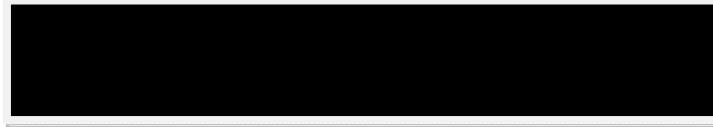


JOHNSON	Issue date	2017-2-20	Edition	01	Doc No.	SM-TM-AF-009
	Revision date		Edition time	01	Page	35



<h1>A30/A50</h1> <h2>Service manual</h2>
--

Approval	Review	Editor
Kyle.Schweitzer	Alex Tang	Dora Feng



Matrix Retail A30

Matrix Retail A50



		A30	A50
Frame	Resistance System	Internal ECB	Induction Brake
	Handle Bar Type	Stationary DA Arm - foam wrapped	Stationary DA Arm
	Power Supply	Yes (9 ft / 2.75m)	Yes (8 ft / 2.44m)

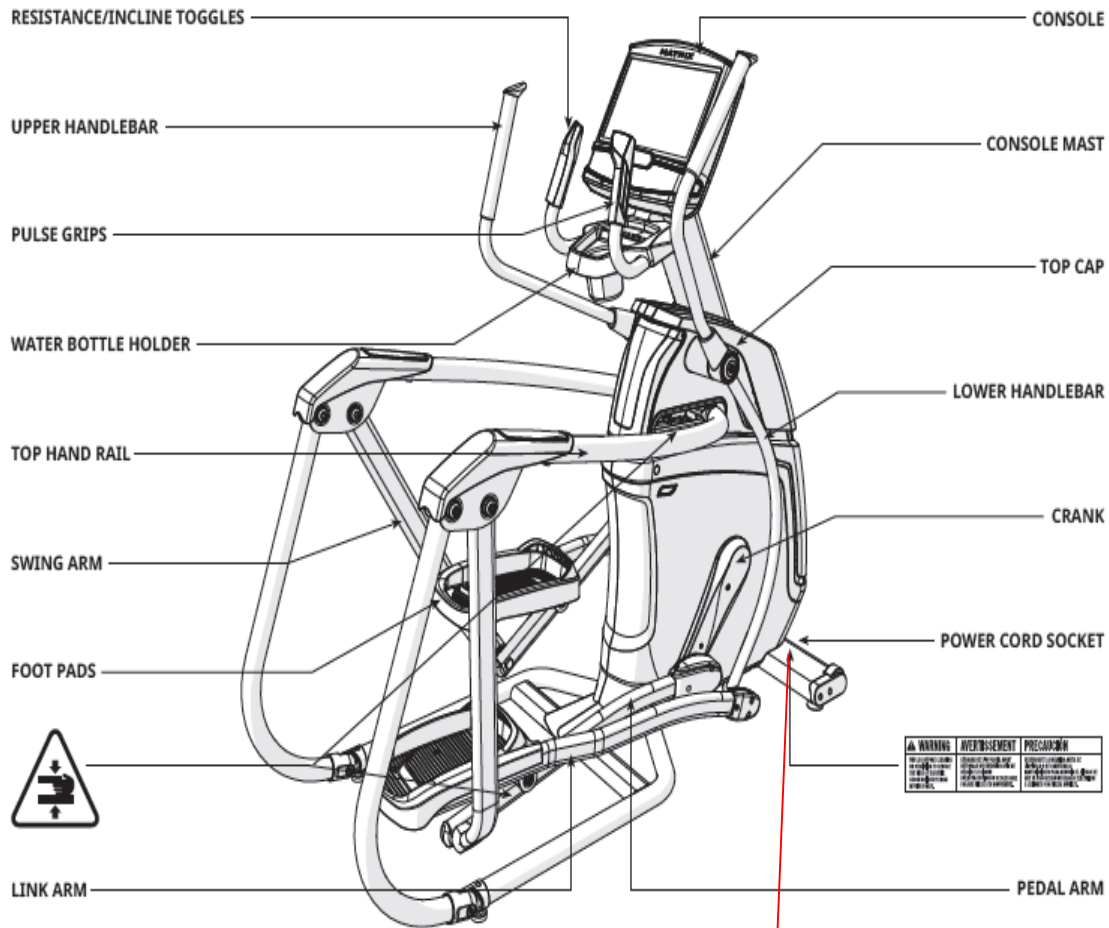
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CHAPTER 1: Serial Number Location

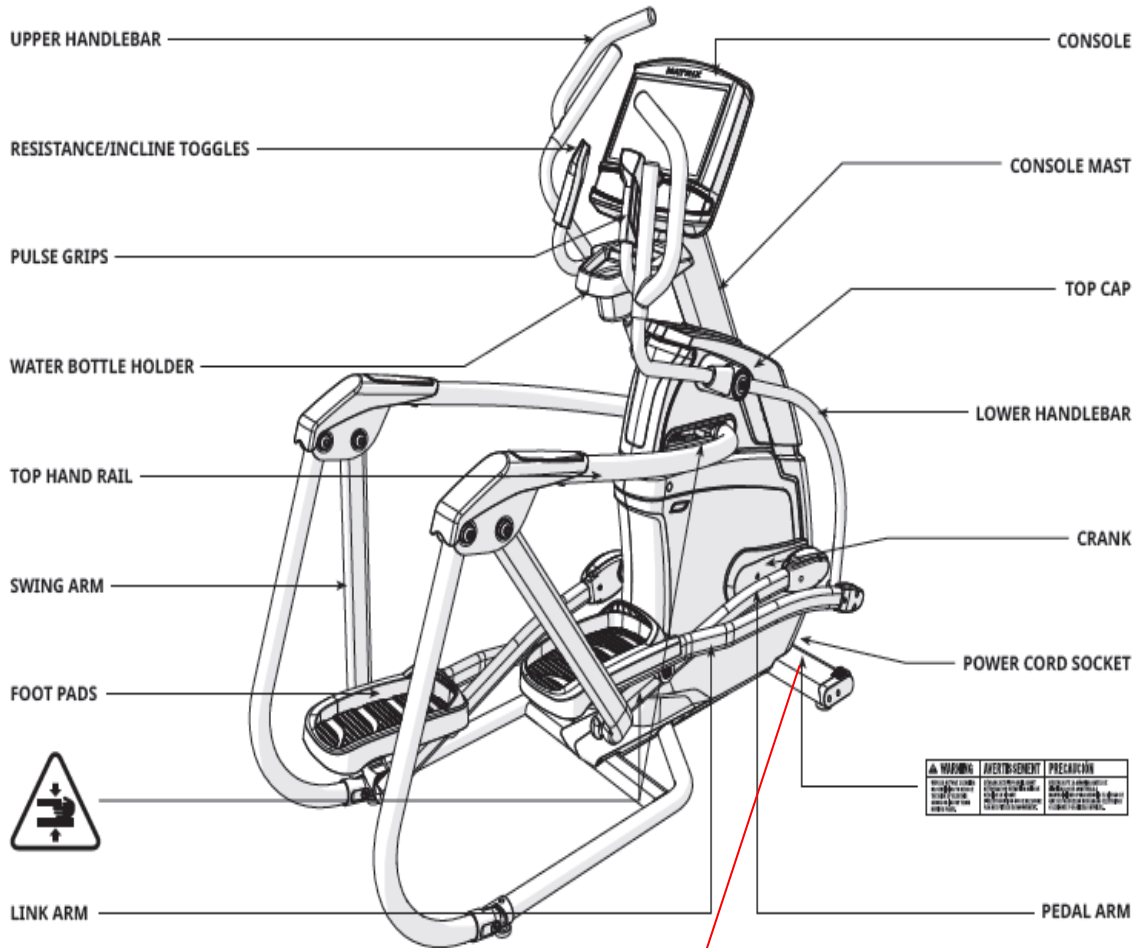
MATRIX A30 ELLIPTICAL FRAME



EP701-1US-F 10706987
MODEL:A-30-02-F
S/N :EP7011601CX00001
MADE IN CHINA

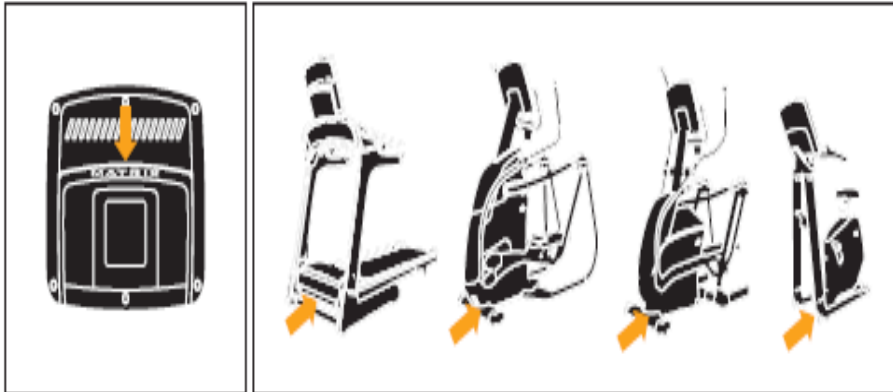
CHAPTER 1: Serial Number Location

MATRIX A50 ELLIPTICAL FRAME



EP702-1US-F 10706988
MODEL:A-50-F
S/N :EP7021601CX00001
MADE IN CHINA

SERIAL NUMBER LOCATIONS



Before proceeding, find the serial numbers located on barcode stickers and enter them in the spaces provided below.

CONSOLE SERIAL NUMBER

FRAME SERIAL NUMBER

CONSOLE

XR
 XER
 XIR

MODEL

<input type="checkbox"/> TF30	<input type="checkbox"/> TF50	MATRIX FOLDING TREADMILL
<input type="checkbox"/> T50	<input type="checkbox"/> T70	MATRIX NON-FOLDING TREADMILL
<input type="checkbox"/> E30	<input type="checkbox"/> E50	MATRIX SUSPENSION ELLIPTICAL TRAINER
<input type="checkbox"/> A30	<input type="checkbox"/> A50	MATRIX ASCENT TRAINER LOWER BODY
<input type="checkbox"/> R30	<input type="checkbox"/> R50	MATRIX RECUMBENT CYCLE
<input type="checkbox"/> U30	<input type="checkbox"/> U50	MATRIX UPRIGHT CYCLE

SOFTWARE UPDATE

Occasionally a software update may be available for your console, via automatic download when connected to Wi-Fi.

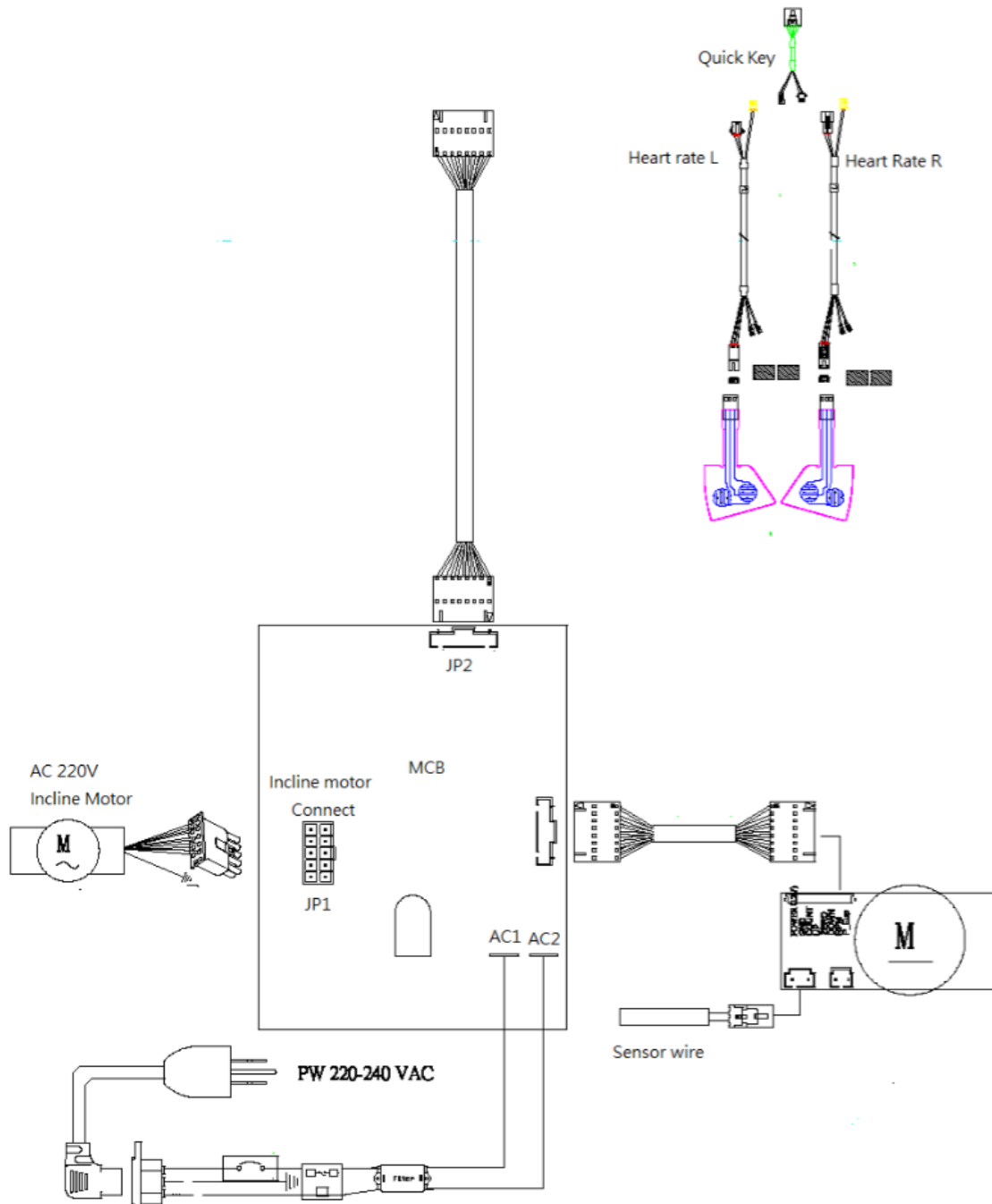
* Use the information above when calling for service.

Please refer to XR/XER/XIR service manual to get more details.

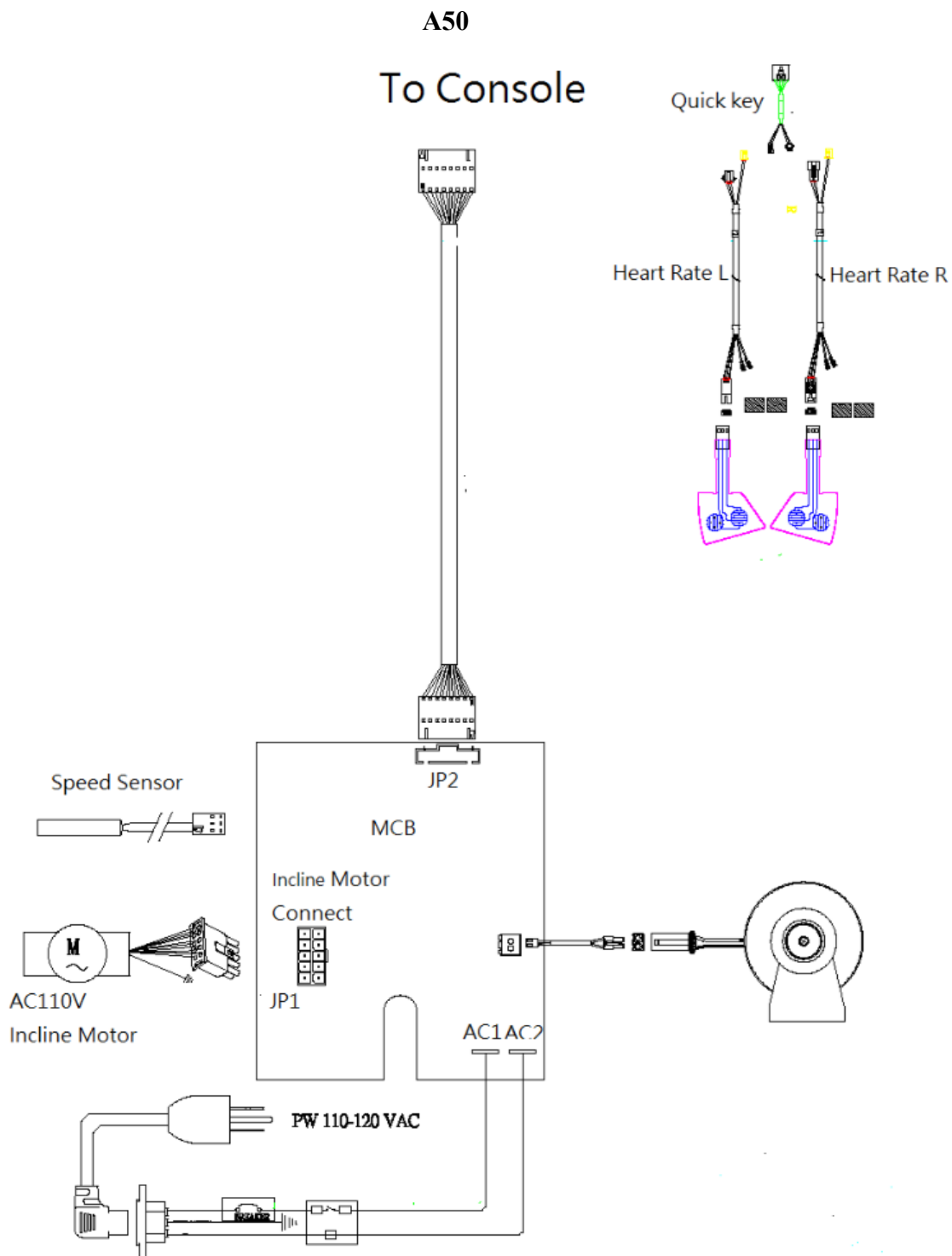


3.1 ELECTRICAL DIAGRAM

A30



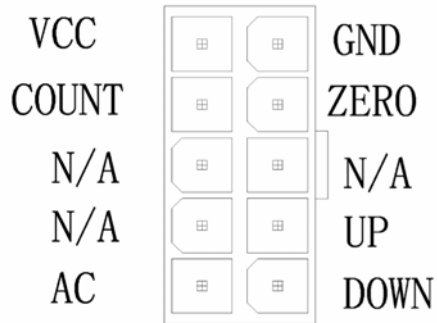
3.1 ELECTRICAL DIAGRAM



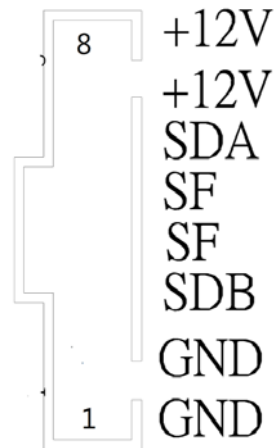
3.1 ELECTRICAL DIAGRAM

A30/50 Connection

Incline Motor CONNECT



Console Connection



3.2 MCB Connections

A30 MCB



1	AC input connector
2	Incline connector
3	ECB connector
4	Console connector

Number of LED Blinks	Status	Description	Possible Problem Component
1	Works normally	Works normally	
2	Optical Encoder without feedback	The optical encoder is without feedback for 3 seconds during start procedure or 1 second during workout	Poor contact or damage to the optical encoder
6	The incline motor is stuck or has lost efficiency	There is no signal to the MCB when the incline motor is energized.	Incline Motor
7	Communication abnormal	No or abnormal communication between the console and LCB.	Console Cable, UCB, or LCB

3.2 MCB Connections

A50 MCB



CN1	Incline Motor Connector
CN2	Console Connector
CN3	RPM feedback wire connector

Number of LED Blinks	Status	Description	Possible Problem Component
1	Works normally	Works normally	
3	overload/overcurrent	The motor current is over rated for more than 4 seconds.	
7	Communication abnormal	No or abnormal communication between the console and LCB.	Console Cable, UCB, or LCB

3.3.1 TROUBLESHOOTING – CONSOLE DOES NOT LIGHT UP

Symptom: No power to the console.

Solution:

1. Check the connection of the console cable at the console. Unplug the console cable from console, and use a multi-meter to check the voltage through the console cable. Normally it should be 12VDC between pin1 & pin8. If no voltage is present, the console cable or LCB is defective. Test voltage at LCB, if voltage is present replace console. If not, replace LCB.
2. If the voltage through the console cable is 12VDC, the console is defective. Replace it.

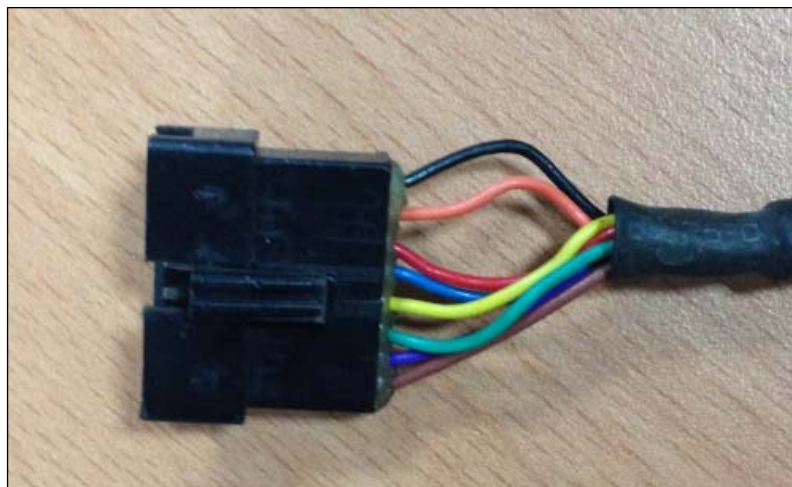
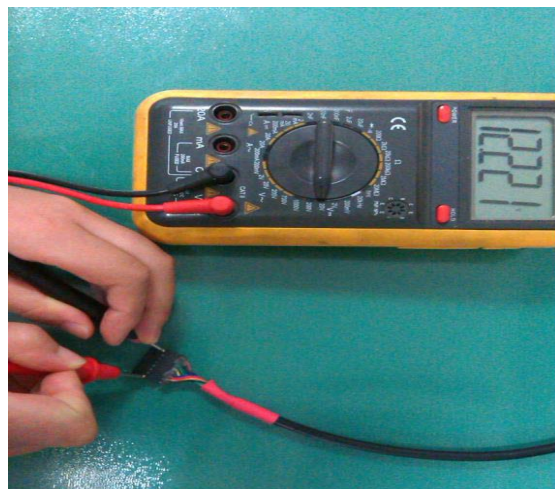
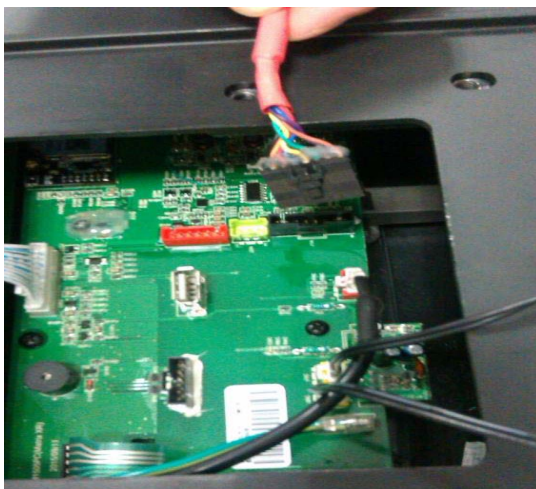


FIGURE A
(Console cable's connectors with UCB)



3.3.2 TROUBLESHOOTING- No Console Response

Symptom: The power is on, the console lights up, and a program can be started, but there is no control over the program.

Solution:

Enter into Engineering Mode and make sure that the Machine Type is set correctly.

3.3.3 TROUBLESHOOTING- System Will Not Boot

Symptom: System Will Not Boot

The LCD has a back light, but the system does not boot up (does not display the Matrix logo)

Solution:

1. Reload the software into UCB. Test the UCB. If fail, the system crashed, replace the UCB.

3.3.4 TROUBLESHOOTING- No Display on the Console or the Display is Dim

Symptom: No Display on the Console or the Display is Dim

Solution:

1. Check the connection of the console cable at the UCB.
2. Remove the console cable from the J5 socket on the console. Pedal the machine. Set your multi-meter to DC voltage. Place both terminals on pins 1 & 4 of the console cable. There should be a reading of more than 5.5VDC .If voltage is more than 5.5VDC, replace the console. If voltage is less than 5.5VDC, or the new console does not resolve the issue, replace the console cable.
3. Open the shrouds then check if all the wire harnesses are connected properly to the terminals of the LCB.
4. A50.

Unplug the generator cable from the control board, set your multi-meter to OHMS place both terminals on pins 1 &2, pins 2 & 3, and pins 3 & 1 of the generator terminal to check if the OHMS are all equal. If the OHM reading shown same on all 3 phases, replace the LCB. If the OHMS reading shown is not same, replace the generator.

3.3.5 TROUBLESHOOTING – No RPM Display

Symptom: No RPM shown on the console.

Solution:

1. Bad connection between the console cable and the console: re-connect the console wire.
2. Speed sensor wire defective: Check the gap between the speed sensor and magnet on pulley. It is normal within 5mm (Fig A). Adjust the gap if it is too large. Test sensor with Ohm meter with pin1 and pin2, pass magnet by sensor to test.
3. Lost magnet of pulley: Re-install a new magnet (Fig. B).
4. Console defective: Replace the console set.



3.3.6 TROUBLESHOOTING – NO RESISTANCE OR INCORRECT RESISTANCE

Symptom :

1. The resistance cannot be adjusted during exercise.
2. The resistance is reverse or much too heavy.

Solution (For A30) :

1. Turn on the console and check the ECB motor.

In resistance level 1, the head of steel rope directs to top right side (around 45 degree).

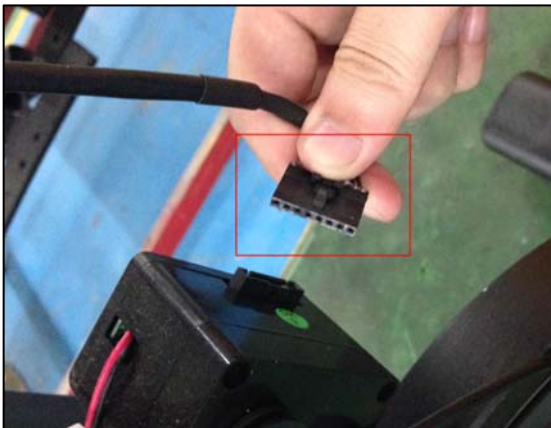
If the head of steel rope points to bottom left side, the resistance will be reverse. Adjust the head of steel rope to the correct position.

Notes: in the highest resistance level, the cable should have no tension (see ECB motor replacement section).



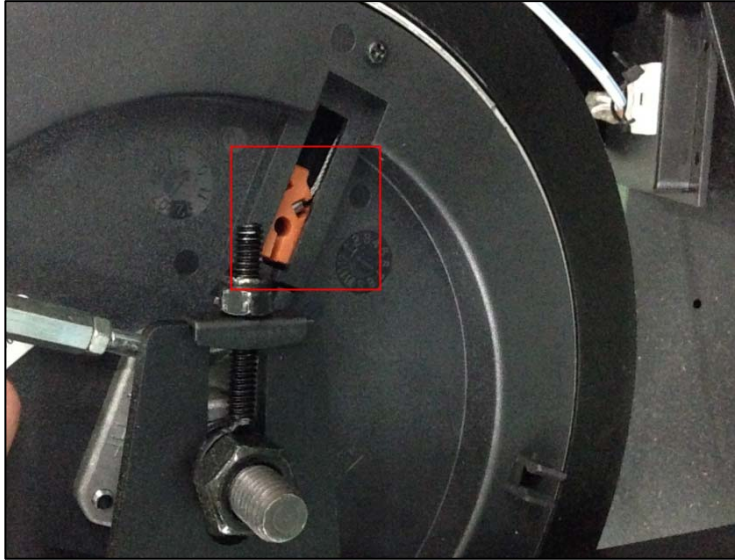
2. Press key “+” or “↑”to adjust the resistance.

A) If ECB motor cannot move, the resistance will not be changed. The ECB motor or console cable is defective. Check the console cable inserted in ECB motor. Re-connect the console cable first, if still not working, test cable for damage. If tests good, replace the ECB motor, make sure both cable ends are seated properly.

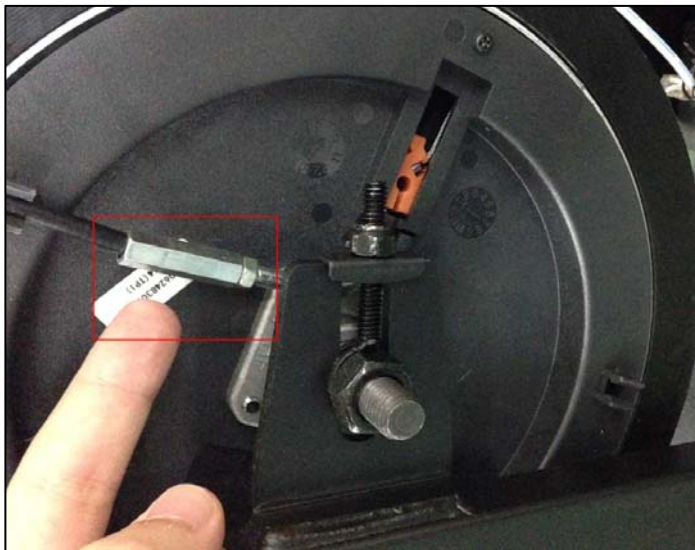


3.3.6 TROUBLESHOOTING – No Resistance Or Incorrect Resistance

B) If the ECB motor can move, the resistance can be adjusted. If the resistance is still too heavy, check the gap between orange block and the bottom. It should be within 1-2 mm.



If the gap is larger than 1-2 mm, the resistance will be heavier than normal. Adjust the cable to the correct gap range.



3. If all above conditions are ok, and the resistance is still too heavy, inside magnet is defective. Replace the ECB flywheel.

Solution (For A50) :

1. Check the power resistor wire connection between the power resistor and LCB (fig-1)
2. Check the Connection wire between consoles to LCB. Try to plug off and plug on connector (Page 13 ,CN2)
3. Check the power resistor whether 10K Ω by multi-meter (Fig-2), if not, replace power resistor.
4. If yes, Replace. LCB.

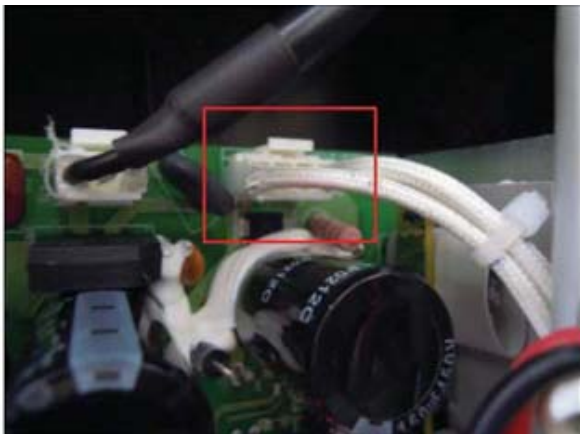


Fig1



Fig2

3.3.7 TROUBLESHOOTING-Heart Rate Function Issues

Symptom: Heart Rate Function Does Not Work or is Reading Incorrectly

Solution:

1. The heart rate grips are not connected properly or are defective.
With a multi-meter set for DC voltage, place one terminal on each of the HR grip plates. The HR grip should give a voltage reading of between 0.5 and 2.0VDC. If the voltage is not between 0.5 and 2.0VDC, remove the 3 screws holding the HR grip together and check the connection of the HR grip wiring.

2. The heart rate grip wiring is damaged or not connected correctly.
Check continuity of the HR grip wiring.
Place one terminal of a multi-meter set for resistance on the HR grip wiring at the HR grip, and the other terminal on the HR grip wiring at the console. An ohm reading of around 1 should be expected. If the reading is higher than 1,replace the HR grip wiring. Also test continuity of one terminal and to the frame (ground) to test for a pinched wire.

3. The HR board is damaged
Remove the console. Remove the 6 screws holding the front of the console to the rear. Check the connection of the HR board wiring to the UCB. If all the wiring is intact and has good contact, replace the HR board.

4. The UCB is damaged.
If the HR board, HR grips, and HR grip wiring do not solve the issue, replace the UCB.

3.3.8 TROUBLESHOOTING- Pedals Slipping/Belt Replacement

Symptom: Pedals Slipping or Belt Replacement

Reason:

1. The belt tension is not high enough;
2. The one way bearing is damaged.

Solution:

1. Remove the shrouds and check the belt tension. Tighten the drive belt tension if needed by moving the spring tension clip to another hole. The generator bolt should be tightened to 85 ft / lbs.
2. If the belts are tensioned correctly, belt tension range should be 175-190HZ. The one way bearing is damaged, replace the drive assembly.

3.3.9 TROUBLESHOOTING- Knocking or Creaking Noise

Symptom: Knocking or Creaking Noise

Solution:

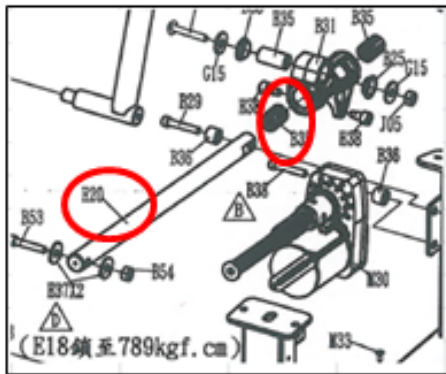
a. Hardware not tight or missing.

-Inspect the unit and check for any loose hardware. Pay special attention to areas where arms meet.
Tighten hardware where found.

b. The noise is related to the internal incline.

-If the noise is present only during incline, check to make sure the Teflon washers are installed at the incline motor connection point.

-Lubricate the guide rod of the incline motor with grease to reduce the abrasion with washer



c. The belt tension is not high enough, or the belts are too dirty.

-Remove the covers and check the belt tension.

-Tighten the drive belt tension if needed by moving the spring tension clip to another hole. It should be set to 180 ft / lbs of tension. The generator belt should be tightened to 90 ft / lbs.

-Clean the belts. If they are worn or will not clean, replace the belts.

3.3.10 TROUBLESHOOTING- handlebar keypad failure

1) Symptom:

No response from handlebar keypad, or stuck buttons.

2) Solution:

1. Disconnect handlebar keypad connection wire from back of console, and then press any button of console. If console display normal, this is handlebar keypad problem.

a. Check if the handlebar connector on console orientation is correctly?

Check if connector is 180 degree reverses on circuit board?

b. Check if use correct handlebar connection wire?

2. Inspection the Handlebar keypad as below procedures:

a. When handlebar key does not work, firstly measure the pins with AVO meter to check if the keypad is bad.

Pic1

b. Measure the resistance of keypad: "Ω" position on AVO meter, press keypad— keypad is good if the value <200Ω.

c. Same as step2, measure the other side keypad. Pic3.

d. If handlebar keypad is both good, next step is to judge if the handlebar cable works normally, replace the part to try to solve it.



Pic1

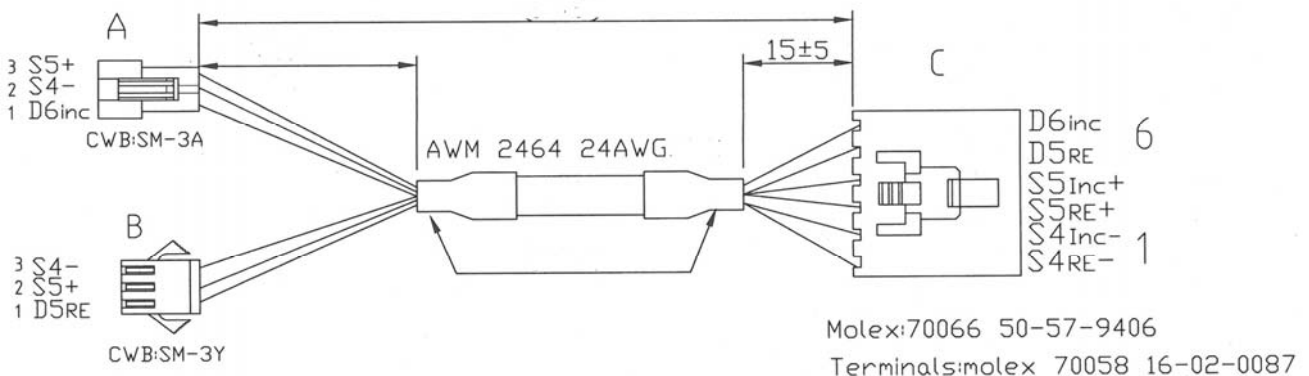


Pic2



Pic3

Note: A30/A50 Quick-key wire connection



4.1 CONSOLE REPLACEMENT

- 1) Remove the 4 screws holding the console back cover to the frame (Figure A).
- 2) Remove the 4 screws holding the Console to the frame (Figure B).
- 3) Disconnect all connections from the console and remove the console from console mast. (Figure C)



FIGURE A



FIGURE B



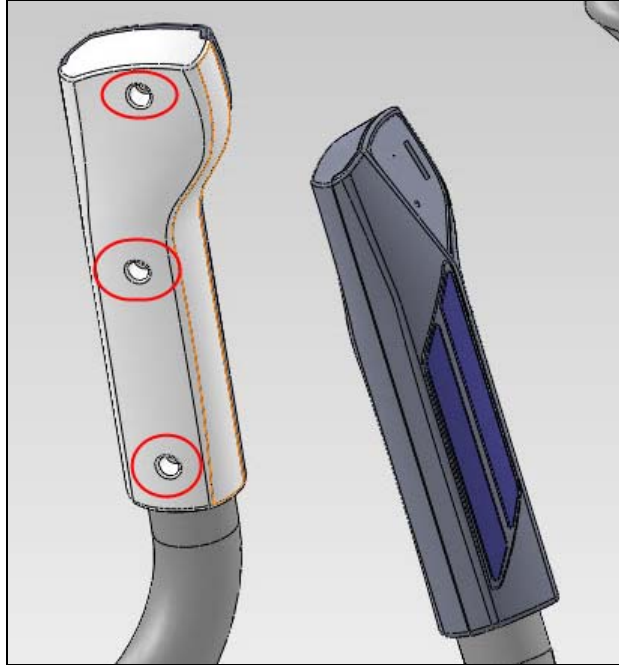
FIGURE C

- 4) Reverse steps to install the console.

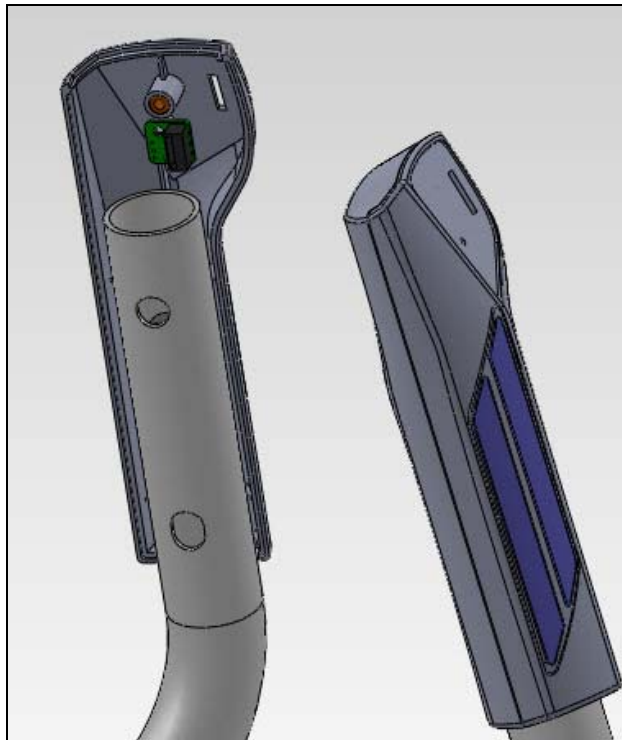
Notes: Carefully push the wires into the console and mast until they are clear of the console / mast connection.

4.2 HEART RATE GRIP REPLACEMENT

1. Remove 3 screws from the heart rate grip.



2. Separate the covers and disconnect all wires.



4.3 UPPER HANDLEBAR REPLACEMENT

1. Lift up on the cap by handlebar pivot joint (Figure A)

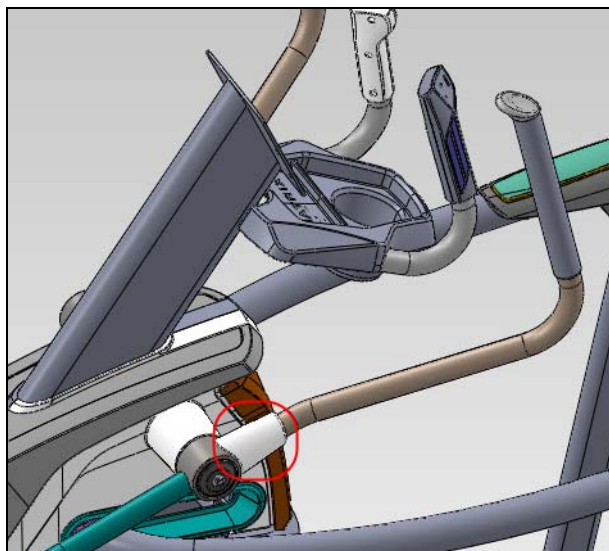


Figure A

2. Loosen the two sets screws, then you can pull the handle bar out of pivot joint.(Figure B)

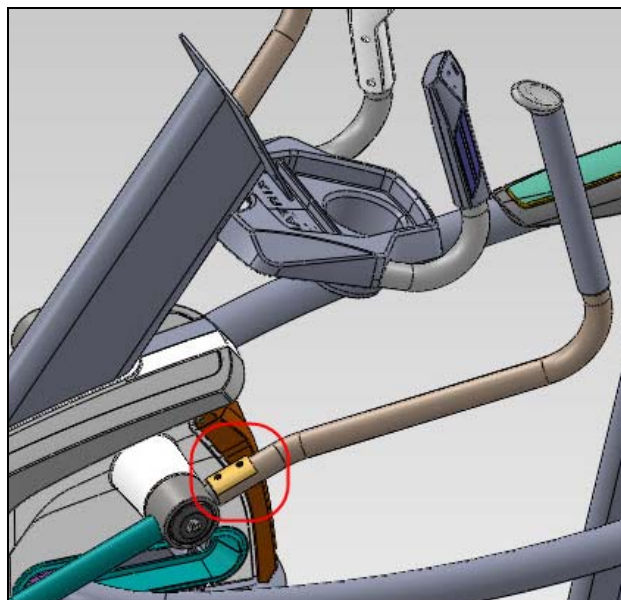


Figure B

4.4 LOWER HANDLEBAR REPLACEMENT

1. Remove bolt from the pivot joint which is marked "1", and remove the cap marked "2" (Figure A)

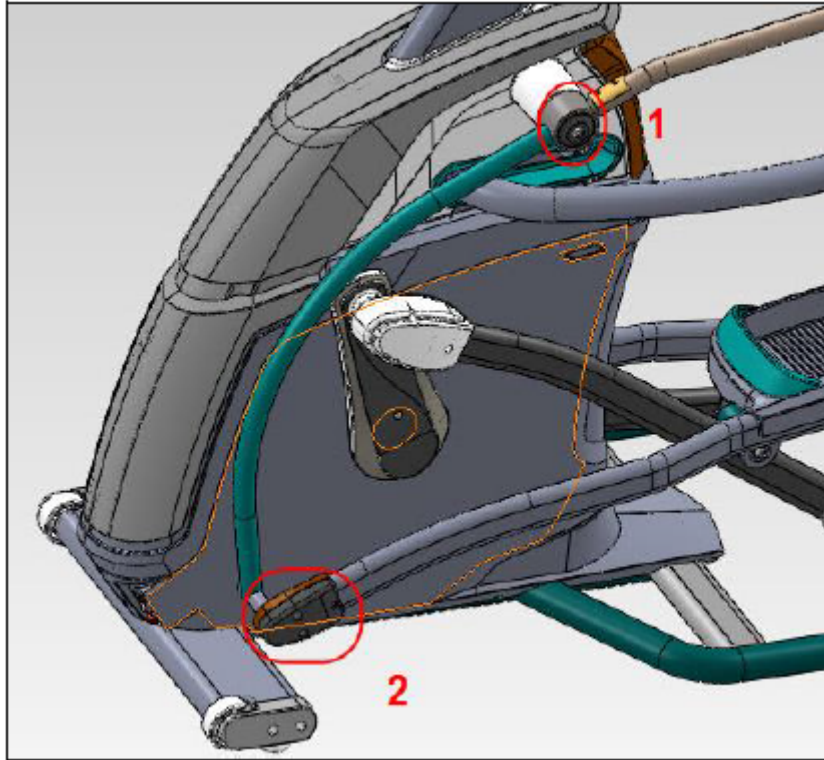


Figure A

2. Remove cap, bolt and screws to take off the Lower handlebar (Figure B)

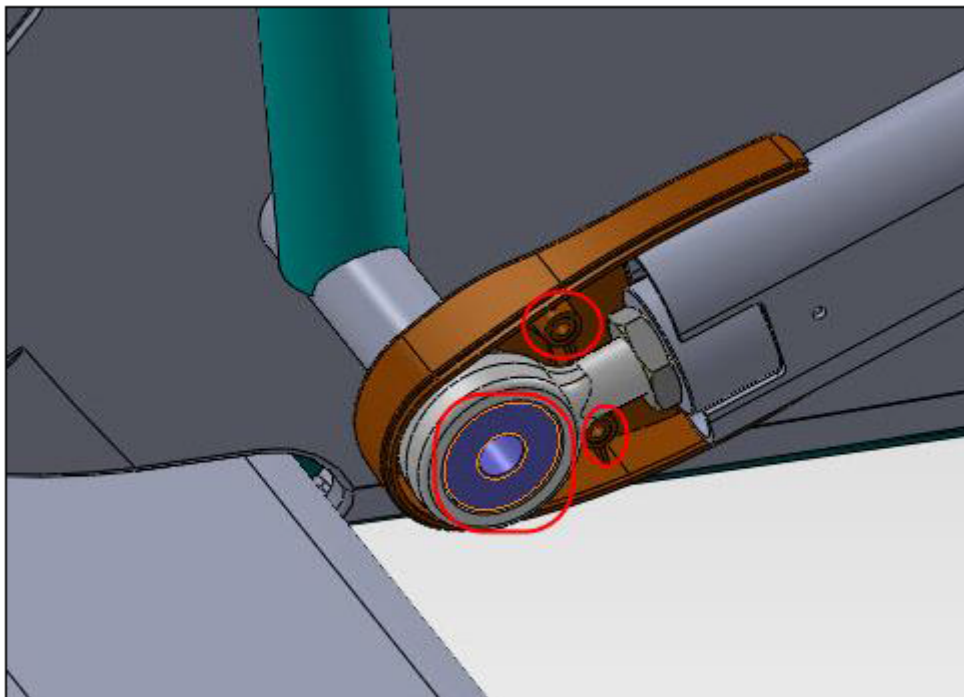


Figure B

4.5 PEDAL ARM SET REPLACEMENT

1. Remove the following—lower handlebar (see section 4.4).
2. Remove the bolt shown in Fig A, remove the pedal arm.

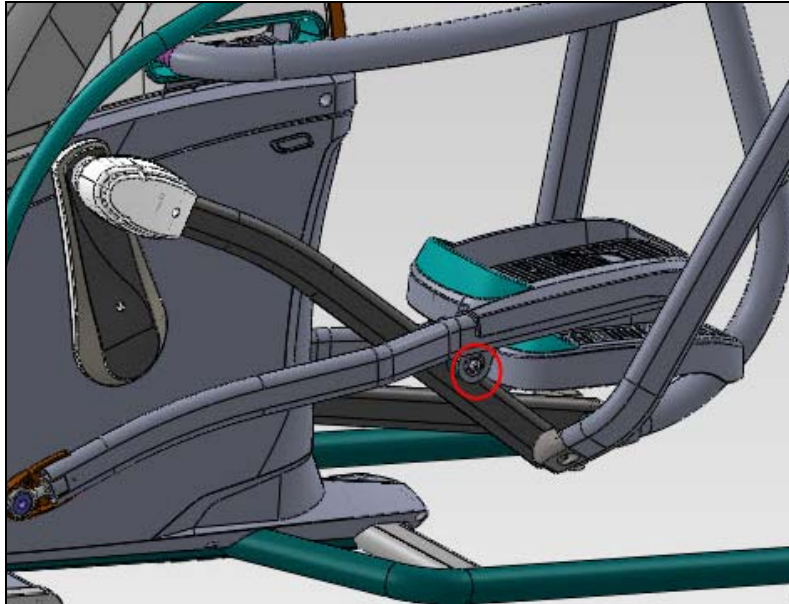


Figure A

4.6 CONSOLE MAST COVERS REPLACEMENT

1. Remove the 4 screws which fix the front cover. 2 in front and 2 in rear.(Figure A&B)

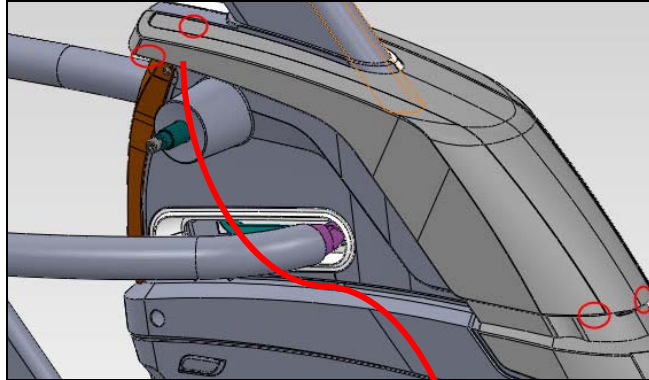


Figure A

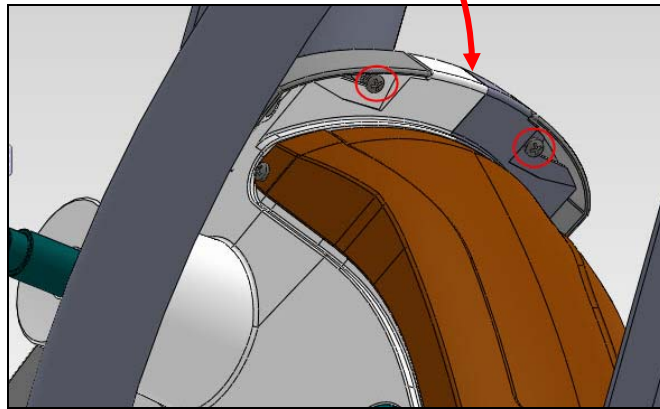


Figure B

2. Remove the 2 screws of the two side of rear cover to remove it (Figure C)
3. After removing the side cover you will see the console mast. (Figure D)

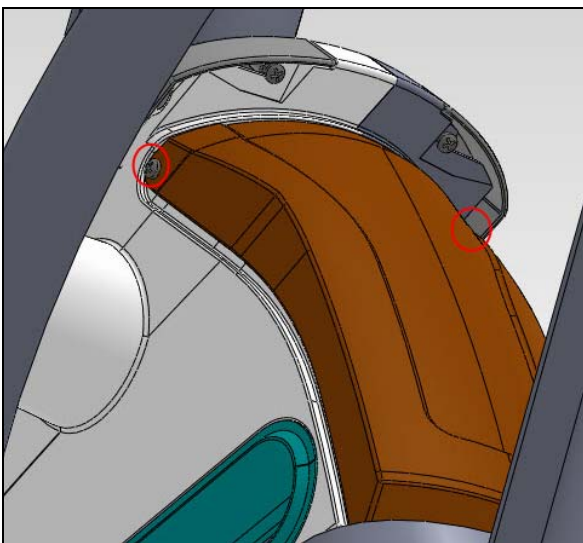


Figure C

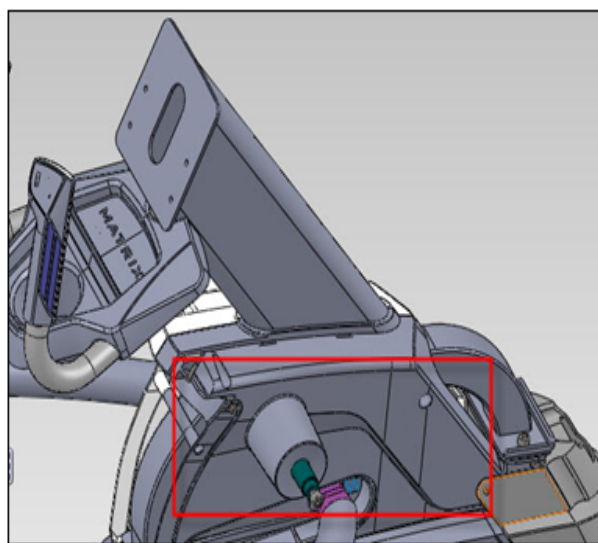


Figure D

4.7 CONSOLE MAST REPLACEMENT

1. Remove the following:
 - console (section 4.1)
 - console mast covers (section 4.6)
2. Remove the 4 bolts in front and rear. (Figure A&B)

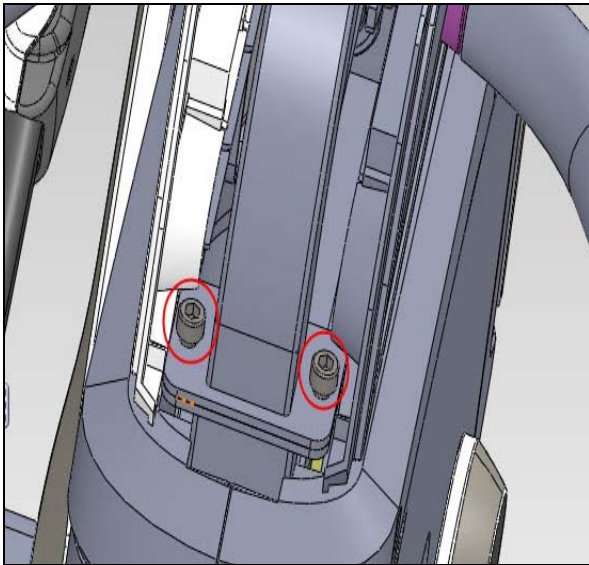


Figure A

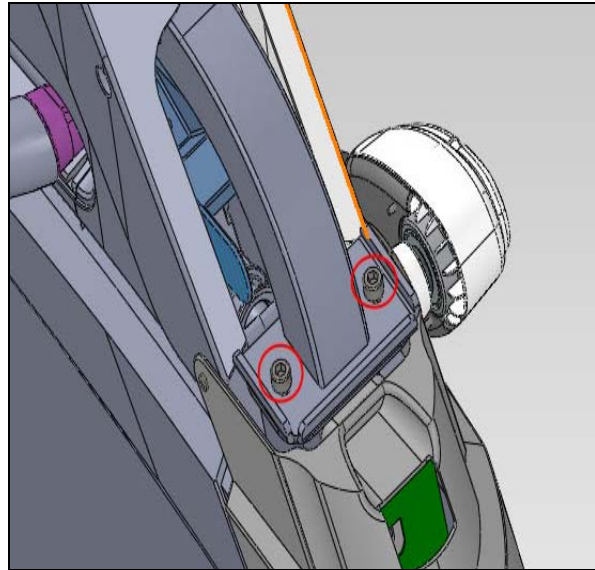


Figure B

3. Pull off the console mast , guide the console wires to protect from damage. (Figure D)

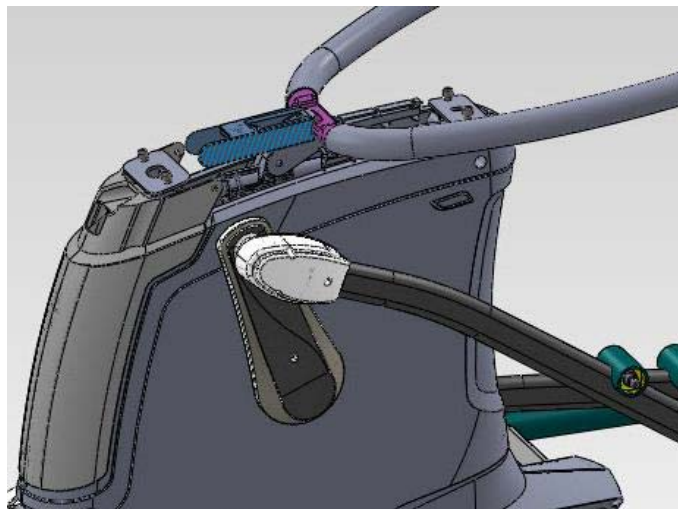


Figure C

4.8 LINK ARM REPLACEMENT

1. Remove the pedal arm (see section 4.5)
2. Remove the plastic cover (Figure A), then remove the link arm bolt (Figure B).

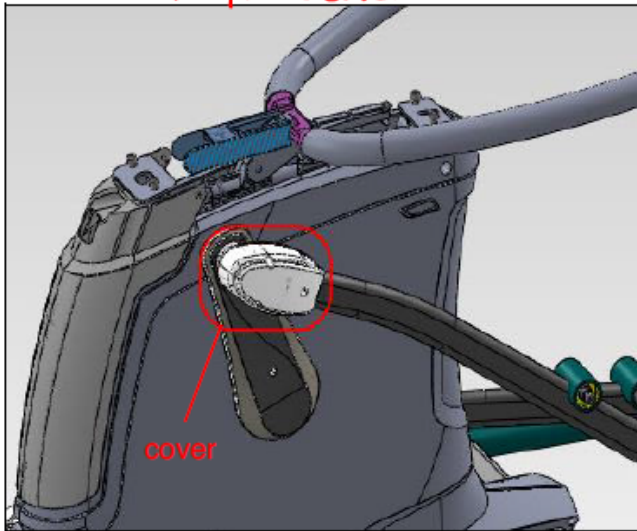


Figure A

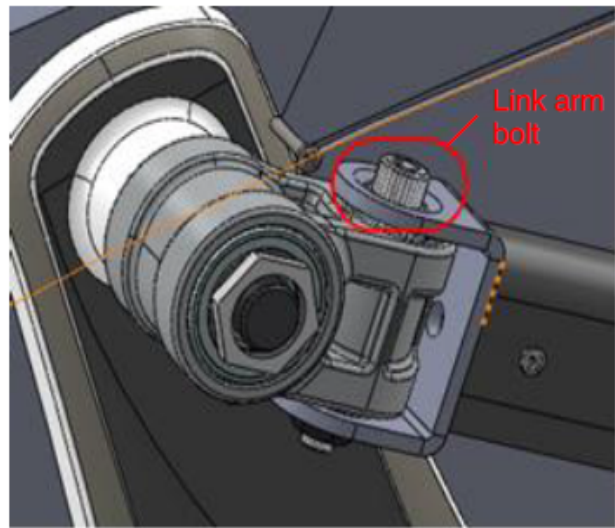


Figure B

3. Remove the bolt which fix the link arm and connected tube. (Figure C&D) Then remove the link arm.

Notes: torque for the link arm bolt is 800kgf.cm.

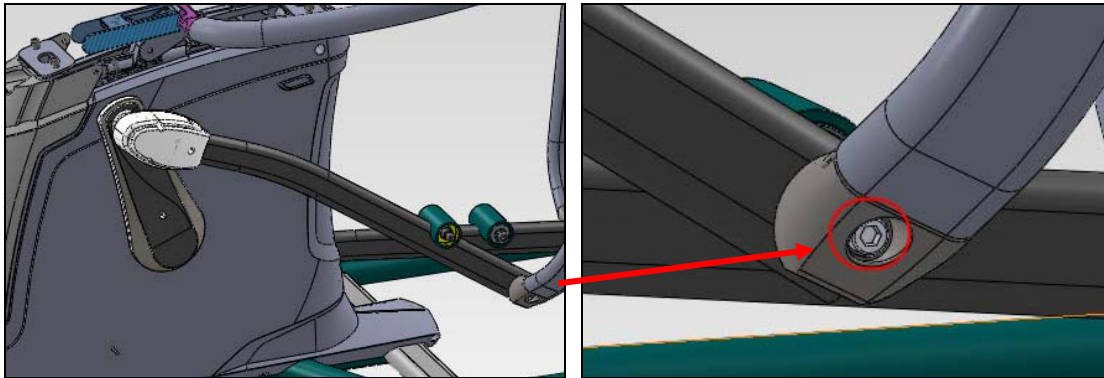


Figure C&D

4. Reverse steps to replace link arm.

4.9 CRANK REPLACEMENT

1. Remove the link arm(see section4.8)
2. After remove the link arm, you can see the crank. Remove the nut and screws to remove the plastic cover of the crank. (Figure A)
3. After remove the cover, remove the crank arm bolt to remove the crank, a two jaw puller might be needed. (Figure B)

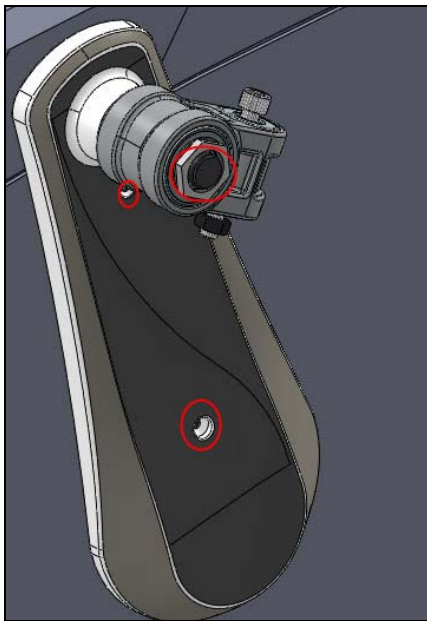


Figure A

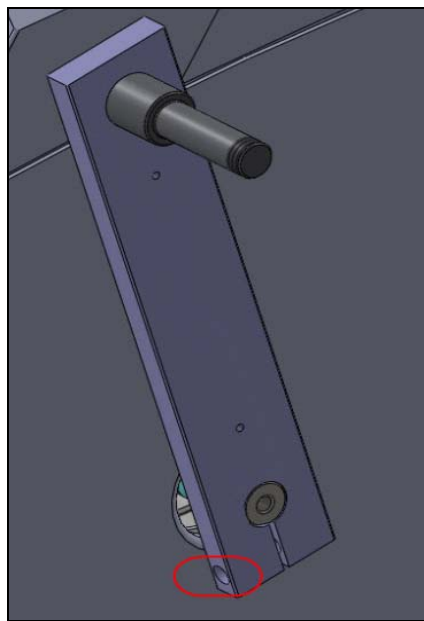


Figure B

4. The torque on crank bolts must be 800kgf.cm (Figure C & Figure D)



Figure C



Figure D

4.10 FRONT COVER REPLACEMENT

1. Remove the console mast covers(section4.6).
2. Remove the two screws to take off the front cover. (Figure A)
3. Reverse steps to replace front cover.

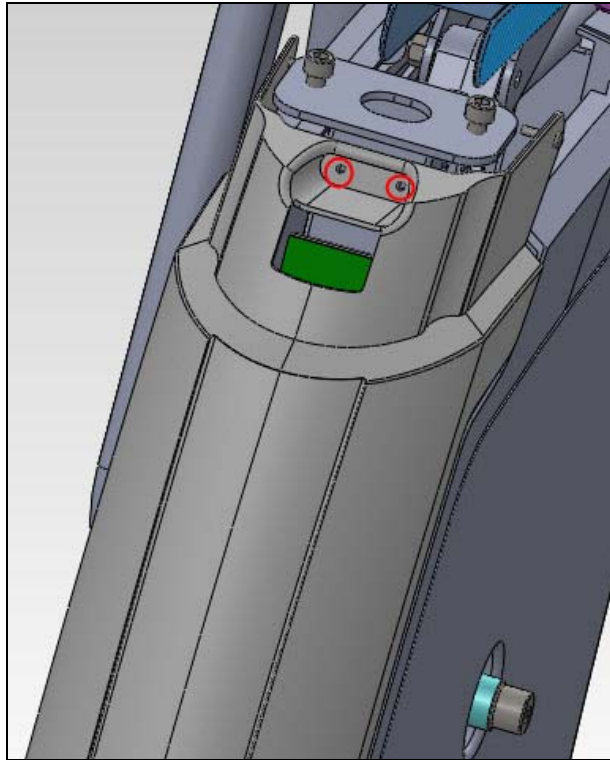


Figure A

4.11 SIDE COVER REPLACEMENT

1. Remove the following:
 - console mast covers (see section4.6)
 - Front cover (see section4.10)
 - crank arms (see section4.9)
2. Remove the 9 screws which fix the side cover.
3. Remove the 2 screws as Fig B.
4. Reverse steps to install side cover.

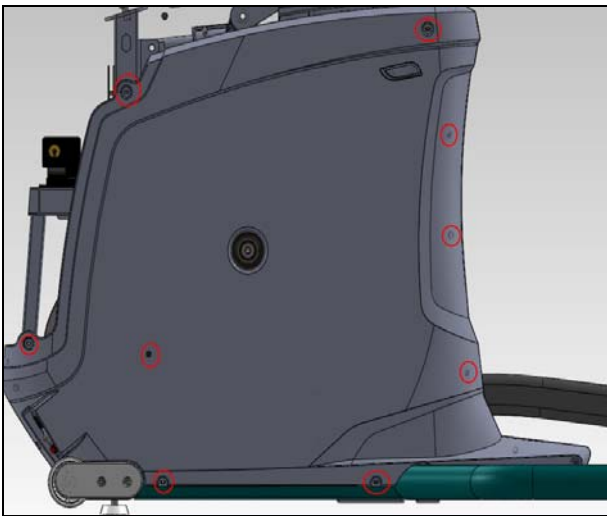


Figure A



Figure B

4.12 LCB AND ECB MOTOR REPLACEMENT

1. Remove the following:
 - console (section4.1)
 - console mast covers (section4.6)
2. Remove the 2 screws to replace LCB. (Fig A)
3. Remove the 4 screws to replace the ECB motor (Fig B).



Figure A

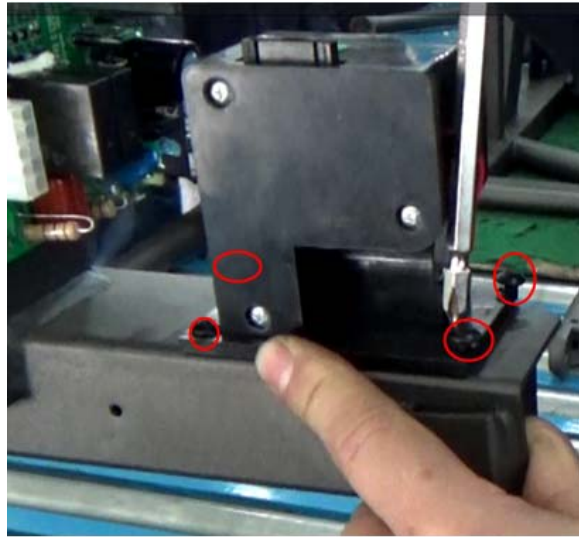


Figure B

Note:

Note: the circuit board could become damaged during this procedure from electrostatic discharge. We recommend wearing an ESD wrist strap.

4.13 ELEVATION MOTOR REPLACEMENT

1. Remove the following:
 - console (section4.1)
 - console mast covers (section4.6)
2. Remove 4 bolts, except H38, the torque of other bolts should be 500kgf.cm, Fig A&B &C.



Figure A & B & C

3. Reverse steps to install elevation motor.

Notes: when install H38 bolt, please twist negative direction half round.