

# WALLYFULCRUM INSTRUCTIONS

## THE WALLYFULCRUM:

- Offers the ability to adjust azimuth on tonearms that lack azimuth adjustment mechanisms
- Precision made with highly rigid material to offer a solid union between cartridge and tonearm
- Allows user to control azimuth adjustment angle in 0.25° increments
- Makes your tonearm a TRUE azimuth tonearm. In other words, unlike on INDIRECT azimuth tonearms, changes to azimuth angle while using the WallyFulcrum will NOT also change your stylus rake angle

## INSIDE THE BOX

- WallyFulcrum made from ultra-rigid material offering up to 4° of azimuth freedom
- Pair of 12mm long 2.5mm screws in the event extra length is needed to accommodate the WallyFulcrum in headshell
- 0.015" pink shim for cartridge leveling
- 2mm Allen key
- 2mm WallyReference Shim



## INSTRUCTIONS FOR USE

**WATCH THE WALLYFULCRUM INSTRUCTIONAL VIDEO SERIES ON THE WALLYTOOLS ANALOG SETUP TOOLS YOUTUBE CHANNEL**

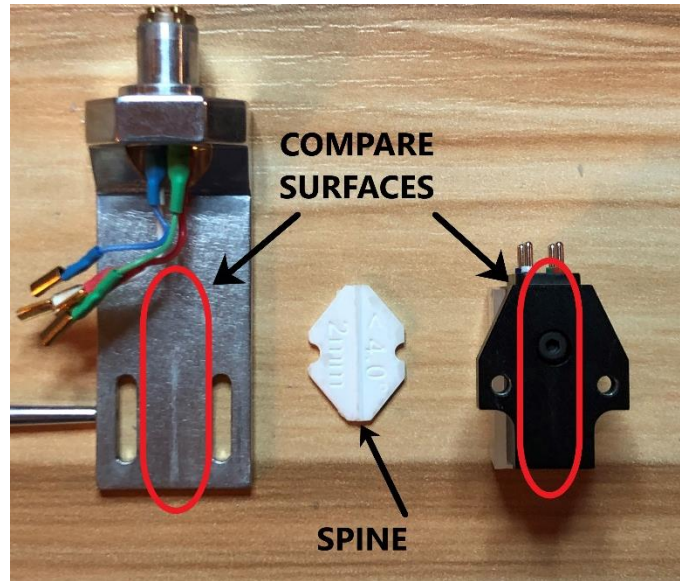
## RAISE TONEARM & LEVEL HEADSHELL

1. Raise the tonearm at its base by exactly 2mm. This will allow for accommodation of the height of the WallyFulcrum being added to the cartridge/headshell union.
2. Follow the “Re-leveling Headshell on Left/Right Axis Following Change in Tonearm Height” section of the WallyReference instructions.
  - 2.1. Be sure to install the WallyReference Left/Right blade plus appropriate shims to match the height of your cartridge **PLUS 2mm shim to account for the additional height added by the WallyFulcrum.** Level the tonearm.
3. **ALTERNATIVE:** if you do not own a WallyReference you can simply add 2mm of height at the tonearm base to accommodate the WallyFulcrum. However, you must understand that since you cannot confirm the headshell is level to the record surface once the cartridge and WallyFulcrum are mounted to it, the instructions below that allow you to measure the tilt-angle of your ideal azimuth setting will not be reliable.

## DETERMINE WALLYFULCRUM ORIENTATION

4. The “Spine” of the WallyFulcrum must be in contact with a surface that is flat, featureless and rigid along the length of the Spine. Maximum contact between the Spine and the headshell or cartridge is ideal. Avoid having the Spine in contact with compliant (non-rigid) material.

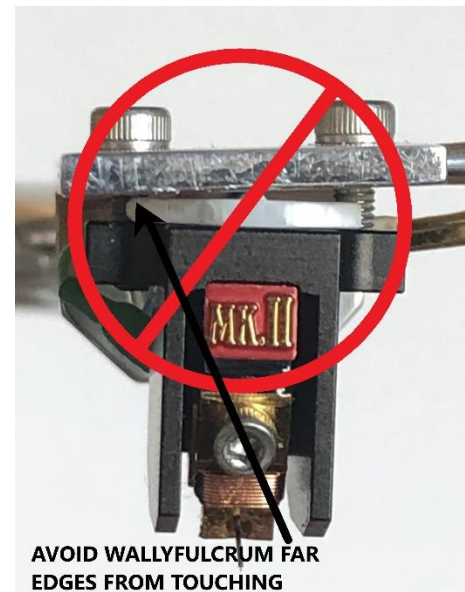
4.1. With cartridge removed from headshell, inspect underside of headshell and the top surface of the cartridge for flatness/featurelessness/rigidity in the area where the Spine will make contact. Choose the best of the two surfaces - the “Spine Mating Surface”.



## INSTALL WALLYFULCRUM

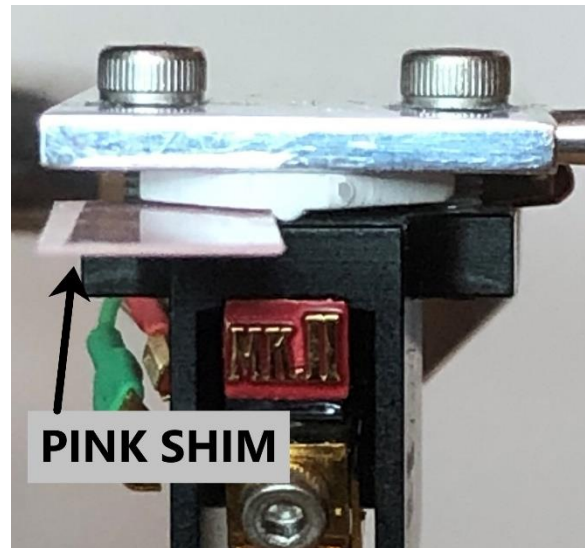
5. Install WallyFulcrum between cartridge and headshell with the Spine in contact with the chosen mating surface (the “Spine Mating Surface”). As you begin to fasten the screws, you should aim for the cartridge to be roughly level. Don’t worry about getting it absolutely level until the next step. For now, just be sure that the cartridge does not look visibly tilted and there is no contact between the WallyFulcrum and the Spine Mating Surface other than the spine itself. When looking at the front of the cartridge from record height, note the Left and Right Edges of the WallyFulcrum to ensure they look roughly equidistant from the Spine Mating Surface.

5.1. Lightly tighten both screws by making a very small rotation on one screw then the other and back again to the first and so on until lightly tightened.



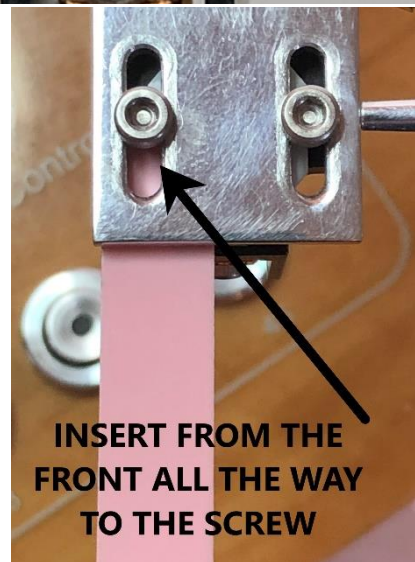
## FINE-ADJUST THE LEVELING OF THE CARTRIDGE

6. If the cartridge is level in the headshell, the pink shim stock will be able to easily slip between the WallyFulcrum and the Spine Mating Surface on BOTH the left and right sides of the spine all the way through until it touches the screw. If it cannot slip all of the way in on one side, then the screw on this side needs loosening and the opposite side needs to be tightened by the same rotation amount. Use no more than 1/8 rotations (one screw clockwise and the other screw counterclockwise). When the resistance you feel when inserting the shim on the left and on the right side of the spine feels the same, the cartridge is leveled.



## ALIGN STYLUS/CANTILEVER ASSEMBLY

7. Re-check your Vertical Tracking Force (VTF) with a reliable scale that measures VTF at record height.
8. Using the WallyTractor, align your overhang and cantilever offset angle. If you know your stylus zenith angle, use the WallyZenith to align the offset angle.
9. When loosening screws to allow movement of the cartridge in the headshell, it is important to loosen and tighten both screws uniformly so as to avoid changing the azimuth. If you are concerned that you may have gotten off level, simply use the pink shim to confirm the WallyFulcrum is level. If the cartridge is visibly tilted, then it **WILL BE IMPOSSIBLE TO GET YOUR STYLUS/CANTILEVER ALIGNMENT CORRECT** (unless you know how to use the WallyZenith).



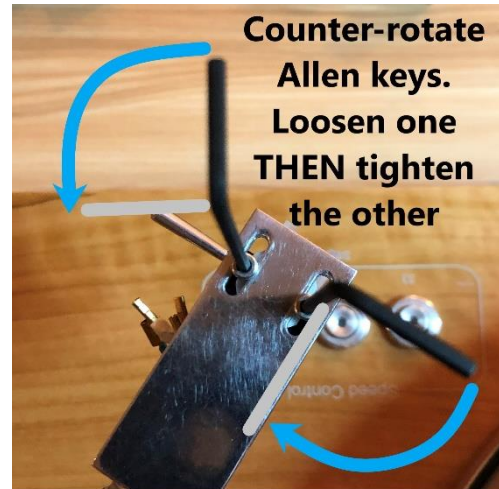
## UNDERSTANDING HOW TO CONTROL AZIMUTH ANGLE

The supplied “L” shaped Allen key (“hex key”) offers a means to control azimuth angle. When the Allen key is inserted into a headshell screw, use the orientation of the horizontal arm of the Allen key to determine the amount of screw rotation made. The amount of rotation determines how many degrees azimuth angle changes.



Assuming a level cartridge with the WallyFulcrum installed, by turning one of the screws clockwise one full revolution (360°) and the other screw counterclockwise one full revolution the maximum 4° azimuth angle is introduced.

- 1 full revolution of one screw and counter-revolution with the other creates a 4° azimuth angle. Therefore,
- 1/4 contra-revolution of both screws (one clockwise and the other counterclockwise) introduces a 1° change in azimuth angle
- 1/8 revolution (and counter revolution) results in a 0.5° azimuth angle change
- 1/16 contra-revolution results in a 0.25° azimuth change



1/4 turns of Allen key = 1 degree azimuth shift

Once the Allen key is inserted into the headshell screw, consider the *orientation* of the horizontal portion of the Allen key before making any changes to the rotation of the headshell screws. Use that as the starting point before beginning the revolve.

Clockwise revolutions of a screw results in that side of the cartridge coming closer to the headshell. Conversely, a counterclockwise revolution causes that side of the cartridge to move away from the headshell. Therefore, if you tighten (clockwise) the screw closest to the spindle while loosening (counterclockwise) the screw furthest away from the spindle, you are creating a clockwise azimuth rotation of the cartridge (when viewing the cartridge head-on from record surface.)

## MEASURE FOR IDEAL AZIMUTH ALIGNMENT

**10.NOTE:** The **ONLY** way to measure for ideal azimuth angle for any cartridge is by using the electrical method. Analogplanet.com has a two-part article on this process under the “Setup Tips” menu item.

- 10.1. Also see WallyTools website’s WallySchool! blog to learn why other methods (including the left-right channel cancellation method) are faulty and do NOT measure for ideal azimuth
11. Starting from the level position, take your first azimuth measurement.
12. Choose one direction and begin with a 0.5° azimuth tilt (1/8 Allen key revolutions). Take another azimuth reading.
13. Tilt another 0.5° in the **SAME** direction and take another reading. If azimuth results are improving, you are headed in the right direction. When getting close to ideal results (less than 3dB of crosstalk differential), begin using 0.25° changes (1/16 Allen key revolutions) to dial in the best possible results. With such fine changes in azimuth tilt you should be able to achieve <1dB crosstalk balance.

14. **NEVER** tilt the cartridge by more than  $0.5^\circ$  (1/8 turns) at a time, even if you have measured you are going the wrong way to get to ideal azimuth and have some distance in the opposite direction to go. Because the alignment of the stylus/cantilever has already been perfected on the WallyTractor, you do not want to risk losing that position. You can maintain that position of the stylus/cantilever assembly by keeping each of your adjustments limited so that the cartridge cannot move freely in the headshell. So, if you have travelled, say,  $1^\circ$  too far in the wrong direction and need to come back, you will do so in no more than  $0.5^\circ$  (1/8 turn) increments at a time.
15. Once ideal results are achieved, a final tightening of the headshell screws may be necessary. Start by tightening one of the screws clockwise by an exceedingly small amount - certainly less than a 1/16 revolution - followed by same amount in the same clockwise direction on the other screw. Return to the first screw and repeat process until you are satisfied with the torque achieved.
- 15.1. **NOTE:** cartridge screws are not meant to be TIGHT. The TIPS of your thumb and index finger alone provide plenty of torque.



**ENJOY ANALOG FOREVER!!! . .**  
- Wally Malewicz

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