Procedure 5.3 - Troubleshooting the Lift System (i Units)

Lift System Description:
The C962i and C964i treadmills were manufactured with two types of lift systems. Units built prior to April 20, 2000 consisted of an AC line voltage driven lift motor (120 Vac or 240 Vac) and an external 10 KW potentiometer. The 10KW potentiometer rotates as the lift operates and indicates the current lift position. The lift system is factory calibrated, but will require re-calibration whenever the upper PCA is replaced (refer to procedure 4.2). Units built after April 19, 2000, utilized a lift motor with an internal 1 KW potentiometer. Use the procedure in steps 1-14 for trpubleshooting units manufactured prior to April 20, 2000. Start with step 15 for units manufactured after April 19, 2000.

Note:
All resistance measurements must be performed with power removed from the treadmill. Performing resistances measurements with voltage applied may damage your ohmmeter. Whenever the upper PCA is replaced on a C962i or C964i manufactured prior April 20, 2000, the lift system must be re-calibrated.

1. If the lift motor operates but creates a lift error (error 40, 41 or 42) go to step 8. If the lift motor will not move continue with step 2.

2. Put the treadmill in a condition in which the lift motor is ready to be operated (for example, quick start into the manual program). Using an AC voltmeter, monitor the voltage across the lift capacitor and press one of the incline keys. Approximately 1.4 times the AC input voltage should appear on the lift capacitor when a incline key is pressed. Approximately 170 Vac on a 120 Vac unit or approximately 340 Vac on a 240 Vac unit. The actual lift capacitor voltage will vary with the AC input voltage. If AC line voltage or 1.4 times line voltage is on the lift capacitor go to step 6. If no AC voltage is on the lift capacitor, continue with step 3.

3. Set the treadmill circuit breaker in the ìoffî position. Remove the 2 amp lift fuse (F2) from the lower PCA. Using an ohmmeter, measure the fuse resistance. The fuse should measure approximately 1W or less. If the fuse is open (ï) or significantly higher than 1W, replace the fuse. If the fuse was bad, perform the test in step 4 before applying power to the lift. If the fuse was good continue with step 5.

4. Using an ohmmeter, measure the resistance across the lift capacitor terminals. The lower PCA resistance should be extremely high (megohms), the capacitor resistance should be extremely high (megohms) and the lift motor winding should read approximately 34W (120 Vac units) or 122W (240 Vac units). Therefore, if the measurement is significantly lower than 34W or 122W, disconnect both red leads from the lift capacitor. Measure the resistance between the black leads on the lift capacitor and red lead to the lower PCA. If it measures significantly low, replace the lower logic/lift PCA. Measure the resistance between the black leads on the lift capacitor and red lead to the lift motor. If it measures significantly low, replace the lift motor. Measure the resistance between the black leads on the lift capacitor and other terminal of the lift capacitor. If it measures significantly low, replace the lift capacitor.

5. At this point the lift fuse is good, but there is no AC voltage on the lift capacitor when the lift is actuated. There are three potential causes for this condition. They are lower logic/lift PCA, ribbon cable or upper PCA. There are no good means of troubleshooting these components other than substituting known good components. Replace only one component at a time. If the component that you replaced does not correct the problem, replace the original component. Try substituting the lower PCA first, the ribbon cable second and the upper PCA third.

6. If you have performed all of the above procedures and have been unable to correct the problem, call Precor Customer Support.

7. Using an ohmmeter, measure the resistance across the lift capacitor terminals. The lower logic/lift PCA resistance should be extremely high (megohms), the capacitor resistance should be extremely high (megohms) and the lift motor winding should read approximately 34W or 122W. If it measures significantly high or open (ï), replace the lift motor.

8. If the resistance measurement in step 6 was approximately 34W (120 VAC units) or 122W (240 VAC units), replace the lift capacitor. If you have performed all of the above procedures and have been unable to correct the problem, call Precor Customer Support.

9. Typically, when the lift is able to physically move but causes a lift error, the problem is in the lift position identification system (lift potentiometer or lift calibration).

10. Measure the voltage between the red wire (term. 1 of J1) and the black wire (term 3 of J1) on the lower PCA. The voltage should measure approximately 5 Vdc. If the voltage is 0 Vdc or significantly low, continue with step 11. If the voltage is correct go to step 12.

11. Disconnect the J1 connector from the lower logic/lift PCA. Measure the voltage between term.1 of J1 and term 3 of J1on the lower PCA. If the voltage is still 0 Vdc or significantly low replace the lower logic/lift PCA. If the voltage is correct with the J1 connector disconnected, replace the potentiometer assembly.

12. Disconnect the J1 connector from the lower logic/lift PCA. With an ohmmeter, measure the resistance between the red wire (term. 1 of J1) and the black wire (term 3 of J1). The measurement should be approximately 10KW. With an ohmmeter, measure the resistance between the red wire (term. 1 of J1) and the white wire (term 2 of J1)and measure the resistance between the white wire (term. 2 of J1) and the black wire (term 3 of J1). The sum of the last two measurements should total approximately 10 KW.

13. If either of the two 10 KW measurements are open (ï) or significantly low or high, replace the potentiometer assembly.

14. If you have performed all of the above procedures and have been unable to correct the problem, call Precor Customer Support.

15. If the lift motor operates but creates a lift error (error 40, 41 or 42) go to step 22. If the lift motor will not move continue with step 2.

16. Put the treadmill in a condition in which the lift motor is ready to be operated (for example, quick start into the manual program). Using an AC voltmeter, monitor the voltage across the lift capacitor and press one of the incline keys. Approximately 1.4 times the AC input voltage should appear on the lift capacitor when a incline key is pressed. Approximately 170 Vac on a 120 Vac unit or approximately 340 Vac on a 240 Vac unit. The actual lift capacitor voltage will vary with the AC input voltage. If AC line voltage or 1.4 times line voltage is on the lift capacitor go to step 20. If no AC voltage is on the lift capacitor, continue with step 17.

17. Set the treadmill circuit breaker in the ìoffî position. Remove the 2 amp lift fuse (F2) from the lower PCA. Using an ohmmeter, measure the fuse resistance. The fuse should measure approximately 1W or less. If the fuse is open (ï) or significantly higher than 1W, replace the fuse. If the fuse was bad, perform the test in step 18 before applying power to the lift. If the fuse was good continue with step 19.

18. Using an ohmmeter, measure the resistance across the lift capacitor terminals. The lower PCA resistance should be extremely high (megohms), the capacitor resistance should be extremely high (megohms) and the lift motor winding should read approximately 32W (120 Vac units) or 115W (240 Vac units). Therefore, if the measurement is significantly lower than 32W or 115W, disconnect both red leads from the lift capacitor. Measure the resistance between the black leads on the lift capacitor and red lead to the lower PCA. If it measures significantly low, replace the lower logic/lift PCA. Measure the resistance between the black leads on the lift capacitor and red lead to the lift motor. If it measures significantly low, replace the lift motor. Measure the resistance between the black leads on the lift capacitor and other terminal of the lift capacitor. If it measures significantly low, replace the lift capacitor.

19. At this point the lift fuse is good, but there is no AC voltage on the lift capacitor when the lift is actuated. There are three potential causes for this condition. They are lower logic/lift PCA, ribbon cable or upper PCA. There are no good means of troubleshooting these components other than substituting known good components. Replace only one component at a time. If the component that you replaced does not correct the problem, replace the original component. Try substituting the lower PCA first, the ribbon cable second and the upper PCA third.

20. If you have performed all of the above procedures and have been unable to correct the problem, call Precor Customer Support.

21. Using an ohmmeter, measure the resistance across the lift capacitor terminals. The lower logic/lift PCA resistance should be extremely high (megohms), the capacitor resistance should be extremely high (megohms) and the lift motor winding should read approximately 32W or 115W. If it measures significantly high or open (ï), replace the lift motor.

22. If the resistance measurement in step 6 was approximately 32W (120 VAC units) or 115W (240 VAC units), replace the lift capacitor. If you have performed all of the above procedures and have been unable to correct the problem, call Precor Customer Support.

23. Typically, when the lift is able to physically move but causes a lift error, the problem is in the lift position identification system (lift potentiometer or lift calibration).

24. Measure the voltage between the red wire (term. 1 of J1) and the black wire (term 3 of J1) on the lower PCA. The voltage should measure approximately 5 Vdc. If the voltage is 0 Vdc or significantly low, continue with step 11. If the voltage is correct go to step 12.

25. Disconnect the J1 connector from the lower logic/lift PCA. Measure the voltage between term.1 of J1 and term 3 of J1on the lower PCA. If the voltage is still 0 Vdc or significantly low replace the lower logic/lift PCA. If the voltage is correct with the J1 connector disconnected, replace the potentiometer assembly.

26. Disconnect the J1 connector from the lower logic/lift PCA. With an ohmmeter, measure the resistance between the red wire (term. 1 of J1) and the black wire (term 3 of J1). The measurement should be approximately 1KW. With an ohmmeter, measure the resistance between the red wire (term. 1 of J1) and the white wire (term 2 of J1)and measure the resistance between the white wire (term. 2 of J1) and the black wire (term 3 of J1). The sum of the last two measurements should total approximately 1 KW.

27. If either of the two 1 KW measurements are open (ï) or significantly low or high, replace the lift motor assembly.

28. If you have performed all of the above procedures and have been unable to correct the problem, call Precor Customer Support.

Procedure 5.4 - Troubleshooting the Speed Sensor

Note:
The speed sensor is a hall effect sensor that emits a pulse when a flywheel lobe passes it. The speed control circuit processes the pulse train emitted by the speed sensor. The speed sensor signal is a real time representation of the operating speed of the treadmill. The speed control circuit compares the real time speed (speed sensor output) with the speed that it expects the treadmill to be operating at and acts accordingly to control treadmill speed or initiate an error code sequence, if necessary. Typically, if a problem exists with the speed sensor the drive motor will operate (perhaps only briefly) before a speed related error occurs (errors 20-26).

Note:
Some speed sensor have red, black and white wires and some have red, black and green wires. The following procedures will assume red, black and white wires. If the speed sensor on the unit under test has red black and green wires, perform your test procedures using the green wire instead of the white wire. The white and green wires serve the same function.

1. Set the treadmill circuit breaker in the ìonî position. Using a DC voltmeter, measure the voltage between terminal 1 of J5 (red wire) and terminal 3 of J5 (white wire) on the lower PCA. Slowly, rotate the drive motor flywheel. The voltage should read approximately 5 Vdc as a flywheel lobe passes the speed sensor and approximately 0 Vdc when a flywheel lobe is not in front of the speed sensor.

2. If the voltage in step 1 is correct, go to step 5. If the voltage in step 1 is 0 Vdc or significantly low when a flywheel lobe passes the speed sensor, continue with step 3.

3. Measure the voltage between terminal 1 of J5 (red wire) and terminal 4 of J5 (black wire) on the lower PCA. The voltage should read approximately 5 Vdc.

4. If the voltage is missing or significantly low, disconnect the speed sensor plug from the lower PCA. Measure the voltage between pins 1 & 4 of the J5 plug on the lower PCA. If the voltage is approximately 5 Vdc, replace the speed sensor. If the voltage is missing or significantly low, replace the lower PCA.

5. At this point the speed sensor output is good, but speed error occur. There are three potential causes for this condition. They are ribbon cable, upper PCA or lower PCA. There are no good means of troubleshooting these components other than substituting known good components. Replace only one component at a time. If the component that you replaced does not correct the problem, replace the original component. Try substituting the ribbon cable first, the upper PCA second and the lower PCA third.

6. If you have performed all of the above procedures and have been unable to correct the problem, call Precor Customer Support.