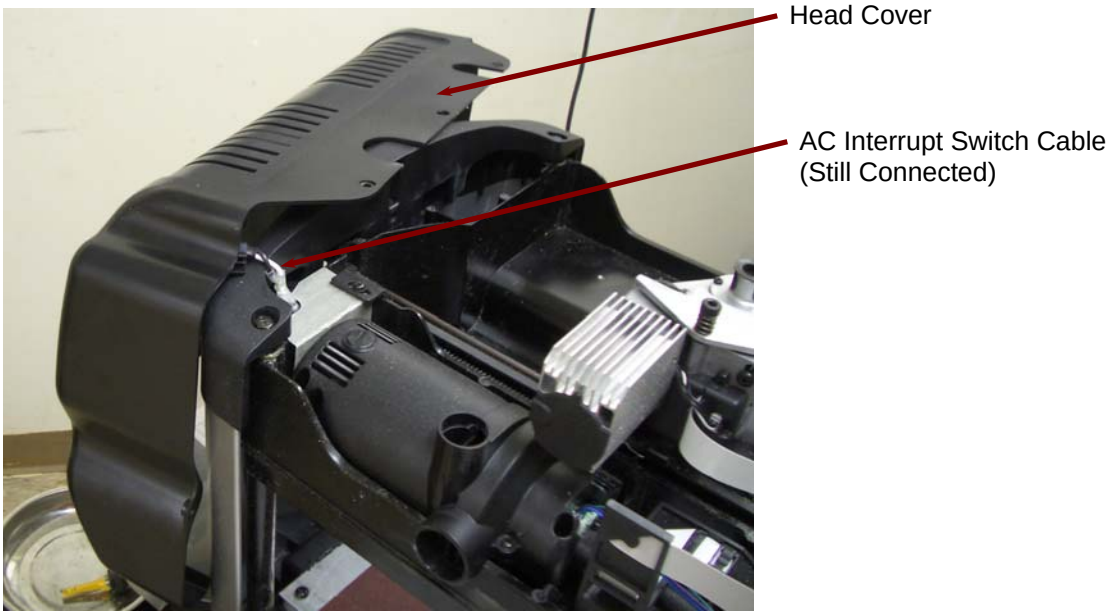
f. Replace the four screws as shown in Figure 4. The two long screws go in the vertical locations.

g. Verify that the head cover is laying flat on the head. Verify that the blow deflector is lined up with the vertical blow port located in the head. Verify that the FFC cable does not drag on the Y-motor heatsink when the Z-truck is pushed all the way to the left hand side.

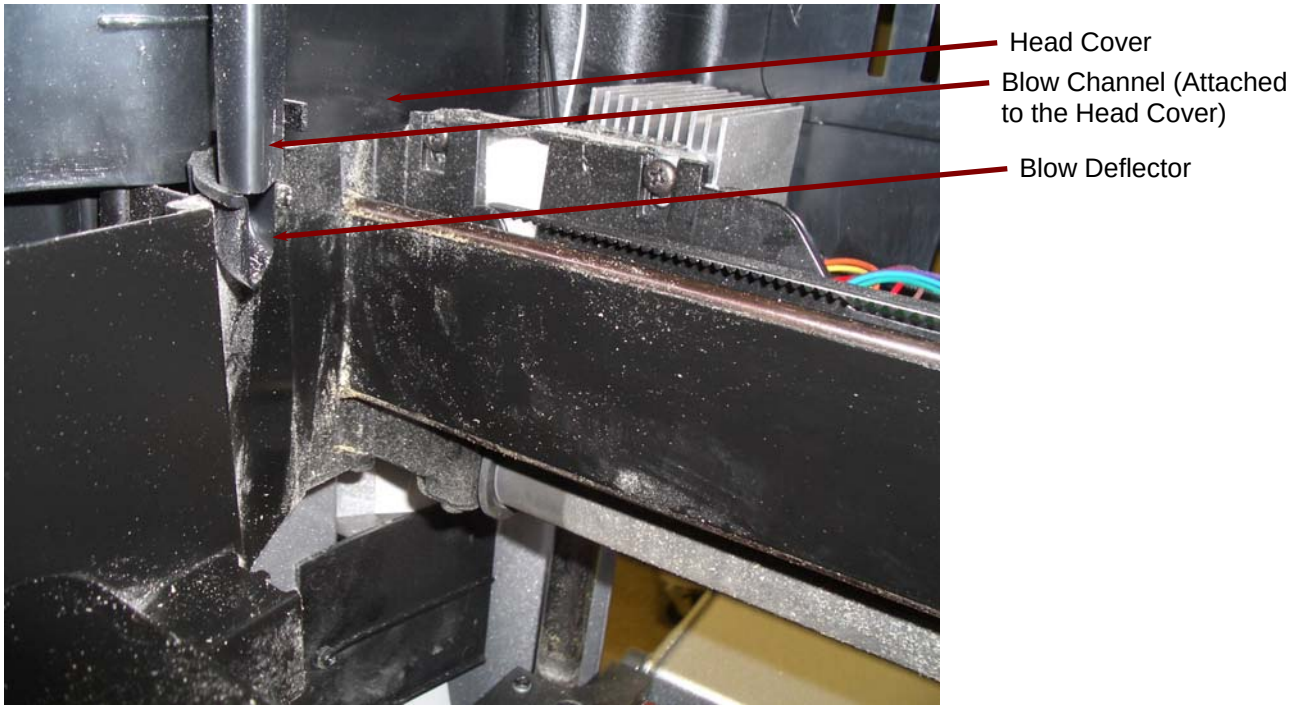
6. **Prepare the flexshaft assembly for re-insertion into the machine:** Reinsert the flexshaft core. Push the core into the sheath and make sure that it slips into, and engages, the AC cutting motor. It will drop into the receptacle on the motor side about 5/8ths of an inch. Turn the core by hand and feel for resistance of the motor. If the shaft spins without resistance, push the core inward while rotating until it drops into the slot and engages the motor.

7. **Insert the flexshaft into cutting head:** Looking through the slot in the top cover, locate the flexshaft receptacle on the top of the Z-truck. Inside the receptacle there is a square recess that mates with the exposed square end of the flexshaft core. Turn the chuck on the bottom of the cutting head (open the safety cover for access) until the square core end can be inserted into the recess. Press the flex shaft all the way down into its receptacle. A click will be heard and felt as the shaft snaps into place.

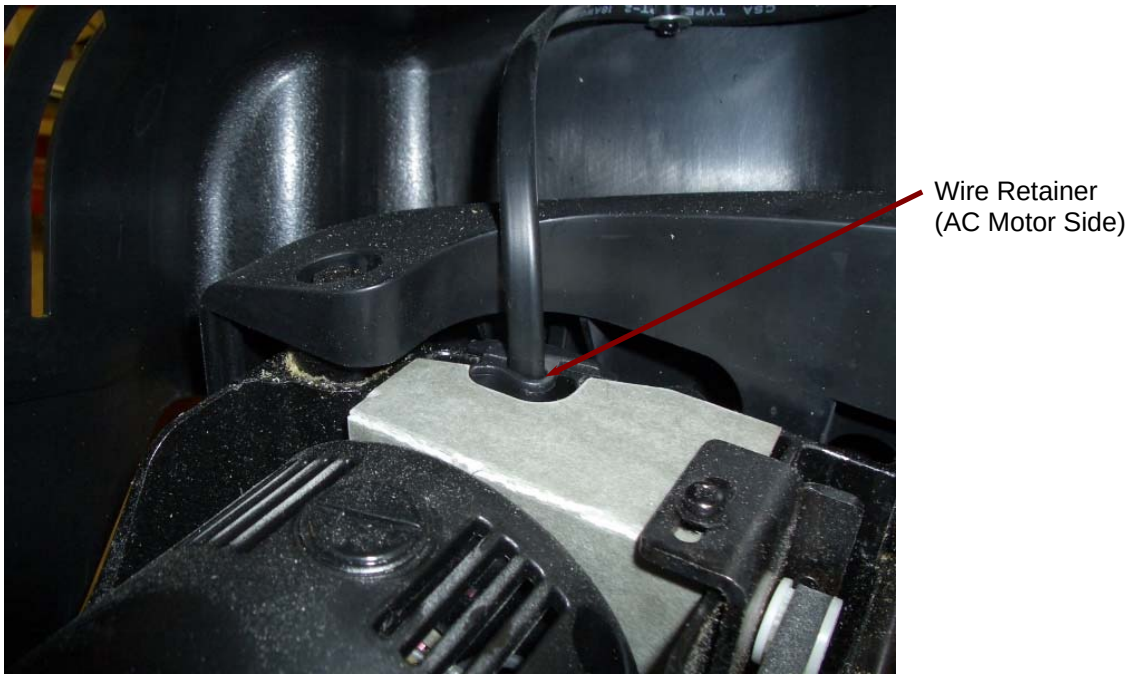
Appendix A



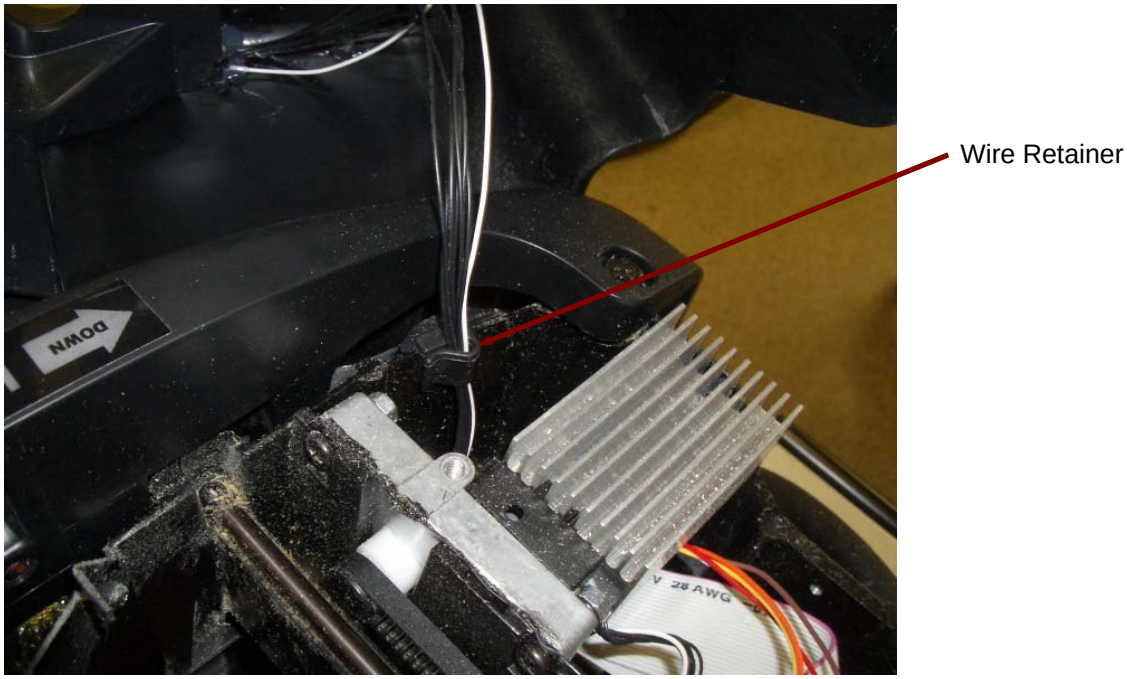
PICTURE 1: LAYING THE HEAD COVER OVER THE SIDE OF THE MACHINE



PICTURE 2: LOCATION OF THE BLOW DEFLECTOR



PICTURE 3: LOCATION OF AC INTERRUPT SWITCH CABLE WIRE RETAINER



PICTURE 4: LOCATION OF HEAD CABLE HARNESS WIRE RETAINER