

# The Air-Flex Flexion-Distraction TREATMENT TABLE



  
Hill Laboratories  
COMPANY

REFERENCE MANUAL

# Hill Air-Flex Manual

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# *Congratulations!*

**AND WELCOME TO THE HILL LABORATORIES FAMILY**

Hill Laboratories Company has been making

quality a family business since 1945.

Your Hill Air-Flex Table

is built in a tradition of innovation and value that Hill Laboratories

products have become known for.

Our good name rests on the confidence that

your Hill Table will provide you with solid, reliable service

for many years to come.

# READY FOR USE

Your Hill Air-Flex comes ready to plug into any 110 outlet.

## Thoracic and Lumbar Drop

with Thoracic Breakaway

## Tilting Headpiece

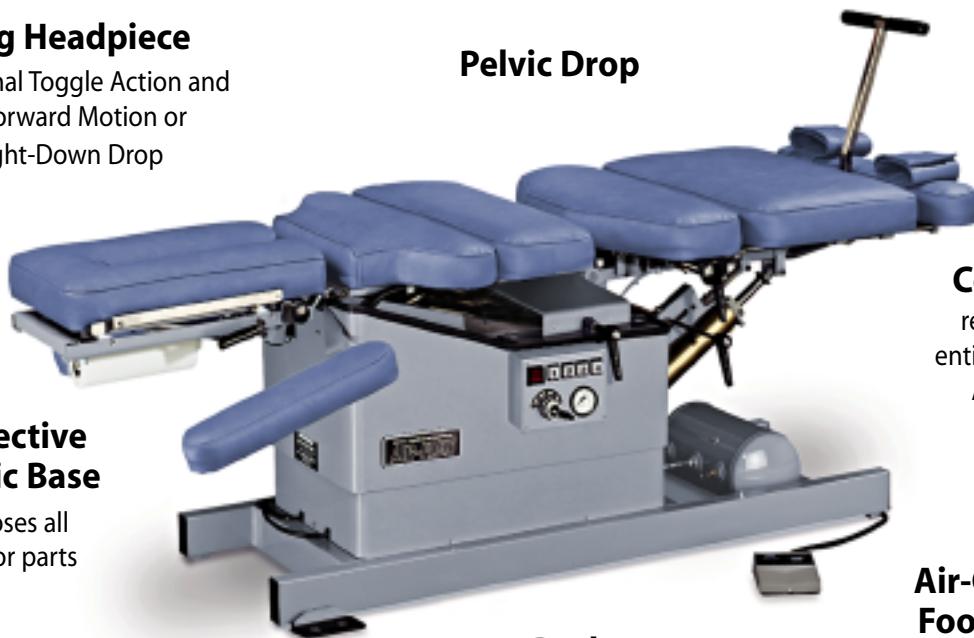
With optional Toggle Action and  
Drop-Forward Motion or  
Straight-Down Drop

## Pelvic Drop

## Tiller Bar

## Ankle Straps

for extension



## Protective Acrylic Base

Encloses all interior parts

## Rocker Foot Pedal

adjust height from either side of the table

## Control Panel

refer to next page entitled "Preparing the Air-Flex for your patient"

## Air-Control Foot Pedal

for pressure control and cocking the drops

# SPECIFICATIONS

- Lifting capacity - 450 pounds
- Acrylic thermo-plastic base
- Ultra-Cell® foam for comfort and shape retention
- Electric requirement - 110 volts, 60 Hz., 4.8 amps.  
or where specified - 220 volts, 50 Hz.
- Height Range - 20<sup>1</sup>/<sub>2</sub>"-28" or 22<sup>1</sup>/<sub>2</sub>"-29"
- Shipping weight approximately 250 lbs.
- Standard width 24", optional 22" and 27"

# TABLE CARE

This page and the following pages contain some helpful suggestions for keeping your Hill Table in excellent working order plus some technical drawings and service sheets for instruction in the event of a problem.

## CLEANING YOUR TABLE

Your Hill Table comes upholstered in a highly durable vinyl material. Its appearance is guarded by Prefixx™ brand protective finish. Your upholstery may be cleaned with the Hill Laboratories Vinyl Cleaner or any non-abrasive household detergent without change to surface luster. Stubborn stains can be cleaned with most common solvent cleaners such as naphtha (lighter fluid), rubbing alcohol (IPA type), toluene, Coleman gas, turpentine (paint thinner), and nail polish remover (50/50 mixture of acetone and water) with no change to surface luster or color. One hundred percent acetone can also be used for short periods but it is suggested that it first be tested on an inconspicuous area of the table.

**Caution:** These solvents are highly flammable; exercise proper care when cleaning with these materials and do not use near open flame or intense heat. Wear rubber gloves during all cleaning activities.

When cleaning other parts of your table (besides upholstery) use only nonabrasive household detergents and water.

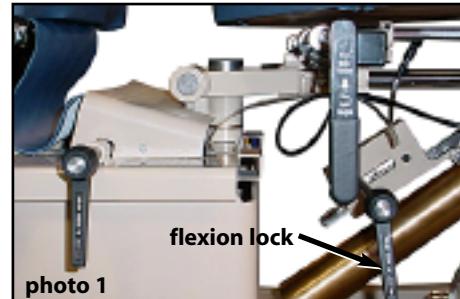
## GENERAL MAINTENANCE

We recommend that the actuator be regreased approximately once a year to keep your table running smooth and quiet. For instructions refer to the 'Trouble Shooting' section on page 6 of this manual. Be sure to unplug table before performing any maintenance on the table.

# READY FOR USE

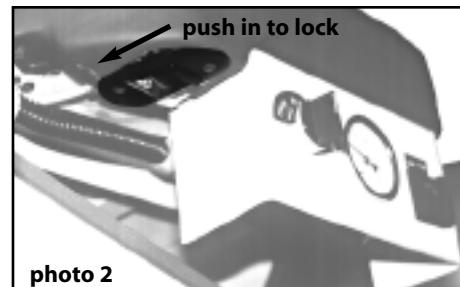
## Preparing the Air-Flex for your patient

1. Plug your table into any 110 grounded outlet.
2. Press the ON/OFF button of the Control Panel (see photo 5) to start your table's air-compressor. Compressor will stop automatically when the pressure level reaches approximately 90 lbs.
3. Use the Rocker Foot Pedal (see page 2) to adjust the table to its lowest setting.
4. It is very important that all three locking handles are firmly in the locked position (pointing towards the floor as in photo 1) before positioning your patient on the table. This will prevent unwanted movement of the table and avoid possible injury to the patient. Also, if your table has a Thoracic Spring Breakaway, be sure to push down on the Thoracic section before positioning patient to be sure that it is locked in the UP position (see photo 2).



### Thoracic Release/Thoracic Air-Breakaway

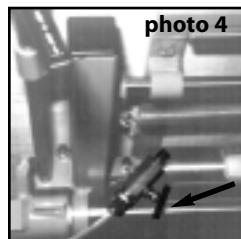
1. If your table is equipped with a Thoracic Release only, simply pull the switch (shown in photo 3) towards you to the out position and while holding it, adjust the cushion to the desired depth. Releasing the switch locks the cushion.
2. If your table is equipped with a Thoracic Release and a Thoracic Spring Breakaway, use the following instructions to regulate the Breakaway mechanism.
  - Set the selection switch on the control panel to 'Thor' (thoracic).
  - Pull the thoracic lock switch towards you to allow the cushion to move freely. (Breakaway locks will click and stay in position without holding)
  - Press the air-foot pedal on the righthand side to increase the air-pressure in the thoracic section. Push down on the thoracic cushion a few times as you add air to test for desired firmness.
  - To lock the cushion at any point, push the thoracic lock switch in towards the table. Be sure to depressurize the thoracic section after locking to prevent an abrupt release when you unlock it for the next patient.



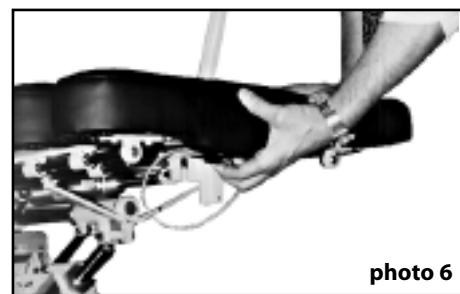
### Distraction

1. Remove the Tiller Bar from its bracket (see page 2).
2. Place the patient face-down on the table with feet extended over the ankle rest.
3. Extend the foot section out to accomidate for patient's height using the foot section switch (see photo 6).
4. Secure Ankle Straps (if equipped). Set the selection switch to 'DIST' for distraction (see photo 5). Press the righthand side of the air-foot pedal. This will cause the foot section to slowly extend without removing your hands from the patient.

Note: The rate of distraction can be adjusted with the valve shown in photo 4.



1. Be sure that Flexion Lock is in the locked position (see photo 1). Insert the Tiller Bar back into its bracket.
2. Set the selection switch to 'FLEX' for flexion. Press the air-foot pedal until 80 lbs. is reached on the pressure gauge.
3. Move Flexion Locking Handle to unlock position. Depending on patient's weight, more or less pressure will be needed to counterbalance their lower body. Lower the pressure with the foot pedal until little force is required to push down on Tiller Bar. If leg cushion does not spring back, increase pressure.



# READY FOR USE

## Instructions for using the Rotation Lock on the Hill Air-Flex Table

The Rotation Lock for the Air-Flex Table can be used at any angle of patient rotation. Unlike the locks for flexion and lateral motion which consist of a gear lock, the rotation lock is Mechlok®, controlled. A handle with a positioning pin is also provided to assist in locating the horizontal, "home" position.

### To use the rotation feature

Unlock both the Mechlok switch (see "A", Photo 1) and turn the home position handle to the 4 o'clock position (see "B", Photo 1). This will allow freedom of movement in rotation.

### To lock the rotation at any angle

Simply push the lever for the Mechlok switch in towards the patient.

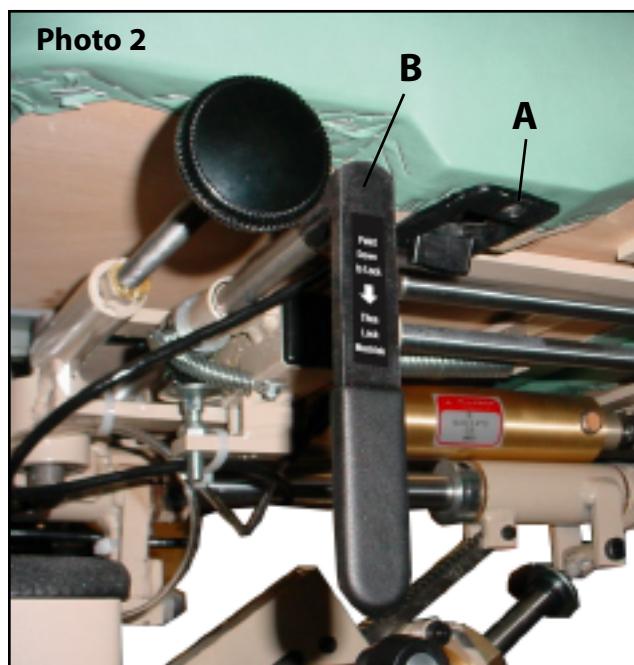
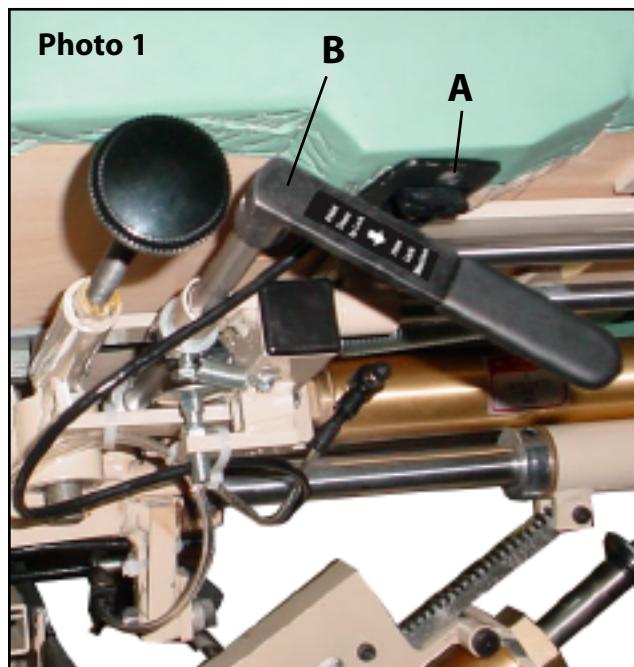
### To treat without rotation,

Lock the cushion in the following manner:

- Manually move the Flexion Cushion to the "home" / horizontal position. Then engage the home position handle (again, "B", Photo 2), by turning it to the straight down position. Once the home position handle is engaged, then also lock the Mechlok switch (A, Photo 2).

**NOTE:** If the home position handle will not engage it is because the cushion is not yet in the horizontal position. Adjust the cushion position until the handle engages.

**CAUTION:** Unless in rotation, never treat a patient unless the Mechlok is locked.



# READY FOR USE

## Instructions for using the Air-Flex with added drops and toggle headpiece

The procedure for using the Air-Flex Table with added drops is the same as using the regular Air-Flex except for the following:

1. The Air-Flex with added drops has an expanded control panel (see Photo 1). The control panel has an ON/OFF switch, a Function Control Switch and four push-button drop-selector switches.

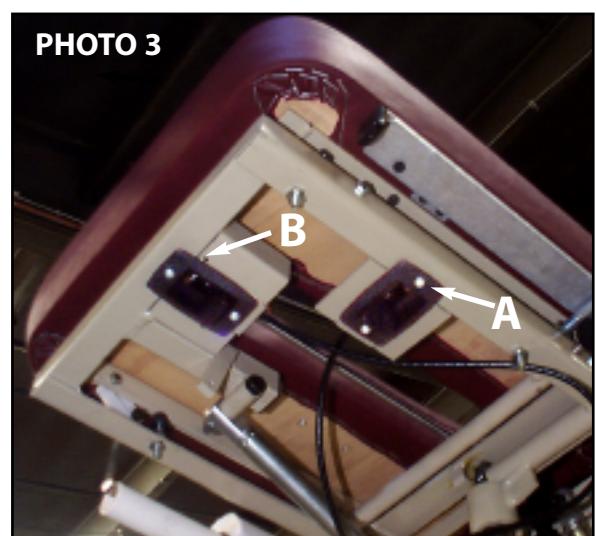
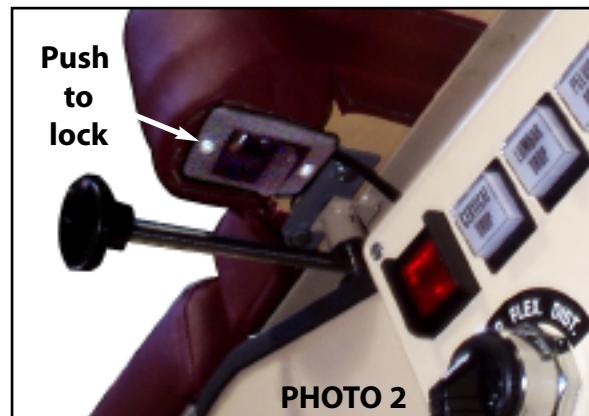
**The Function Control Switch-** Once the table is turned on with the ON/OFF button, you may choose whatever table function you desire by using the Function Control Switch (see A, Photo 1). The Function Control Switch directs air pressure to that function of the table needed for use. Unlike the regular Air-Flex, the Air-Flex with added drops has an added setting on the Function Control Switch labeled 'DROP'. The Function Control Switch must be set on the 'DROP' setting in order to use the drops on the table.

**The Drop Selector Switches-** The Drop Selector Switches (B, Photo 1) are used when you are ready to use the drops on your table. With the Function Control Switch set on 'DROP', press the button that corresponds with the drop you want to use. Pressing the button will channel the flow of air to cock the desired drop once you hit the foot pedal.

**The Thoracic Lock Switch-** The Thoracic Lock Switch is used to lock the thoracic and lumbar cushions in any position down to 5 1/2". You will want the switch locked in the UP position in most cases whenever you're using the drops (with the possible exception of treating pregnant patients, etc.). The lock is engaged when the switch is pushed in towards the table (see Photo 2).

**The Headpiece Height Adjustment Switch (for toggle headpieces)**  
The Headpiece Height Adjustment Switch controls the height of the Toggle Headpiece (see A, Photo 3). When adjustment is desired, pull the switch handle out, away from the table, and while holding it, adjust the height of the headpiece with the other hand (for best results, adjust the headpiece by placing your hand towards the rear of the cushion, not the front).

**The Headpiece Tilt Adjustment Switch-** The Headpiece Tilt Adjustment Switch controls the angle of tilt for the headpiece (see B, Photo 3).



# READY FOR USE

## Instructions for Dual Action Headpiece.

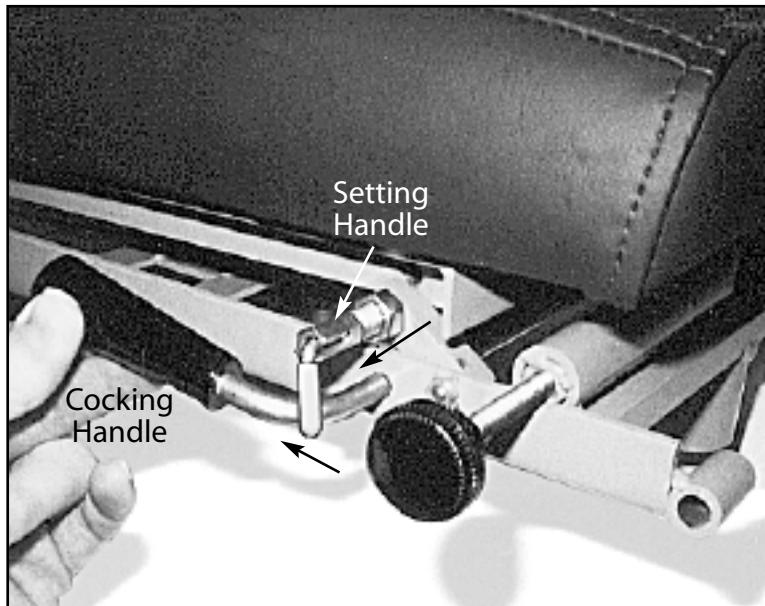
### Important Note:

Whenever adjusting the setting, be sure that the headpiece is in the down position (not cocked)

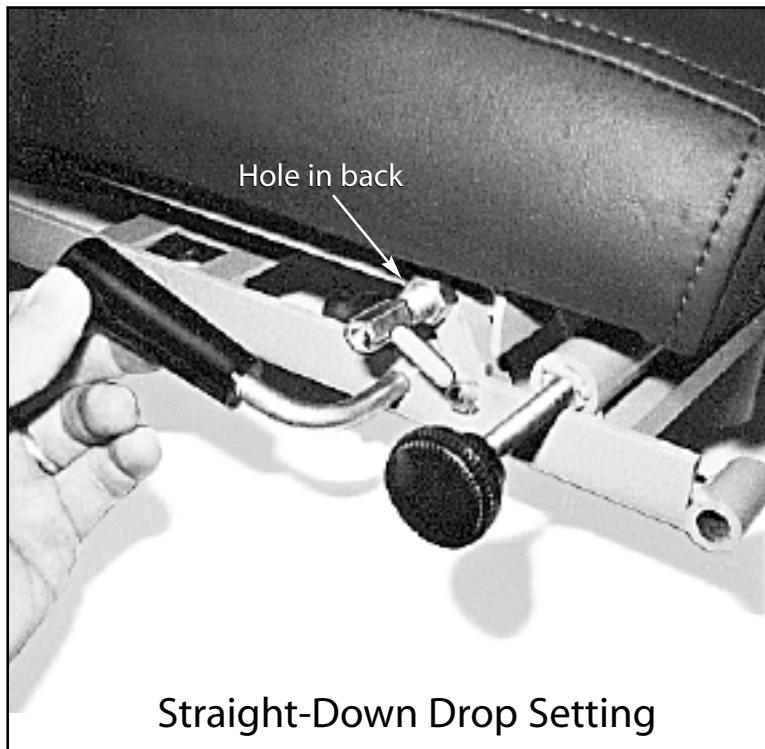
**1.** To use the Drop-Forward Motion action of the headpiece, simply pull the setting handle out towards you and turn it to the left until it hits the cocking handle (see photo).

Cock the drop with the cocking handle; the drop is ready to set.

**2.** To use the Straight-Down Drop action of the headpiece, simply push the handle back to the right until it springs into the channel on the side of the setting mechanism (see photo). Be sure that the pin of the mechanism locks into the hole directly behind it; if it doesn't, the drop will not work. Cock the drop with the cocking handle; the drop is ready to set.



Drop-Forward Motion Setting



Straight-Down Drop Setting

# READY FOR USE

## Instructions for Using the Cervical Flexion Headpiece

### Set Up:

Prior to flexion, release the cushion lock pin to allow the cushion to slide ("A" Photo 1). Pull and turn the lever to disengage the pin.

### Lateral Adjustment:

To adjust the position of the headpiece in the lateral direction, locate the switch as shown in photo 2. Pull the lever of the switch toward you to the unlock position. This allows you to move the headpiece freely to any point in the lateral range. To lock the headpiece at any point, push the switch back to the lock position.

### Height Adjustment:

To adjust the height of the headpiece, locate the switch as shown in photo 3. Pull the lever of the switch toward you while moving the headpiece up or down to the desired position. Release the switch to lock at any point.

### Tilt Adjustment:

To adjust the tilt angle of the headpiece, locate the switch as shown in photo 4. Pull the lever of the switch toward you to the unlock position. This allows you to move the headpiece freely to any point in the tilt range. To lock the headpiece at any point, push the switch back to the lock position.

Photo 1

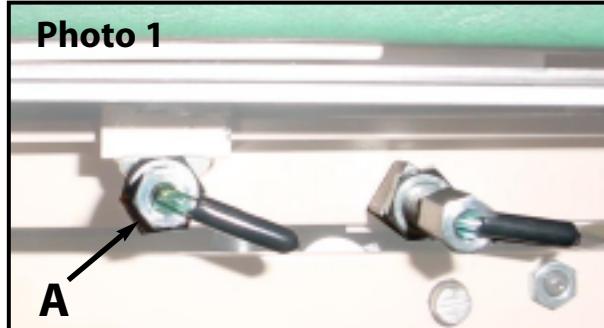


Photo 2



Photo 3

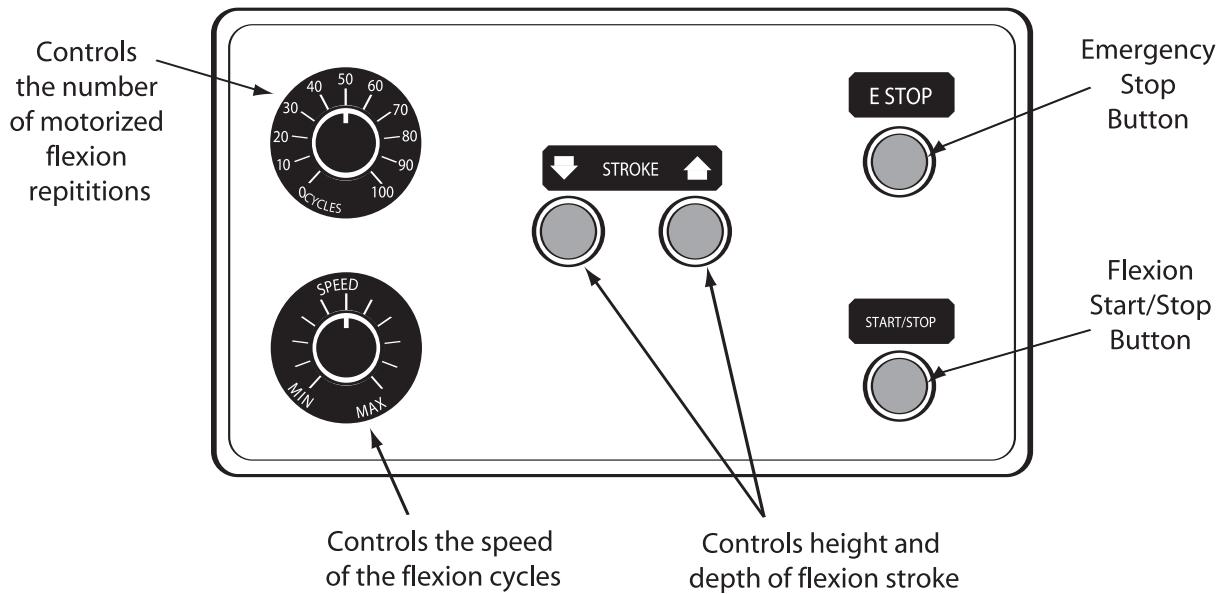


Photo 4



# READY FOR USE

## AUTO-FLEX CONTROL PANEL



### Safety Specifications for the Auto Air Flex

These instructions are in addition to instructions in the standard Air Flex manual

**Safety Caution:** Children should not be left alone in the room with the Auto Flex. Moveable parts can cause severe damage to any person who might put his hand under the flexion end of the table when the table is running. The flexion motor will run hot. Avoid contact

#### How to operate

Read the manual on the operation of the standard Air Flex table before becoming familiar with the Auto-Flex. It is very important that you become familiar with how to balance the patient with the air pressure. Failure to do this will result in the auto flexion not working properly

#### How to balance the table

1. Press the ON/OFF switch on. It will light up. It may be left on all day.
2. Make sure all locking handles are facing down and the thoracic cushion is locked. Place the patient on the table.
3. Turn the FUNCTION CONTROL SWITCH to flex.
4. Press the power foot pedal until the gauge reaches approximately 35 to 40 psi. For lighter than average patients, use 25 to 30 psi. Heavier patients will require 50 psi.
5. Move the flexion lock handle to a 3 o'clock position. This allows for manual flexion.
6. Push down on the end of the table by either pressing on the cushions or the tiller bar. Determine if the patient is in extension or flexion. The patient should be balanced so that the leg section of the table starts at approximately 5° below horizontal. To do this, use the pressure foot pedal. If the patient is in an extension position, release some of the pressure by tapping the downside of the pedal to lower the end of the table. If the patient is in flexion (more than 5°), add some pressure by tapping the upside of the pressure pedal. *(continued next page)*

# READY FOR USE

(continued next page)

## Applying the Auto Flexion

You are now ready to use the Auto Flex feature. We have designed the Auto Flex to be as safe as possible. The table will always start out with only one degree or less of flexion. The operator can then change speed and depth allowing for patient feedback. When using the distraction feature with Auto Flex, the flexion may not need to be as deep. Once you make notes of the speed, depth, and cycle times on the patient's chart, it will be easier to duplicate treatment on subsequent visits.

### **DURING OPERATION OF AUTO-FLEX, PATIENT MUST BE SUPERVISED AT ALL TIMES.**

1. Become familiar with the control panel.
2. Move the flexion locking handle to the 2 or 1 o'clock position. You will feel the handle move a cam into a lock position. This is engaging the motor.
3. Turn the CYCLE dial to the desired number of flexion cycles. We suggest you turn it to 5 cycles more than you need as you will use a few cycles just reaching the required depth.
4. Turn the MIN/MAX speed dial to MIN.
5. Press the round START/STOP button. It will light up.
6. The table will flex only one degree or less as it starts.
7. Immediately press the DOWN STROKE button. Each time the button is pressed, the table will flex 1/6 of the maximum depth. By pressing the button once, the table will flex 1/6 of the available depth; pressing three times produces flexion of half the available depth; pressing six times results in flexion to full depth.
8. You can now change the MIN/MAX dial to adjust the speed of the flexion
9. Once the cycle time has ended, the patient will always return to the starting or horizontal position. Make certain the flexion lock handle is at the 6 o'clock locked position, You will feel it click into place. Lock all other locks before the patient gets off the table.
10. Return the MIN/MAX speed dial to MIN.

### ***Emergency Stopping***

To immediately stop the automatic flexion movement of the table, press E STOP. The light will come on and the Auto Flex will immediately stop.

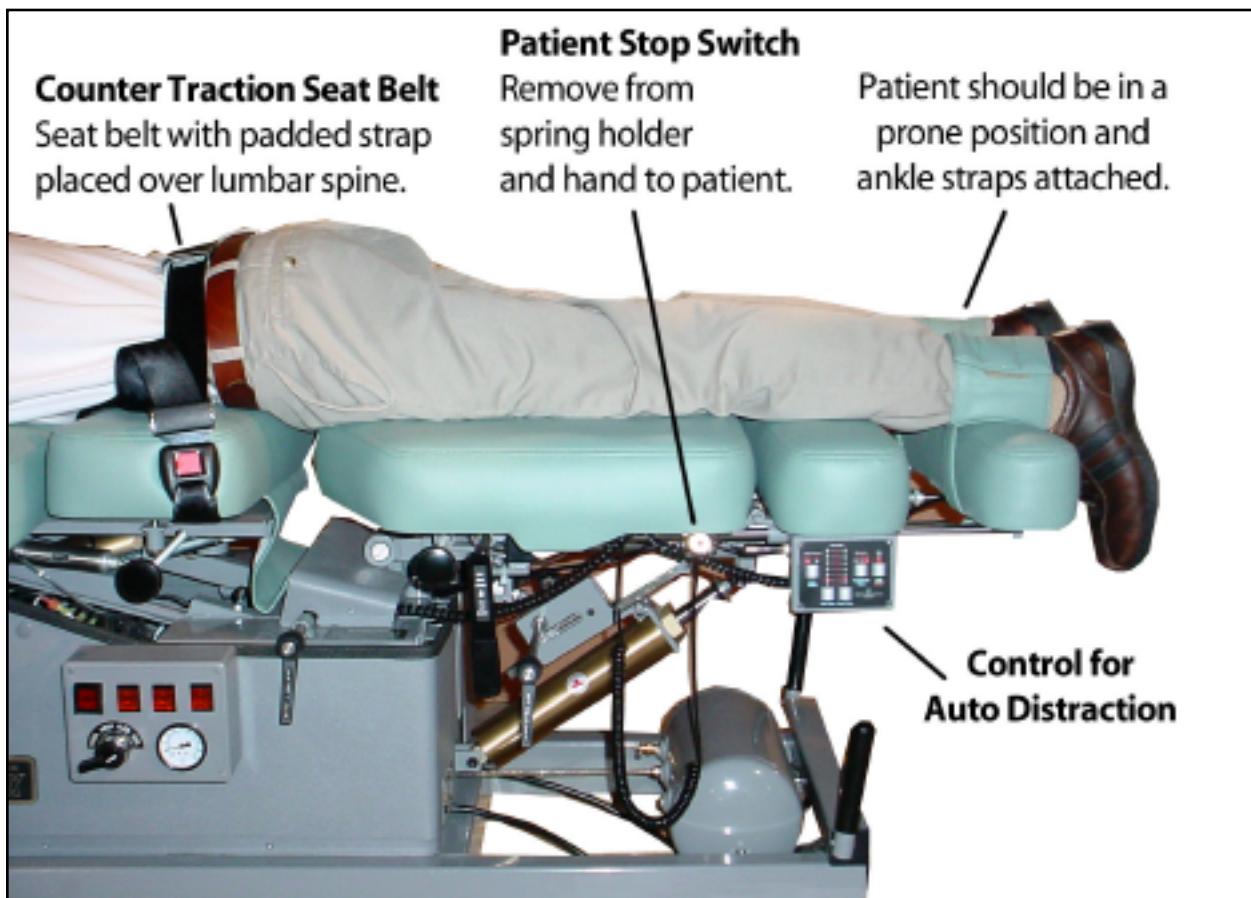
At this point, either lock all locks and assist the patient off the table or turn the speed dial to MIN and press the START button to slowly move the patient to the horizontal stop position. Lock all locks and the patient can then safely get off the table. Reminder: Once you press the E STOP you must press START to bring the table top back to a horizontal position. The E STOP light will go out when the START button is activated..

# READY FOR USE

## How to use the Auto-Distraction Feature

Prior to using auto-distraction, read and become familiar with the section in the manual titled - **Preparing the Air Flex for Your Patient**

1. Press the red power button on the center control panel.
2. Set the selector switch to distraction.
3. Make sure the pelvic section is as close as possible to the thoracic section; if it is not, press the down arrow on the power foot pedal.
4. Place the patient in a prone position on the table, adjust the ankle rest to the patient's height, fasten the ankle cuffs and pull out on the ankle rest so that the patient feels a slight distraction.
5. Located on the thoracic section is the counter traction seat belt and pad. Place it over the lumbar spine so that the padded portion is in contact with the spine and secure firmly with the seat belt.



*Continued on next page...*

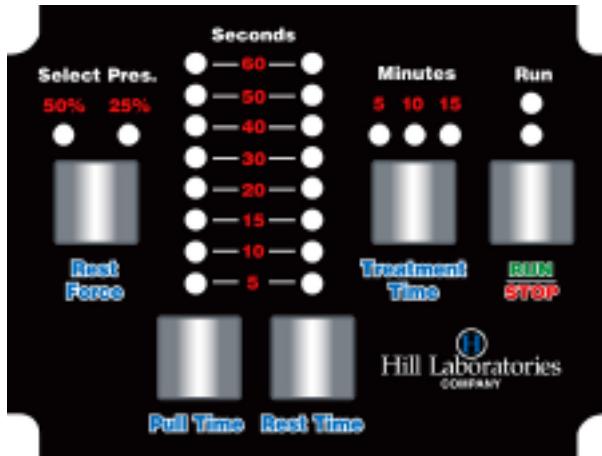
# READY FOR USE

*Continued from previous page*

## Preset the Auto-Distraction Selection Buttons

The control box at the foot end of the table can now be set for the desired treatment time, rest and pull time, and rest-force percentage which will decrease the pull down to 25% or 50% of the original set amount.

1. Set treatment time to 5, 10, or 15 minutes by tapping the treatment-time button to change time.
2. Push the rest-force button to select the rest-force percentage of 25% or 50%.
3. Select the rest and pull time from 5 seconds to 60 seconds. Hold the button down until the desired time is indicated.
4. The patient STOP SWITCH is located on the underside of the table and should be given to the patient prior to the start of the treatment. It can be used to stop the treatment any time the patient experiences discomfort. If the patient switch is not plugged into the control box, if the wires become disconnected, or if the patient switch becomes faulty, the auto-distraction will not work. If the patient presses this button any time after the treatment has started, the treatment will abort.



## Starting the Treatment

Once the parameters have been set and the patient is positioned on the table, treatment may begin.

1. With the selector switch in the distraction position, press the upside arrow on the power foot pedal. The table will distract out. The gauge will indicate the amount of pressure you are giving. As you palpate the spine, you will feel a slight separation.
2. Press the run-stop button to change it from red to green. The treatment will immediately go into the rest-cycle time. The indicator lights above the rest time will progressively light up illustrating the elapsed time. Once the preset time is reached, the treatment will switch over to the pull cycle and the table will distract out and proceed to cycle.
3. Treatment can be stopped at any time by pressing the run-stop button. It will flash back and forth (red and green) until the lower end of the table retracts. This will also occur if the patient depresses the patient stop-button.

When the treatment time has elapsed, the table will automatically retract and the run-stop light will flash indicating the treatment time has expired.

# TROUBLE SHOOTING

## Problem

The table is making a high-pitched squealing sound, usually when reaching the high end of the stroke.

## Solution

The actuator pin needs adjustment.

Do the following to fix the problem:

**(IMPORTANT:** It is not necessary to remove the actuator from the table as shown here.)

1. With the foot pedal, adjust the table to the down position. Unplug the table.
2. Gently roll the table over on its side to expose the underside of the base.
3. Locate the pin on the actuator shaft (see photo 1). Notice that it protrudes out both sides of the shaft. Use a hammer and a punch (or screwdriver) to gently tap the pin on one side to make it protrude further out the opposite side of the shaft. Now plug the table back in and run the actuator to see if the squealing has stopped. If not, tap the pin gently from either side until it does.
4. Apply grease to both sides of the actuator shaft as shown in photo 2.

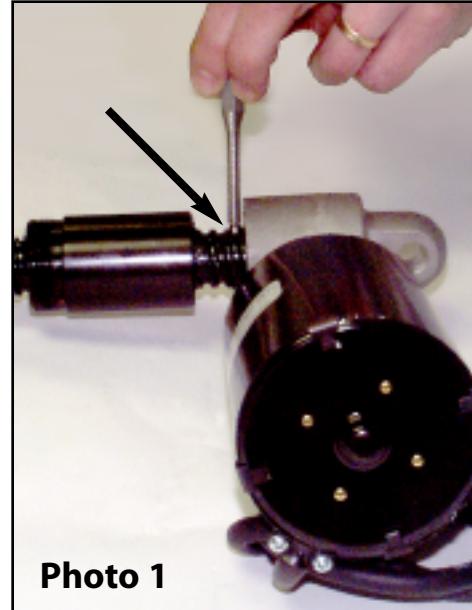


Photo 1

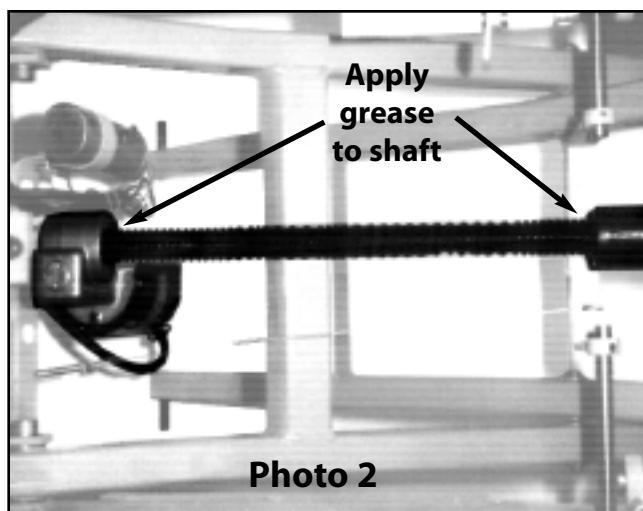


Photo 2

# TROUBLE SHOOTING

## Problem

The table is making a rumbling or grinding sound when the height is adjusted and/or the height of the table slips downward when height is not being adjusted.

## Solution

The actuator brake needs to be replaced. Do the following to fix the problem:

1. Adjust the table height to the highest setting. Unplug the table, and then remove the screws around the bottom of the plastic base skirting. Next, lift the inside skirt up so that it slides inside the outside skirt and then attach the bottom of the skirts together with masking tape to keep them up and out of the way while you work.

**IMPORTANT:** It is not necessary to remove the actuator from the table as shown here.

2. Remove the 3/8" nuts that hold the black motor to the actuator casing (2 or 3 depending on the age of the table). Then lift the motor off the casing to



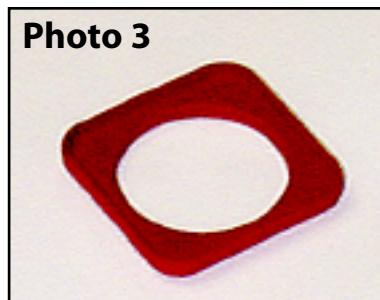
**Photo 1**

3. Using a needle nose pliers, grasp the actuator brake on both sides and carefully remove it and the gasket underneath (see photos 2 and 3).

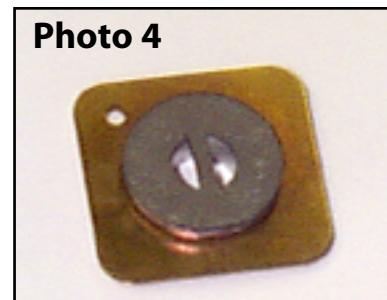


**Photo 2**

4. Clean the inside the casing, removing any grease and dirt. Insert the new gasket and brake being careful that the "smooth side" of the brake is face up (photo 4).



**Photo 3**



**Photo 4**

5. Reattach the motor with nuts. Lower the inside skirt and secure with screws.

# TROUBLE SHOOTING

## Problem

The table is making a high-pitched winding sound when the height is adjusted.

## Solution

The actuator worm gear needs to be replaced. Do the following to fix the problem:

**IMPORTANT:** It is not necessary to remove the actuator from the table as shown here!

1. Adjust the table height to the middle height setting. Unplug the table, and then gently tip the table up so that it stands on the foot end of the table.
2. If your table has a grease fitting (see Photo 1), first remove it with a pliers or adjustable wrench.
3. For actuators that do not have a grease fitting, unscrew the cap by tapping counter clockwise with a hammer and nail (or punch), angling the nail into the depressions in the cap as shown in photo 2.
4. Take the new worm gear and coat it completely and generously with grease.
5. Take a rag and wrap it around the actuator shaft (see photo 4). Then with your hand on the rag, slowly rotate the shaft clockwise until the worm gear pops up from the casing as shown in photo 3. **IMPORTANT:** Only rotate the wormgear upwards enough to grasp it with your fingers but no further. Also, do not turn the actuator shaft after removing the wormgear as this will make placing the new one more difficult.
6. Remove the old worm gear.
7. Insert the new worm gear into the casing, aligning it with the "half-moon slots in the brake at the bottom of the hole. If the gear does not immediately align, then grasp the actuator shaft with your hand, and slightly rotate the shaft. The gear will pop into place as you move the shaft (it may be necessary to pull the gear back out and rotate the actuator slightly.) When the gear is properly seated, it should recede approximately 1/4 inch below the top of the casing in order to replace the cap.
8. While continuing to hold the actuator shaft, replace the cap and tighten.



# TROUBLE SHOOTING

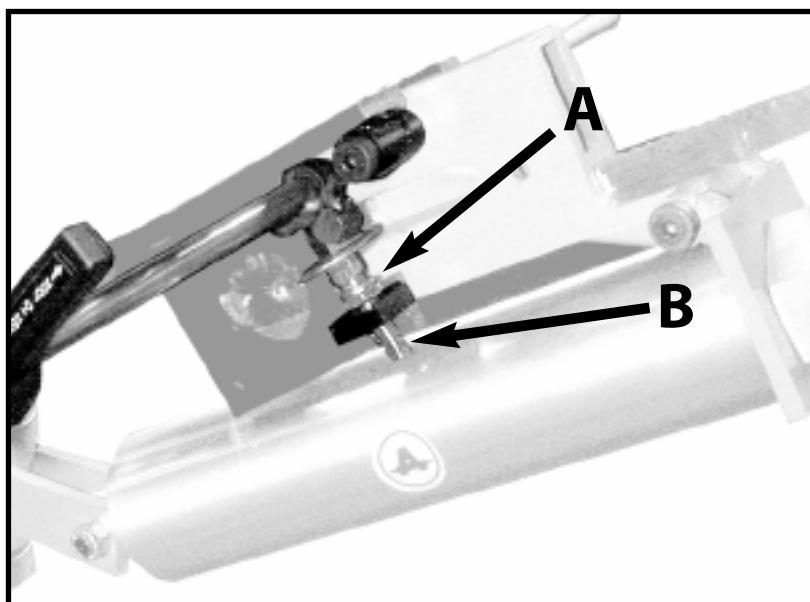
## Problem

The Auto-Flex motor does not engage when it is started because the gear on the motor and the gear rack mechanism are out of adjustment.

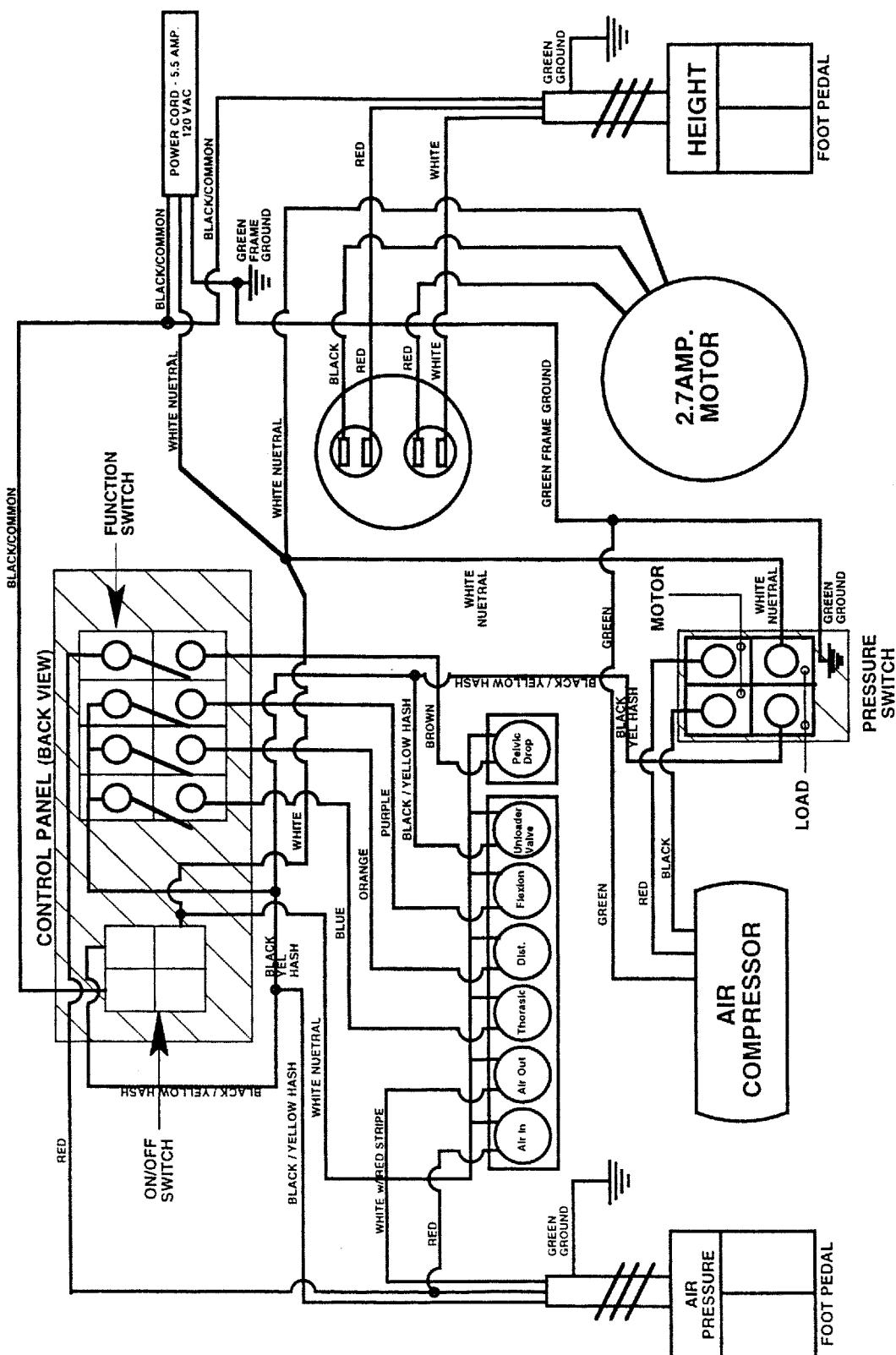
## Solution

The cam on the Auto-Flex motor needs adjustment. Please follow the directions below to fix the problem -

1. Locate the bolt labeled "A" in the photo and loosen (counter clockwise) with a 1/2" open-end wrench. Turn until there is about 1/8" space immediately below it.
2. Grasp the bottom of the Cam Adjustment ("B") with your hand and turn it counter clockwise 1/4 turn.
3. Try the the motor mechanism to see if it engages properly. If so, tighten bolt "A" back down against the black bracket.
4. If the motor mechanism does not engage, continue to turn the Cam Adjustment 1/4 turn at a time until engagement is achieved. Then tighten bolt "A" down against the black bracket.



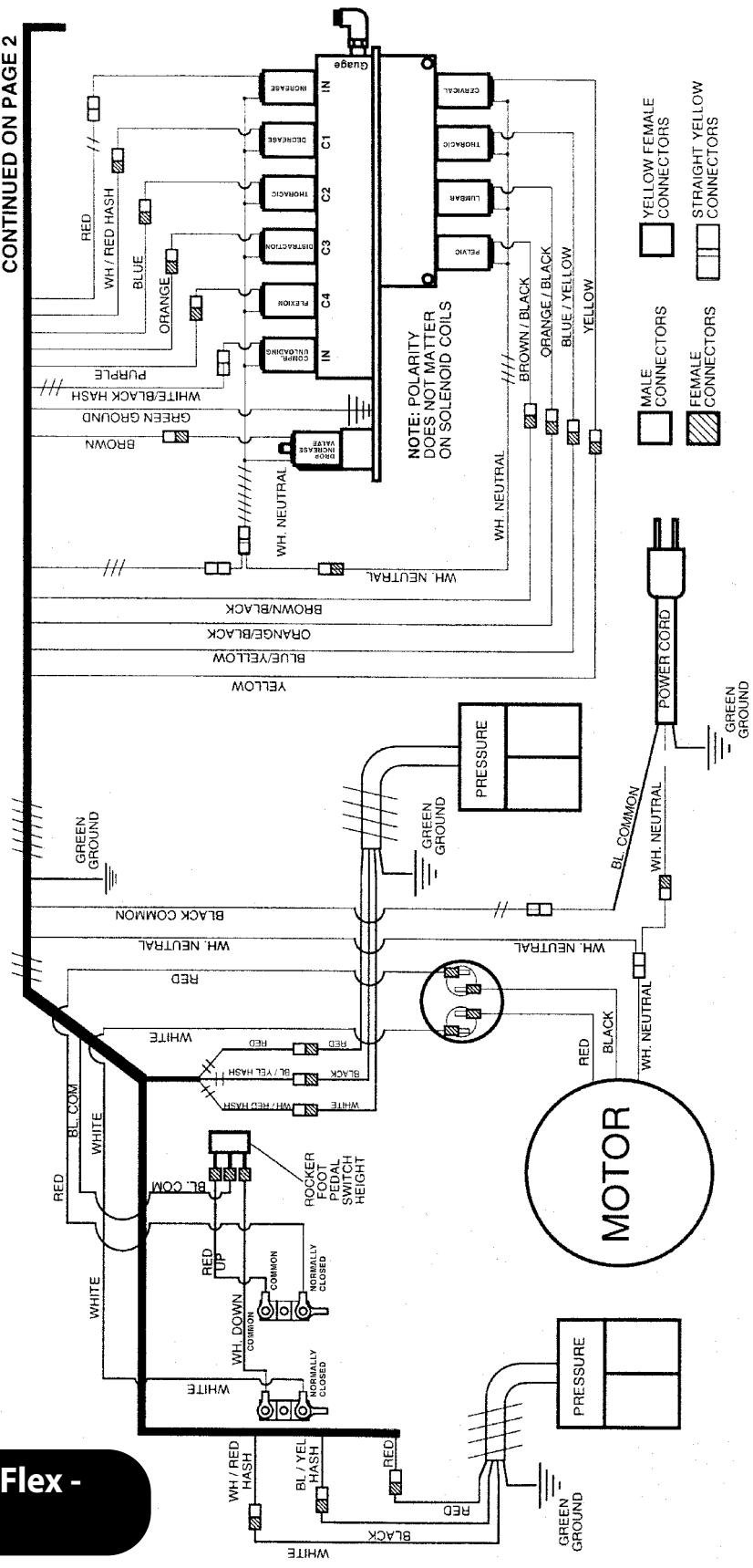
# WIRING DIAGRAM



## Standard Air-Flex Wiring Diagram

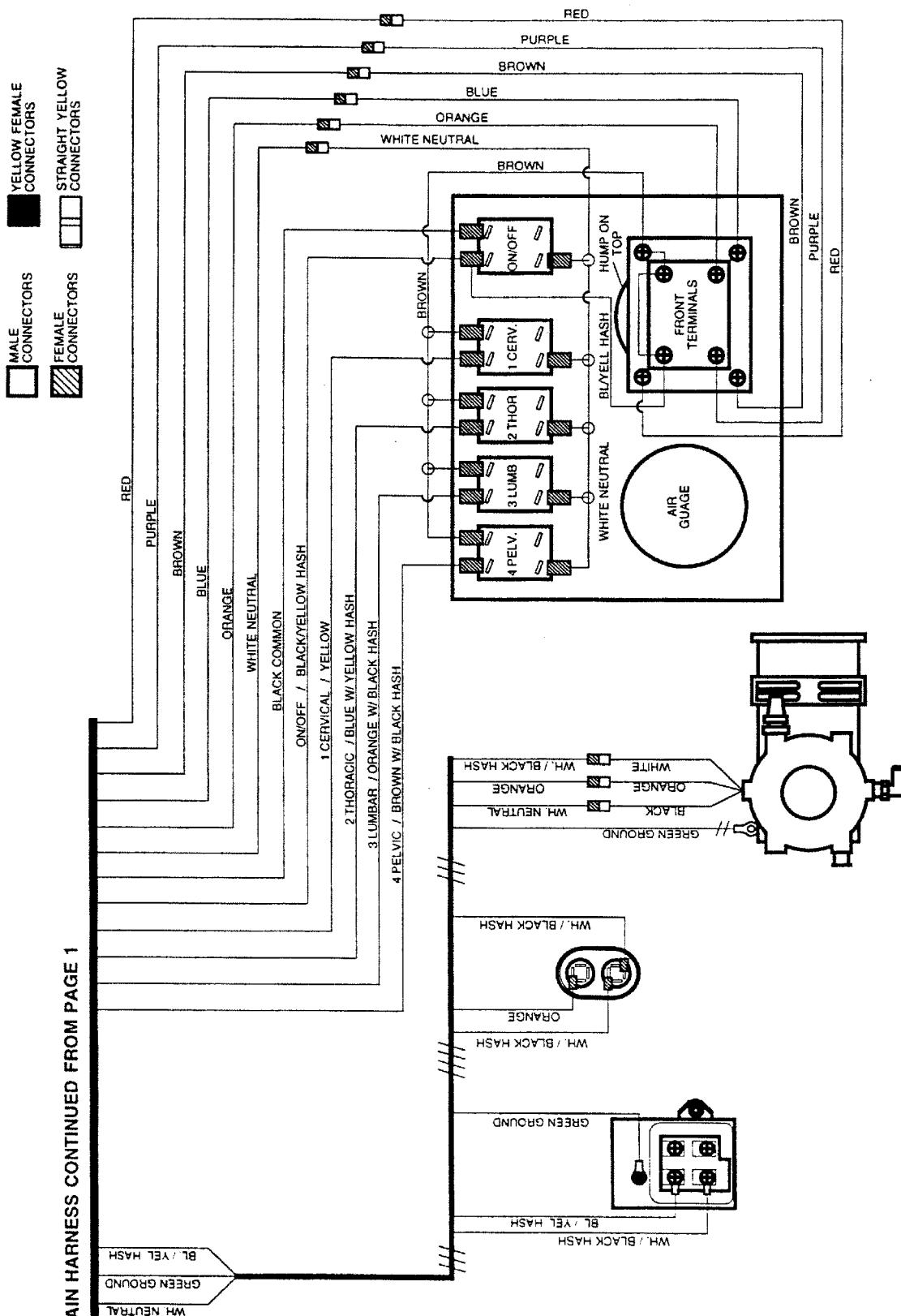
# WIRING DIAGRAM

**MAIN HARNESS  
CONTINUED ON PAGE 2**



# 4 Drop Air-Flex - Part 1

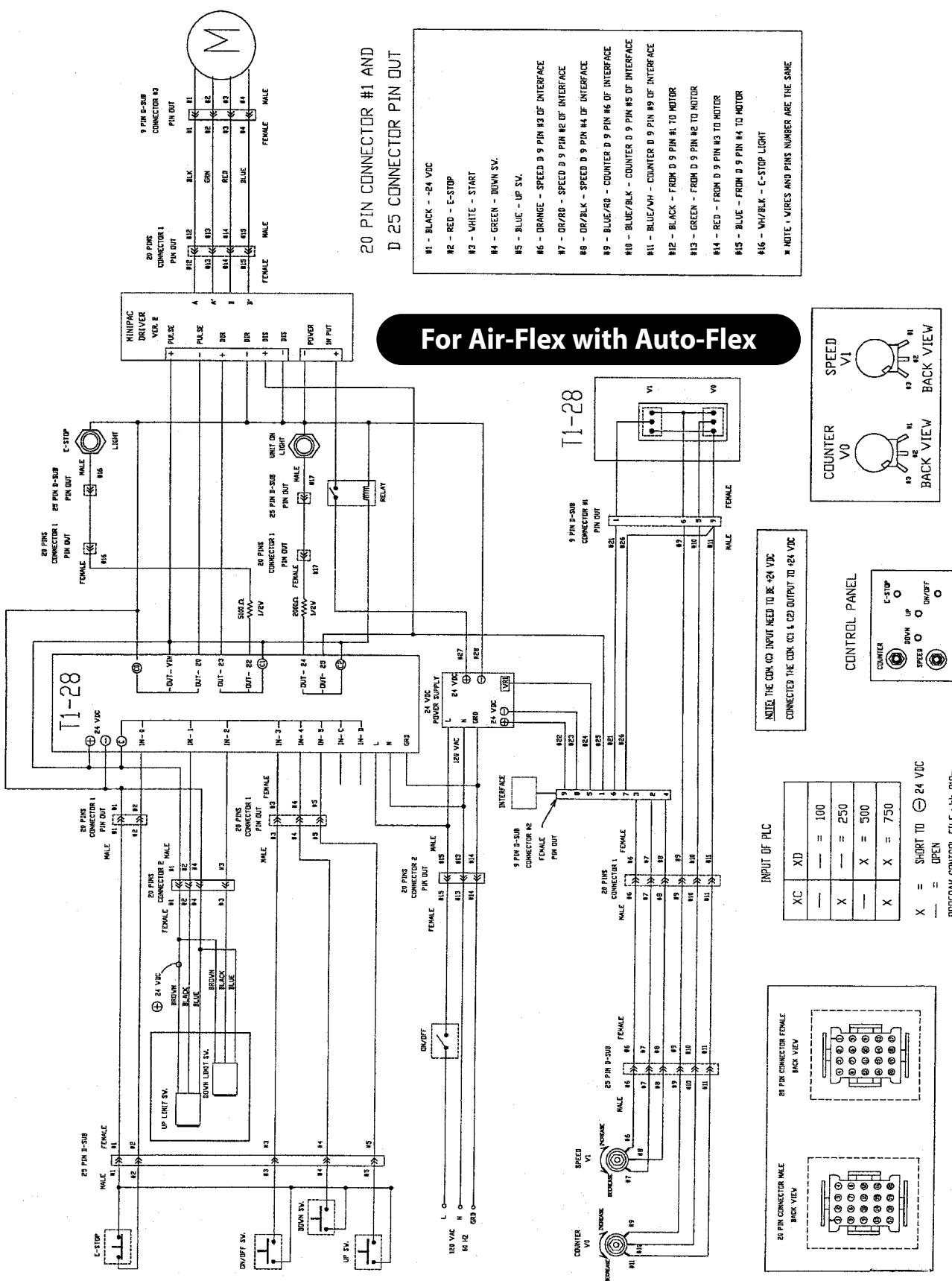
# WIRING DIAGRAM



MAIN HARNESS CONTINUED FROM PAGE 1

## 4 Drop Air-Flex - Part 2

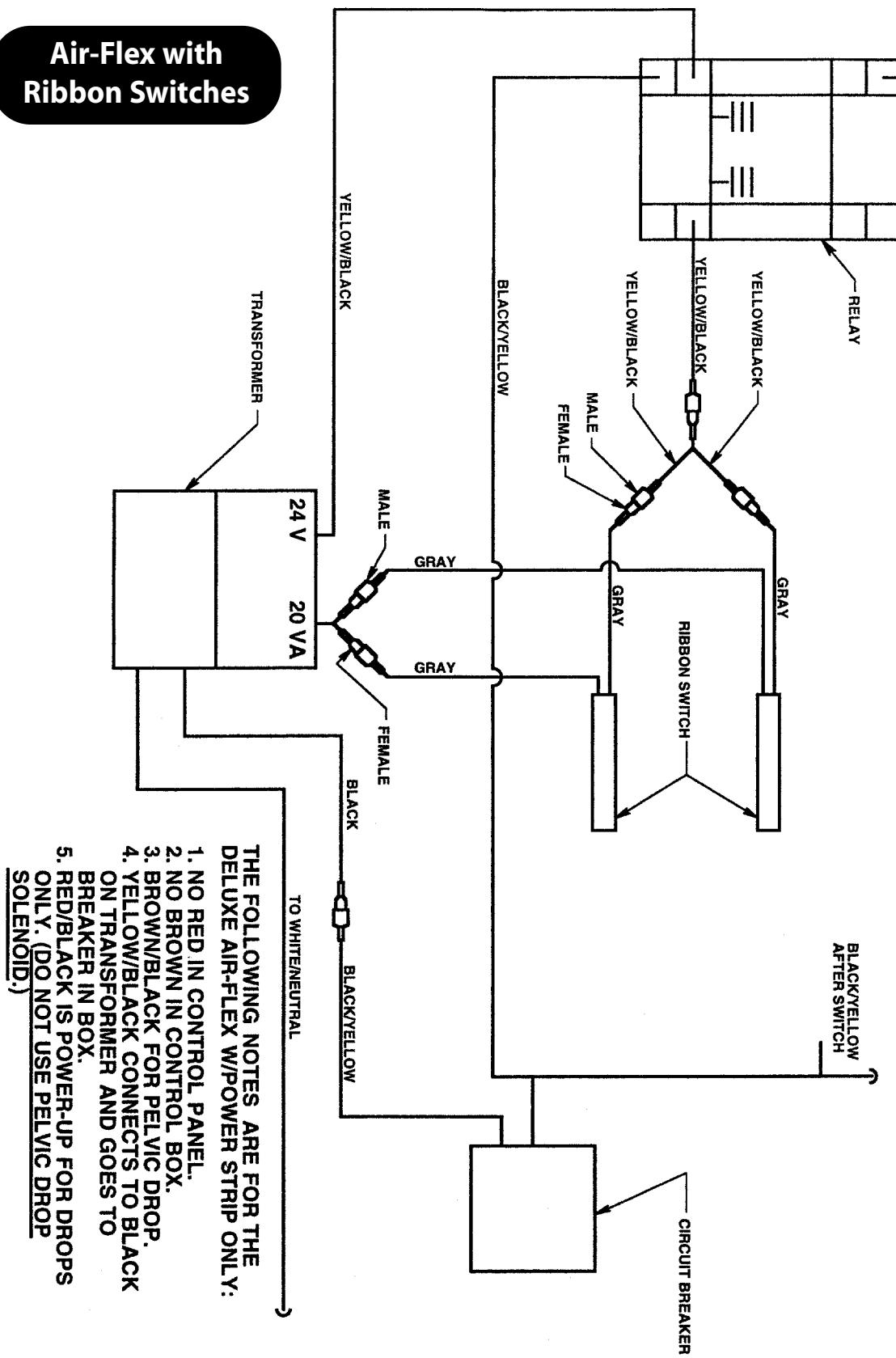
# WIRING DIAGRAM



# WIRING DIAGRAM

## Air-Flex with Ribbon Switches

RED/BLACK GOES TO CONTROL PANEL BOX FOR POWER TO DROPS



# *At Your Service*

## **THE HILL LABORATORIES GUARANTEE**

Your Hill Laboratories Air-Flex Table has been thoroughly tested and inspected before shipment. All parts are guaranteed against defect in materials for one full year from date of purchase. During this period, any such defect will be remedied by Hill Laboratories or by a factory-authorized repair service without charge. Tables damaged by mishandling or accident will be repaired at a reasonable charge.

All correspondence should be directed to your local dealer, or when this is not possible, to Hill Laboratories directly.

We appreciate your business and your confidence in our product. Our aim is to provide you with excellent service and satisfaction for many years to come.



President of Hill Laboratories Company

Table Serial Number\_\_\_\_\_

# Tables Manufactured by Hill Laboratories



Anatomotor  
Roller Massage



Anatomotor  
Masasage w/Traction



HA90C



Air-Drop HA90C



Air-Flex  
w/4 Drops



Hi-Lo



Extend-R



HA90



HA90 Lift Back



Mat Table



PT Tilting



PT Mobilization



Rath Mechanical  
McKenzie Technique



Repex Table  
McKenzie Technique



HA90E



90MD



Podiatry Model



Counterstrain  
(multi-positional)



HA90 Tilt  
Vascular/Diagnostic



Occupational Table



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