

## Dual 1219, 1229 Service for Amateurs

I'm a retiree who is always looking for a new and challenging hobby. I am an amateur hobbyist, not a working turntable repairman. To that extent use this guide at your own risk. I have been a hi fi addict since the late 60's. Just before Christmas 2008 I got the bug to get my old hi fi equipment out, a 1974 Marantz 2270 and a Garrard Zero-100C I bought new, still have all the boxes and paperwork for. After a little work on the receiver and a proper service of the Garrard this equipment still makes some beautiful music. I also upgraded my speakers, replacing some cheapie interim Kenwoods that replaced my Pioneer CSR500's which sadly were destroyed. The new speakers are some early 90's Klipsch Quartets in oak oil that look beautiful and sound terrific. While I was waiting for the Garrard to be serviced I got interested in Dual 12-series tables. My brother always had duals and he swore by them, his last table was a 1229Q. I looked on E-Bay and I wound up buying a US version of the 1219, a 1229 and a couple of junk for Europe metric 1219's mostly because one of them had a choice Dual base with the fold down front and also because some parts are interchangeable. I have 1 of the Euro tables, the for US 1219 and the 1229 up and running and they are amazing to listen to. The other Euro table was missing parts and the gimbal bearings were destroyed so it is parts only.



Above are pictures of the Dual 1229 I recently purchased on E-Bay for the princely sum of \$69 + shipping. It had a Shure V15 Type III cartridge and no base cabinet. The base cabinet was another \$9.99 on E-Bay + shipping. It was quite tired when I got it probably never having been serviced since new. The start/stop switch was loose and the speed control lever was stuck.

***Caution: Never force a stuck speed control. If it won't move easily it must be cleaned and lubricated. The plastic speed control cam will shatter if you force the control lever.***

The table was dusty and dirty and had a tweaked transport screw in one corner. I did a quick cleanup of the chassis with a paint brush, replaced the transport screw from a donor table, released the stuck start switch and tightened the set screw on the bottom of the chassis and cleaned up the speed control (detailed description later) just to get the table to spin up and allow me to finish checking it out. The table actually ran in single play 33rpm on the 12 inch record setting only. The cueing lever also seemed to work well. While the other speeds worked the tone arm would not move to 10 inch or 7 inch positions in single play mode. Additionally after a few minutes of running the drive motor became noticeably noisy.

I then inserted the multi-play stacker spindle and very carefully moved the mode lever to the multi-play position.

***Caution: Never force a stuck single-multi play mode control. If it won't move with very light effort and you force the lever you will break the plastic ears off the bottom of the gimbal ring. There are no service parts for this, you will either scrap the table or have to replace the complete tone arm and gimbal assembly if you can find one.***

My mode lever moved quite easily and the tone arm did rise, a good sign that the gimbal assembly was intact. I put a couple of old records on the stacker and hit start. The tone arm rose from its rest, a record dropped and the tone arm set back down on the rest and the table turned off. I also manually moved the tone arm to the starting groove of the record and found quickly that in multi-play mode the tone arm was dragging and would not track.

These symptoms are typical for a table that is stuck with old grease, has a broken rubber washer in the single-play multi-play tone arm height control, needs a new tone arm clutch (sometimes referred to as a "guide white" or "steuerpimpel") and a drive motor that needs to be disassembled, cleaned and re-lubed. Below are some better step-by-step descriptions of how I brought this table back to life.

### **Some differences between early and later 1219 tables and 1219 and 1229 tables**

Some early 1219's were built for use in either US or Europe with a 110v/220v switch on the motor terminal box and had hardwired phono cables and no separate chassis ground wire. Many of these also had 50cycle strobe patterns on the platter. Use of US 110v 60cycle power required a change of the motor pulley to produce set speeds. Metric record sizes were stated on the switch mask. Later United Audio units intended for US only had no 110/220v switching, had RCA output jacks under the table and had ground wires. They had no strobe patterns on the platter.

1219's had metal speed control levers and 2 piece pitch control knob knobs where 1229 tables had 1 piece pitch control and plastic speed control knob.

### **Preparing the table for service**

After disconnecting the table and moving it to a work table I first removed platter retaining clip and the platter, cartridge and head shell and the counterweight at the back of the tone arm. Make sure the tone arm is locked on the rest at this point. Next unlock the transport screws, tilt them out of their slots in the mounting board and lift the table out of the base. I have found with careful handling it is safe to work on either side of the turntable when it is placed on a thick soft layer of terrycloth bath towels.

### **Servicing the speed control mechanism**

#### **Disassembly**

The example speed control is a 1219 unit which has slightly different pitch knobs and speed switch lever.

1. With the table right side up remove the vinyl keeper washer on the idler wheel and set the idler wheel aside. After the wheel is removed it's a good idea to put the keeper washer back on the idler shaft.



!229 speed control switch shown above has plastic lever and 1 pc pitch knob.

2. Turn the table over and carefully set it on a thick layer of towels. Pictured below is the speed control mechanism.



3. Find the actuator spring that connects the idler wheel arbor on the speed control mechanism and remove the E clip that retains it to the shaft on the motor switch arm and lift the spring off the motor arm shaft.

4. Remove the nut on the bottom of the speed control that holds the detent plate (see above) Carefully remove the washer and detent plate from the bottom of the speed control switch shaft. All units have a ball and spring that lock the detent plate into position for the various speeds. On some units the ball and spring are loose parts and should be removed and set aside. I have found at least one that the ball was captive in the end of the hole in the speed control housing but make sure these parts don't fall out and get lost.

5. Turn the chassis right side up again and lift out the speed control switch lever and the fluted aluminum pitch control knob.

6. Under the pitch control knob above the pitch pointer is a fairly large C clip. This C clip must be removed then the pitch pointer and a wave washer come off above the chassis.

7. Turn the chassis upside down. Grasp the speed control housing and the idler bracket as a unit and remove the 2 screws that hold the assembly to the bottom of the chassis. Lift the assembly off the bottom of the chassis and try to do it without letting the cam spring push the whole assembly apart until you can get it out and look at how the idler bracket pin inserts into the side of the plastic cam. Once you see that you will have an easier time re-assembling the speed control. As an assembly aid I have some pictures below that show the speed control assembly removed from the chassis.





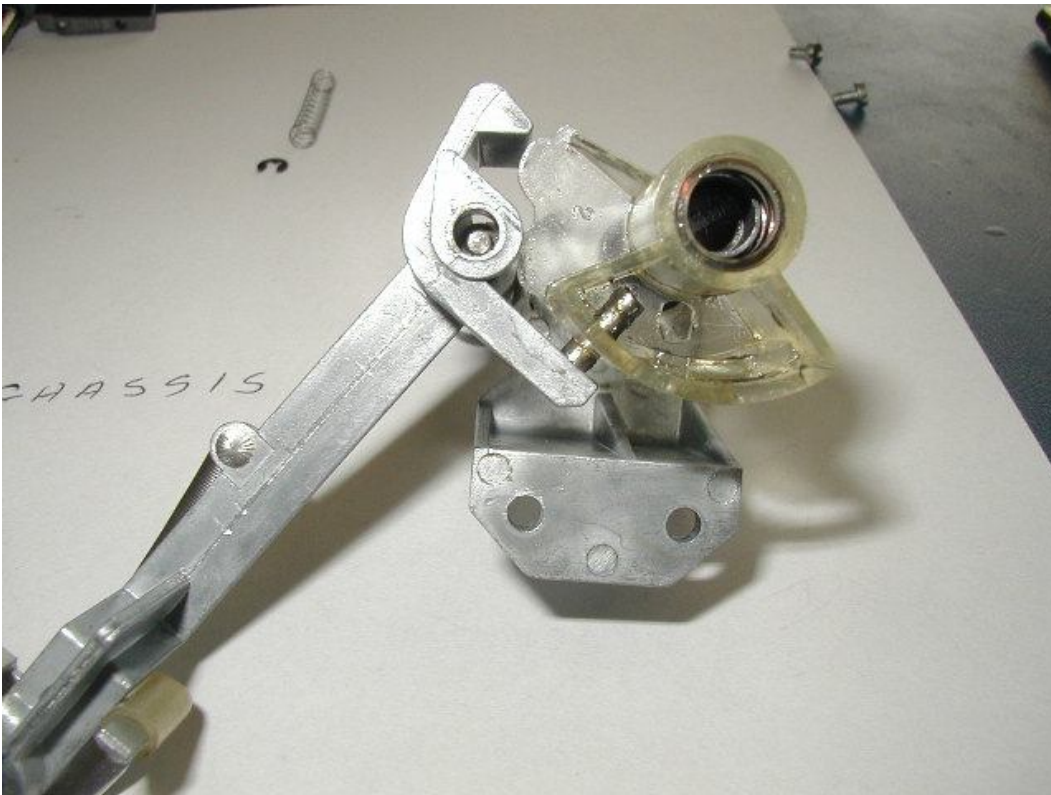
Detent plate removed...



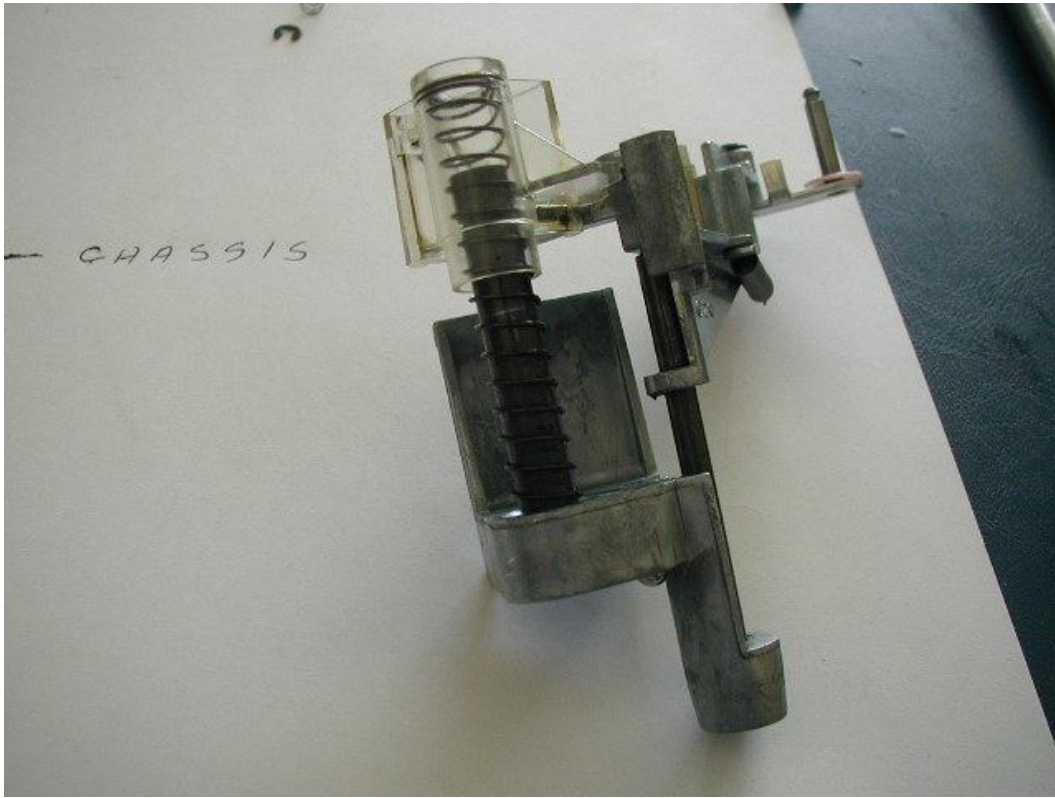
Speed control switch lever and pitch control knob removed-1219 2pc pitch knob.



Large C-clip partially removed from pitch pointer...

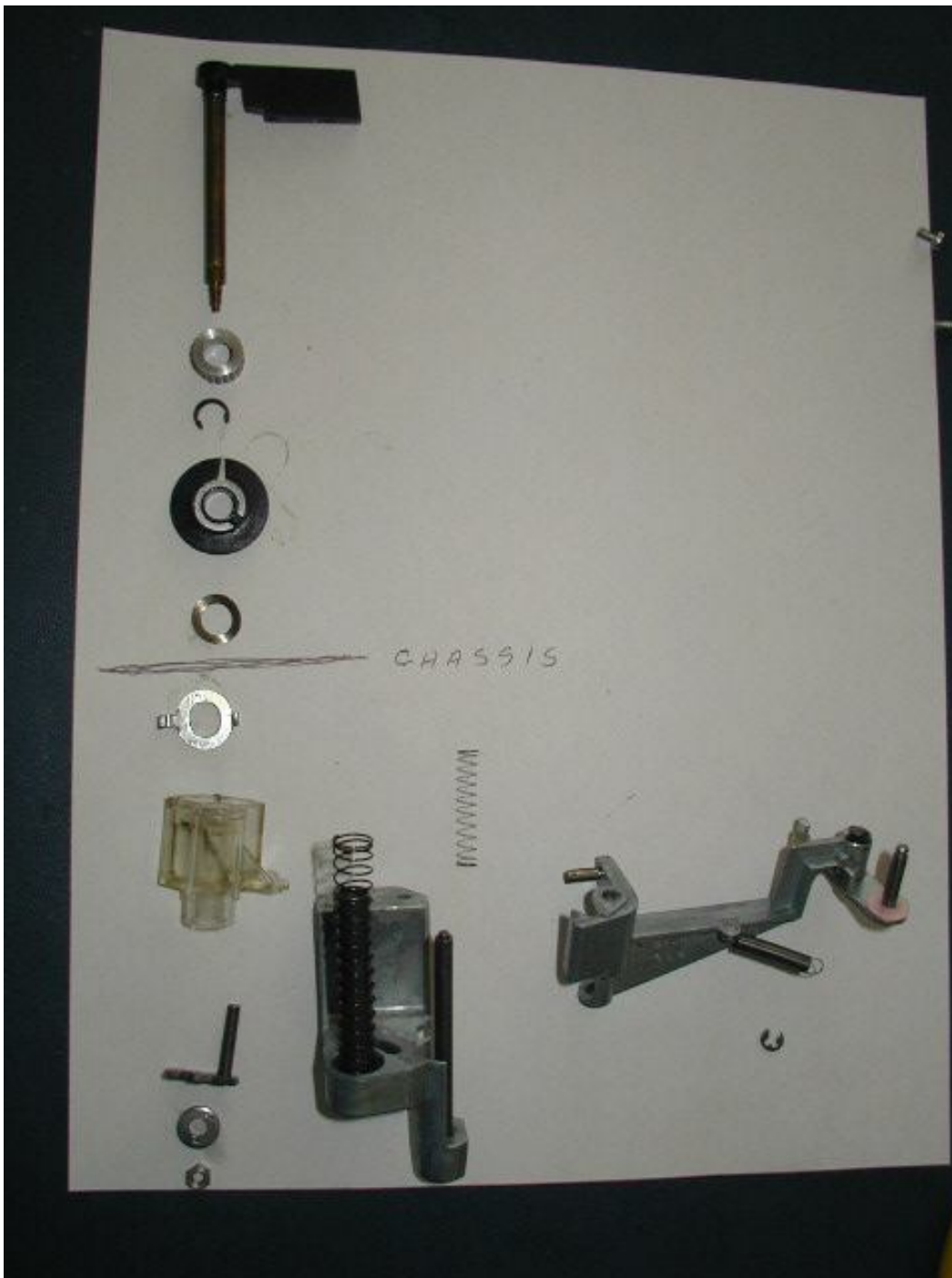


A view of the idler bracket and plastic speed control cam. Note how the pin on the idler bracket passes through the S-slot in the side of the plastic cam.



Another view of cam idler bracket assembly to main housing...





Speed control parts laid out in order of assembly. Note parts above the “chassis” line assemble on top of the chassis and all others including the 2 attaching screws in upper right corner of picture go below the chassis. Note the first part below the chassis is a washer with 2 small right angle tabs that must be assembled to the chassis so the center hole lines up with the hole in the chassis that the switch tube passes through. Note also that there is a step on the steel pin that the idler bracket slides on. This step down fits into a small hole in the bottom of the chassis to correctly align the speed control assembly. Make sure when installing the speed control to the bottom of the chassis this step down pin is located in the chassis hole before tightening the 2 mounting screws or the speed control will not work correctly and you may damage the speed control casting.



## Cleaning

All parts of the speed control except the pitch pointer can be degreased easily with charcoal lighter and a hobby paint brush. **Caution: The pitch pointer is a hard rubber and will be attacked by petroleum products.** Use rubbing alcohol and a soft cloth only on this item.

## Reassembly

1. Once all old oil and grease are removed put a trace of Phono Lube or other very light lithium grease in the S-slot of the plastic cam and on the switch tube the cam swivels on.
2. Refer to the exploded view picture above and place the large spring back on the switch tube portion of the main speed control casting.
3. Smear a drop of 10w30 motor oil on the idler bracket shaft and slide the bracket up and down the shaft a few times to make sure it moves freely.
4. Raise the idler bracket almost off the shaft, place the plastic cam over the end of the big spring on the main casting, engage the idler bracket pin in the S-slot of the cam and slide the cam and idler bracket together down the switch tube and idler bracket shaft.
5. Hold the cam down on the switch bracket against the spring force and install the tab washer above the cam on the switch tube and the small spring on the top of the exposed portion of the idler bracket shaft.
6. Carefully start the idler bracket and switch tube through the chassis holes from below the chassis.
7. Rotate the tab washer to engage the tabs in the slots in the chassis.
8. Carefully center the idler shaft spring over the alignment hole in the bottom of the chassis and insert the idler shaft through the small spring and then the step of the idler shaft into the alignment hole. Make sure idler shaft spring is not kinked or crushed and that the idler shaft step down pin enters the alignment hole in the chassis.
9. Maintaining assembly pressure on the speed control assembly install the 2 mounting screws to attach the speed control assembly to the bottom of the chassis.
10. Place the motor switch spring back over the end of the motor switch link pin and re-install the small E-clip.
11. Turn chassis right side up and put a dab of Phono Lube on both sides of the wave washer and place it over the switch tube.
12. Place the pitch pointer over the switch tube, rotate it to engage the cam and re-install the large C-clip.
13. Install the fluted pitch control knob and finally smear a little Phono Lube on the brass speed control switch shaft and insert it into the switch tube.

14. Turn chassis upside down again and re-install detent spring and ball in hole on bottom of main speed control casting.
15. Insert the pin of the detent plate into hole in bottom of plastic cam and install detent plate over the flats on the bottom of the speed control switch shaft and install cupped side of washer down against detent plate and install and lightly tighten the nut.
16. Turn chassis right side up.

### **Idler wheel inspection and installation**

The perimeter of the idler wheel must be perfectly round to prevent rumble and free of rubber glazing to supply proper traction.

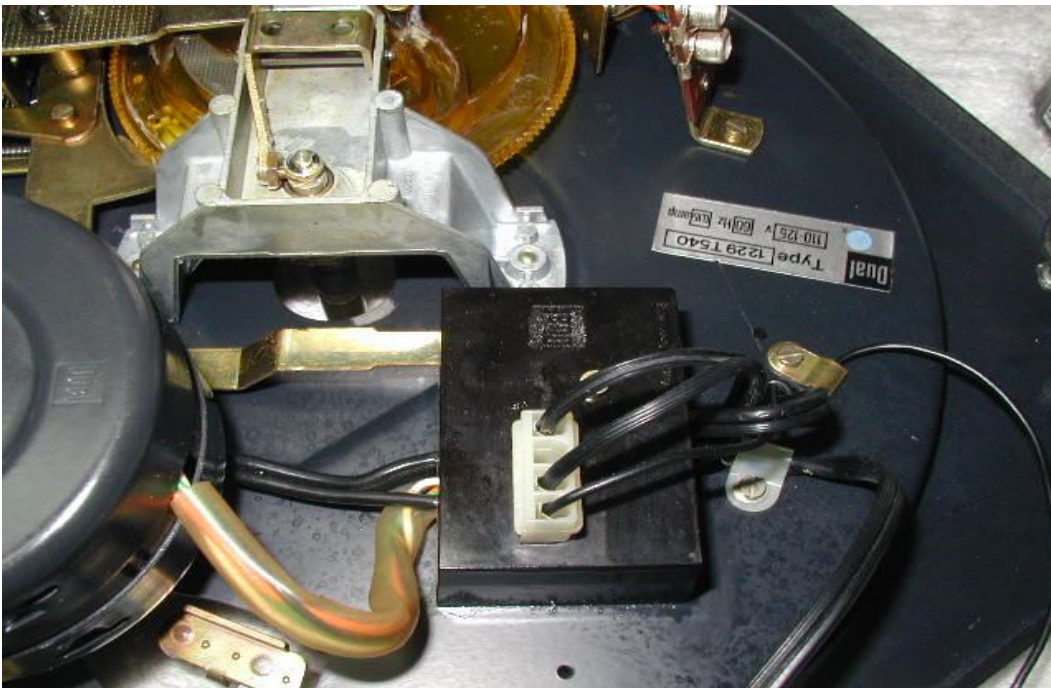
1. Very carefully inspect perimeter of idler wheel to make sure it is free of flat spots. A common cause of flat spots is a table that was stored away with the motor switch left on so the idler wheel sits in contact with the motor pulley for a long period of time.
2. Very very small flat spots may be cleaned off by putting the idler wheel shaft flange finger tight in a drill press chuck (do not use a chuck key or you may collapse the flange and wreck the bearing) then lightly dressing the edge of the wheel with a fine emery board. If the wheel has more than very very small flat spots it must be replaced or it will rumble.
3. If it is only glazed the edges can be lightly feathered with 280 grit paper and wiped clean with alcohol.
4. Once the idler is in reasonable condition remove the vinyl keeper washer from the idler wheel shaft, coat the shaft with a drop of 10w30 motor oil, insure the fibre thrust washer is present at the bottom of the idler shaft, install idler wheel and keeper washer.



### **Motor service**

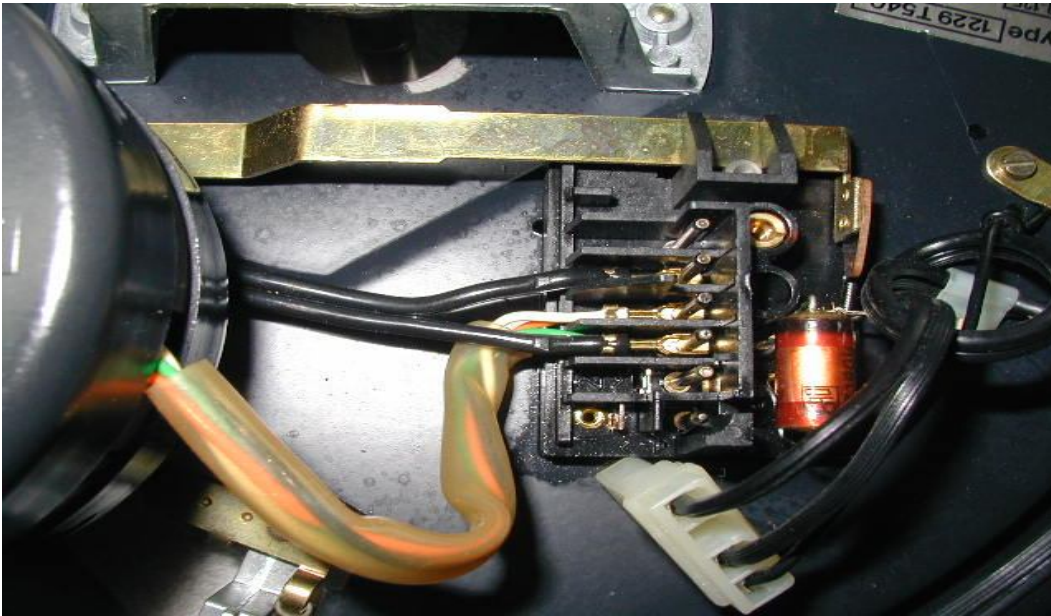
Drive motor leads must be disconnected from the switch box and the motor must be removed from chassis for disassembly, cleaning and lubrication.

1. Turn chassis upside down and remove the mains plug from the bottom of the switch box then remove the switch cover screw and cover and set aside.



2. Note that the terminals are numbered in the switch box. Make a list of which colored wire goes on what terminal post.





3. Use a small hook made from piano wire or brass tubing to aid in removal of wire connectors from switch box terminals. Place the hook under each wire terminal close to the terminal post and using other hand to slightly rotate wire terminals on their posts gently lift terminals with the hook up and off the terminal posts. Be very careful not to apply side pressure to the plastic divider walls between terminals or you will break the plastic switch box.
4. After all wires are removed from the switch box turn the table right side up and using a 7mm metric socket remove the 3 motor nuts and lift the table off the motor assembly and set aside.



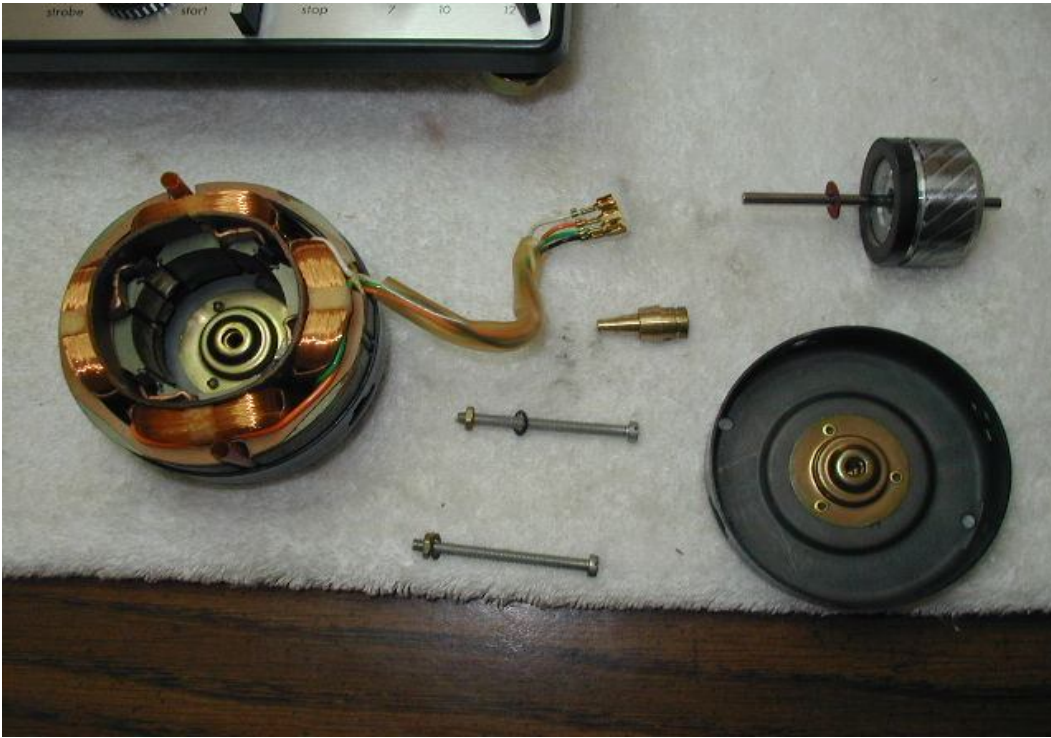
5. Before the motor is disassembled put a pencil or paint reference mark on the upper and lower shells to assure proper reassembly.



6. Wipe off the exterior of the motor before disassembly.

7. Loosen the motor pulley setscrew and remove the motor pulley. Carefully inspect the shaft surface near the motor pulley setscrew contact area to assure there are no burrs on the motor shaft. If there is it must be dressed down carefully with an emery board or you will score the motor bearing when you pull the shaft through the bearing.

8. Remove the 2 frame screws nuts and spider washers. Using an expanding jaw plier or snap ring plier inserted next to one frame screw insulator recess then the other carefully force the shells apart a little at a time until they separate.



9. Carefully wipe any debris out of the inside of the motor cans.
10. If the armature has rust on its exterior carefully sand it off with 280 wet dry paper. Do not get the dust in the bearings.
11. If bearings are varnished they should be degreased with the charcoal lighter. Otherwise put several drops of 10w30 motor oil in the bearing cup surrounds which have felt wicks in them and can hold a fair quantity of oil.
12. After the wicks are saturated put a drop of oil right on motor shafts and making sure top washer and the 2 frame screw insulators are installed in the motor half that has the field windings carefully install armature and position housing halves so reference mark lines up and screws install without binding.
13. Press halves together with your bare hands until nuts will safely thread onto frame screws without washers. Tighten frame screws  $\frac{1}{2}$  turn at a time until motor shells seat. Remove nuts and reinstall spider washers and tighten just snug.
14. Make sure motor shaft turns easily and smoothly.
15. Reinstall motor pulley.
16. Reinstall motor in chassis.
17. Reinstall wiring in switch box.
18. Lightly spray motor switch contacts with De-Oxit.
19. Reinstall switch cover and mains hard shell connector.

### **Tone Arm Mechanism Cleaning and Service**



Much of this section is washing out old grease and re-lubing parts. There are also 2 critical part replacement routines described in this section that have everything to do with restoring the precision operation of the tone arm.

1. Starting with the spindle plunger that resides in the center of the platter arbor casting that supports the large cam wheel I use charcoal lighter and a camel hair hobby paint brush to get the grease off, use a spray dry air duster (Techspray Duster) to blow the dissolved grease out then replace the old lube with Phono Lube or other thin white lithium grease.

2. Clean the tracks of the plastic cam, blow it clean and dry and using the Phono Lube I grease lightly in a few areas. As the cam rotates in normal use the grease will be distributed as mating parts rotate through the grease. Make sure you identify each surface of the cam that interacts with a lever or switch and put a light coat of grease on all of these surfaces.

3. Widen the cleaning and re-greasing to the various metal levers. It is easy to see where the old grease was and if you work one lever at a time from center of the table outward you will find the key items. Make sure you degrease and free up the tone arm landing adjustment screw under the chassis hole near the cuing lever and arm rest so it can easily be adjusted if necessary after servicing.

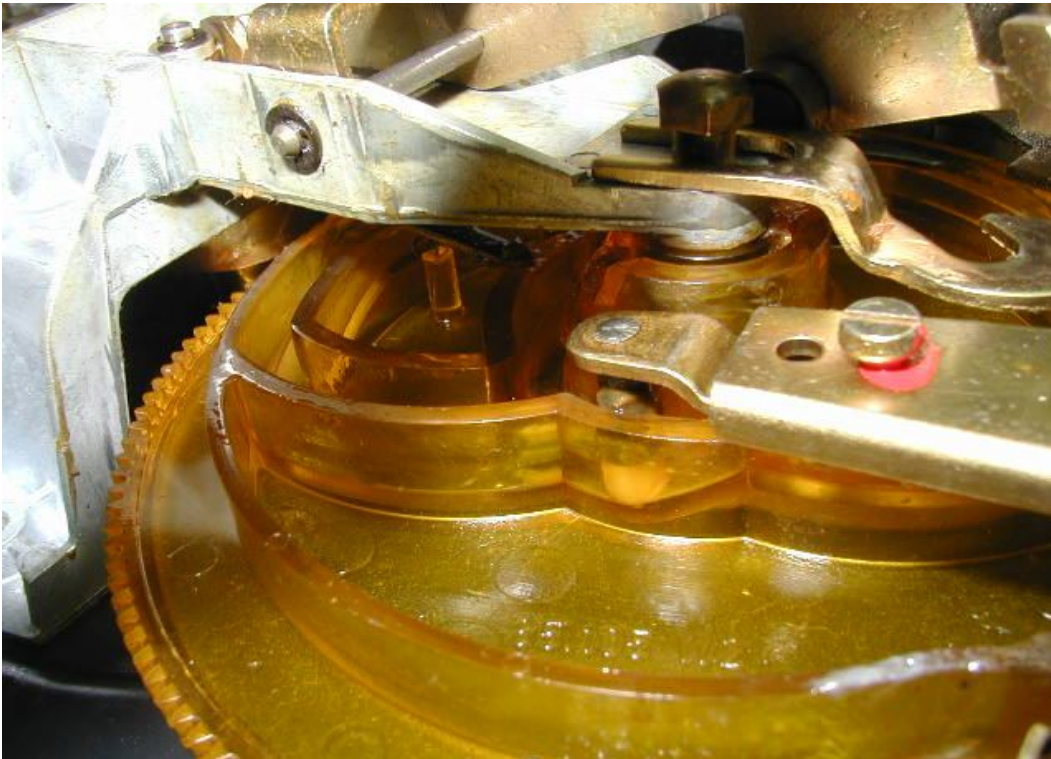
### **Sleeve Washer and Tone Arm Clutch Guide Replacement**

Finally it is time to deal with the rubber washer and tone arm clutch parts.

1. Carefully remove the cam operated tone arm actuating lever, that's the one with the setscrew with the red daub of paint on one end and a spade shape with semi circular slot in the other end. This part is held on by a thru pin with small E clips at the approximate center of the lever, Refer to pictures below and remove the E clip from one end of the thru pin and extract the pin.



2. Before you lift the lever note the cam wheel end of the lever has a pin that fits into a track on the cam. This pin must go back into the same track when reassembling or you will break the plastic cam wheel. See picture below.



Lever pin in cam wheel track

3. At the other end a hook shaped portion of the long cueing lever goes thru the semi circular slot and after removing the thru pin and lifting the lever out of the cam wheel you must carefully maneuver the lever off the cueing lever hook without bending anything. Work carefully and do not force. See picture of cueing lever hook in slot below.

4. Once the tone arm lever is removed it and the thru pin will need to be thoroughly degreased and set aside.





Hooked end of cueing lever. Tone arm lever must be lifted free at cam wheel then carefully rotated to a position that allows hooked end of cueing lever to slip out of slot. Re assemble in reverse order, maneuver lever back onto cueing hook, then onto thru pin bracket at center of lever making sure end pin is engaged in track on cam wheel.



Tone arm actuating lever removed. That's the thru pin and small E clip in the background.





A very dirty greasy spade end of the tone arm actuator. This needs to be cleaned completely of old grease and a very small amount of Phono Lube should be applied around slide pins and slot of black plastic slider. **DO NOT** get grease on the gray worn area of the metal lever as this is where the guide white tone arm clutch contacts the lever and it needs traction to work properly.

Guide white and rubber washer replacement parts can be ordered from Turntable Experts South Street Service <http://www.turntableexperts.com/>. Original Dual guide part number 223-777 and rubber sleeve washer part number 216-845 are no longer available from Dual but Adam at Turntable Experts handles substitute parts that work very well. They are guide pt # 223-777/S & sleeve washer pt# 216-845/S--cost--\$6each + \$5 SH. Adam sent 2 styles of washer to me, one is a black material that is pretty stiff and needs to be heated in hot water to allow it to stretch. The other is a tan silicone material that stretches a little easier. I installed a black one on my 1219 and a tan one on this 1229 table and they both work fine. The washer is hardest to do and I like to do it first.

5. Remove the old washer which is usually split. The trick here is not to lose the two 3mm loose ball bearings that the washer bears against on the bushing post.



Above is a good picture of a broken sleeve washer, you can see one of the ball bearings the washer is supposed to bear against. The purpose of this mechanism is to lock the tone arm platform into the lower position for single play and an elevated position for multi play. I use a magnetized screwdriver to extract the 2 ball bearings. Straight left of the sleeve washer you can see the old translucent tan guide clutch rendered useless because the metal pin is exposed beyond the clutch. Just left of that is a good view of the hook end of the cue lever.

6. Once the balls and broken sleeve washer are removed thoroughly degrease and clean the sliding parts of the tone arm height detent bushing slides, blow them dry with Tech Spray Duster and oil with a few drops of 10w30 motor oil.

The next picture shows the old washer, 2 ball bearings, 2 styles of new sleeve washer, new guide white clutch (barely visible between and left of ball bearings) and a tool I use to safely install the new sleeve washer without losing the detent balls. The tool is a piece of brass tube from the hobby shop just the right size to slip over the brass bushing tone arm detent busing.

7. Using the installation tool put a light coating of oil on the tube and slide a tan sleeve washer or a heated black sleeve washer onto the tool.



8. Put a dab of Phono Lube on each detent ball and using a magnetic screwdriver insert the balls back into their holes in the detent bushing.

9. Maneuver the tool and washer down over the detent bushing and carefully work the washer off the tool pushing down on the edges of the sleeve washer as you lift the tool out.



Tool and sleeve washer positioned over detent bushing. Don't forget the balls!  
10. When properly installed the sleeve washer will be completely below the edge flange at the top of the brass detent bushing and smooth and uniform all the way round as shown in picture below. If you have a lump one of the detent balls is not seated in it's hole in the detent bushing.

11. Cycle the single play- multi play mode switch a couple of times to assure smooth operation and positive detent operation.



12. The next step is to simply remove the old tan tone arm clutch guide and install the new one in it's place. If you got this part from Turntable Experts one end is open and marked red to go on the mounting pin. The other end is closed to prevent the metal pin from contacting the tone arm actuator lever.



New sleeve washer successfully installed, new guide clutch in place.

13. Once these parts are installed observe that the textured metal tone arm plate blade passes through a black plastic guide located just right of the sleeve washer in the above picture. The black plastic guide is held in adjustment by a single phillips head screw on the back of the curved gold colored tone arm mechanism guard.

14. Stand the turntable chassis on it's front edge so the tone arm hangs down. Place the mode selector in Single Play. Release the tone arm rest lock and gently move the tone arm through its travel from rest to end of record position and watch the textured metal blade to make sure it does not drag on the black plastic guide. If it does the tone arm will stick and stall the arm part way through a record. If the blade touches loosen the Phillips screw and adjust the guide to center it over the edge of the tone arm blade. Repeat this test with the mode lever set to Multi Play. The tone arm blade must not touch or drag in the black plastic guide in either mode. The last step is to reinstall the tone arm actuating lever. If you are rebuilding cueing mechanism see section below before reinstalling tone arm lever.

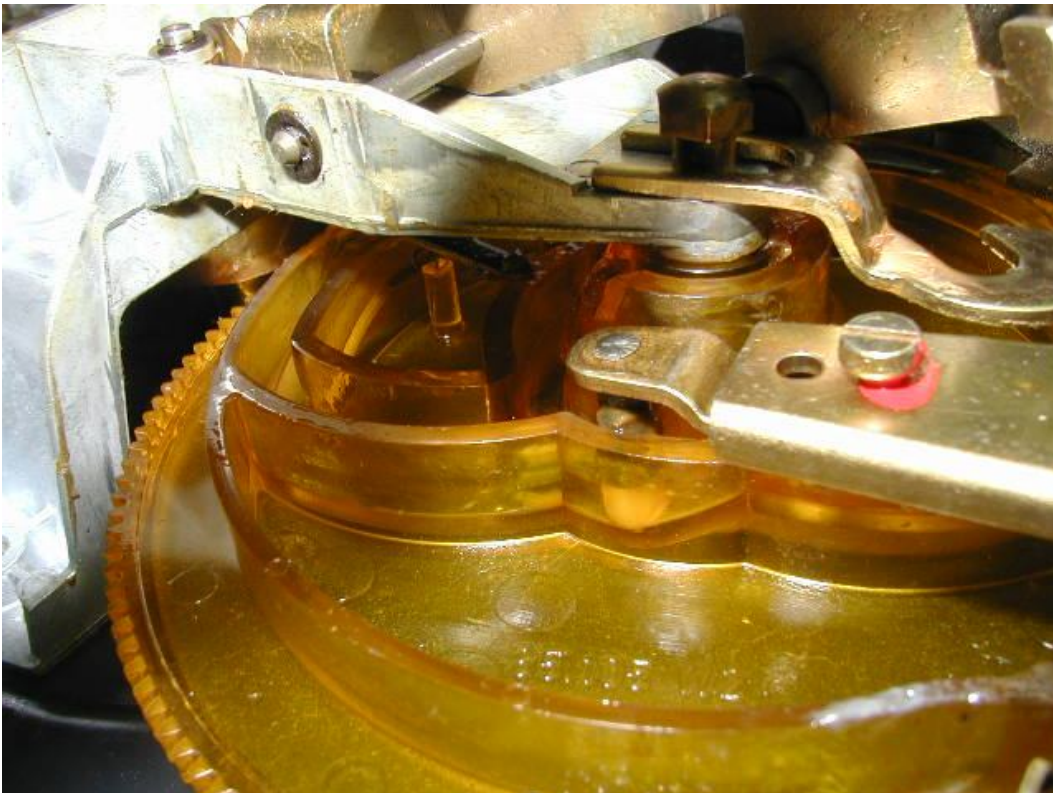
15. Put a dab of Phono Lube or other light white lithium grease on the lever pivot holes of the lever and the bracket it mounts on.

16. Put a liberal coating of grease on the pin at the cam wheel end of the lever.

17. Carefully maneuver the slot in the wide end of the lever back over the hooked end of the cueing lever and rotate the tone arm lever so the pin at the cam end drops back in the track of the cam then reinstall the thru pin and it's C-clip.



Hooked end of cueing lever in slot



Pin end of tone arm lever back in cam slot

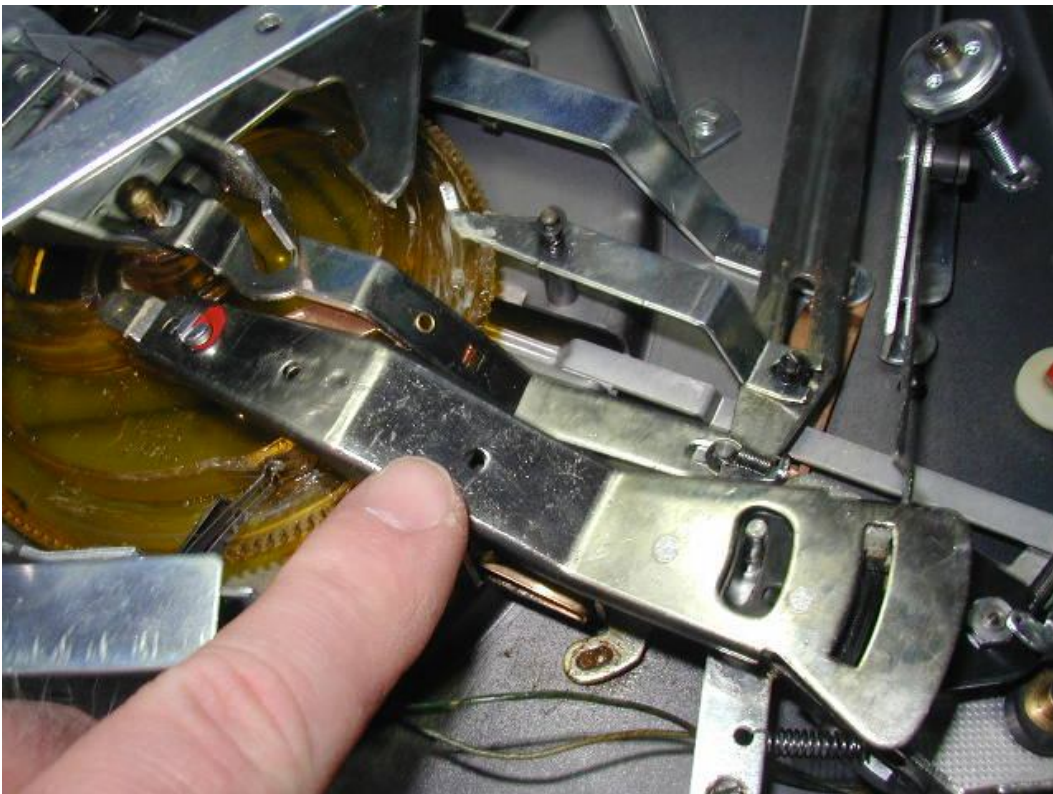




Thru pin reinstalled with C-clip completing tone arm lever installation

### **Cueing Damper Repair**

1. Remove main cam gear (or tone arm actuating) lever.

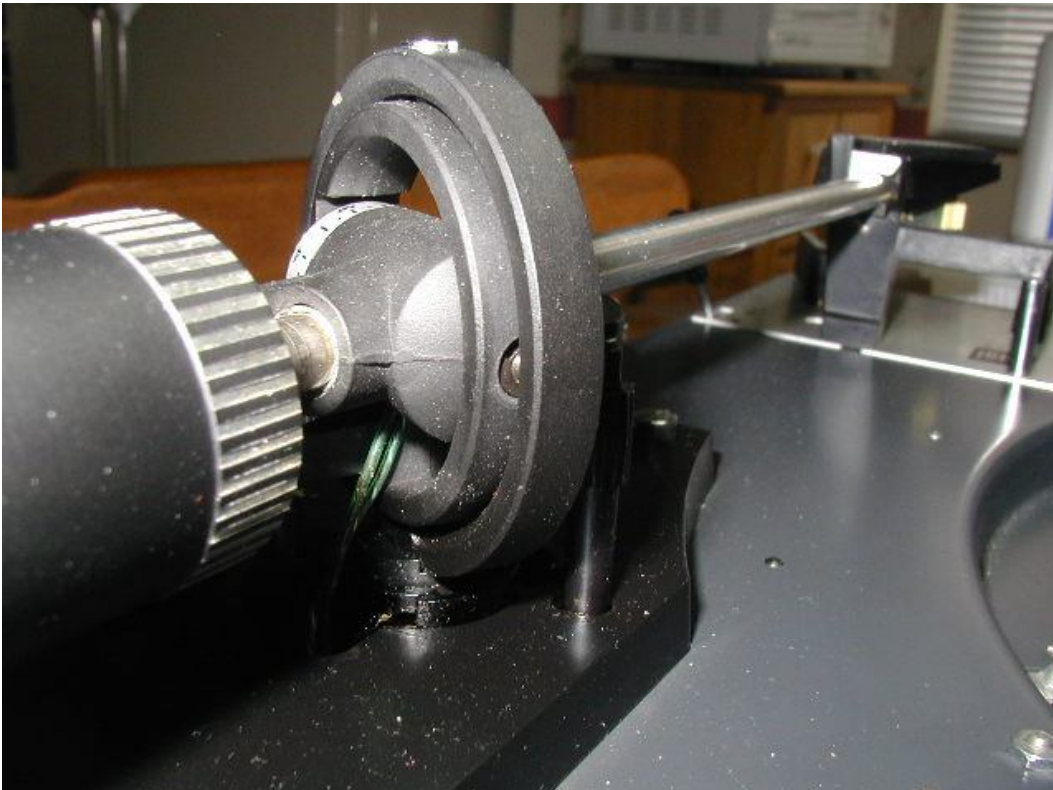




2. Remove cueing lever



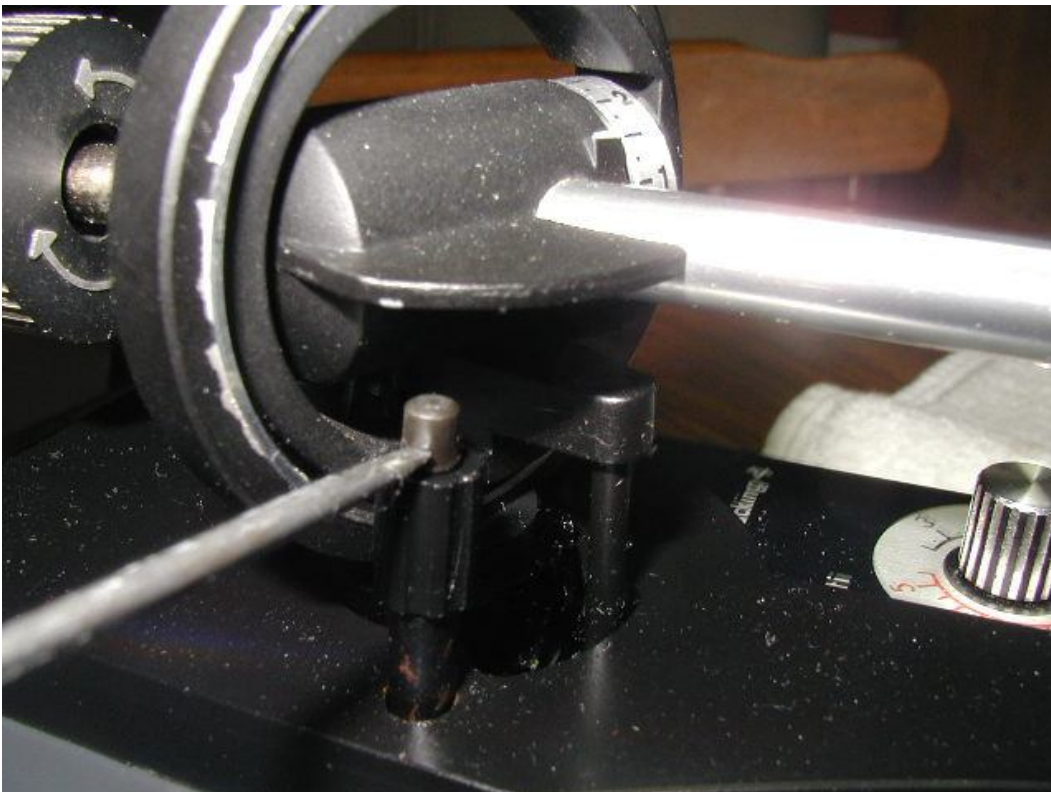
3. Notice the position of the inner gimbal ring as it relates to the outer ring, when the tone arm is locked in it's rest - important to go back in the exact same position.



4. Remove the 7 MM nut on the bottom of the cueing assembly mounting plate.

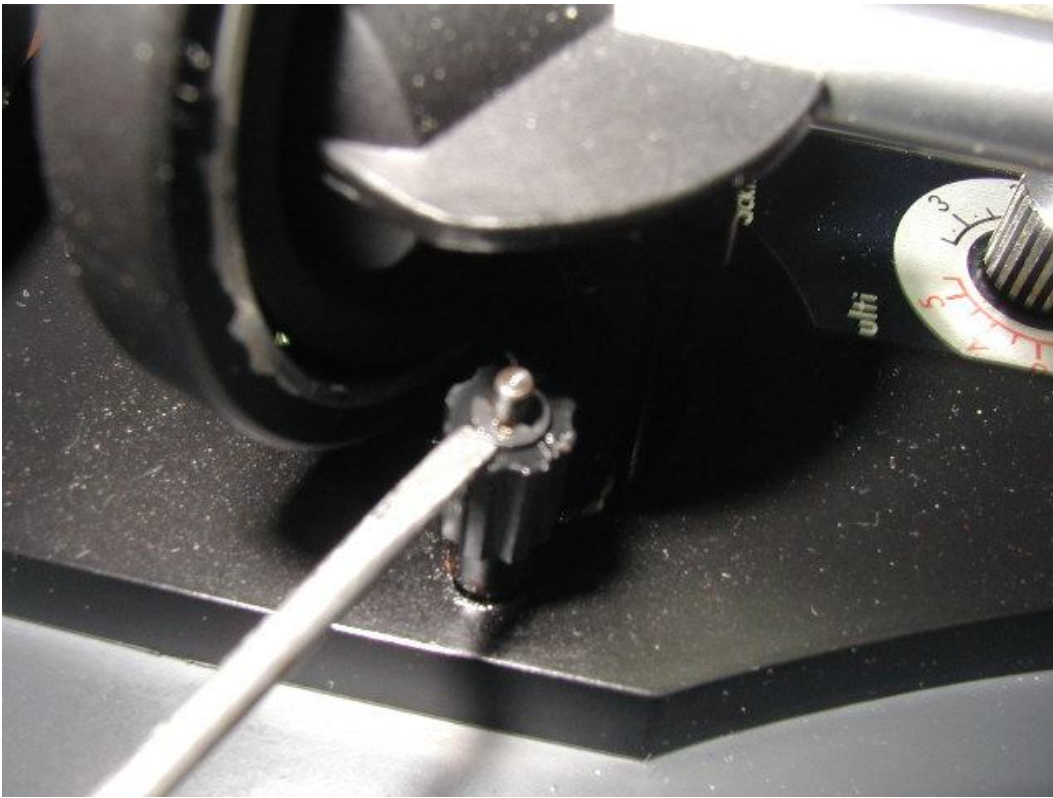


5. Pull the assembly partially down, and turn the table right side up. Remove the cueing clutch (little black plastic cap). It just pulls off top of cueing piston pin.

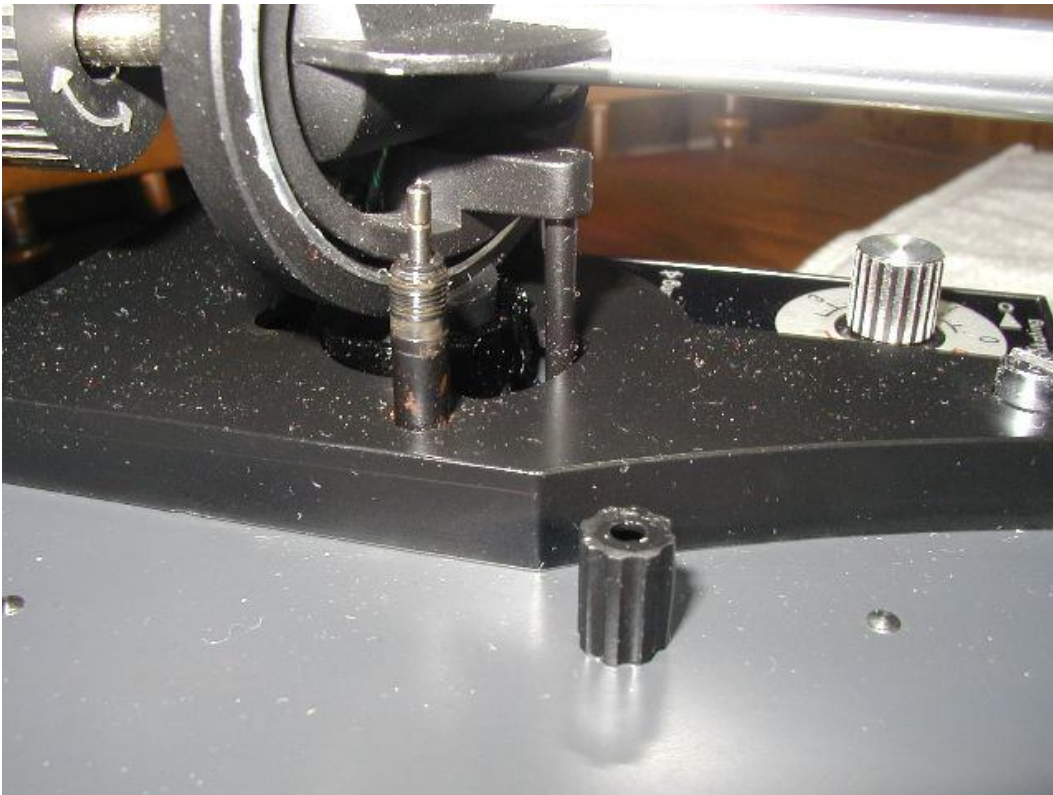




5. Remove the E clip just underneath where the clutch cap was.



6. Remove the knurled black plastic collar.





7. Turn the table over and finish removing the cueing assembly. Remove the 2nd E clip.



8. The cueing piston can now be pulled out of cylinder. Piston and cylinder should be thoroughly cleaned. I use charcoal lighter and a plastic tray and soak parts thoroughly. Note that there is a return spring above the piston that will come out when the parts are cleaned. I like to insert piston rod in cylinder, submerge cylinder completely in solvent and pump the piston a few times to get all traces of old silicone out of cylinder. I use a Tech Spray Duster to thoroughly blow out all traces of solvent and make sure parts are dry and free of any other type of oil before adding silicone paste. I found Kyosho 500,000 viscosity "Diff Oil" at a hobby supply called The Rotorworks <http://www.therotorworks.com/> that works very well in 1219/1229 cueing dampers.

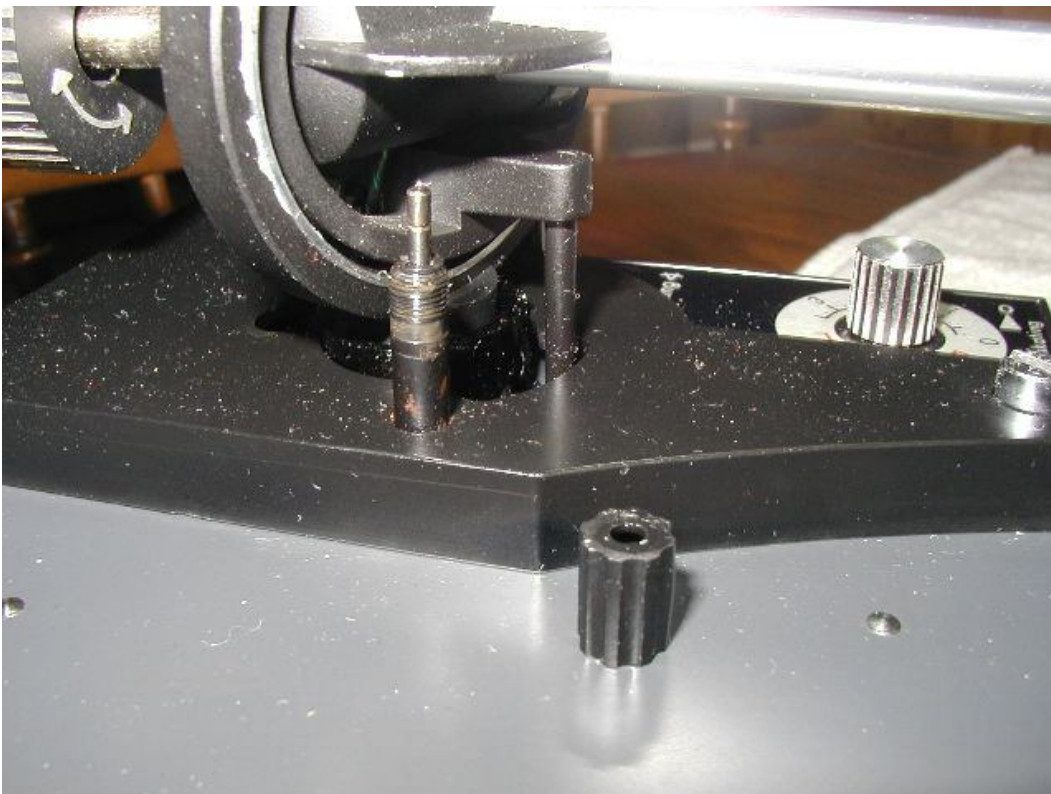


9. Drop the cueing piston return spring into cylinder with large end up toward piston. Force a bit of silicone paste into bottom of cylinder, coat entire working surface of piston with silicone paste. Hold a finger over top cylinder hole and slowly insert piston with a twisting motion until top of piston pin begins to exit top cylinder hole. Remove your finger and continue to gently insert piston until second E clip groove appears. Reinstall lower E clip on piston pin. Wipe all excess silicone paste off exterior of cueing damper assembly.

10. Clean cueing clutch surface on tone arm and the cueing clutch cap with alcohol and a cue tip. If the cueing clutch surfaces are dirty or oily the tone arm will drift toward the arm rest under the force of the anti skating mechanism.

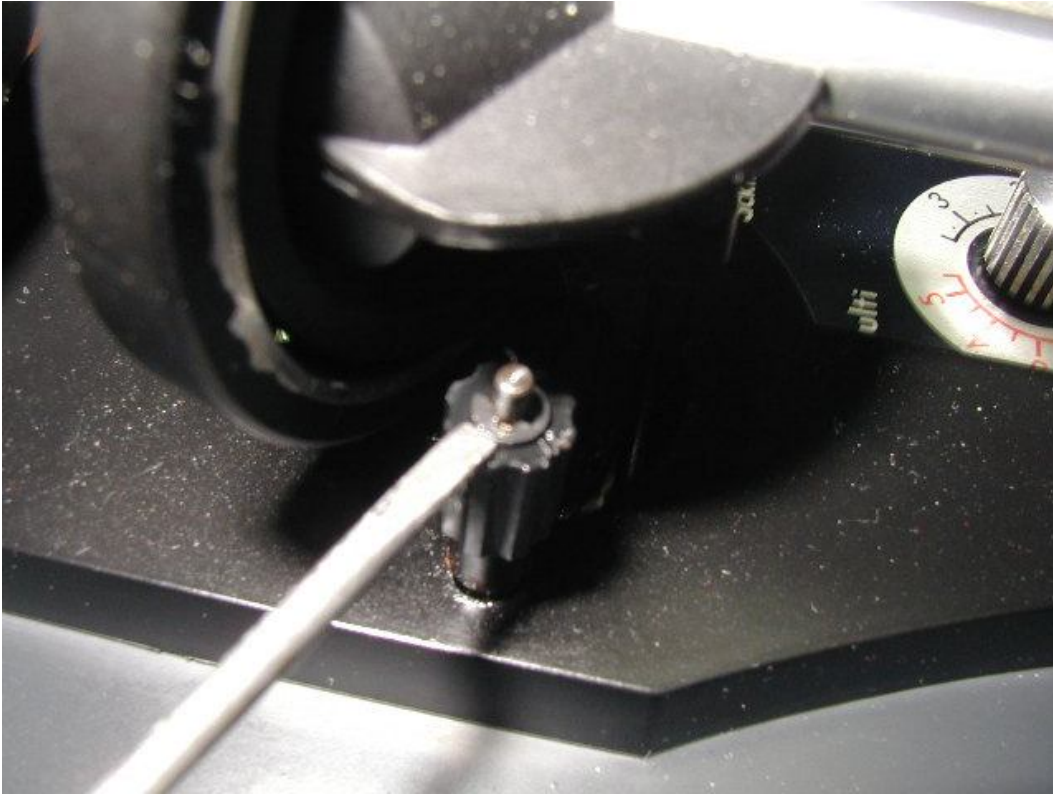


11. Reassemble basically in reverse order. Start cueing damper back into bottom of table. Turn table right side up and push damper up just far enough to allow installation of fluted arm height adjustment nut,





top E clip



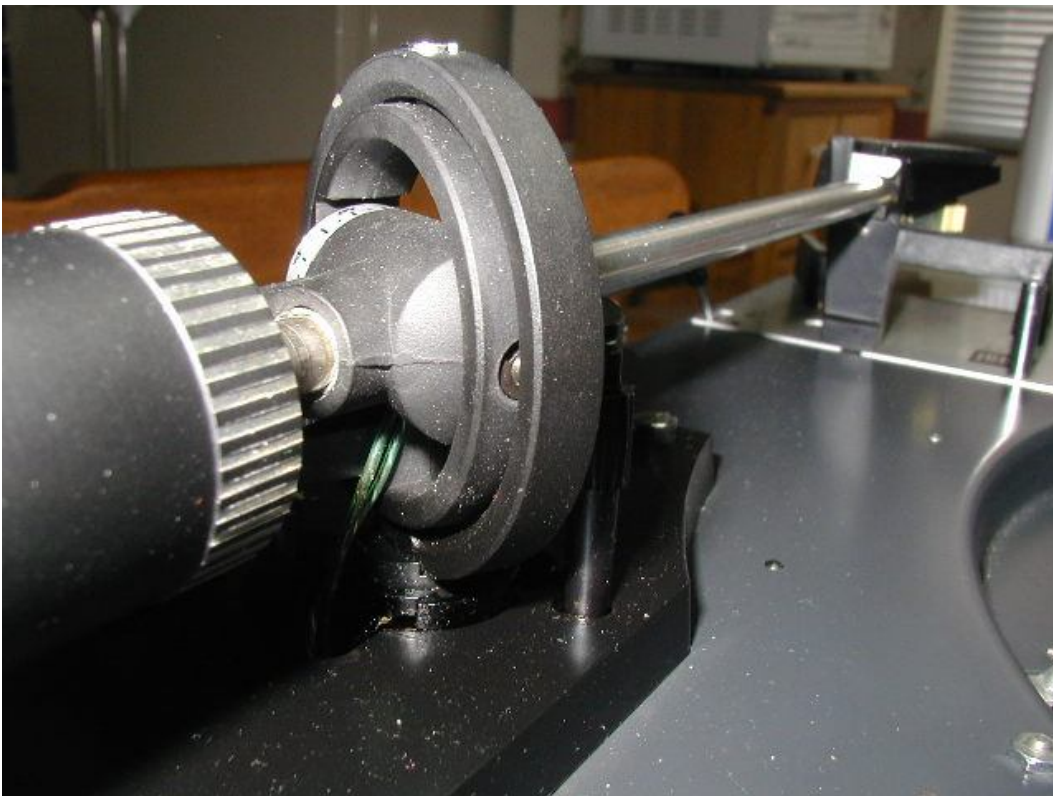
and cueing clutch cap.



12. Turn table upside down and continue installing cueing damper. Make sure when you install the damper assembly back onto gimbal stud that the multi play stacker and tab on damper assembly are correctly aligned as shown below.



13. Reinstall 7mm nut with tone arm locked on rest and holding outer gimbal ring in position it was in before nut was removed.





**14. Tighten 7mm nut just snug, do not over tighten or you will pull gimbal stud out of outer gimbal ring destroying tone arm support system!!!**



15. Reinstall cueing lever.





16. Reinstall main cam (tone arm) lever. Make sure white pin goes back into track on plastic cam gear or you will break the cam gear.



17. Turn table over, balance tone arm, set tracking and anti-skate forces, install platter. With single play multi play lever in single play push start lever and rotate platter clockwise by hand until arm is suspended over rest. There should be 1/8" to 1/4" more vertical travel play when you gently pick up arm. If there is not adjust fluted arm height adjuster clockwise to get required play and prevent arm binding. Continue turning platter clockwise by hand to clear start cycle and place arm back on rest.

18. Shift to multi-play. Make same check as above to make sure arm does not bind during lift cycle. Turn platter clockwise by hand, clear cycle and return arm to rest. Install table on base, lock arm on rest, connect to amplifier and mains outlet. Lock arm on rest and press start to perform arm calibration cycle. In single play mode adjust cueing damper height (large chrome screw on front edge of plastic tone arm stage) to allow arm to clear ledge on rest by about 1/8". Return cue lever to down position.

19. Put a test record on platter and start table. Make sure stylus lands in starting groove or adjust landing position screw accessed through small hole in table chassis next to arm rest. Play a single test record checking for correct tone arm landing, tracking, end of record cycle and shutoff. Try cueing during record playback. Pulling cueing control lever quickly to up position should produce nice slow smooth ascent off the record. Flipping cueing control to down position should result in nice slow descent to surface of record with stylus landing about 1 musical phrase before the point in the music it lifted off from or about 1 full revolution of the record back toward beginning of record from the point the arm lifted.

