



## **Instruction manual**

### **KUZMA 4POINT 14 inch TONEARM**

Serial Number: .....

2016-09

# KUZMA LTD

## INSTRUCTION MANUAL FOR 4POINT 14 tonearm

The 4POINT 14 tonearm is a very precisely engineered piece of equipment, however, the construction is robust and requires minimal maintenance for optimal performance. It differs from standard 4Point due almost 3 inches longer tube. It this requires different mounting distance.

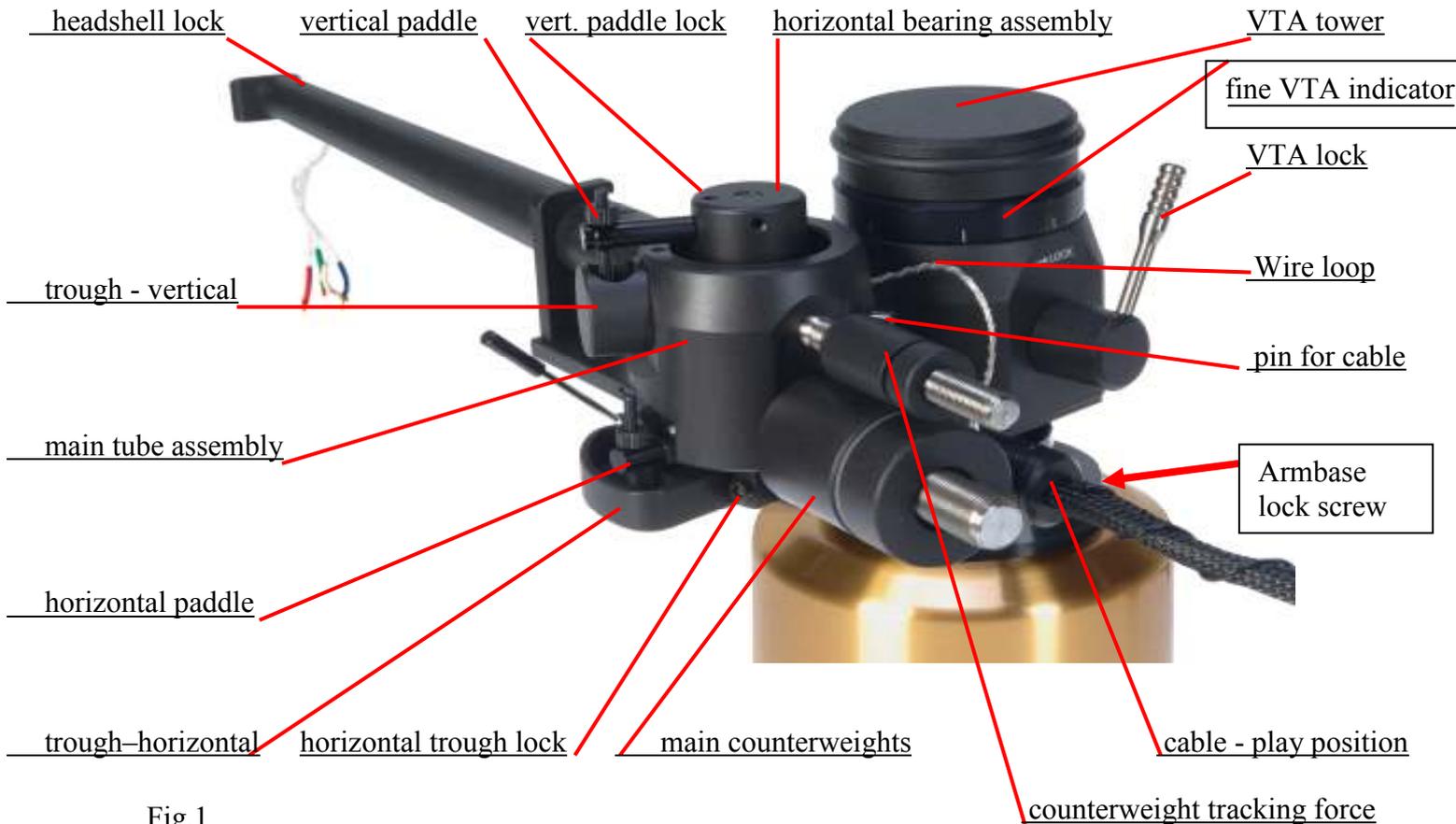


Fig.1

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## **General description**

This tonearm differs from other arms by incorporating several unique features. The zero play bearing is configured on 4 points (spikes). There is very precise VTA adjustment and, despite a longer effective length of 353 mm (14 inches), fits the mounting distance of 291 mm (as for 12 inches arms).

The heart of the new construction is a unique 4 point bearing. The first set of two points (similar to a double unipivot bearings) allows vertical movement. The second set of two points allows horizontal movement. All four points have minimal friction and zero play in all playing directions thus ensuring the cartridge platform and the cartridge itself to move with very low friction and minimal vibration across the record. It is normal to feel slack in the bearings in certain directions.

The whole construction is mounted on a rigid VTA tower which allows very precise VTA adjustment while playing, without any loss of rigidity, yet with up to 0.01 mm of precision and zero play.

The main tube is constructed and machined from solid aluminium. The counterweights set balances the tonearm and there is a second small counterweight with which the tracking force can be finely adjusted. Azimuth can be adjusted in small repeatable increments with zero play, by means of an Allen key.

A feature of the tonearm is a unique detachable headshell (one spare included as standard). The electrical connection is via standard pins but the headshell can be simply removed by unscrewing with an Allen key. The headshell is fixed with a precise hexagonal locking system giving the same rigidity as with a fixed headshell.

Two separate troughs damp vertical and horizontal resonances and can be finely adjusted independently. The troughs can be removed from the tonearm.

Internal wiring is of superior special alloy silver wires. Set of 4 wires runs unbroken from the cartridge pins into a 1.4 m long tonearm cable with silver bullet connectors.

## **Product registration and warranty extension**

Kuzma products have a non transferable 2 year limited warranty on parts and labour, which may vary in each country.

To obtain the 5 year limited warranty from us, you need to register the product on our web site within 30 days of purchase. We suggest registration of products in any case because this will also help you to receive our technical support more easily and with resale of products.

Simply register on our web site, complete the forms and you will receive an extended five year warranty card on your email within a few days.

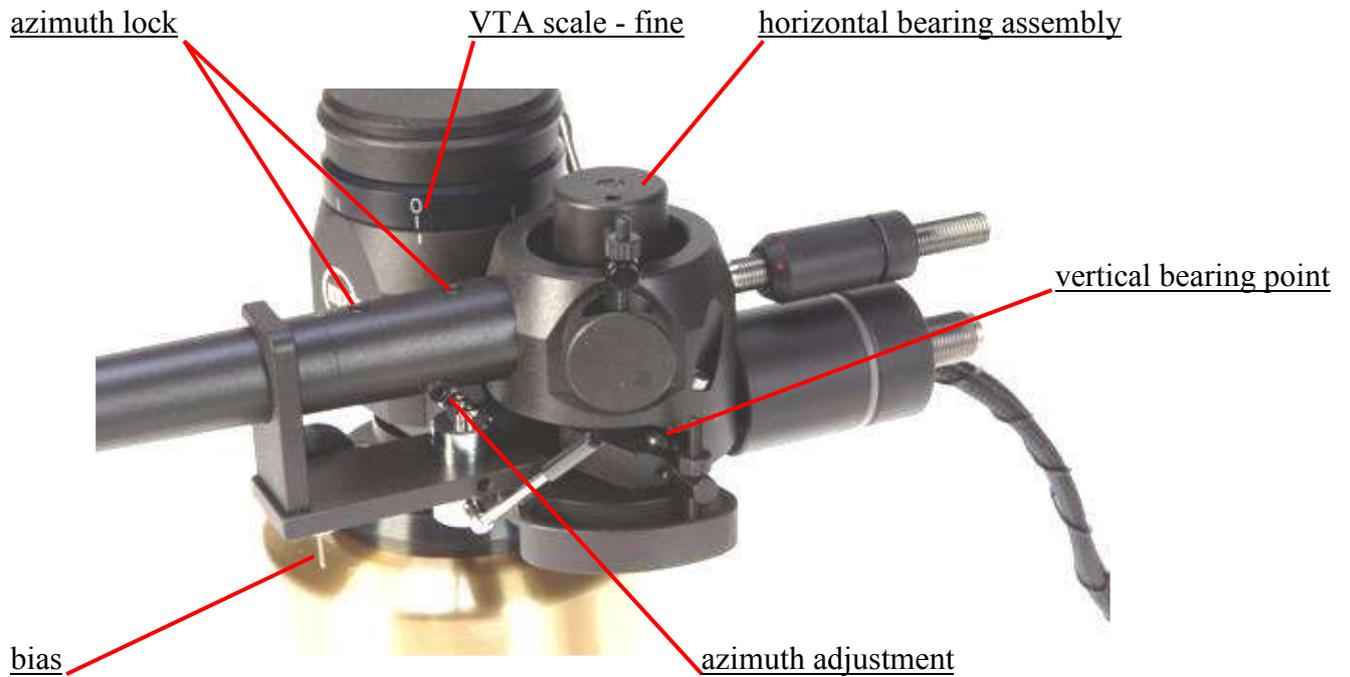


Fig. 2

### Technical data:

Mass:	2150 gr
Effective length :	353 mm ( 14 inch) ( Lofgren "A")
Mounting distance:	291 mm( 291, 50 mm )
Offset angle:	15.35 degrees
Distance from spindle to horizontal bearing:	340 mm ( 338-348 mm)
Effective mass:	19 g
VTA adjustment:	yes
Azimuth adjustment:	yes
Bias adjustment:	yes
Vertical damping:	yes
Horizontal damping:	yes
Detachable headshell:	yes ( one extra supplied)
Cables:	silver
Arm mount:	Kuzma cut
Optional:	extra headshells, headshell containers, different wiring option

## 1. Unpacking

Open the box carefully and remove top covers.

The tube with vertical bearing points is packed separately (tube assembly) on the top of the box. Please do handle with care and when put aside, ensure that nothing is touching the bearing points. Bear in mind how you will handle tube with output cable.

The horizontal bearing assembly is permanently mounted on the main VTA arm tower. This is blocked during transport. (Fig. 3)

First remove the armbase and prepare it for fixing onto the turntable. Be sure that the armboard on the turntable has the correct cut-out on correct distance (main central hole must be 40 mm in diameter).

## 2. Basic set up

### Armbase:

Mount the armbase on the turntable's armboard on distance of 291-292 mm. If the pre-cut has a thread, then use three screws and fix them from the top through the armbase into the armboard threads. A second way is to use a ring underneath and fix three screws through holes into this ring, which will then hold the armbase very tightly. Be sure that you position the armbase so as to give access to an Allen key for fixing arm into armbase (towards the back of the turntable). Also check, when mounting the arm on other turntables, that you allow enough clearance for counterweights and correct position of the tube in relationship to the platter. Due to the bearing construction, there is only a limited arc which the arm tube can travel in a horizontal way. Rotation of the VTA arm tower of the arm, to achieve the correct distance of 340 mm ( 338-348 mm ) is done by measuring distance from pivot to centre of the horizontal tower bearing. Fig.4. Due long tube this distance is not so critical.

### VTA arm tower:

Insert the VTA arm tower into the armbase. Ensure that the height is such, that the top surface of the platform holding cueing device is at the same height as the record. Fix it with an Allen key. The vertical bearing cups should be at the same height as the record. This are all only starting height- later this will change when you set up precise VTA. Also check that the VTA adjustment is in the middle position, to allow fine VTA adjustment up and down 5 mm each way.



Fig.3. Pull out fixing foam on the horizontal bearing assembly

With 1.5 mm Allen key, release the height ring ( Fig. 3.) which is on the fixing pillar below the VTA arm tower. Now it will drop down and touch the armbase. Fix the ring again and release the VTA arm tower. You now have the correct height but you can freely rotate the VTA arm tower horizontally. Rotate it to such a position that the distance from the centre of the record to the centre of the horizontal bearing is 340 mm ( 338-348 mm) Fig. 4. Now fix VTA arm tower.



Fig.4. Distance for pivot to spindle



Fig.5. Black cable holder

Remove the fixing foam on the horizontal bearing assembly ( Fig.3.). **When tonearm is shipped by airmail, courier service, insert foam back!** Check that the bias thread is fixed and gently rotate horizontal bearing assembly from one to another extreme. It is normal to feel slack in the bearings.

**Tube assembly:**

Carefully take the tube assembly with cable gently position it around the horizontal bearing assembly so that **both** two points will fit into the appropriate bearing cups. Position it into the armrest. (Fig. 6.)

Remove cable from the tube assembly by releasing the black cable holder from the transport position with the 1.5 mm Allen key. Fix it to the empty pin at the back of the VTA tower, below the VTA locking lever. Fix it in such way, that the naked wires will go upwards towards the tube in a loop ( Fig 5). Be sure, that the VTA arm tower is fixed in the armbase, because the weight of the cable might otherwise rotate it.

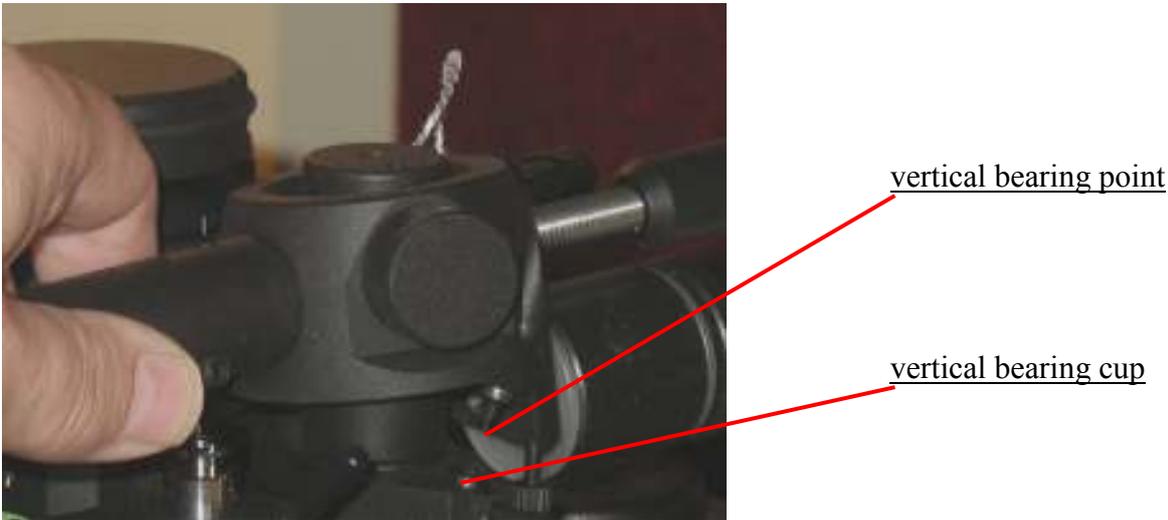


Fig.6. Assembling the tube onto the horizontal bearing tower.

### 3. Setting up the tonearm

#### Connecting tonearm:

Check the horizontal movement of the tube to ensure that the headshell will reach the inner grooves (approximately to the edge of record label), but will not travel to the centre of the record. Also check the arm wire loop and connect the tonearm cable into the phono sockets of the preamp. (Fig.5)

Due to the high tonearm mass, turntable levelling and suspension should be checked and adjusted according to the turntable manual.

#### Cartridge mounting:

Mount the cartridge with the appropriate set of M 2.5 mm screws. When fixing cartridge pins be sure that you do not damage wires under insulation tubes! If you wish you can fix fingerlift at the side of the headshell- no key required.( Fig. 8)

#### Headshell removal and fixing:

This tonearm has a detachable headshell and fixing and positioning it has no negative effect on tonearm performance. The whole headshell is fixed with Allen key 2 mm.

Insert it in the top hole and release screw with Allen key for at least one turn (ACW).

Disconnect cartridge pins, remove Allen key and pull out the headshell. (Fig.7-7B)

Fix the cartridge and return headshell back in to the tube. If it can not be inserted easily, rotate the screw a little more in ACW direction. Then fix it back in CW direction with gentle force, around one turn.



Fig.7. Locked

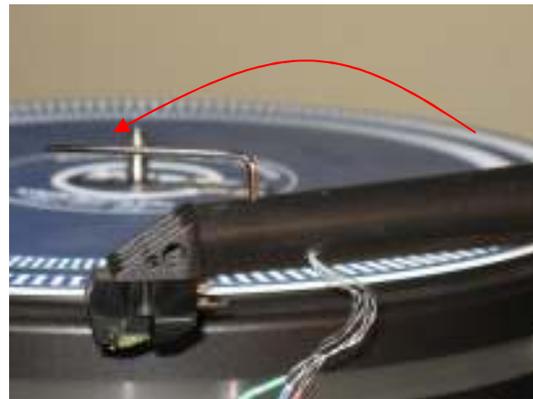


Fig.7A Unlocked

**Note:** Do not over-tighten the screw which locks the headshell.

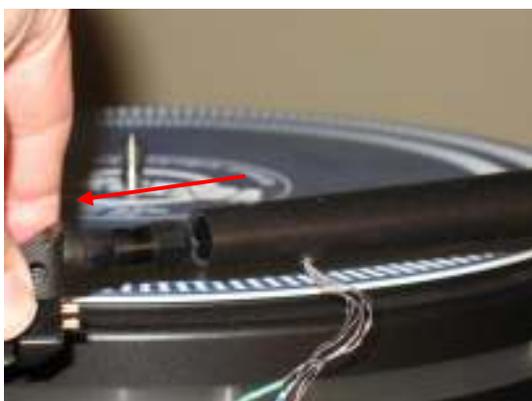


Fig.7B Removing headshell



Fig.8. Headshell's fingerlift

### Balancing of the tonearm:

Fix cartridge pins. Add extra counterweights to the lower threaded carrier as per chart below, until the tonearm is roughly balanced. Fig. 9.

Knowing the approximate mass of the cartridge( add aprox 1 gr for screws and 1 gr for fingerlift), enables choice of the correct configuration of different counterweights. Aim for roughly zero balance. Even if the counterweights are not screwed to the end, as long as you rotate two against each other, they will be fixed on the thread.

**The main long counterweight (40 mm) remains fixed on the tonearm all the time.** You can use any mix as long as you can achieve the desired tracking force.



Fig. 9. Full counterweight complement

### Counterweight configuration:

<b>Length:</b>	<b>mass:</b>	
40 mm	235 gr	main counterweight ( 1 pc)
14 mm	80 gr	( 1 pc)
12 mm	70 gr	( 1 pc)
4 (3.8) mm	20 gr	( 4 pcs)
Cartridge total weight:		main ( 40) + counterweights configuration (mm)
0-4 gr		+4
6gr		+4
8g		+4+4
10g		+4+4
12g		+4+4+4
14g		+12
16g		+12
18g		+12+4
20g		+14+4
22g		+14+4+4
24g		+14+4+4
26g		+12+4+4+4
28g		+14+4+4+4
30-32g		+12+4+4+4+4

Move the small upper counterweight for more precise balance, by rotating it. The tonearm's centre of gravity is chosen to be around the height of vertical rotation. Therefore balancing the tonearm to

zero is very difficult. Adjust it to be roughly balanced and increase tracking force with upper smaller counterweight.

If this is too loose, hold the front part of the counterweight and rotate the rear part until there is a tighter fit, or lock it into position on the threaded carrier. Opposite rotation will make the smaller counterweight looser.

#### **4. Adjustment of tracking force**

Balance the tonearm with the tracking scale, which must be at record height. Rotate the smaller upper counterweight towards the tube. Rotation for one turn (observe red dots) will change tracking force for approximately 0.1g. If you are unable to obtain the correct tracking force, add or remove counterweights. By rotating two counterweights along the thread you can obtain the desired balance. Then simply rotate them one against other and this will fix them. (Fig.1)

Check that the cueing device is at the correct height (See paragraph 10).

#### **5. Adjustment of tangential geometry**

Put a record on the platter and adjust VTA in such a way, that the central axis of the tube will be parallel to the record. This is only a starting point for VTA.

Using the two zero point protractor, adjust geometry at two null points. Rough guidance is by the edges of the cartridge body, but accurate adjustment is by observing whether the cantilever and lines are parallel at the two null (zero) points. See our web site for more information.

#### **6. Adjustment of VTA**

It is extremely easy to set up VTA on this tonearm. Just unlock the lever at the back and rotate the VTA knob. VTA knob rotation CW- VTA down (Fig.1, Fig. 10.)

VTA adjustment between any two lines is 0.1 mm (the whole rotation of VTA knob is 0.8 mm) which allows for very fine repeatable adjustment. The rigidity of the assembly is such that even in the unlocked position you will not feel slack. Move the tonearm VTA to the desired height. Simply lock the lever back with gentle force. Observe the 1 mm scale at the left hand side of tonearm tower. If you run out of range (10 mm), then you must reposition the tonearm height in the armbase. ( Fig. 10) However take into account what is the optimal VTA by listening.

Once you find out the correct VTA, rotate outer ring of the VTA main knob and position it into null position. This is now your starting point for very fine tuning. You can use digital microscope and laptop and adjust VTA- for most cartridges angle for diamond tip is 92 deg. See our web site for more information.



Fig. 10. VTA tower side-rough scale

## 7. Adjustment of azimuth

To make azimuth adjustments, release the two screws locking the mechanism at the centre top of the main tonearm tube, with Allen key 2mm. Under the main tube is a tiny rod with a hexagonal screw. Insert the Allen key 2 mm into the screw (it may feel loose), rotate it slightly and it will alter the azimuth. (Fig.2)

Rotating it back will bring azimuth to its previous position. Changes can be seen by misalignment of the white lines on the top of the centre of the tube. Even 15 degrees rotation of the Allen key will make a significant difference in sound. See our web site for more information.

## 8. Bias

The bias should be adjusted roughly according to the tracking force. Using Allen key 1.5 mm, unlock the screw on the bias weight and position it to the equivalent of gap X to your chosen tracking force. Lock the screw back, when in position. Fig. 11-11A.

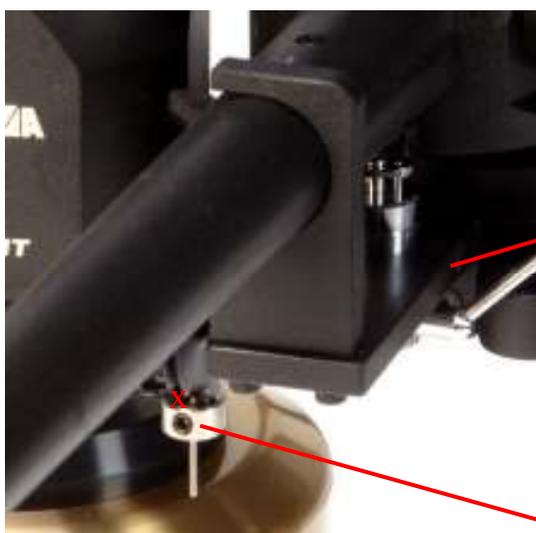


Fig. 11. Bias adjustment

X	P
mm	gr
0	1.00
4	1.50
8	2.00
10	2.25
12	2.50

Cue device lock

bias lock

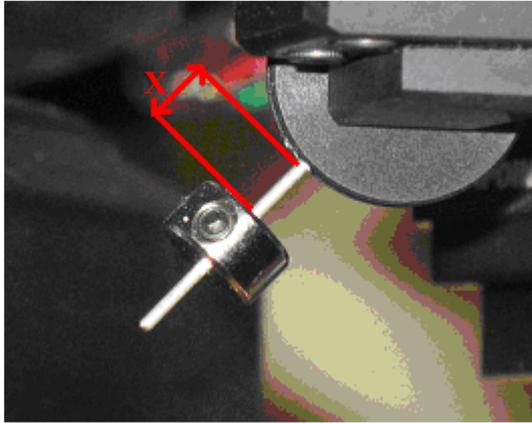


Fig. 11A Bias distance "X"

For maximum tracking, it is advisable to set the bias by use of an appropriate test record, ie. those with tracking bands. Please do not use test records with blank space where the tip of the needle sits on the surface rather than in the groove. If in doubt use less then more bias force!

## 9. Damping

This tone arm has two independent damping systems. The lower trough is for horizontal damping and the second trough on the arm tube assembly is for vertical damping. (Fig.1)

Both troughs are removable.

The horizontal holder with paddle is permanently fixed on the horizontal bearing assembly.

### Vertical& horizontal damping:

The vertical paddle is inserted after the tube assembly. Fix holder in the hole with 1.5 mm Allen key. (Fig. 12.)

The paddles long screws (1.5 mm Allen key) are fixed with fingers by a small black plastic nut. Start with both at zero damping. The more the paddle is inserted into the liquid, the stronger the damping. First start with horizontal, then add vertical, but feel free to experiment.

Be sure that you do not adjust the paddle in the trough so that it touches the bottom.



Fig.12. Fixing vertical damping holder

Paddles are fixed by holding a screw with Allen key 1.5mm and ACW rotation with fingers of the small black nut.

### **Adding damping oil:**

First insert silicone damping oil into the troughs. Let the liquid settle, before adding more. Stop filling, when you reach the silver lines about 3mm below the edge of the troughs.

### **Removing trough:**

Removing trough using Allen keys 1.5 mm (vertical- Fig .13) and 2.5 mm (horizontal- Fig.14). Release fixing screw and pull away trough. But firstly put paddles in the vertical position out of the oil so that oil will drip off. Fig. 15.



Fig.13 Removing vertical trough



Fig.14 Removing horizontal trough

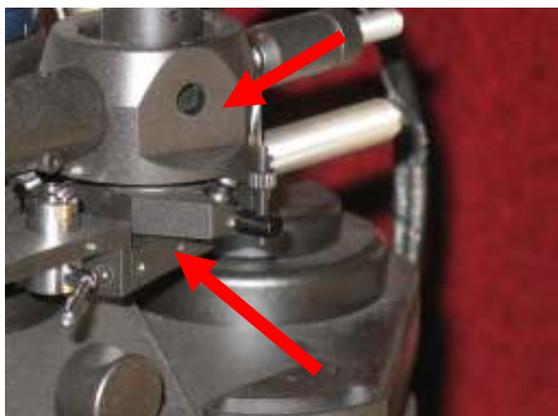


Fig.15 Both troughs removed

## **10. Cueing device adjustment**

Should you find that in the 'up' position the cartridge is too high or too low above the record then the cueing device can be raised or lowered.( due VTA changes) This can be done simply by using Allen key 1.5 mm. (Fig. 11.)

Insert key into screw on side of arm rest.

Release screw, raise or lower device and retighten.

Rotation of cueing device can affect the drift of cartridge while travel vertically down.

The cueing device may lift slightly as the screw is retightened. Do not over-tighten as this may cause the cueing device to stick in the 'up' position. Should this occur, slightly release the screw.

## 11. Maintenance

The bearing does not need maintenance. Clean dust from the tonearm with a dry cloth or brush and use a soft cloth and alcohol to remove silicone oil.

## 12. Transport

During transport the tube assembly with cable must be removed from the horizontal bearing assembly. To do this you must remove the vertical paddle. Remove vertical trough and reposition cable on the tube assembly. **REMOVE ALL SILICONE OIL!**

**Always return fixing foam below tower of the horizontal bearing assembly! See Fig. 16=3.**

If you transport a turntable with tonearm, ensure that hard vibration from the car does not transmit directly to the tonearm. Placing soft material such as rubber, foam or a thick blanket below the turntable is helpful in filtering rough vibrations even when the platter is removed.



Fig.16. Insert fixing foam by lifting horizontal tower- see same Fig. 3

## 13. Troubleshooting

1. Cartridge jumps in the inner grooves: See if the tube can travel towards the edge of the record label- check that position of the tonearm is correct with protractor for distance of 344 mm.

2A. Cartridge is too close to the record edge: Check if the tube travels too much toward the centre of the record- check that position of the tonearm is correct with protractor for distance and spindle to armbase distance is 291 mm.

2B: Cartridge is not reaching inner grooves: check that position of the tonearm is correct with protractor for distance 344 mm and spindle to armbase distance is 291 mm.

3. Headshell cannot be removed- check that the screw is released enough with Allen key.

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