

Flex-Mate K500 Service/Repair – Help Sheet

1. **Visually inspect all units for unusual damage, missing parts, or components** upon removing from box or packaging. (Note any damage to shipping container that is unusual or excessive)
 - Is the unit excessively dirty on the outside or is it clean.
 - This might indicate the care that has been given to the device
 - Are the housing covers in good shape? Or are they damaged, discolored badly, chipped, broken, cracked excessively – make note of condition if abnormal in any way.)
2. **After inspecting device visually, plug the unit into an outlet and turn device “On”.** Listen for it to make an audible “beep”. If no audible beep, possible problem with controller, cable connection or both.
 - If unit doesn’t power on at all then probably a Transformer problem.
 - Secondly, possibly a problem with the Motor PCB
3. **Look at device settings (Flex, Ext, Speed, Pause).** This might help give clues or ideas as to potential problems. It’s also probably the settings the user had it set for when problems occurred (not always though).
4. **Check Keypad** - how easy do the buttons work. Are the buttons hard to depress, are they flattened out, are the buttons torn, cut or damaged in any other way, etc..
5. **Note condition of both Controller Cables and Potentiometer cables** (cut or stretched excessively, wires pulled out of controller, base of unit, transformer casing, etc..)
 - Potential patient or device owner rough care of device
 - Might provide insight into what is causing problems with unit
6. **Check controller read out.** Are the numbers steady? Are the numbers flickering or jumping 2-3-4° while unit is stationary?
 - Potential Controller cable problem
 - Potential bad Potentiometer
 - Potential Keypad problem
7. **Press the “Start/Stop” button and let unit run** for a bit (if possible)
 - Listen for unusual sounds from device (grinding noise, squealing, knocking, creaking, tuning fork sound, excessive motor noise, etc...)
 - Each different noise can be helpful in determining what the potential problem might be and what you will need to do to correct it.
 - You may need to put some weight on the carriage by either pushing in the thigh area or leaning on the tibial section and/or rocking or changing weight pressure

from side to side in order to hear sounds. **Don't be fooled** by device... so **always** put some weight in, or onto the device to check it out more completely.

Common Causes of various sounds:

- Squealing or Tuning fork - felt pad needs replaced
- Creaking – eyebolt readjustment or bent yoke (needs straightened)
- Grinding – dirty lead screw, or bad bearings on one or either end of lead screw, possibly bent yoke,
- Clicking – Optical sensor wheel (on Motor) hitting optical sensor.
- Clunking – bad Acme Nut or bent lead screw
- Scratchy or constant scraping – welding rods to nylon brushes rubbing large pulley.
- Excessive motor noise – motor brushed worn and needs replaced.

**** Make sure you check the femoral adjustment lengths. They need to be equal in order to make a good evaluation of noises and potential other problems.**

8. **Unit won't run at all or only for a few degrees** and then it generates an "Err" message displayed on controller. Do the following:

- Turn the power to unit "Off" and then back "On" to clear the Err message.
- Depress the Start/Stop button to make unit run again.
- If you get another "Err" message repeat a (3x).
- Repeated failure – typically indicates the Motor PCB is bad. (Replace) and re-test.

9. **Display readings of (-71) (-53)** or other negative readings below the normal (-10) in extension normally means:

- There is a problem with the Potentiometer.
 - Potentiometer Cable Disconnected to the Motor PCB
 - Wire broken or pulled off Potentiometer
 - Other problems with Potentiometer cable. (Cut, stretched, Old)

10. Check Drive Train

- Excessively dirty - need to clean
- Change Felt pad in Nut housing if drive train and lead screw very dirty
- Check tracking of nut housing by sliding carriage up and down in drive train after lead screw has been removed.
 - If the carriage tracks hard, or stiff when moving by hand – then probably will need to realign eyebolts at the end of the femoral extension tubes, check yoke (metal that each plastic wheel attaches too) to see if it is bent out of normal shape. If so, need to use special metal tool to bend back into proper position by hand. (future – we will use hydraulic device to do this).

- If wheels are sliding and not turning in drive train then normally this means yoke is bent or possibly femoral adjustments are not equal. If a wheel is flat on a side replace it.

11. Felt pad Changing and Nut Housing Assembly Cleaning

- If the yoke is not bent then this can be performed without removing the frame from the drive train.
- Remove lead screw from device
- Set femoral carriage adjustments at setting 34 cm.
- Move frame into Extension
- Rotate Nut housing upward as far as possible.
- Push Acme Nut out of nut housing assembly
- Remove felt pad
- Clean Nut Housing Assembly with rags as best as possible; also try to clean end where the felt pad sits (as best as possible.)
- Check Nut Housing Assembly on inside by wheel screw threads for excess Red Loctite. If present scrape out with flathead screwdriver. This allows nut to float more freely in nut housing and in relation to lead screw.

12. “Err” messages and causes

- Refer to other handout that describes the main (3) causes of “err” messages and how to correct. The (3) potential causes are the following:
 - [120° Error](#) - Unit sticks at 120 and “Errors”
Suggested Remedy: Adjust R5 pot on Motor PCB.
 - [Control Cable Error](#) – Unit seems to “Err” when the speed is set on 30 or 40. When set on higher speeds unit seems to run fine.
Suggested Remedy: Replace Control Pendant Cable.
 - [Start/Stop Error](#) – Unit generates an “Err” when the Start/Stop button is depressed. When the power is shut “Off” and then turned back “On” this clears the “Err” message, but each time the Start/Stop button is depressed the unit generates a new “Err” message.
Suggested Remedy: Replace Motor PCB