



## **Instruction manual**

**KUZMA AIR LINE AIR BEARING TONEARM (on Stabi XL turntable)**

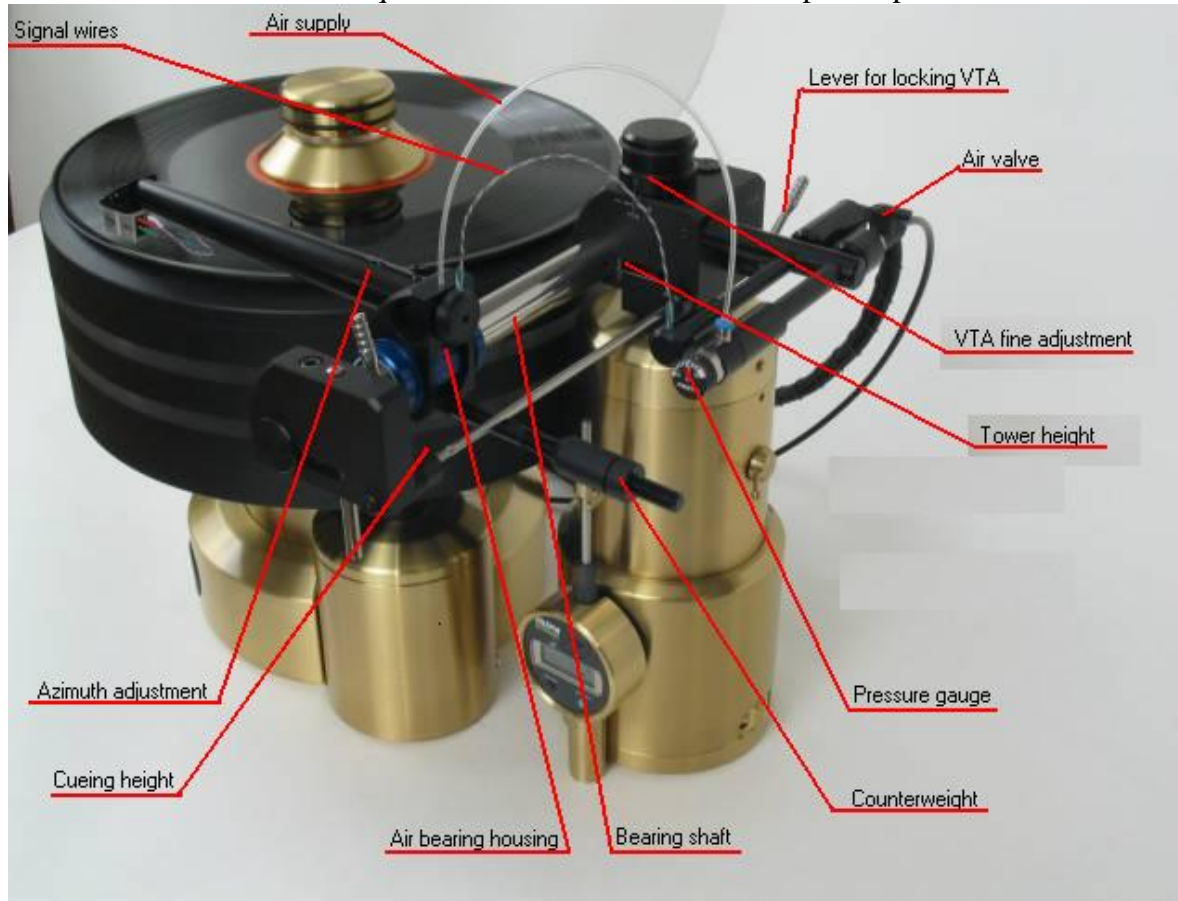
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# KUZMA LTD

## INSTRUCTION MANUAL FOR AIR LINE tonearm

The Air line tonearm is a very precisely engineered piece of equipment. However the construction is robust and requires minimal maintenance for optimal performance.



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## 1.0. General description:

Main outer box contains two inner boxes. One box contains the compressor with oil, PVC double drain bottles and the second box contains the tonearm with all spare parts: Allen keys, armbase, filters, geometry protractor and PVC tubing.

Oil lubricated electric compressors, which are the quietest on the market supply the air. The compressor has a cylinder (head) where air is compressed and then is stored in a reservoir. On the outlet of the reservoir is an automatic sensor system which measures the pressure inside the reservoir. When the air pressure drops below a certain level (**6 bar**), the system automatically starts the compressor head and fills the reservoir to a higher pressure, at which point the system automatically switches off (**8-8.5 bar- 2 minutes working & 2 minutes cooling**). On the outlet of the reservoir there is an air filter and pressure regulator, which keep the air output pressure on the chosen level of **4.2- 4.5 bar (60 psi)**.

Due to compression, moisture in the air is collected in the system. This is automatically drained by an electronic device system (timer & solenoid) and mechanically with automatic drain systems. Water (with a little brown oil) is collected into plastic bottles from the reservoir, filter and the automatic sensor system (three black tubes into bottles).

Silver filters are positioned separately nearby the tonearm and they dry the air further and remove any oil mist from the compressed air. This is automatically drained into holder stands. The compressor is equipped with a safety valve and switches off in case of overheating. The whole system is easily maintained and simple to use.

## 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. \* not valid for ex demo products.

## KUZMA AIR LINE-Linear tracking air bearing tonearm:

Effective length	184 mm
Fixing distance	212 mm-Kuzma cutout
Effective mass	13 gr vertical
Recommended cartridge compliance	Below 25 cu
Minimum clearance below platter	30 mm
Height adjustment	Yes
VTA fine adjustment	10 mm
Azimuth fine adjustment	Yes
Air bearing	Diameter 20mm x 50 mm
Load axial or radial	30 N (aprox 3 kg)
Air pressure	4 bar ( 60 psi )
Air consumption	4 L/min
Mass	2 Kg

**Safety Precautions:**

Electrical connection to the mains comes from the compressor via the cable. Please keep the compressor away from moisture and be careful not to damage the mains cable.

**Important Note:**

The turntable or turntable support must be capable of very fine horizontal adjustment levelling to give the Air Line the desired horizontal level. The correct level is achieved with the tonearm acting itself as the most precise spirit level. See 5.5.

**2.0. Unpacking:**

Fig. 1 Compressor with “Double drain bottle system” and Test switch

**2.1. Compressor box:**

Open the box and lift up the compressor by the handle. It is a heavy item. Remove the plastic bag. Inside the box is the instruction manual for the compressor, a bottle with oil, and a plastic drainage bottles. In a small bags inside the compressor housing are the air filter and black PVC nozzle with tube for pouring oil into the compressor. Remove the two pieces of cardboard wedged between compressor head and housing for transport. The compressor should not be transported with oil inside unless you can guarantee that it will be in a vertical position at all times. Position the compressor on a hard surface with plenty of air for ventilation!!! Do not position it in a closed space, sun or in temperatures below freezing. The compressor will be connected to the mains voltage.

## **2.2. Tonearm box:**

On top of the box you will find this instruction manual. After lifting the top cover and second layer of foam, remove the black armbase, one Double silver filters with supporting stands, the set of Allen keys and black PVC tubing. Lift filters out carefully because the filter stands are not fixed onto the filters and they can slide down. Do not remove tonearm until you have fixed the armbase onto the turntable.

## **3.0. Setup description:**

**Do not slide the tonearm bearing unnecessarily without compressed air!**

**Do not tilt the compressor while it contains oil! For transport check page 15!**

**Do not rotate VTA knob when the lever is in the lock position!**

**Check working cycle of the compressor!**

## **3.1. Tonearm:**

Mount the armbase onto armboard. The dimension and position is the same as for Stogi tonearms but the main cutout hole is bigger. It is called the Kuzma cutout- that means that central hole has 40 mm in diameter. Three screws will fix the armbase from the top through the armboard into the black metal ring. On Stabi XL it is fixed directly on to the XL's brass arm base.

With the Allen key, firmly secure armbase. Position it in such way, that the hole for fixing tonearm height (rough VTA) is easily accessible during mounting. The usual direction is away from the platter.

Lift the tonearm from box, taking care of wires and tube loop, as well as tonearm cable. Then fix the tonearm gently into the armbase with Allen key 2mm. The tonearm should be rotated in such a position that the headshell is outside of the platter, i.e. as in the rest position off the record. The height of the tonearm in the armbase should be such that the centre of the main stainless steel bearing shaft is at the approximate height of an LP.

Unscrew the **small black ring** under the tonearm. It will slide down to the armbase. Fix it gently. If you now unlock the tonearm in the armbase, this ring will hold the tonearm at the same height but it can still be rotated horizontally. This is important when adjusting tonearm geometry.

Check that the scale for VTA, in front of the main base, is in the middle position with the edge in line with the thicker mark. This means that the actual VTA can be precisely adjusted plus/minus 5 mm. If this is not the case, move the locking rod lever away from the lock position, in a similar way to lowering a cueing device. Now by rotating the VTA knob bring the position of the base to the middle part of the scale. Lock back gently.

## **3.2. Air supply description:**

The compressor is factory set for working pressure. Position it in a suitable place with mains outlet.

Position silver filters vertically on the floor or other suitable place near the tonearm. Check the arrows for air flow, which should be from the compressor to silver filters and then to tonearm.

Choose the shorter piece of PVC tube that runs from the tonearm to the silver filters output ( see silver arrows marked F). Connect PVC tube. All connections are 'quick fit'. Simply push in the tube at the filter and at the tonearm. It seals automatically.

When removing the tube, you must first push in the blue (or black) plastic collar and at the same time pull out the tube. This is much easier done when there is no compressed air inside the tube.

The longer piece of tubing connects the compressor output and silver filters input. It is a hard but flexible tube and it can be hidden behind your skirting board. Permanent walking or placement of furniture on top of it, however, will break it.

If necessary the PVC tube can be cut to length with a sharp knife. Position the tube on a hard surface and cut down at 90 degrees.

#### **4.0. Air supply Setup:**

##### **4.1. Compressor:**

**Note: The working cycle of the compressor takes around 2 minutes building up pressure from 6 to 8 bars and then cooling down for 2 minutes (not working). It is necessary to monitor this cycle occasionally!**

Everything is set and checked by Kuzma Ltd. The only item to be added is oil inside the compressor and air intake filter, which must be fitted after transport.

If the compressor is in an upright position, it can be moved safely.

For more details see instructions with the compressor.

If the working cycle is longer then 4-5 minutes (heating the compressor), and stand by (cooling) shorter then 1 minute, stop using the compressor and check maintenance, FAQ (web) or “troubleshooting“ pages!!!

When you first turn ON compressor it will take a bit longer time (3-5 minutes) to fill the reservoir from zero to 8 bars. But the compressor must be connected to the air supply tube.

**Note:** The compressor has a safety valve and overheating protection!

**Note:** Do not position it in a small non ventilated space!

**Note:** The compressor is factory adjusted to a higher pressure (8 bar-120 psi) than quoted in the Compressor Instruction Manual. (See label at the side of the cover!)

**Note:** Do not switch on the compressor before filling with oil and connecting the air intake filter. Also insure that all air supply tubes are connected.

**Note:** Oil should last for at least 5 years of normal use and should be replaced when it is very dark - almost black in colour.

**Note:** Check water condensation occasionally, 1-3 months approx.



Test switch

Fig.2 Front of the compressor

Remove the small plastic cap from the metal input tube at the head of compressor, which is on the side wall marked “oil”. Fig. 4.

Fix the nozzle with clear tube onto the oil bottle.

Put the tube into the metal tube, gently squeeze all the oil into the compressor. Wipe any spillage of oil. Cover the tube with plastic cap.



Fig.3 Rear of the compressor



Fig.4 Oil filling from side of the compressor



Fig.5. Double drain PVC bottle system

At the rear of the compressor is a glass bubble which will show the correct level of oil when the compressor is not working for half an hour. Fig. 3.

Fix the air intake filter on to the metal tube at the rear of compressor. Fig. 3.

Locate the double PVC drain bottle which have three black 'quick fit' fittings at the top end of bottle. There are three black tubes (6mm in diameter), which drain moisture from various parts of the compressor (reservoir, filter, cylinder). Push them into the top of the fitting on the bottle. Fig. 5.

#### 4.2. Air tubes:

Connect the PVC tubes in blue 'Quick fit' fittings. Keep the valve lever closed at the tone arm.

There are two pieces of PVC air supply tubing. The shorter connects the air supply from the red filters to the tonearm and the longer connects the compressor to the red filters. On one end of the longer tube is a valve. This end should be connected to the input silver filters. The valve lever should be in “**close position**” (as supplied i.e. with lever at 90 degrees to the tube). The other end is plugged in at compressor output. See page 6.

#### 4.3. Silver filters (dryers):

**Note: Keep the silver filters in an upright position. They might leak otherwise.**

**Note: They should be sealed; otherwise the compressor can not build up pressure.**

The silver filters which are positioned near the tonearm have an automatic drainage system. When full air pressure is reached in the compressor (and compressor stops), open valve on the tube before the silver filters (allowing the air to flow in). This will automatically seal the automatic drain systems in these dryers. If there is no pressure inside, they will not seal. Fig.6.

Check if it is sealed properly by listening for any hissing noises.



Fig.6 Silver filters-dryers- see arrow for airflow

#### 4.4. Air pressure Setup:

**Note: keep valves on air tube supply and tonearm in the closed position. All tubes must be connected.**

#### **4.4.1. Compressor ON:**

Plug the compressor into the mains and leave it permanently turned ON. The main switch is under the cover on the top. It has two positions. Be careful inside not to hurt your fingers, although there is no danger of electrical shock. When the main switch is turned ON, pressure will start to build up and this will be shown on the pressure gauge on the left side of the compressor. This shows the air pressure in the reservoir. It should rise and reach 8-8.5 bars (110-120 psi) in about 3-5 minutes. The right hand pressure gauge shows output working pressure. It should rise and then show constant 4.5 bars (65 psi). The knob on top of the filter is for readjusting the working pressure. To readjust, it must first be pulled up. Fig. 2.

#### **4.4.2. Silver filters sealed:**

When full air pressure is reached in the compressor (the compressor stops working in about 3-5 minutes) open the valve on the tube before silver filters and the air pressure will flow into the filters which will automatically seal the automatic drain systems in these dryers-filters.

#### **4.4.3. Tonearm's air pressure in the bearing:**

**Note: When tonearm is not in use the valve on the tonearm should be in the closed position. You should not move the tonearm unnecessarily.**

Open the valve on the tonearm and the small pressure indicator will show a similar level of air pressure (4-4, 5 bar) as on the right hand pressure indicator on the compressor. If not, check for leaks (hiss noise) at red filters.

**Note: See also 5.0:** On the tonearm now remove protective shaft cover and the security wire which has restricted movement of the arm bearing during transport. The tonearm is not balanced, as there is no extra weight on the headshell. When the air bearing is functioning, the counterweight will rotate the tube so that the headshell will go up.

Open the valve again and move the tonearm once or twice along the main bearing shaft (if tonearm is new or has not been used for few days). This will clean the shaft of dust particles. After use merely close the valve on the tonearm and the pressure indicator on the tonearm will show zero pressure. You can not move the tonearm now. The compressor will go on standby. Every few hours or so air release noises can be heard and the compressor will switch on a few times per day when resting in the stand by position.

#### **5.0. Tonearm Setup:**

**Note: See also 4.4.3.**

On the tonearm remove the protective shaft cover and the security wire which has restricted movement of the arm bearing during transport. The tonearm is not balanced, as there is no extra weight on the headshell. When the air bearing is functioning, the counterweight will rotate the tube so that the headshell will go up. To avoid this, mount the cartridge in the headshell with stylus guard on. Open the valve. Pressure on the small pressure gauge on the tonearm, should show about 4 bars.

By holding the headshell and lifting it, so that the counterweight support is not touching

the cueing device rod, gently move the tonearm towards the centre of the platter a few times and also rotate it up and down. If you feel any resistance do not push but check the air supply or pressure. Check wire and air supply loops to ensure that they are not crossing each other.

### **5.1. Mounting of the tonearm:**

Again check the height of the tonearm. The basic height should be such, that the centre of the shaft (centre of vertical movement), is at the height of an LP on the platter. If there is a big difference, readjust the height of the armbase. If small (1 – 2mm), readjust by rotating the VTA knob, after first unlocking the VTA lever.

Put the alignment protractor on the platter without a record. Be careful not to touch the cantilever. Rotate the tonearm so that the base is parallel to and touching the narrow part of the protractor. This will precisely position the tonearm. Fix the tonearm with the Allen key 2.5mm. Due to its special construction, it is not necessary to over tighten.

If necessary, due to the added weight of the tonearm, re-balance the turntable. Use a spirit level to adjust horizontality of the turntable platter. If this is not possible readjust the turntable support. Do note that spirit levels are not completely accurate. The turntable should be horizontal; otherwise the tonearm will slide in one direction more than in another.

### **5.2. Mounting the cartridge:**

With Allen screws 2.5mm, fix the cartridge onto the headshell. The position of the needle should be in line with the end of the headshell when viewed from the side. Then fix cartridge pins with tweezers.

Cartridge pins are: colours or other symbols:

Right	(+)	red
Left	(+)	white
Right ground	(-)	green
Left ground	(-)	blue

### **5.3. Adjustment of tracking force:**

The counterweight is made from two parts. Rotating the counterweight position from one red point to another, changes the tracking force for 0.1grams. Locking is achieved by holding the part which is nearest to the bearing and rotating the smaller part (view from headshell) anticlockwise for about quarter of a turn.

In the unlocked position rotation of the counterweight is easy. To begin with, the tonearm should be balanced to zero tracking force. This is not easy to achieve due to the very low friction in the bearing.

**Heavy cartridges** (above 15g): use a small counterweight which should be firmly screwed by hand at the end of the threaded rod for counterweight.

**Light cartridges** (below 3 g): as an option a lighter counterweight is available.

Add tracking force by rotating the counterweight anticlockwise, then locking the counterweight. Move the tonearm gently with the fingers in one direction, while the cueing device is in the up (not play) position. The counterweight support will slide along the cueing

device rod with a certain friction. The tonearm will move to a certain distance. Now repeat the same in the other direction. A big difference in the distance travelled means that the tonearm is not horizontal. Try to adjust the level of the turntable again, especially in the direction along the bearing shaft.

#### 5.4. Adjustment tangential geometry:

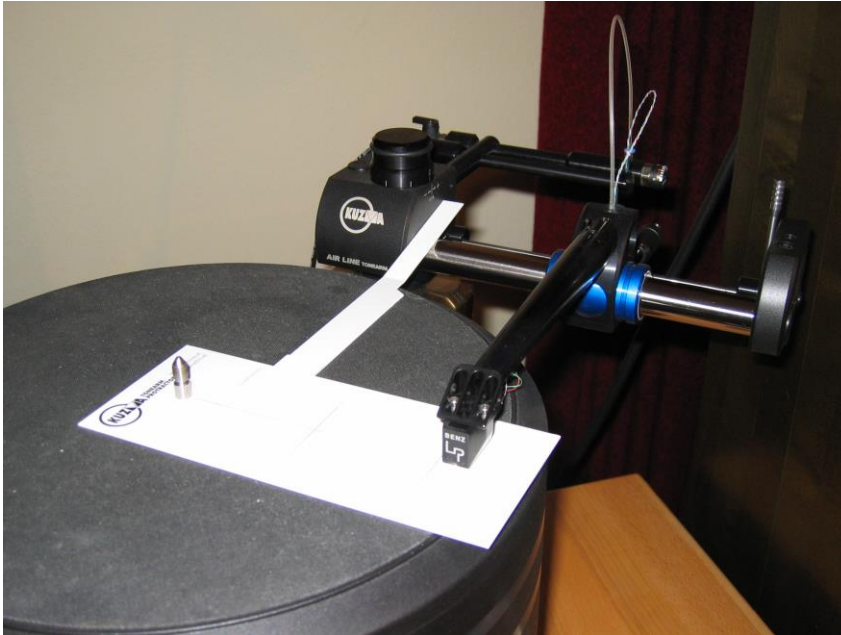


Fig. 7 Protractor position

Put a record on the platter and, using the cueing device lever, lower the cartridge onto the record. Observe the VTA. If you know, what is the best VTA for your cartridge, and then adjust VTA by unlocking lever from 'Lock' position and rotating the knob to achieve the desired VTA, locking the lever back gently. Remove the record and put on the geometry protractor which should touch the side base of the tonearm. If you can, fix the platter and protractor against rotation.

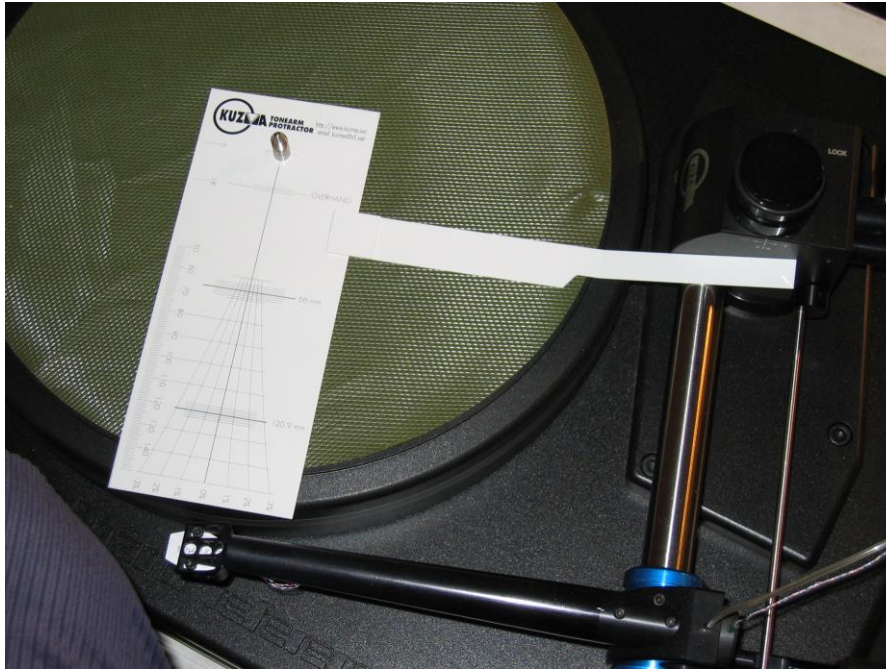


Fig. 8 Protractor – position from top

Move the cartridge along the headshell to such a distance, that the tip of the diamond (needle) is on the line on the protractor, which goes from centre of record towards edge of record. This is the line where the tip of the diamond will be 'tangential' to all grooves on an LP.

Using the cueing device, just lift the needle above the protractor for an mm or so. Move the tube along to see if the needle is travelling along this line. If it is travelling parallel to the line but in front or at the back, then reposition the cartridge. But if it travels at an angle to this line, (e.g. if tip is at line 66mm but not at 121mm) then rotation of the tonearm must be repeated. The protractor was not precisely aligned against the base, or the cutout for position of the armbase was not precise. Experimenting with small rotations of the tonearm will solve the problem. The tip of the diamond must travel parallel to the centre line, even if it is in front or behind. Now simply position the cartridge backwards or forwards. When you are sure, check by actually lowering the tip onto the protractor. The cantilever will deflect due to the tracking force.

When this is complete the needle should travel along the line. You must achieve a tangential position on the grooves. Rotate the whole cartridge without moving it along the headshell, so that cantilever is tangential to the parallel lines. Just chose one and then align the cantilever to be parallel, by twisting the cartridge body in the headshell.

When this has been done, check again if the needle travels along the line from the centre of the spindle. Check again, if cantilever is in a tangential line. Fix the cartridge screws one at a time, gradually, being sure not to move the cartridge.

After the cartridge is firmly secured check geometry again.

**Note: Do not use the damping facility while levelling the tone arm! Lift out paddle from oil.**

Now you can start playing LPs. On a spinning record gently lower the needle into the first groove. When the needle touches the record it will move in and out a little before settling into

the first groove. If it moves inside, skipping a few grooves or drops from the record, that means that the horizontality of the tonearm is not correct.

If it jumps out towards the edge of the record, then the tonearm is tilted too much downwards towards the edge of the LP. You must raise that part of the turntable. If it moves inwards, towards the centre of the record, then it is tilted too much upwards and you must lower that part of the turntable. See 5.5.

### **5.5. Fine horizontal levelling of the tone arm:**

**Note: Do not use the damping facility while levelling the tone arm! Lift out paddle!**

**Note: Do not use spirit level for fine levelling adjustment.**

This will avoid cartridge skipping in the grooves. The tonearm itself is the best levelling device.

Bring the cartridge above the LP in the middle of the modulated grooves having the cueing device in the upper position. Then lift up the headshell and let it drop back towards LP. The cueing device being in the “up” position will prevent the cartridge dropping on the LP. The headshell will bounce up and down because rod of cueing device will restrict movement of the threaded rod of counterweight at the back. At the same time the whole assembly will drift sideways in one direction, or only move very little. Try the same experiment above the outer perimeter of the LP and also at the inner grooves

#### **The tone arm is correctly levelled when:**

Above the outer grooves the whole assembly moves slowly away from the record.

Above the middle of the grooves it stays more or less stable or has a very small drift.

Above the inner grooves the whole assembly moves slowly towards the record centre.

If the tone arm is stable at the outer groove and moves towards the centre at the middle and inner grooves, then the tone arm should be levelled in such a way, that the whole assembly will slide towards the outer perimeter of the LP.

If it is stable at the inner groove and moves slowly outwards at the middle and also if at the outer perimeter of LP it runs outwards (away from LP centre). Then the arm should be levelled so that the whole assembly will drift towards the LP centre at inner groove.

### **5.6. Adjustment of VTA:**

**Note: Do not operate VTA knob while the lever is in the lock position!**

VTA is adjusted by rotating the knob on the top of the base. Rotation in the direction of the arrow (+), means that the tonearm will be raised at the support. A rough scale can be seen on the front of the main base. This is on a scale of 10mm. In the middle of the scale is a stronger line indicating the zero starting point. The space between each line represents 1mm difference. Full rotation of the knob is 8 markings, representing 0.1mm between two lines.

To make VTA adjustment easier, you can rotate the ring while holding the main knob to adjust the zero starting point on the knob. This knob can rotate a little even when the lever is

in the lock position (the lever locks the support mechanism and not the knob itself). The lever, gently pushed into the lock position, gives rigidity to the VTA system due to its special construction. Fine adjustments, of only few 0.1mm, will make a big difference in sound on the same LP. Bear in mind that the tonearm cables need at least 40 hours of 'burning in' for optimal performance.

### **5.7. Adjustment of azimuth:**

To make azimuth adjustments, release the two screws locking the mechanism at the centre top of the tube, with Allen key 2mm. The small tube, with a hexagonal screw on the left side, is for fine rotation of the tube. To change azimuth, insert Allen key 2mm and finely rotate it. The Allen key might feel loose in the screw but when you rotate it, by small increments, it will change the azimuth. Returning 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.

Of course the use of a test record and oscilloscope is mandatory for optimal azimuth. VTA changes and even changes in the height of the armbase will not change azimuth, due to precision in construction.

### **5.8. Adjustment of the cueing device:**

The cueing device has no damping for motion as is usual. Due to the construction it is not needed. It can stay in any position and can be precisely cued on the record. Using the Allen key 1.5mm to release the small knob, which holds the lever and rotating it, we can adjust the height of the cartridge above the record.

### **Note: Cueing device level resistance:**

The blocking plate, at the end of air bearing shaft, controls ease of movement of cueing device lever. If released with Allen key 4mm, it can be pushed away from the main tone arm tower and this eases movement. When fixing the blocking plate back, be sure that it is parallel to the main tower, otherwise this can cause the distance from diamond tip to record surface to be different at the outer grooves compared to the inner grooves. Slight rotation of the blocking plate can correct this. See page 16.

### **6.0. Operation of the tonearm:**

The compressor should be permanently switched ON. When tonearm is not in use, the valve on the tonearm should be in the lock (closed) position. In use, open the valve and move the tonearm once or twice along the main bearing shaft (if tonearm has not been used for more than few days). This will clean the shaft of dust particles.

After use merely close the valve on the tonearm and the pressure indicator on the tonearm will show zero pressure. You cannot move tonearm now. The compressor will go on stand by. Every few hours or so air release noises can be heard and the compressor will switch on a few times per day when resting in the stand by position. Cue cartridge slowly.

## 7.0. Damping:

**Note: if you pack tonearm for shipping be sure to remove ALL silicone oil from trough and paddle with holder. Best is to remove these two parts from the tonearm, clean them and put them in the PVC bag. Remove trough by using Allen key 2mm and for paddle holder 1.5mm.**

A damping system, consisting of a paddle, damping trough and silicone oil is fitted at the rear of shaft.

The paddle is fixed on to the threaded rod and the trough is fixed on to the blocking plate. With oil levels, paddle height, damping can be changed from zero to max. This is suitable for cartridges with high compliance.

**Note: Do not use the damping facility while levelling the tone arm! The tonearm will not move freely.**

### Inserting silicone oil:

Cut off the tip of the nozzle from PVC bottle. Squeeze silicone oil into the trough- it will go slowly before it spreads evenly. Fill it up to the line or about half way up.

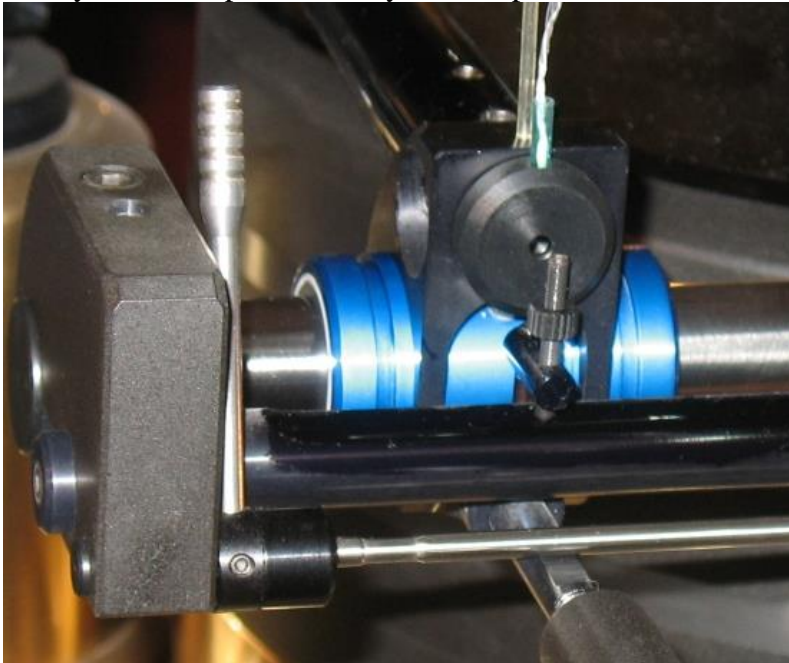


Fig. 9 Damping system

### Damping change:

Release black plastic nut by hand and rotate the paddle-screw into the trough with Allen key 1.5mm. To secure paddle at the desired height, fix it with the rotating CCW plastic nut, while preventing paddle - screw rotation with an inserted Allen key.

### Optimisation:

The only way to reach optimum damping is by experimentation. Start with the height of the paddle when the needle is in the groove so that the tip of the paddle is just touching the surface of the silicone oil. Listen to the sound and increase the depth. Also observe what happened when the needle touches the grooves, how the whole assembly moves in a horizontal level a few times, before stabilising in the groove. If you have a test record observe how the damping decreases movement of the assembly when resonance occurs.

For a lot of cartridge combinations the best sound will be without the use of damping. But cartridges with higher compliance might benefit.

### **8.0. Zero Switching kit (optional):**

The function of the “zero switching kit” is to eliminate the noise of the compressor switching ON and OFF being heard through the speakers.

Kit is available from us, consisting of switching box, which can be fitted in the compressor **ONLY** by a qualified electrician.

### **9.0. Maintenance:**

**NOTE: Check our web site for frequently asked questions (FAQ) for some more answers.**

When air is consumed, the compressor works automatically, approximately every 2 minutes and then rests for about 2 minutes (**working cycle**). When it stops you will hear the noise of air being released. The automatic drainage system works every few hours ( you can test this by pressing **TEST switch**: Fig.1 : 1-2 seconds long burst of air will rush into PVC bottles ) and you will hear a similar noise when air is released from the reservoir in the compressor. This is normal. The amount of water& brown oil released depends on the working hours of the compressor and the humidity of the air. In winter months there is less. Water will be collected in the PVC bottles. Air pressure will push liquid from the first into the second bottle. When the second bottle is half full, unscrew it and empty it. From the silver filters, small amounts of water might drain into the supporting stands. Lift up the filters and empty the liquid. Occasionally some noises will be heard due to the automatic drainage system releasing water.

With normal use check this every few months. If the tonearm is used every day and humidity is high, (over 70%) then monthly checking is recommended. In the compressor manual, working conditions are described for compressors used all day, every day, and all the time in industry, where conditions are much more demanding.

### **9.1. Disassembly of the tonearm:**

#### **9.1.1. Removing the bearing assembly from the shaft:**

**Note: Clean only occasionally- i.e. every year or two.**

**Note: Remove trough by using Allen key 2mm and paddle. Do not spill silicone oil.**

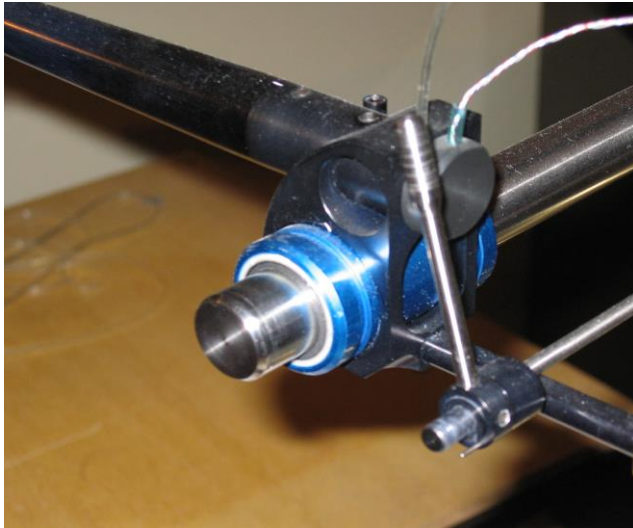


Fig. 10 Air bearing assembly and bearing shaft with cueing device-blocking plate removed.

Protect the cartridge. Do not slide the bearing without compressed air. Allen key 4 mm will release the top screw of the blocking plate, which is at the end of the shaft. Slide it off. With level of damping oil or remove through. Then gently pull off the whole assembly (tube with blue bearing). Be careful as the wires are short, and put the assembly down on the platter. The wires can be pulled out from the rear of the tube a little with gentle force and can be pushed back if the wire loop is too big.

Using the cloth supplied (which does not leave small particles), soak with 75-95% isopropyl alcohol (not acetone or any other solvents) and wipe the shaft clean.

Spread the cloth over the platter under the blue bearing and from the bottle, squeeze alcohol onto the inside of the bearing, which will then drain on to the cloth. You will hear bubbling noises of the air coming through it. After a few minutes the shaft and bearing will be dry and you can gently slide back the bearing. Move it a few times back and forth. Fix back the blocking plate.

Be careful to also insert the cueing mechanism bearing in the 'up' position. Press gently and fix it. Then align the plate vertically with the main tonearm base. If the cueing mechanism is too hard to move, unlock the plate so there is less pressure against it.

Check loops and, if necessary, push back a little bit of wire. The wire loop should be long enough, but if it is too long the loop will wobble.

## 9.2. Compressor & tonearm transportation:

Compressor:

If you can **ensure** the compressor will be in an upright position at all times it is not necessary to remove the oil. If, however, there is a possibility that it may be tilted or turned upside down then the **oil must be removed!** To do this it is necessary to refer to the compressor instruction manual.

**Note:** First ensure that there is no pressure in the compressor and that it is disconnected from the mains. Loosen the screw holding the rubber seal on top of the compressor head and lift off

the cover. Pour away oil and return the head cover and fix the screw. Ensure that sealing ring is correctly positioned.

Tonearm:

Use original packing and fit parts in appropriate slots.

**Note: if you pack tonearm for shipping be sure to remove ALL silicone oil from trough and paddle with holder. Best is to remove these two parts from the tonearm, clean them and put them in the PVC bag. Remove trough by using Allen key 2mm and for paddle holder 1.5mm.**

## **10.0. Troubleshooting:**

**NOTE: Check our web site for frequently asked questions (FAQ) for some more answers. See also appendix of this manual.**

### **10.1. Cartridge skips the groove:**

Tonearm is not horizontal: check horizontality

Excessive dirt on record: check and clean for small particles stuck in the groove

Inaccurate geometry: check that the cartridge tip follows line

Low tracking force

Moisture or dirt in the bearing: clean and check PVC bottle and Red filters stands

Clean shaft and bearing with alcohol- see # 11

### **10.2. Cartridge does not cue first groove but runs in:**

Tonearm is tilted down toward the centre of the record: adjust horizontal level down.

See above

### **10.3. Cartridge runs from record outwards:**

Tonearm is tilted up towards the edge of the record: adjust horizontal level upwards.

### **10.4. Compressor cannot generate enough pressure, or runs for longer than normal:**

**Note:** Check that the silver filters drainage system is sealed, as described at build up of the pressure. Leaking (hiss noise) in the system: check tubes and its connections, silver filters, and the compressor.

Check **working cycle** when the arm is operating. The compressor should take two minutes to build up pressure from 6 to 8- 8.5 bar. It should then cool down for 2 minutes. If the working cycle is longer or the cooling shorter, there is a leak in the system or a damaged compressor.

When the arm is not operating (valve on the arm closed and arm meter shows no pressure) the compressor will be on standby and it will switch on occasionally (2-4 times per day). This also means that there is no leak in the system. If it is switching on every hour or so, there is a leak in the system and the working cycle might be too long.

Close the valve on the arm and see if the pressure builds into normal cycle from 6 to 8 bars in less than 2 minutes. Then open the valve on the toner arm and the working cycle should be around 2 minutes. If it is longer than 3 minutes, then there is a leak in the system. The working pressure should be 4-4.2 bar. If it is higher readjust.

Close the pressure regulator valve to zero output ( lift up black knob and rotate ACW) and see if the pressure builds up to 8 bars and the compressor switches off after approx. 2 minutes. If not, then the problem is in the compressor. If the pressure build up is normal, then readjust working pressure back to 4-4.3 bar.

#### **10.5. Compressor does not start:**

Check the mains electricity. Compressor was overheated and overheating protection switches it off. Overheating protection needs replacing.

#### **10.6. Compressor switching noise through the speakers:**

The compressor has the same effect as household refrigerators which generate noise when switching on or off. Some systems are more sensitive than others. If possible the compressor should be connected to a secondary electrical circuit then the audio system. If this is not possible then the compressor should be as far away as possible from the audio system connected to the mains. A noise filter on the compressor together with a long mains cable might help. See also **Zero Switching kit**: 8.0.

**NOTE: Check our web site for frequently asked questions (FAQ) for some more answers. See also Appendix on web.**

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