Section 5:

Parts Replacement

Should the **STAR TRAC** 4500 Treadmill experience a problem requiring replacement of a specific part, the following procedures will help and instruct in the replacement of major parts.

Contents

Drive Motor Replacement

** CAUTION **
Always turn the power switch to the off position. Unplug the treadmill power cord from the power outlet.

Tools:

- **Running Belt Drive Motor**
- **Philips-head screwdriver**
- **Bungee cord, approx. 24 inches**
- **Needle nose pliers**
- **5/16-in socket and torque socket wrench to measure 110 in/lb.**
- **1/8-in. Allen torque wrench to measure 75 in./lb.**
- **Plastic hammer**
- **Punch**
- **Straight edge, 24 inch**
- **Belt Tension Gauge, to 90 lbs. (optional)**

Procedure: Lift motor shroud

The drive motor is located below the plastic shroud at the front of the treadmill. To remove the shroud at access the motor, proceed as follows:

1. Remove the Philips-head screw at the center of the front edge of the shroud.

2. Lift up the front of the shroud, lifting from both sides to separate the Velcro strips.

3. Lift the shroud up the vertical rails as far as it can go, then suspend it using a bungee cord looped over the gooseneck rail and hooked up under the upper edge of the shroud.

The drive motor is now accessible for replacement.

Disconnecting Motor Wiring

1. Follow the green ground wire from the motor to the grounding point in the frame (marked with the ground symbol), then remove the screw that hold the wire terminal to the frame.

2. Cut the two wire ties that hold together the remaining wiring from the motor.

3. Using needle nose pliers, pull apart the black plug-in connector of the red and black wires. *Do not pull on the wires.*

4. Follow the gray sensor cable to the connector marked J# on the left end of the circuit board, and pull the cable connector upwards to disconnect it from the board.

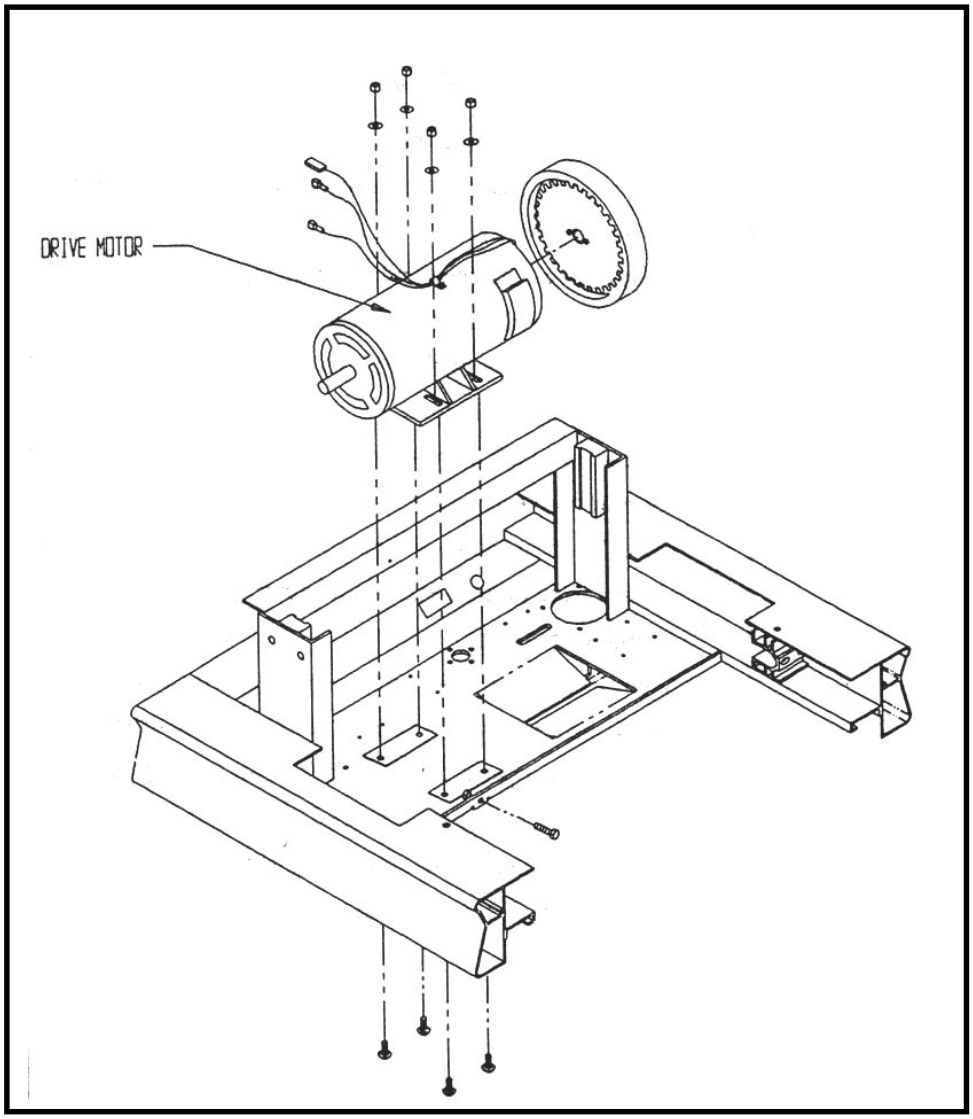
Drive Motor Replacement

Remove Motor

1. Loosen the 5/16-inch nut that locks the motor alignment screw, then unscrew the screw several turns.

2. Loosen the four 5/16-inch motor mount nuts so that the motor slides freely on the frame.

See Diagram A below.



Drive Motor Replacement

3. Using a 1/8-inch Allen wrench, loosen the two set screws in the motor pulley.

4. Slide the motor towards the rear of the treadmill l to give slack to the motor drive belt.

5. Slip the drive belt off the motor pulley, then remove the pulley and the locking key.

6. Remove the four motor mount nuts, then lift the motor out of the treadmill and set l aside. Mark it as the removed motor to avoid confusion with the replacement motor.

This completes motor removal procedures.

Install Replacement Motor

1. Set motor mount onto the four captive screws in the frame.

2. Fit the motor pulley over the motor shaft so that thither of the set screws is aligned with the shaft's keyway

3. Using a plastic hammer and a punch, tap the locking key into the keyway so that it's end protrudes about 1/16-inch past the inner face of the pulley.

4. Tighten the set screws that is over the keyway to hold the pulley in place, but do not torque tightly at this time.

5. Place a 5/16-inch flat washer onto each mountain screw, then loosely turn a 5/16-inch lock nut onto each screw.

6. Place the drive belt over the motor pulley, aligned with pulley surfaces.

7. Using a hand on each end of the motor, press motor towards the front of the treadmill to tighten the belt.

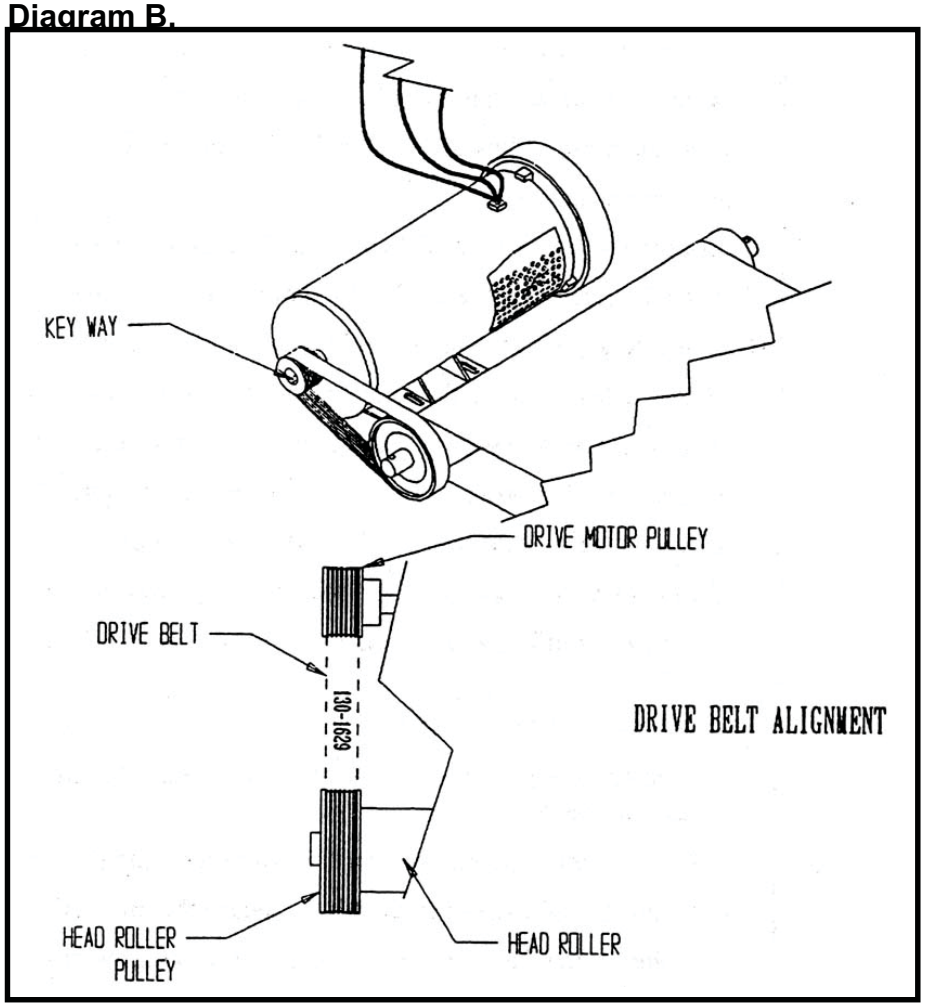
8. Slightly tighten the four mounting nuts, just tight enough to hold the motor in place.

9. Check motor alignment relative to the running belt pulley. Hold the edge of a steel straightedge against the outer face of the running belt pulley. The straightedge should be flush against the outer face of the motor pulley. **See Diagram B**.

10. If the straightedge is not flush against the motor pulley, loosen motor-mount nuts, adjust motor position so that it becomes flush, and then slightly retighten mounting nuts.

Drive Motor Replacement

Diagram B.



Check and Adjust Belt Tension

1. Place a tension gauge onto the center of the belt and check tension. The gauge should indicate 90 inch-pounds.

2. If you have not tension gauge, press down on top of the belt, midway between pulleys, very hard with your thumb. The belt should deflect between 3/8 inch and ½ inch.

3. Screw the motor adjustment screw against the motor mount, moving the motor towards the front of the treadmill pulleys to equalize tension through the belt.

4. When the gauge indicates 90 or when deflection is as specified in preceding step 1, tighten the motor-mount nut nearest the adjustment screw.

5. Recheck pulley alignment and belt tension.

6. When alignment and tension are correct, tighten all four motor mount nuts using a socket torque wrench set at 75 inch-pounds.

7. Lock the motor adjustment screw by tightening the locking nut against the frame.

8. Loosen the set screw at the motor pulley, then recheck alignment.

9. Slide the pulley on the shaft until alignment is restored.

10. Check to see that the pulley locking key still extends about 1/16-inch past the inner face of the pulley. Tighten the set screw over the keyway first, then tighten the other set screw. Use a 1/8-inch Allen torque wrench set for 50 inch-pounds.

11. Recheck both tension and alignment. Check alignment while rotating the belt and pulleys. Use a thickness gauge to measure any gap. If the gap between the outer face of the pulley at its edge, and the straightedge, exceeds 0.007 inches, repeat alignment procedures until that gap is reduced to less than 0.007 inches.

Reconnect Motor Wiring

1. Connect the gray sensor cable to the connector marked J3 on the left end of the circuit board.

2. Press together connectors for the red wires, and then for the black wires.

3. Using a Philips-head screwdriver, secure the lug on the green wire to the ground point on the frame, using the screw removed previously.

4. Using small wire ties, neatly tie together the four wires.

Replace Shroud

1. Release the shroud from the bungee cord that has held it to the handrail gooseneck, and carefully slide the shroud downwards so that it rests on the treadmill frame.

2. Match the screw hole in the lower front edge of the shroud with the mating hole in the frame, then insert and star the Philips-head screw previously removed.

3. Press down on the side and front of the shroud to engage the Velcro strips on the frame.

Tighten the screw to complete shroud-replacement .

Elevation Motor Replacement

** CAUTION **
Always turn the power switch to the off position. Unplug the treadmill power cord from the power outlet.

Tools:

- **Replacement elevation motor**
- **Philips-head screwdriver**
- **Pliers**
- **Tap nuts, ½-inch (2)**
- **Allen wrench, 9/64 in.**
- **Socket wrench with 17-mm socket**
- **Shop hammer**
- **Large screwdriver or steel chisel**

Procedure: Lift motor shroud

The drive motor is located below the plastic shroud at the front of the treadmill. To remove the shroud at access the motor, proceed as follows:

1. Remove the Philips-head screw at the center of the front edge of the shroud.

2. Lift up the front of the shroud, lifting from both sides to separate the Velcro strips.

3. Lift the shroud up the vertical rails as far as it can go, then suspend it using a bungee cord looped over the gooseneck rail and hooked up under the upper edge of the shroud.

Tip the Treadmill on its side

Lift either side of the treadmill and tip the treadmill on its side. This makes accessible both the elevation motor and the belt drive train below the motor plate.

Remove the Elevation Motor

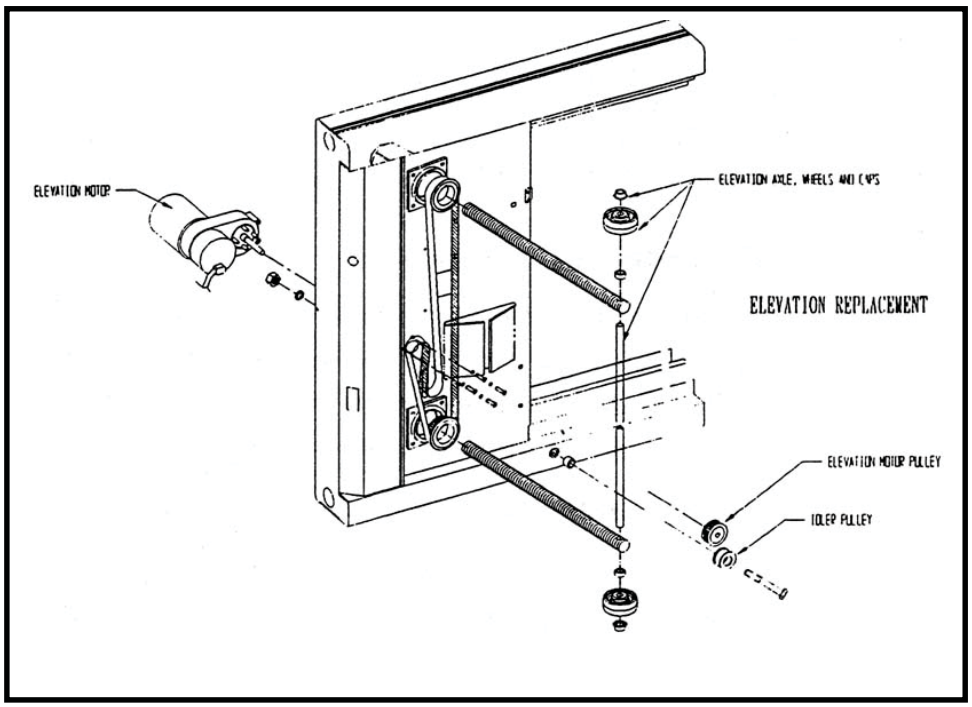
1. Using pliers, remove the end cap (tap nuts) from both ends of the wheel axle at the front end of the treadmill.

2. Remove the wheels and the bushings from both ends of the axle, then remove the axle from the treadmill.

3. At the bottom of the motor plate, loosen the idler pulley-mounting nut using a 17-mm socket wrench. See **Diagram A**.

Elevation Motor Replacement

Diagram A



4. Slide the idler pulley in its slot to loosen the elevation drive belt, then remove the belt from the idler pulley.

5. Using an Allen wrench, loosen the screws around the drive pulley, then remove the pulley from the elevation motor shaft.

6. At the Motor Control Board, disconnect the elevation motor cable from connector J5.

7. At the upper surface of the motor plate, remove the four screws that hold the elevation motor to the motor plate. Use a 9/64-inch Allen wrench.

8. Remove the elevation motor from the treadmill.

Elevation Motor Replacement

Replacement the Elevation Motor

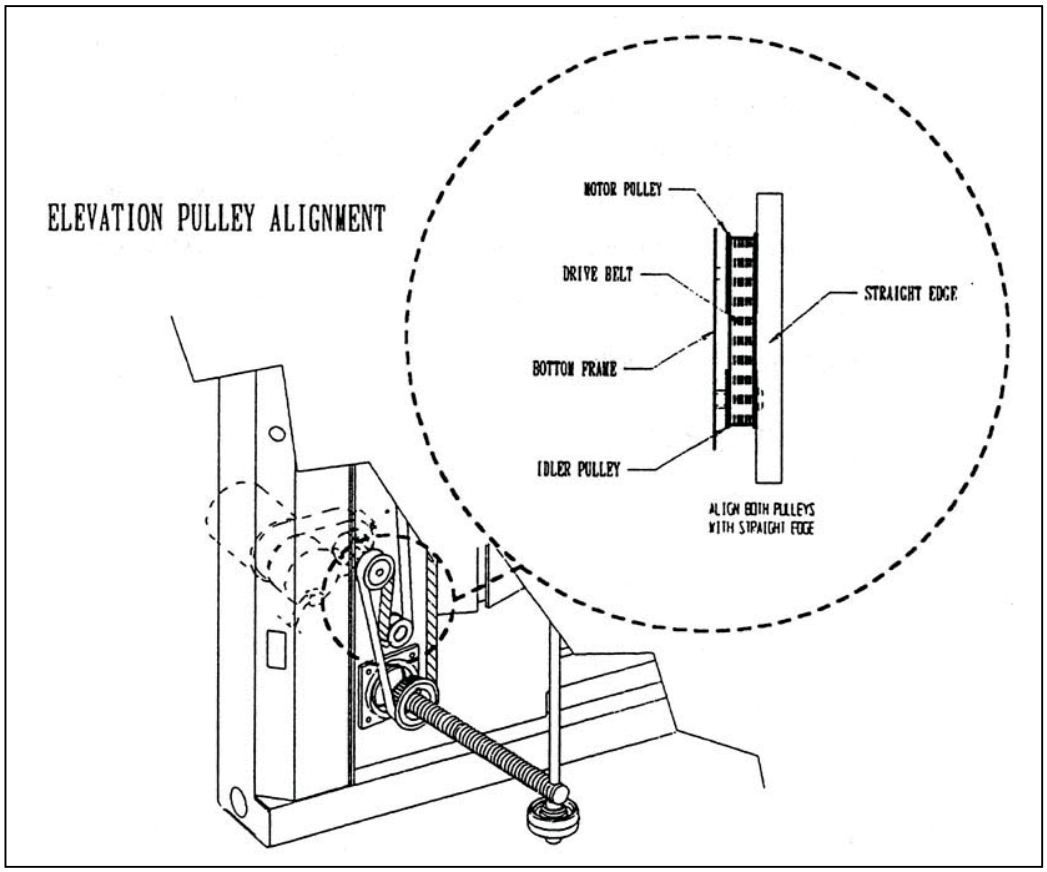
1. Position the elevation motor in its mount. Be sure to hold the motor's electrical cable closely against the motor to prevent its being pinched between the motor and the treadmill frame.

2. Replace and tighten the four screws that hold the elevation motor to the motor plate. Use a 9/64-inch Allen wrench.

3. Connect the motor cable connector to the connector J5 on the Motor Control Board.

4. At the bottom of the motor plate, replace the drive pulley on the motor shaft.

5. Check vertical alignment of the drive pulley, idler pulley, and right hand elevation screw bearing. To do this, rest a straightedge on the pulley and the bearing faces, then position the drive pulley on the shaft until alignment is achieved. **See Diagram B**.



6. Tighten Allen screws in the drive pulley, taking care to preserve the alignment achieved in the preceding step.

7. Place the drive belt over the idler pulley.

8. Slide the idler pulley tightly against the belt, then finger tighten the mounting screw on the idler pulley shaft.

9. Manipulate the drive belt so tat tit is flush with the inside surface of all pulley flnages and the right-hand drive screw bearing.

10. Tighten the idler pulley mounting nut ¼ to ½ turn.

11. Using a large screwdriver or steel chisel, and a hammer, tap the middle of the idler pulley shaft sharply to drive the pulley against the belt.

12. If you have a belt gauge, measure belt tension. Adjust tension until the gauge indicates 50 to 60 pounds, then tighten the idler pulley mount nut. If you have not suitable belt gauge, pinch the sides of the belt together, using strong thumb and finger pressure, in the middle of the belt length. The sides of the belt should not quite touch. Re-adjust belt tension if necessary loosening the idler pulley mounting nut, then repeating the preceding steps **11** and **12** until correct belt tension is achieved.

13. Re-install the wheel axle, align with bushings, wheels, and *new* tap nuts.

Set the Treadmill Upright

Test Treadmill Operation

After you have completed replacement of the elevation motor, perform a complete system test.

Side Bed Cover Replacement

** CAUTION **
Always turn the power switch to the off position. Unplug the treadmill power cord from the power outlet.

Tools:

- Side bed cover
- Philips-head screwdriver
- Slot-head screwdriver
- 1/8-in Allen wrench
- 5/8-in socket and socket wrench with ratchet
- Plastic-head hammer
- Wooden block

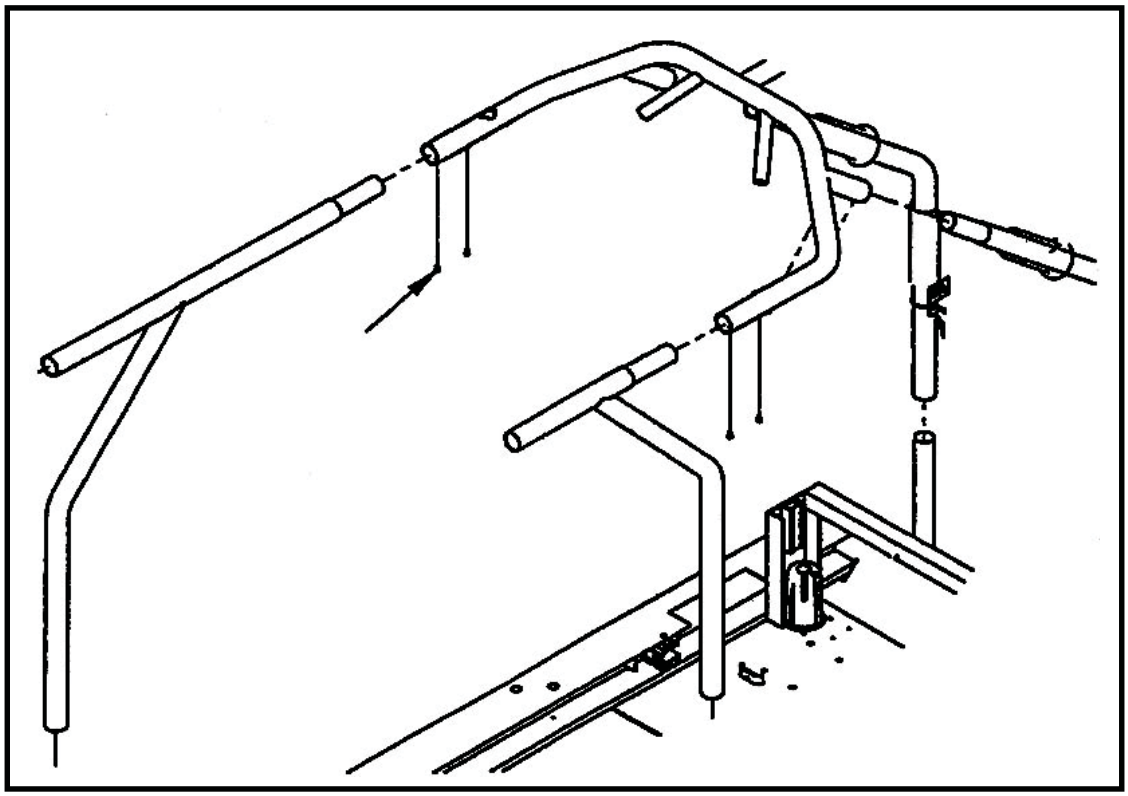
Procedure: Removing the Side Bed Cover.

1. Remove the 5/8-in. hex-head screw at the bottom of the frame and inline with the bottom end of the vertical section of the handrail. **See Diagram A**.

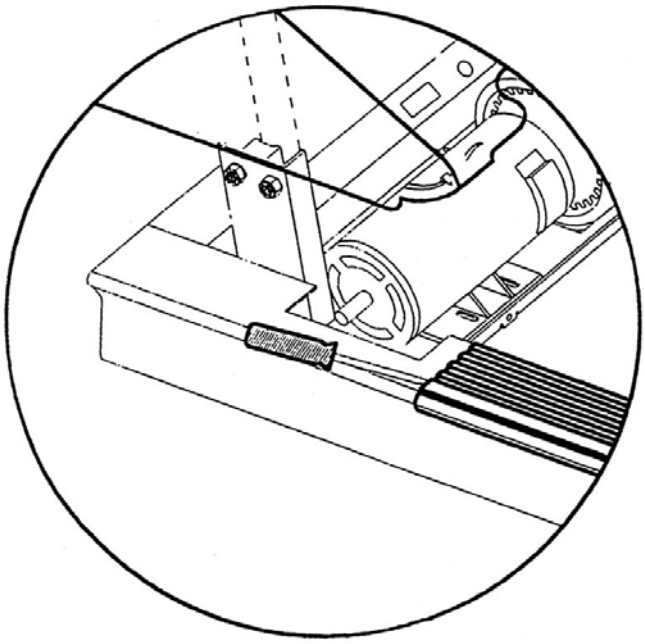
2. Lift the bottom of the vertical section of the handrail to clear the side bed cover and pull it to the side of the frame only far enough to clear the side bed cover.

3. Slip a screwdriver under the front end of the side bed cover, near the outside edge and pry the edge upwards until the outer flange is clear of the frame. **See Diagram B**.

Diagram A



Side Bed Cover Replacement



4. Starting at the raised corner of the flange, lift upwards and outwards to free its outer edge from the frame along its length.

5. Lifting the outer edge of the cover, push the cover towards the center of the treadmill to clear the cover's inner flange from the frame and remove from the treadmill.

Installing Replacement Side Bed Cover

To replace the cover, proceed as follows:

1. To be sure that you have the correct cover (right or left), position it so that the wider flange is at the outside edge of the frame. The hole in the cover should be located nearer the front end of the treadmill.

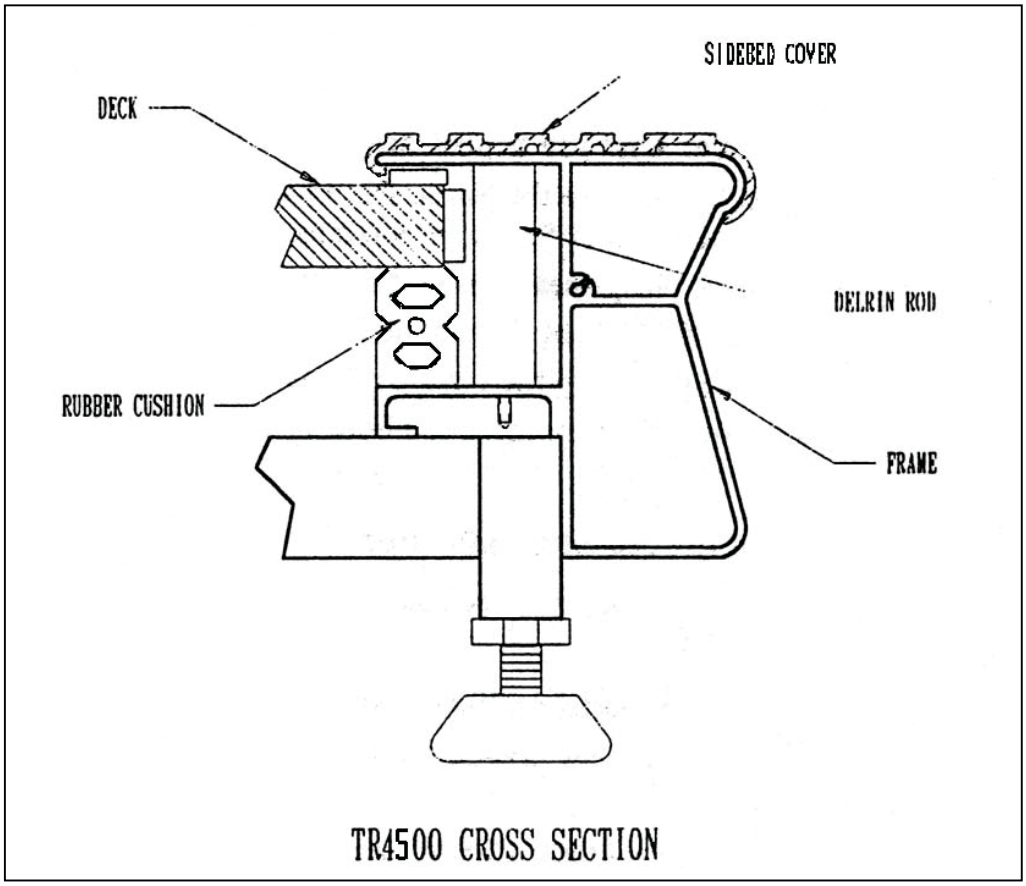
2. Position the new cover so that the hole is nearest the front of the treadmill. If it is a left-hand cover, be sure to position the front end first, fitting the inner flange to clear the running belt pulley.

3. Move the cover parallel to the frame and hook the inner flange over the frame.

Side Bed Cover Replacement

4. At the front end, pull the outer flange over the frame, then use your hand or a soft mallet to “pop” the outer flange over the frame along its full length. The rear end of the cover should butt against the end cap. **See Diagram C**.

Diagram C



5. If the rear end of the cover does not meet the end cap, set a short section of wooden board against the front end of the cover, then tap the board with a plastic hammer to slide the cover flush against the end cap.

6. Lift the vertical section of the handrail to clear the new side bed cover, then set it carefully into the hole in the side bed cover. Be careful not to scratch the side bed cover.

7. Screw the 5/8-inch hex head screw through the bottom of the frame and into the bottom of the vertical section of the handrail, and tighten.

This completes side bed cover replacement procedures.

Autotransformer Replacement

The autotransformer may be tapped to accommodate line voltages from 195VAC to 250VAC. Following are procedures for replacing a failed autotransformer.

Tools:

- Replacement autotransformer
- Philips-head screwdriver
- Slot screwdriver

Procedure: Lift motor shroud

The drive motor is located below the plastic shroud at the front of the treadmill. To remove the shroud at access the motor, proceed as follows:

1. Remove the Philips-head screw at the center of the front edge of the shroud.

2. Lift up the front of the shroud, lifting from both sides to separate the Velcro strips.

3. Lift the shroud up the vertical rails as far as it can go, then suspend it using a bungee cord looped over the gooseneck rail and hooked up under the upper edge of the shroud.

Remove the Autotransformer

The autotransformer is located on the left-hand side of the motor plate.

1. Pull the connectors of the red and blue wires from the transformer lugs**. See Diagram A for wire color layout**.

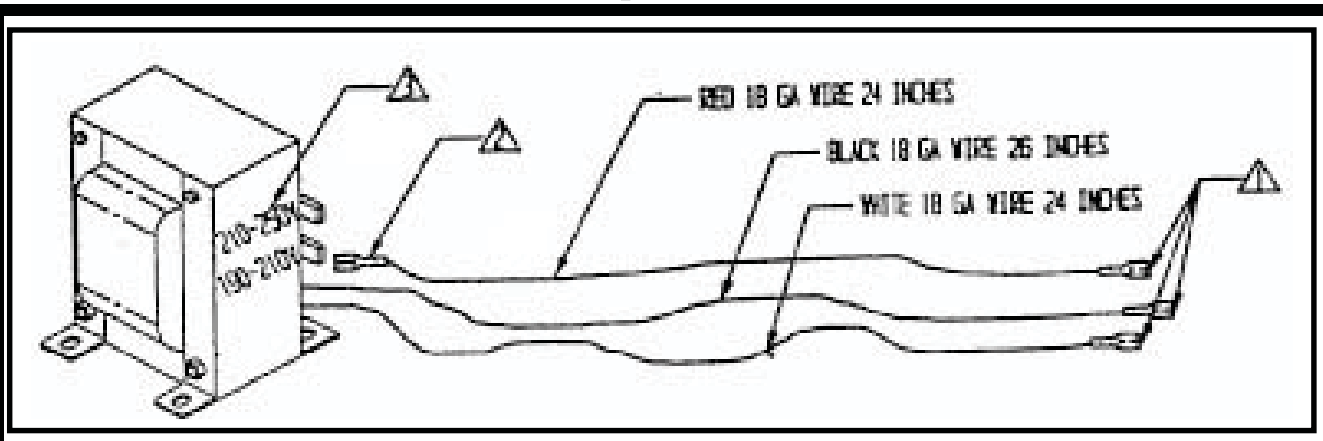
2. Pull the connector of the transformer's black wire from the connector AC1 at the left – rear corner of the Motor Control Board.

3. Using a slot screwdriver, disconnect the transformer's white wire from the WHT terminal on the barrier strip.

4. Disconnect the transformer's brown wire from terminal AC1on the barrier strip.

5. Using a Philips-head screwdriver, remove the four screws that hold the autotransformer to the motor plate. Reach under the treadmill to hold and retrieve the related washers and nuts.

Autotransformer Replacement



Replace the Autotransformer

1. Position the replacement autotransformer over the four holes in the motor plate so that the connector lugs are towards the left-hand side of the treadmill.

2. Drop the four screws removed in the preceding step 5 into the mounting holes of the autotransformer.

3. Reaching under the treadmill, install related washers and nuts, and tighten the mounting screws.

4. Reconnect the autotransformer's brown wire to terminal AC1 on the barrier strip.

5. Reconnect the autotransformer's white wire tot he terminal marked WHT on the barrier strip.

Reconnect the autotransformer's black wire to terminal AC1 at the left-rear corner of the Motor Control Board.
Connect the blue wire to the lug on the autotransformer.

1. Connect the red wire to the same lug from which it was removed in the previous step. If there is a question about the available line voltage, or if EL STL messages have been appearing on the display, check and follow the recommendations in *Selecting the Voltage Tap*.

Replace the Shroud

1. Release the should from the bungee cord that has held it to the handrail gooseneck, and carefully slide the shroud downward so that it rests on the treadmill frame.

2. Match the screw hole in the lower front edge of the shroud with the mating hole in the frame, then insert and start the Philips-head screw previously removed.

3. Press down on the sides and front of the shroud to engage the Velcro strips on the frame.

4. Tighten the screw to complete shroud-replacement procedures.

Test Treadmill Operation

After you have completed replacement of the autotransformer, perform a complete system test.

Selecting the Voltage Tap (if there have been EL STL messages).

The treadmill may be operated over a wide range of line voltages. Either of two voltage taps on the autotransformer may be selected optimize the voltage at the elevation motor. If the treadmill has been generating EL STL messages on the display, the elevation motor has either been overheating and shutting down, or it has been failing to respond to the elevation commands.

Measure the line voltage when the facility's power line is under a typical load.
- If line voltage is less than 220 VAC, connect the red wire to the lower lug on the autotransformer.
- If the voltage is greater than 210 VAC, connect the wire to the upper lug.

Heart Grip Replacement

** CAUTION **
Always turn the power switch to the off position. Unplug the treadmill power cord from the power outlet.

Tools:

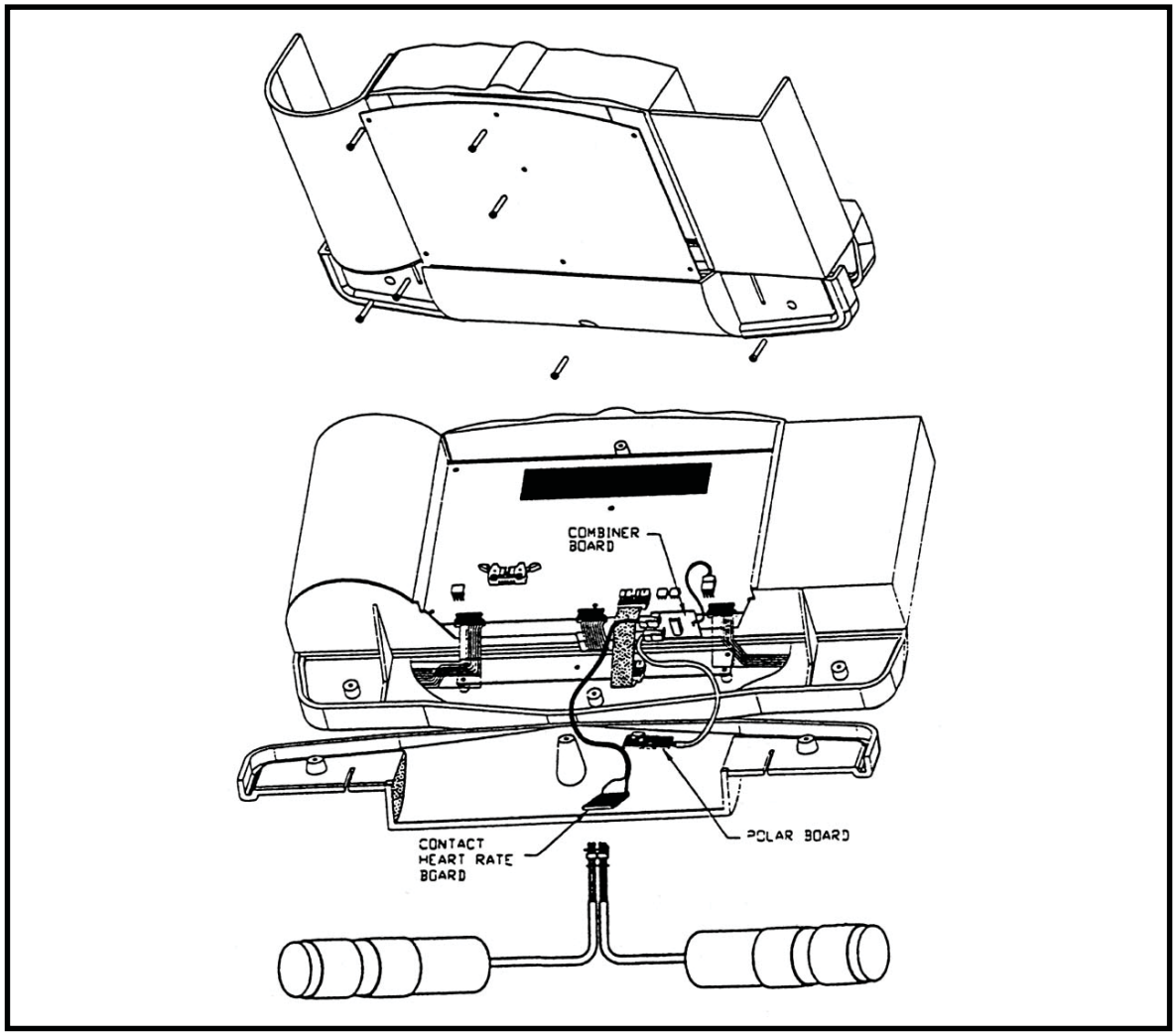
- Handgrip Kit
- 1/16 inch Allen wrench
- Light nylon cord
- Isopropyl alcohol

Procedure: Remove the Display Panel

1. Using a 1/16-inch Allen wrench, remove the five screws from the rear of the display panel mount and carefully lay the panel down on the display rail.

2. Unplug the two handgrip cables from their connectors. See **Diagram A**.

Diagram A



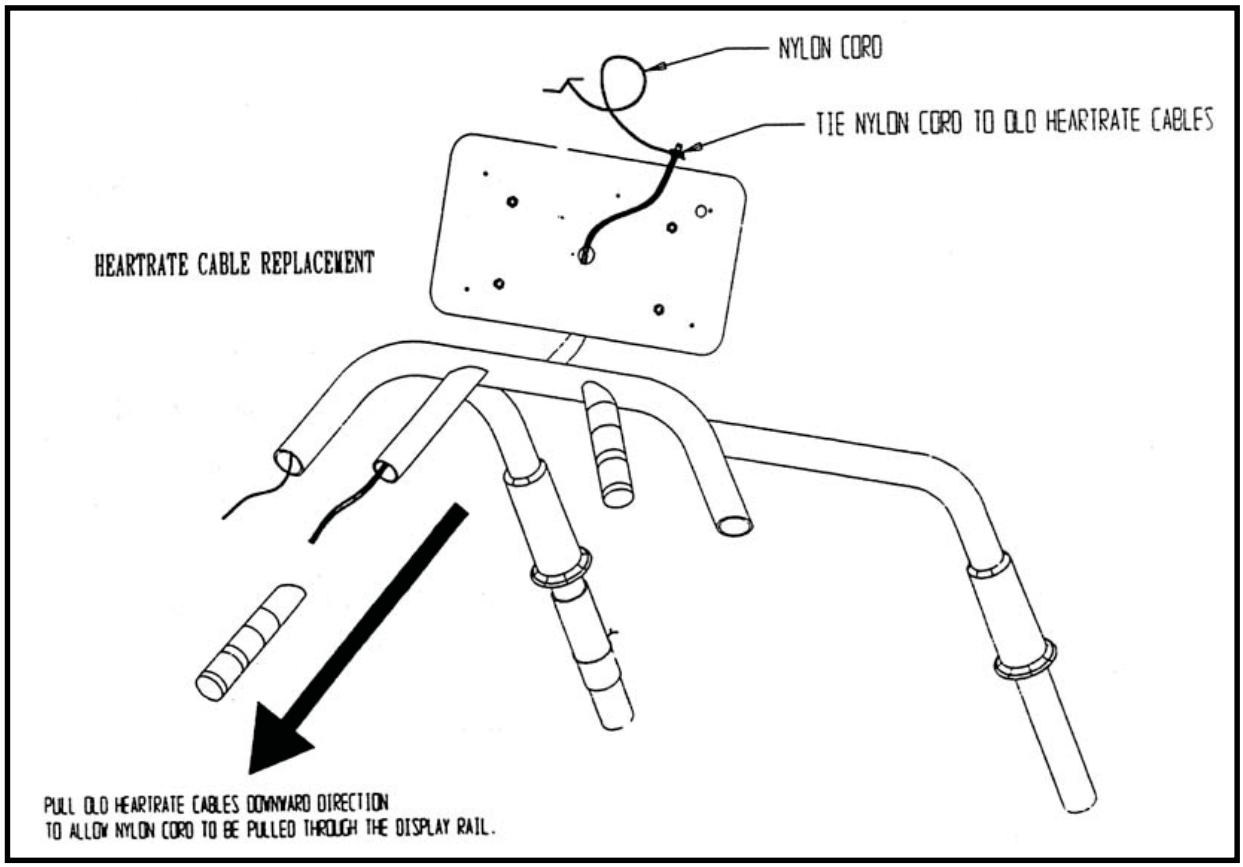
Heart Grip Replacement

3. Lift the handgrip cables to separate the Velcro strips on the cable from the Velcro on the rear of the panel, then remove the two Velcro strips that hold the two cables together.

4. Cut and remove the cable ties from the handgrip cables.

5. Tie a 4-foot length of strong nylon cord to each cable, just below the connector. **See Diagram B**. Secure the free end of each cord so that it will not be pulled into the gooseneck. The cord will be the means of pulling the new cables back through the gooseneck to the display panel.

Diagram B



Heart Grip Replacement

Remove the Handgrips

1. Pull and twist the handgrips free of the rail tubing. If they will not slide off the tubing, use a knife or scissors to cut the rubber along its length, then slide the handgrips off the tubing.

2. Continue to pull each of the handgrip cables though the gooseneck and the display rail until they emerge with the nylon cord attached.

3. Remove the nylon cord from each cable and discard the handgrips.

Replace the Handgrips

1. Remove the new handgrips from their package. Mark cable connector of the handgrip that is to be on the left-hand side.

2. Tie each nylon cord securely to the end of a handgrip cable, just below the connector.

3. For each handgrip cable, pull the related nylon cord out of the gooseneck, drawing the cable up though the gooseneck.

4. Before each handgrip is drawn to the rail tubing, lubricate the inside of the rubber, until the rubber sleeve fits snugly against the tubing joint. Pull the remainder of the cable out of the gooseneck during this step.

5. Bring the cable ends together and apply a cable tie approximately 12 inches from the ends.

6. Wrap Velcro strips (furnished) around both cables approximately 2-1/2 to 3 inches from the cable ends.

7. Connect the cable connectors to the mating connectors on the rear of the display panel.

8. Press Velcro strips on the cables down onto the Velcro strip on the rear of the display panel.

Replace Display Panel

1. Position the display panel over the display panel mount, matching screw holes in the back of the panel with holes in the mount.

2. Using a 1/16-inch Allen wrench, replace and tighten each of the five screws removed in a previous step.

Test Treadmill Operation

After you have completed replacement of the handgrips, perform a complete system test.