



The Leica RM2145 Microtome

Online Troubleshooting Guide

Leica
MICROSYSTEMS

Leica RM2145 Troubleshooting Guide

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Problem

1. Thick and thin sections

- a) Partial sections
- b) Shorter sections in ribbon
- c) Section thickness varies from one section to another
- d) Skipping sections
- e) Varied thickness in one individual section

Cause (s) / Corrective Action

I) The clearance angle is too small.

- a) Systematically try several clearance angle adjustments until the optimum angle is found. For the RM2100 series use 2.5° (disposable).

II) Insufficient clamping of specimen.

- Orientation head
- Cassette clamp



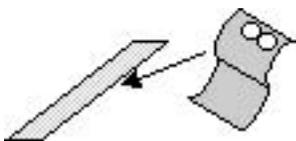
- b) Check if all levers are locked and if screws are tightened on the specimen. Retighten the levers and screws, if necessary.
- c) If the clamp lever can be tightened at more than a 60° turn, adjustment is needed.
- d) Schedule a service call for the adjustment of the specimen head clamp lever.
- e) Check the 4 screws that hold the orientation head to the advance arm.
- f) On the cassette clamp, check the 4 screws that hold cassette clamp to the orientation head.
- g) Check for movement of cassette while in holder. If movement exists, it may be caused by: Weak/broken springs, Wax build up, or Lack of grease

A service call is required to replace springs, and properly grease. If it is wax build up, clean with a sparing amount of Xylene.

III) Locking levers are not well lubricated or cleaned, causing them to be not completely fastened or stuck in a non-locked position.

- h) Remove all locking levers, clean off all paraffin and debris, then apply a sparing amount of the provided Leica lubricant. Lubricate only with recommended KuBer Topas Grease, which can be ordered through Leica. Part number: **14033624744**

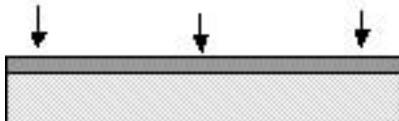
IV) Leaf spring is worn.



- i) Replace leaf spring. Part number: **14050229557**
- j) If the leaf spring does not solve the problem, then replace the locking lever. *A service call is required for this.*

V) Dull knife/blade.

- k) Use a different part of the cutting edge or use a new knife/blade.



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Problem

1. Thick and thin sections *(continued)*

- a) Partial sections
- b) Shorter sections in ribbon
- c) Section thickness varies from one section to another
- d) Skipping sections
- e) Varied thickness in one individual section

Cause (s) / Corrective Action

VI) Backlash in specimen advance system.

- l) Test for backlash by trying to rotate the object head clockwise and counter clockwise. If there is play in the system, *schedule a service call* for the internal adjustments of the specimen advance system.



VII) Stepper Motor.

- m) To check the stepper motor, turn the sectioning mode on and advance forward. A continuous advance noise should be heard. If noise is choppy and not continuous, *schedule a service call*.

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Problem

2. Compressed sections: extremely compressed, wrinkled or jammed together

- a) Compressed
- b) Wrinkled
- c) Jammed

Cause (s) / Corrective Action

I) Dull knife/blade.

- a) Use a different part of the cutting edge or use a new knife/blade.

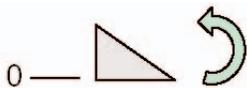
II) Blade/knife is gummed up with paraffin.

- b) Clean knife with a swab moistened with Xylene. Stroke the swab in an upward motion away from the blade edge, not down on the blade edge.

III) Specimen is too warm.

- c) Pre-cool the specimen on a cold plate.
- d) Cool the specimen in iced water or with an ice cube.
- e) Use freeze spray immediately before sectioning. (NOTE: Some labs prohibit the use of this spray, please advise)

IV) Clearance angle is too big.



- f) Clearance angle adjustment; systematically decrease the clearance angle until the optimum adjustment is obtained.
- g) Check leaf spring screw for washers and tightness.

V) Leaf spring is worn.

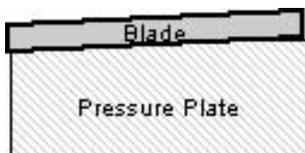


- h) Replace leaf spring. Part number: **14050229557**
- i) If the leaf spring does not solve the problem, then replace the locking lever. *A service call is required for this.*
- j) Check angle of pressure plate facet to see if it is correct. Refer to User Manual, pages 29-30.

VI) Paraffin build up on the back of the pressure plate.

- k) Clean knife with a swab moistened with Xylene. Stroke the swab in an upward motion away from the blade edge, not down on the blade edge.

VII) Knife blade is not parallel with the pressure plate.



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Problem

2. Compressed sections: extremely compressed, wrinkled or jammed together *(continued)*

- a) Compressed
- b) Wrinkled
- c) Jammed

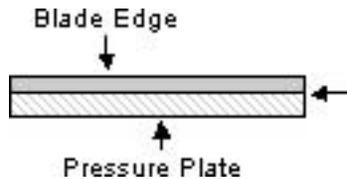
Cause (s) / Corrective Action

VII) Knife blade is not parallel with the pressure plate. *(cont.)*

- l) Adjust the pressure plate with set screws at the bottom of knife holder (turn counter clockwise or clockwise) until blade is parallel with the top of the pressure plate.



- m) When the blade is parallel with the pressure plate, the base line of the blade should line up with the top of the pressure plate after being clamped.



VIII) Insufficient tension of the handwheel.

- n) With manually turning, rotate the handwheel 5 times and release your hand from the handwheel. If the handwheel rotates freely more than 3 times, adjustment is needed. *Schedule a service call.*

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Problem

3. Chatter

- a) Venetian Blind affect
- b) Wash board
- c) Undulations

Cause (s) / Corrective Action

I) Insufficient tension of handwheel.

- a) With manually turning, rotate the handwheel 5 times and release your hand from the handwheel. If the handwheel rotates freely more than 3 times, adjustment is needed. *Schedule a service call.*

II) Spring balance system is not calibrated.



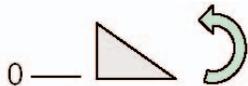
Spring Balance Adjustment Screw

- b) Set handwheel to the 3 o'clock position and let it sit. If the wheel drifts upward or downward then the spring system is not balanced and requires adjustment.

If the handwheel does not drift, then no adjustment is necessary.

- If adjustment is necessary, you can balance the unit by adjusting a flathead screw, which is accessible through the hole on the underside of the microtome base plate. Removal of the section waste tray is necessary.
- If the specimen head slightly rises, turn the screw counter clockwise, completing 2 or 3 full rotations.
- If the specimen head slightly drops, turn the screw clockwise completing, 2 or 3 full rotations.
- Please refer to page 39, fig. 39 in your operations manual for reference.

III) Clearance angle is too big.



- c) Clearance angle adjustment; systematically decrease the clearance angle until the optimum adjustment is obtained.

IV) Damage to pressure plate exists:

- Bent
- Nicked

- d) Replace the pressure plate. Part number: 2100 series complete: **14050233128**

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Problem

3. Chatter (continued)

- a) Venetian Blind affect
- b) Wash board
- c) Undulations

Cause (s) / Corrective Action

V) Insufficient clamping of specimen and/or knife.



- e) Check if all levers are locked and if screws are tightened on the specimen knife holder systems. Retighten the levers and screws if necessary.
- f) Check the front pressure plate lever for wear. If the round on the lever is worn, then replace the lever. Clamping lever Part number: **14050229554**

VI) Incompatible blades. Blade is possibly too thin, causing flex if the specimen is too hard.

- g) Try using a different brand or grade of blades.

VII) High profile knife may be too thick.

- h) Try using a different brand or grade of blades.

VIII) Wax build-up on the back of the front pressure plate.

- i) Clean the back of the pressure plate.

IX) Application issue, not a microtome problem.

- j) – Infiltration
- Dehydration
- Decalcification
- Paraffin is too old
- Paraffin Impurities

X) Tabletop stability.

- k) Move the microtome or table to a more stable location, or replace the table if it is flimsy.

XI) Vibration in specimen advance system.

- l) Check if orientation has been changed or disassembled. If reassembled or installed incorrectly, re-install properly and include all parts.

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Problem

4. Scratches or splits in sections

Cause (s) / Corrective Action

I) Knife:

- Defect in knife edge
- Hard specimen in block
- Paraffin on front or back of knife edge
- Possible staple left in paraffin

- a)** Move to a new area of the knife and observe if the scratches move with it. If so, replace the knife or have it sharpened.
- b)** Notify your supervisor about the hard specimen in the block and how to proceed from there.
- c)** Clean the knife with a swab moistened with Xylene. Stroke the swab in an upward motion away from the blade edge, not down on the blade edge.
- d)** Try to move blade or replace.
TIP: Use a wooden stick and run it across the blade once and check again.
- e)** Clean the pressure plate with a swab moistened in Xylene.
- f)** Trim through this area of the paraffin block or use a different block

II) Blades:

- Defect in knife edge
- Hard specimen in block
- Paraffin on front or back of knife edge
- Coating deterioration on blade edge

Clamping Lever



- a)** Move to a new area of the knife and observe if the scratches move with it. If so, replace the knife or have it sharpened.
- b)** Notify your supervisor about the hard specimen in the block and how to proceed from there.
- c)** Clean the knife with a swab moistened with Xylene. Stroke the swab in an upward motion away from the blade edge, not down on the blade edge.
- d)** Try to move blade or replace.
- e)** Remove paraffin from the front or back of the pressure plate.
- f)** Clean the pressure plate with a swab moistened in Xylene.

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Problem

5. No specimen advance and consequently no section produced

Cause (s) / Corrective Action

I) Specimen reached the front feed limit.

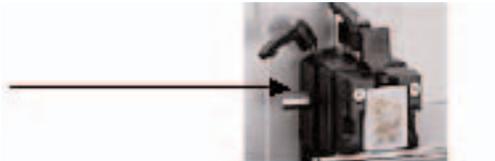


- a) Activate the coarse feed advance switch on the control panel to bring the specimen arm back.



II) The coarse feed may be jammed with debris.

- b) Remove any obstruction.



III) Internal mechanism (spindle) may be defective.

- c) Schedule a service call for the replacement of the spindle, or adjustment of torque values.

IV) Coarse feed motor may be faulty.

- d) Schedule a service call to replace the coarse feed motor. For S/N starting in the following: **0959 / 07.1999**, please use Part number: **14050233483**.
NOTE: Older units with S/N prior to the above mentioned have the old style motors, which can still be ordered. Upgrade is not necessary.
Use Part number: **14050229448**. (This part has a LCC of 3.)

V) PCB Control board may be faulty.

- e) Schedule a service call for replacement of the control board. For S/N starting in the following: **0959 / 07.1999**, please use Part number: **14050333140**.
NOTE: Older units with S/N prior to the above mentioned have the old style control boards, which can still be ordered. Upgrade is not necessary.
Use Part number: **14050330968**. (This part has a LCC of 3.)

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Problem

6. Drifting of handwheel

Cause (s) / Corrective Action

1) Spring balance system is not calibrated.



Spring Balance Adjustment Screw

- a) Set handwheel to the 3 o'clock position and let it sit. If the wheel drifts upward or downward then the spring system is not balanced and requires adjustment.
If the handwheel does not drift, then no adjustment is necessary.
 - If adjustment is necessary, you can balance the unit by adjusting a flathead screw, which is accessible through the hole on the underside of the microtome base plate. Removal of the section waste tray is necessary.
 - If the specimen head slightly rises, turn the screw counter clockwise, completing 2 or 3 full rotations.
 - If the specimen head slightly drops, turn the screw clockwise completing, 2 or 3 full rotations.
 - Please refer to page 39, fig. 39 in your operations manual for reference.

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Problem

7. Specimen is picked up in the return stroke of the specimen arm

Cause (s) / Corrective Action

I) Static electricity charge may be built up on the knife holder or specimen head.

- a) Adjust the temperature or humidity level in the room.
- b) Use an ionizer to neutralize the static charge.
- c) Clean components of the microtome with alcohol.

II) Adjustment of retract value may be needed.

- d) Increase the retract value to a max. of 50 microns. If you like to rock, then use rocking mode.

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Problem

8. Sections are sticking to pressure plate

Cause (s) / Corrective Action

- I) **Too much paraffin.**
 - a) Clean the knife with a swab moistened with Xylene. Stroke the swab in an upward motion away from the blade edge, not down on the blade edge.
- II) **Dirty pressure plate.**
 - b) Clean the plate with a swab moistened with Xylene.
- III) **Static.**
 - c) – Spray static solution
 - Increase humidity
 - Ground the instrument
- IV) **Too much Xylene on pressure plate.**
 - d) Remove Xylene with alcohol.

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Problem

9. Unable to retract specimen

Cause (s) / Corrective Action

- I) **Retraction mechanism on specimen advance system is defective.**
 - a) Schedule a service call. Spindle may be faulty.

- II) **Possible PCB Control board faulty**
 - b) Schedule a service call for replacement of control board. For S/N starting in the following: 0959 / 07.1999, please use part number: **14050333140**.
*NOTE: (Older units with S/N prior to the above mentioned have the old style control boards, which can still be ordered. Upgrade is not necessary. Use Part number: **14050330968**. (This part has a LCC of 3.*

- III) **Coarse feed motor faulty.**
 - c) Schedule a service call to replace the coarse feed motor. For S/N starting in the following: 0959 / 07.1999, please use part number: **14050233483**.
*NOTE: (Older units with S/N prior to the above mentioned have the old style motors, which can still be ordered. Upgrade is not necessary. Use part number: **14050229448**. (This part has a LCC of 3.*

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Problem

10. Microtome makes "clunking noise" when sectioning

Cause (s) / Corrective Action

- I) **Linear bearings in cage are at their lower limits.**
 - a) *Linear bearings need to be cleaned and possibly re-greased.*

- II) **Alignment of bearing cage is incorrect.**
 - b) *Schedule a service call.*

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Problem

11. No key pad response from control panel

Cause (s) / Corrective Action

III) Microtome has no functionality.



- a) Check the connection on the back of microtome for connectivity.
- b) Schedule a service call if above does not correct the problem.