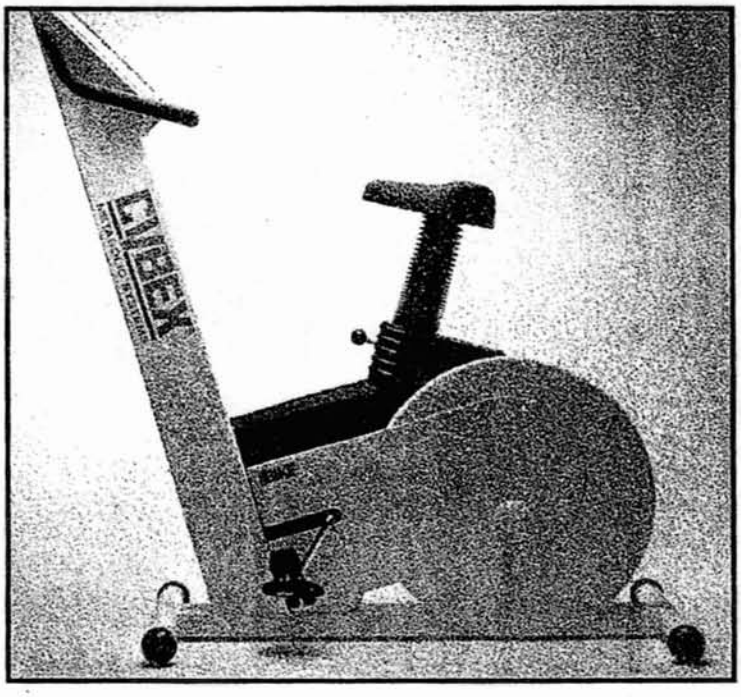
THE BIKE

SERVICE & PARTS MANUAL



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THE BIKE

SERVICE & PARTS MANUAL

The Repair Procedures covered in this manual apply to all units starting with the serial number:

3670H326017

The serial number is located within the enclosure on the front of the seat post frame.

Disclaimer:

CYBEX makes no representations or warranties regarding the contents of this manual. We reserve the right to revise this document at any time to make changes to the product described within it without notice or obligation to notify any person of such revisions or changes.(a12)

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SECTION
1

INSTALLATION

SPECIFICATIONS AND REQUIREMENTS

Physical:

Overall Dimensions:
22.5" wide x 55" long x 62.75" high

Ceiling Height Minimum Requirement:
7' (2.1m)

Note: *Extremely tall individuals may require a higher ceiling.*

Recommended Minimum Installation Area:
3' (0.9m) wide x 5' (1.5m) long

The BIKE's Display Module is equiped with a POLAR™ Heart Rate Monitor receiver. To reduce the possibility of signal interference between heart rate monitor users, no other transmitters should be within a four foot radius of the Display Module.

Maximum Weight of The BIKE and Rider:
530 pounds (241 kg)

Static Floor Loading:
79 lbs./ sq. ft. (3780 Pa)

Electrical:

Input Voltage:
90 to 264 Volts AC

Input Frequency:
50/60 Hertz

Power Requirement:
65 Watts, maximum

Power Entry Fuse:
250 VAC, 1 Amp, TYPE 2AG

Input Circuit Current Requirement:
15 Amp line, minimum

Number of Daisy–Chained Units per 15 Amp Line:
5, maximum

INSTALLATION

Installation Area Requirements

Before unpacking and installing **The BIKE**, its location should be determined. The selected site should meet the following requirements;

- The mounting surface should be level, dry, even and clean.
- If carpeting is used, a high density type is recommended.
- The installation area should be free of dust.
- The unit should not be operated in high–vibration environments.
- All cabling must be routed out of traffic areas and passageways.
- Do not allow foreign objects or liquids to enter the internal portion of the equipment.
- The area should be well lit while the equipment is in use.

When a satisfactory location has been decided upon, **The BIKE** can be unpacked and installed. Remove the pendulum restraint strap located along the left side of **The BIKE**. Grasp the pendulum restraint strap and pull downward.

CAUTION: *The pendulum restraint strap **must** be removed before operating* **The BIKE.**

Position the cycle in the desired location. Rotate the right front (eccentric) caster so that The BIKE is stable.

Make certain that the ON/OFF switch, situated on the Power Module which is located at the right front of the unit frame, is in the **0** (off) position. Connect the AC power cord to the appropriate connector of the Power Module (see Figure 1.1).

INSTALLATION

IMPORTANT SAFETY INSTRUCTIONS

When using **The BIKE**, basic precautions should always be followed, including:

Read the entire Owner's Manual before using **The BIKE.**

DANGER: *To reduce the risk of electric shock:*

- Always unplug **The BIKE** from the electrical outlet before cleaning.

WARNING: *To reduce the risk of burns, fire, electric shock or injury:*

- Use the **The BIKE** as described in the Owner's Manual. Do not use attachments not recommended by CYBEX.
- Never operate this unit if it has a damaged power cord or plug, if it is not operating properly, or if a liquid has entered it.
- Keep the power cord out of traffic areas and away from heated surfaces.
- Never operate this unit with the air vents blocked. Keep the air vents free of lint, hair and the like. Do not drape towels over the Display Module.
- Never drop or insert any object into any opening.
- Do not use outdoors.
- To disconnect, set the ON/OFF switch to the **0** (off) position, then remove the plug from the outlet.
- Obtain medical clearance before beginning any exercise program, and never over–exert.

INITIAL POWER–UP

After properly installing and grounding **The BIKE**, it is ready to be turned on.

CAUTION: *Ensure that the pendulum restraint strap has been removed.* ***DO NOT*** *pedal* ***The BIKE*** *during the Power–Up procedure. Wait until the CYBEX logo appears in the LED Display before pedaling.*

To power the unit, turn the ON/OFF switch which is located on the Power Module to its **1** (on) position. Three events occur:

1. A system diagnostic is performed to verify that all devices are functioning properly.

   If the diagnostics are unsuccessful, a big "X" appears in the LED Display and an error code appears in the Message / Data Display. *Refer to Section 4: System Checkout.*

2. A torque baseline calibration procedure is executed at the conclusion of a successful diagnostic check.

   If the diagnostic test is unsuccessful, the torque baseline procedure is ***not*** initiated. *Refer to Section 4: System Checkout.*

3. The *Initial State* is entered.

Initial State

While in its Initial State, **The BIKE** is sitting idle waiting for the user to select an exercise mode. The Initial State is characterized by the CYBEX logo scrolling on the LED Display and the message "SELECT MANUAL, PROFILE OR RACE" in the Message / Data Display.

SECTION
2

PREVENTIVE MAINTENANCE

INTRODUCTION

The BIKE has been designed to require an absolute minimum of periodic maintenance. Common **non–abrasive** household cleansers can be used to clean external parts. All of the bearings are sealed and lubricated for life. There are no user adjustments required.

All BIKEs are calibrated at the factory so field calibration should not be required under most circumstances. The calibration procedure should only be needed when the BIKE's accuracy must be verified. Refer to *Section 4: System Checkout* for the calibration procedure.

MAINTENANCE PROCEDURES

DAILY MAINTENANCE

The following cleansers applied to a clean, soft cloth may be used for cleaning.

- isopropyl alcohol
- glass cleaner
- general purpose liquid cleanser
- ammonia*

* *Diluted according to manufacturer's recommendations.*

Do Not Use the following cleansers for cleaning the display module or any plastic parts.

- abrasive cleanser
- mild abrasive cleanser
- ethyl alcohol
- methyl alcohol
- acetone

The BIKE's exterior should be cleaned once a day to preserve its appearance. Wipe down the frame using a soft cloth dampened with an approved cleanser. The plastic enclosure, hand grips and seat can be cleaned in the same manner. Stains and scuff marks may be removed with a more aggressive cleanser. Stubborn scuff marks may require a mild abrasive. Under no circumstances should a solvent be used on any plastic parts. Permanent damage to the plastic will result.

Cleaning the Display Module

Apply an approved cleanser to a soft cloth and wipe the surface clean. Do not spray cleaner directly onto Display Module.

Note: *Avoid spraying liquids into vent openings.*

CAUTION: *DO NOT use any abrasive or mild–abrasive cleansers on the Display Module.*

EVERY THREE MONTHS

1. Remove the left side enclosure as described in *Section 5: Repair Procedure,* **Enclosure Removal**.

2. Inspect the chain for a "dry" condition, little or no lubricant present.

   a. If chain is dry, lubricate the chain using a light household oil, such as **3 in 1**. Apply oil sparingly since any excess will get dispersed about the interior.

3. Check the surface of the flywheel on which the resistance belt rides. If there is an accumulation of dirt or deposits, they can be removed as follows:

   b. Turn power off (**0**) then on (**1**). This will relieve the tension on the belt. When the motor stops running, turn power off (**0**).

   c. Slide the resistance belt off the flywheel.

CAUTION: *Do not bend, crease or twist the belt.*

   d. Carefully apply 240 grit or finer sandpaper to the flywheel circumference while slowly turning the left pedal.

PREVENTIVE MAINTENANCE

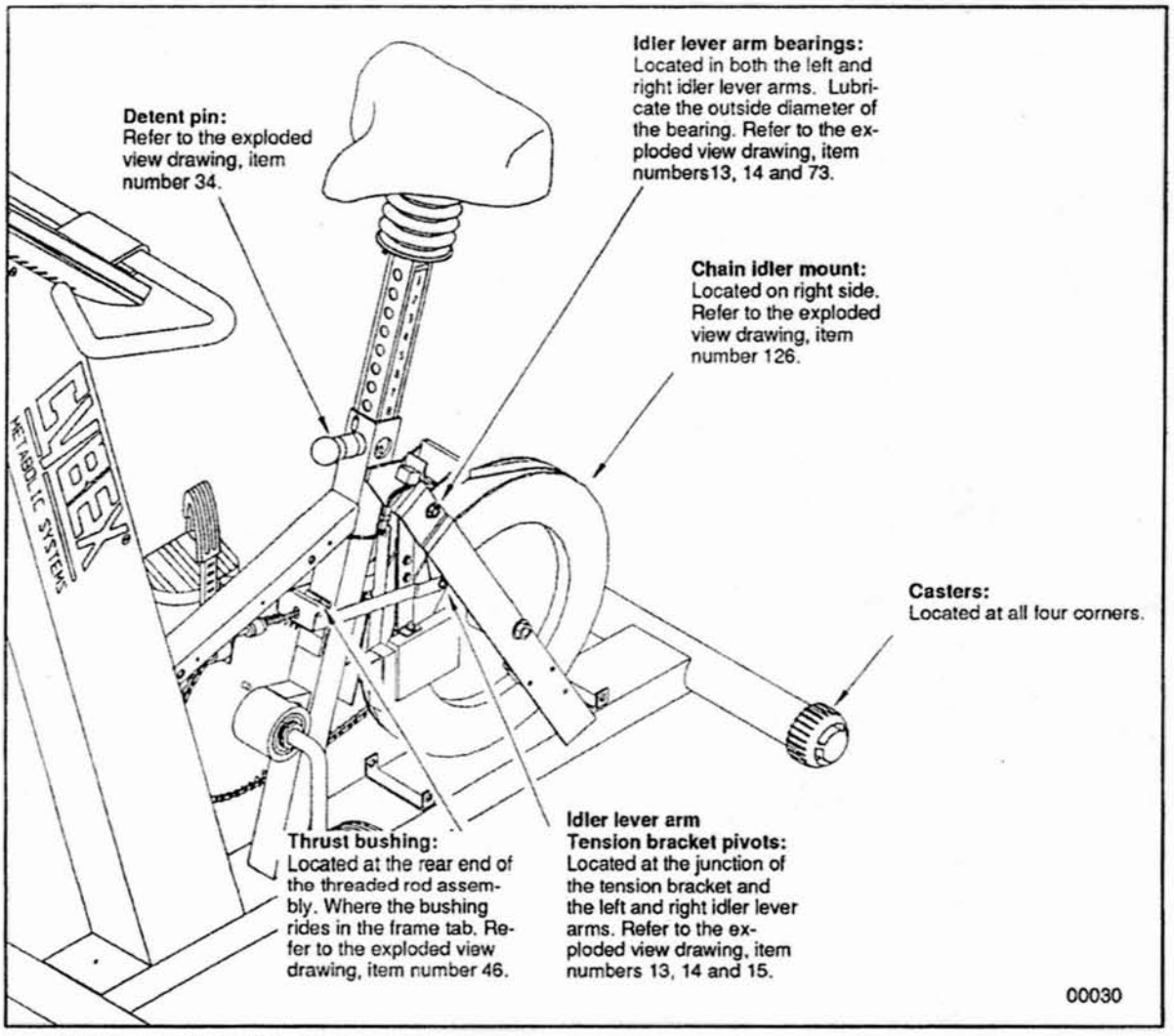


Figure 2.1 Lubrication Points.

LUBRICATING REPLACEMENT PARTS

The following parts must be lubricated when installing replacements, but do not generally require regular lubrication (refer to figure 2.1). Lubricate only under conditions described previously under **Periodic Lubrication.**

- Chain idler mount (use multi–purpose Lithium grease)
- Thrust bushing (use multi–purpose Lithium grease)
- Casters (use Teflon grease)
- Idler lever arm bearing outside diameter (use multi–purpose Lithium grease)
- Idler lever arm tension bracket pivots (use multi–purpose Lithium grease)
- Detent pin (use Teflon grease)

SECTION
3

SYSTEM OVERVIEW

OPERATIONAL ASSEMBLIES

The BIKE's basic operational assemblies include the crank, flywheel, resistance belt, belt tensioning mechanism, pendulum, power supply and Display Module, as shown in Figure 3.1. When The BIKE is pedaled, the crank turns the cast–iron flywheel, via a chain drive. A fabric belt is wrapped around the flywheel and when tensioned, provides braking action on the flywheel. This in turn, produces resistance to the pedaling operation, or torque. A D.C. Gearmotor, controlled by the Display Module, adjusts the tensioning mechanism by moving the position of a cam which presses on the belt. This action determines the amount of resistance or torque at the pedals.

For ease in diagnostics and repair, The BIKE's basic operational assemblies are grouped by function into subsystems: they include, drive train (flywheel, freewheel and crank), speed sensing (Hall effect board and magnets), speed control (belt tensioning mechanism and D.C. Gearmotor), torque (Pendulum and optical encoder), the Display Module, and the electrical subsystem (power supply, cable harness and power entry module).

For subsystem diagnostics, refer to *Section 4: System Checkout.*

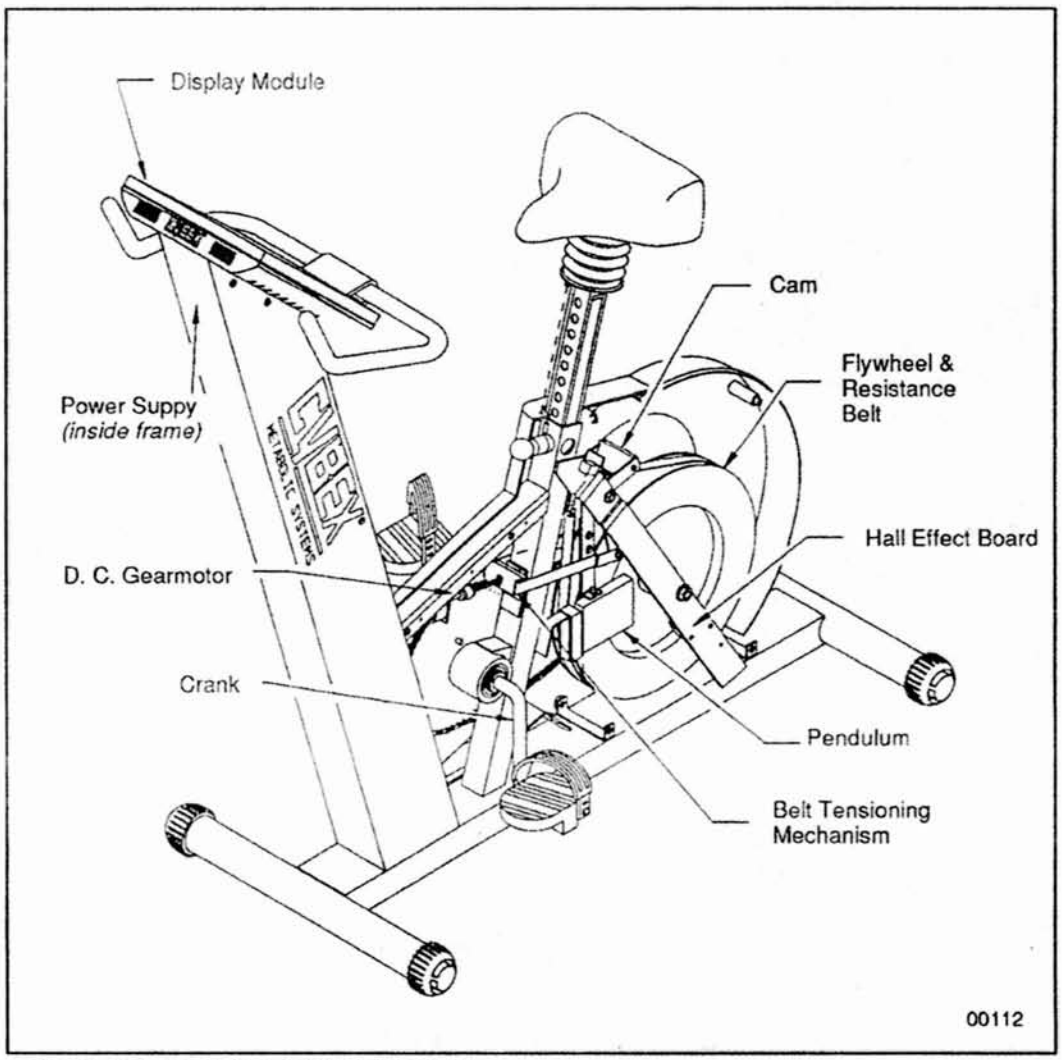


Figure 3.1. Basic Operational Assemblies.

the LED display with a level 8 work load. Each LED represents 25 Watts. At level 8, the maximum workload will be 225 Watts (nine LEDs in height) and the minimum will be 50 Watts (two LEDs in height).

After all profile mode parameters are entered, the chosen profile, with proper effort level scaling, is shown on the LED display. During the exercise session, the system adjusts the resistance from stage to stage, based on the profile and its effort level. The setting of the resistance starts when the rider begins pedaling above 30 RPM. The current stage in the profile is indicated by that column of LEDs blinking.

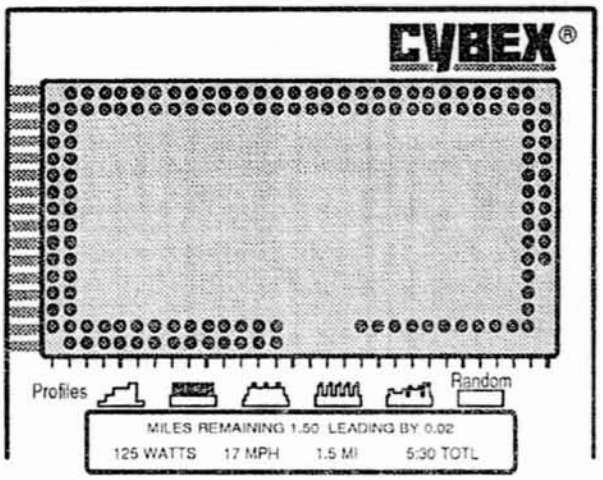


Figure 3.4 Typical Race Mode Display

Race Mode

The Race mode is an exercise session where the rider races against a pacer. The distance of the competition and the pacer speed are selected by the rider. The system will maintain a constant resistance (unlike Manual or Profile mode) and display the racers' positions throughout the entire session.

The race starts after all the parameters are entered and the rider presses the START key. The Vacuum Fluorescent Display (VFD) shows the remaining distance for both the rider and the pacer along with the distance that the rider leads or trails the pacer (in units of hundredths of a mile/km).

The LED display forms two concentric laps. The outside lap represents the rider and the inside lap represents the pacer. Each lap is 1/10 of a mile or 1/10 kilometer, with the start/finish line located at the bottom center of the LED window. Immediately upon selection of the Race mode, one LED in each lane will appear at the start line. As the race begins, these LEDs travel through the laps, reflecting the contestants' current positions, based upon their individual distances traveled.

The rider's speed will depend on the gear selected (as a constant resistance setting) and the pedaling speed. The gear level determines the torque setting maintained by the resistance belt. The pacer's speed is preselected by the rider.

Submax Test

The Submax Aerobic Test is a measure of the rider's response to sub–maximal work. It receives heart rate information at various work rates and then predicts the rider's maximum ability to consume oxygen (max VO_2) as well as maximum work capacity, maximum MET level and maximum calories per hour.

The software in the Submax Test provides the appropriate work load (at constant power), based upon the rider's heart rate response to the exercise and then establishes the relationship between work load and heart rate.

The rider's heart rate is measured externally and entered via the keypad.

Anaerobic Test

The Anaerobic Test is a measure of the rider's peak power and endurance. This test has the rider exercise at a constant resistance for 30 seconds. The BIKE records the rider's total power production at every five second interval as well as the total power production for the full 30 second period.

Upon entering the Anaerobic Test, the rider's body weight is entered via the keypad. This body weight determines the resistance setting (in constant resistance mode) that will be used during the exercise.

SPEED CONTROL SUBSYSTEM

The *Tension Bracket Assembly* is adjusted by a *D.C. Gearmotor* coupled to a threaded control rod by a flexible coupling. The coupling compensates for any misalignments between the motor shaft and control rod. When the motor turns, it rotates the threaded control rod. A translating plastic nut, called the rod pivot, travels up and down the control rod, depending on the direction of motor rotation. Tension arms attached to the rod pivot are connected to the ends of the cam idler arms. This action pushes or pulls on the idler arms to pivot the cam and adjust belt tension.

On initial startup, the motor drives the tension bracket assembly down toward the minimum belt tension position. At the end of travel, the rod pivot encounters a compression spring. As the rod pivot continues driving, the spring compresses to a point where the motor stalls. The Display Module detects this condition through a rise in motor current. A preset current threshold is reached and the motor shuts off and then reverses, driving the control rod in the other direction. It continues to run in this up direction for a short period of time and then shuts down. The tensioning mechanism and the belt tension are now at a low resistance position: the starting position.

When The BIKE is pedaled in its Initial State (with the CYBEX logo display), it increases belt tension until a small amount of torque is measured. This is referred to as the minimum resistance position. All subsequent tension positions are based on this reference location.

Belt Tensioning Mechanism

The purpose of the belt tensioning mechanism is to tighten the friction belt around the flywheel in order to develop braking torque or resistance. The tighter the belt wraps around the flywheel, the more torque is produced. This belt tensioning is produced by a mechanical linkage and an eccentric cam idler. During operation the tension bracket assembly is pushed or pulled causing the cam to pivot into the belt, increasing or decreasing tension on the belt, as shown in Figure 3.5. The D.C. Gearmotor moves the tension bracket via a threaded rod.

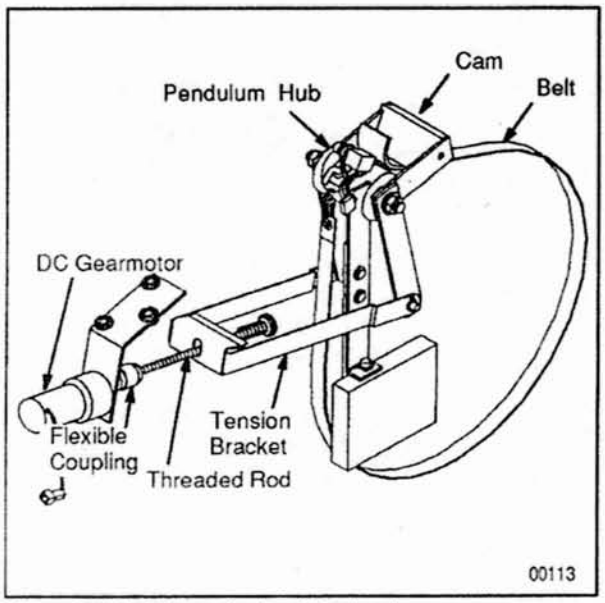


Figure 3.5 Belt Tensioning Mechanism.

D.C. Gearmotor

The rotary motion needed to spin the control rod is provided by a permanent magnet D.C. Gearmotor. The 12V Gearmotor receives its power from the CPU Board in the Display Module. The CPU Board sends power pulses of varying lengths, depending on the amount of resistance change required. The direction of rotation and the length of the power pulses are determined by the CPU Board after assessing the pendulum angle, the speed of the flywheel, and the mode of operation. Gearmotor direction is reversed by changing the polarity of the motor supply voltage.

The Gearmotor connects to the frame via a bracket isolated by rubber shock mounts. These shock mounts, along with the flexible coupling, keep motor vibration and noise to a minimum.

Termination

22 AWG stranded insulated wire.

Red wire to pin 1, Black wire to pin 2

Red wire positive, Black wire negative = Clockwise rotation facing shaft end.

LED Display Board

The 16 x 30 LED array on the Display Board is a major part of the Display Module. The Display Board is passive and is completely controlled by the CPU Board. The 40–pin connector, J1, sends all power (+5V) and control signals to the Display Board.

Keypad and Overlay

The entire front of the Display Module is covered by a coated graphics overlay assembly. This overlay contains filters for the LED and VFD display areas. In addition, the keypad assembly is integrated into this overlay. User input to the Display Module is via this keypad.

The keypad is a flat, non–tactile membrane switch assembly. The graphics layer on the overlay indicates the active key areas. Approximately 12 ounces of force are needed to activate a key. The CPU Board's audio transducer is used to indicate when a keystroke has been detected, since there is no tactile feedback (motion under an active key area is only a few thousandths of an inch).

The keypad assembly also contains a separate ESD shield layer. This electrically conductive layer is used to ground any high–voltage electrostatic discharge (ESD) pulses, produced when a statically charged person hits the keypad. This prevents most of the high–voltage discharge from reaching the CPU board.

The outer layer of the overlay contains a hardcoat finish to protect it against minor scratching and cleaning chemicals. Only use cleaning agents recommended by CYBEX to clean the overlay and do not use anything abrasive to wipe it (see *Section 2: Preventative Maintenance* for cleaning instructions).

Speaker

The CPU Board contains a piezoelectric audio transducer which produces tones. This low–power device is used primarily to produce a short tone each time a valid keypad input is received, giving the user feedback.

ELECTRICAL SUB–SYSTEM

Power Supply

The BIKE utilizes an industry standard 40 Watt, universal input, triple output switching power supply. This automatically operates over a universal range of input AC line power and produces the DC voltages required by The BIKE. No jumpers or switches are needed to select input line voltage.

The power supply is UL, CSA, and VDE approved for compliance with safety and electromagnetic emission standards.

Specifications

Type:	40 Watt universal input, triple output, open frame switching power supply.
Input:	
AC Voltage:	90–264 VAC
Frequency:	47–63 Hz
EMI:	Meets or Exceeds FCC CLASS B
Leakage Current:	600 µa @ 132 VAC Maximum
Input Fuse:	2 AMP, 250 Volt

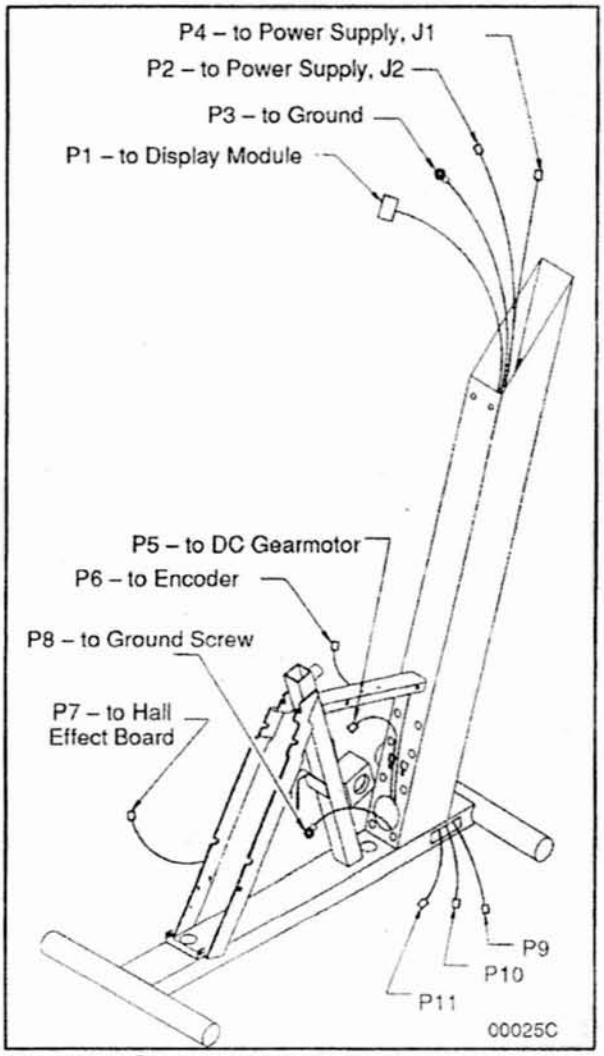


Figure 3.6 Cable Harness Replacement.

Cable Harness Description

The BIKE uses a single cable harness to interconnect all of its electrical components. This harness, consisting of 18 individual, insulated wires, connects 11 different connectors.

Most of the cable harness wires terminate at the connector for the Display Module (P1), the heart of The BIKE's electronics.

The cable harness for The BIKE connects the Optical Encoder, Hall Effect Board, DC Gearmotor and Power Supply outputs to the Display Module. It also connects the Power Entry Module to the Power Supply input. The harness is one piece consisting of 300V insulated wire attached to eleven connectors. The main connector, (P1), terminating at the Display Module, is a 25 pin D connector. It incorporates thumb screws to easily attach or remove the connector from the Display Module without using tools. The other connectors either have high insertion force or locking ramps to insure tight connections.

See Figure 3.6 and refer to the chart on the next page.

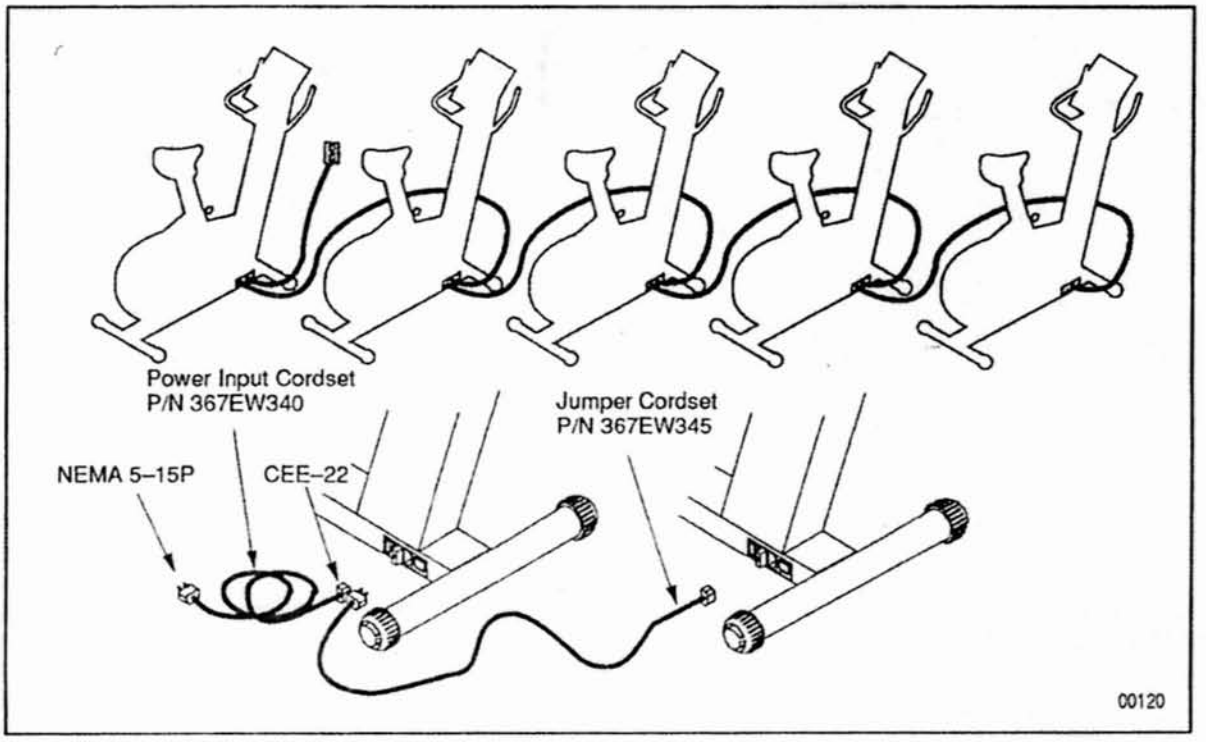


Figure 3.7 Power Distribution.

INTERNATIONAL CONSIDERATIONS

From its inception, The BIKE was designed to be an international product. That is why the only differences between U.S. domestic and international versions of The BIKE are the languages used. Great pains were taken by CYBEX to ensure international compatibility, as in the power supply selection.

The BIKE's power input cord was chosen with forethought for international use. As a result, a universally standard female input, used commonly for computers, computer printers and peripherals, was selected. The male adapter supplied is standard for U.S. power sockets. However, other male adapter styles should be readily available in the country of interest.

Power

The power supply used on The BIKE is an industry standard 40 Watt, triple output, universal input, switching power supply. The 90/264 VAC, 47/63 Hz universal input eliminates the need for an external 115/220 VAC switch. Refer to the **Power Supply** subtopic for a complete specification and description of the power supply unit.

Electrical Wiring Considerations

The BIKE uses the following conventions for internal AC wiring:

AC HOT	Black wire.
AC NEUTRAL	White wire.
CHASSIS GROUND	Green/Yellow stripe wire.

Both the HOT and NEUTRAL lines are switched by the Power Entry Module.

SYSTEM OVERVIEW

SOFTWARE CONSIDERATIONS

There are a total of eight different language versions (seven languages) of the Display Module. The only physical difference is the EPROM (software versions) and the Keypad/Overlay (with legends unique to each language).

The software program in all versions is logically identically. The only difference in each program is the language of the user prompts and the default system of measurement.

Note: *The Field Service Diagnostics appear in English for all versions of the program.*

LANGUAGE	DISPLAY MODULE PART NUMBER	COLOR	DEFAULT MEASUREMENT SYSTEM
English / Non Metric	3670S699	White	English System
	3670S699–1	Black	
English / Metric	3670S699–E/M	White	Metric System
	3670S699–1E/M	Black	
French	3670S699–F	White	Metric System
	3670S699–1F	Black	
German	3670S699–D	White	Metric System
	3670S699–1D	Black	
Italian	3670S699–I	White	Metric System
	3670S699–1I	Black	
Japanese (Katakana)	3670S699–J	White	Metric System
	3670S699–1J	Black	
Spanish	3670S699–E	White	Metric System
	3670S699–1E	Black	
Swedish	3670S699–S	White	Metric System
	3670S699–1S	Black	

SECTION
4

SYSTEM CHECKOUT

POWER UP DIAGNOSTICS

The Power Up tests for the The BIKE's CPU Board are broken into two parts. A failure in the first part, the *Module Check*, indicates that the CPU Board has a fault and the Display Module should be changed. A failure in the second part, the *Peripherals Check*, means that there can be a problem with the CPU Board, the system cable harness, an internal Display Module connection or one of the peripherals. In this case, the **Field Service Diagnostics** should be run to isolate the problem.

When The BIKE is first turned on, the Power Up tests are run. These tests return their results to the main executive program as an Error Word. This Error Word value is originally set to all 1 's (hexadecimal value = FF). As each test runs successfully, the corresponding bit is turned off in the Error Word (set to 0). If all Power Up tests run successfully, the Error Word becomes zero. If not, the main executive program sees a non–zero value in the Error Word and a large **X** appears on the LED display while the Error Word value is written to the VFD. The Error Word is displayed as a hexadecimal value (1 – FF). To clear the error condition and resume BIKE operation for troubleshooting, press the **Stop** key.

Module Check Tests

A failure in any of the following tests indicates a faulty CPU Board and requires replacing the Display Module:

RAM Test – Bit 0
(Error Word Value = 01)

The 32K SRAM is tested with a simplified walking 1 's and 0's pattern. This bit pattern is written to the RAM and then read back. If the wrong value is read back, an error is generated. This is the first code executed upon power up.

ROM Test – Bit 7
(Error Word Value=80)

The 64K program EPROM is tested by calculating its basic checksum. If this error is reported (Error Word = 80), replace the Display Module.

Timer Tests – Bit 1, 2, 3
(Error Word Value = 2, 4, 8)

There are three internal timers which are set up to count down and generate interrupts at specified time intervals. These provide all timing operations for the CPU Board.

For this test, the three counters are initialized and start counting down. As each timer counts down to zero, it causes an interrupt and the appropriate bit is turned off in the error word, indicating correct operation. These bits are:

Bit 1 = Timer 0 Test (Error Word Value = 02)

Bit 2 = Timer 1 Test (Error Word Value = 04)

Bit 3 = Timer 2 Test (Error Word Value = 08)

Peripherals Check Tests

A failure in any of the following tests indicates a fault in either the CPU Board, internal Display Module cable connections, the peripheral itself or the system cable harness:

Motor Stall Test – Bit 4
(Error Word Value = 10)

For this test, the motor is turned off and the MOTOR STALL bit is read back. It should be high indicating the motor is not in the stalled condition. If this bit is low, an error is indicated. This error would normally be caused by a faulty CPU Board.

Keyboard Interface Test – Bit 5
(Error Word Value = 20)

For this test, the CPU checks the READ KEYPAD port for data. There should be no keystroke pending. If there is keypad data, it is an error. This can indicate either a faulty CPU Board, a faulty keypad or a faulty keypad ribbon connector.

SYSTEM CHECKOUT

DIAGNOSIS AND REPAIR

All repair procedures mentioned in the chart below can be found in *Section 5: Repair Procedures* unless otherwise noted.

PROBLEM	POSSIBLE CAUSE	REPAIR PROCEDURE
There is a rough feel while pedaling.	Pedal bearings are binding.	If the feel is rough on only one pedal, perform **Pedal Replacement.**
	Chain is "dry."	Refer to *Section 2: Preventive Maintenance.*
	Chain idler or crank bearings are binding.	If the feel is rough in both forward and backward pedaling, inspect the chain idler and crank bearings. Replace as needed.
	Flywheel bearings are binding.	If the feel is rough in only forward pedaling, perform **Flywheel Bearing and Spacer Replacement.** Repair or replace as needed.
The pedals jump on each down stroke. ***Note** : See also "There is a rough feel while pedaling." above.*	The idler bushing is sticking.	Lubricate or replace as necessary.
	The chain is loose.	Inspect the chain idler for a faulty tension spring. Replace tension spring if necessary.
	Tooth may be bent on drive sprocket.	Inspect sprocket for bent tooth. Perform **Crank/Sprocket Replacement** as required.
There is no resistance.	The belt may have slipped off of the flywheel.	Slide belt back into flywheel groove.
	The belt is broken.	Inspect the friction belt. Perform **Friction Belt Replacement** as required.
	The tension pivot rod is stripped.	If the motor turns freely but the mechanism does not move, perform **Rod Pivot, Spring, Threaded Rod and Thrust Bushing Replacement.** Repair or replace as needed.
	The belt tensioning mechanism is binding.	Loosen the flex coupling at the motor. Turn the threaded rod, if the rod will not turn; perform **Rod Pivot, Spring, Threaded Rod and Thrust Bushing Replacement.** If the threaded rod itself is free but the rest of the mechanism binds, perform **Pendulum Hub Bearing and Idler Lever Arm Bushing Replacement.** Repair or replace as needed.
	The motor, Hall Effect Sensor board or Display Module have failed.	Perform the Field Service Diagnostics in this section. If the motor does not move during the test, check for the presence of + and –12V at the motor connector while using the diagnostics test. If voltage is present perform **D.C. Motor Replacement.** Otherwise replace the Hall effect Sensor board or Display Module as required.

SYSTEM CHECKOUT

PROBLEM	POSSIBLE CAUSE	REPAIR PROCEDURE
The displays (LED and vacuum fluorescent) are not operating properly.	Either the Display Module or individual elements have failed.	Perform Field Service Diagnostics to verify an LED or VF failure. Replace the Display Module if necessary. Perform **Display Module Replacement.**
The unit does not respond to keypad commands.	Either the Display Module or keypad have failed.	Perform Field Service Diagnostics if possible to verify which key is failing. Verify that Display Module is Rev. C or better. Replace the Display Module if necessary. Perform **Display Module Replacement.**
The display does not register the correct RPM.	A Hall Effect Magnet has fallen off.	Inspect the flywheel for the presence of two magnets. Perform **Hall Effect Magnet Replacement.**
	A Hall Effect Sensor board is faulty.	Perform the Field Service Diagnostics in this section. If, while rotating, the display does not toggle between 1 and 0 as each magnet passes by the sensor board, perform **Hall Effect Sensor Replacement.** If the display toggles between 1 and 0 for only one of the magnets, replace the faulty magnet. Perform **Hall Effect Magnet Replacement.**
	The System Cable Harness has failed.	Check System Cable Harness for loose connections, shorts to the frame and continuity between the Hall Effect board connector and the Display Module.
	The Display Module has failed.	Replace the display Module. Perform **Display Module Replacement.**
Testing does not start.	A Hall Effect Sensor board is faulty.	Perform the Field Service Diagnostics in this section. If, while rotating, the display does not toggle between 1 and 0 as each magnet passes by the sensor board, perform **Hall Effect Sensor Replacement.** If the display toggles between 1 and 0 for only one of the magnets, replace the faulty magnet. Perform **Hall Effect Magnet Replacement.**
Heart rate monitor receiver has been determined to be source of heart rate monitoring problems. (Refer to The BIKE/The SEMI Owner's Manual for troubleshooting the heart rate monitor transmitter.)	The connection between the heart rate monitor receiver and the Display Module CPU board has come loose.	Perform **Display Module Replacement,** check receiver connection, reinstall Display Module.
	Receiver is inoperable.	Perform **Display Module Replacement.**

SYSTEM CHECKOUT

Checking the Belt Tensioning Mechanism

The tension bracket assembly's action should be a smooth, continuous motion throughout its range of travel. If it is not, check that the D.C. Gearmotor is working properly (see D.C. Gearmotor below). Check that the control rod is freely rotating without binding. Check for proper adjustment of the flexible coupling by grasping the rod and gently pushing fore and aft (parallel to the control rod). No play should exist in this area. Check for adequate lubrication on the thrust bearing and washers. If binding or roughness is detected, inspect the threads in the rod pivot. Replace the rod pivot if motion is not smooth and continuous while rotating slowly by hand.

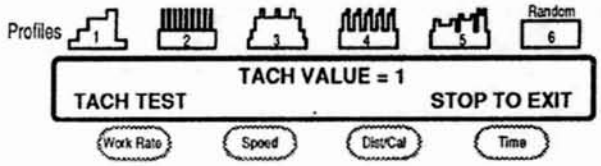
The bracket arms should not contact any other parts. Eliminate any interference with adjacent parts by gently bending the appropriate part. Axial play between the tension bracket weldment and the rod pivot can be checked by grasping the bracket and gently pushing fore and aft (parallel to the control rod). The relative motion between the bracket and the rod pivot should not exceed 3/32". If it does, replace the tension bracket weldment.

Checking the D.C. Gearmotor

The motor should run smoothly while cycling up and down. If binding or roughness occurs, disconnect the flexible coupling from the Gearmotor output shaft. Run the **Motor Test** again while squeezing the motor shaft between your fingers. The motor should run freely and not stall easily. Check that the motor runs in both directions. If it does not run at all, or in one direction only, unplug the motor leads and attach a DVM with the negative lead at pin 2. Run the **Motor Test.** A reading of +12 volts (CW) or –12 volts (CCW) should be obtained. If voltage readings are correct, replace the motor. If voltage readings are not correct, check the Display Module and the System Cable Harness.

Tach Test

The tach test verification operation shows the function of the Hall Effect Board and the magnets on the flywheel. When the tach test is selected, the VFD shows the following:

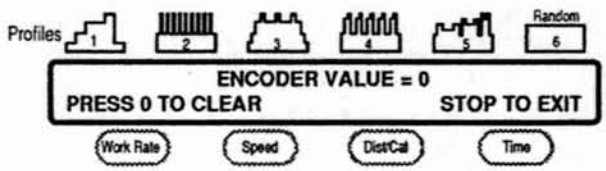


During the test, rotating the flywheel slowly causes the TACH VALUE to toggle between 1 (no magnet near the Hall Effect Board) and 0 (magnet close to the Hall Effect Board) as each of the two magnets on the flywheel passes the Hall Effect Board. No change in the TACH VALUE while the flywheel is rotating indicates a faulty Hall Effect Board, faulty or missing magnets or poor alignment of the board and magnets. Should the TACH VALUE fail to change as one of the two magnets passes by the Hall Effect Board, the magnet may be faulty or missing.

Note: *The TACH VALUE automatically reverts from 0 back to 1, even if a magnet remains close to the Hall Effect Board.*

Encoder Test

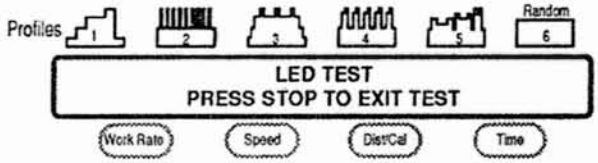
The encoder test verifies the encoder operation by displaying a value corresponding to the pendulum angle. This test is also used to check the pendulum's operation. When the encoder test is selected, the VFD is similar to the following:



SYSTEM CHECKOUT

LED Test

The LED test is used to check the function of the LED display. When the LED test is selected, the VFD shows the following:

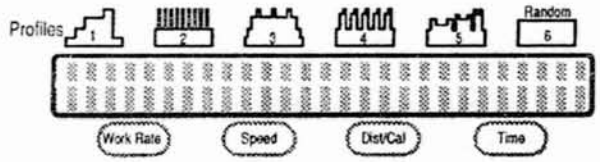


Each column of LEDs light and stay on, one at a time, from left to right, until the entire screen is lit. Then each column turns off, one at a time, until the display is blank. The process is repeated until **Stop** is pressed to exit the test.

If one or more column of LEDs does not respond, replace the Display Module. Refer to **Display Module Replacement** in *Section 5: Repair Procedures.*

VF (Vacuum Fluorescent) Display Test

The VF test is used to check the function of the vacuum fluorescent display VFD. When the VF test is selected, the VFD resembles the following:

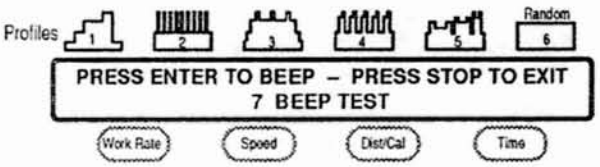


During the test, every pixel of each of the two rows of 40 display elements is lit. They remain lit until **Stop** is pressed to exit the test.

If one or more pixel does not respond, replace the Display Module. Refer to **Display Module Replacement** in *Section 5: Repair Procedures.*

Beep Test

The beep test is used to check the function of the sound module. When the beep test is selected, the VFD shows the following:



During the test, press **Enter** to generate a beep tone. Press **Stop** to exit the test.

If no "beep" is heard, replace the Display Module. Refer to **Display Module Replacement** in *Section 5: Repair Procedures.*

8. If the unit requires calibration, loosen the two adjustment lock–screws on the pendulum support. See figure 4.3. If the LED Display shows lit LEDs above the horizontal line (see Figure 4.2), turn the Allen screw in the pendulum weight counterclockwise (lowering the weight) until the display shows **SET**. If the LED Display shows lit LEDs below the horizontal line, turn the Allen screw in the pendulum weight clockwise (raising the weight) until the display shows **SET**.

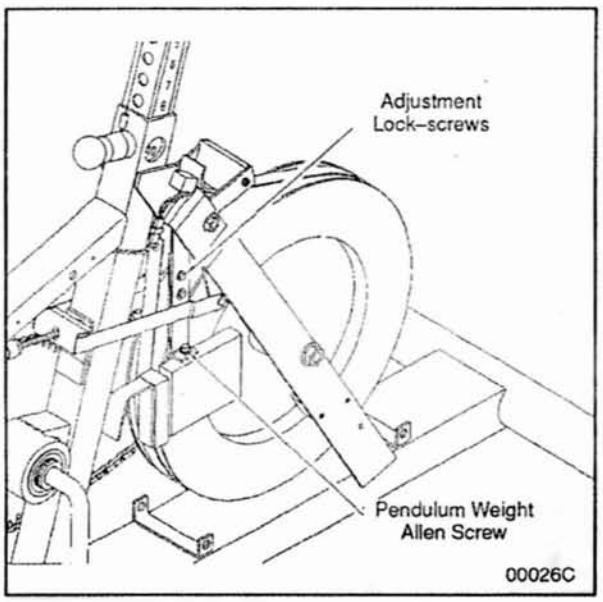


Figure 4.3 Pendulum Adjustment Screws.

Note: *There should be no tension on the pendulum hub during the calibration procedure. If weight is applied and the unit is not "SET," the most probable cause is tension on the pendulum hub. Check that the friction belt is not caught on any part of the frame. Check the encoder belt for excessive tension. Check that the hub bearings are not binding.*

9. Tighten the two adjustment lock–screws on the pendulum support. Ensure that the display still shows **SET**.

10. Remove the 2 kg calibration weight from the spring.

11. Reattach the belt: route the belt around the flywheel, but off to the side and under the eccentric cam. Hook the free end of the belt to the spring. Slide the belt onto the flywheel and into the groove.

12. Press [STOP] followed by (9) and [ENTER] to end the calibration procedure and exit the Field Service Diagnostic Program.

13. Reinstall the enclosure; refer to the **Enclosure Installation** procedure in *Section 5: Repair Procedures.*

SYSTEM CHECKOUT

DISPLAY MODULE TEST POINTS

If a problem with the Display Module is suspected, several test points are provided on the CPU Board to aid in troubleshooting. To access these test points, remove the Display Module from the tube, **but do not disconnect the 25–pin D connector from the cable harness.**

Supporting the Display Module face–down on the handlebars, part of the CPU Board is accessible through the opening for the mounting bracket. Several test points are available with silk–screened legends, as shown in Figure 4.4.

These test points are as follows:

Legend	Location	Description
5V	C34	+5V power supply
12V	C39	+12V power supply
GND	C34	Ground
TACH	R20	Tachometer pulses from Hall Effect Board
CURSENS	R12	Motor current sense voltage (1.0 Volt/Amp)

Notes: *The +12V supply can rise to over 13 Volts when the motor is not on.*

The tachometer pulses at R20 are unlatched, directly from the Hall Effect Board. This point should normally be a logic high unless a flywheel magnet is near the Hall Effect sensor.

The motor current sense produces a voltage equivalent to 1.0 volt/amp. When the motor is under slight loading (at low, decreasing belt resistance), the current can be under 100 mA (0.1V). When the motor stalls, the current can be 2.0 amps (2.0V) or higher.

CHECKING THE POWER SUPPLY

Before testing the power supply, check the Power Entry Module fuse and replace if necessary. Check that AC power is available at the Power Entry Module.

CAUTION: *Always remove AC power from The BIKE before attempting to service the Power Supply. The Power Supply contains dangerously high voltages.*

1. Refer to the **Power Supply Replacement** procedure in *Section 5: Repair Procedures* to remove the power supply.
2. Pull the assembly out of the tube and rest it on the handlebar mount. Visually check the supply for obvious component failures.
3. Remove the 6 pin output connector.
4. Turn on the power switch.
5. Check for proper AC voltage at connector J1 on the power supply board.
6. Check for proper output voltages at J2 on the power supply board.

Note: *Output voltages may not be within regulation limits when tested under this no–load condition.*

Common – pins 4 & 5
+5 volts – pins 2 & 3
+12 volts – pin 1
–12 volts – pin 6

7. If no power is available at J2, check voltage across the power supply fuse. If voltage is present, the fuse has blown and the power supply must be replaced.

SECTION 5

REPAIR PROCEDURES

ENCLOSURE REMOVAL AND INSTALLATION

(White : Right p/n 367PE194, Left p/n 367PE195
Black : Right p/n 367PE194–1, Left p/n 367PE195–1)

WARNING: *When performing any of the following procedures with the enclosure removed, exercise extreme caution when working with moving parts.*

Tools Required

- Phillips screwdriver

CAUTION *Always remove the left enclosure first.*

Removal

1. Turn the power to the unit to the **0** (off) position and remove the power cord from the wall outlet.
2. Position the left side crank so that it is parallel with the slot in the enclosure.
3. Remove the six 9/16" Pan–L screws securing the left side enclosure. Lift the left side enclosure off. See Figure 5.1.

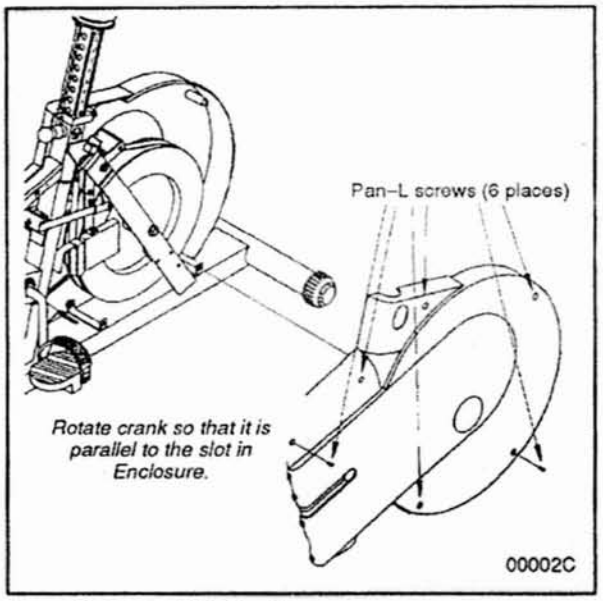


Figure 5.1 Left Side Enclosure.

4. Squeeze the front and rear of the bottom bellows ring together and remove bellows from right side enclosure. If there are any Ty–Wraps securing the bellows to the frame, they will need to be cut before attempting to remove the bellows.
5. Position the right side crank so that it is parallel with the slot in the enclosure.
6. Remove the four 9/16" Pan–L screws securing the right side enclosure. Remove the right side enclosure. See Figure 5.2.

Installation

1. Position the right side crank so that the slot in the enclosure passes over it.
2. Lift the right side enclosure into position. Loosely reinstall the four 9/16" Pan–L screws used to secure the right side enclosure. Push the enclosure, ensuring that the gasket seals against the main tube. Snug tighten front enclosure screws. Snug tighten other screws. See Figure 5.2.

Note: *Do not over–tighten the Pan–L screws. Doing so could damage the fasteners.*

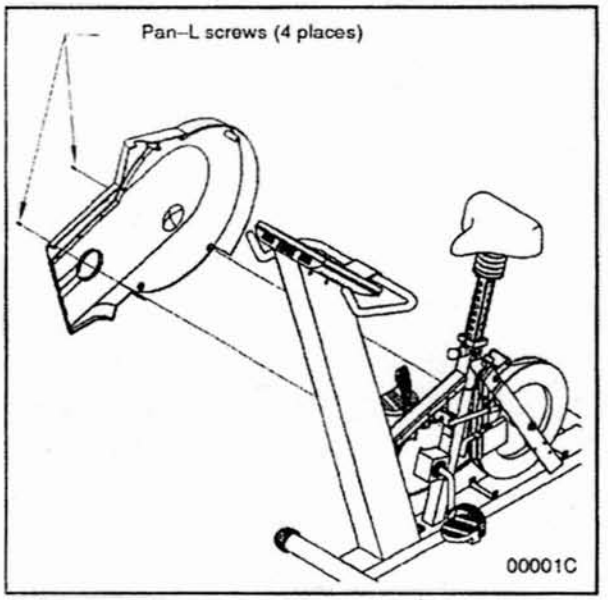


Figure 5.2 Right Side Enclosure.

REPAIR PROCEDURES

PEDAL REPLACEMENT (p/n GT000200)

Tools Needed

- 5/8" Wrench
- Solvent & Clean rag
- LOCTITE® 242

Removal

1. To remove the left pedal, face pedal and with a 5/8" wrench, remove it from the crank by turning the pedal nut clockwise (CW).
2. To remove the right pedal, face the pedal and with a 5/8" wrench, remove it from the crank by turning the pedal nut counterclockwise (CCW).

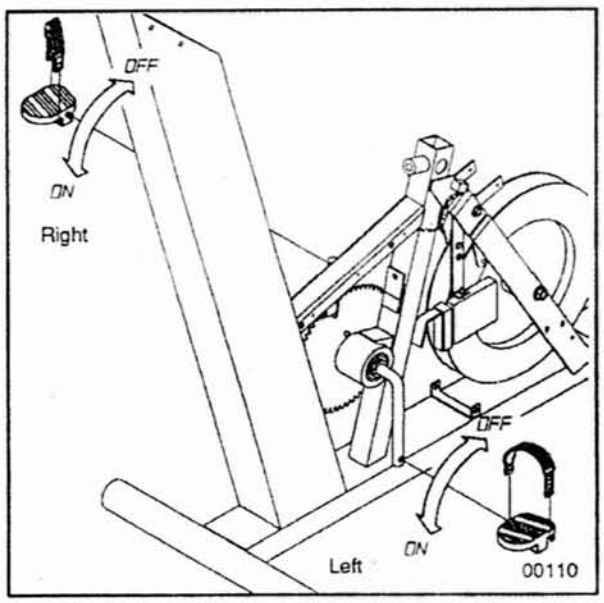


Figure 5.4 Pedal Replacement.

Note: *Pedal nuts are stamped with an "L" for LEFT and an "R" for RIGHT. Be sure to reinstall them accordingly.*

Installation

1. Clean the threaded part of the pedal and the threaded part of the crank with solvent. Inspect both parts to make sure the threads are not distorted. If the threads are distorted, replace the part. If they are not distorted, reinstall the pedal onto the crank.
2. To install the left pedal, apply LOCTITE® 242 to pedal threads, face the unit and thread the pedal CCW into the crank. With a 5/8" wrench, turn the nut CCW tightening securely.
3. To install the right pedal, apply LOCTITE® 242 to pedal threads, face the unit and thread the pedal CW into the crank. With a 5/8" wrench, turn the nut CW tightening securely.

SEAT REPLACEMENT (p/n 3670M135)

Tools Needed

- 3/16" Hex key

Removal

1. Grasp the top ring of the bellows, squeeze the front and rear together while pulling down to free the bellows from the bottom of the seat. If there are any Ty–Wraps securing the bellows to the frame, they will need to be cut before attempting to remove the bellows.
2. With a 3/16" Hex key, remove the four flat head cap screws securing the seat.

Installation

1. Holding the replacement seat in position, reinstall the four flat head cap screws. See Figure 5.5.
2. With a 3/16" Hex key, tighten the four screws.
3. Lift the bellows to the seat bottom plate. Align the three tabs to their holes in the bottom of the seat plate and press firmly upward until the tabs click into place. Replace any Ty–Wraps that were removed in **Removal** step 1.

FRICTION BELT ATTACHMENT CABLE REPLACEMENT (p/n 367JC212)

Tools Required

- 7/64" Hex key
- Medium flat blade screw driver

Removal

1. Perform **Enclosure Removal.**
2. Locate the Belt Attachment Cable screws located at the top rear of the pendulum hub. See Figure 5.9.

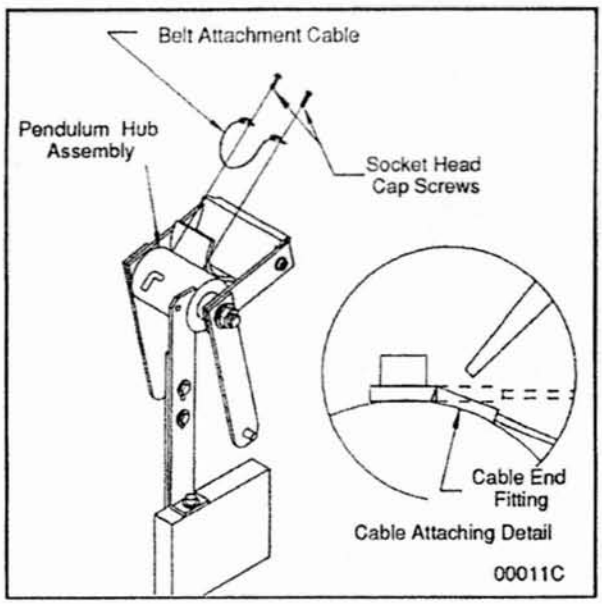


Figure 5.9 Belt Attachment Cable.

3. Slide the friction belt off of the flywheel and remove the attachment spring from the cable.
4. With a 7/64" Hex key, remove the two screws securing the cable.

Installation

1. Install the replacement cable and the two screws (install the screws only finger tight).
2. Reattach the friction belt spring to the cable and slide the belt into its groove.
3. With a 7/64" Hex key, tighten the two screws. *Do not allow the cable lugs to turn and kink the cable or to interfere with the optical encoder drive belt.*
4. Using the broad side of the flat blade screwdriver, gently bend cable end fittings approximately tangent to surface of hub. See Figure 5.9.
5. If no other service is required perform **Enclosure Installation.**

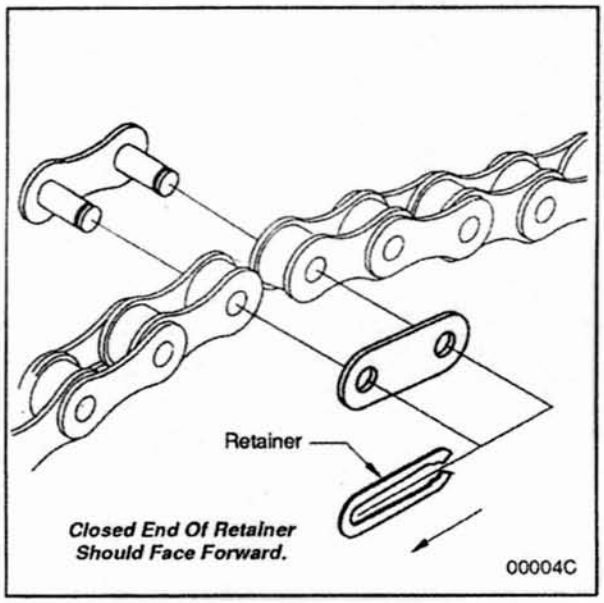


Figure 5.10 Chain Replacement.

CHAIN REPLACEMENT

(p/n 367GS260)

Tools Required

- Phillips screwdriver
- Needle–nose pliers

Removal

1. Perform **Enclosure Removal.**

Note: *Note the routing of the chain before removing it.*

2. Locate the master link of the chain.
3. Using needle–nose pliers, remove the master link retainer. Remove the master link and the chain.

ROD PIVOT (p/n 3670M545), SPRING (p/n BS071367), THREADED ROD (p/n 3670M241) and THRUST BUSHING (p/n 367PE185) REPLACEMENT

Tools Required

- 5/64" Hex key
- Wheel bearing grease

Removal

1. Perform **Enclosure Removal.**
2. With a 5/64" Hex key, loosen rear screw in the flex coupling. Slide the coupling down the threaded tension rod shaft.
3. Remove the grip rings from the pivot pins of the tension arms. See Figure 5.12. Slide the tension bracket off of the pivot pins.

Note: *The grip rings deform easily, refrain from spreading them too far apart. If they should open too much, pinch them closed with a plier or replace them.*

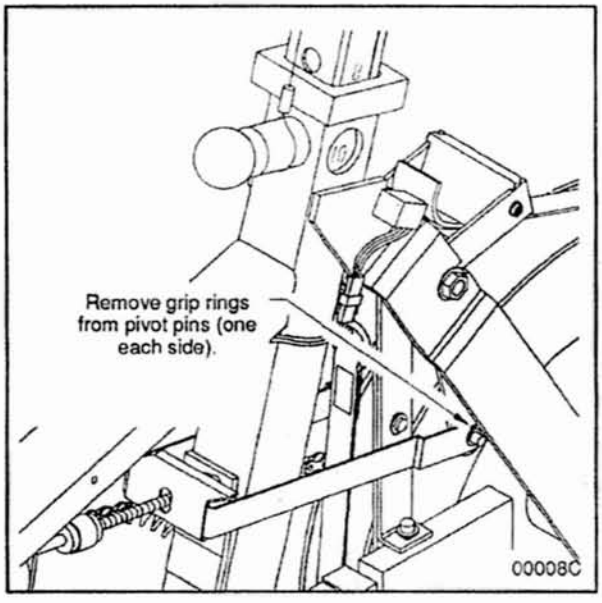


Figure 5.12 Rod Pivot Pins.

4. Remove rod pivot and tension bracket as an assembly.
5. Remove coupling. Unscrew the threaded rod from the rod pivot and remove the compression spring.
6. Rotate rod pivot 90° to orient the tapped hole away from the bracket opening. The rod pivot should drop free. See Figure 5.13.

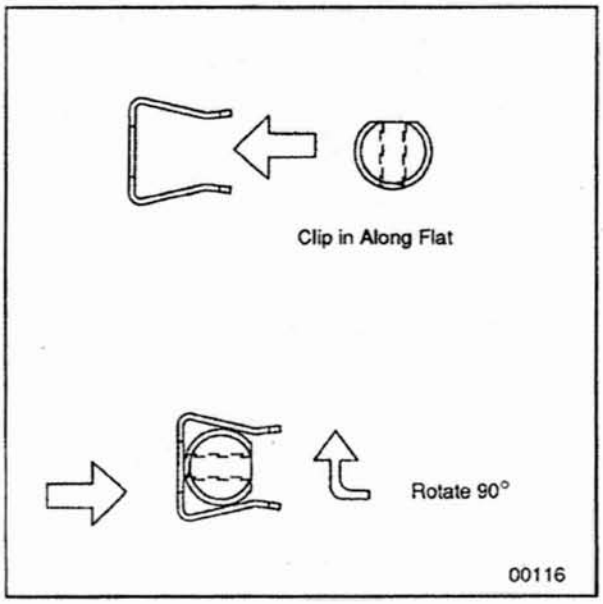


Figure 5.13 Rod Pivot Alignment.

Installation

1. Position the rod pivot at the tension bracket opening. Rotate the rod pivot so that it slips into position and rotate it so that the tapped hole aligns with hole in tension bracket. See Figure 5.13.
2. Apply a coating of automotive wheel bearing grease to the bushing (flat) end. See Figure 5.14.
3. Install spring onto threaded rod. Clean old grease from thrust washers and thrust bushing. Apply a new coat of wheel bearing grease to both sides of thrust washers and thrust bushing. See Figure 5.14.

Installation

1. Position the replacement board on the mounting bracket and press into place (board mounts one way only).

2. Connect the wiring harness connector to the sensor board. The connector can only be plugged in one way.

3. Position the mounting bracket against the left side flywheel support so that the screw holes in the mounting bracket are aligned with the screw key holes in the support frame and the connector is toward the top.

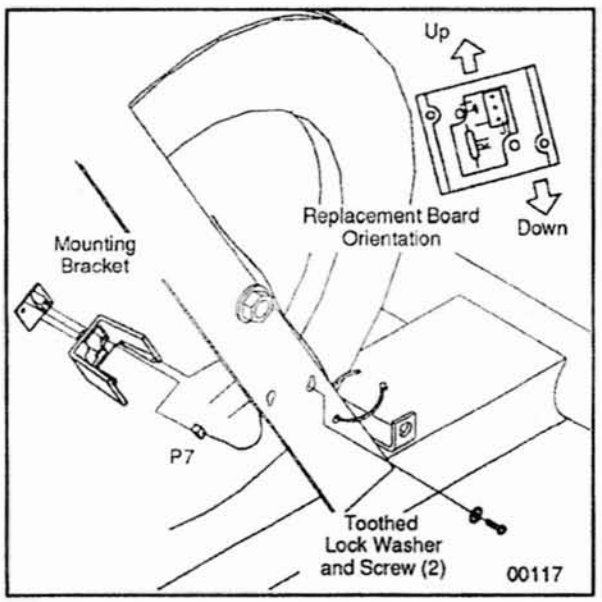


Figure 5.16 Hall Effect Sensor Orientation.

4. Install the two screws and toothed lock–washers through the frame (into the narrow end of the key holes) and into the bracket. Verify that wires are not pinched.

5. With a Phillips screwdriver, tighten the screws, do not over tighten.

6. Run the **Tach Test** as described in *Section 4: System Checkout.*

7. If no other service is required perform **Enclosure Installation.**

ENCODER REPLACEMENT (p/n 3670K030)

Tools Required

- .050" Hex key
- 5/16" wrench
- LOCTITE® 242

CAUTION *Handle the wiring very gently.*

Removal

1. Perform **Enclosure Removal.**

2. With a .050" Hex key, loosen the set screw in the encoder pulley. It may be necessary to lift the pendulum to the rear so that the pulley rotates and the screw is accessible.

3. Slide the pulley toward the end of the shaft.

4. With 5/16" wrench, loosen and remove the retaining nut on the encoder.

5. With the nut free, move the encoder toward the hub until the encoder belt can be pulled free of the pulley, then pull the encoder free of the frame. Be sure to catch the pulley, retaining nut and flat washer.

6. Disconnect the encoder from the wiring harness.

Installation

1. Apply a small amount of LOCTITE® 242 to threads on the retaining nut.

Note: Exercise extreme care when applying LOCTITE to prevent it from entering the encoder bearing.

2. Position the replacement encoder at the groove in the frame. Slide the flat washer and retaining nut onto the encoder shaft. Slide the pulley (set screw side away from the encoder) onto the shaft while looping the belt over it. See Figure 5.17.

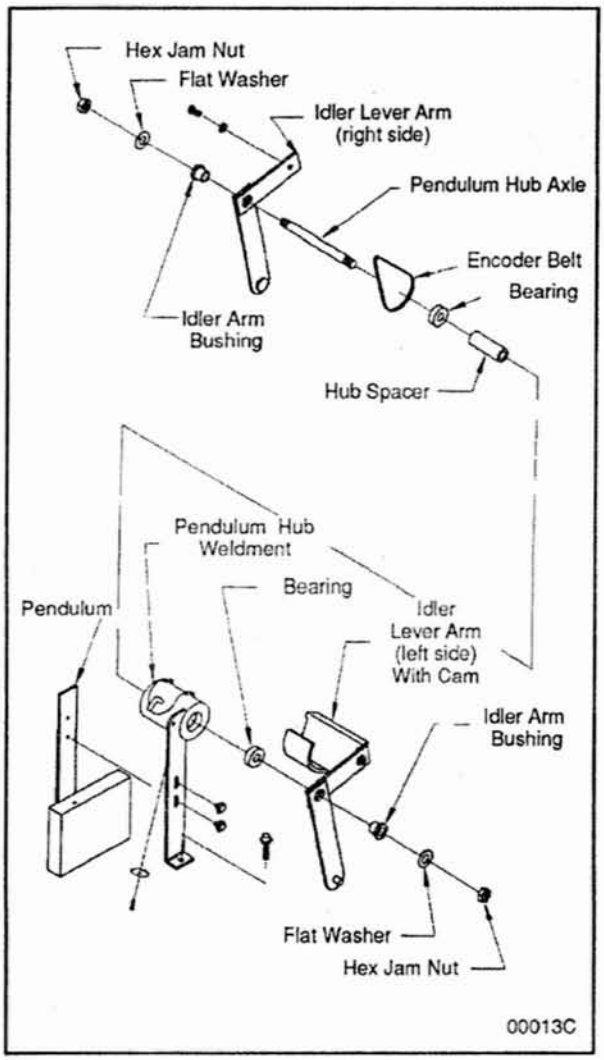


Figure 5.18 Pendulum Hub & Idler Lever Arm Bearing.

3. Loop the encoder belt over the encoder pulley. Position the axle in the frame and install two flat washers.

4. Apply a drop of LOCTITE® 242 on the pendulum hub axle threads and replace and securely tighten the hex jam nuts with a pair of 9/16" wrenches.

5. Perform **Friction Belt Installation.**

6. Run the **Encoder Test** as described in *Section 4: System Checkout.*

7. If no other service is required perform **Enclosure Installation.**

ENCODER BELT REPLACEMENT

(p/n GB000367)

Tools Required

- 3/16" Hex key
- 2 – 9/16" Wrenches
- Plastic faced mallet
- Drift pin
- LOCTITE® 242

Removal

1. Perform **Enclosure Removal.**
2. Take a pen or pencil and mark the position of the encoder belt on the pendulum hub.
3. Perform **Friction Belt Removal.**
4. Perform **Pendulum Hub Bearing Removal** (steps 3 through 5).
5. Lift the encoder belt off the pulley.
6. Using the 3/16" hex key, remove the socket screw and washer from the pendulum hub to release the belt.

Installation

1. Install the replacement belt in the same position as the original. Replace the screw and washer making sure the belt is aligned with the mark made in removal step 2.
2. Perform **Pendulum Hub Bearing Installation** (steps 1 through 5).
3. Run the **Encoder Test** as described in *Section 4: System Checkout.*
4. Perform **Friction Belt Installation.**
5. If no other service is required perform **Enclosure Installation.**

Installation

1. Perform **Flywheel Bearing and Spacer Installation** on replacement flywheel.
2. Perform **Freewheel Installation.**
3. Perform **Hall Effect Magnet Installation** if required.
4. Install the flywheel into the frame.
5. Reinstall the two flat washers onto the axle. Apply one drop of LOCTITE® 242 to the axle threads. Reinstall the two hex nuts and, with a pair of 3/4" wrenches, tighten.
6. Reposition the Hall Effect Sensor mounting bracket against the frame with the connector toward the top. Install the two screws through the frame and into the bracket. With a Phillips screwdriver, gently tighten the mounting bracket screws. Do not over tighten the screws.
7. Perform **Chain Installation.**
8. Perform **Friction Belt Installation.**
9. If no other service is required perform **Enclosure Installation.**

FLYWHEEL BEARING (p/n 3670K040) and SPACER REPLACEMENT

Tools Required

- Large adjustable wrench
- Plastic faced mallet
- Drift pin
- LOCTITE® 242

Removal

1. Perform **Enclosure Removal.**
2. Perform **Flywheel Removal.**
3. Using a large adjustable wrench, remove hex nut from flywheel. See Figure 5.20.
4. Using a plastic faced mallet, tap the bearing cartridge out of the flywheel from the side opposite the freewheel.

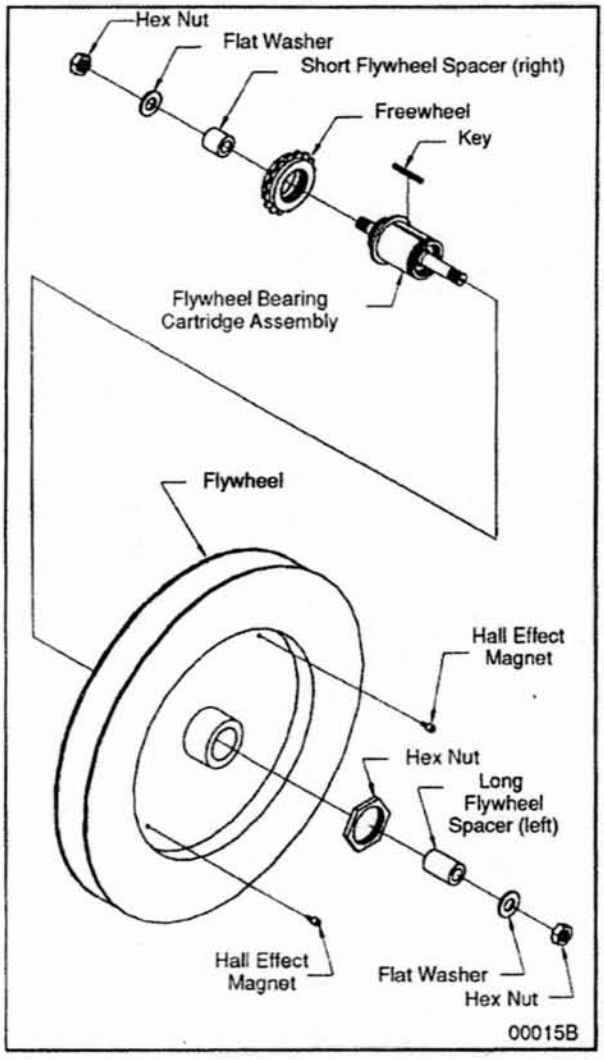


Figure 5.20 Flywheel Bearing & Spacer Replacement.

Installation

1. Align the key in the new cartridge with the keyway in flywheel and tap the cartridge fully into flywheel.
2. Apply a drop of LOCTITE® 242 to threads on cartridge, reassemble hex nut and tighten.

REPAIR PROCEDURES

CHAIN IDLER SPROCKET REPLACEMENT (p/n 3670M365)

Tools Required

- 9/16" Wrench
- LOCTITE® 242

Removal

1. Perform **Enclosure Removal.**
2. With a 9/16" wrench, remove the screw securing the chain idler sprocket. See Figure 5.21.

Installation

1. Install idler sprocket screw through replacement sprocket; apply LOCTITE® 242 to screw threads and thread screw, with sprocket, into lever arm.
2. With a 9/16" wrench, tighten the screw. Check chain alignment.
3. Perform **Enclosure Installation.**

CRANK/SPROCKET (p/n 3670K045), CRANK BEARING KIT (p/n 3670K360) and BEARING CUP (p/n FB030016) REPLACEMENT

Tools Requires

- Adjustable wrench or 1¼" wrench
- Flat blade screwdriver
- LOCTITE® 290
- Wheel bearing grease

Removal

1. Perform **Enclosure Removal.**
2. Perform **Pedal Removal.**
3. Perform **Chain Removal.**
4. With an adjustable (or 1¼") wrench, remove the lock nut located on the left crank leg by turning the nut clockwise (CW). Slide nut off the crank. See Figure 5.22.
5. Use the adjustable (or 1¼") wrench to remove the left bearing assembly by turning it clockwise (CW). Pass the bearing assembly over the left crank leg and remove.
6. Slide the loosened crank assembly out of the crank housing.
7. Inspect and clean the bearing cups. If they show wear and need to be replaced, tap them out of the crank housing by using a flat blade screwdriver and hammer.

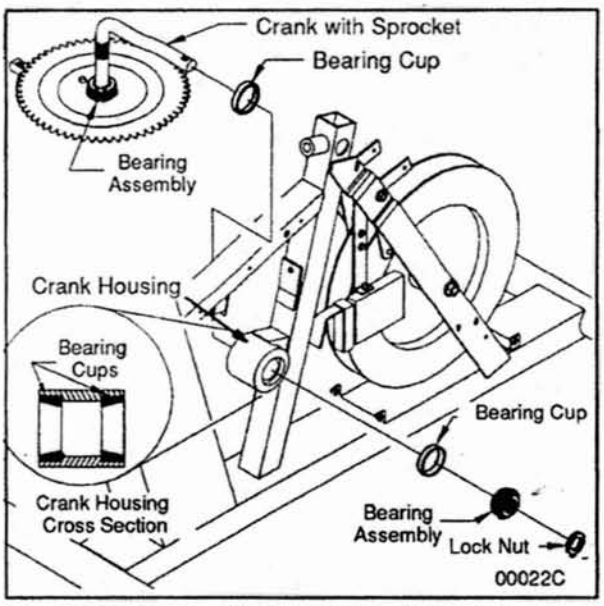


Figure 5.22 Crank with Sprocket and Crank Bearing.

2. Tilt the module forward and rest the mounting tabs in the main tube. While pressing down on the Display Module to hold it against the top of the tube, reinstall the four Pan–L screws. Do not over tighten.

3. Reinstall the power cord.

4. Refer to *Section 4: System Checkout* to perform **Power Up Diagnostics** and **Field Service Diagnostics.**

POWER SUPPLY REPLACEMENT

(p/n EP470367)

Tools Required

- 5/16" Nut Driver
- Phillips Screwdriver

CAUTION: *Always remove AC power from The BIKE before attempting to service the Power Supply. The Power Supply contains dangerously high voltages.*

Removal

1. Perform **Display Module Removal.**

2. With a 5/16" nut driver, remove the two hex nuts securing the top of the power supply. Remove the lockwasher and flat washer from each stud. Remove the ground lead (P3). See Figure 5.24.

3. Note the orientation of the power supply board within the power supply cover. Remove the four pan head screws securing the power supply to the cover. Remove power supply from cover.

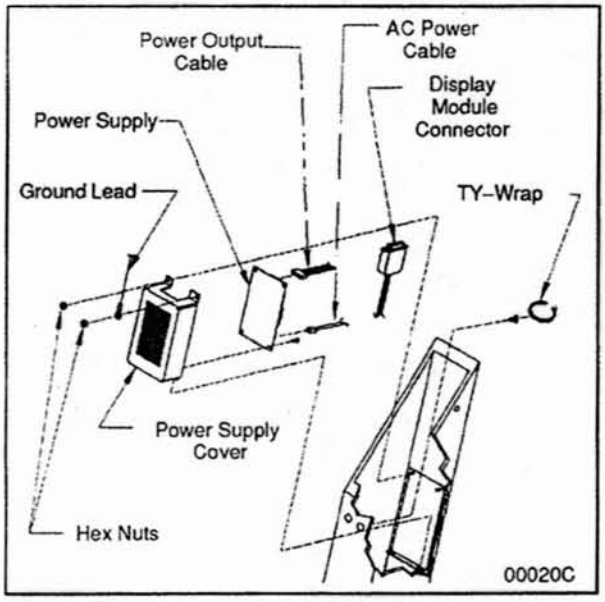


Figure 5.24 Power Supply Removal.

Installation

1. Position the replacement power supply in the power supply cover. The P2 six pin connector should be oriented toward the top. Refer to Figure 5.24. Secure the power supply to the cover with four pan head screws.

2. Position the power supply at the main tube and connect the two plugs from the wiring harness to the power supply board. Connect as follows:
   P2 of harness to J2 of power supply board.
   P4 of harness to J1 of power supply board.

3. Slide the power supply into the main tube. The tabs along the bottom edge will hook into the catches in the main tube. Slide the top portion of the power supply cover over the two studs.

4. Install the ground lead (P3 of harness) onto the left stud and fasten with a flat washer, lockwasher and hex nut. Install a flat washer, lockwasher and hex nut onto the second stud. With a 5/16" nut driver, tighten both hex nuts.

5. Perform **Display Module Installation.**

6. Refer to *Section 4: System Checkout* to perform **Power Up Diagnostics** and **Field Service Diagnostics.**

Installation

1. Reach inside the power entry module access hole in the side of the base tube and retrieve P9, P10 and P11.
2. Attach the connectors to the power entry module as follows:
   P9 of harness to L1 of module
   P10 of harness to N1 of module
   P11 of harness to GND of module
3. Position the power entry module as shown in Figure 5.26 and snap back into place. Be sure not to pinch the wires.
4. Plug the power cord into the power entry module and power outlet. Set the power switch to the **1** (on) position. Ride The BIKE to make sure it works properly.

CABLE HARNESS REPLACEMENT

(p/n 3670S377)

Note: *When replacing the cable harness, the power entry module (p/n ES000367) must also be replaced as it must be destructively removed to replace the cable harness*

Tools Required

- Utility blade
- Hammer
- Flat blade screwdriver
- Ty–Wraps

Removal

1. Turn the power to the unit to the **0** (off) position and remove the power cord from the power outlet and the power module.
2. Perform **Enclosure Removal.**
3. Perform **Display Module Removal** and **Power Supply Removal.**
4. Cut the Ty–Wraps that hold the harness to the bike frame. There are two around the crank housing and three on the left flywheel support bracket.
5. Perform **Power Entry Module Removal.**
6. Unscrew the ground lug near the front tube.
7. Disconnect the D.C. gear motor, pendulum encoder and Hall Effect board.
8. Lift the power supply from the main tube and disconnect the two connectors (P2 and P4) from the main board.
9. The old harness is now free and the new harness can be installed.

Note: *The old harness will be used as a snake to install the new harness.*

Installation

1. Ty–Wrap the new harness, just behind the 25–pin D–connector, to the part of the old harness hanging out of the 3–inch access hole in the 4 x 6 tube.
2. From the top of the 4 x 6 tube, pull out the old harness until the D connector of the new harness hangs out of the tube about 12 inches. Cut the Ty–Wrap and discard the old harness.
3. Reach inside the power entry module access hole, in the side of the base tube, and retrieve plugs P9, P10 and P11.

   The new harness is now installed. Reconnect and install all components and connectors removed in steps 1 through 7. Refer to Figure 5.27.

SECTION 6

WARRANTY AND SERVICE POLICY

THE CYBEX SERVICE POLICY

This statement of Service Policy is not a warranty and in no way alters the terms, conditions or requirements of the warranty. The Service Policy represents only our current procedures for handling service requirements during and after the warranty period. Although we do not have sales and service representatives in every location, we can and will provide excellent warranty and continued maintenance service. Please call CYBEX Customer Service if you have any questions.

1. Shipping Cost Policy

If a service requirement arises during the first year of use for any CYBEX product which requires the return for repair or replacement of that product or any of its components, parts or accessories, it is the current policy of CYBEX to pay directly or reimburse our customer for all shipping costs connected with the repair or replacement in excess of five dollars ($5.00). The only requirements for obtaining this extra service are that a Return Authorization Number be obtained from the CYBEX Customer Service Department and that any return shipments are made only by the method or carrier instructed by Customer Service.

This policy does not include total cost of air freight shipments requested by the customer. These will be paid or reimbursed on a pro–rated basis (difference between motor and air freight cost is the responsibility of the customer). This also does not include shipment outside of North America.

2. Return and Replacement Policy

If a need for service arises during the first year of use of any CYBEX product which requires the replacement of a defective component, part or accessory, it is the current policy of CYBEX to expedite service by immediately shipping – and invoicing for the appropriate replacement. This invoice is then credited in full on receipt of the authorized return by CYBEX. Invoicing and return for credit may be waived in some cases when cost of handling exceeds value of item.

To obtain credit, any returned component, part or accessory must be packed carefully to avoid damage in transit and must be clearly marked with Return Authorization Number obtained from CYBEX Customer Service. When appropriate, Customer Service will provide a special re–usable crate for the shipment of certain major components. These crates are shipped and invoiced, then credited in full on return.

3. Repair Policy

A Return Authorization Number is required on any return for repair or credit. For non–warranty repairs, a written purchase order is required to cover material, labor and shipping costs. Repairs paid for by customers are warranted for 90 days from date of repair. Subsequent parts failure unrelated to the repair are not warranted and therefore chargeable.

4. Response Time Policy

It is the policy of CYBEX to respond to customer requests for technical service by dispatching service personnel and/or by shipping necessary components, parts or accessories normally within two business days in major metro areas and four days in rural areas from date of request.

5. Standard Service Rates

For service rates for out–of–warranty repairs, consult the Services Price List.

Minimum Service charge is the minimum one–hour charge plus appropriate zone charge.

Standard Warranties

Every CYBEX product is warranted against defects in materials and workmanship. Warranty periods vary among products.

It is the policy of CYBEX to provide (with no charges for parts, labor or transportation) appropriate warranty repair or replacement of any defective component, part or accessory within ten business days from the date a problem is reported.

6. Standard Business Hours:

Inside Telephone Technical Support is available from Monday – Friday 8 a.m. – 6 p.m. Eastern Time Zone toll–free at 1–800–892–2732.

On–Site Technical Service is available from Monday through Friday 8 a.m. – 5 p.m. in your respective time zone.

WARRANTY AND SERVICE POLICY

Warranty Disclaimers and Additional Information

There are no additional warranties, either expressed or implied, arising out of the sale of this product other than those contained herein except an implied warranty of fitness for the purpose intended for a period of two years or as noted below. This warranty extends only to the repair or replacement of the product and does not afford additional coverage with respect to any incidental or consequential damages arising from the use or non–use of this product. CYBEX is not responsible for any lost data or interrupted system operation.

Systems that are used in mobile environments, or that are relocated by other than CYBEX carriers and technicians, require special warranty and service coverage which is available at extra cost depending on individual circumstances. Warranty is voided if system is moved from place of original installation without approval of the CYBEX Customer Service Department.

Some states do not allow the exclusion or limitation of incidental or consequential damages and/or limitation on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which may vary from state to state.

POLAR WARRANTY: Transmitter, Belt and Watch

POLAR warrants to the original consumer/purchaser that the transmitter and the watch will be free from defects in material or workmanship for one year from date of purchase. Warranty does not cover damages due to misuse, abuse, or accidents, negligence of the precautions; improper maintenance or commercial use; cracked or broken cases. Warranty is voided if repairs are made by persons not authorized by POLAR.

To assure proper registration of your POLAR™ HRM, in USA, please mail warranty registration card within 14 days after purchase using the enclosed warranty card.

This warranty gives the purchaser specific legal rights, and the purchaser may also have other rights depending on state law.

The warranties contained herein are expressly in lieu of any other warranties, including implied warranty of merchant ability and/or fitness for purpose. During this warranty period (one year), the product will be either repaired or replaced (at POLAR's option) without charge in the country where it was originally purchased.

For repair or replacement of your POLAR™ HRM, in the USA, there is a $7.50 US charge for handling through POLAR.

SERVICE

To insure proper service of your POLAR™ HRM please fill out and mail the enclosed warranty registration card within 14 days after purchase.

- Carefully pack the POLAR™ HRM transmitter and wrist receiver in a shipping carton so it will not be damaged.
- Enclose proof of purchase (or photocopy). Please include a statement explaining why the unit is being returned for repair.
- Mail postage prepaid to:

  POLAR CIC, Inc.
  99 Seaview Boulevard
  Port Washington, NY 11050

- Remember to include a check or money order for the $7.50 handling, return postage and insurance charge (this is not a repair charge).

TECHNICAL DATA

- Estimated average battery life: 2500 hours of use when handled according to the care and maintenance instruction.
- Battery Type: CR 2025
  Battery Replacement:
  Transmitter: replace transmitter
  Wrist receiver: only by those persons authorized by POLAR, or at a qualified watch store.
- Water resistant 20m.

SECTION 7

EXPLODED VIEW DRAWING AND PARTS LIST

PART ORDERING INFORMATION

We realize that whenever a replacement part is ordered, receiving the correct part in a timely fashion is extremely important.

As a result, the following information will greatly enhance our service to you. Please have this information ready when calling:

1. The unit SERIAL NUMBER.

2. The unit NAME.

3. The PART DESCRIPTION and the PART NUMBER.

   Identify the part needing replacement in the exploded view drawing on the following pages. Using the item number on the drawing, locate the item number on the Parts List to obtain the part description and part number.

4. The FACILITY NAME, ADDRESS and CONTACT NAME.

   (Your CUSTOMER NUMBER is helpful, but not necessary.)

In addition to the replacement parts listed on the following pages, POLAR™ Heart Rate Monitor transmitters can be purchased. Their part numbers are as follows:

Description	CYBEX Part No.
Transmitter and belt	3670HRTB
Belt only	3670HRB
POLAR™ Favor *(Transmitter, belt & watch)*	3670HRF

To order parts, or for assistance, contact CYBEX Customer Service at 1–800–892–2732, in New York State call 516–585–9000.

APPENDIX A

TOOL LISTING

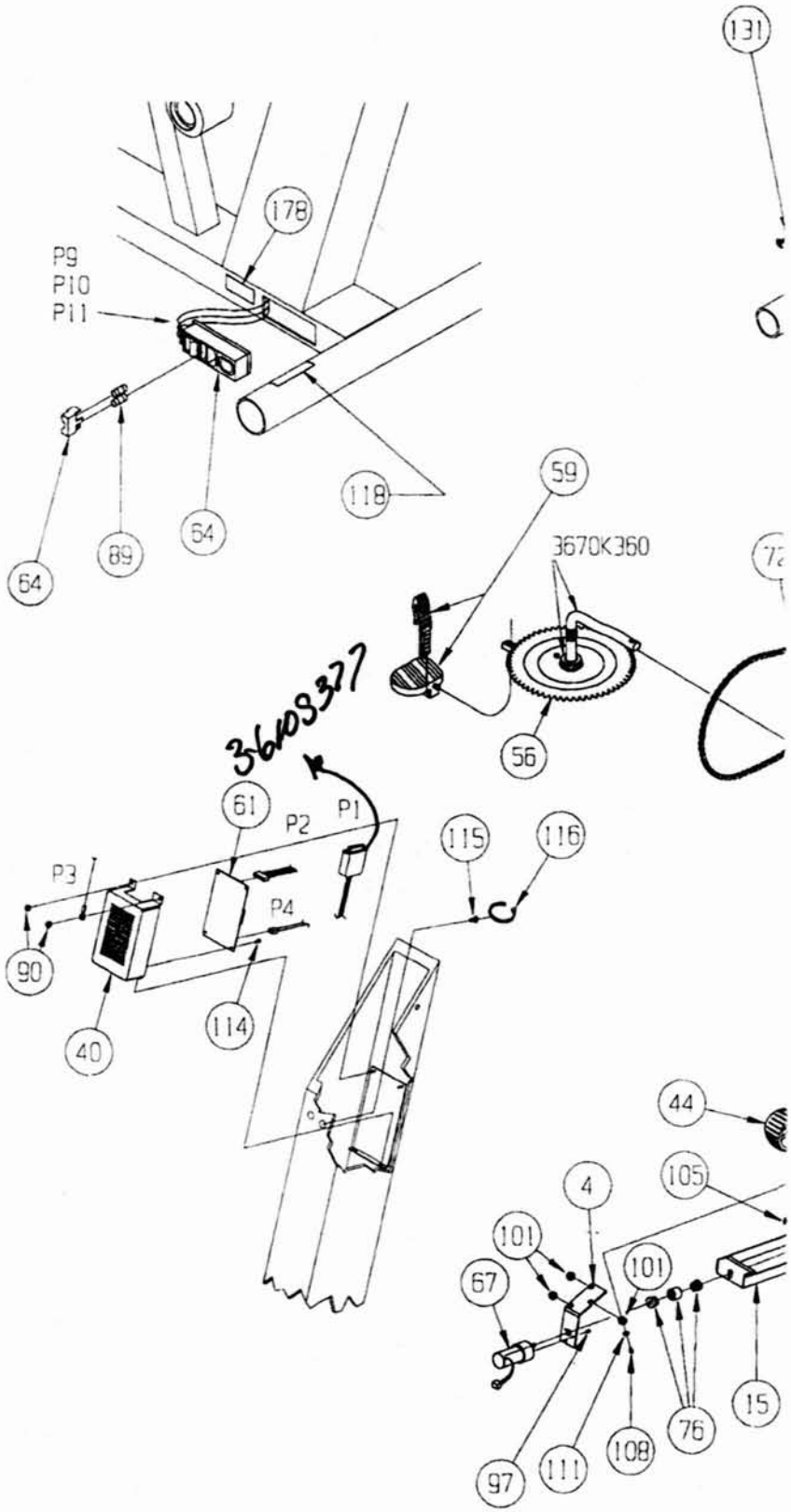
List of tools required for service procedures featured in this publication. The tools contained in this list do not coincide with the order of their appearance in this publication.

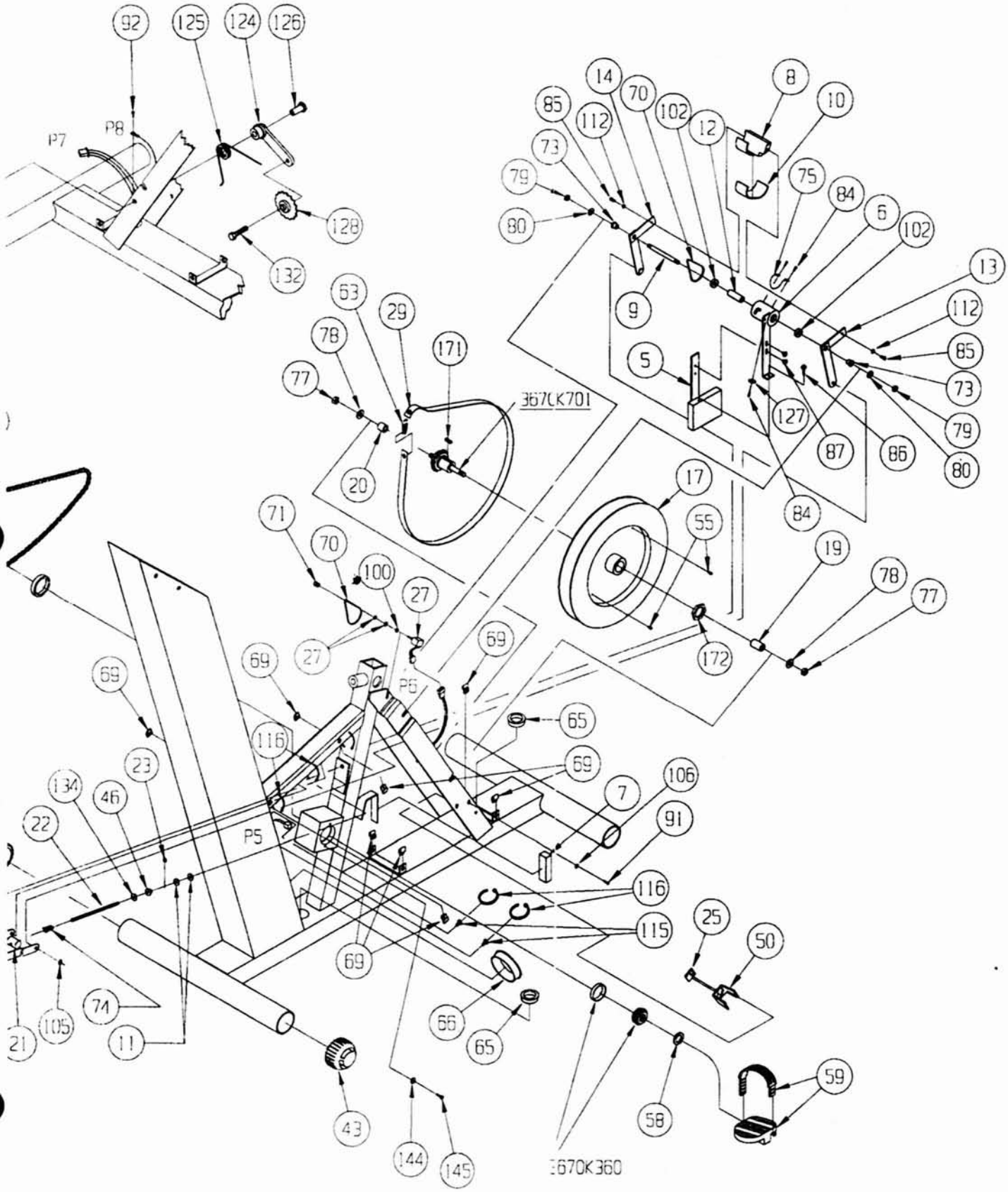
No.	Description	Qty.
1.	Phillips Screwdriver	1
2.	Small Phillips Screwdriver	1
3.	Flat Blade Screwdriver	1
4.	Large Flat Blade Screwdriver	1
5.	Adjustable Wrench	1
6.	Large Adjustable Wrench	1
7.	Needle Nose Pliers	1
8.	Vise Grip or Channel–lock Pliers	1
9.	Fine Grit Sand paper	1
10.	.050" Hex Key	1
11.	5/64" Hex Key	1
12.	7/64" Hex Key	1
13.	3/32" Hex Key	1
14.	1/8" Hex Key	1
15.	5/32" Hex Key	1
16.	3/16" Hex Key	1
17.	1/4" Hex Key	1
18.	5/16" Open End Wrench	1
19.	9/16" Open End Wrench	2
20.	5/8" Open End Wrench	1
21.	3/4" Open End Wrench	2
22.	1/4" Nut Driver	1
23.	5/16" Nut Driver	1
24.	Drift Pin	1
25.	Plastic Faced Mallet	1
26.	Hammer	1
27.	Utility Blade	1
28.	Teflon Based Grease	a/r
29.	Wheel Bearing Grease	a/r
30.	LOCTITE® 222	a/r
31.	LOCTITE® 242	a/r
32.	LOCTITE® 290	a/r

Note: *In case of accidental spillage of LOCTITE®, soak up with an inert absorbent. Store in a partly filled, closed container until disposal. Check with local and EPA regulations for proper disposal method. In case of skin contact, wash affected area thoroughly with soap and water. In case of eye contact, flush eye at least 15 minutes with water and obtain medical attention.*

INDEX

CRIPTION	PART No.
DMENT, CYCLE FRAME (WHITE)	3670C100
DMENT, CYCLE FRAME (BLACK)	3670C100-1
DMENT, HANDLEBAR (WHITE)	3670C125
ELDMENT, HANDLEBAR (BLACK)	3670C125-1
DMENT, SEAT POST	3670P137
CKET, MOTOR MOUNTING	3670C110
DMENT, PENDULUM BLOCK	3670C215
DMENT, PENDULUM DRUM	3670C202
CK, FOAM (PENDULUM)	3670M114
DMENT, CAM	3670C265
, PENDULUM HUB	3670M220
-FRICTION TAPE, 1.25 WIDE	YD000036
WASHER	HS347603
ER, HUB	3670P221
DMENT, IDLER LEVER ARM (L)	3670C238
DMENT, IDLER LEVER ARM (R)	3670C240
DMENT, TENSION BRACKET	3670C225
/HEEL	3670M201
ER, FLYWHEEL (LONG)	3670P507
ER, FLYWHEEL (SHORT)	3670P506
PIVOT	3670M545
ADED ROD	3670M241
INING RING	BR030367
AY MODULES (WHITE)	
MESTIC/STANDARD	3670S399
MAN	3670S399-D
NISH	3670S399-E
LISHMETRIC	3670S399-E/M
NCH	3670S399-F
IAN	3670S399-I
NESE	3670S399-J
DISH	3670S399-S
AY MODULES (BLACK)	
MESTIC/STANDARD	3670S399-1
MAN	3670S399-1D
NISH	3670S399-1E
LISHMETRIC	3670S399-1E/M
ICH	3670S399-1F
AN	3670S399-1I
NESE	3670S399-1J
DISH	3670S399-1S
SSY, HALL EFFECT	3670S310
DER, 128 LINE	EC000367
ESS	3670S377
RICTION	3670S601
MOLDED	3670M135
. SEAT POST RETENTION	367JC140
HANDLEBAR	367PP129
ETENT	3670P151
, COMPRESSION .	BS070205
NOB, 1.375 DIA.	PP460200
SEAT POST SCALE	367CM145
, POWER SUPPLY	3670M190
SURE ASSY, RIGHT SIDE (WHITE)	367PE194
OSURE ASSY, RIGHT SIDE (BLACK)	367PE194-1
SURE ASSY, LEFT SIDE (WHITE)	367PE195
OSURE ASSY, LEFT SIDE (BLACK)	367PE195-1
, CONCENTRIC	367WC188
, ECCENTRIC	367WC189
T BUSHING	367PE185
BELLOWS ATTACHMENT	367PE186
VS	367PR187
ET, MOUNTING (MOLDED)	367PP197
ET, FLYWHEEL	EV420003
ET, 60 TEETH	3610M260
NUT 7/8 - 24	3610P264
RIGHT PEDAL W/STRAP	GT000200
. SUPPLY, 90 - 265 VAC	EP470367
LOGO	367CM299
	BS070367
ENTRY MODULE	ES000367

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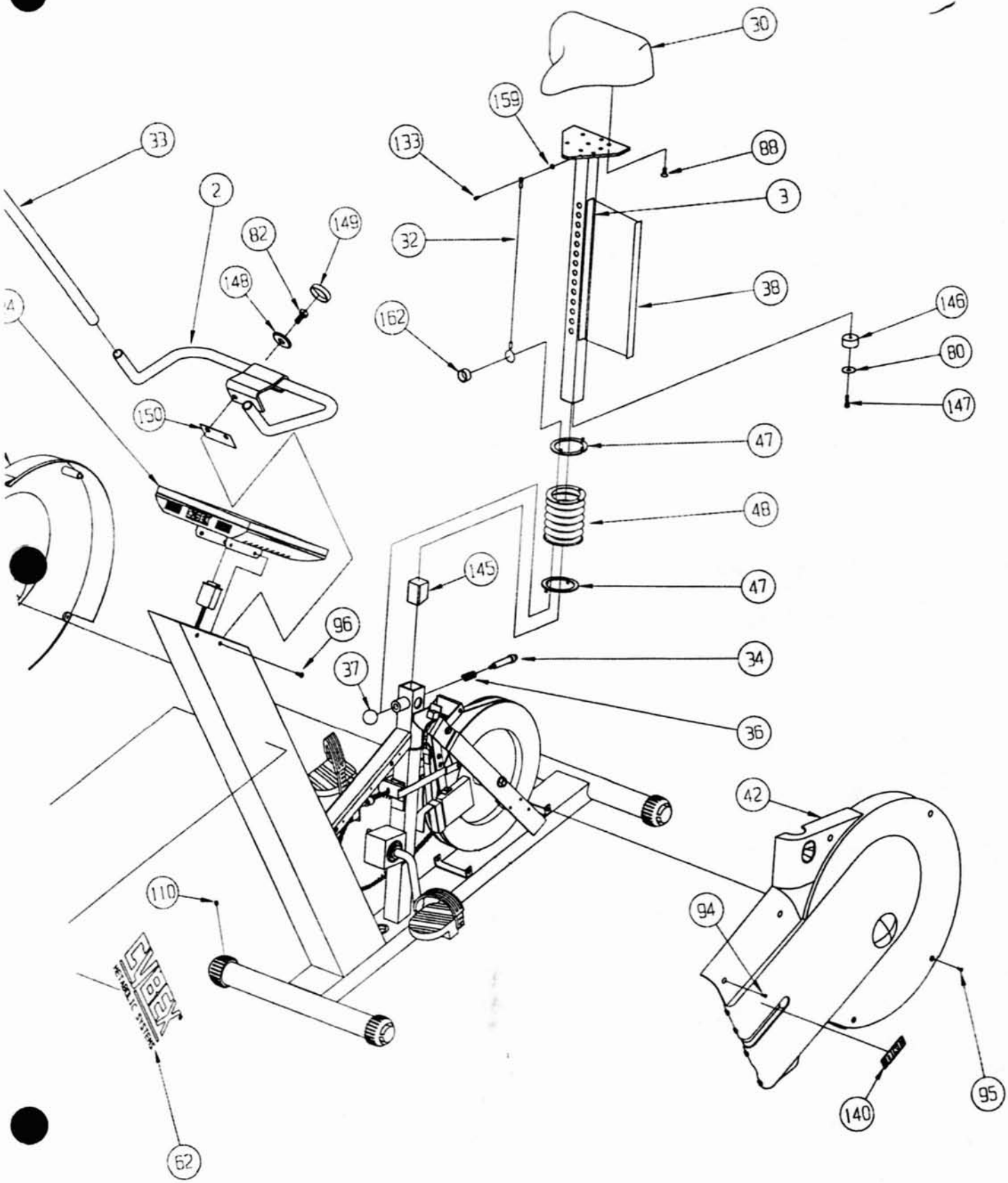
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No.	DESCRIPTION	PART No.
65	BUSHING, SNAP, 1.5 DIA	EL410007
66	BUSHING, SNAP, 3.0 DIA	EL410008
67	DC MOTOR	367EM250
69	FASTENER, TINNERMAN, 8-32 J-TYPE	HF080005
70	TIMING BELT, ENCODER	GB000367
71	PULLEY, TIMING BELT (ENCODER)	GP000367
72	CHAIN, DRIVE, 98 LINK	367GS260
73	IDLER ARM BUSHING	3670P152
74	SPRING, COMPRESSION	BS071367
75	CABLE, BELT ATTACHMENT	367JC212
76	GEARGRIP FLEXIBLE COUPLING	FC100367
77	NUT, 1/2-20 UNF-3B SELF LOC HEX	HN79440000
78	FLAT WASHER, 1/2	HS760101
79	HEX JAM NUT, 3/8-24	HN714400
80	WASHER, .383 ID x 1.25 OD x .03	HS347602
82	HEX HD CAP SCREW, 1/2-20 x 1	HC781217
84	SOCKET HD CAP SCREW, 6-32 x 3/8	HC532810
85	SOCKET LO HD CAP SCREW, 10-24 x 3/8	HC572811
86	SOC HD CAP SCREW, 10-32 x 3/4	HC572815
87	LO HD SOC CAP SCREW, 10-24 x 1/4	HC583408
88	FL HD SOCKET SCREW, 5/16-18 x 3/4	HC661015
89	FUSE, 1 AMP @ 250V	EF290010
90	HEX NUT, 6-32 KEPS	HN534300
91	SCREW, THREAD FORMING, #6 x 1/2	HW062512
92	SCREW, HEX SLOT, 8-32 x 1/2	HM541712
94	PAN-L SCREW, 8-32 x 9/16 (GRAY)	HM541813
95	PAN-L SCREW, 8-32 x 9/16 (WHITE)	HM541813-1
	PAN-L SCREW, 1/4-20 x 5/8 (GRAY)	HM541813
96	PAN-L SCREW, 1/4 - 20 X 3/4 (WHITE)	HM621814
	PAN-L SCREW, 1/4 - 20 X 3/4 (BLACK)	HM621815-3
97	SOCKET HD CAP SCREW, 4-40 x 1/4	HC522808
100	ENCODER WASHER	HS307603
101	SHOCK MOUNT, MOTOR MOUNTING BRACKET	PP260367
102	RADIAL BALL BEARING (PENDULUM)	AL040004
105	EXTERNAL GRIP RING	BR030053
106	LOCKWASHER, #6 EXTERNAL TOOTH	HS068300
108	PH PAN HD SCREW, 8-32 x 5/16	HM542609
111	FLAT WASHER, #10	HS107607
112	LOCK WASHER, #10	HS108300
114	#6 x 1/4 PH PAN HD SCREW W/LWASHER	HM532508
115	PUSH MNT CABLE TIE ANCHOR, 1/4	PC149628
116	CABLE TIES 5/8 - 3/4 DIA	EW000013
118	LABEL, UL WARNING	367CM297
124	WELDMENT, CHAIN IDLER ARM	3670C360
125	TORSION SPRING	BS072367
126	CHAIN IDLER MOUNT	3670P364
127	FLAT WASHER,1 OD x .15 ID x .045	HS067602
128	SPROCKET, IDLER	3670M365
131	FLAT HD SOCKET SCREW, 1/4-20 x 1	HM620914
132	HEX HD CAP SCREW, 3/8-16 x 1/4	HC701220
133	SHOULDER SCREW, #10-32 x 3/16	HD303306
134	WASHER	HS107601
140	LABEL, "THE BIKE"	367CM295
	LABEL, "THE BIKE"	367CM295-1
144	SOCKET LOW HD SCREW #10-24 x 3/8	HC572811
145	CUSHION, SEAT POST	3670M143
146	RUBBER BUMPER	PR060367
147	HEX HEAD SCREW, 1/4-20 x 1	HC621217
148	SCREW CAP WASHER	HS010001
149	SCREW CAP (WHITE)	PP080007
	SCREW CAP (BLACK)	PP080005
150	SHIM, HANDLE BAR	3670M130
159	FLAT WASHER	HS087601
162	RETAINER	3670M517
171	KEY	3670M511
172	NUT	3670P512
178	VOLTAGE RATING LABEL	367CM293
	FLYWHEEL BEARING ASSEMBLY	3670K701
	BIKE/SEMI CRANK REPLACEMENT KIT	3670K360
	WHITE TOUCH-UP PAINT	KT090008
	BLACK TOUCH-UP PAINT	KT050002