

Hello friends of Thorens turn tables!

You may ask what you can improve on your old but established device. Approximately 30 years ago THORENS did produce with high quality and every important character was tested with highest carefulness.

Products like oil and the belt do and did guarantee this high level of quality. But later on the goal of THORENS shifted to more profit and quantity instead of improving the technology and quality.

The name remained but the players were not the same.
Design and price were the driver.

As a enthusiast of THORENS it is not necessary to spend a lot of money but with know-how you can improve a lot of.

THE BELT:

It does not matter if you will use an original or a reproduction one. Both are too tight! The reproduction do have a more polished surface. This is not an improvement because of the adhesion effect.

The high quality requirements of the belt are not practicable by a low production volume even by a nature product like rubber because of the permanent changes of the climate. Therefore a belt adjustment is highest recommendable.

The one and only different is that the THORENS belt allows a better elongation.

The belt is the most important part in the player because it lets or prevents the vibrations from the motor to the platter bearing and even to the pick-up.

The tighter the belt is the more motor vibrations will be transmitted.

A not elongated belt will stress the platter bearing with up to 200g. This make no sense if 20g to 30g are sufficient. Each elongation of 10mm reduce the stress of 100g.

An old belt can be used if it is elastic enough and do have the right length. To mount the belt you have to elongate the belt of 1cm.

minimum length:	260mm for pulleys up to 13mm diameter
minimum length:	265mm for pulleys more than 13mm diameter
maximum length:	275mm for all belts

A too longs belt for TD125/TD126 will fit for TD280 or TD2001. Every belt must have the right length in order to prevent too high stress to the bearing and or the motor.

This will lead to noise from the bearing. If the belt jumps in the start-up phase you can adjust this by justify of the sub chassis or -depending of the type or model- by justify (tilting) of the motor.

Do not bring the belt in contact with chemical fluids. The belt must be stored in darkness. To clean the belt use carefully spirit. This should be done fast and short and dry the belt at once.

The turntables TD280/520/320III and TD2001 need a belt delimiter due to keep the belt in stable function.

To conserve the belt it helps to use for the bearing oil with low viscosity because it reduces friction.

THE BEARING OIL (CHANGE):

The oil must be changed if the oil in the bearing is black colored. Too less oil has a negative impact on the bearing itself, the motor and the belt.

A thin oil ring on the axle should be there after assembling the smaller sub-platter (where the axle is pressed in) in the bearing.

How to clean the bearing? Its quite simple. Use a clean cotton, which does not fuzz. The dry bearing have to be checked regarding noise.

To do that rotate (push) fast the smaller sub-platter by hand. You should not hear the bearing.

Please do it in a quiet and silent room. The smaller sub-platter must rotate approx. 1 to 2 minutes (depends on the bearing).

If it is below one minute than it seems that the bearing surface is damaged. But you can repair it by polishing. Details will be explained later.

The oil must be selected depending of bearing clearance and bearing noise or else the a standard oil is sufficient.

Older turntables which have aught noise an oil with damping properties should be selected.

But first of all the root cause has to be eliminated (polish the bearing).

Use sufficient oil, so a small oil ring will be produced on the axle on the top of the bearing.

The smaller sub-platter should be sink slowly and the platter must rotate a little bit and without any noise.

By lifting and sinking of the smaller sub-platter you should not hear any noise! But take care dont damage the axle with other metal parts! Each smallest cut or scratch will cause noise in the bearing.

If the bearing is absolutely free from noise you can use a light oil (JB N°1). This oil reduces additional the friction, distress the motor and the bearing.

This leads to a further reduction of vibrations.

Available oil products:

For special purpose you may inquiry for special oil for TD124, TD110/115/104/105 (old THORENS oil). These oils are sparing oils without additives with SAE standard and without dissolver.

Model	Year	Replacement
TD 124/224	1957	N° 2
TD 125/126 and 126 II	1968	N° 2 "S"
TD 126 III with Brass Bearing	1972	Titan Super
TD 127	1983	N° 2 "S"
TD 145	1975	N° 2 "S"
TD 146	1982	N° 2 "S"
TD 147	1982	N° 2 "S"
TD 150	1965	N° 2 "S"
TD 160	1972	N° 2 "S"
TD 165	1972	N° 2 "S"
TD 166	1982	N° 2 "S"
TD 160 IV / V	1999	N° 1
TD 180	1991	N° 1
TD 280	1985	N° 1
TD 280/4	1992	Instrumenten grease
TD 290	1992	N° 1
TD 316/318	1983	N° 1
TD 320	till 1985	N° 2 "S"
TD 320	ex 1986	N° 1
TD 520/521	1985	N° 1
TD2001/3001	1989	N° 1
Concrete	1988	N° 1
Phantasie	1984	N° 1
TD 104/105	1978	N° 2 "s"
TD 110/115	1977	N° 2 " S"
TD 115 MK2	1982	N° 2 "S"

For all absolutely free of noise and clearance brass bearing I recommend to use the oil JB N°1. This oil reduces the friction the bearing, eliminate the load of the motor, belt and electronic. This leads to a better sound precision and dynamic.

Additional informations concerning bearings:

- ✍ The series TD280/316/318/320/321/Concrete/Phantasie/520/2001/3001 have friction bearing.
- ✍ The series TD105/105 have sintered bearings.
- ✍ The series TD124/125/126/226/127 have sintered bearings with oil depot.
- ✍ The series TD 115/146/147 have friction bearings with oil depot.

You can oil all bearings with my oil, if your turntable is not too old. For older bearings with some bearing clearance I can provide you a special oil type (old THORENS special oil for TD 124/126/126/150/165).

Instructions for oil change:

- ✍ smaller sub-platter, rubber mate and belt must be disassembled
- ✍ The platter must be lifted with out any tilting
- ✍ Remove the old oil by using a small sponge
- ✍ The bearing must be degreased by using wet chemical methods (alcohol, petroleum ether) with an absolutely fuzz free cotton
- ✍ Dry the bearing
- ✍ Fill in the bearing 1ml oil and spread 1ml oil on the axle shaft
- ✍ The platter has to mount (sink) in the bearing with a rotation
- ✍ Degrease the pulley and the belt contact surface on the platter
- ✍ Assemble the belt and the remaining parts

Instructions to eliminate the platter run out:

- ✍ Use a small piece of paper and put it as close as to the rotating turntable platter
- ✍ Turn the outer platter a little bit on the inner side smaller sub-platter as long as you will minimize the run out
- ✍ After you have found the smallest run out, mark both plates in order to find the right position later when you will change the belt or oil

The platter should not have a height run out. This can be corrected by bending the axle only. But this must be done by experts, because it is easy to break the axle due to the hardness.

Instructions to reduce noise from the motor:

Each motor produces noise and vibrations. These will be picked up from the pick-up and you can hear it from your loudspeaker. Synchronous- and DC-motor should be absolutely silent! Following instructions will reduce or even eliminate this problem.

- ✍ put a small drop (not more) of oil to the axle base if you have a DC-motor
- ✍ In some cases a complete lubrication with oil. Depending on the motor different oils are available
- ✍ A permanent lubrication with oil for storage is recommended
- ✍ The pulley should not have a run out. The clutch system must work silent and easily
- ✍ The pulley have to be cleaned with alcohol

How do reduce the noise from the bearing:

You can reduce them by 100%, You need only tools for polishing which fits to your bearing diameter.

THORENS turntables have bearings with following diameters:

- ✍ 15mm
- ✍ 14mm
- ✍ 10mm
- ✍ 7mm

This tools for polishing are mild and do not destroy the bearing itself. It is more complicate to polish the axle. For this you need diamond rubber and polish paste. But the result will improve the sound of the turntable and there will be no need to do it a second time.

Instructions to polish the bearing:

- ✍✍ Remove the rubber mate outside platter and the belts
- ✍✍ The smaller sub-platter has to be lifted without any tilting
- ✍✍ A fuzz free cotton must be wrapped on a wooden bar.
- ✍✍ Then clean the bearing and remove the old oil
- ✍✍ Put the tool in the bearing, shake the polish liquid and pour it from the top into the groove.
- ✍ Rotate the polish tool and move it up and down in order to spread it.
Remove the polish liquid on the top of the bearing
- ✍✍ By using a hand driller you will be faster. But do this with slow revolutions and not longer than one minute
- ✍✍ If you are doing by hand you may polish longer
- ✍✍ Clean the bearing with the wooden bar and paper
- ✍✍ The bearing must bright in light
- ✍✍ The axle must be polished by using soft cotton. The axle must be like a mirror
- ✍✍ Pour 1ml oil into the bearing and onto the axle.
- ✍✍ Mount the smaller sub-platter with the axle into the bearing by rotating the platter
- ✍ Mount the belt, the outer platter and the rubber mate

Further informations and hints regarding bearing:

The first time (start up phase) in the life time of the player, the roughnesses in the bearing will be eliminated or compensated. This may happen because the valleys will be filled with oil and/or small particles of abrasion. The result is an excellent tribological pairing with low friction. After this start up phase and evaluation of the bearing make sense.

Do not use graphite or molybdenum sulfate based oil because they will increase dramatically the friction at low temperatures.

Also silicon oil should not be used. The producer of this oil normally do not recommend it for metal pairing.

Grease should be used in the TD 280 MKIV only.

Do not use grease in the high quality players like TD124/125/126/150/160/320/2001 even the bearing clearance is too high.

Use oil with high viscosity if the polished bearing causes unsteady low noises. If you can hear a constant low noise high viscosity oil will not help and normally not necessary.

In most cases a small bearing clearance will not be a problem.

Be aware the main task of oil is to reduce the friction and not to increase it as normally usual!

Pulley; adjustments and modifications:

Do not use a metal pulley because it is heavier and this leads to more rumbling. If you want to use anyhow a metal pulley you have to take care that the fixing screw should not be in the belt running area, and in addition this pulley needs more surface care.

An additional reason why you should not use a metal pulley can be found in the friction clutch.

This clutch enables the stretching of the belt and prevents the tilting of the sub chassis and even it prevents that the belt will jump from the pulley.

If it seems to you that the pulley has a run out a change it is normally not necessary, because first an adjustment of the felt have to be performed.

The belt contact area of the pulley can be improved by polishing. But take care that this part must be absolutely round.

THORENS used metal pulleys (they were pressed onto the motor axle) for a short time period.

Only the TD2001 remains with this part but unfortunately without friction clutch system.

This disadvantage can be covered with a belt limiter.

Floating Chassis Adjustment for TD 150/160 /145/147/146/166.....

Please consider all points.

- 1) Please be sure to use a belt of correct length (min. 255 mm)
 - 2) for the following steps you must have the belt mounted.
 - 3) In order to get the correct adjustment, please mount the platter and put the original plattermat and of course a vinyl disc on it.
 - 4) Dismount the three springs
 - 5) Dismantel the springs from the foam material cases
 - 6) Afterwards remount the three springs and have a look for the correct mounting position. The lower end of the springs must point to the platter bearing.
 - 7) Only for the older Thorens there is the need to mount an additional swash plate between chassis and each spring.
- Now screw everything together and adjust the three springs. Afterwards the platter should float for about 6 mm in height parallel to the upper edge of the chassis/ motorplate.
- 9) In case the platter is too high, please start the readjustment with the spring on the motorside first.
 - 10) In case you have the swash plates mounted it is possible to center the spring by turning the swash plate.
 - 11) Any time you correct the fitting or the preloading of the springs or by turning the swash plates you have to readjust the height of the platter.
 - 12) By pushing the platter on the spindle the platter must swing freely and for about 15 seconds

Several tuning hints:

You may replace the rubber mate by a leather or an cork one. But be aware that all of them will not reduce rumbling by 100%. You have to improve other mechanic issues first otherwise you will not have success.

Example:

Considering the stabilizer and the super platter; only few of THORENS are equipped with an Hardmetal thrustplate (just the 320 "S" , TD 520 "S" ,TD 2001 or Ambiance) in the bottom of the bearing. Without them heavy platter and the stabilizer are inapt because the effect are similar to a brake and the rumbling will increase.

On some turntables this will cause a damaged bearing bottom. You will not see or recognize it immediately but long term related you will get troubles.

To cover this problem I sell Hardmetal Thrustplate in several diameter for turntables ex TD124.

You have also to consider that the spring systems are not designed for additional load. Each increase of the platter weight will increase the load to the motor, belt and bearing. The additional load/stress leads to a higher belt tension and this enables a better transmitting of vibration of the motor. This leads to much more rumbling of the system.

The most important on a turntable is not the price and not the design it is the technical know-how only!

Example:

✍ Transrotor (5000 or 70000) flutter approx.:	0,06%
✍ THORENS TD147 (below 1000DM) flutter approx.:	0,05%
✍ THORENS TD125 flutter approx.:	0,035%

When you compare these figures you may imagine that 30 years old THORENS turntables are really comparable to competitors new products or even better.

It is a matter of fact that a proper maintained turntable will be keep the quality for many many years.

Important steps prior sound tunings:

First of all you have to think about the sequence. The following one is in my opinion the right one.

- ✍ The bearing must be free of noise and must have the lowest possible friction
- ✍ The belt must be used according the table on page 1
- ✍ The motor must be free of noise and treated preventive
- ✍ Damping of the inner smaller sub-platter with a foam ring (TD125/126) or a resonance filter• made of wood (disc).
- ✍ Reduce/eliminate the subsonic noise, impact sound and the airborne sound. This is depends on the turn table. But it improves the tracking ability and this means further a clearer sound and more precision.
- ✍ Depending on the turn table you can improve the housing, or the base plate and the stands. MDF is a proper material for this purpose.
- ✍ Try to use leather or cork instead of the rubber mate. A positive effect can be reached if you have a noise free bearing only
- ✍ If you have a bright, detailed and clear sound then you have no problem form the impact sound side
- ✍ Make the improvements only step by step. Otherwise you will not see the result of a single change and in some cases two changes may compensate each other. In addition you should take enough time to test the improvements

I will not give you specific hints for sound tuning because it depends from too much aspects and parameters. Try it yourself and step by step only. Than you will get an better sound which will make you enthusiastic.

Instructions for safe and secure shipping:

- ✍ The box (carton) must be large enough that all dimensions are larger than min. 10mm of the dimensions of the turn table
- ✍ Ship the dust cover separately with all loose parts, manual, tone arm and weight if possible
- ✍ On the bottom of the box put a thick carton on order to gain it
- ✍ Put the outer platter and the mate in a plastic bag and then direct on the bottom
- ✍ A foam plate will be the next part which must cover the platter and the mate
- ✍ The next important step is the preparation of the turn table itself
 - ✍ 2-3cm stripes of carton must be put between the chassis and the case and fix them with a glue tape
 - ✍ Put a carton with a hole for the spindle between smaller sub-platter and chassis. this carton must thick enough in order to prevent damages on the bearing bottom. If you will not use a carton, the spindle will create a mark on the bearing bottom. This will cause noise and higher friction
 - ✍ The tone arm must be fixed on the tone arm support. Remove the pick-up the weight and the antiskating weight
 - ✍ Below the tone arm base you must put a carton too. This is very important if you have SME tone arms
- ✍ After doing that you can put the turntable into the middle of the box
- ✍ Fill the free space between the turn table and the box with sufficient foam or carton. Make sure that the carton or foam must higher than the tone arm (1 to 2 cm)
- ✍ A prepared carton large enough that it covers the complete box with a large hole for the tone arm must be put on the filling material. Take care that this carton do not touch the tone arm
- ✍ Fill the remaining space with paper rolls or similar. This prevents that the smaller sub-platter has space for movements
- ✍ Finally check if the turn table has no possibility to move to the carton wall.

With this hints the turn table will be received without any damages. It also helps if you mount a holder made of cord on the box. It may prevent that the box will fall to the ground during handling in the post office. Also labels like GLASS or HANDLE CAREFULLY will help.

Damping of subsonic noise for metal sheet players:

You need a small piece of foam plastic stripe . A piece with the size of approx. 5mm wide and 10mm high have to be put in the gap of the tone arm base and the chassis. (see arrow in the picture) If the result is not sufficient an additional damping foam plastic piece can be mounted under the tone arm base.

You can produce the foam plastic stripe by yourself. This stripe will effect an additional damping and prevents a damage of the pick-up and belt jump or even acoustic feedback.

CHECK LIST OF POSSIBLE FAILURES:

Turn table:

- ✍ loose or too tightened screw connections
- ✍ dirty or loose electrical connections (ground)
- ✍ run out of the pulley because of a knock
- ✍ run out of the platter
- ✍ contact area of the smaller sub-platter and outer platter are dirty
- ✍ belt dirty, worn out or too tight
- ✍ belt too smooth (adhesion)
- ✍ belt jumps out of the pulley
- ✍ insufficient oil or wrong oil type
- ✍ cable of the tone arm: wrong routing
- ✍ insufficient clamping force of the cable clamp or contact with the chassis
- ✍ wrong adjustment of the sub chassis (platter has contact with the chassis)
- ✍ transportation lock lot loose
- ✍ turntable not in balance
- ✍ wrong adjustment of the tone arm (weight antiskating)
- ✍ wrong tone arm geometry
- ✍ incorrect height of the tone arm (must be parallel to the disc)
- ✍ insufficient stability and cleanliness of electrical contacts
- ✍ isolation pieces are missing (important for Stanton pick-up)
- ✍ weak adjustment of the pick-up
- ✍ bad soldering in the signal path
- ✍ worn out phono jacks
- ✍ too tight or cracked parts
- ✍ bearing damaged/cracks/cuts

Pick-up:

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- ✍ worn out diamond
- ✍ bended cantilever
- ✍ damping rubber too old
- ✍ dirty diamond
- ✍ dirty coils (cannot be seen)
- ✍ wrong adjusted cantilever (not parallel with the body)
- ✍ insufficient stability of the electrical and mechanical connections
- ✍ shutted cables
- ✍ influence of the transformer
- ✍ wrong pin connections

Common checklist:

- ✍ length of the belt (see table)
- ✍ position of the belt during operation (middle of the pulley)
- ✍ run out of the motor axle
- ✍ noise of the motor
- ✍ oil level and color
- ✍ run test without belt (1 minute in minimum)
- ✍ noise of the bearing (no noise)
- ✍ revolution and switch off test (with single)
- ✍ start up phase within five seconds
- ✍ lift up and down must be equable
- ✍ small inner platter run out not more than 0,15mm
- ✍ outer platter run out not more than 0,25mm
- ✍ clearance of the tone arm bearing (horizontally and vertically) as low as possible (smaller than 20mg)
- ✍ tracking force
- ✍ geometry of the tone arm
- ✍ left and right channel
- ✍ short circuit to ground

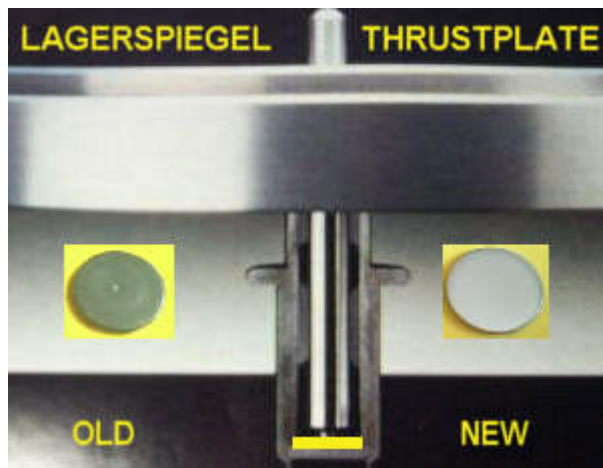
Dear friend of analogue music reproduction and of THORENS turn table:

In order to maintain the appearance and the character of THORENS turntables I try to offer my 20 years old experience on these players. I offer unspectacular simple products which are efficient and do have fair prices. Following articles can be sold:

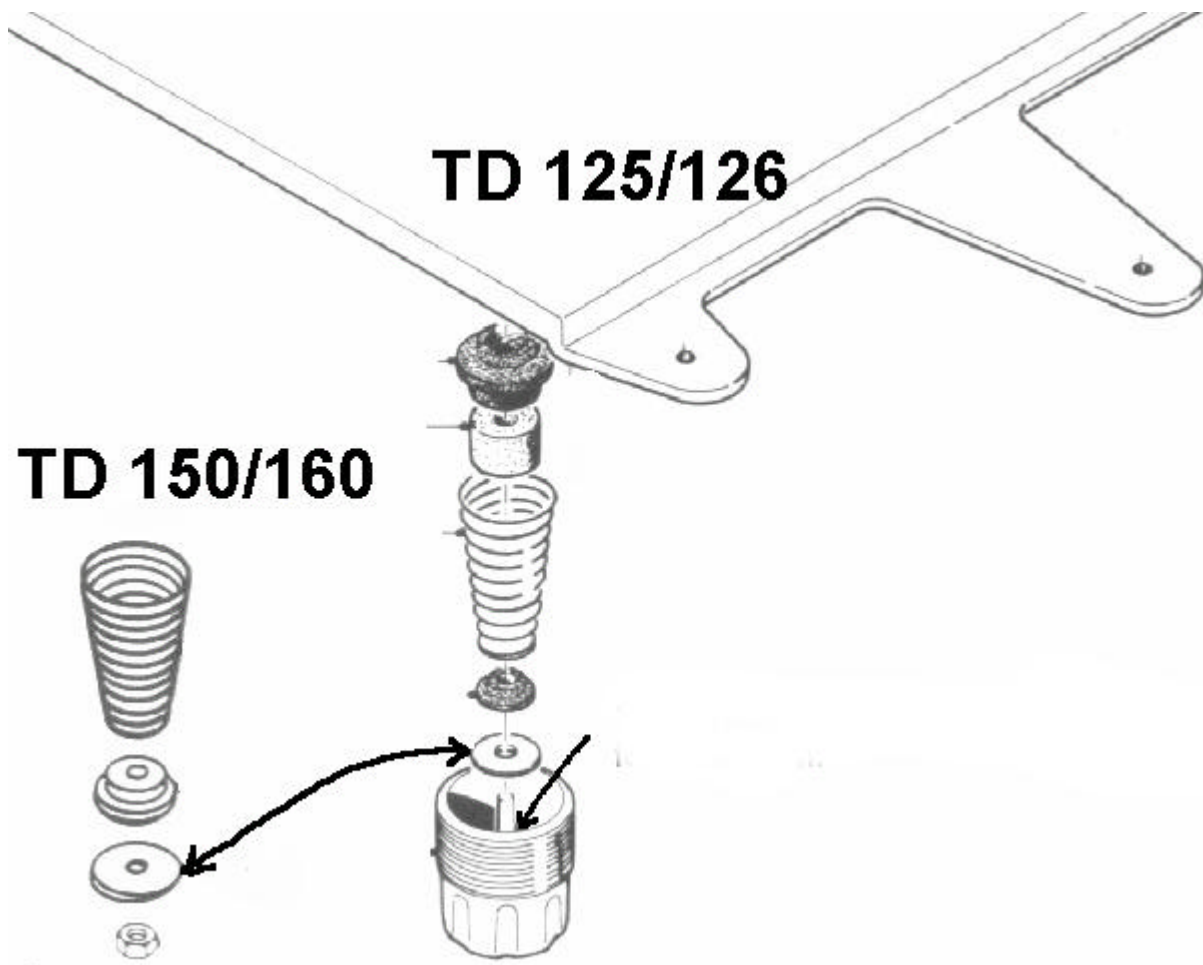
Kit for the maintenance , Hardmetal thrustplate and Polish Kit for brass Bearing.
Drive Belt and oil for the synchronous motor and Main bearing.



Brass bearing and on the right side bronze sintered bearing.



All the TD have Nylatron thrustplate
 Only the TD 320 “S”, TD 520 “S” and TD 2001, Ambiance have
 hardmetal thrustplat



I wish of many hours of pleasure with your THORENS turntable.

Joel

Tabelle und Schablone für Thorens ® Antriebsriemen

At first wait few weeks and control.

	250 mm
Original Thorens (nur mit Thorens Logo)	255 mm
TD 146 / 166 / 160 MK2 / 110 / 115 bzw. TD 125 + TD 126 mit Pulley D = max. 13mm	260 mm
TD 320 / Phantasie / Concrete mit Pulley D = max. 30mm	265 mm
TD 280 / 318 MK3 / 320 MK3 / 520 / 2001 mit Pulley D = max. 42mm	270 mm

Thorens original mit dem Schriftzug : effektive Länge = 510mm , Breite = 4mm , Dicke = 0,9 mm

TD 280 MK 4 = 360 mm

TD 180 = 450 mm

TD Prestige = 510 mm

TD 124 = 320 mm