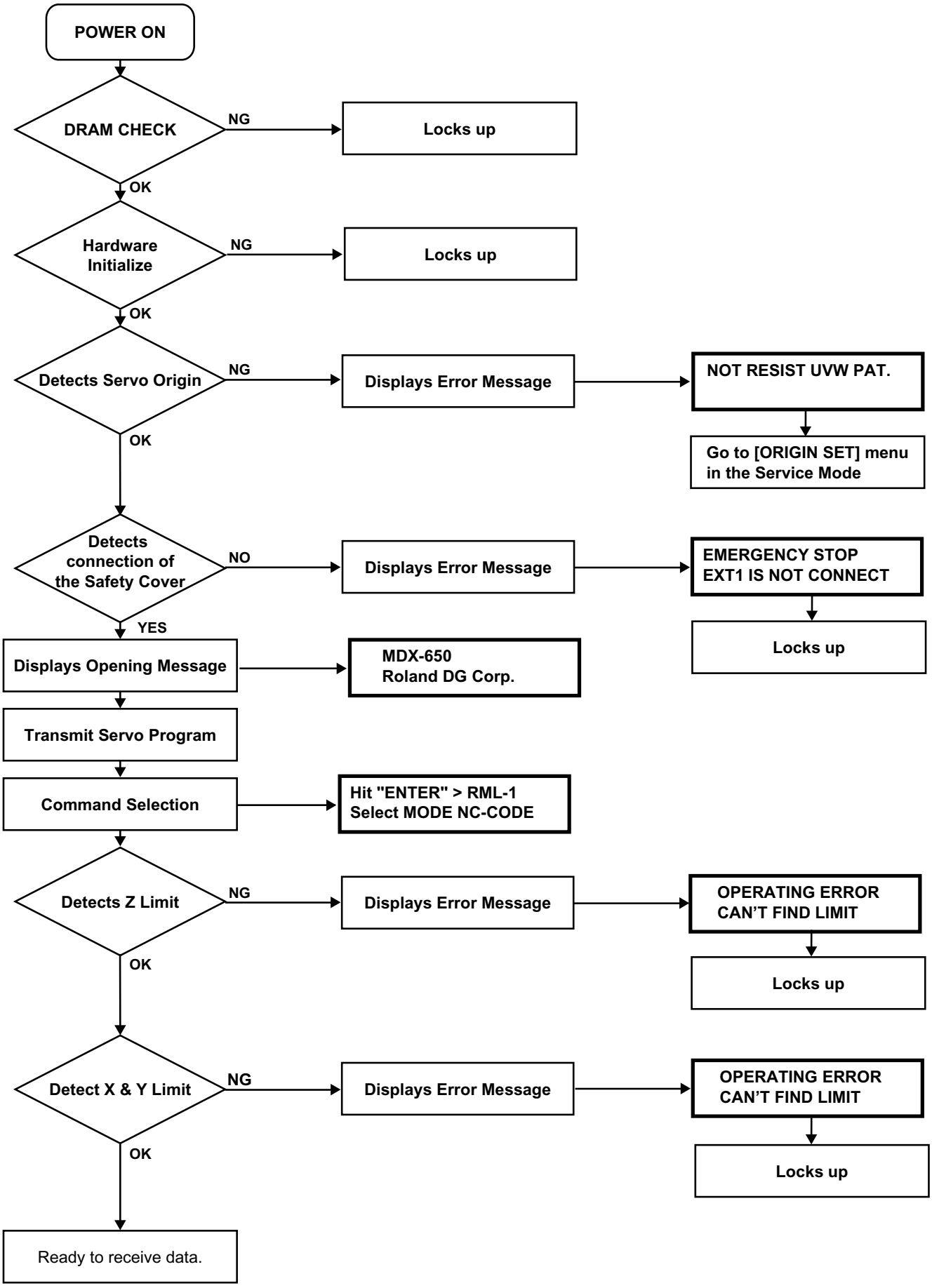
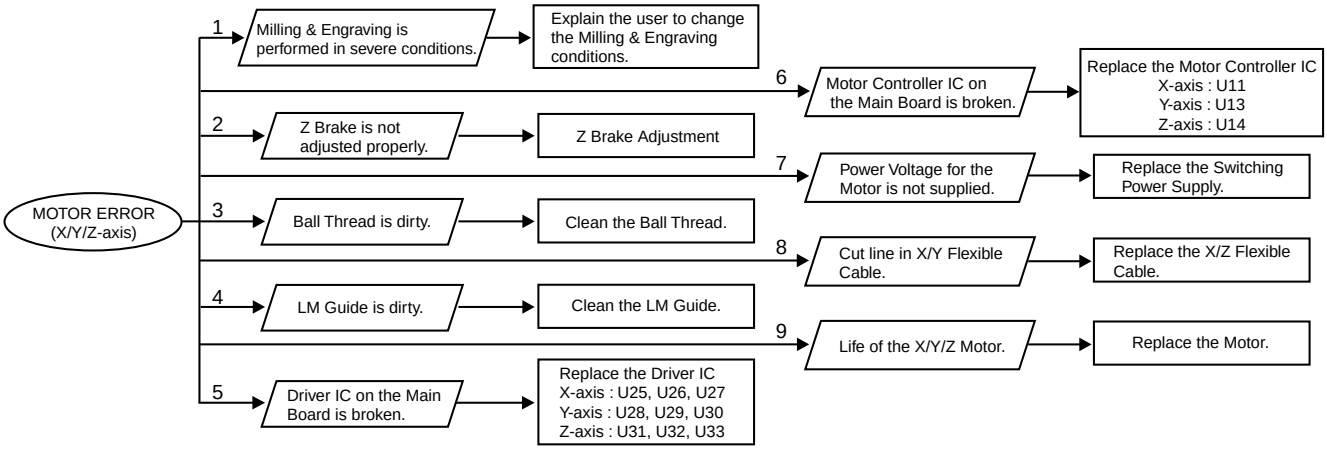
5-1 OPERATIONAL SEQUENCE



6-5 MOTOR ERROR (X/Y/Z-axis) REVISED 1



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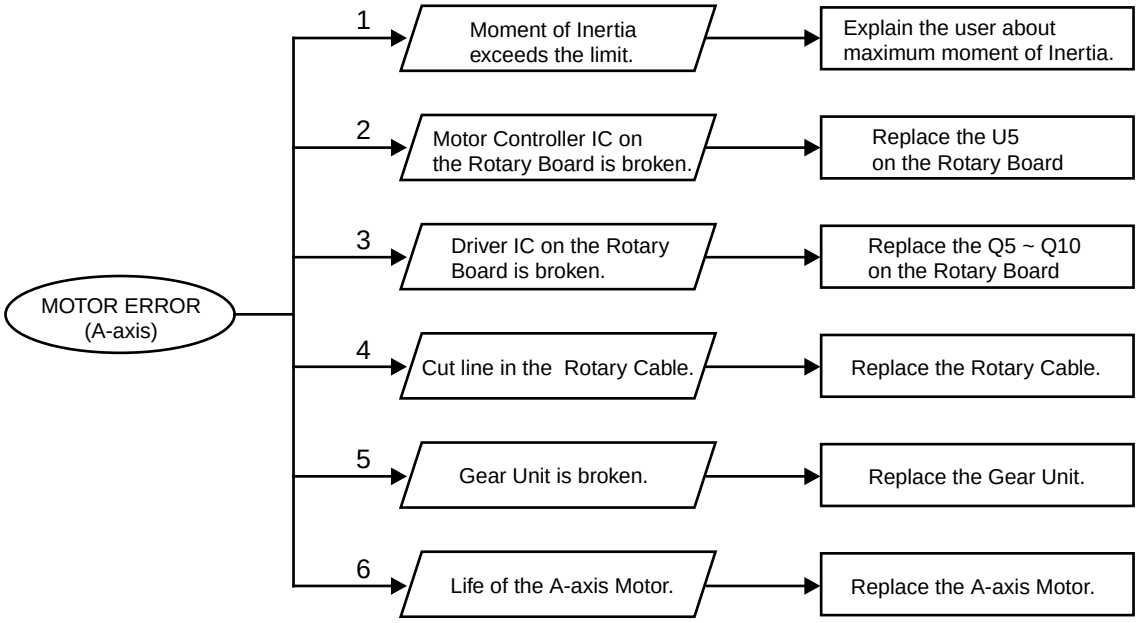
NO	CHECKING POINT	ACTION	REFERENCE	OUTLINE
1	Milling & Engraving is performed in severe conditions	Explain the user to change the Milling & Engraving conditions		When setting up the modelling or engraving speed too fast or cut-in depth too deep, load on the motor increases and results in Motor Error. In most cases, the machine will be recovered by turning it off and on again. However, if the modelling and engraving conditions are not reset properly for the material, motor error reoccurs or the tool wears out quickly. In the worst case, tool could break.
2	Z brake is not adjusted properly	Z brake adjustment	4-5	When power is on, the Z brake is released. If the gap beween the pulley and the solenoid is less than 1mm, the brake is not released perfectly and the load is put on the motor that leads to the motor error.
3	Ball Thread is dirty	Clean and lubricate the Ball Thread		When the Ball Thread is dirty and doesn't rotate smoothly, too much load will be put onto the motor which is driving the Ball Thread and results in the motor error.
4	LM Guide is dirty	Clean and lubricate the LM Guide		When there is too much load in the movement of the LM Guide, the load will be put onto the motor and results in the motor error.
5	Motor Driver IC on the Main Board is broken	Replace the Motor Driver IC on the Main Board		Motor Driver IC is a chip to supply the current to drive the motor. When it is broken, motor doesn't rotate as instructed by the servo chip and results in Motor Error because the IC can not supply the correct current.
6	Motor Controller IC on the Main Board is broken	Replace the Motor Controller IC		Motor Controller IC is a chip to control the current that is supplied to the motor. When it is broken, motor doesn't rotate as instructed by the servo chip and results in Motor Error because the current won't be supplied to the motor correctly.
7	Power Voltage for the Motor is not supplied	Replace the Switching Power Supply		The Power Voltage for the Motor can be checked at CN9 on the Main Board. 2nd pin -> GND 3rd & 4t pin -> +24V
8	Cut-line in X/Z Flexible Cable	Replace X/Z Flexible Cable		If the motor error occurs always at the same position and there is no load in the mechanical movement, there could be cut-line in the X/Z Flexible Cable.
9	Life of theX/Y/Z Motor	Replace the Motor		MDX-650 uses the AC Servo Motor which doesn't have brushes. However, in a long run, bearing inside the motor will wear and put load in its revolution resulting in the motor error.

6-6 MOTOR ERROR (A-axis) REVISED 1



NO	CHECKING POINT	ACTION	REFERENCE	OUTLINE
1	Moment of inertia exceeds the limit	Explain the user about maximum moment of Inertia		The maximum moment of inertia of the Rotary Unit is 0.02kgm^2. The moment of inertia can be reduced by making the material smaller and reset the material so that the turning-radius becomes smaller.
2	Motor controller IC on the Rotary Board is broken	Replace the U5 on the Rotary Board		Motor Controller IC is a chip to control the current that is supplied to the motor. When it is broken, motor doesn't rotate as instructed by the servo chip and results in Motor Error because the current won't be supplied to the motor correctly.
3	Motor Driver IC on the Rotary Board is broken	Replace the Q5 ~ Q10 on the Rotary Board		Motor Driver IC is a chip to supply the current to drive the motor. When it is broken, motor doesn't rotate as instructed by the servo chip and results in Motor Error because the IC can not supply the correct current.
4	Cut line in the Rotary Cable	Replace the Rotary Cable		If there is a cut line in the Rotary Cable, A-axis motor can not be controlled properly.
5	Gear Unit is broken	Replace the Gear Unit	ZCL-650 3-2	The bearings inside the Gear unit wear in a long run, and it results in the rotation problem.
6	Life of the A-axis Motor	Replace the A-axis Motor	ZCL-650 3-1	MDX-650 uses the AC Servo Motor which doesn't have brushes. However, in a long run, bearing inside the motor will wear and put load in its revolution resulting in the motor error.