INTRODUCTION

HOW TO USE SERVICE MANUAL AND CONTACT CUSTOMER SUPPORT SERVICES

This service manual is applicable to Cross-Trainer Models X5i, X5, X3i and X3. Illustrations in this service manual represent typical configurations and may differ slightly from actual equipment. The Service Manual provides safe and efficient step-by-step service operations. This manual consists of:

When an operating problem occurs, refer to troubleshooting guides and diagnostic mode to isolate the cause. When applicable, guides are listed by problem symptom followed with suggestions of probable cause(s).

Once the source of problem is identified, consult the "How To..." guides for recommended repair procedures. "How To..." sub-sections are organized by replaceable part or assembly name. For convenience, sub-section lists recommended “Tools Required” to complete specific function. Refer to PARTS IDENTIFICATION to identify proper name and number of part to order for repair of equipment.

A reproducible FAX order claim form is given in COMMUNICATING BY TELEFACSIMILE for convenient ordering of service parts.

To order parts, contact Life Fitness Customer Support Services.
Via FAX - 24 hrs. /day, 7 days/week.
Via telephone - Monday through Friday from 8:00 AM to 5:00 PM Central Standard Time.
Via post - At address cited.

To speed Life Fitness Customer Support Services response to your needs, please provide:

- Model number,
- Serial number,
- Symptom, and
- Part name and number

Before installing part, review "How To..." and follow step by step procedures recommended to install part safely and efficiently. If you have questions or comments please telephone, FAX or, write us. We are:

LIFE FITNESS - CUSTOMER SUPPORT SERVICES
10601 Belmont Avenue; Franklin Park, IL 60131; U.S.A.
Telephone: 847.451.0036 Toll-free: 800.351.3737
FAX: 847.288.3702 Toll-free: 800.216.8893

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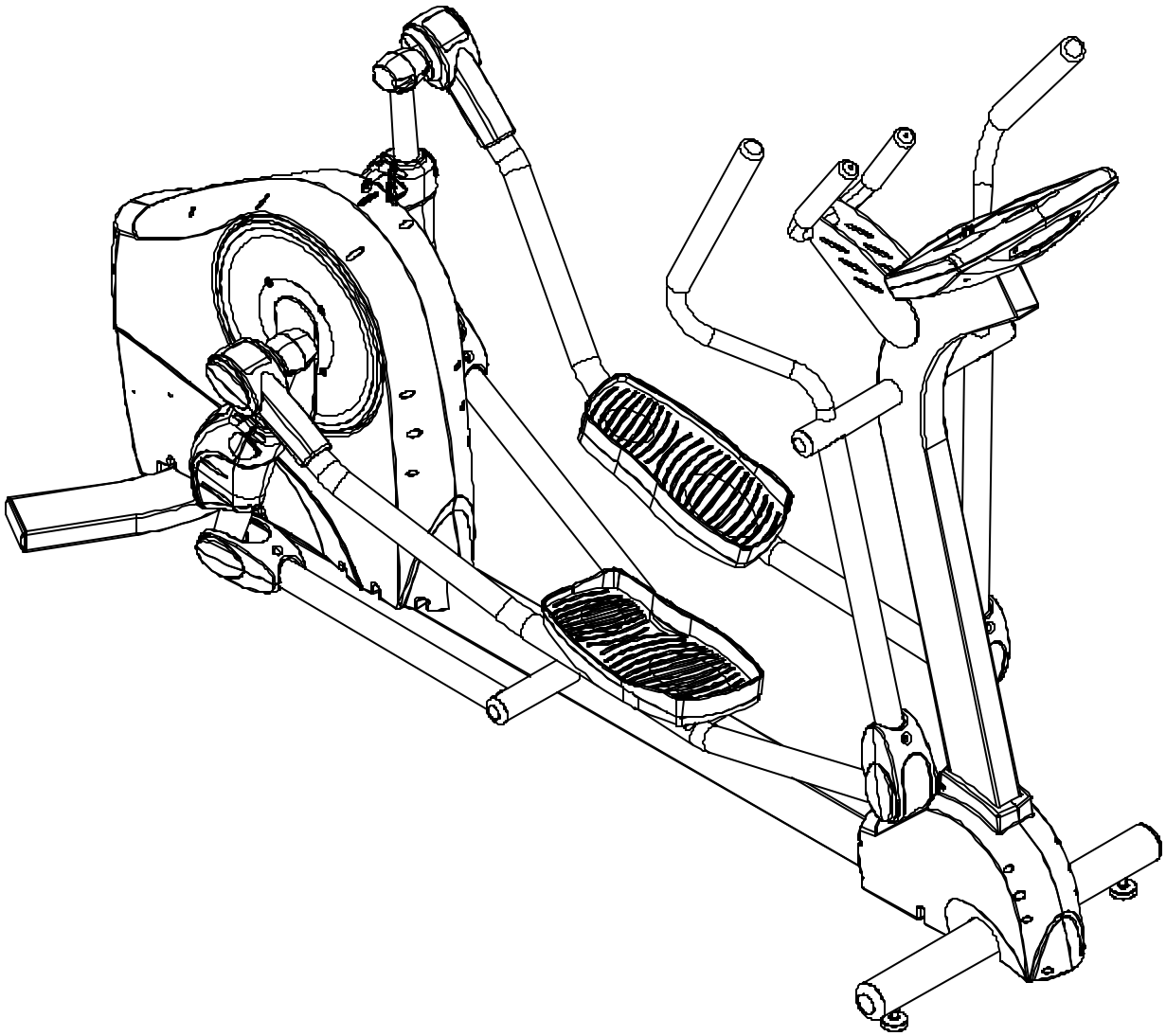
LifeFitness

Models X5i, X5, X3i, and X3 Cross-Trainers



Customer Support Services

SERVICE MANUAL

SECTION I

TROUBLESHOOTING GUIDE

Notes:

TROUBLESHOOTING GUIDE

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Slight “bump” or “hitch” in pedal motion.	Pivot points are not broken in.	Remove all clevis covers and loosen all six bolts that connect links to clevis brackets. Loosen the nuts a couple of turns so the machine can still be operated. Operate the machine a few revolutions to help seat the pivot points. Retighten the six bolts and install the clevis covers.
	Levelers are not in contact with the floor.	Levelers must be in contact with the floor. Make sure that the leveler jam nuts are also properly tightened. For further assistance, contact Life Fitness Customer Support Services.
Clunking noise.	Damaged washers, retaining rings, or wave springs.	Remove the clevis covers, and check for damaged washers, retaining rings, and wave springs. If necessary, replace. Remove the end caps from lower link arm, and then remove the bolt. Check that retaining ring is correctly installed. Repeat for all pivot areas.
Metallic scraping noise occurs in forward or reverse direction.	Magnet is rubbing on the aluminum disk or chopper wheel may be hitting the OPTO Sensor. Applies only to Version 1 units.	Remove bottom rear shroud (See How To…) and inspect the position of the magnets to see if they are rubbing on the aluminum disk. If so, re-center the OPTO Sensor.
No speed readout on console. Applies only to Version 1 units.	Loose connections between the OPTO sensor and wiring harness.	Verify that the connections between the OPTO sensor and wiring harness are secure.
	Chopper wheel is not spinning between the two tabs of the OPTO sensor.	Bend the OPTO bracket slightly upwards.
No speed readout on console. Applies only to Version 2 units.	Magnet missing or faulty reed switch.	Check for missing magnet or replace switch.
Console is out, non-operative.	Transformer is not plugged in. Wiring harness is not connected to the console. Pinched wire harnesses.	Verify that the transformer is plugged in. Verify that the wiring harness is connected to the console. Check wiring harness in upright tube or at the base frame. Verify that the harnesses are properly connected. If all connections are correct, replace transformer, if this does not solve the problem then replace console.

TROUBLESHOOTING GUIDE

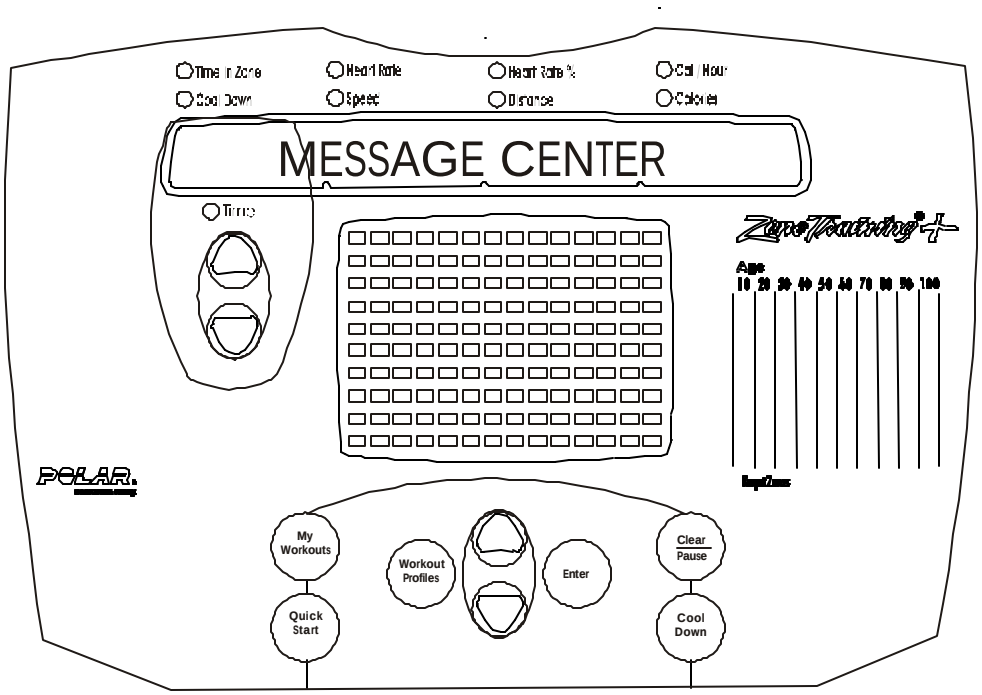
SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Console erratic.	Clock within the console not functioning or the memory chip is corrupted.	Replace the console.
Dim or not functioning LED segments on displays.	Defective console.	Test console in diagnostics. Replace console if necessary.
Buttons not functioning on EZ user pod.	Bad connection between EZ user pod and console.	Check connections between EZ user pod and console.
Buttons not functioning on console.	Faulty connection at membrane switch of console.	Check the connection of the membrane switch on the console. Look in the hole in the back of the console, the connector is on the bottom of the board assembly and to the right side of the hole.
	Defective keypad on console.	Replace the console.
Erratic heart rate.	Receiver mounted incorrectly in accessory tray.	Check that the mounting of the heart rate receiver in the accessory tray is secure and not loose. Verify that the receiver has been inserted into the foam tube.
No heart rate readout.	Faulty connection between receiver and console or faulty receiver.	Check connections between the heart rate receiver and the console, or if faulty receiver, then replace the receiver.
At power up, #8's appear on the console and beep sounds (standard console). At power up, motor error appears on console and beep sounds.	This is a fault condition showing that the Eddy current or Servo Motor is not moving or is not moving to the location it's supposed to.	Verify that the Eddy current on Version 1 or Servo Motor on Version 2 is connected to the wiring harness. Test Eddy current or Servo Motor in Diagnostic 4. If the display is functioning and the numbers on the left side of the display are changing in value with each key press but the magnet does not move and numbers on right side of display do not appear, then the Eddy current assembly needs to be replaced. If no number is shown on the left side of the display, then the console needs to be replaced.
After beginning of program, the unit does not change resistance, followed by "Motor Error" message on the display.	Bad connection at Eddy Current or faulty Eddy Current.	Verify the cable connection at the EDDY current assembly is properly connected. If all connections are making proper contact, then replace the EDDY current assembly.

SECTION II

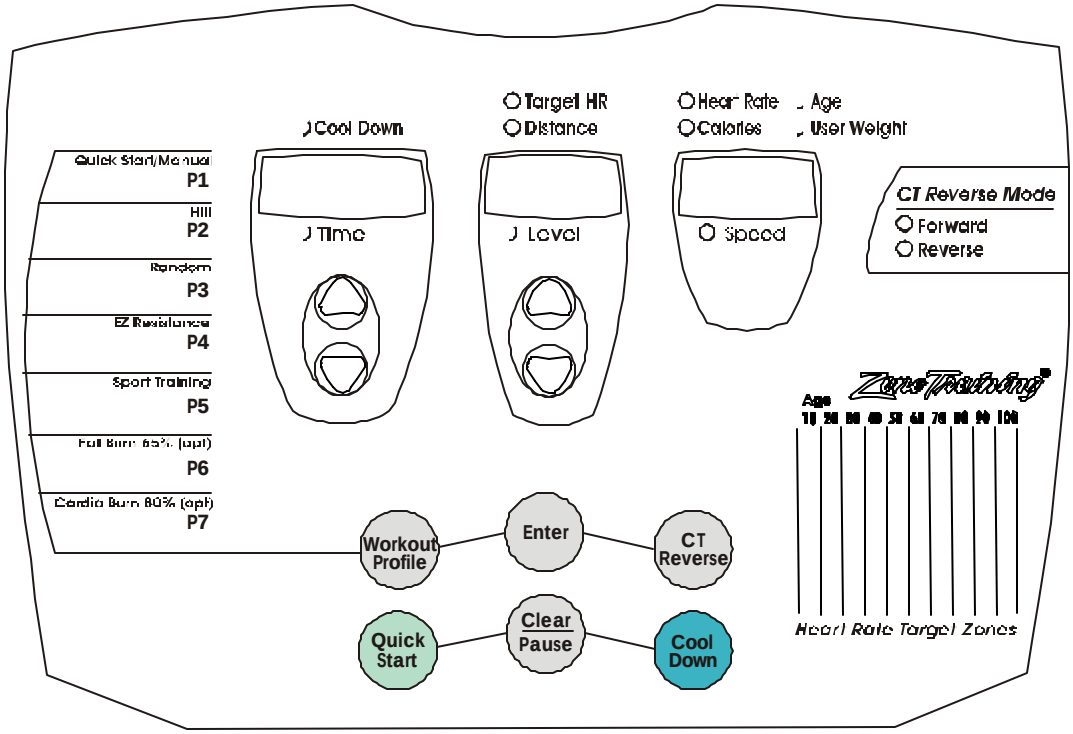
DIAGNOSTIC MODES

NOTE

X5i, X5, X3i, and X3 Display Consoles

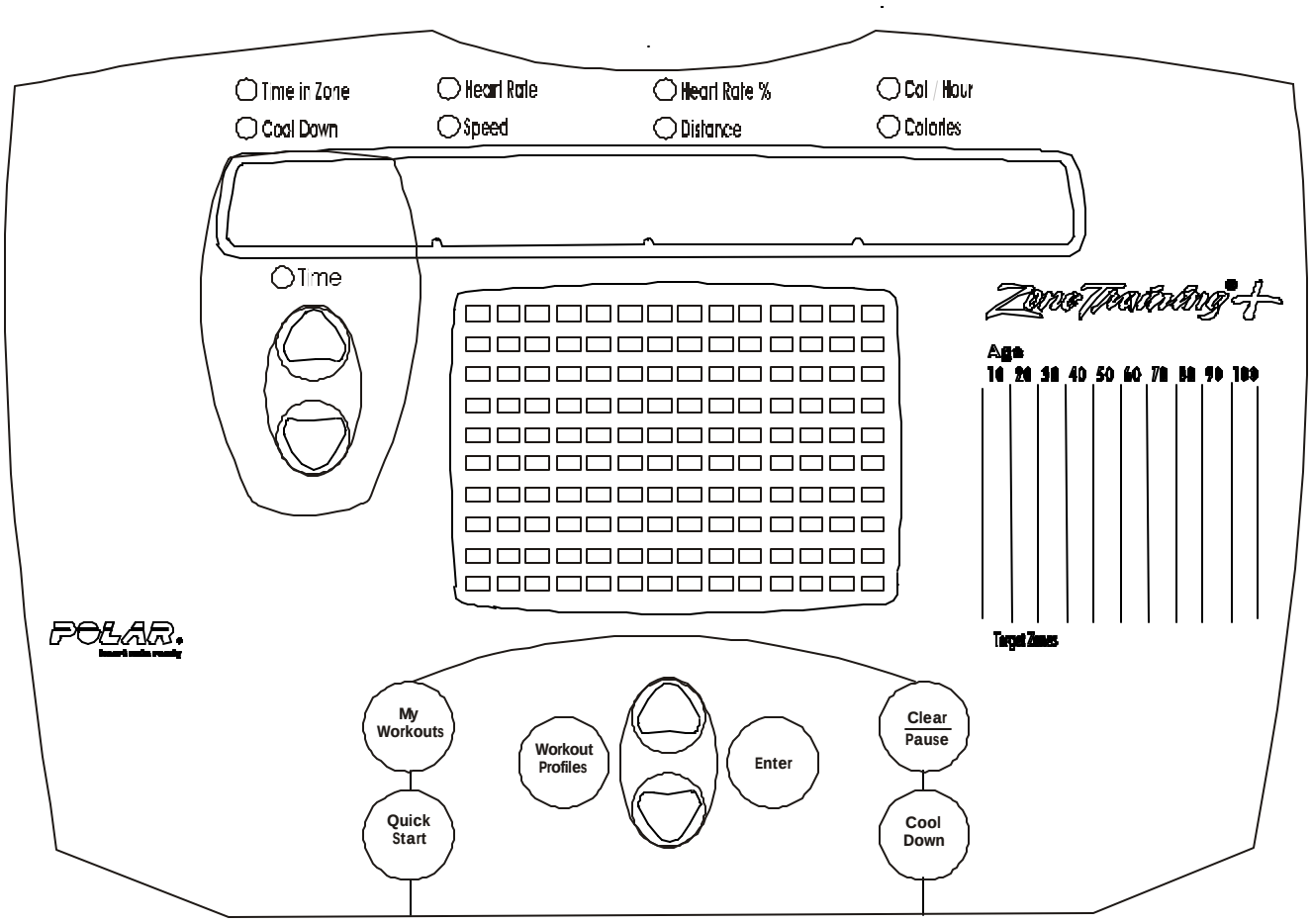


X5i and X3i Deluxe Monitor



X5 and X3 Standard Monitor

Diagnostic Mode For Deluxe Monitor



ENTERING DIAGNOSTICS MODE

Diagnostics can only be entered from IDLE mode. Enter Diagnostics by pressing the Pause/Clear button twice, and then press the Cool Down button, sequence must be completed within 3 seconds, or the monitor returns to IDLE mode.

Upon entering the Diagnostics mode, the monitor will beep three times before entering Diagnostic State 1.

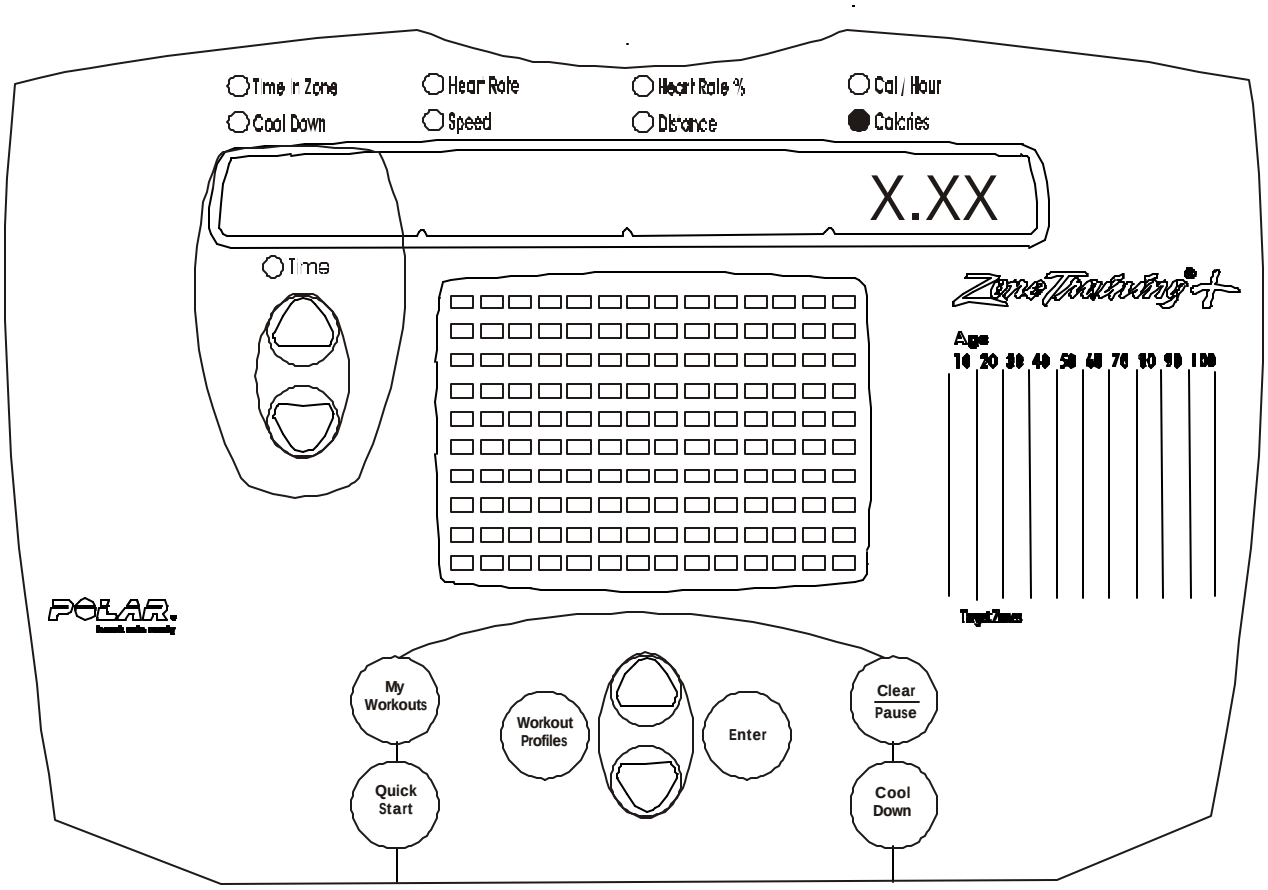
TOGGLING THROUGH DIAGNOSTIC STATES

Pressing the Enter button will advance to the next Diagnostic State. Diagnostics can only advance.

Once the Last State has been reached, pressing the Enter button again will exit the Diagnostic mode and the monitor will enter the IDLE mode.

Diagnostic Mode For Deluxe Monitor

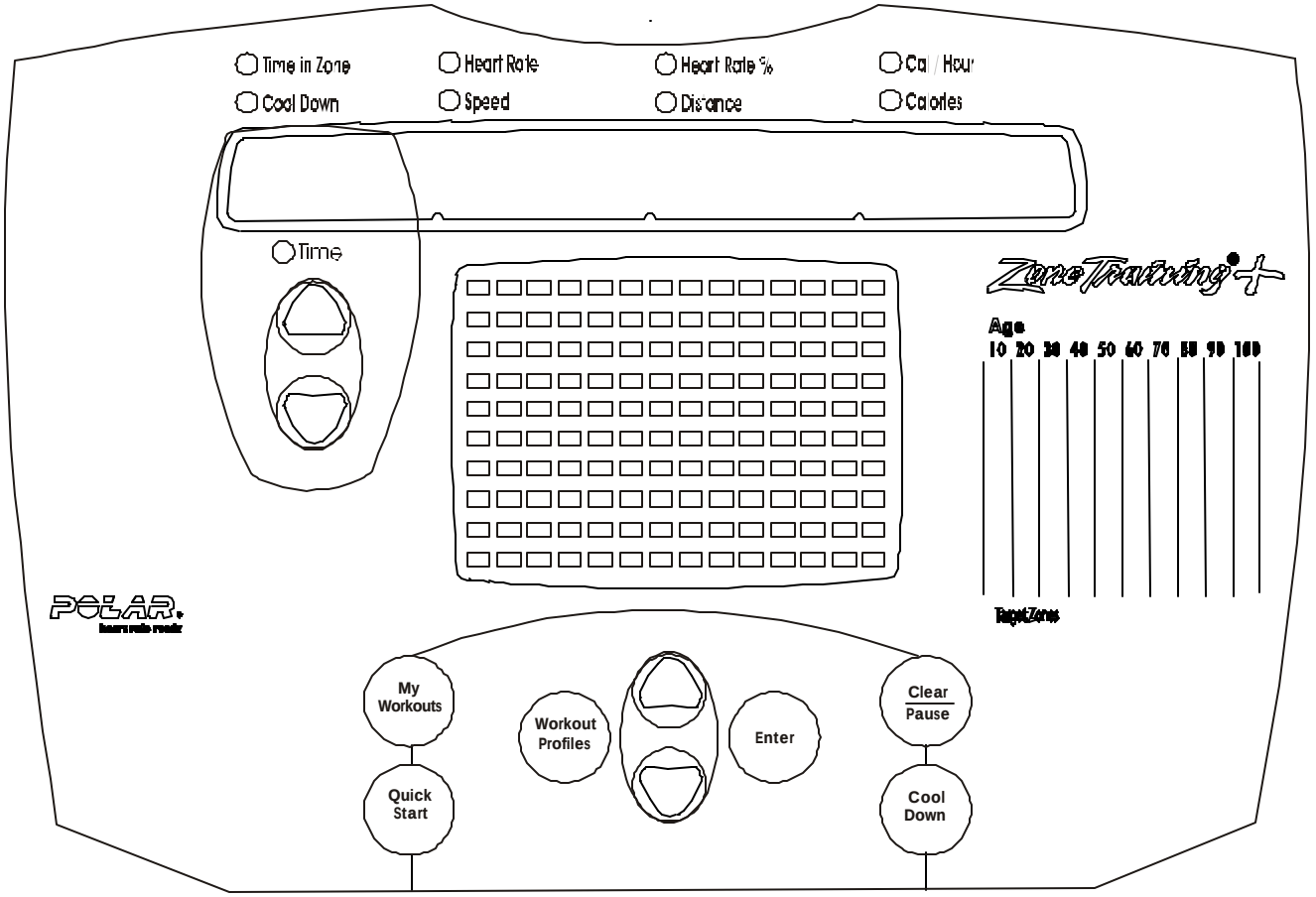
Diagnostic State 1 - Software Version Number



The Calories LED will light and the software version will be displayed in the message center.

Diagnostic Mode For Deluxe Monitor

Diagnostic State 2 - Keypad Test Mode



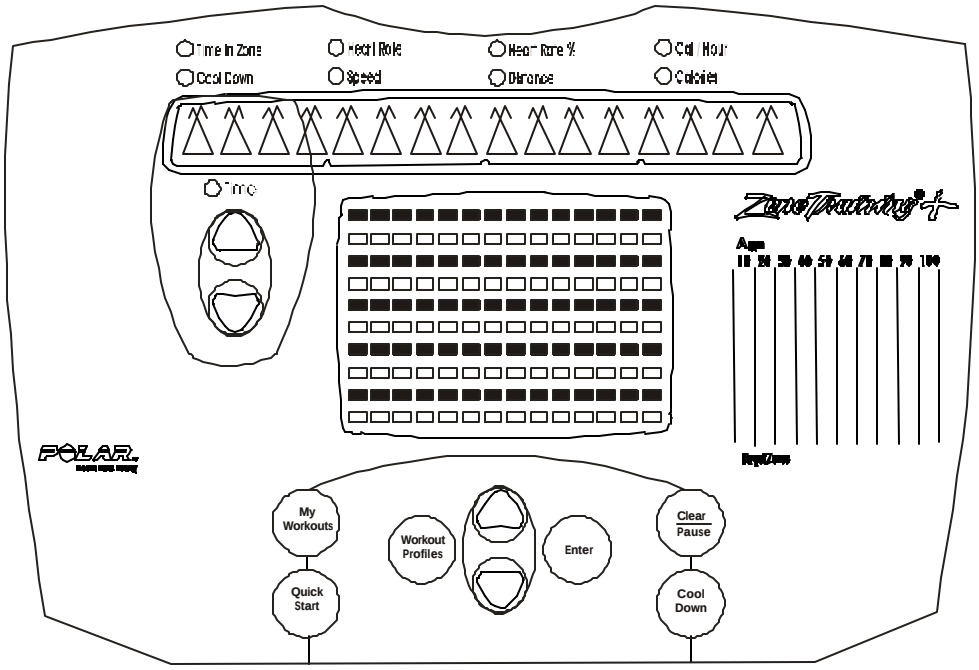
All LEDs will be off until the keypad buttons are pressed. The following is to be displayed while a button is held down button. An audible beep will occur with each key press.

BUTTON	DISPLAY
Time ⮝	"1111111111111111"
Time ⮟	"2222222222222222"
My Workouts	"3333333333333333"
Quick Start	"4444444444444444"
Workout Profile	"5555555555555555"
Level ⮝ (Main console)	"6666666666666666"
Level ⮟ (Main console)	"7777777777777777"
Clear/Pause	"8888888888888888"
Cool Down	"9999999999999999"
Enter	This will advance the monitor the next diagnostic state #3.

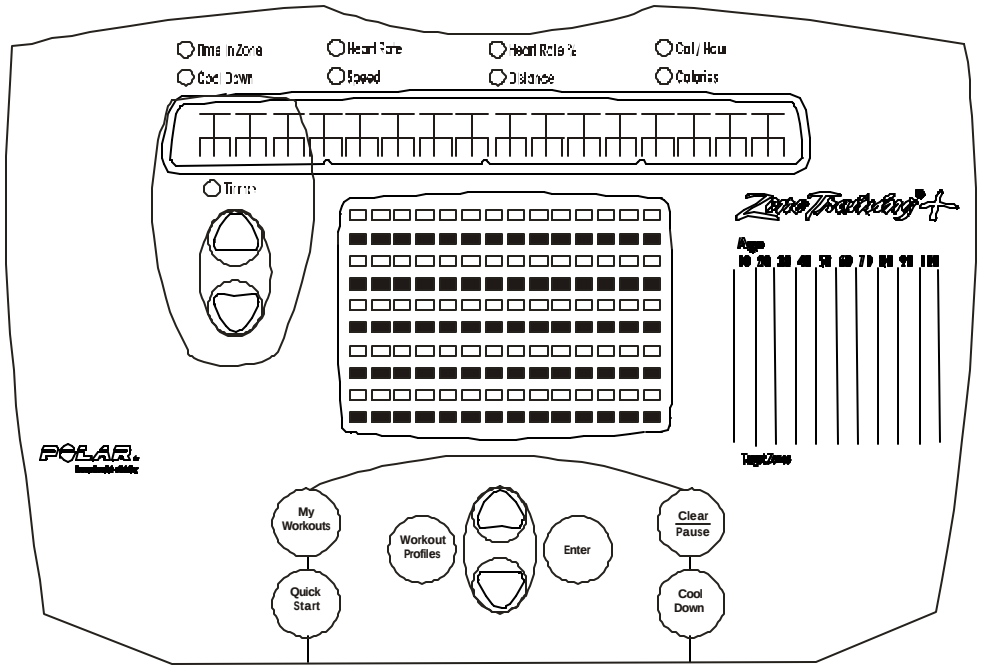
EASY POD NOT SHOWN	
Level ⮝ (on the EZ pod)	"AAAAAAAAAAAAAAAA"
Level ⮟ (on the EZ pod)	"BBBBBBBBBBBBBBB"
CT Reverse	"CCCCCCCCCCCCCCC"
CT Aerobics	"DDDDDDDDDDDDDDD"

Diagnostic Mode For Deluxe Monitor

Diagnostic State 3 - Display Test Mode



DISPLAY "A"

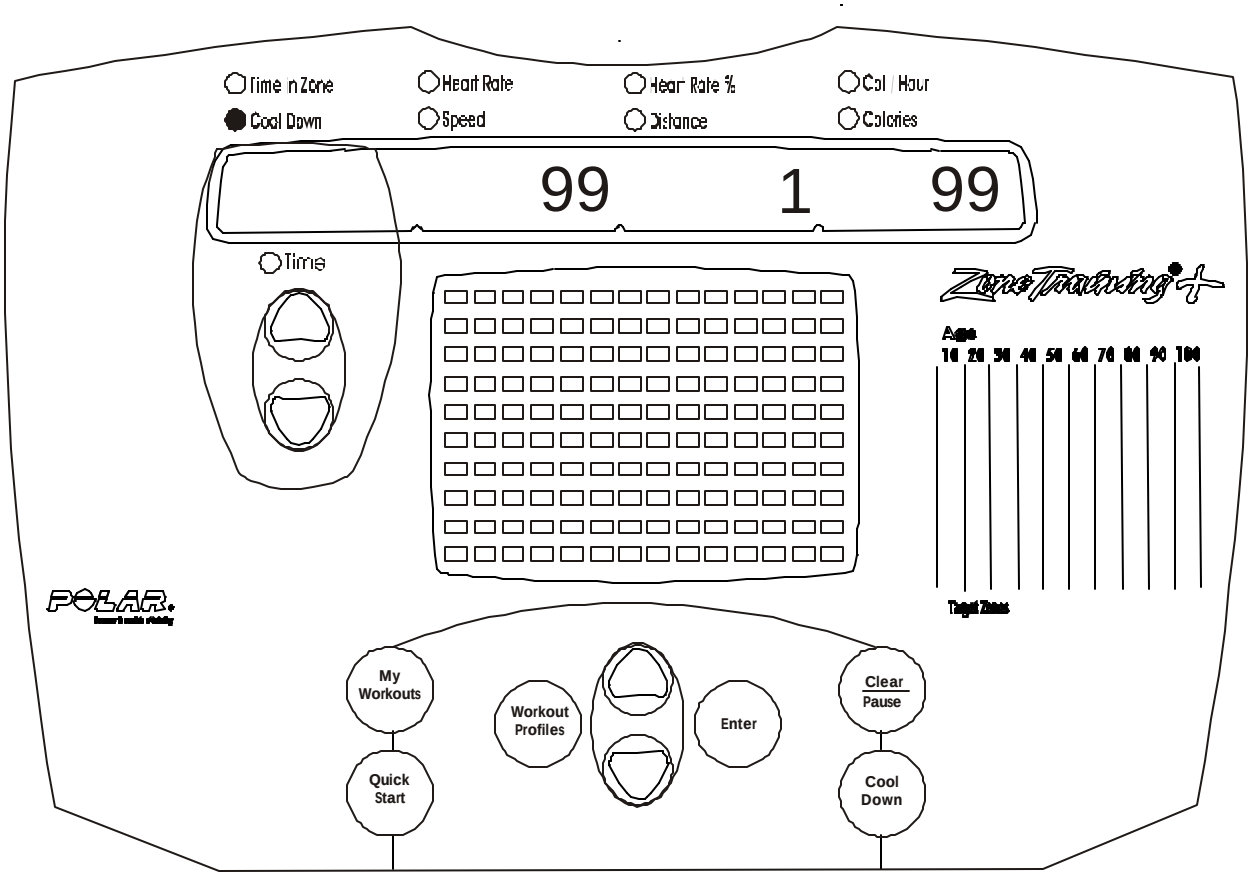


DISPLAY "B"

In this state the LED patterns will toggle between DISPLAY "A" or "B" as shown.

Diagnostic Mode For Deluxe Monitor

Diagnostic State 4 - Magnet Position



Upon entering the magnet test, the Cool Down LED is lit. The Message Center displays 3 different numeric values.

The left hand numeric display of 4 digits will show the desired position of the magnets. Numbers will range from 99-256 on Version 1 Models and from 21-190 on Version 2 Models.

The right hand numeric display of three digits will show a number from 1 to 256. The number displayed is the actual position of the magnets.

Pressing the Level(⮝) button will activate the motor and move the magnets as to increase resistance. The center display will show the Resistance setting, the other 2 displays will show the associated desired and actual position of the magnets.

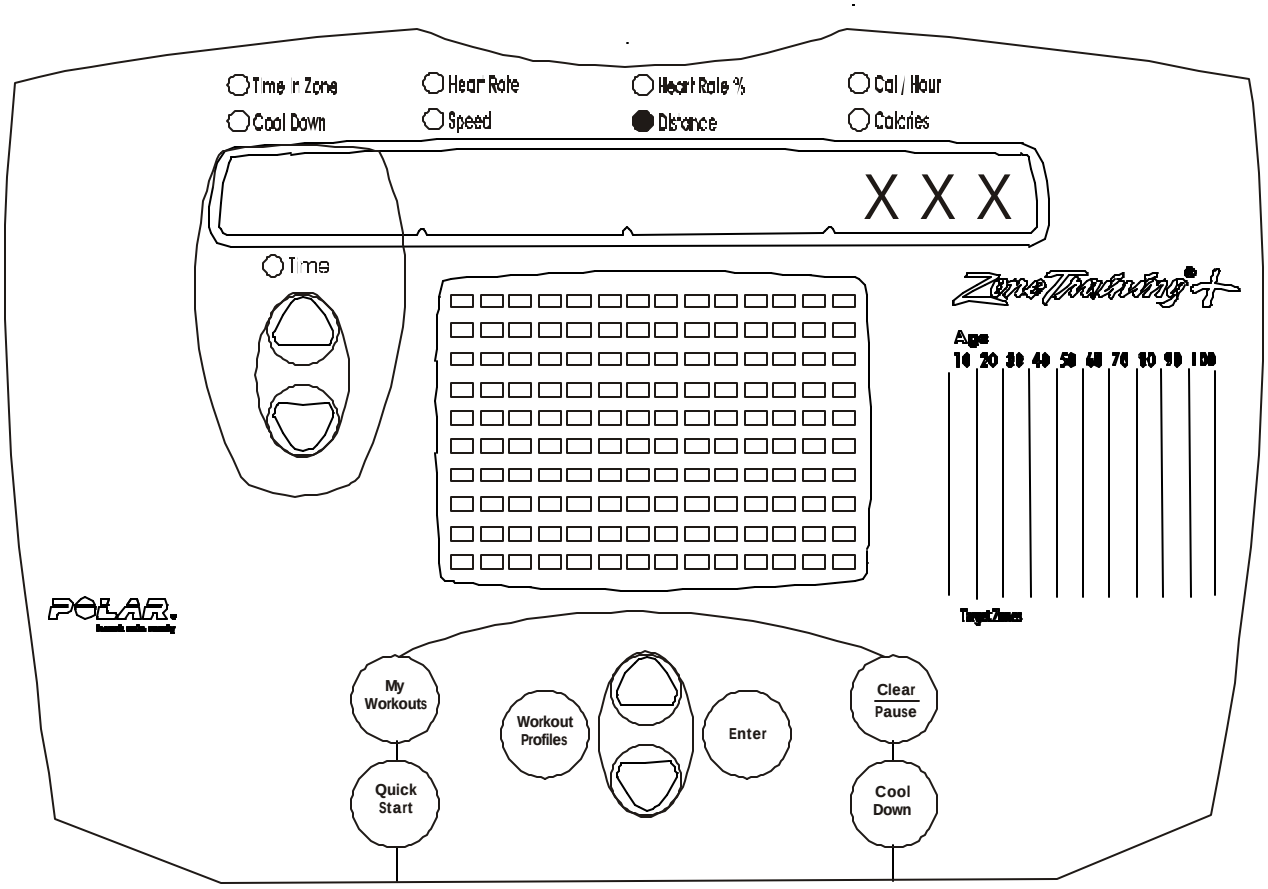
Pressing the Level(⮟) button will activate the motor and move the magnets as to decrease resistance. The center display will show the Resistance setting, the other 2 displays will show the associated desired and actual position of the magnets.

If the system determines that the motor is not responding properly, the display shows Motor Error and beeps to indicate a motor control error. Power will be removed from the motor in order to prevent damage. Power must be removed from the console to clear the error by unplugging the unit.

Press Enter to advance.

Diagnostic Mode For Deluxe Monitor

Diagnostic State 5 - A/D Test

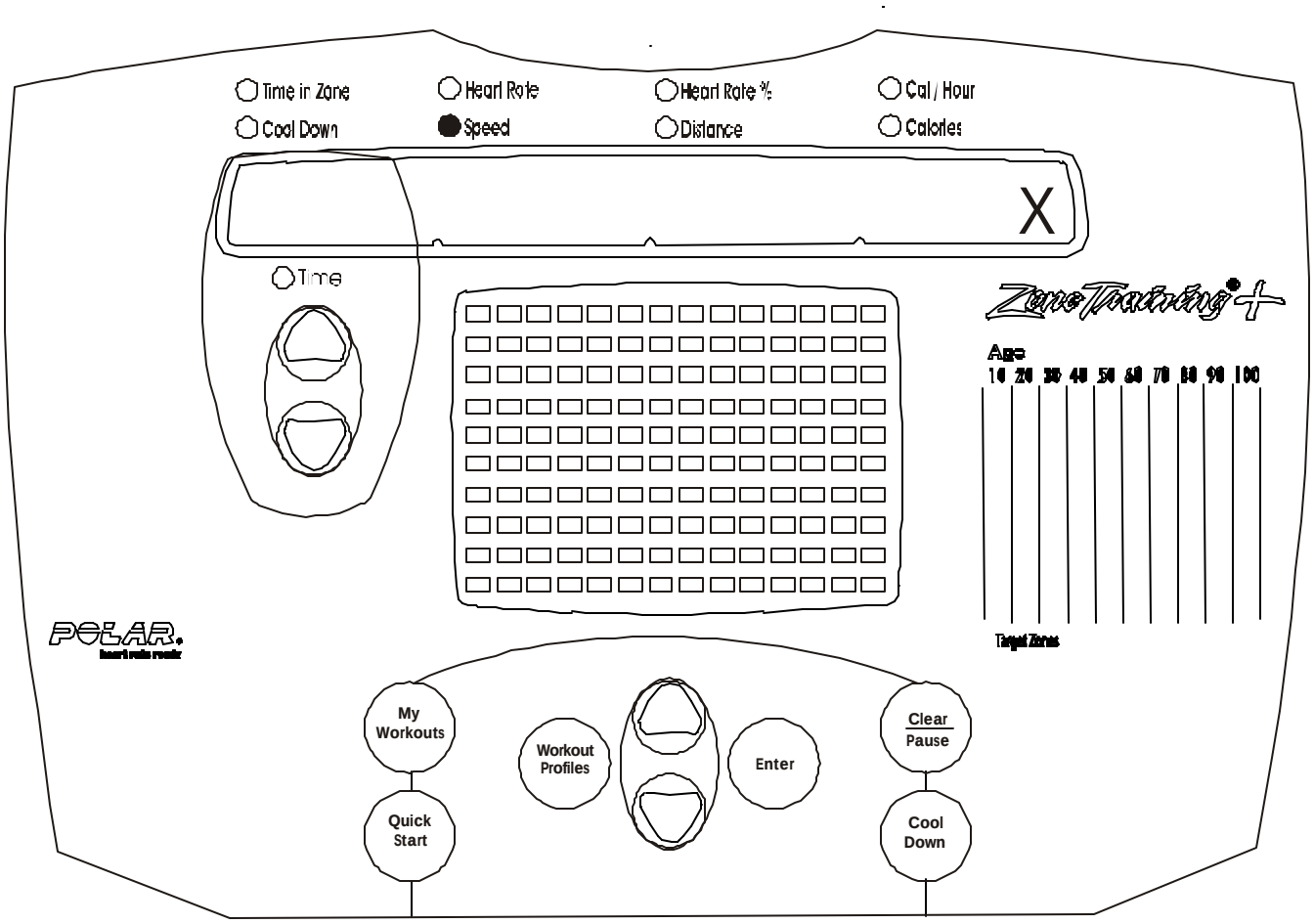


Entering diagnostics State 5 indicates current motor position.

Press Enter to advance.

Diagnostic Mode For Deluxe Monitor

Diagnostic State 6 - Speed Reading Test

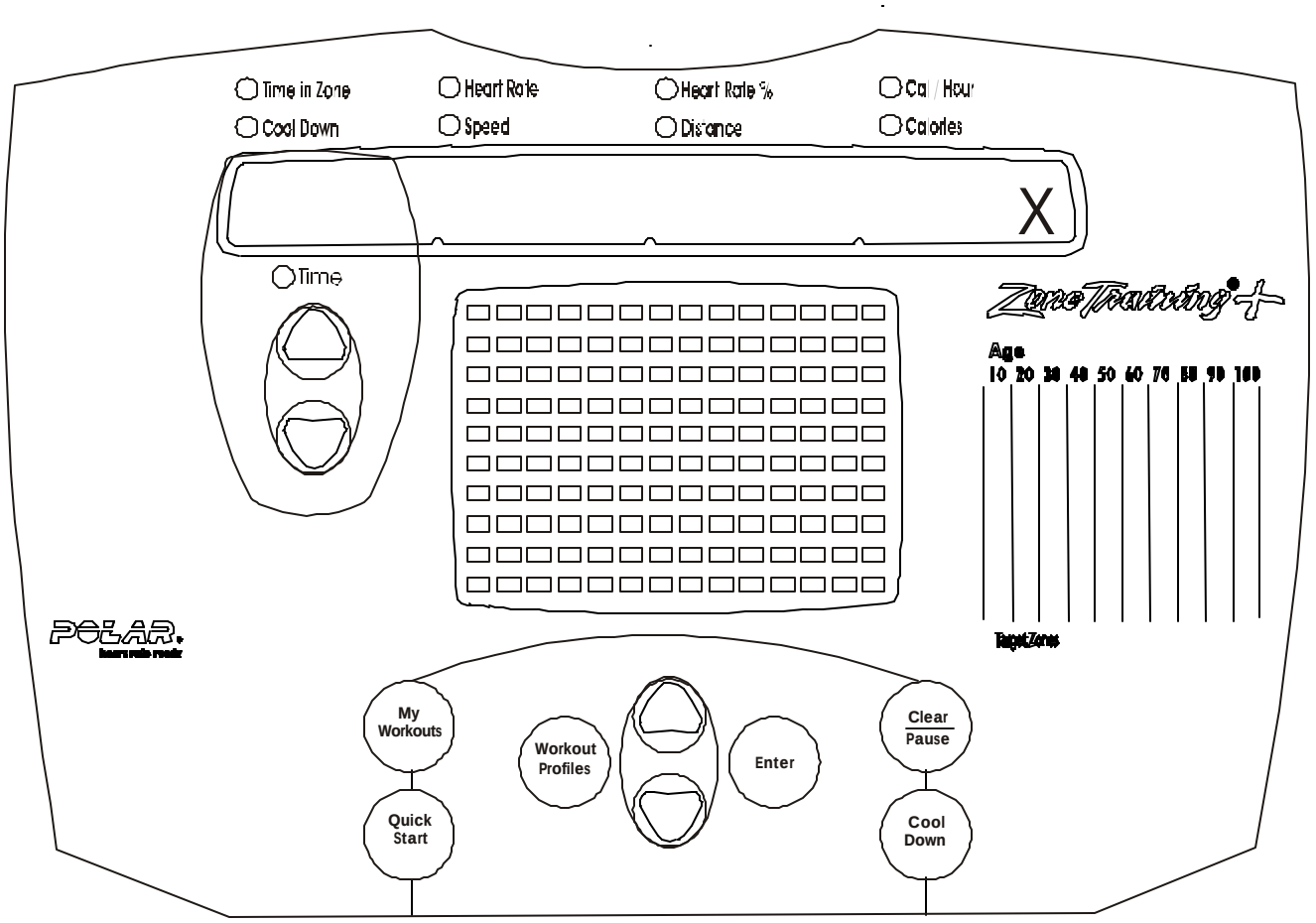


Upon entering, the SPEED LED will light. Diagnostic State 6 is used to test the OPTO or RPM Sensor function. To verify RPM signal, pedal and observe RPM value.

Note: On Version 2 Models, the Speed LED will flash each time a magnet passes the Reed Switch.

Diagnostic Mode For Deluxe Monitor

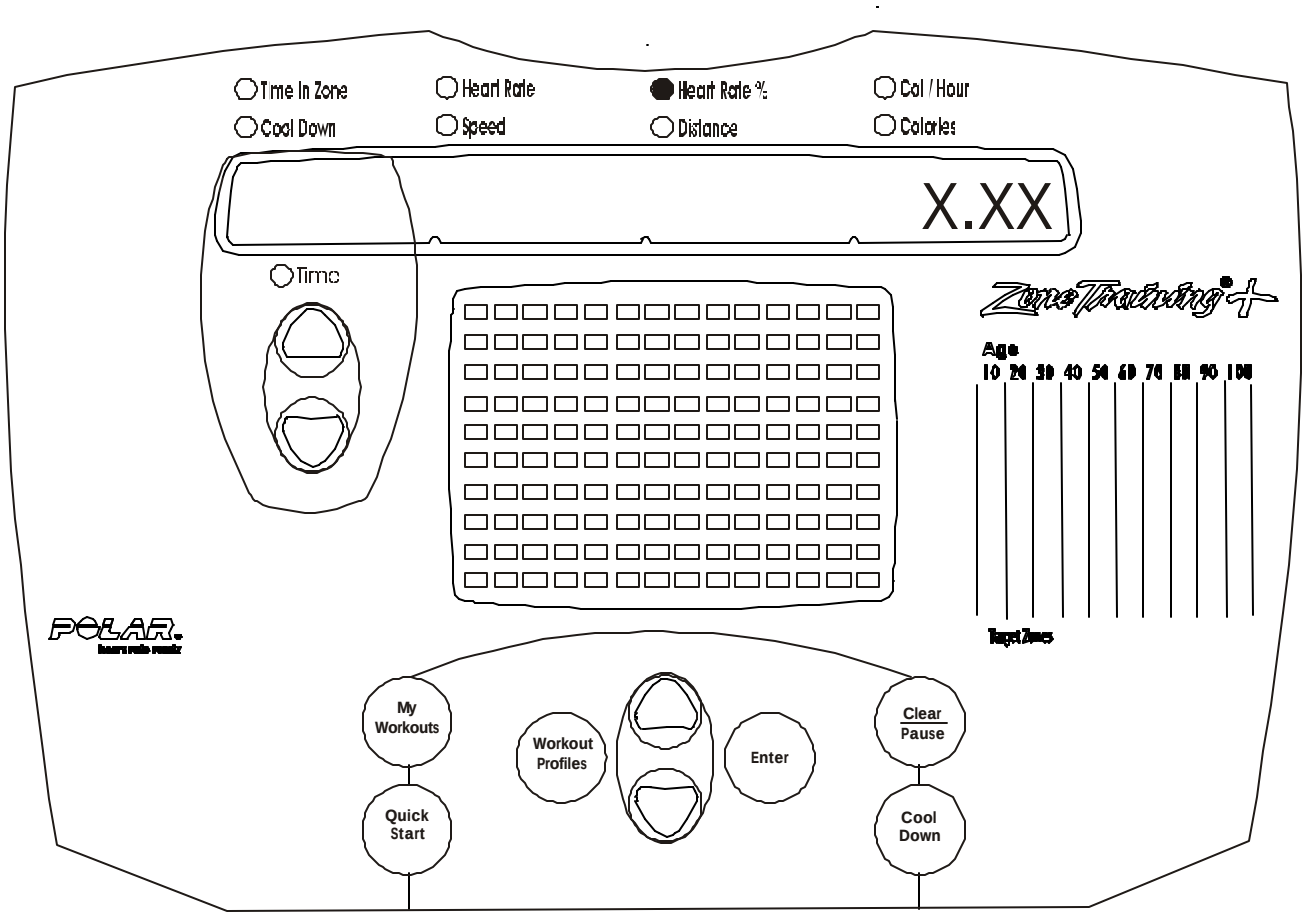
Diagnostic State 7 - Heart Rate Test



To verify that the heart rate system is functioning properly, use a polar simulator or a chest strap. If the unit functions correctly the Heart Rate LED will flash and a heart rate value will be displayed in the Message Center. If heart rate is not detected, the Heart Rate LED will not be lit.

Diagnostic Mode For Deluxe Monitor

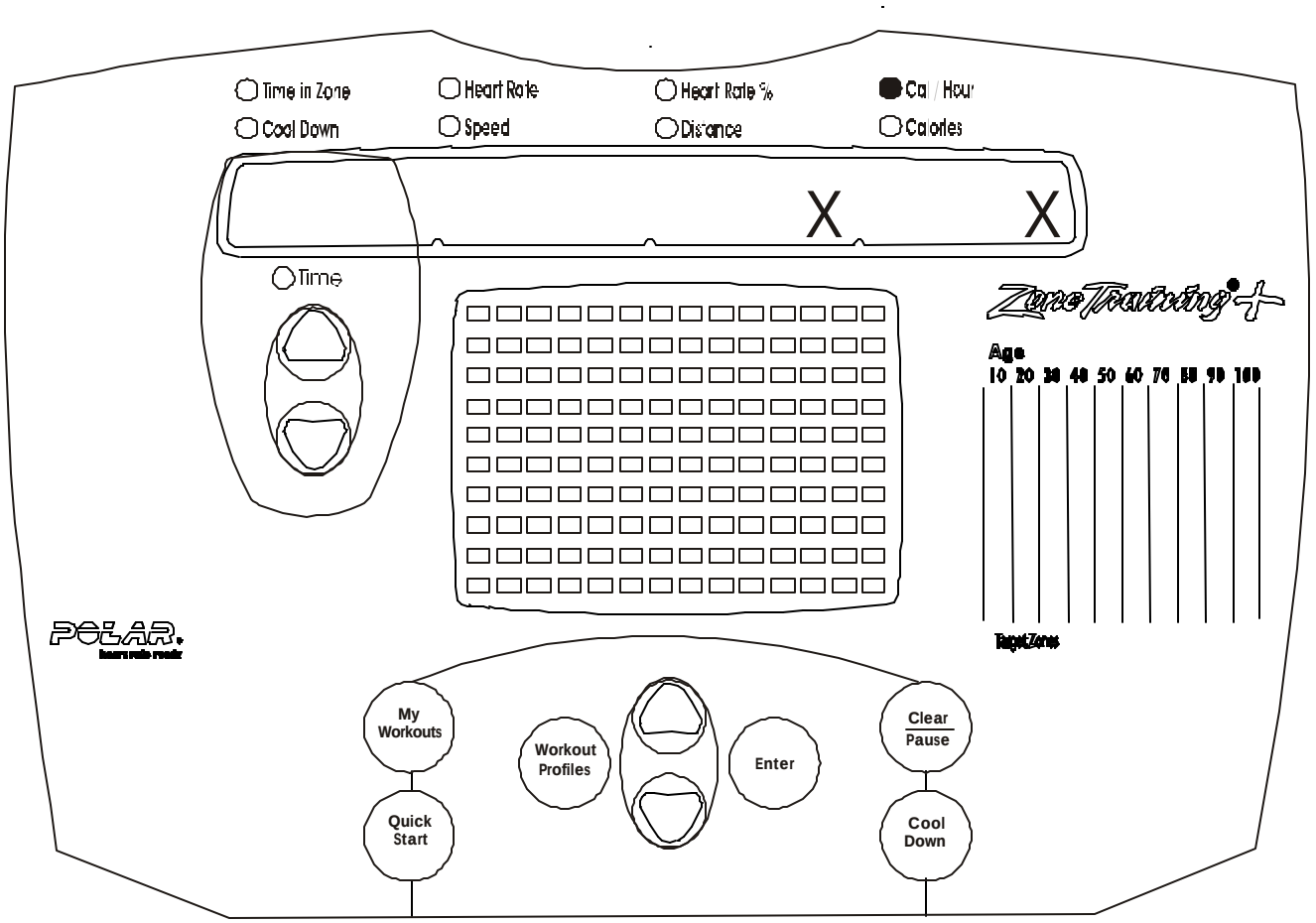
Diagnostic State 8 - EEPROM Version Number



This state displays the EEPROM Version Number. If the EEPROM is not present or fails to function correctly, the display shows ”EEPROM ERROR”. The Heart Rate % LED will be lit.

Diagnostic Mode For Deluxe Monitor

Diagnostic State 9 - Run Time



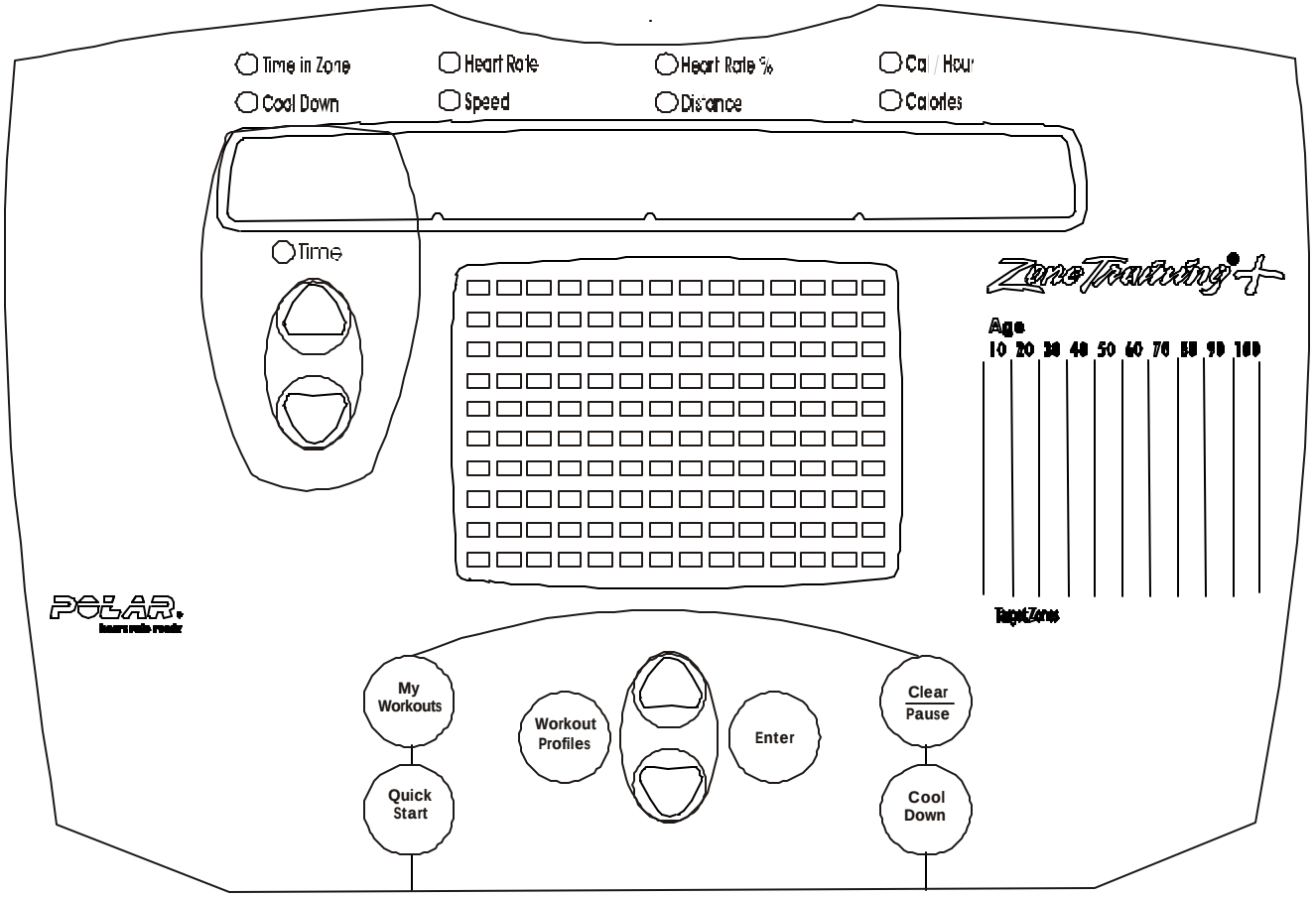
Displays the total accumulated Time used on the machine.

The left hand 4 digits will show accumulated hours up to 9999 and the center 2 digits of the display will show accumulated minutes up to 59.

The Cal/Hour LED is lit.

Diagnostic Mode For Deluxe Monitor

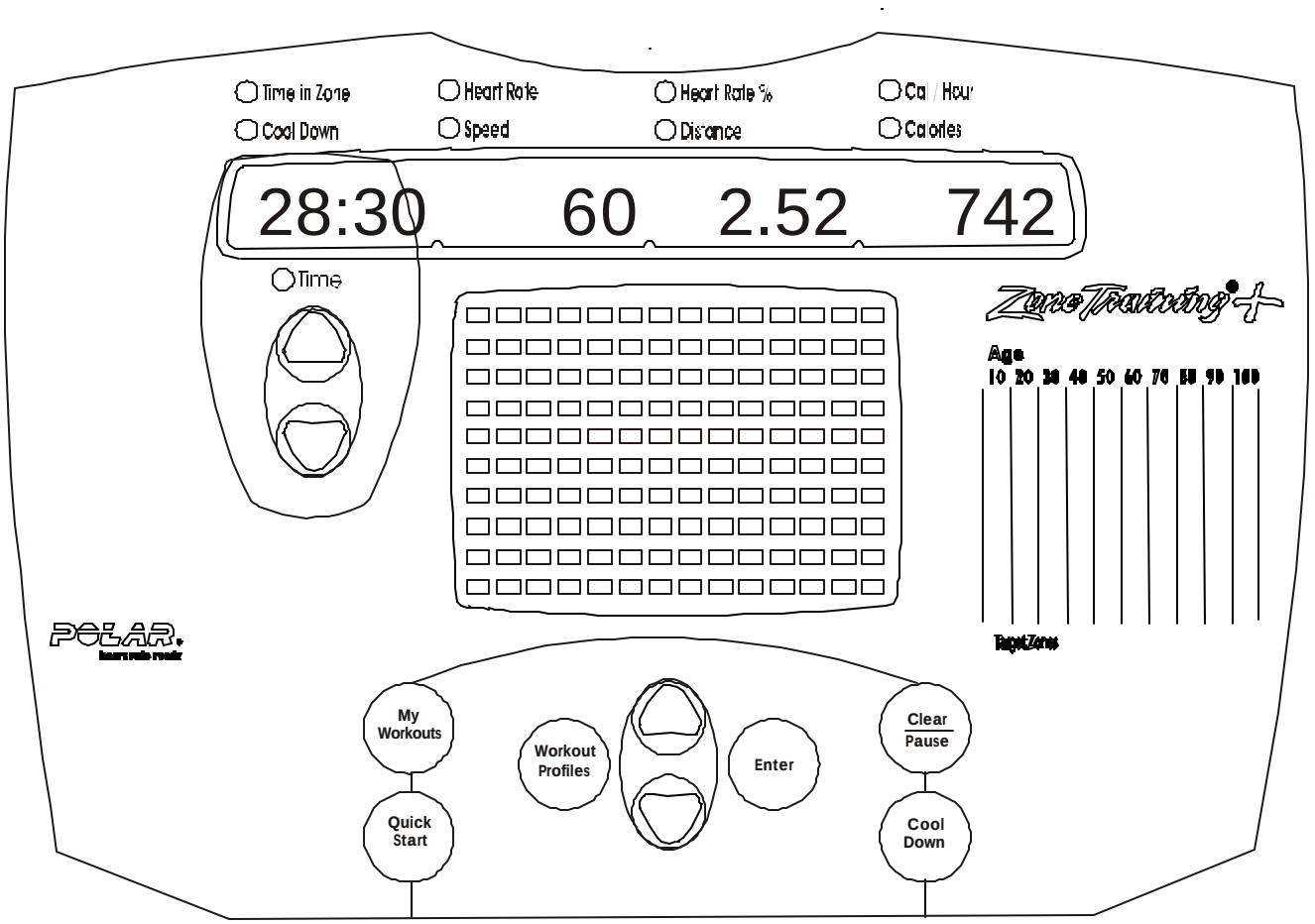
Diagnostic State 10 - Display Test



All of the monitor LEDs will be on.

Diagnostic Mode For Deluxe Monitor

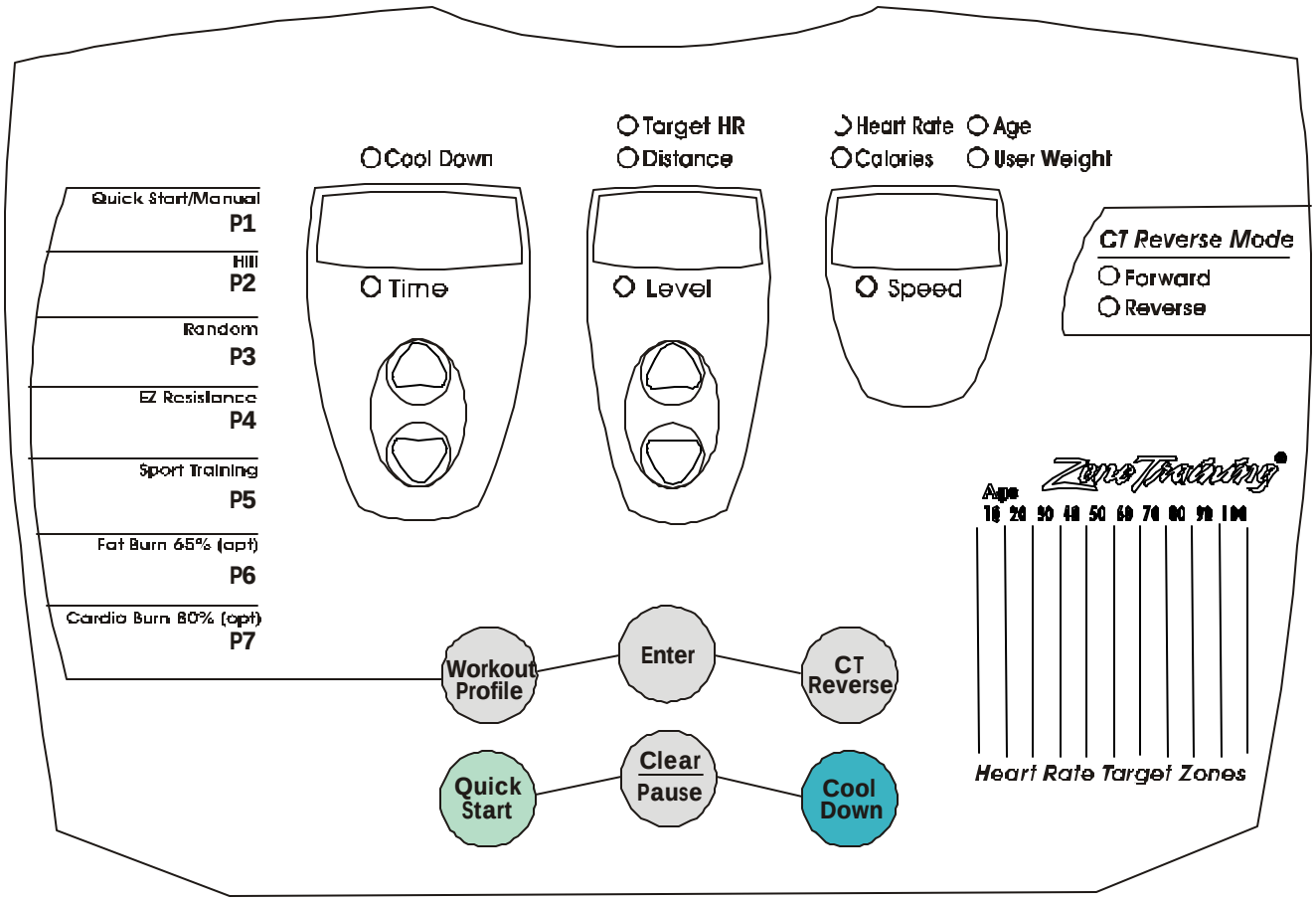
Diagnostic State 11 - Photo Shoot Mode



This State puts the monitor display in a static state, which simulates the users workout showing:

- The Time LED will be lit and the TIME display will show 28:30
- The Speed LED will be lit and the SPEED display will show 60
- The Distance LED will be lit and the DISTANCE display will show 2.52
- The Calorie LED will be lit an the CALORIE display will show 742

Diagnostic Mode For Standard Monitor



ENTERING DIAGNOSTICS MODE

Diagnostics can only be entered from IDLE mode. Enter Diagnostics by pressing the Pause/Clear button twice, and then press the Cool Down button, sequence must be completed within 3 seconds, or the monitor returns to IDLE mode.

Upon entering the Diagnostics mode, the monitor will beep three times before entering Diagnostic State 1.

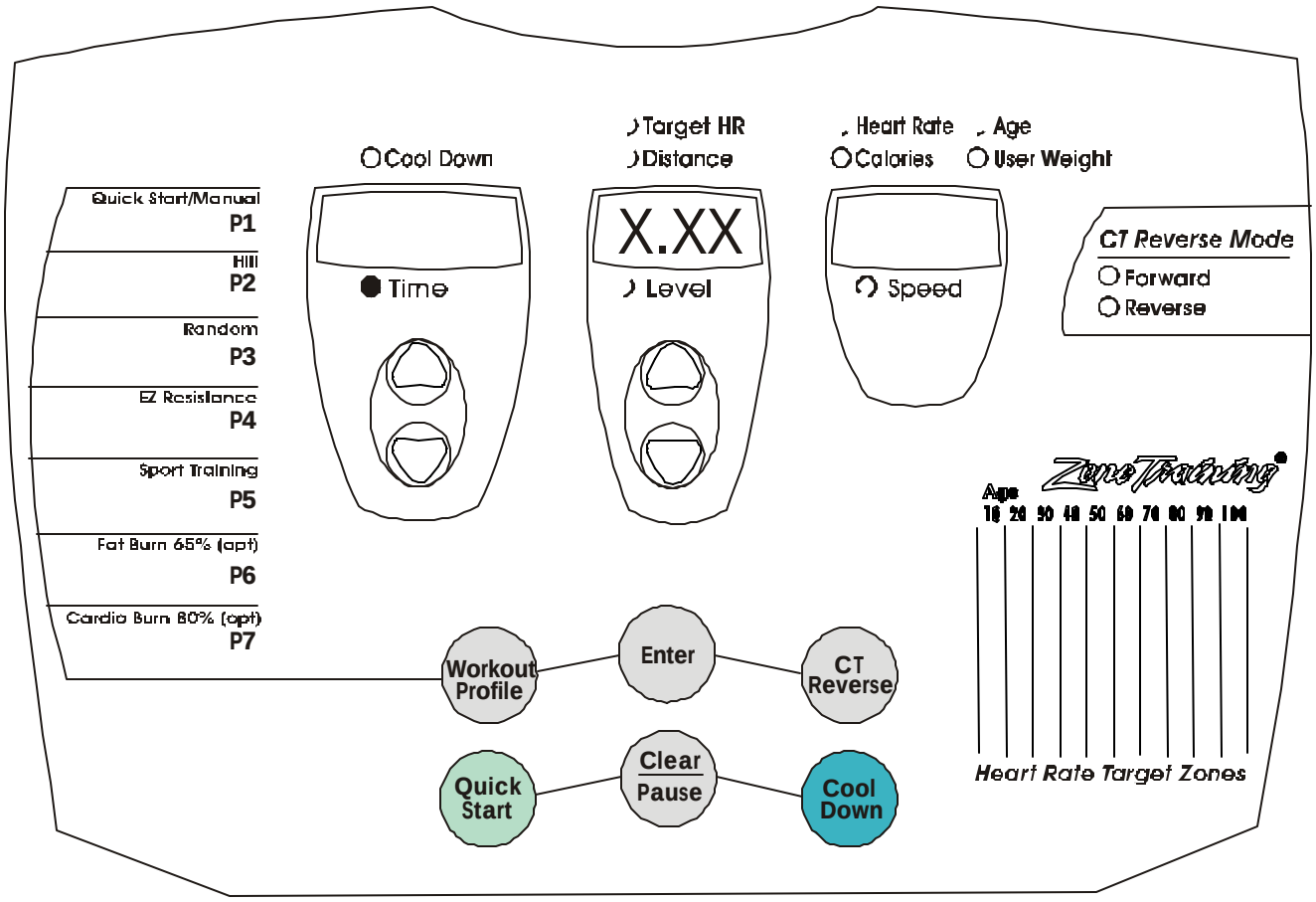
TOGGLING THROUGH DIAGNOSTIC STATES

Pressing the Enter button will advance to the next Diagnostic State. Diagnostics can only advance.

Once the Last State has been reached, pressing the Enter button again will exit the Diagnostic mode and the monitor will enter the IDLE mode.

Diagnostic Mode For Standard Monitor

Diagnostics State 1 - Software Version Number

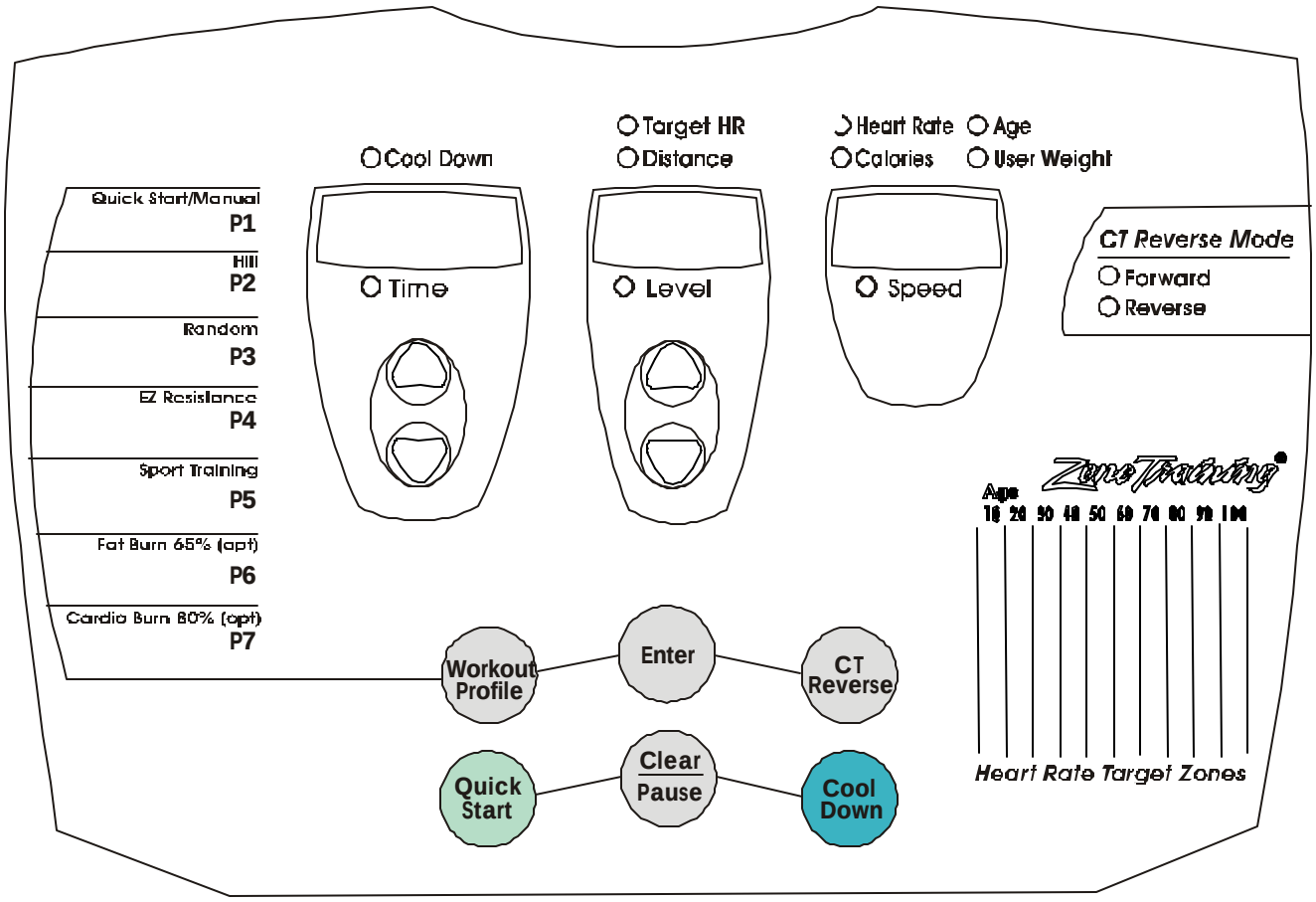


The TIME indicator LED will light to show the monitor is in Diagnostic State 1.

Diagnostics State 1 shows the software version number in the center numeric display as “X.XX”.

Diagnostic Mode For Standard Monitor

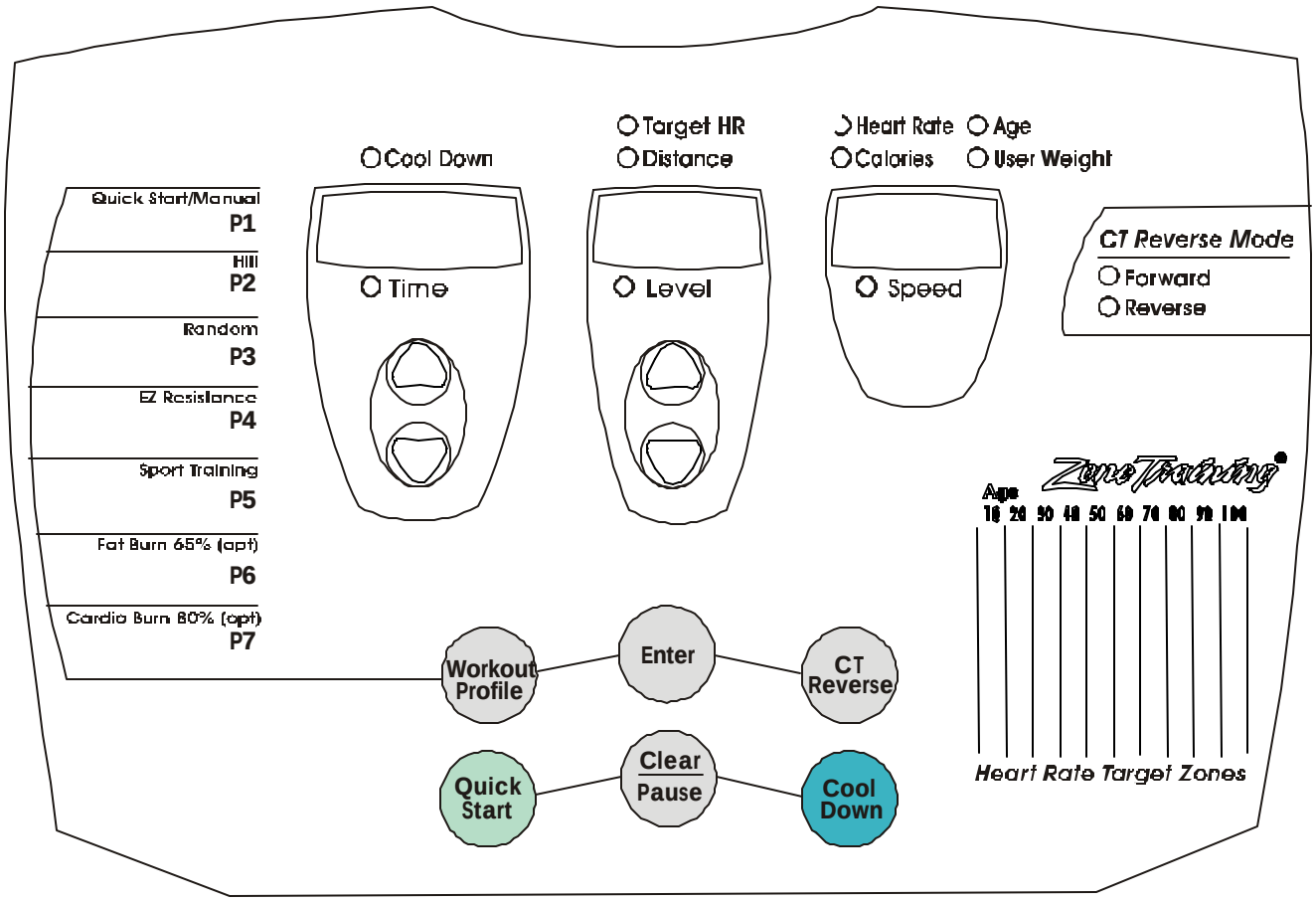
Diagnostic State 2 - Display Test Mode



All LEDs and LED segments are lit in this mode.

Diagnostic Mode For Standard Monitor

Diagnostic State 3 - Keypad Test Mode

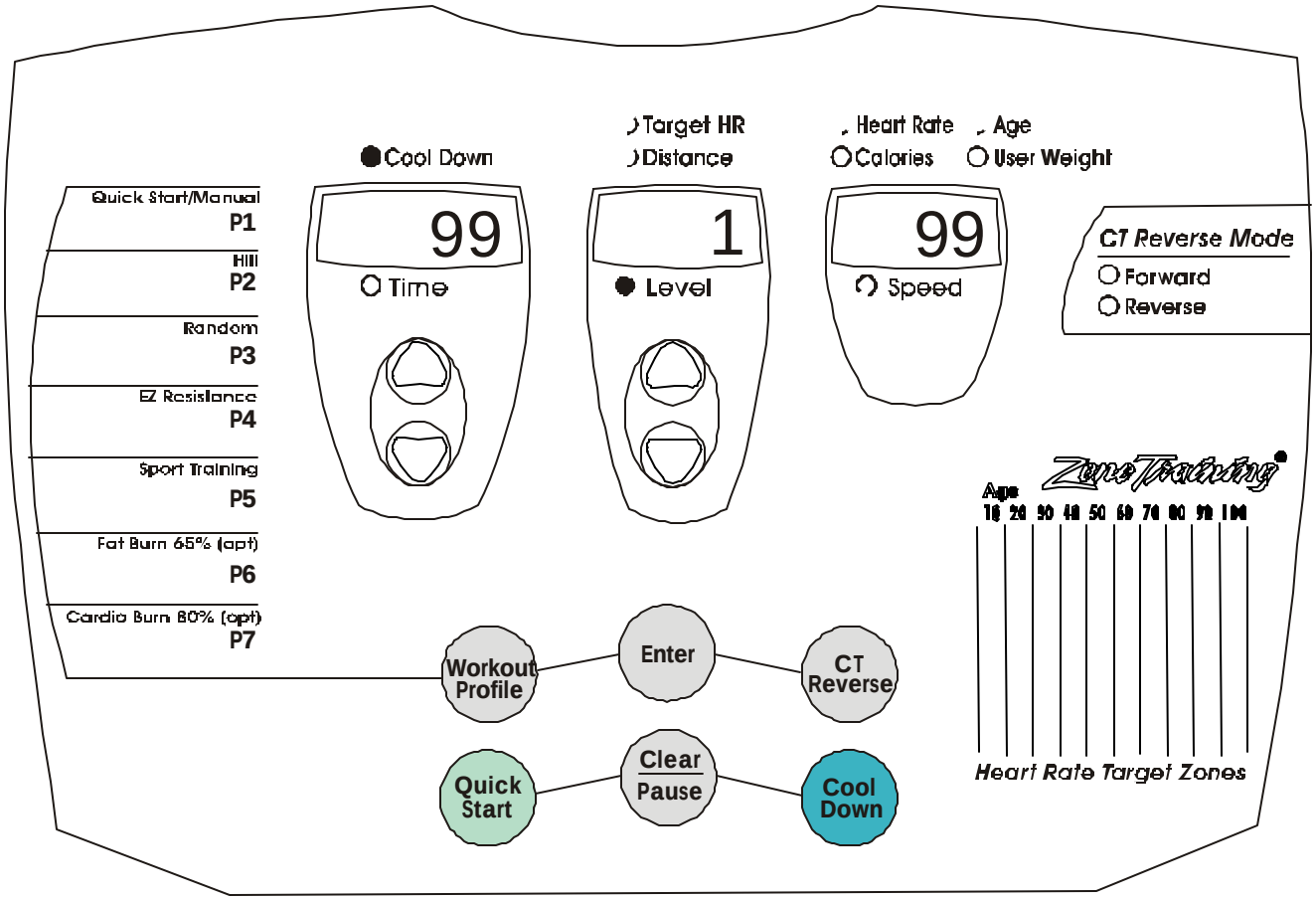


The following is to be displayed with a key press of the associated button and an audible beep will occur with each key press.

BUTTON	DISPLAY
Time ⮝	“0000 000 000”
Time ⮟	“1111 111 111”
Level ⮝	“2222 222 222”
Level ⮟	“3333 333 333”
Workout Profile	“4444 444 444”
Enter	This will toggle to the next diagnostic state
CT Reverse	“5555 555 555”
Quick Start	“6666 666 666”
Clear/Pause	“7777 777 777”
Cool Down	“8888 888 888”

Diagnostic Mode For Standard Monitor

Diagnostic State 4 - Magnet Position



Upon entering the magnet test, the Cool Down LED is lit. The Message Center displays 3 different numeric values.

The left side number represents the “DESIRED” EDDY current or MAGNETIC position and ranges from 21 to 256

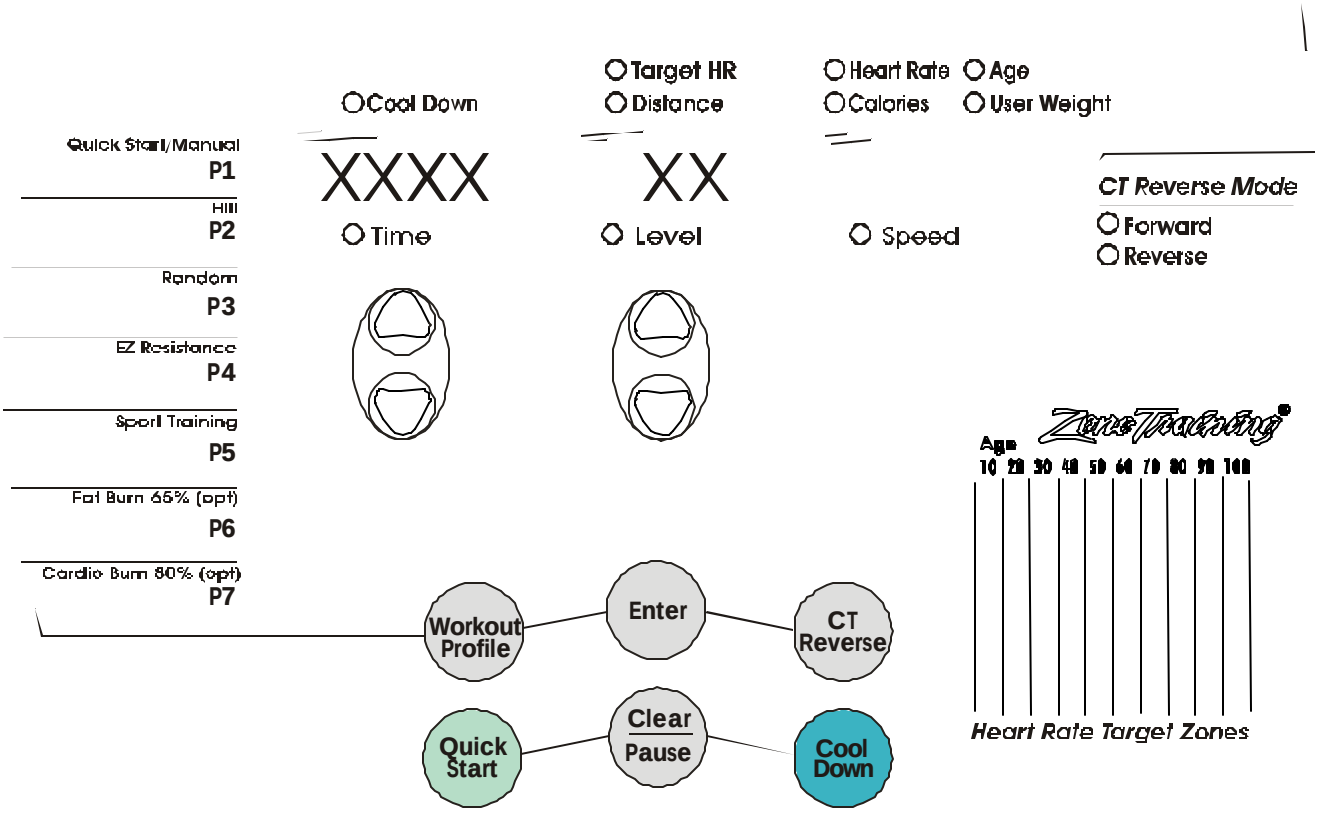
The center number represents sitting or level 1-20. The right side number represents the “ACTUAL” magnet position and ranges from 1 to 256. If the system determines that the motor is not responding properly, the display show “88:88 888 888” and beeps to indicate a motor control error. Power will be removed from the motor in order to prevent damage. Power must be removed from the console to clear the error.

Pressing the Level(⮝) button will activate the motor and move the magnets as to increase resistance. The center display will show the Resistance setting, the other 2 displays will show the associated desired and actual position of the magnets.

Pressing the Level(⮟) button will activate the motor and move the magnets as to decrease resistance. The center display will show the Resistance setting, the other 2 displays will show the associated desired and actual position of the magnets.

Diagnostic Mode For Standard Monitor

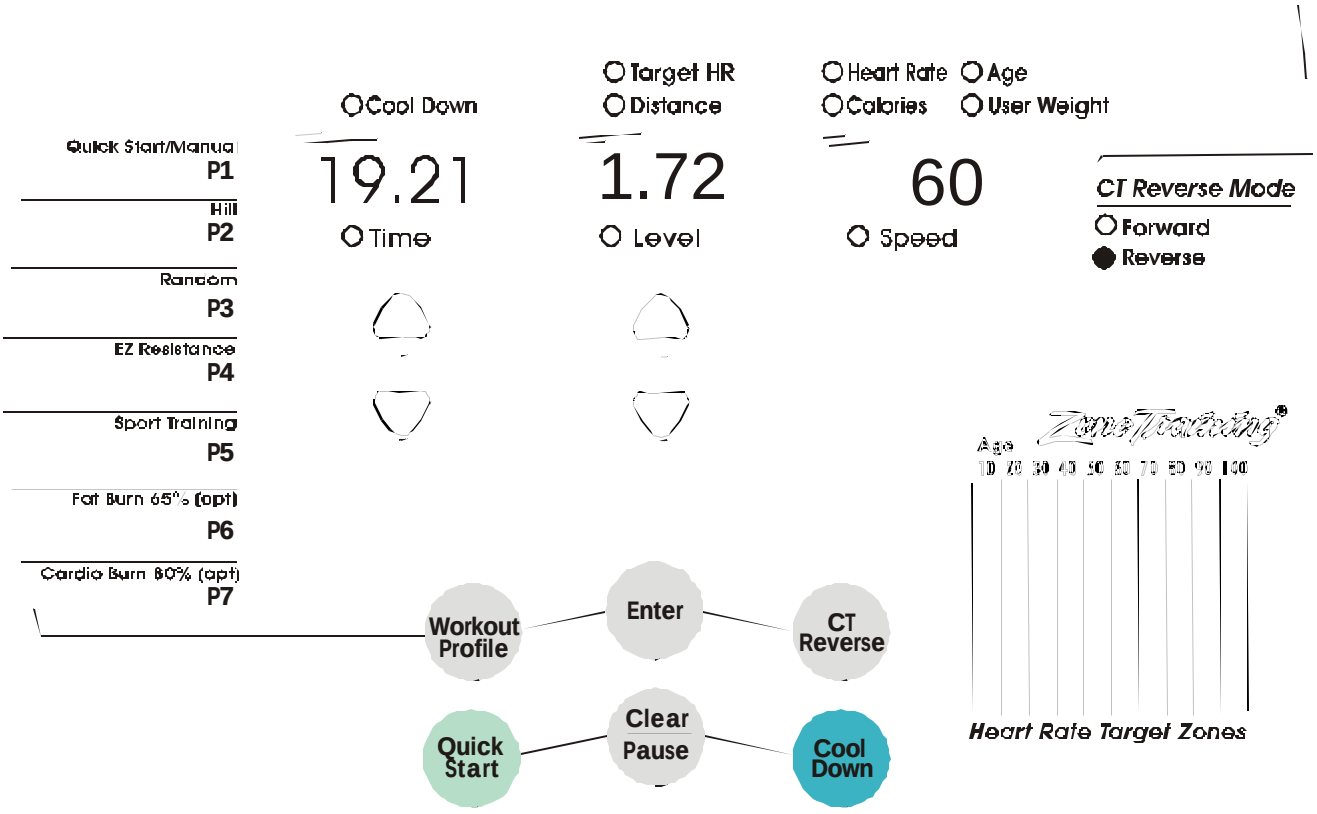
Diagnostic State 5 - Run Time



Displays the total accumulated Time used. The left hand 4 digits will show accumulated hours up to 9999 and the center 3 digits of the display will show accumulated minutes up to 59.

Diagnostic Mode For Standard Monitor

Diagnostic State 6 - Photo Shoot Mode



This State places the monitor displays in a static state, which simulates a user's workout showing:

- The Time the LED will be lit, and the TIME display will show 19:21
- The Distance LED will be lit, and the DISTANCE display will show 1.72
- The Speed LED will be lit, and the SPEED display will show 60
- The CT reverse LED will be lit

SECTION III

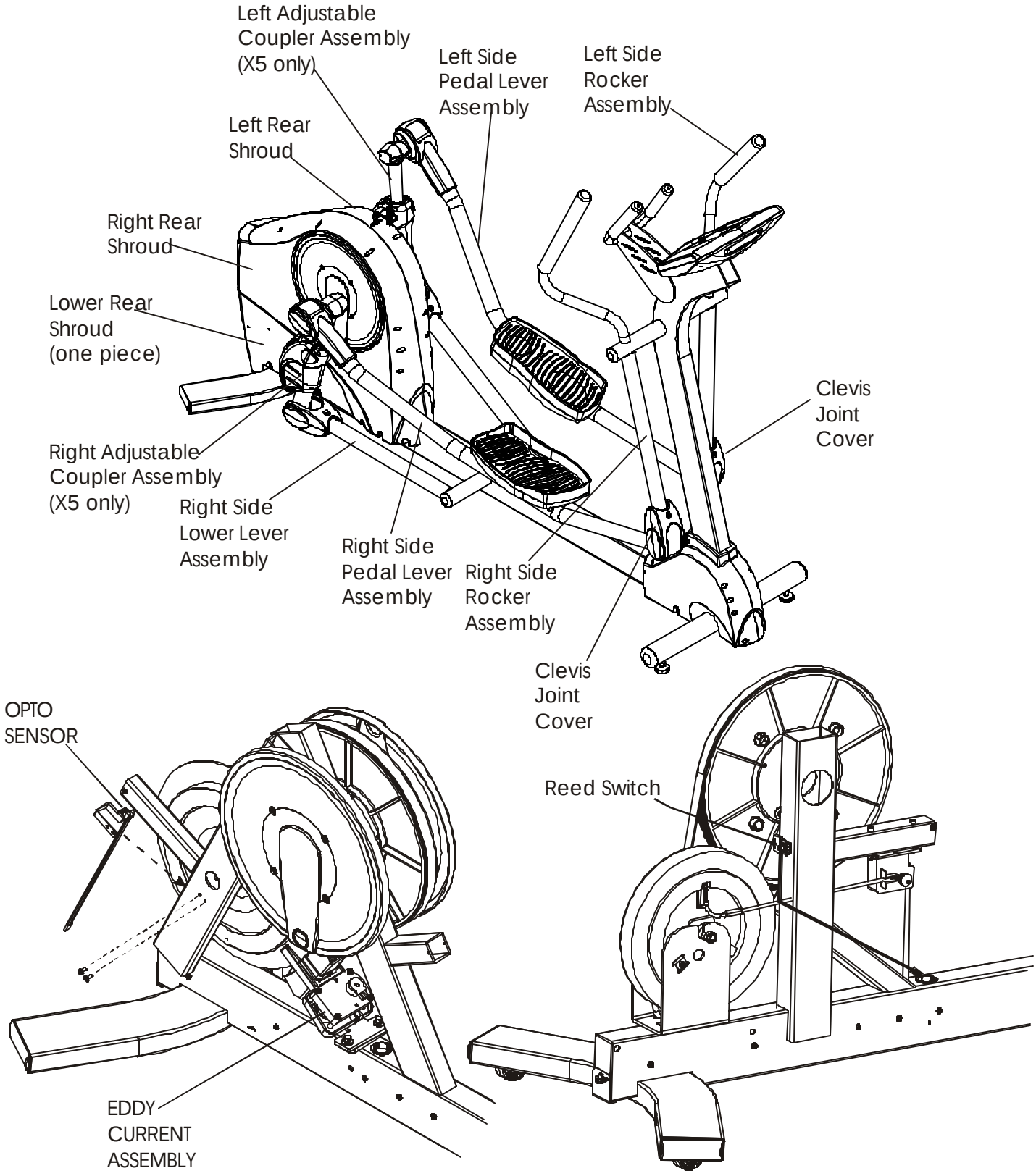
HOW TO…
SERVICE AND REPAIR GUIDE

NOTES

How To... Service and Repair Guide

Special Service Tools Required: NONE

NOTE: During service and repair, refer to the illustrations below to aid in parts identification.



Life Fitness Models X5i, X5, X3i, and X3 Cross-Trainers

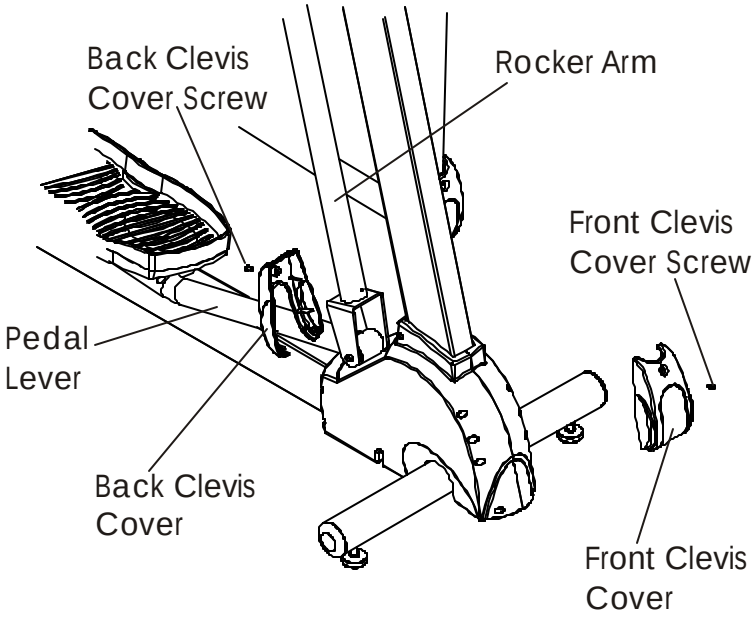
How To... Replace the Side Shrouds

Special Service Tools Required: NONE

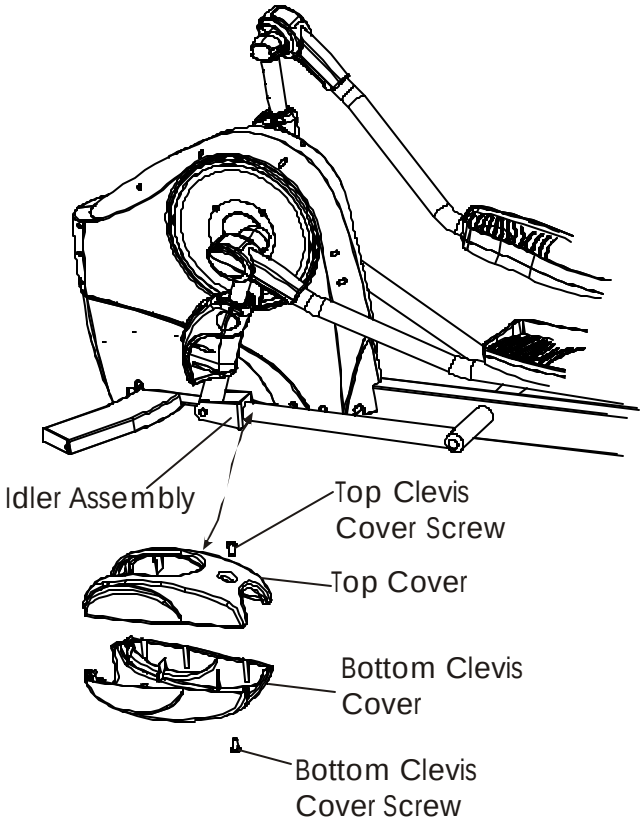
Note: Throughout this procedure, version X5 and X5i are illustrated.

Note: To replace either of the Side Shroud requires removal of the Pedal Link and Crank Arm Assembly. Directly mounted under the Side Shrouds, is a one piece, Lower Rear Shroud, which is replaceable without removing the Side Shrouds.

1. Remove the Clevis Joint Covers from the front of the Pedal Lever, and then remove the Bolt and Nut securing the front end of the Pedal Lever to the Rocker Arm clevis. Lower the Pedal Lever to the ground.

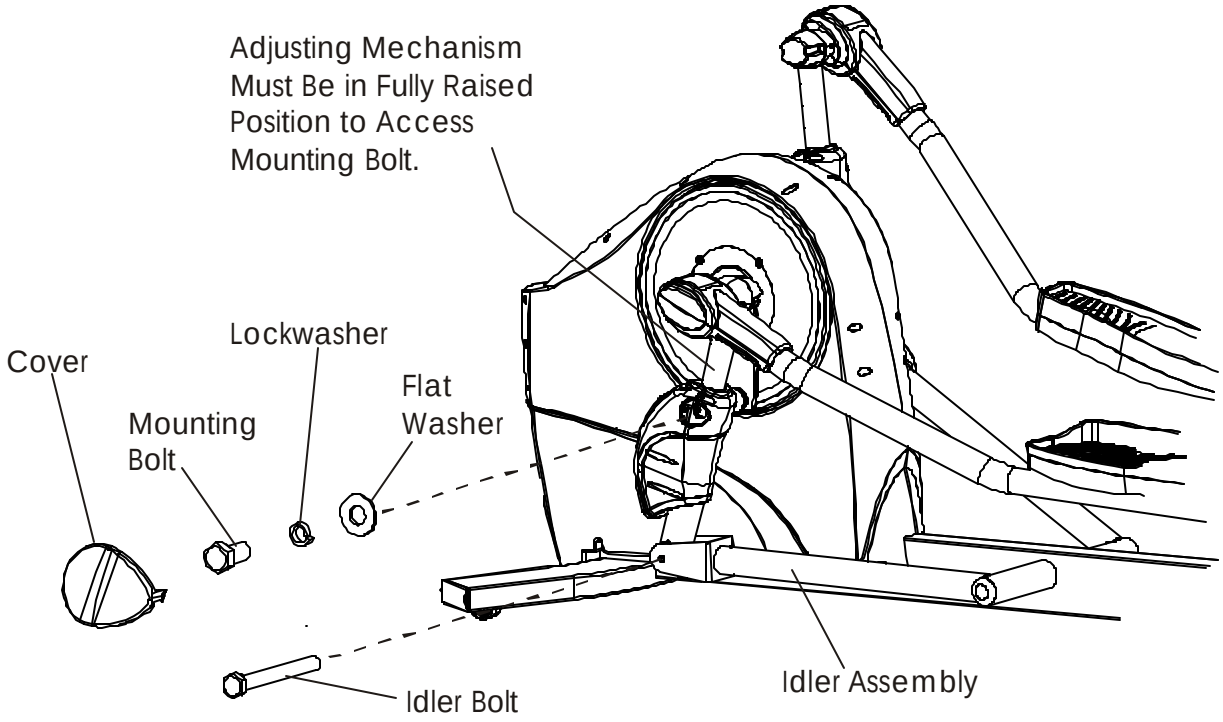


2. Remove the Clevis Covers from the Idler Assembly.



How To... Replace the Side Shrouds - Continued

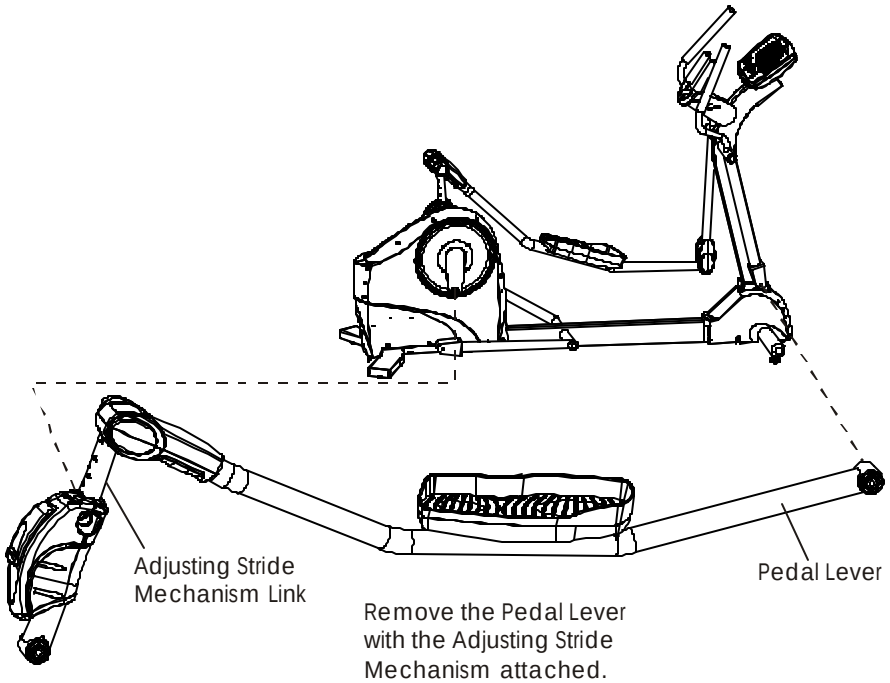
Special Service Tools Required: NONE



3. Remove the Bolt and Nut securing the Idler Assembly to the Coupler Assembly.

4. Remove the Cover, Bolt, Lock Washer, and Flat Washer securing the Coupler Assembly to the Crank Arm.

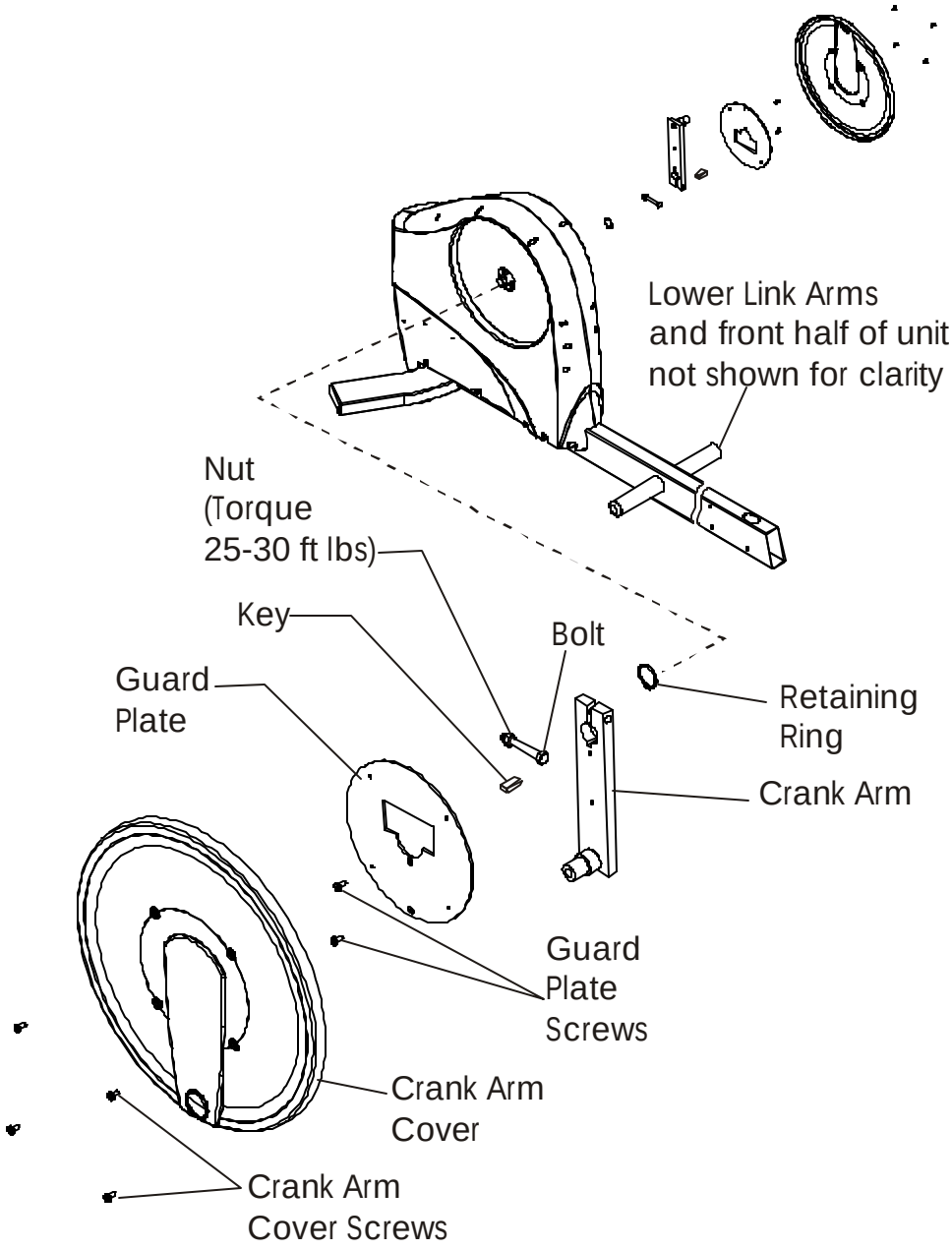
5. Remove the Pedal Lever with the Adjusting Stride Mechanism Link attached.



How To... Replace the Side Shrouds - Continued

Special Service Tools Required: NONE

6. Remove the Crank Arm Cover, Guard Plate, and Crank Arm from the Crank Shaft.



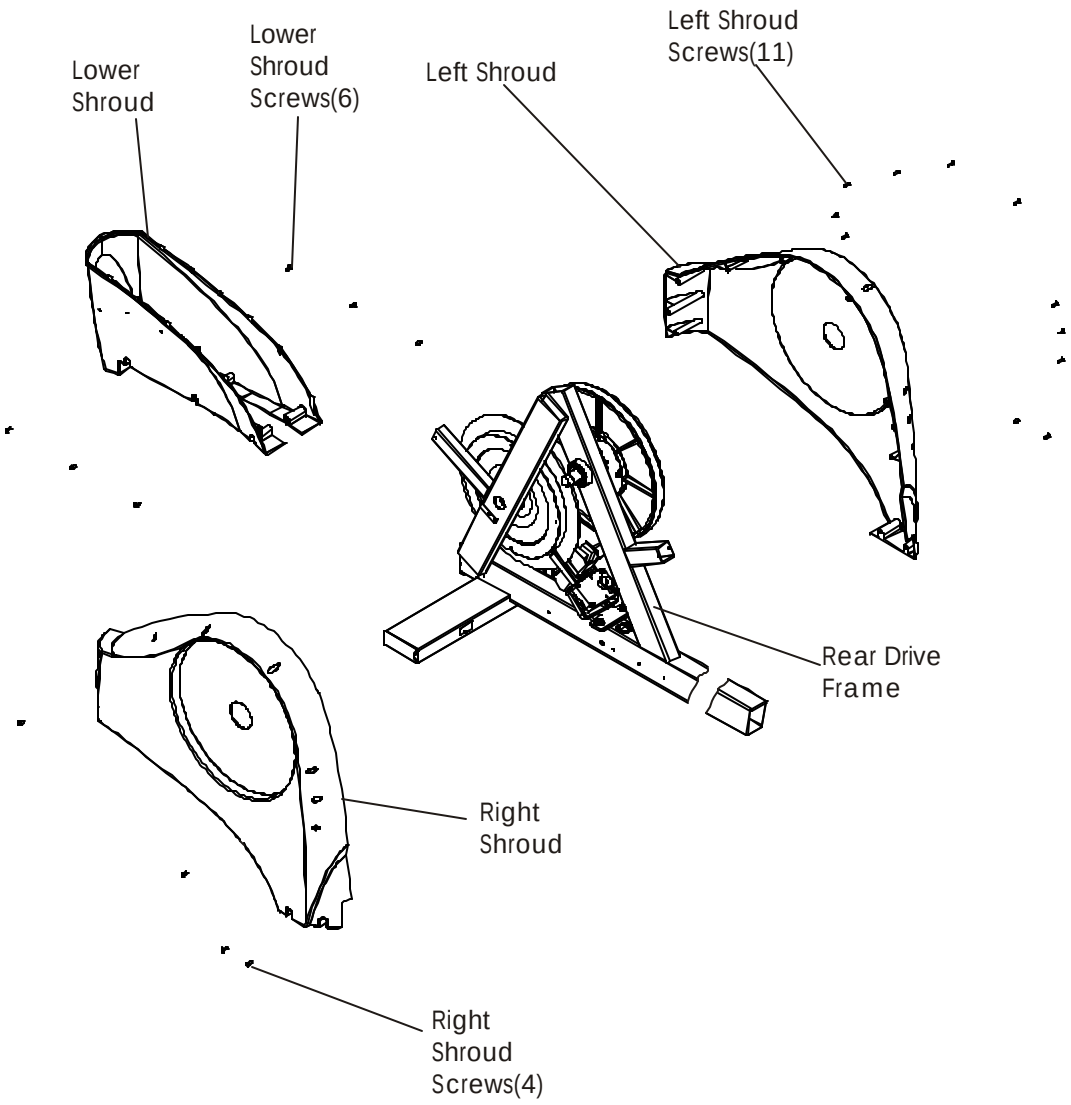
How To... Replace the Side Shrouds - Continued

Special Service Tools Required: NONE

7. Remove the side shrouds. The left Shroud is held in place by eleven screws, while four screws hold on the right Shroud. The Lower Shroud is held in place by six screws.

8. Install Shrouds in reverse order.

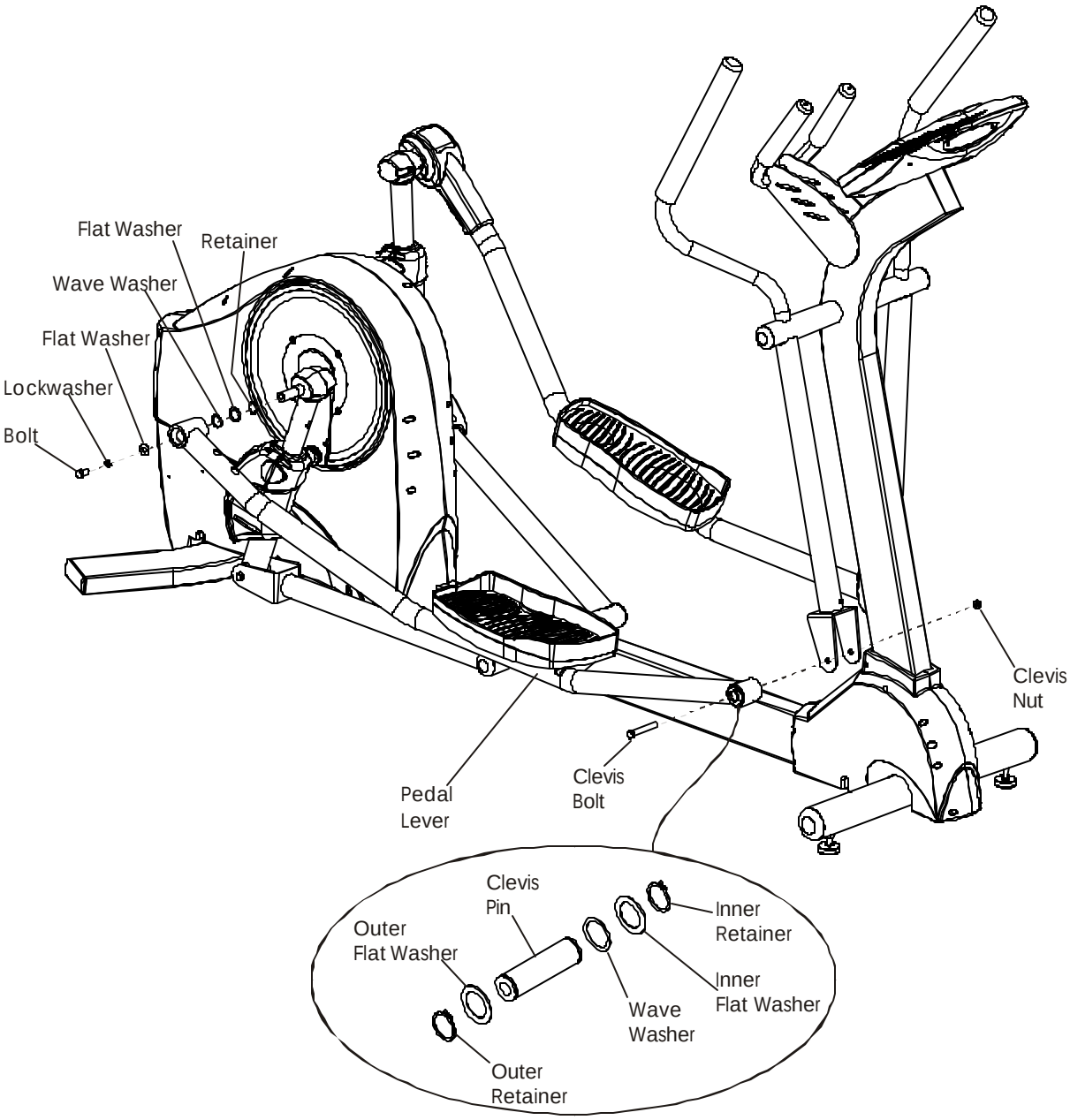
Note: The Side Shrouds do not require removal in order to remove the Lower Shroud.



Life Fitness Models X5i, X5, X3i, and X3 Cross-Trainers

How To... Replace the Pedal Lever Components

Special Service Tools Required: NONE

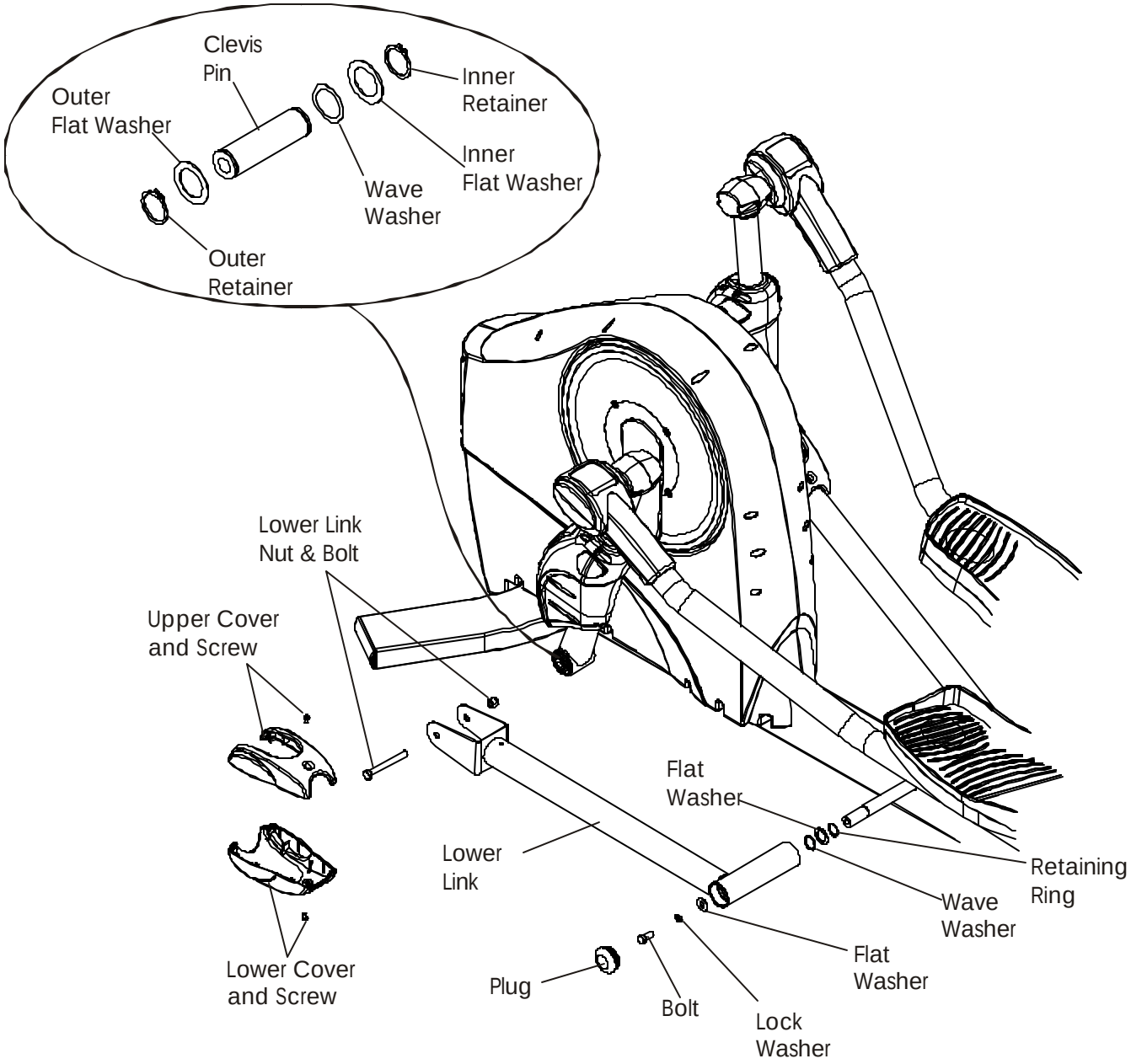


1. Remove the front and rear Clevis Covers, and then remove the Pedal Levers.
2. At the front end of the Pedal Lever, remove the Outer Retainer and then remove remaining components as shown.
3. At the rear end of the Pedal Lever, remove the Nut, Lock Washer, and Flat Washer, and then remove remaining components as shown.
4. Install in reverse order.

Life Fitness Models X5i, X5, X3i, and X3 Cross-Trainers

How To... Replace the Idler and Coupler Assembly Components

Special Service Tools Required: NONE



1. Remove the Lower Rear Clevis Covers and then remove the Lower Link.

2. At the front end of the Lower Link, remove the Plug, Bolt, and Lock Washer and then the remaining components as shown.

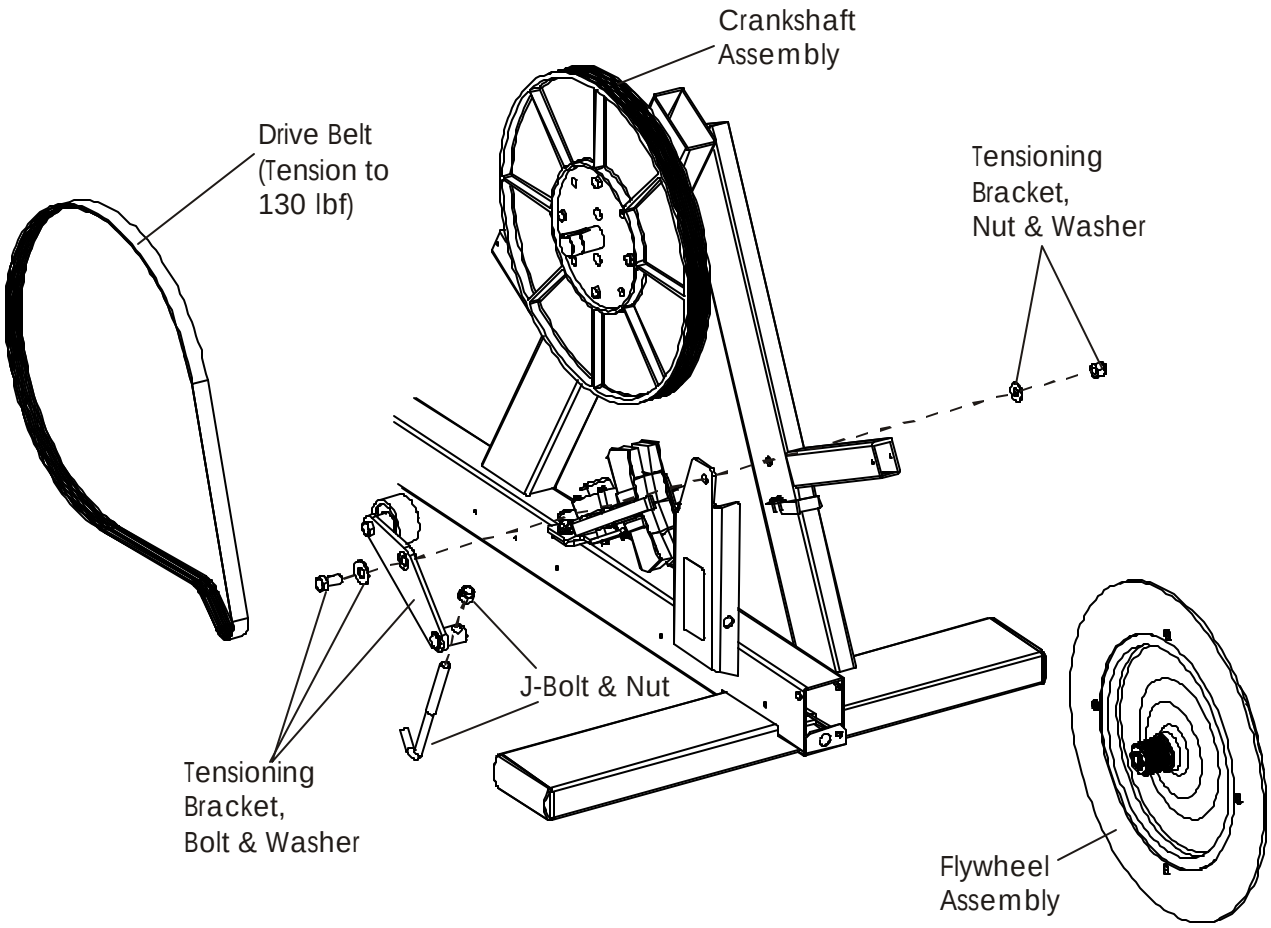
3. At the rear end of the Lower Link, remove the Retaining Ring and then remove remaining components as shown.

4. Install in reverse order.

Life Fitness Models X5i, X5, X3i, and X3 Cross-Trainers

How To... Replace the Drive Belt and Flywheel Assembly - Version 1

Special Service Tools Required: NONE

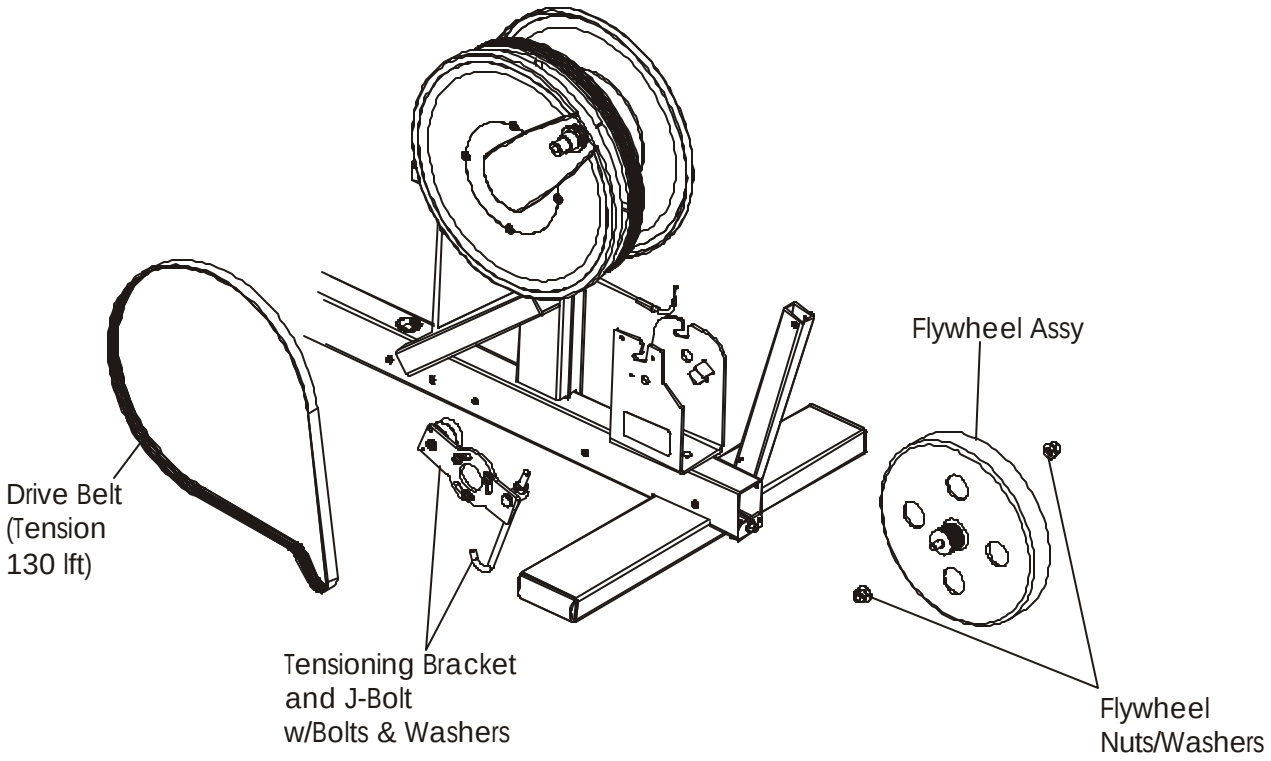


1. Remove the Side Shrouds and Lower Shroud. See “How To…” in this section.
2. Loosen the J-Bolt nut until the Drive Belt is slackened.
3. Hold onto the Flywheel Assembly, and then remove the Tensioning Bracket Bolt, Nut, and Washers.
4. Lower the Flywheel Assembly, and then remove the Drive Belt.
5. Install new Drive Belt in reverse order.

Life Fitness Models X5i, X5, X3i, and X3 Cross-Trainers

How To... Replace the Drive Belt and Flywheel Assembly - Version 2

Special Service Tools Required: NONE



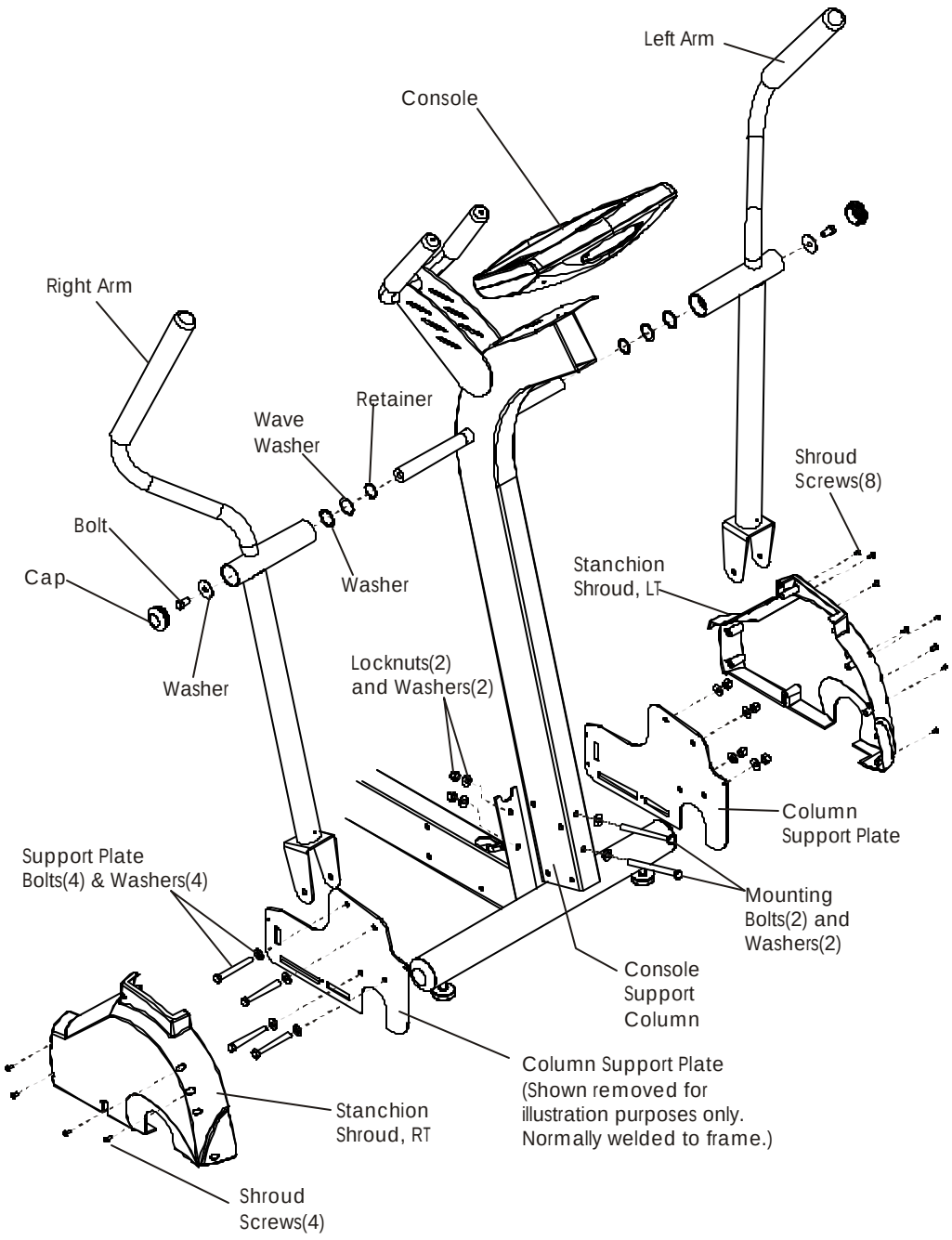
1. Remove the Side Shrouds and Lower Shroud. See “How To…” in this section.
2. Loosen the J-Bolt nut until the Drive Belt is slackened.
3. Remove the Tension Bracket with J-Bolt.
4. Remove the Nut and Washer securing each side of the Flywheel, and then lift out the Flywheel.
5. Remove the Drive Belt from the Pulley.
6. Install new Drive Belt in reverse order. Make sure to tension belt to 130 lft.

Life Fitness Models X5i, X5, X3i, and X3 Cross-Trainers

How To... Replace the Console Support Column

Special Service Tools Required: NONE

1. Remove the Console from the Console Support Column. See “How To…” in this section.
2. Remove the Cap, Bolt, and Washer from the left and right User Arms. Note the location of the Wave Washers.
3. Remove the front Clevis Covers and disassemble the user Arms from the Pedal Levers.
4. Remove the user Arms.
5. Remove the Stanchion Shrouds from the Column Support Plate.
6. Remove the mounting bolts securing the Column to the Frame, and remove the column by lifting upwards.
7. Install new Console Support Column in reverse order being careful not to pinch wire harness.

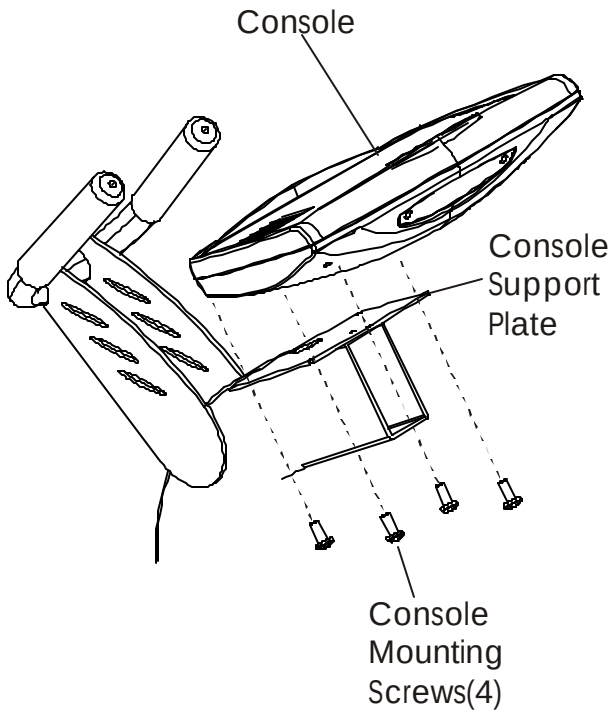


Life Fitness Models X5i, X5, X3i, and X3 Cross-Trainers

How To... Replace the Console Assembly

Special Service Tools Required: NONE

1. Remove the four Console Mounting Screws from the back of the Console Support Plate.
2. Lift the Console up enough to disconnect the cable connections.
3. Install the new Console in reverse order.



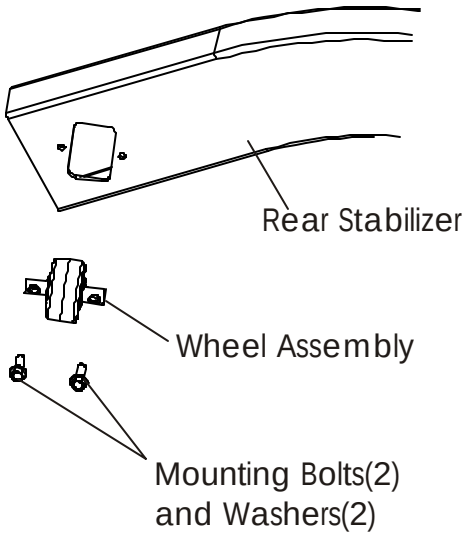
Life Fitness Models X5i, X5, X3i, and X3 Cross-Trainers

How To... Replace the Rear Wheels & Front Levelers

Special Service Tools Required: NONE

Rear Wheels

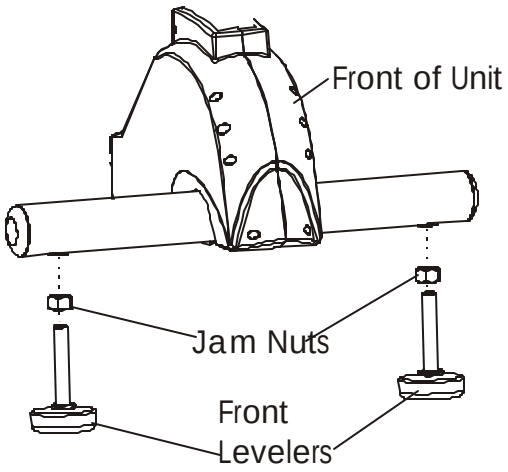
1. Remove two mounting bolts and washers securing the Wheel Assembly to the Rear Stabilizer.
2. Remove the Wheel Assembly from the Rear Stabilizer and discard.
3. Install new Wheel Assembly in reverse order.



Front Levelers

1. Loosen the Jam Nut.
2. Unscrew the front Leveler.
3. Install new leveler in reverse order. Make sure the unit is absolutely leveled, after which make sure to retighten the Jam Nuts.

Note: It is critical to proper unit operation that the unit be leveled.



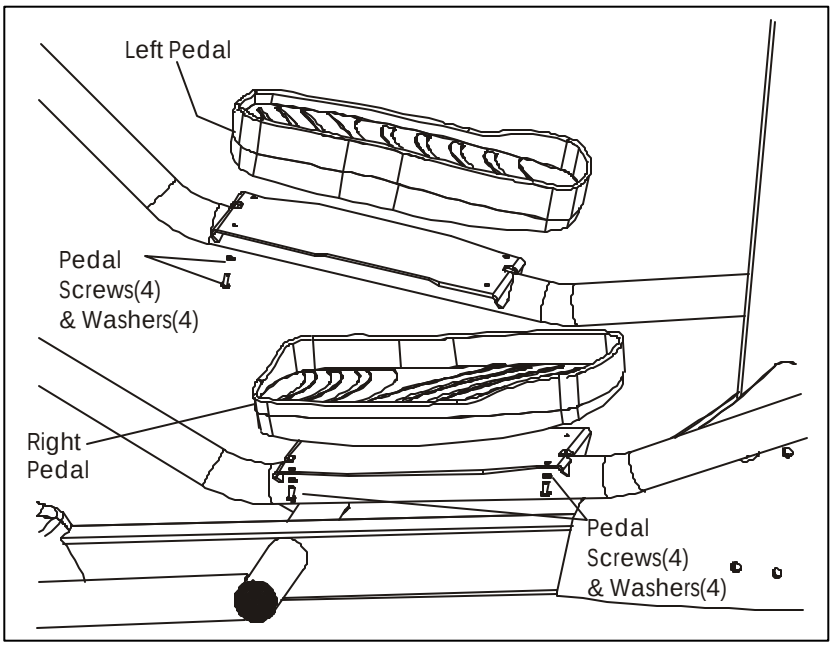
How To... Replace the Pedals

Special Service Tools: NONE

1. Each pedal is secured by screws(4) and washers(4), which are located under pedal. Remove these screws and washers, and then lift off the pedal.

2. Install new pedals in reverse order.

Note: New screws will come with pedals.



How To... Replace the Eddy Current Assembly - Version 1

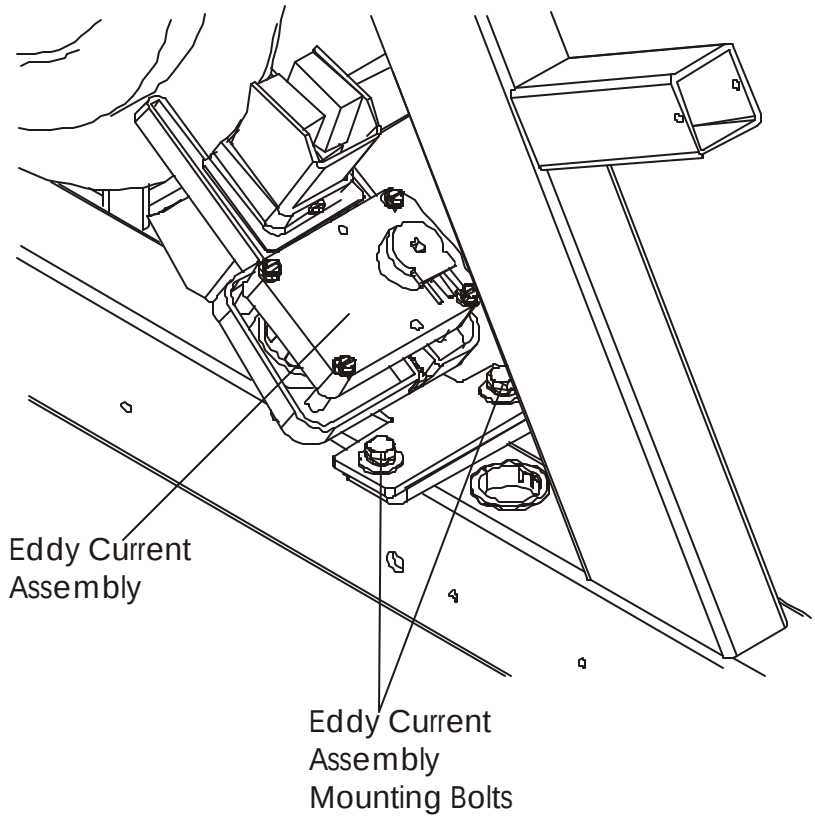
Special Service Tools Required: NONE

Remove the side shrouds. See “How To…” in this section.

Disconnect the wiring cable.

Remove two Mounting Bolts and lift out the Eddy Current Assembly.

Install new Eddy Current Assembly in reverse order.

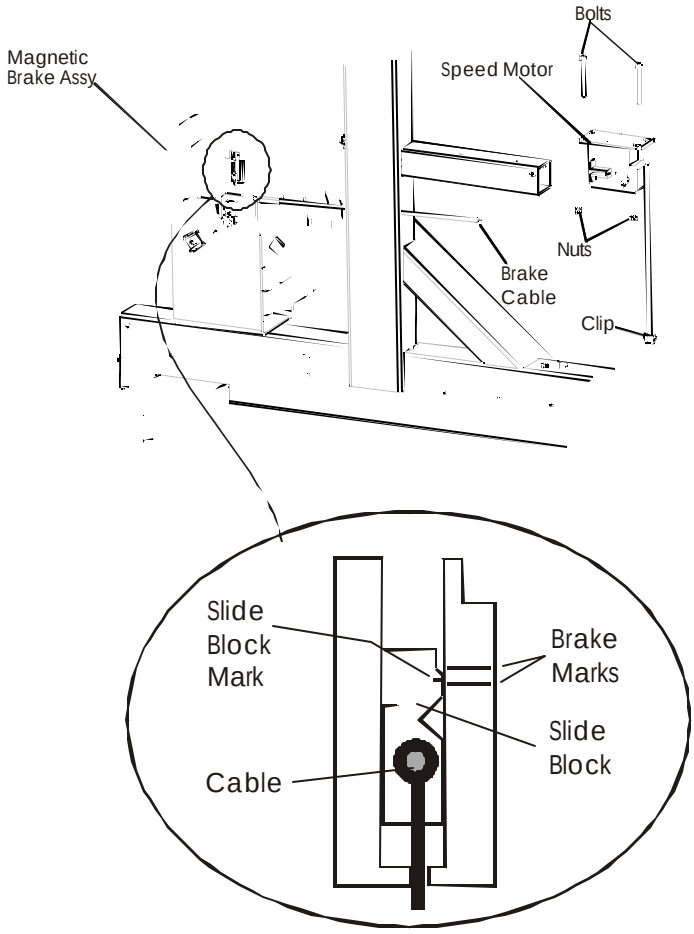


Life Fitness Models X5i, X5, X3i, and X3 Cross-Trainers

How To... Replace the Speed Motor Assembly - Version 2

Special Service Tools Required: NONE

1. Remove the Side Shrouds. See “How To…” in this section.
2. Disconnect the Brake Cable from the Magnetic Brake, and then from the Speed Motor.
3. Remove the mounting Bolts and Nuts from the Speed Motor.
4. Disconnect the wire harness.
5. Install new **Speed Motor** in reverse order.
6. Apply power to unit, which will automatically set unit level at 1.
7. Using the cable adjuster, set the mark on the slide block so that it is positioned between the two marks on the magnetic brake.
8. Using Diagnostic State 4, run resistance to maximum level, and then back down to level #1. If no motor error message appears, the unit is set properly. If motor error message appears, then repeat Step 7.

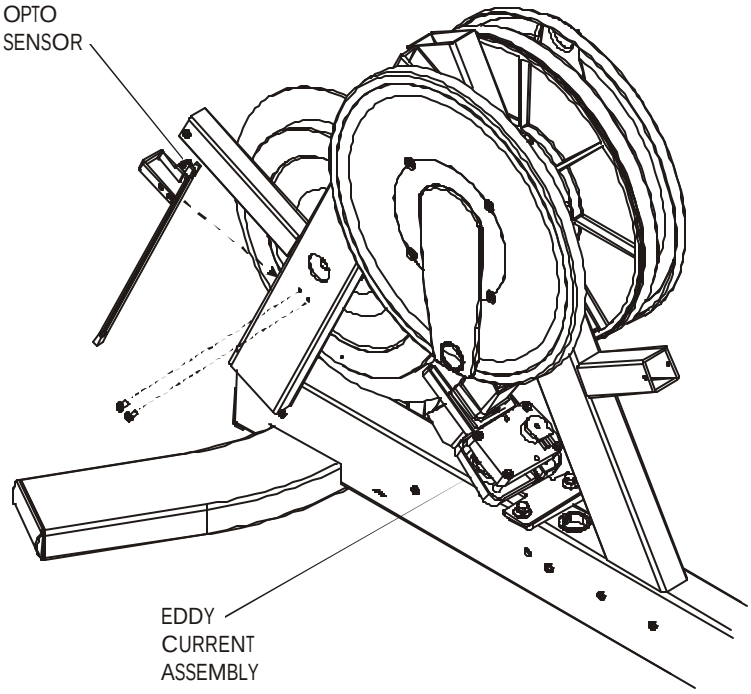


Life Fitness Models X5i, X5, X3i, and X3 Cross-Trainers

How To... Replace the OPTO Sensor - Version 1

Special Service Tools Required: NONE

1. Remove the Side Shrouds. See “How To…” in this section.
2. Disconnect the OPTO Sensor Cable from the Lower Frame Cable.
3. Remove the OPTO sensor by removing the two Phillips screws while holding the OPTO Sensor to the frame.
4. Install new OPTO Sensor in reverse order ensuring that the chopper wheel is centered.

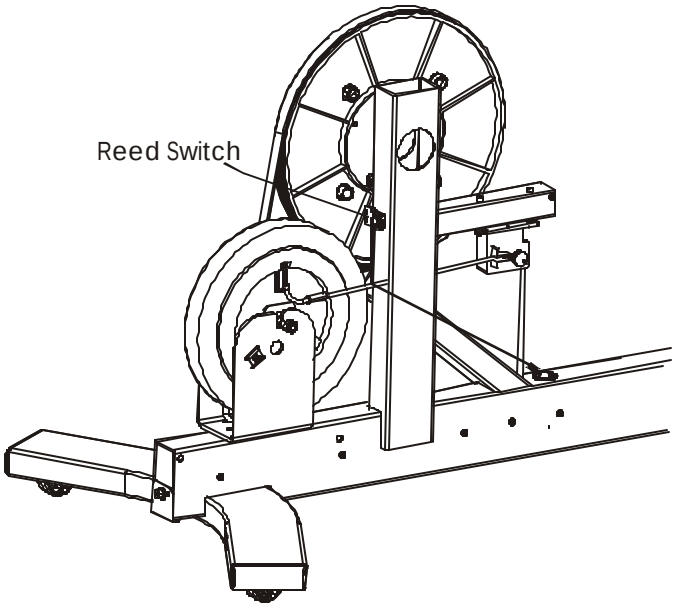


Life Fitness Models X5i, X5, X3i, and X3 Cross-Trainers

How To... Replace the Reed Switch - Version 2

Special Service Tools Required: NONE

1. Remove the Side Shrouds. See “How To…” in this section.
2. Disconnect the Reed Switch from the Lower Frame Cable.
3. Remove the Allen Bolt that mounts the Reed Switch.
4. Install new Reed Switch in reverse order. Set the gap between the edge of the Reed Switch and the face of the magnet holder to 1/8”.
5. Verify for proper function by performing a Speed Test in Diagnostic.



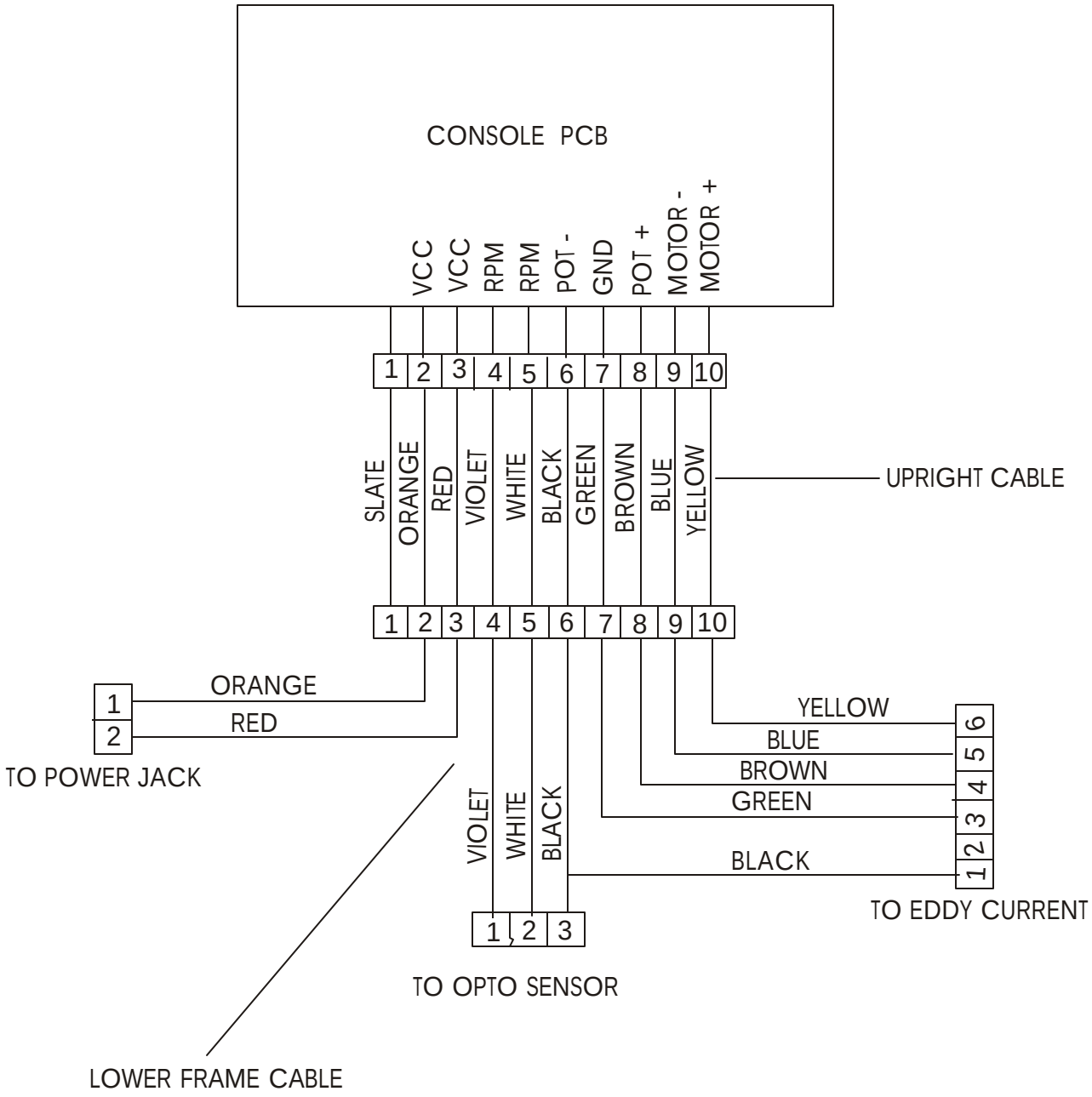
NOTES:

SECTION IV

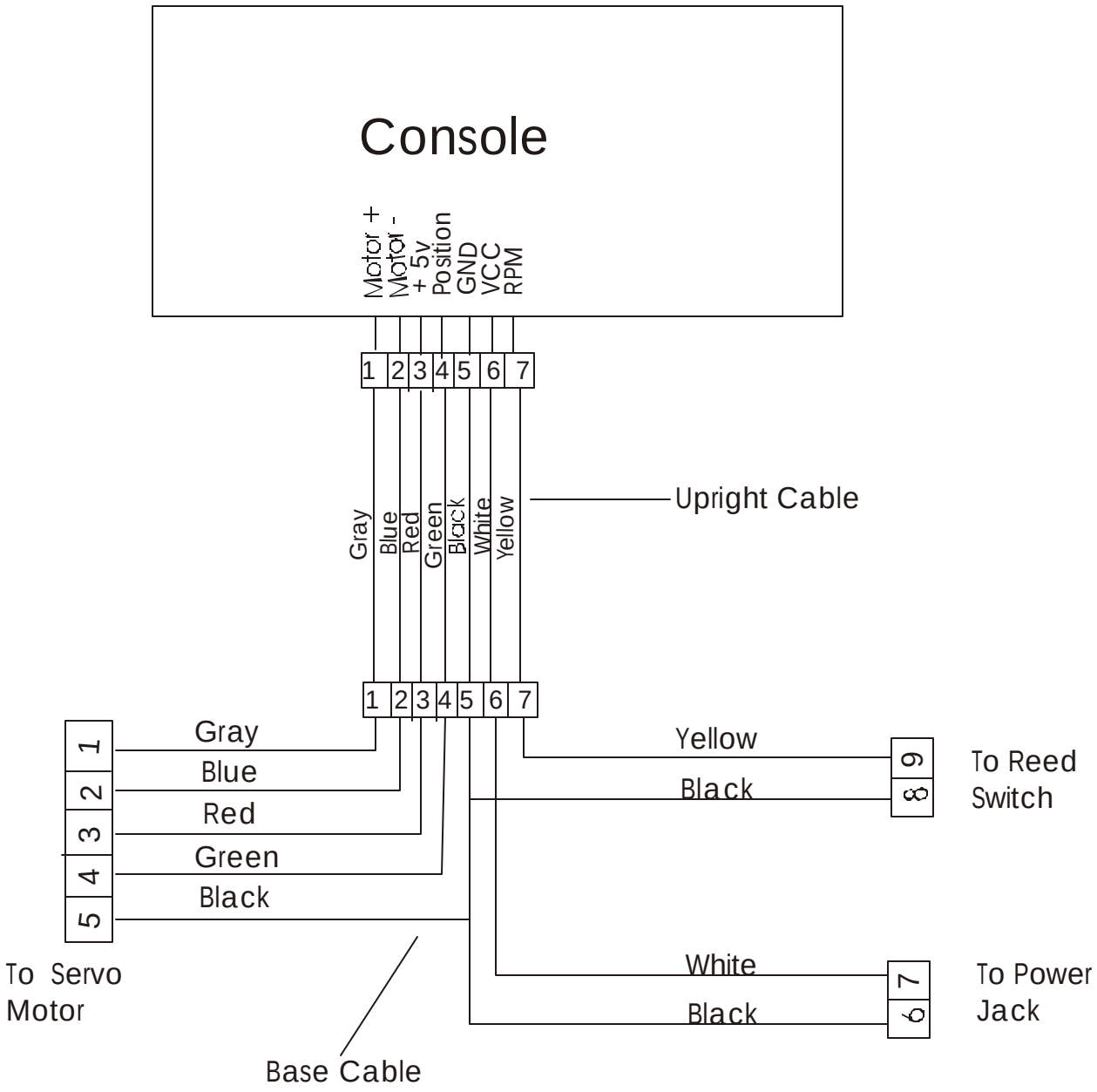
ELECTRONIC OVERVIEW AND WIRING BLOCK DIAGRAM

NOTES

Cables Version 1



Cables Version 2

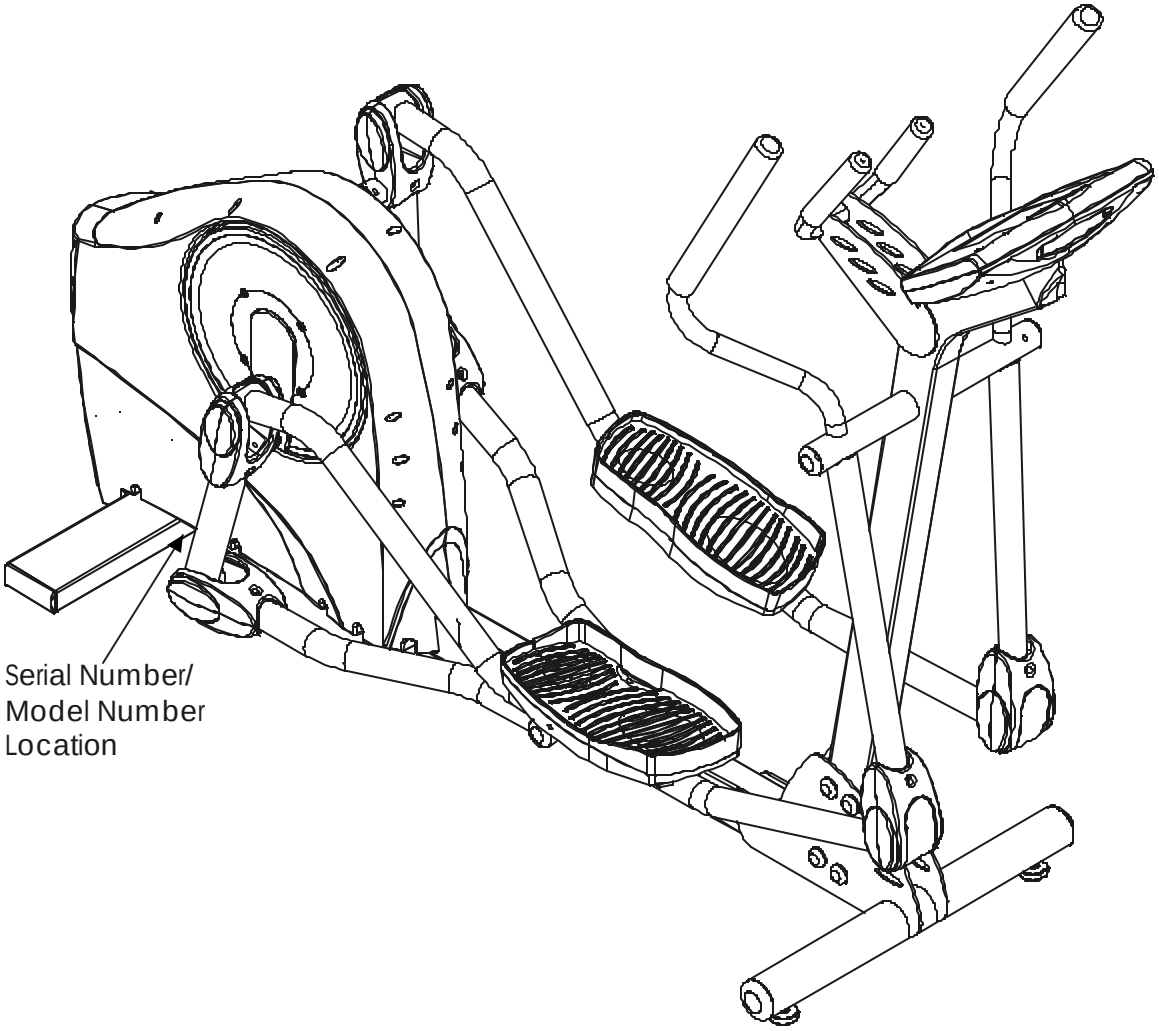


SECTION V

MISCELLANEOUS INFORMATION

NOTES

Serial and Model Numbers



PREVENTIVE MAINTENANCE TIPS

Preventive Maintenance Schedule

ITEM	WEEKLY	MONTHLY	QUARTERLY	BI-ANNUAL	ANNUAL
DISPLAY CONSOLE ASSEMBLY					
Hardware				Inspect	
Overlay	Clean			Inspect	
HANDLEBAR ASSEMBLY					
Hardware				Inspect	
Handlebar				Inspect	
FRAME ASSEMBLY					
Hardware				Inspect	
Shrouds	Clean				
Motor Electronic Compartment		Vacuum Clean		Inspect	
Drive Belt				Inspect	
Leg Levelers		Inspect/Adjust			

1.1. DIAGNOSTICS MODE

1.1.1. ENTERING DIAGNOSTICS MODE

Diagnostics mode can only be entered from Idle mode.

Diagnostics mode can be entered by pressing the Pause/Clear button twice and then pressing the Cool Down button or the Quick Start button. (Very few units were programmed to use the Quick Start button.) The time window for the three button presses is 4 seconds. If this button sequence is not completed within 4 seconds, the monitor returns to Idle mode.

Upon entering Diagnostics mode, the monitor will beep three times and enter Diagnostic State #1

1.1.2. TOGGLING THROUGH DIAGNOSTIC STATES

While in Diagnostics mode, pressing the Enter button will advance the monitor forward to the next Diagnostic State.

Once the last State **(Section 4.7.8)** has been reached, advancing the monitor forward via the Enter button will exit the Diagnostic mode and the monitor will enter IDLE mode.

1.1.3. DIAGNOSTICS STATE #1, SOFTWARE VERSION NUMBER

The TIME indicator LED will light to show the monitor in Diagnostic State #1.

Diagnostics State #1 will show the software version number in the center numeric display as “X.XX”.

A letter “b” is to show in the right hand numeric display at the same time that the version is being displayed if the software version is “beta”.

A checksum of the memory chip will be displayed in the left most numeric display. The checksum display to be defined by the supplier of this product.

1.1.4. DIAGNOSTIC STATE #2, DISPLAY TEST MODE

All LEDs and LED segments are lit in this mode.

Note; The LEDs can be lit at a reduced level in this mode if necessary.

1.1.5. DIAGNOSTIC STATE #3, KEYPAD TEST MODE

The following is to be displayed with a key press of the associated button and an audible beep will occur with each key press.

BUTTON	DISPLAY
Time ▲	“0000 000 000”
Time ▼	“1111 111 111”
Level ▲	“2222 222 222”
Level ▼	“3333 333 333”
Workout Profile	“4444 444 444”
Enter	This will toggle to the next diagnostic state
CT Reverse	“5555 555 555”
Quick Start	“6666 666 666”
Clear/Pause	“7777 777 777”
Cool Down	“8888 888 888”

Note; The LEDs can be lit at a reduced level in this mode if necessary.

1.1.6. DIAGNOSTIC STATE #4, MAGNET POSITION

The center numeric display of 3 digits will show the Resistance setting from 1 to 20.

The left hand numeric display of 4 digits will show a number from 1 to 256 (assuming an 8 bit A/D converter). The number displayed is the **desired** numerical equivalent for the location of the magnets from the microprocessor.

The right hand numeric display of three digits will show a number from 1 to 256. The number displayed is the **actual** numerical equivalent of the location of the magnets from the Analog to Digital converter or microprocessor.

Pressing the Level(⮝) button will activate the motor and move the magnets as to increase resistance. (Rapid Advance applies) The center display will show the Resistance setting, the other 2 displays will show the associated desired and actual position of the magnets.

Pressing the Level(⮟) button will activate the motor and move the magnets as to decrease resistance. (Rapid Advance applies) The center display will show the Resistance setting, the other 2 displays will show the associated desired and actual position of the magnets.

If the system determines that the motor is not responding properly, the display shows “88:88 888 888” and beeps to indicate a motor control error.

1.1.7. DIAGNOSTICS STATE #5, RUN TIME

This state displays the total accumulated Time used of the machine.

The left hand 4 digits will show accumulated hours up to 9999 and the center 3 digits of the display will show accumulated minutes up to 59.

Run Time is defined as the amount of time the monitor detects a SPU signal.

1.1.8. DIAGNOSTIC STATE #6, PHOTO SHOOT MODE

This State places the monitor displays in a “frozen” state simulating a users workout.

1.1. DIAGNOSTICS MODE

1.1.1. ENTERING DIAGNOSTICS MODE

Diagnostics mode can only be entered from Idle mode.

Diagnostics mode can be entered by pressing the Pause/Clear button twice and then pressing the Cool Down button. The time window for the three button presses is 2 seconds. If this button sequence is not completed within 2 seconds, the monitor returns to Idle mode.

Upon entering Diagnostics mode, the monitor will beep three times and enter Diagnostic State #1

1.1.2. TOGGLING THROUGH DIAGNOSTIC STATES

While in Diagnostics mode, pressing the Enter button will advance the monitor forward to the next Diagnostic State.

Once the last State has been reached, advancing the monitor forward via the Enter button will exit the Diagnostic mode and the monitor will enter IDLE mode.

1.1.3. DIAGNOSTIC STATE #1, SOFTWARE VERSION NUMBER

The Calories indicator LED will light to show the monitor in Diagnostic State #1.

Diagnostics State #1 will show the software version number in the display of the message center.

1.1.4. DIAGNOSTIC STATE #2, KEYPAD TEST MODE

The following is to be displayed with a key press of the associated button and an audible beep will occur with each key press. All LEDs will be off until the keypad buttons are pressed.

BUTTON	DISPLAY
Time ▲	“1111111111111111”
Time ▼	“2222222222222222”
My Workouts	“3333333333333333”
Quick Start	“4444444444444444”
Workout Profile	“5555555555555555”
Level ▲ (in the center)	“6666666666666666”
Level ▼ (in the center)	“7777777777777777”
Clear/Pause	“8888888888888888”
Cool Down	“9999999999999999”
Level ▲ (on the EZ pod)	“AAAAAAAAAAAAAAAA”
Level ▼ (on the EZ pod)	“BBBBBBBBBBBBBBBB”
CT Reverse	“CCCCCCCCCCCCCCCC”
CT Aerobics	“DDDDDDDDDDDDDDDD”
Enter	This will advance the monitor the next diagnostic state #3.

1.1.5. DIAGNOSTIC STATE #3, DISPLAY TEST MODE

The LEDs will toggle between the two bit patterns shown below. See figure 1 and figure 2. The adjacent LEDs in the 14 segment display should not light together. The single LEDs should light individually. The rows of the 10X14 brickyard display should light individually.

Figure 1

Figure 2

1.1.6. DIAGNOSTIC STATE#4, MAGNET POSITION

The Cool Down LED is lit.

The center 3 digits of the message center digits will show the Level setting from 1 to 20.

The left hand 4 digits of the message center will show a number from 1 to 256 (assuming an 8 bit A/D converter). The number displayed is the **desired** numerical equivalent for the location of the magnets from the microprocessor.

The right hand 3 digits of the message center will show a number from 1 to 256. The number displayed is the **actual** numerical equivalent of the location of the magnets from the Analog to Digital converter or microprocessor.

Pressing the Level(⮝) button will activate the motor and move the magnets as to increase resistance. (Rapid Advance applies) The center display will show the Resistance setting, the other 2 displays will show the associated desired and actual position of the magnets.

Pressing the Level(⮟) button will activate the motor and move the magnets as to decrease resistance. (Rapid Advance applies) The center display will show the Resistance setting, the other 2 displays will show the associated desired and actual position of the magnets.

1.1.7. DIAGNOSTIC STATE #5, A/D TEST

This state displays a number indicating the current motor position and the number that the system used to set that position. The Distance LED is lit.

1.1.8. DIAGNOSTIC STATE #6, SPEED READING TEST

This state displays the signal readings received at the SPU input. The Speed LED will be lit and the current RPM reading will be displayed.

1.1.9. DIAGNOSTIC STATE #7, HEART RATE TEST

This state displays the signal readings received by the heart rate receiver input connection. The heart rate LED will flash with each pulse received.

1.1.10. DIAGNOSTIC STATE #8, EEPROM TEST & EE VERSION

This state displays the EEPROM version number. If the EEprom is not present or fails to function correctly the display shows ”EEPROM ERROR”. The Heart Rate % LED will be lit.

1.1.11. DIAGNISTIC STATE #9, RUN TIME

This state displays the total accumulated Time used of the machine.

The left hand 4 digits will show accumulated hours up to 9999 and the right 2 digits of the display will show accumulated minutes up to 59.

Run Time is defined as the amount of time the monitor detects a SPU signal. The Cal / Hour LED is lit.

1.1.12. DIAGNOSTIC STATE #10, DISPLAY TEST

All of the monitor LEDs will be on.

1.1.13. DIAGNOSTIC STATE #11, PHOTO SHOOT MODE

This State places the monitor displays in a “frozen” state simulating a users workout.

1.2. USER MENU

The User menu is defined as a user programming state in which the following parameters can be read and/or programmed;

Prog. State	Setting	Range	Default	Description
#1	Pause Time	1-99	5 min.	Number of Minutes a work out is Paused.
#2	Sleep Time	0-99	5	Number of minutes before Sleep mode is entered. 0 is defined as no Sleep mode.
#3	Hold Time	1 – 99	10 seconds	Number of seconds the current display is held before automatic enter/advance
#4	Units	Eng./Metric	Eng.	Sets units as English or Metric
#5	Software			Displays current software revision.

1.2.1. ENTERING USER MENU

The User Menu can only be entered from Idle mode.

The User Menu can be entered by pressing the Pause/Clear button twice and then pressing the Enter button. The time window for the three button presses is 2 seconds. If this button sequence is not completed within 2 seconds, the monitor returns to Idle mode.

Upon entering the User Menu, the monitor will beep three times, display “USER MENU”(center justified) on the message center for 2 seconds and then enter User Menu, programming state #1

1.2.2. TOGGLING THROUGH USER MENU STATES

While in the User Menu, pressing the Enter button will advance the monitor forward to the next programming state.

While in the User Menu, pressing the CT Reverse button will advance the monitor backwards to the previous programming state.

All programmed values are “automatically” saved when Enter is pressed.

If Enter is not pressed after a value has been programmed while the monitor is in any User Menu state, the monitor will accept the displayed value and toggle to the next state after 30 seconds.

If Enter has not been pressed while the monitor is in User Menu program state #4, the monitor will return to Idle mode after 30 seconds.

Once the last User Menu programming state has been reached, advancing the monitor forward via the Enter button will exit the User Menu and the monitor will return to Idle mode.

1.2.3. PROGRAMMING STATE #1, PAUSE TIME

See section 6.1.1 for definition of Pause Time.

See section 4.9 for Default Pause Time.

The message center display will show “PAUSE = XX” with the readout center justified within the display.

Pressing the Level(⮝) or Mode(⮝) button will increment the Pause Time.

Pressing the Level(⮟) or Mode(⮟) button will decrement the Pause Time.

1.2.4. PROGRAMMING STATE #2, SLEEP TIME

This state programs the monitor for the amount of time it will stay in Idle mode before toggling to Sleep mode.

See section 4.9 for Default Sleep Time.

The message center display will show “SLEEP = XXX” with the readout center justified within the display.

Pressing the Level(⮝)or Mode(⮝) button will increment the Sleep Time.

Pressing the Level(⮟)or Mode(⮟) button will decrement the Sleep Time.

1.2.5. PROGRAMMING STATE #3, HOLD TIME

This state programs the monitor for the amount of time it will hold the current display before the system times out, accepts the user entry, and advances to the next step.

See section 4.9 for Default settings and range .

The display will show “HOLD = XX”. Where XX is the time per section 4.9 or as the user last entered.

Pressing the Level(⮝) button will increment the Button Time-out.

Pressing the Level(⮟) button will decrement the Button Time-out.

1.2.6. PROGRAMMING STATE #4, ENGLISH/METRIC CONVERSION

This state allows the user to choose between English or metric as the measurement system for the monitor.

See section 4.9 for Default setting.

The display will show “UNITS = ENG” if English.

The display will show “UNITS = MET” if Metric.

Pressing either the Level/Mode(⮝) or Level/Mode(⮟) buttons will toggle the monitor from English to Metric or Metric to English.

1.2.7. PROGRAMMING STATE #5, SOFTWARE VERSION

Programming State #5 will show the microprocessor software version number in the center numeric display as “X.XX”.

1.2.8. RETURNING TO DEFAULT VALUES

Pressing the Clear/Pause button for more than 2 seconds while the monitor is in User Menu programming states 1, 2 or 3 will return the displayed value to its respective default value.

1.3. MY WORKOUT

My Workout is a custom programmed profile that can be used by the user.

My Workout is used to store statistics for up to 4 different users.

My Workout is used to program workout profile configurations for up to 4 profiles. One profile per user.

My Workout is used to program the names for up to 4 different users.

1.3.1. USER STATISTICS

The My Workout Mode will store the statistics for accumulated Time, accumulated Calories and accumulated Distance for up to 4 users.

Display	Definition
HOURS=XXXX	Hours of accumulated workout time
MINUTES=XX	Minutes combined with hours is total accumulated workout time.
CALORIES=XXXXX	Accumulated Cal.
DISTANCE=XXXXX	Accumulated Dist.

1.3.2. PROGRAMMABLE PARAMETERS

Operating parameters can be programmed for up to 4 users.

Programmed parameter	Definition
Name	Name of the user, 16 characters, center justified
Profile	Workout Profile
Time	Time duration of workout
Weight	Weight of user
Age	Age of user

THR or Level	THR for Heart rate profiles, Resistance Level for other profiles.

1.3.3. NAME, PROGRAMMING

Up to 4 user names can be programmed.

User selects their name by pressing the My Workout button.

The default display before programming by the user is; MY WORKOUT 1 through MY WORKOUT 4.

User enters editing mode for name or workout by pressing and holding the My Workout key for 2 seconds after the user has selected the user. The message center then shows and scrolls the following message “PRESS ENTER TO EDIT NAME – PRESS MY WORKOUT TO EDIT WORKOUT”

If the user presses the Enter button to edit name then the message center will show the user their name or MY WORKOUT X with the first letter flashing.

The user uses the arrow keys to toggle through the alphanumeric characters for the letter that is flashing. Pressing a ⮝ button scrolls forward and pressing a ⮟ button scrolls backwards through the alphanumeric characters. Key rapid advance applies.

When the user has selected the character to be programmed, pressing the Enter key accepts the letter and toggles the display to the next letter.

The user can press the Pause/Clear button at any time while programming a name to erase the currently flashing letter and edit the previous letter.

Pressing the My Workout button at any time while programming a name will save the displayed name and the console will toggle to editing workout mode. The message center will show “NAME SAVED” center justified, for 3 seconds.

If the user presses the Pause/Clear button and holds it for 2 seconds while in the Name programming mode, then the user’s name will not be saved and the monitor will return to Idle mode.

The characters that can be programmed are the alphabet (capitalized), numerics from 0-9, a blank space and a dash.

The order of the characters is to be alphabet, numbers, space, dash. If the user scrolls through all characters and reaches the end of the character list, the character list will continue scrolling from the beginning.

If there are no key presses within 30 seconds, the monitor will exit programming mode and return to Idle mode. No name will be saved and the message center will display the previously saved name or the default display the next time this mode is entered.

1.3.4. WORKOUT, PROGRAMMING

If the user presses My Workout while the message center is displaying “PRESS ENTER TO EDIT NAME – PRESS MY WORKOUT TO EDIT WORKOUT” The message center will then display “PRESS ENTER TO EDIT WORKOUT – PRESS MY WORKOUT TO ACCESS STATISTICS”.

The message center will display “SELECT A WORKOUT”. The user will select a workout via the Workout Profile button or will toggle through the profiles using the arrow buttons. Pressing enter will accept the profile.

The user will be prompted for data just as if the user had selected a profile. (See section 6.1.6 and 4.14.2)

Upon acceptance of data by the last press of the Enter button the message center will display “WORKOUT SAVED” center justified, 3 seconds.

The monitor will then return to Idle Mode.

If there are no key presses within 30 seconds, the monitor will exit programming mode and return to Idle mode. No workout will be saved and the message center will display the previously saved workout or the default display the next time this mode is entered.

1.3.5. STATISTICS, DISPLAY

If the user presses the My Workout button when the message center is displaying “PRESS ENTER TO EDIT WORKOUT – PRESS MY WORKOUT TO ACCESS STATISTICS” the monitor will show the statistics for the user chosen.

The display will toggle to the first statistic to be displayed, which is to be hours of accumulated Time.

Pressing the My Workout button will advance the message center to the next statistics which is accumulated minutes. Minutes combined with hours is the total accumulated workout time.

Pressing the My Workout button will toggle the message center to the next statistics which is accumulated Calories.

Pressing the My Workout button will toggle the message center to the next statistic which is accumulated Distance.

Pressing the My workout button will exit the statistics display mode and return the monitor to Idle mode.

If the user presses and holds the Pause/Clear button for 2 seconds while and statistic is being displayed then the statistic being displayed will be cleared.

If there are no key presses within 30 seconds, the monitor will exit statistics display mode and return to Idle mode.