About this Troubleshooting Document

This document lists the error codes that exist within the Precor software hierarchy. Each section will include a description of the error code being displayed and the systems associated with the error code.

The document will then list potential causes for the error code with the most likely cause listed first and the least likely cause listed last. It must be understood that this document can not anticipate every possible cause for a particular error code. However, it should list the causes encountered in the majority of cases.

The document will then list the suggested remedies associated with each of the possible causes. The possible remedy listing will numerically coincide with the possible cause listing.

Error 00, 01, 02, 03, 04 - Memory, Ram & EEPROM Test Errors

Description

Errors 00 through Error 04 check upper PCA memory locations, RAM memory locations and EEPROM checksum during the power up test sequence. If a fault is found during the power up test sequence, the appropriate error code will be displayed.

Possible Causes

1. These errors messages almost always indicate an upper PCA problem when they are consistently displayed. Failures causing these error messages to be displayed are rare.

Possible Remedies

1. If the error message is consistently displayed when the unit is powered up, the upper PCA should be replaced. It is possible to see one of these messages displayed intermittently due to external causes. If the units A.C. input significantly dips during the power up test sequence the test could fail resulting in one of these messages being displayed. Treadmills operating on non-dedicated A.C. circuits may see these messages displayed on an intermittent basis.

Error 05 - Key Depressed at Power Up

Description

The power up test sequence has detected a key in the operated condition. The power up test sequence is performed every time the unit is turned on (powered up). This test is performed because a permanently stuck key will inhibit the correct operation of the unit.

Possible Causes

1. A key on the display housing is permanently stuck in the operated condition.
2. One of the upper PCA's keypad interface chips has failed.
3. Liquid (perhaps perspiration) is present on the surface of a touch sensitive display.

Possible Remedies

1. Remove the keypad connector cable from the upper PCA. Restart the power up sequence, if the ERROR 5 is no longer present, the keypad is the cause. The keypad is typically part of the display housing. Replace the display housing to correct the problem.
2. Remove the keypad connector cable from the upper PCA. Restart the power up sequence, if the ERROR 5 is still present, the upper PCA is the cause. Replace the upper PCA to correct this problem. Most upper PCA's are provided without software. Therefore, the software (chip) must be removed from the upper PCA being replaced and re-installed on the replacement upper PCA.
3. Wipe the surface of the touch sensitive display clean of all liquid. Restart the power up sequence, if the ERROR 5 is no longer present, the liquid was the cause.

Error 09 - Lower PCA Memory Test Errors

Description

Error 09 checks lower PCA memory locations during the power up test sequence. If a fault is found during the power up test sequence, error 09 will be displayed. This error code is only used on products utilizing the dual microprocessor system.

Possible Causes

1. This error message almost always indicates a lower PCA problem when it is consistently displayed. Failures causing this error message to be displayed are rare.

Possible Remedies

1. If the error message is consistently displayed when the unit is powered up, the lower PCA should be replaced. It is possible to see this error message displayed intermittently due to external causes. If the units A.C. input significantly dips during the power up test sequence the test could fail resulting in this message being displayed. Treadmills operating on non-dedicated A.C. circuits may see this message displayed on an intermittent basis.

Error 10 - Line Frequency out of Acceptable Range

Description

This error is present on treadmills using an SCR motor controller and the C544 EFX. Because the treadmill running belt speed (and C544 resistance) is derived from the A.C. line frequency, it is critical that the unit's operating system can correctly identify the A.C. line as either 50 Hz. or 60 Hz. and ensure that the line frequency is within acceptable tolerances.

Possible Causes

1. The treadmill is operating on a non-dedicated A.C. circuit.
2. On 120 V.A.C. circuits the A.C. hot and A.C. neutral wires are reversed.
3. Incorrect jumper setting on the upper PCA
4. The fuse feeding the treadmills stepdown transformer is blown.
5. The A.C. line frequency is incorrect.
6. The A.C. line may be extremely noisy.

Possible Remedies

1. Treadmills must be installed on a completely dedicated 20 amp A.C. circuit. Both the hot and neutral leads must be dedicated to the treadmill. If another piece of equipment is sharing a circuit with the treadmill it can create enough electrical noise to make A.C. line frequency identification impossible. The treadmill's A.C. circuit must be reconfigured as a completely dedicated 20 amp circuit.
2. Most line frequency detection systems monitor the A.C. line frequency on the hot A.C. line. In the case of a reversed 120 V.A.C circuit, the monitoring is taking place on the neutral (ground) side of the A.C. line. Many of the monitoring systems are incapable of detecting line frequency on the neutral wire. It must first be determined if the reversal is in the A.C. wiring feeding the treadmill or in the treadmill internal wiring. The hot and neutral wires can be verified by measuring each in reference to A.C. (green wire) ground. The hot lead will read full line voltage (typically 105 to 120 V.A.C.) and the neutral line should read approx. 0 V.A.C.
3. Some upper PCA's had jumper setting for use with "SCR" or "PWM" drive circuits. If the upper PCA jumper was set for "PWM" operation on an SCR unit, error 10 would be displayed. Change the upper PCA jumper setting to "PWM" to correct the problem.
4. Some treadmills (C944 PWM version 2 and C96X PWM version 2) utilized a pair of fuses feeding the stepdown transformer for the low voltage power supply on the lower PCA. The A.C. line frequency was monitored on the output of one of the fuses. If the fuse blew, A.C. line frequency could no longer be detected even though the treadmill appeared normal otherwise.
5. Even though unlikely, the A.C. line frequency could actually be out of acceptable limits. This is more likely to occur in countries where A.C. power systems may not be well developed and controlled. There may be little that can be done about this condition. If the source frequency can not be corrected the only possibility may be replacing the treadmill with a treadmill utilizing a PWM motor controller. PWM motor controllers do not depend on line frequency for speed control.
6. Sometimes A.C. being fed into the distribution system is too electrically noisy to allow correct line frequency identification. This can be caused by other equipment within the A.C. distribution system creating the electrical noise. Identifying the source of the electrical noise can be difficult. There may be little that can be done about this condition. If the source can not be located or the source can not be removed or made electrically quiet the only possibility

may be replacing the treadmill with a treadmill utilizing a PWM motor controller. PWM motor controllers do not depend on line frequency for speed control.

Error 11 - Watchdog (Upper PCA)

Description

The error 11 watchdog monitors the upper PCA low voltage power. If the low voltage power drops below a preset level, the error 11 will be displayed.

Possible Causes

1. A failure in the upper PCA overloads the low voltage power supply and causes it to drop below the preset limit.
2. A fault in the interconnect cable (lower PCA to upper PCA) causing the input voltage to the upper PCA to be too low.

Possible Remedies

1. If the error message is consistently displayed when the unit is powered up, the upper PCA should be replaced. It is possible to see this message displayed intermittently due to external causes. If the units A.C. input significantly dips during the power up test sequence the test could fail resulting in this message being displayed. Treadmills operating on non-dedicated A.C. circuits may see this message displayed on an intermittent basis.
2. Substitute a known good interconnect cable in place of the existing cable to determine if the interconnect cable is the cause. For the purpose of the test, the substitute cable should be connected directly between the upper and lower PCA's.

Error 12 - Watchdog (Lower PCA)

Description

The error 12 watchdog monitors the lower PCA low voltage power. If the low voltage power drops below a preset level, the error 12 will be displayed.

Possible Causes

1. A failure in the lower PCA overloads the low voltage power supply and causes it to drop below the preset limit.
2. A fault in the interconnect cable (lower PCA to upper PCA) causing the lower PCA low voltage power supply be too low.
3. A failure in the upper PCA that overloads the lower PCA low voltage power supply causing it to be too low.

Possible Remedies

1. If the error message is consistently displayed when the unit is powered up, the lower PCA should be replaced. It is possible to see this message displayed intermittently due to external causes. If the units A.C. input significantly dips during the power up test sequence the test could fail resulting in this message being displayed. Treadmills operating on non-dedicated A.C. circuits may see this message displayed on an intermittent basis.
2. Substitute a known good interconnect cable in place of the existing cable to determine if the interconnect cable is the cause. For the purpose of the test, the substitute cable should be connected directly between the upper and lower PCA's.
3. Substitute a known good upper PCA for the existing PCA to determine if the upper PCA is the cause.

Error 13 - Fan at Incorrect Speed

Description

This error monitored the rotating speed of an external cooling fan attached to the drive motor on 9.55, C954 version 1 and C956 version 1 treadmills. The system used an optical speed sensor that read an infrared signal reflected back to the speed sensor from a target attached to the hub of the cooling fan.

Possible Causes

1. It was determined that the fan speed sensing system was unreliable and false error 13 indications were being displayed. The lower software was changed to remove all error 13 indications.
2. If the installed software includes an error 13, the fan may be clogged with dust and/or dirt.

Possible Remedies

1. Replace the lower PCA software with the most current lower PCA software available.
2. Clean the fan. If the error 13 still occurs, replace the lower PCA software with the most current lower PCA software available.

Error 20 - Too many Maximum Power Requests in 1 Second

Description

This error monitors the treadmills power bit reading when the treadmill was operating at speeds of 1 mile per hour or less. Power bits indicate the relative time that the motor controller drive circuit is turned on. Therefore power bits is an indication of the amount of power the load is demanding from the motor controller. Error 20 indicates that at a speed of 1 mile per hour or less an excessive amount of power is being demanded from the motor controller for an excessive period of time.

Possible Causes

1. The treadmill user (especially a heavier user) is standing on the drive belt as they start the running belt into motion. Starting the running belt into a very heavy load can cause the error 20 condition.
2. The running bed and/or running belt is badly worn and the error 20 occurs when the user steps onto the running belt.
3. The drive motor brushes are badly worn and not making sufficient contact with the drive motor commutator. The error 20 occurs when the user steps onto the running belt. The treadmill may also bog down when the user steps onto the running belt.
4. On treadmills utilizing an SCR motor controller, a leaky or shorted drive motor filter capacitor could raise the current demand sufficiently to cause the error 20.
5. On treadmills utilizing an SCR motor controller, a leaky or shorted drive motor inductor could raise the current demand sufficiently to cause the error 20.
6. A shorted or de-magnetized drive motor is causing the high power demand.

Possible Remedies

1. The user should be instructed to straddle the running belt and start the treadmill at a low speed (1 mile per hour or less) and then step onto the running belt.
2. A clamp-on A.C. ammeter must be used to determine the amount of A.C input current being drawn by the treadmill under no load and loaded conditions. The current readings can be used to determine the condition of the running belt and/or running bed. These same readings should be taken on a similar unit with a known good running belt and running bed. Those readings can then be used as a benchmark for future use. Replace the running belt and/or running bed as required. Remember, many running beds are double sided and the bed can be flipped over rather than being replaced.
3. Replace both drive motor brushes.
4. A clamp-on ammeter should be used to measure the A.C. input current at no load. The filter capacitor should then be electrically isolated from the drive motor circuit. The drive motor leads must be kept intact so that the drive motor will operate with the filter capacitor removed from the circuit. The no load A.C. input current should be measured again, if the A.C. input current is significantly lower, replace the filter capacitor.
5. Use the same procedure as in step 4 above, except remove and isolate the inductor from the drive motor circuit instead of the filter capacitor.
6. A known good drive motor must be substituted for the existing drive motor.

Error 21 - Too many Maximum Consecutive Power Requests

Description

This error monitors the treadmills power bit reading when the treadmill was operating at speeds above 1 mile per hour. Power bits indicate the relative time that the motor controller drive circuit is turned on. Therefore power bits is an indication of the amount of power the load is demanding from the motor controller. Error 21 indicates that at a speed of greater than 1 mile per hour an excessive amount of power is being demanded from the motor controller.

Possible Causes

1. The running bed and/or running belt is badly worn and the error 21 occurs while the treadmill is being used..
2. The drive motor brushes are badly worn and not making sufficient contact with the drive motor commutator. The error 21 occurs while the treadmill is being used. The treadmill may also bog down when the load or speed is increased.
3. Some lower PCAs require a jumper when installed in 120 V.A.C. treadmills.
4. On treadmills utilizing an SCR motor controller, a leaky or shorted drive motor filter capacitor could raise the current demand sufficiently to cause the error 21.
5. On treadmills utilizing an SCR motor controller, a leaky or shorted drive motor inductor could raise the current demand sufficiently to cause the error 21.
6. A shorted or de-magnetized drive motor is causing the high power demand.

Possible Remedies

1. A clamp-on A.C. ammeter must be used to determine the amount of A.C input current being drawn by the treadmill under no load and loaded conditions. The current readings can be used to determine the condition of the running belt and/or running bed. These same readings should be taken on a similar unit with a known good running belt and running bed. Those readings can then be used as a benchmark for future use. Replace the running belt and/or running bed as required. Remember, many running beds are double sided and the bed can be flipped over rather than being replaced.
2. Replace both drive motor brushes.
3. If the lower PCA requires the 120 VAC jumper and the jumper is not installed, the treadmill will typically display an error 21 between 7 and 8 M.P.H. Install the lower PCA jumper to correct this problem. **WARNING:** Be sure the treadmill is a 120 V.A.C. unit before installing the jumper. Installing the jumper on a 240 V.A.C. will cause the lower PCA to fail.
4. A clamp-on ammeter should be used to measure the A.C. input current at no load. The filter capacitor should then be electrically isolated from the drive motor circuit. The drive motor leads must be kept intact so that the drive motor will operate with the filter capacitor removed from the circuit. The no load A.C. input current should be measured again, if the A.C. input current is significantly lower, replace the filter capacitor.
5. Use the same procedure as in step 4 above, except remove and isolate the inductor from the drive motor circuit instead of the filter capacitor.
6. A known good drive motor must be substituted for the existing drive motor.

Error 22 - No Motor Pulses at Start Up

Description

Error 22 indicates that the drive motor (running belt) has been instructed to start, by either manual or program control, and the monitoring system has not received any response from the speed sensing system indicating that the drive motor has started.

Possible Causes

1. The treadmill utilizes an optical (infrared) speed sensor and the line of sight between the speed sensor and the speed sensor target is obstructed.
2. Drive motor brushes are bad.
3. The speed sensor position relative to the speed sensor target is incorrect.
4. The speed sensor potentiometer adjustment is incorrect (when equipped).
5. The speed sensor is inoperative.
6. The lower PCA is bad.
7. The lower PCA to upper PCA interconnect cable is bad.
8. The upper PCA is bad

Possible Remedies

1. Carefully, vacuum out the drive motor compartment with a static safe vacuum cleaner. Pay special attention to the area between the speed sensor and speed sensor target.
2. If the motor brushes do not make sufficient contact with the motor commutator, the drive motor will not start when drive voltage is applied. Replace both drive motor brushes.
3. Adjust the speed sensor position so that the space between the speed sensor and the speed sensor target is 3/16 inch and so that the speed sensor photo eye is aimed at the larger portion of the targets wedge shaped section. On hall effect speed sensors (magnetic sensor) the space between the end of the speed sensor and the flywheel tooth should be 3/16 inch.
4. Locate the speed sensor potentiometer on the lower PCA. Set the speed sensor potentiometer at mid-range. Start the treadmill and increase the speed to 6 mile per hour. Carefully adjust the speed sensor potentiometer to the point where the treadmill is operating the smoothest. Increase the treadmills speed to full speed at repeat the previous adjustment. These two adjustments are typically small and are usually only a matter of fine tuning.
5. If the speed sensor in inoperative the drive motor will start and run briefly before the error 21 occurs. If it is possible to access the speed sensor wiring, measure the D.C. voltage between the speed sensor leads Two of the leads will constantly read approximately 5 Vdc. Two of the leads will toggle between 0 Vdc. and 5 Vdc. as you slowly rotate the speed sensor target. If you do not see both measurements above, the speed sensor is inoperative and must be replaced. In some cases the speed sensor is mounted on the lower PCA and the the lower PCA must be replaced.
6. Substitute a known good lower PCA to determine if the lower PCA is bad.
7. Substitute a known good interconnect cable for the existing cable.
8. Substitute a known good upper PCA to determine if the upper PCA is bad.

Error 23 - Motor Pulses Missing after Start Up

Description

Error 23 indicates that the speed sensor signal was lost while the treadmill was in operation.

Possible Causes

1. The treadmill utilizes an optical (infrared) speed sensor and the line of sight between the speed sensor and the speed sensor target is obstructed.
2. The speed sensor position relative to the speed sensor target is incorrect.
3. The speed sensor potentiometer adjustment is incorrect.
4. The speed sensor or drive motor wiring has an intermittent connection.
5. The drive motor brushes are badly worn and not making sufficient contact with the drive motor commutator
6. The lower PCA is bad.
7. The lower PCA to upper PCA interconnect cable is intermittent.
8. The upper PCA is bad

Possible Remedies

1. Carefully, vacuum out the drive motor compartment with a static safe vacuum cleaner. Pay special attention to the area between the speed sensor and speed sensor target.
2. Adjust the speed sensor position so that the space between the speed sensor and the sped sensor target is 3/16 inch and so that the speed sensor photo eye is aimed at the larger portion of the targets wedge shaped section
3. Locate the speed sensor potentiometer on the lower PCA. Set the speed sensor potentiometer at mid-range. Start the treadmill and increase the speed to 6 mile per hour. Carefully adjust the speed sensor potentiometer to the point where the treadmill is operating the smoothest. Increase the treadmills speed to full speed at repeat the previous adjustment. These two adjustments are typically small and are usually only a matter of fine tuning.
4. Physically test all wiring and wire connections associated with the speed sensor and drive motor. Replace or repair wiring and wire connections as appropriate.
5. Replace both drive motor brushes.
6. Substitute a known good lower PCA to determine if the lower PCA is bad.
7. Substitute a known good interconnect cable for the existing cable.
8. Substitute a known good upper PCA to determine if the upper PCA is bad.

Error 24 - Reduce Speed Requested, Speed is not Reducing

Description

Error 24 indicates that the the speed control system has instructed the treadmill to slow down and the response from the speed sensing system indicates that the treadmill has not slowed. This error will typically occur when the actual operating speed is greater than the speed being requested under either manual or program control.

Possible Causes

1. The treadmill user (especially a heavier user) is operating the treadmill at a relatively a low speed and a high incline. Some treadmills, under the above conditions, will operate at a speed slightly higher than the selected speed because of the combination of very low running bed and running belt friction and the downward force of the users weight.
2. The lower PCA is bad.

Possible Remedies

1. The user must be informed that this error can occur under low speed, high incline conditions. They must also be aware that the treadmill speed control system must test for an over speed condition. The test and resulting error condition is for their protection.
2. The typical lower PCA failure mode producing an error 24, causes the drive motor to start immediately upon power up (without a manual or program drive motor start request). Replace the lower PCA.

Error 25 - Motor Pulse Count over Acceptable Limit

Description

This error monitors the treadmills power bit reading. Power bits indicate the relative time that the motor controller drive circuit is turned on. Therefore power bits is an indication of the amount of power the load is demanding from the motor controller. The treadmill software sets a maximum allowable power bit limit. Error 25 indicates that the maximum power bit limit is being exceeded.

Possible Causes

1. The running belt and/or running bed is badly worn.
2. On treadmills utilizing an SCR motor controller, a leaky or shorted drive motor filter capacitor could raise the current demand sufficiently to cause the error 25.
3. On treadmills utilizing an SCR motor controller, a leaky or shorted drive motor inductor could raise the current demand sufficiently to cause the error 25.
4. A shorted or de-magnetized drive motor is causing the high power demand.

Possible Remedies

1. A clamp-on A.C. ammeter must be used to determine the amount of A.C input current being drawn by the treadmill under no load and loaded conditions. The current readings can be used to determine the condition of the running belt and/or running bed. These same readings should be taken on a similar unit with a known good running belt and running bed. Those readings can then be used as a benchmark for future use. Replace the running belt and/or running bed as required. Remember, many running beds are double sided and the bed can be flipped over rather than being replaced.
2. A clamp-on ammeter should be used to measure the A.C. input current at no load. The filter capacitor should then be electrically isolated from the drive motor circuit. The drive motor leads must be kept intact so that the drive motor will operate with the filter capacitor removed from the circuit. The no load A.C. input current should be measured again, if the A.C. input current is significantly lower, replace the filter capacitor.
3. Use the same procedure as in step 4 above, except remove and isolate the inductor from the drive motor circuit instead of the filter capacitor.
4. A known good drive motor must be substituted for the existing drive motor.

Error 26 - Motor Pulse Width Incorrect

Description

This error monitors the speed sensor signal and verifies the the speed sensor signal is appropriate for the requested speed. If the speed sensor signal is incorrect or erratic an Error 26 will be displayed.

Possible Causes

1. The treadmill utilizes an optical (infrared) speed sensor and the line of sight between the speed sensor and the speed sensor target is obstructed.
2. The speed sensor position relative to the speed sensor target is incorrect.
3. The speed sensor potentiometer adjustment is incorrect (when equipped).
4. The speed sensor target is damaged.

Possible Remedies

1. Carefully, vacuum out the drive motor compartment with a static safe vacuum cleaner. Pay special attention to the area between the speed sensor and speed sensor target.
2. Adjust the speed sensor position so that the space between the speed sensor and the speed sensor target is 3/16 inch and so that the speed sensor photo eye is aimed at the larger portion of the targets wedge shaped section. On hall effect speed sensors (magnetic sensor) the space between the end of the speed sensor and the flywheel tooth should be 3/16 inch.
3. If the treadmill utilizes a speed sensor potentiometer, locate the speed sensor potentiometer on the lower PCA. Set the speed sensor potentiometer at mid-range. Start the treadmill and increase the speed to 6 mile per hour. Carefully adjust the speed sensor potentiometer to the point where the treadmill is operating the smoothest. Increase the treadmills speed to full speed at repeat the previous adjustment. These two adjustments are typically small and are usually only a matter of fine tuning.
4. Most speed sensor targets consist of a circular arrangement of alternate black and silver sections. If the speed sensor target is torn or badly scratched the speed sensor may receive an incorrect reading. Replace the speed sensor target.

Error 27 - Too Much Drive Motor Current

Description

Some treadmill motor controllers monitor the amount of current being delivered to the drive motor. The software sets a maximum amount of allowable drive motor current. This error indicates that maximum drive motor current has been reached.

Possible Causes

1. The running belt and/or running bed is badly worn.
2. A shorted or de-magnetized drive motor is causing the high power demand.

Possible Remedies

1. A clamp-on A.C. ammeter must be used to determine the amount of A.C input current being drawn by the treadmill under no load and loaded conditions. The current readings can be used to determine the condition of the running belt and/or running bed. These same readings should be taken on a similar unit with a known good running belt and running bed. Those readings can then be used as a benchmark for future use. Replace the running belt and/or running bed as required. Remember, many running beds are double sided and the bed can be flipped over rather than being replaced.
2. A known good drive motor must be substituted for the existing drive motor.

Error 28 - Temperature Too High

Description

Some treadmill motor controllers monitor the temperature of the motor controller output switching device. Typically, these motor controllers use a fan to force cool the output devices heat sink. This error indicates that the heat sink temperature has exceeded maximum.

Possible Causes

1. The lower PCA cooling fan is clogged.
2. The lower PCA cooling fan is inoperative.
3. The running belt and/or running bed is badly worn.
4. The lower PCA is defective.
5. A shorted or de-magnetized drive motor is causing the high power demand

Possible Remedies

1. Check the cooling fan mounted on the lower PCA to ensure that the fan is not clogged with dust. Thoroughly clean the fan and ensure that it spins freely. Some lower PCA's do not have a cooling fan and some lower PCA's have the fan mounted on the underside of the the lower PCA and are not immediately visible.
2. The lower PCA is clean and unobstructed but the fan does not spin. Ensure that the fan wiring is securely and correctly connected to the lower PCA. If the fan is unobstructed and the fan wiring is good, replace the lower PCA.
3. A clamp-on A.C. ammeter must be used to determine the amount of A.C input current being drawn by the treadmill under no load and loaded conditions. The current readings can be used to determine the condition of the running belt and/or running bed. These same readings should be taken on a similar unit with a known good running belt and running bed. Those readings can then be used as a benchmark for future use. Replace the running belt and/or running bed as required. Remember, many running beds are double sided and the bed can be flipped over rather than being replaced.
4. Substitute a known good lower PCA to determine if the lower PCA is defective.
5. Substitute a known good drive motor to determine if the drive motor is defective

Error 30, 31, 32 and 33 - Communications Error

Description

Errors 30 through 33 all indicate the loss of communications or erratic communications between the microprocessors in the upper PCA and the lower PCA. The trouble shooting procedures for all of the are essentially the same. Error 30 is defined as upper PCA not receiving from lower PCA. Error 31 is defined as faulty data received from lower PCA. Error 32 is defined as lower PCA not receiving from upper PCA. Error 33 is defined as faulty data received from upper PCA

Possible Causes

1. An upper PCA to lower PCA interconnect cable is bad.
2. The interconnect cable at the upper PCA was mistakenly plugged into the CSAFE connector.
3. A 5.17 EFX equipped with version 1.01 upper and lower software.
4. A 5.17 with mismatched upper and lower software.
5. A defective lower PCA.
6. A defective upper PCA.

Possible Remedies

1. Substitute a know good interconnect cable between the upper and lower PCAs to determine if the interconnect cable is defective.
2. Remove the interconnect cable from the CSAFE connector and insert it in the correct upper PCA connector.
3. Replace the 5.17 upper and lower software with the most current software versions.
4. If only one of the upper or lower software is version 1.01, replace the version 1.01 software with the most current version of software.
5. Substitute a known good lower PCA to determine if the lower PCA is defective.
6. Substitute a known good upper PCA determine if the upper PCAs defective.

Error 40 - No Lift Motion Detected

Description

Error indicates that the incline (lift) system on either a treadmill or EFX has been instructed to start moving and no lift motion has been detected by the lift position monitoring system.

Possible Causes

1. The lower PCA lift fuse blown.
2. The lift motor is physically jammed and unable to move.
3. The lower PCA is bad.
4. The lift capacitor is bad.
5. A lift motor winding is bad.
6. The upper PCA to lower PCA interconnect cable is bad.
7. The upper PCA is bad.

Possible Remedies

1. Remove power from the unit and remove the lift fuse from the lower PCA. Measure the fuse with an ohmmeter, the fuse should read approximately 1 ohm or less. If the ohmmeter reading is significantly high, replace the fuse. If the fuse is open, please refer to #3 and #4 below before you continue.
2. Disconnect the lift motor from the lift platform (treadmill) or ramp (EFX). If the lift tube or lift nut is jammed against the motor housing, rotate the lift nut or lift tube away from the motor housing. If the lift was jammed, please refer to #3 below before you continue. Calibrate the lift motor per the appropriate service manual procedure and reattach the lift motor to the lift platform or ramp.
3. The lower PCA can fail in one of two modes. The lift switch could fail in an operated condition. If this happens the lift will move (either up or down) as soon as the unit is powered up. The typical result is that the lift will be physically jammed as described above, it will also probably cause the lift fuse to blow.. The lift switch may also fail in an open condition. If this happens the lift will not operate in one direction. If either of these conditions occur the lower PCA must be replaced.
4. Some units use external lift capacitors, most have the lift capacitor mounted inside the lift motor. This section for for use on units with external lift capacitors. If the lift capacitor is shorted, the lift fuse will blow. The capacitor may be checked for a short by disconnecting it from the lift motor and measuring it with an ohmmeter. A good capacitor will read in the millions of ohms. If the reading is significantly low, replace the capacitor. Capacitors also fail in the open condition. If a lift capacitor is open the lift motor will try to run but will not have normal power. The capacitor may checked by measuring the A.C voltage across the capacitor. A good capacitor will read A.C. peak voltage an open capacitor will read A.C RMS voltage.
5. If a lift motor winding is bad the lift will not operate in one or both directions depending on the exact fault in the motor. The lift motor winding may be checked with an ohmmeter. A.C lift motors will have a split winding (3 wires) D.C lift motors will have a single winding. On A.C motors both windings must be checked. Depending on the lift motor being tested, normal winding readings could vary anywhere between 1 and 60 ohms. Refer to the appropriate service manual for the motor being tested.
6. Substitute a known good interconnect cable to determine if the existing interconnect cable is bad.
7. Substitute a known good upper PCA to determine if the existing upper PCA is bad.

Error 41 - Lift has not Responded in Acceptable Time

Description

This error code was present in early versions of software and is no longer being used. Should you encounter software with an error 41, troubleshoot it in the same manner as an error 40.

Error 42 - Lift Position Value Out of Range

Description

This error code monitors the physical lift position via a lift position potentiometer that mechanically tracks the lifts physical position and sends a D.C. voltage back to the control system that is converted to an eight bit digital number. This number is then used to represent the lifts physical position. The software sets upper and lower numerical limits. If the lift position number is found to be outside of the set limits, error 42 will be displayed.

When troubleshooting an error 42 is important to be aware of the actual physical position of the lift when the error occurs. If the lift is physically out of range or jammed you must first determine why the lift is physically out of range. When the lift is out of range the error 42 is a secondary symptom and the problem should treated as an error 40 instead of an error 42.

Possible Cause

1. Bad or intermittent connection in the lift motor connector.
2. The lift motor requires re-calibration.
3. The lift motor potentiometer is bad.
4. The lower PCA to upper PCA interconnect cable is bad.
5. The lower PCA is bad. (this is a rare condition)
6. The upper PCA is bad. (this is a rare condition)

Possible Remedies

1. Intermittent connections can be difficult to locate. If the error 42 condition is intermittent a connection is almost certainly the problem. This is especially true if the error 42 occurs while the lift is within its normal physical range. Carefully inspect the lift potentiometer connector, repair the poor connection, if possible. If the intermittent connection cannot be found or repaired, replace the lift motor. A lift calibration number of 0 or 255 indicates an open or shorted potentiometer connection. This problem could be anywhere between the lift motor and the upper PCA. It can typically be found and traced with an ohmmeter.
2. Refer to the appropriate service manual lift calibration procedure for the unit being tested. If the lift position number/physical lift position does not correspond with the service manual, re-calibrate the lift motor.
3. If the lift calibration number is not 0 or 255 and does not increment when the lift motor moves, replace the lift motor. A
4. Substitute a known good interconnect cable to determine if the existing interconnect cable is bad.
5. Substitute a known good lower PCA to determine if the existing lower PCA is bad.
6. Substitute a known good upper PCA to determine if the existing upper PCA is bad.

Error 43 - Zero Switch not Found

Description

The C944 and several versions of C96X used a lift position identification system that did not utilize a potentiometer.
Instead, it utilized a switch that would be physically actuated by the lift when the lift was in the zero incline position. A revolution sensor counted lifted motor revolutions to determine subsequent lift positions. In addition two limit switches where used to remove power from the lift motor if the lift moved outside of it's normal range.
When the unit was powered up the lift would start to hunt for the zero switch. It would first go up 4% (maximum lowest physical position was -3%) if it did not find the zero switch or it hit the upper limit switch, it would then go down until did find the zero switch. When the zero switch was located it would stop, the system would then know its physical position and be prepared to monitor the revolution sensor. If during this power up procedure the zero switch was not found an error 43 would be displayed.

Possible Causes

1. The lift position actuator does not physically operate the zero switch.
2. The lower PCA is bad.
3. The zero switch is bad.

Possible Remedies

1. There are several physical problems related to the lift platform mounting or the plate the zero switch is mounted on that can cause the actuator knob to miss the zero switch as it moves past. Repair the lift platform mounting, repair or replace the lift switch mounting plate as required.
2. The lower PCA provides a 5 VDC power source for the zero switch. You should measure 5 VDC across the zero switch when the zero switch is activated. If the reading is significantly low, remove both wires from the zero switch and repeat the measurement across the wires removed from the zero switch. If the reading is still significantly low, verify the zero switch wiring. If the wiring is intact and correctly connected, replace the lower PCA.
3. Move the lift to position where the zero is switch is not activated and remove power from the treadmill. Remove both leads from the zero switch and measure the zero switch with an ohmmeter. The zero switch should read very near 0 ohms. While measuring the zero switch with the ohmmeter, activate the switch by hand, the reading should change to infinite (open). If either of the above readings are significantly incorrect, replace the zero switch.

Error 44 - Un-commanded Lift Motion

Description

The lift control system has detected that the lift is in motion without a lift command having been issued. This can happen in one of two ways: either the lift drive circuit has failed in a turned on condition or the lift position sensor (lift position potentiometer or revolution sensor) is sending an erroneous signal to the lift control circuit.

Possible Causes

1. Poor or intermittent connection in the lift position sensor.
2. Bad lift position sensor
3. Bad lower PCA.

Possible Remedies

1. This is the most common cause of an error 44. Verify all wiring and connections associated with the lift position potentiometer. Repair or replace wiring or connections as appropriate. Because of the nature of the revolution sensor an error 44 is rarely associated with it.
2. Operate the lift in the diagnostics while monitoring the lift position number being displayed. The the reading is erratic and makes large changes in readings the lift position potentiometer is probably bad. Replace the lift position potentiometer or the lift motor if it utilizes an internal potentiometer.
3. If there is actual lift motion without a manual or program control lift command having been issued, replace the lower PCA.

Error 45 - Lift Moving in Wrong Direction

Description

The lift control system has detected that the lift is moving in the opposite direction of the issued lift command.

Possible Causes

1. Lift Motor hysteresis.
2. Bad lower PCA

Possible Remedies

1. This error would typically happen when the lift was already in motion (typically downward) when a lift command in the opposite direction (lift up) was issued. Some motors exhibited a very long turn around time and the lift motor would still be moving in the original direction (downward) while the control system was attempting to move the lift in the opposite direction. If the error 45 condition is persistent, replace the lift motor.
2. This is a very rare condition, if the lift moves in the opposite direction of the issued lift command, replace the lower PCA.

Error 50 - Too Much Brake (Magnet) Current

Description

This error is associated with eddy current EFX's. The resistance (brake) control system constantly monitors the amount of current being demanded by the eddy current magnet. Error 50 indicates that amount of current being demanded by the eddy current magnet is excessive.

Possible Causes

1. The most common cause of this error is shorted or damaged wiring between the lower PCA and the eddy current magnet.
2. The eddy current magnet is bad
3. The lower PCA is bad.

Possible Remedies

1. Carefully check the eddy current wiring and connections, ensure that the wires are not shorted together or shorted to the EFX frame. Repair or replace the damaged wiring as appropriate.
2. Remove the wires from the eddy current magnet. With an ohmmeter, measure across the eddy current magnets terminals. The ohmmeter should read approximately 100 ohms. If the reading is significantly low, replace the eddy current magnet. Measure between each eddy current magnet terminal and frame ground. Both readings should be infinite (open). If either reading is significantly low, replace the eddy current magnet.
3. If both the eddy current magnet wiring and the eddy current magnet are good (as tested above), replace the lower PCA.

Error 53 - Can’t Read Target, Can’t Find Home Switch

Description

This error is associated with the 5.17 EFX. When power is first applied to the 5.17, an arm with permanent magnets moves from its last position to the zero resistance position. Moving to the zero resistance position is a two step process. First it must move forward far enough to actuate the home switch and the move rearward to a set position (zero resistance) by reading a revolution sensor on the motor driving the moving arm. It detects the actual distance moved by counting motor revolutions. When in the correct physical position the arm stops and the 5.17 is ready for use. If when moving forward the zero switch is not activated or when moving rearward a response is not seen from the revolution sensor, an error 53 will be displayed.

Possible Causes

1. The F2 fuse is blown.
2. Intermittent or damaged home switch wiring.
3. Intermittent or damaged gear motor wiring.
4. A bad home switch.
5. A bad gear motor.
6. A damaged gear motor target.
7. A bad lower PCA.

Possible Remedies

1. Remove power from the 5.17. Remove the F2 fuse from the lower PCA. Measure the fuse with an ohmmeter. The fuse should measure 1 ohm or less. If the reading is significantly high, replace the fuse. If the F2 fuse was blown there may have been a reason that will cause the fuse to blow again such as; damaged gear motor wiring or a bad gear motor.
2. Carefully inspect the home switch wiring for intermittent or damaged wiring or connections. Replace or repair the wiring or connections as appropriate.
3. Carefully inspect the gear motor wiring for intermittent or damaged wiring or connections. Replace or repair the wiring or connections as appropriate.
4. With the moving arm away from the home switch, remove power from the 5.17. Remove both wires from the home switch. Check the home switch with an ohmmeter. It should measure approximately 0 ohms. While monitor the home switch resistance, activate the home switch by hand, the reading should change to infinite (open). If either reading is significantly incorrect, replace the home switch.
5. With power removed from the 5.17, remove both wires from the gear motor. Measure the gear motor resistance with an ohmmeter, it should read approximately 9 ohms. If the reading is significantly low or significantly high, replace the gear motor.
6. Visually inspect the gear motor target, if it is ripped, torn or badly scratched, replace the target.
7. Measure the voltage at the gear motor during the start up sequence, it should measure approximately 12 V.D.C. The voltage would only be present between the time the sequence was initiated and the error 53 is displayed.. If the voltage is significantly low or absent and the F2 fuse is good (see step 1), replace the lower PCA.

Error 54 - Target Pulses Lost During Operation

Description

This error is associated with the 5.17 EFX. This error indicates that at some time after the initial start up sequence was successfully completed, the gear motor was instructed to move and no response was seen from the motors revolution sensor.

Possible Causes

1. The F2 fuse is blown
2. Damaged or Intermittent gear motor wiring.
3. Bad gear motor
4. Damaged gear motor target
5. Bad lower PCA

Possible Remedies

1. Remove power from the 5.17. Remove the F2 fuse from the lower PCA. Measure the fuse with an ohmmeter. The fuse should measure 1 ohm or less. If the reading is significantly high, replace the fuse. If the F2 fuse was blown there may have been a reason that will cause the fuse to blow again such as; damaged gear motor wiring or a bad gear motor.
2. Carefully inspect the gear motor wiring for intermittent or damaged wiring or connections. Replace or repair the wiring or connections as appropriate.
3. With power removed from the 5.17, remove both wires from the gear motor. Measure the gear motor resistance with an ohmmeter, it should read approximately 9 ohms. If the reading is significantly low or significantly high, replace the gear motor.
4. Visually inspect the gear motor target, if it is ripped, torn or badly scratched, replace the target.
5. Measure the voltage at the gear motor during the start up sequence, it should measure approximately 12 V.D.C. The voltage would only be present between the time the sequence was initiated and an error was displayed.. If the voltage is significantly low or absent and the F2 fuse is good (see step 1), replace the lower PCA.

Error 55 - Brake Home Switch Activated Unexpectedly

Description

This error is associated with the 5.17 EFX. This error indicates that the home switch was activated at a time other than the initial start up sequence. The home switch is only used to initially position the moving arm immediately after the 5.17 has been powered up.

Possible Causes

1. Damaged or shorted home switch wiring.
2. Bad lower PCA.

Possible Remedies

1. Carefully check the home switch wiring for possible shorts or faults to the frame. Replace or repair the wiring as appropriate.
2. If the lower PCA is applying a constant 12 V.D.C. to the gear motor, replace the lower PCA.