

Setting up your LP12 - a Brief Overview

Volume I

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Setting up your LP12 A Brief Overview – Volume I

I started a thread on the LP12 Section of the Linn Forum when it was in existence some years ago in response to a growing number of requests from owners, who perhaps live a long way from their Linn Specialist Turntable Retailers or wish to learn more about setting up and ensuring they were getting great results with their LP12. The set-up guide proved very popular there and the thread was promoted to a sticky status at the top of the first page on the Forum by Linn themselves!

Many readers asked if I could make a downloadable version of the thread postings I made at that time. So, in response to these requests the guide was produced back in 2014.

Since then, there have been a number of new products launched by Linn for the LP12 and so I have attempted to incorporate these in this new 2020 version of the guide.

It is my opinion that it is better for you to have your Linn Retailer set up your LP12 whenever possible, as there is no substitute for good hands-on training and a lot of set-up experience.

It follows that I do not accept any liability whatsoever for works attempted following your reading of any information contained here. As I said, hopefully you will see this as a useful, general guide, and you will gain a better understanding of the setting up process, consequently a better idea of why retailers need to charge a little for the time and expertise they use while setting up your LP12 and also why they are the best people to set-up and get the best sounds from your LP12.

Care, experience, expertise and attention to detail are paramount.

With this guide, I've tried to keep it to the point and as possible and used photographs to illustrate the points made wherever I can, as I hope this will make it more readable for anyone interested in using it as a guide for reference in future. However, it's not completely all encompassing, so if having read it, you have any questions, please just email me at peter@cymbiosis.com

Kind regards,

Peter Swain

Volume I

With any process or call it a journey if you like, one needs to start somewhere and I think the best way would be from the ground up and at component level, so you can pick up the relevant information at whatever point you wish. I also think pictures are often far more useful than just the written word in conveying the salient points.

So, let's start with the plinth and what is important when checking the top plate when fitted.

Plinths come in various finishes as we know and older ones lack corner-braces. These stiffen up the plinth, help to minimise warping and also the corner-braced plinths sound better.

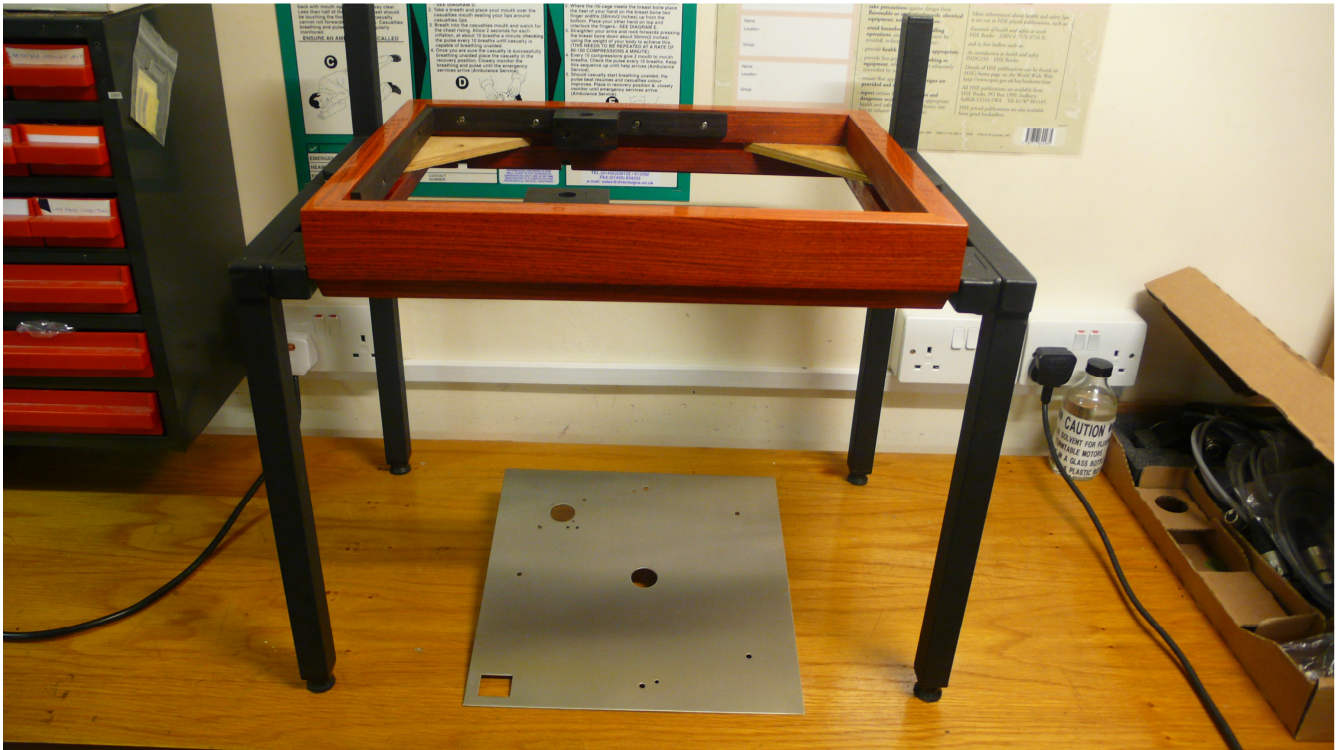


Figure 1 – Corner-braced LP12 plinth in jig and studded top plate

There are two obvious differences between top-plates that you are probably aware of: The older non-studded top-plate and the more recent top plate which has a stud welded to its motor corner. Why? Well, it's of critical importance that the top plate in the motor corner does not rattle against the plinth as this has dire consequences for the sound quality. Often this is missed, and so people are just unaware of the music they are missing out on as a consequence! The addition of the corner bolt makes the fit easier and more consistent during the top plate attachment and ensures there are no corner rattles present. However, it does not make for a better sound than say a well fitted older non-studded top-plate.

Older non-studded top-plates can have either imperial threads cut for the two motor-speed adjustment (tilt) screws, or more likely the more modern M3 threads. How do you tell? Well normally the imperial ones are dull silver cross-heads, later M3 screws are black cross-heads and the modern ones used on the deck are bright silver posi-head. Additional to having imperial threads, very early top-plates can have these two threaded holes non – equidistant from the motor pulley hole, thus giving dealers two problems to overcome if fitting a Radikal or Lingo 4, as off-set

holes could mean pulley to speed sensor bracket contact, and also any attempt to screw the M3 Radikal speed sensor screws in to secure the bracket will end in disaster as although they will start to thread up, very quickly the screws will seize up in the threads and will shear the screw if forced!

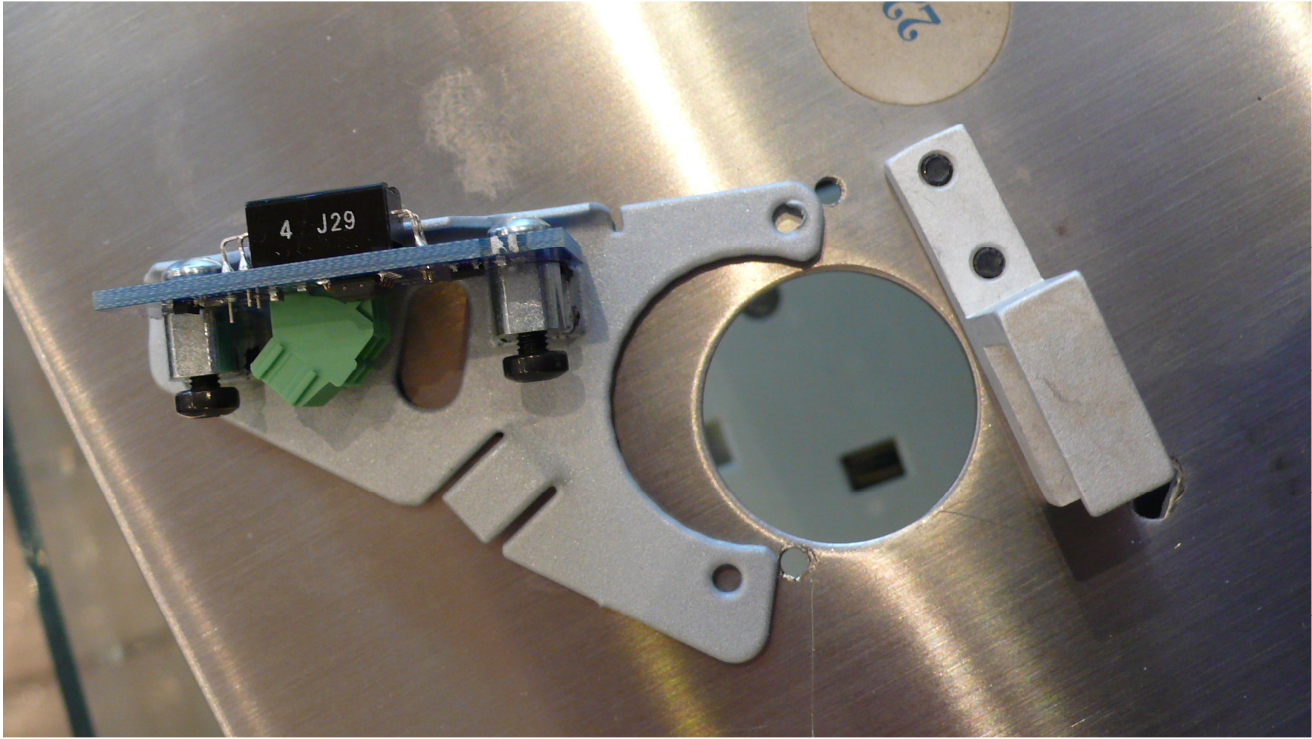


Figure 2 – An unsuitable older top plate for Radikal or Lingo 4

If there is just an imperial thread problem to overcome, then this carefully re-tap the imperial thread out with an M3 tap first. In engineering terms, it is not that great, but I've re-cut these threads to M3 many times, you just have to be careful and deliberate to avoid problems and then the new M3 screws supplied will thread up easily and are up to the job required of them.

If the speed adjustment screws are off-centre like in this picture above, I would not try and re-drill the holes. I would pension off the top plate, save the hassle and use a new top plate as they are relatively low cost.

Top plate bolts. Silver pre-Nirvana ones and their non-locking nuts should be discarded in favour of the far better newer black mushroom headed M5 bolts. Most are posi-head but from about 2013 4mm Allen head bolts were introduced – this makes tightening these bolts up with the M5 nylock nuts far easier.

When fitting any top-plate to a plinth, ensure the left edge from the switch cut out to the motor is as straight as possible. Hold it up and look along the edge and ensure this is so. If not, correct it by careful bending. To do this I normally just use my hands and with a cloth or towel over my knee to protect it when bending. The stainless-steel top is really quite soft and so it is quite easy to overdo things, so check every step of the way – gently! If the top plate is raised at the centre where the two top-plate screws and the two top-plate bolts pull it down against the plinth blocks, then this is fine as it should pull flat once these are tightened.

Start the two top plate screws and tighten to within 1mm of the top plate, then what I do kneeling on a carpet, with the motor side of the plinth wedged against my knees, is pull the top-plate (armboard end) towards me and hard against the plinth. Thus forcing the top-plate into the plinth as far as is possible on the left edge and front, (this will minimise the gap between the top-plate and plinth) and at the same time, tightening the two top-plate screws. Beware overdoing this, as/or if the screws keep turning you should remedy this by initially changing the 6 x 1/2 Supa pan self-tapping screws for 6 x 3/4 Supa pan screws. Also, beware slippage on the screw heads when tightening as if you do slip suddenly with the screwdriver, it's a big scratch you could end up putting in your top-plate!

For the corner bolt/studded top plate one can now fit a mudguard washer and a M5 Nylock, and then start to “nip” it up whilst giving it the knuckle tap test on the top of the top-plate in the motor corner. It doesn't want to be tightened up hard as the top-plate will deform and the deck would sound poor – just enough nipping on the nut to stop any rattling in that corner and no more is best, as overtightening this bolt will deform the top-plate and degrade the sound!

For the non-studded top plate, one hopes there are no rattles in that top corner. If there are, repeat the process until you get it right. Do not cheat by using adhesive in the corner as the deck will sound really poor. Just top-plate tension is what you want to stop top-plate rattles.

Areas on the top-plate rattling other than the motor corner are not particularly good news, and so you should attempt to minimise these wherever possible. For example, if the area near the switch rattles, it looks and feels horrible, so it's best to sort it out before you go any further.

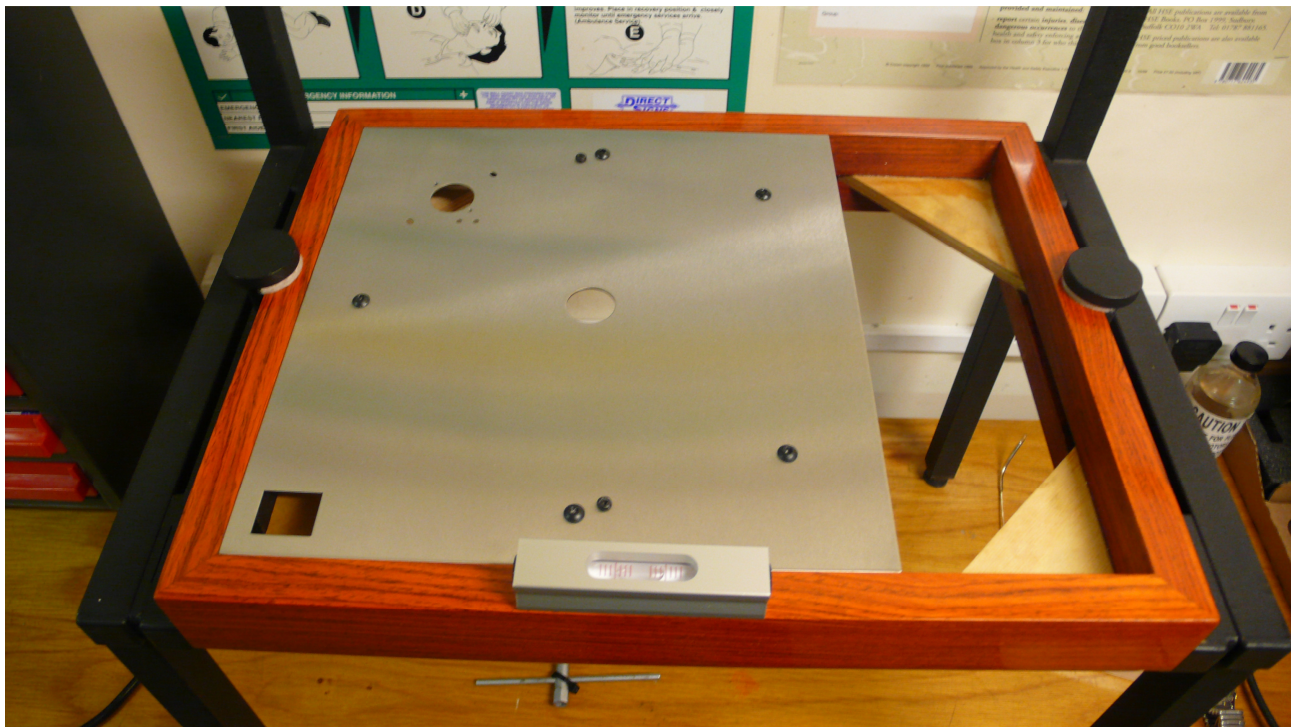


Figure 3 – Plinth with studded top plate fitted being levelled

Once you are happy with the top-plate and plinth union, proceed to the jig and gently clamp the plinth into place ensuring the bottom edges are contacting the support surfaces. Once clamped, level the plinth with a 15-30cm spirit level (not a small round one please) and check level on all four plinth sides.

Note. Older Afromosia decks may be smaller and so not supported properly by the lower metal supports on the jig! If this is so, just pull these plinths off-centre so that they can at least be supported by some of support surface and watch for slippage while tightening the clamps – See Figures 4 and 5 below.

Yes, if the jig's metal plinth supports were a little wider we would not have an issue, but just by pulling the plinth a little, so as it sits in a diagonal fashion, rather than square in the jig, works pretty well. Once clamped in place, please re-adjust the jig so as the four sides of the plinth are once again level.

Here is a small Afro plinth showing the problem and as you can see; I hope! The lower plinth support on the jig isn't in contact with the flat edge of the bottom of the plinth and so as you try and tighten, the clamps will start to ride up the bevelled edge of the lower part of the plinth. Not helpful when trying to level:



Figure 4 – A plinth in the jig sliding between the plinth supports when being clamped

By just shifting the plinth over to a slightly more diagonal position, will at least allow the plinth support rails to do their job in part, as you can see in the image below, and will allow you to clamp up, whereas before you'd struggle! Not perfect, but workable. Just ensure the jig's feet are now adjusted so as the plinth is level side to side and front to back again.



Figure 5 – Diagonal clamping of plinth in the jig giving support where before there was little/none



Figure 6 – Making sure that the plinth is level

We are now ready to check that the spring bolts are hanging vertically. Sometimes this is referred to as bending the bolts straight. However, in reality, the bolts are seldom bent. What one needs to ensure is that the bolt is hanging vertically. The top-plate is relatively malleable, and it is this area of the top-plate where the head of the bolt is secured by an M5 Nylock, that bends/distorts and sometimes needs correcting (bending).

Why do we need to do this? Well, as otherwise there is little chance of having a quiet, even and pistonic bounce. There are various ways of correcting this as you might read in on-line guides, but the tool of choice has to be the specially designed T-Bar. All Linn Turntable Specialist Retailers will use it and it allows for accurate correction of the bolt (top-plate area immediately around the bolt head) so the bolt can hang vertically.



Figure 7 – Using the T-bar so that the spring hanger bolts are vertical

How or what could cause the bolts not to hang vertically?

- 1) A loose nut securing the bolt to the top-plate.
- 2) As a consequence of the work necessary in ensuring the top-plate fits rattle free into the plinth in the motor corner.
- 3) Poor handling, such as carrying the deck round with the outer platter still in place and consequently all of its mass acting on the suspension, hence giving the bolts and particularly top-plate a hard time.
- 4) Poor packaging during transportation. If the LP12 is packed well during transportation, only a major trauma would cause a problem here if the deck has been set-up correctly. The bolts and hence suspension should not move during car journeys for example.

The next subject to be covered will be motor installation and initial alignment, and to start with, the 110v AC motor, it's a 24-pole precision synchronous low noise motor and has been used as far as I can tell, pretty much from day 1 on the very earliest LP12s right up to the current Majik LP12. Obviously, there have been a few small changes made to this motor over the years, but essentially it is the same animal, as you can see from the three in the picture.

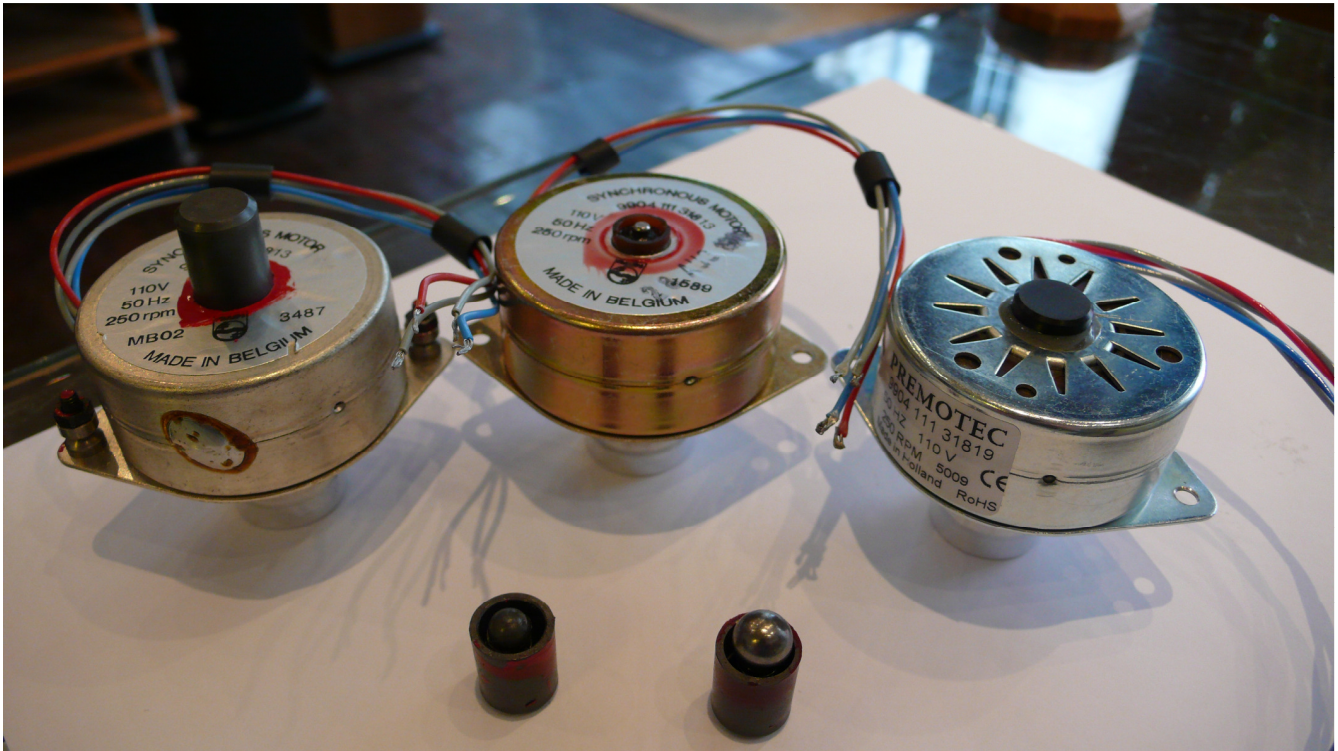


Figure 8 – LP12 110V AC motors over the years, old (left) to new (right)

Motors

Early motors had a nylon thrust pad within the motor cap and this was changed for a ball bearing in 1989. When using the original or Valhalla power supplies the thrust pad should be left in place. However, when using the Lingo (models 1-3), this should be removed as it is not required anymore and can cause start-up problems. Modern motors have a small cap factory fitted (glued in position) to reduce noise and this was introduced in 1991. This motor works well with both Valhalla and Lingo.

This motor is isolated from the top-plate by four small metal domes (two on each mounting) please ensure the rounded face of the domes are in contact with motor – not the flat as this allows one to tip/vary the angle of the motor which is required to set up the correct speed.

Motor fitting is awkward if you have the deck the right way up, so do ensure nothing will fall off/out when you turn the deck up-side down (like the sub-platter!) Please make sure you have the red or black bearing cap fitted or you will have oil everywhere! Also make sure the arm is tethered too, with counterweight removed! You will then be able to safely place the deck in the jig upside-down. If you need to fit a belt guide to the top-plate, attach it now before the motor!

The order of placement is, firstly introduce the two M3 allen bolts through the two motor slots in the top-plate and hold them there by using finger and thumb. Place one dome on each bolt, flat side to top-plate and rounded side facing upwards. Then place the motor onto the two bolts aligned with the motor wire exit facing towards the back of the deck (as illustrated in the picture of the Majik LP12 below in [Figure 9](#)). This allows for correct motor wire dressing.

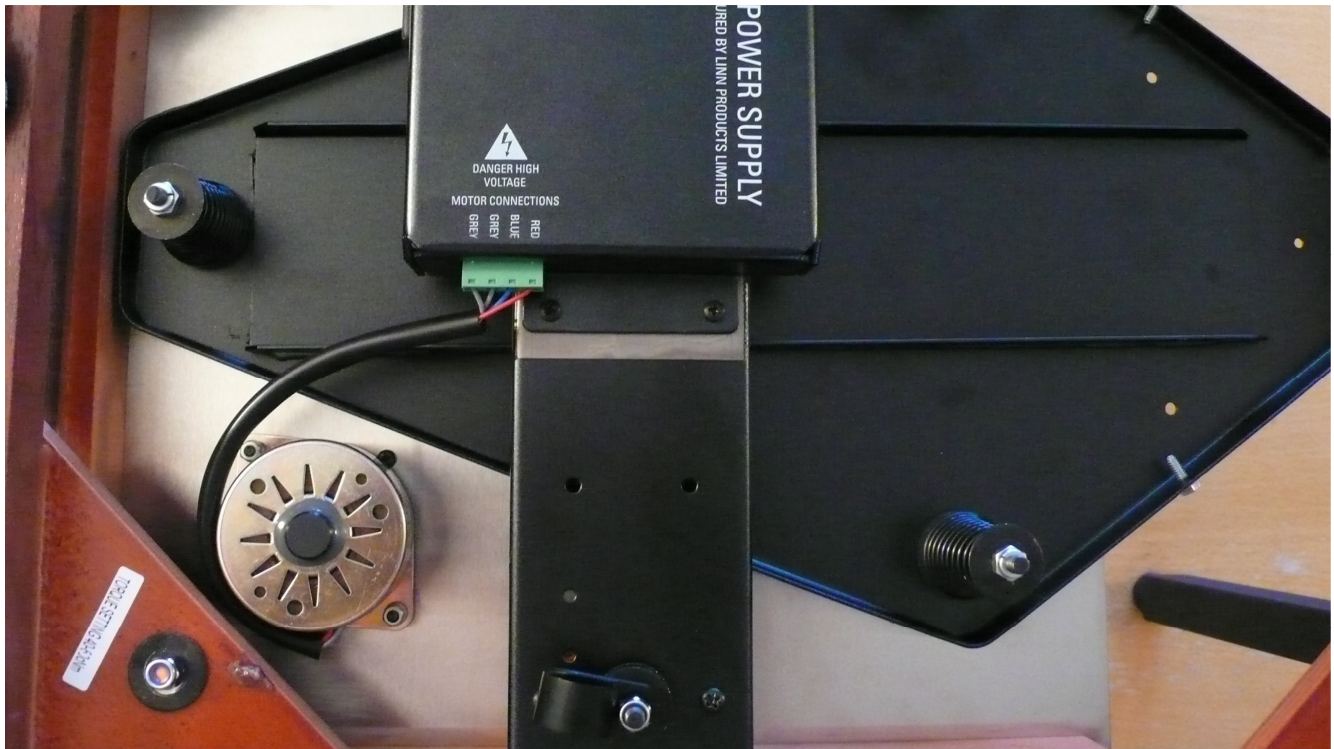


Figure 9 – An image showing the position of the cable exit on the AC motor

Following this, slide the remaining two domes down the M3 bolts with the round faces towards the motor. Finally, thread up the two M3 retaining nuts until finger tight. Only at this point you can remove your finger and thumb and place the deck back in the jig the right way up. Fitting the mountings with the LP12 upside down means that you are not fighting gravity and it's much easier to get the domes, motor and nuts assembled correctly.

Before final tightening of the two mounting bolt nuts, please ensure that the Allen bolt heads are diagonally located within the top-plate slots, this allows for the motor to be centrally located within the pulley hole in the top plate and distanced correctly from the bearing and inner platter. It is wrong to have the two mounts either both pushed in the slots towards the main bearing. Or pulled fully away from it. Diagonal arrangement is the only correct way please and fully orientated anti-clockwise in the slots, then nip up the bolts firmly.

Now is the time to gently screw in the two motor speed adjustment screws in the two remaining top plate holes. As mentioned previously, these will probably be imperial threads on very early decks and M3 on everything after (about 1976 best guess here!). Gently screw these in equally until they just touch the top of the motor (no rattles here please!). Speed adjustment is achieved, by these screws tilting the motor and hence the pulley. This will be discussed in detail later in Volume 3 as for the most accurate speed adjustment of this AC motor it is necessary to have the suspension set up correctly in my opinion.

By contrast, fitting of a Radikal DC motor or the Lingo 4 12v AC motor is more straightforward, as the two M3 torx bolts just bolt the motor housing to the top-plate and so with these motors I find it easier to install with the deck in the jig the right way up, carefully offering the pulley up through the pulley hole in the top plate with the motor housing orientated with the flat edge of the mounting flange facing where the sub-chassis will be for the Radikal and for the Lingo 4 with the CE mark closest towards the plinth as shown in the pictures below.

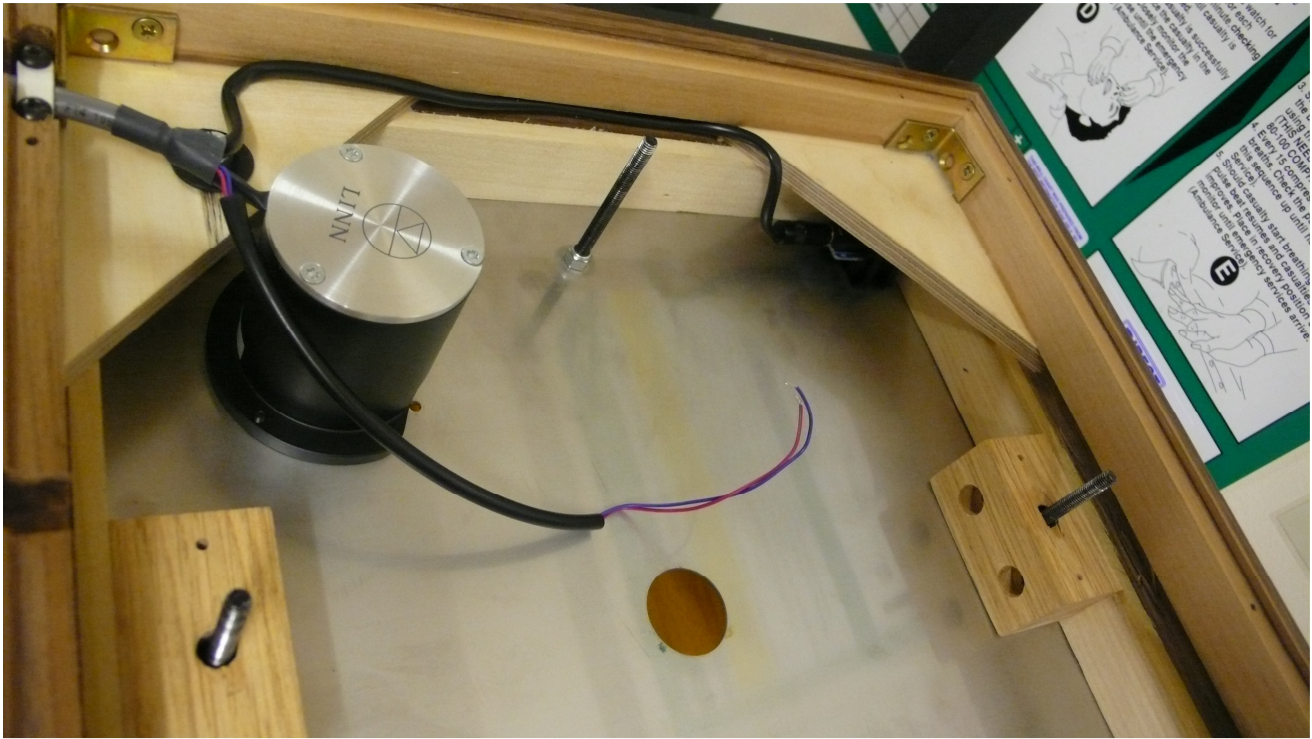


Figure 10 – Radikal motor orientation



Figure 11 Lingo 4 motor orientation

Care is essential at this point, as you can easily mark and damage the motor pulley if you are clumsy when offering it through the top-plate hole. For the Radikal, push the motor up into position thus compressing the foam ring on the motor housing beneath the pulley. Rotate the motor housing carefully until the two M3 fixing threads on the motor mounting flange come into view through the two mounting slots in the top plate.

Once the two bolts are carefully started in the thread properly you can relax a little. Rotate the motor housing so the bolts are diagonally located in the slots, just like I described with the AC motor above. Check the foam interface is evenly clamped between the motor housing and top-plate (if it's not, remove the motor and repeat the process until it is!) and tighten the two housing bolts up. Personally, I nip them both up, leave them for a couple of minutes to let the foam settle following its compression and then carefully tighten again and to a little more than just nipping the bolts. This is very much a feel thing as we all know the importance of torque when it comes to fixings on the LP12.

For me, the important thing to stress here, is do not over-tighten these two mounting bolts as you will strip the relatively fragile threads in the Radikal motor housing as they are plastic and not metal, they are just threads into the housing material! An expensive mistake if you damage these threads, so please don't make it. Additionally, over the years occasionally I have seen the incorrect fitting of the M3 motor and sensor screws!

Please use the short 5mm pan head Torx screws for the sensor and the longer 8mm pan head Torx screws for the motor housing. Remember, caution is good, get it right and take care when tightening these M3 Torx screws. For the Lingo 4, the sensor attaches in exactly the same way as the Radikal using the two M3 5mm pan head Torx screws supplied. The 12v motor is a little more straight forward as there is a gasket fitted to the motor already and the two M3 8mm pan head Torx screws thread into metal inserts directly on the motor flanges. (CE mark positioned closest to the plinth)

Motor connection wires will be covered later...

Sub-chassis

Now the motor is in place. The next thing to do, is to ensure the main bearing is securely bolted up to the sub-chassis, whether it be the steel sub-chassis (early or later Cirkus), the Majik, Kore or the Keel, they all need to be bolted up very securely. (For specific recommended torques for the Cirkus bearing if you wish to investigate, there many discussion threads on various fora).

For the Karousel bearing launched in February 2020 the recommended torque for all sub-chassis is 3.5N.m.

If you have an Aro Kore or Keel, please mount up the Aro arm base first before fitting the sub-chassis. However, leave the arm rest off, as it will foul on the top-plate during insertion. It can be attached later when the deck is the right way up again.

Personally, when fitting sub-chassis, whichever they are, I like to do this with the deck upside down in the jig. Extreme care must be taken to avoid damage to the sub-chassis. Also ensure that the sub-chassis avoids contacting the plinth and damaging it on insertion. I have heard some horror stories about accidental scratching of the sub-chassis and marks on the plinth, so please take your time... I carefully insert the sub-chassis into the deck from underneath through the opening where the armboard would normally sit, motor (more pointed) end first, carefully lifting it over the three spring bolts as I feed it in, then lowering the sub-chassis around them.

Pictures say far more than words here...

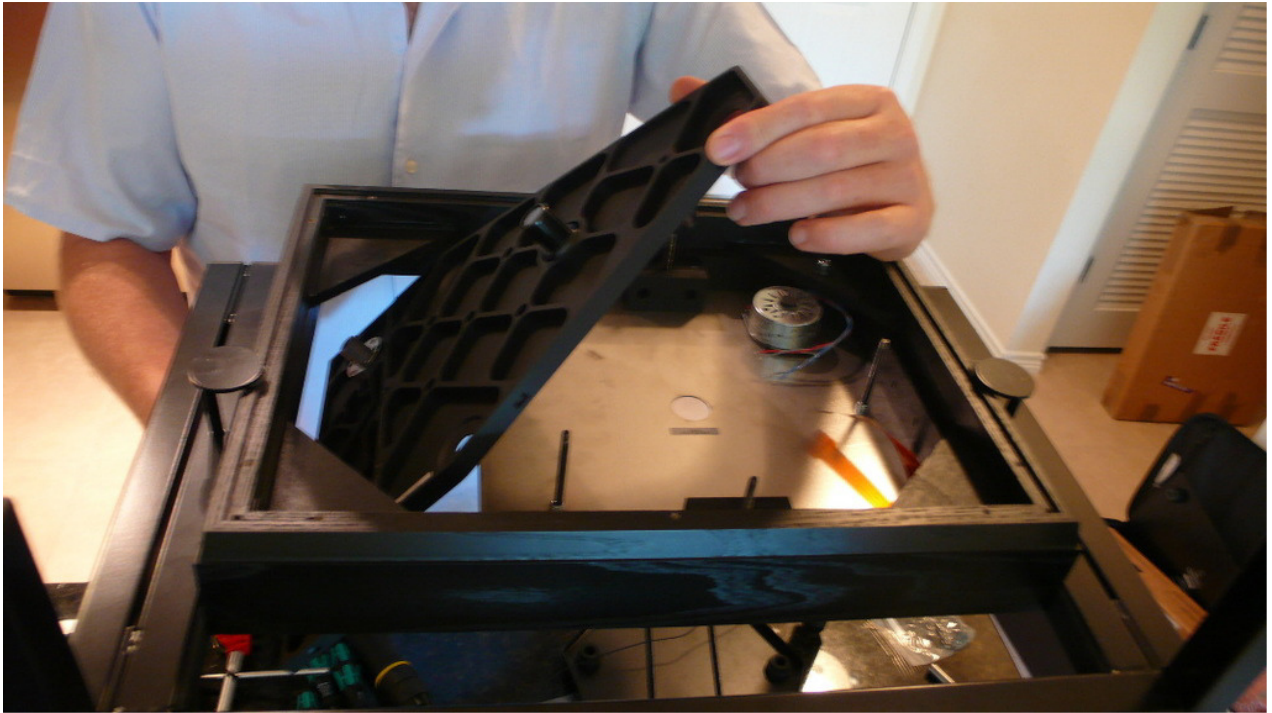


Figure 12 – During Kore or Keel insertion being careful not to strike the top plate and plinth



Figure 13 – After, showing the Keel located



Figure 14 – After, showing the Kore located



Figure 15 - A Cirkus Keel/A showing arm mounting collar already attached

Once the sub-chassis is in position, firstly fit the large grommets then place three selected springs in their correct places, then the small grommets followed by the mudguard washers and finally a turret lock nut (all metal) locks the assembly into place on the M5 spring bolt thread – N.B. This is different to the Nylock nuts used elsewhere on the LP12. They are better than the Nylocks and are needed here as a loose nut on a spring bolt is really bad news as you can imagine!

Despite small variations, the springs will be considered “within tolerance”, but it is useful to be aware that they vary and to use these small variations to one’s advantage!

The springs which appear more difficult to compress can be used where most of the sprung mass is supported, i.e. near the arm. The softest springs can be used on the left side of the sub-chassis near the motor, as the spring at this end will be supporting less of the overall sprung mass.

The spring at the front, to the left of the arm board supports a mass between the other two and so I use a spring whose compliance is intermediate to the other two. This does help a little when trying to achieve the very best, most even and pistonic bounce.

Once the springs, grommets, washers and nuts are fitted, then the sub-chassis can no longer move about freely. This is good, as soon the deck will be turned the right way up again. However, not before the fitting of the cross-member, otherwise known as the wiring strap, to the plinth.

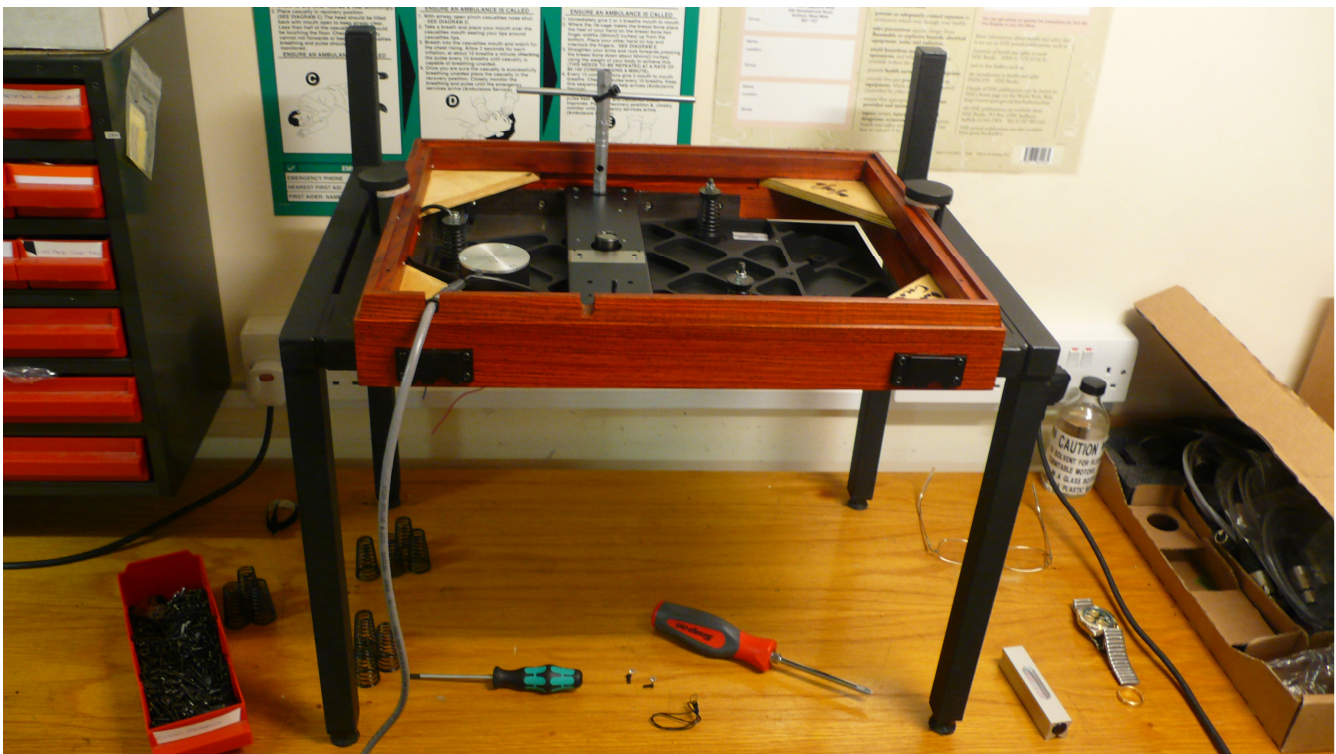


Figure 16 – Springs, grommets and cross-member fitted

Wiring Strap

Wiring straps (I prefer to call them cross-members) have changed over the years. In the early days with the original power supply there was no need for plastic stand-offs. Latterly, additional holes were provided for these. The Valhalla, Lingo and Armageddon boards all need to use these stand-offs in order to be secure inside the deck.

Early cross-members only have single holes at either end, for the top-plate bolts. The additional holes for the two self-tapping screws located either side of the bolt hole at either end came later. Additionally, these earlier cross-members are also longer than the modern (2009 onwards) ones and this can cause problems if they are being fitted to a modern/new plinth where the attachment blocks are now flush with the support rails. Previously the blocks were about 3mm higher than the support rail!

This means the old type cross-member will foul at either end on the wooden support rails and consequently it does not sit properly against the plinth block and doubtless the LP12 would sound awful if left like this. The problem is shown below in [Figure 17](#). You can see the marks that are left, either side of the block at the rear:



Figure 17 – The effects of using an old cross-member on a new plinth

There are two solutions I would suggest here: fit a new shorter cross-member, or if none available to you, you need to put four small slots in the plinth either side of the blocks as shown below in [Figure 18](#).



Figure 18 – Slotting the support rail either side of the blocks so as the cross-member can attach properly

The important thing is for the cross-member to sit flat up against the surface of the block and as mentioned earlier, fitting of the modern (post 2009) cross-member is probably the best course of action and it also ensures compatibility with two of the more recent power supply options available as both the Lingo 4 and the Majik require the threaded inserts present on the later shorter cross-member in order to be attached!

The newer crossmember can be identified by the bare/unpainted strip showing as well as threaded inserts being present. See [Figures 9, 16 and 19](#).



Figure 19 – Newest crossmember shown here at the top and the oldest at the bottom

Power Supplies

There are various power supplies that can be fitted to an LP12, it's again quite a wide topic for discussion. However, I will be limiting myself to showing you to the most frequently used power supplies for ease of reading here and these are Valhalla, Lingo 1-3, Lingo 4, Armageddon and Radikal.

I will be also showing things more pictorially, as I feel this is more use than some wordy descriptions.

Firstly, the Valhalla and 3rd party clones of these; please remember that mains voltage is carried on the board, so disconnect the power cable from the power supply before you begin.

Often this is the kind of sight that greets me when I open an older un-serviced deck. It can be dirty and a few sharp edges, so not a particularly nice environment to work and please take care!

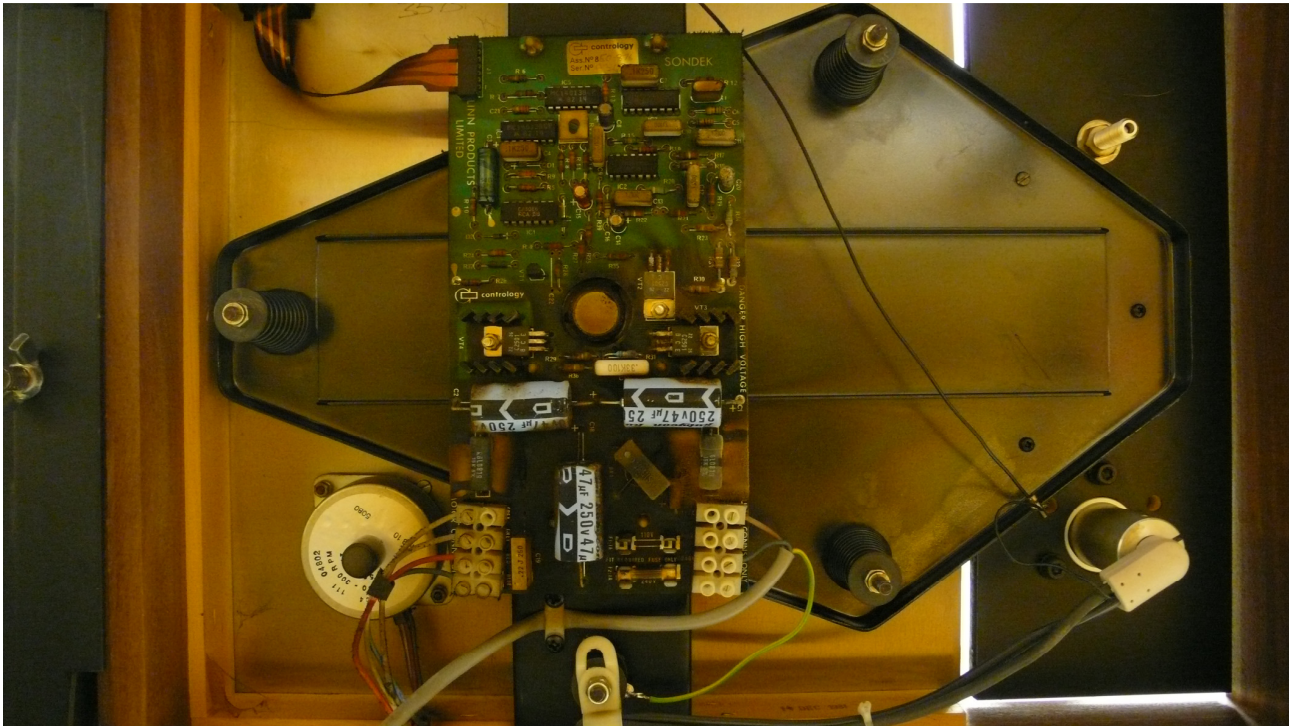


Figure 20 – Old tired Valhalla

The Valhalla clips onto six stand-offs on the cross-member. Please ensure the stand-off heads are fully home and engaged onto the board so that the board is properly held.

Sometimes I find these are loose because they are not pushed fully home. Any fixings that rattle/are loose within an LP12 in my opinion is not good.

Cable connections are simple enough to follow as the board is clearly marked, so firstly ensure you get your four motor connections correct Red, Blue and the two Grey cables.

Sometimes the cable connector grips are deformed from previous use making cable insertion difficult, so I often use a small allen key to push the clamp plate back into position and then both cable insertion is easier and the cable stays in place as you tighten.

By all means, have the cable connectors tight but don't over-tighten as this is counterproductive and can cause deformation and damage to the connector block.

The mains connections on the other side of the board are also well marked and having connected the live, you can determine the voltage required by where you insert the neutral. 240V and 110V are marked on the board. The fourth connector remains unused.

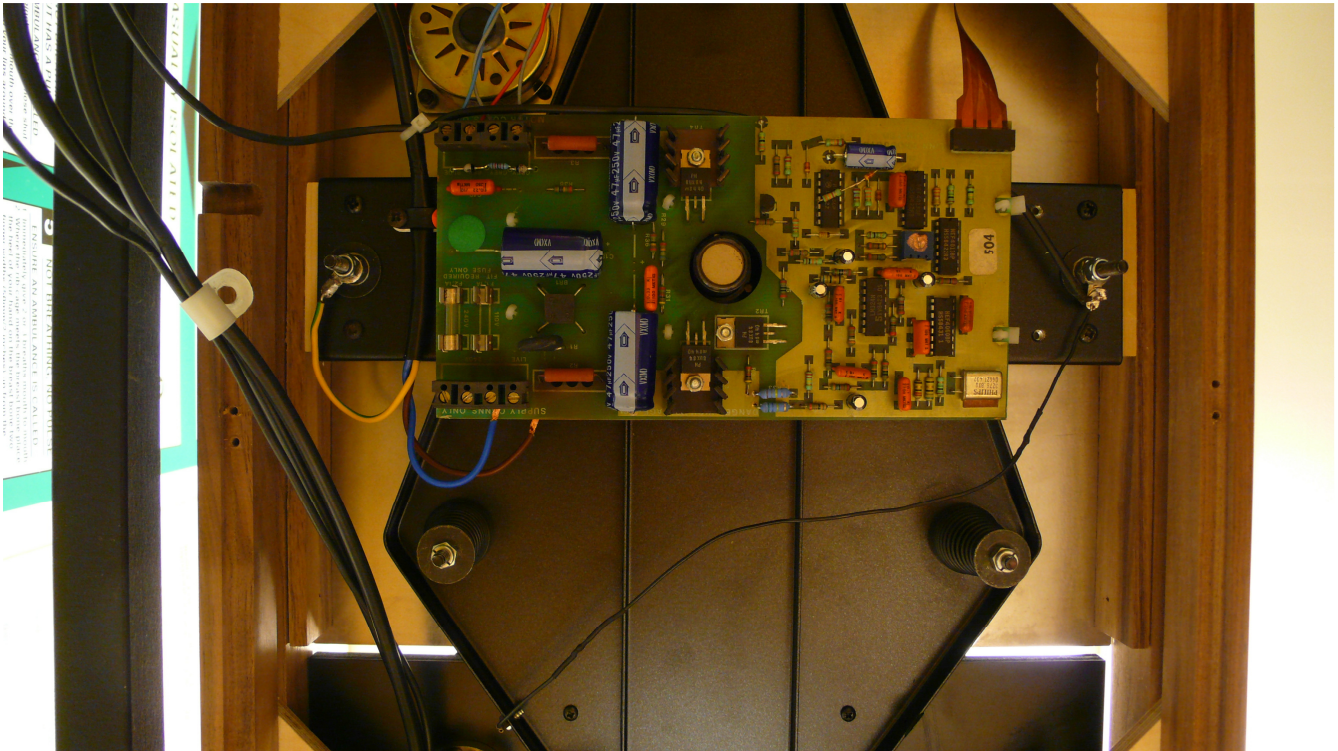


Figure 21 – Fitting the power cable and voltage determination on the Valhalla

The switch just pushes neatly into the hole in the top plate with the red LED innermost and on the side away from the plinth. Ensure it is pushed fully home so the clips hold the switch firmly in place.

The flexi can then just be pushed into the flat black connector at the opposite end of the Valhalla from the mains and motor connections.

Because the flexi can twist, ensure you have the metal contacts on the end of the flexi in contact with the contacts within the connector and pushed fully home as I have heard of people connecting this upside down and then it doesn't work.

Keep all cables dressed as in the picture. Ensure you connect the earth on the mains cable as shown. Please also ensure that none of the cables can foul/rattle against the board or against the suspension as this will reduce performance.

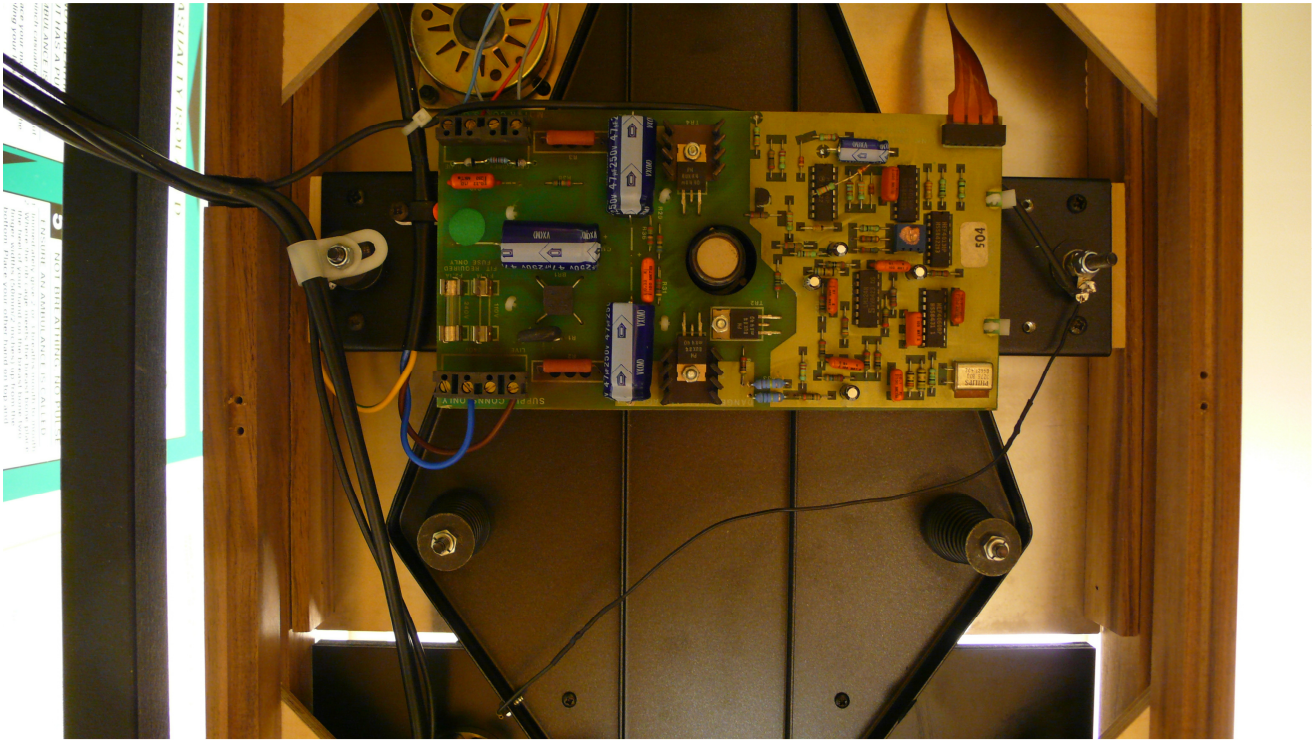


Figure 22 – 230V connection made to the Valhalla

You may see in [Figure 22](#) above, that I've cleaned the fuse and ensured the fuse holder holds the fuse properly, even though I was just about to remove this Valhalla! – Good contacts are always important and a useful picture to illustrate this point.

Those "eagle eyed" amongst you will notice I've changed the Aro arm earth routing a little and away from the motor wires in the Lingo picture below. I think this is better and ensures the earth wire cannot move and foul on the suspension or rattle either.

The Lingo board that fits within the deck is merely a connector, as all the clever stuff is obviously contained within the Lingo box itself.

Motor connections are clear as you can see and connect as per the colour code. The switch again has a flexi and pushes into the connector at the opposite end of the board.

Because the Lingo only has five stand-offs I suggest you remove the un-used one to avoid the chance of it rattling as it's not holding anything. Ensure the board is pushed fully home on all the stand-offs. Again, the less anything can rattle, the better.

Connect the Lingo umbilicus and before you engage it onto the push connector, ensure you have it the right way up. The spacing of the pins will only allow it to push in if correctly orientated.

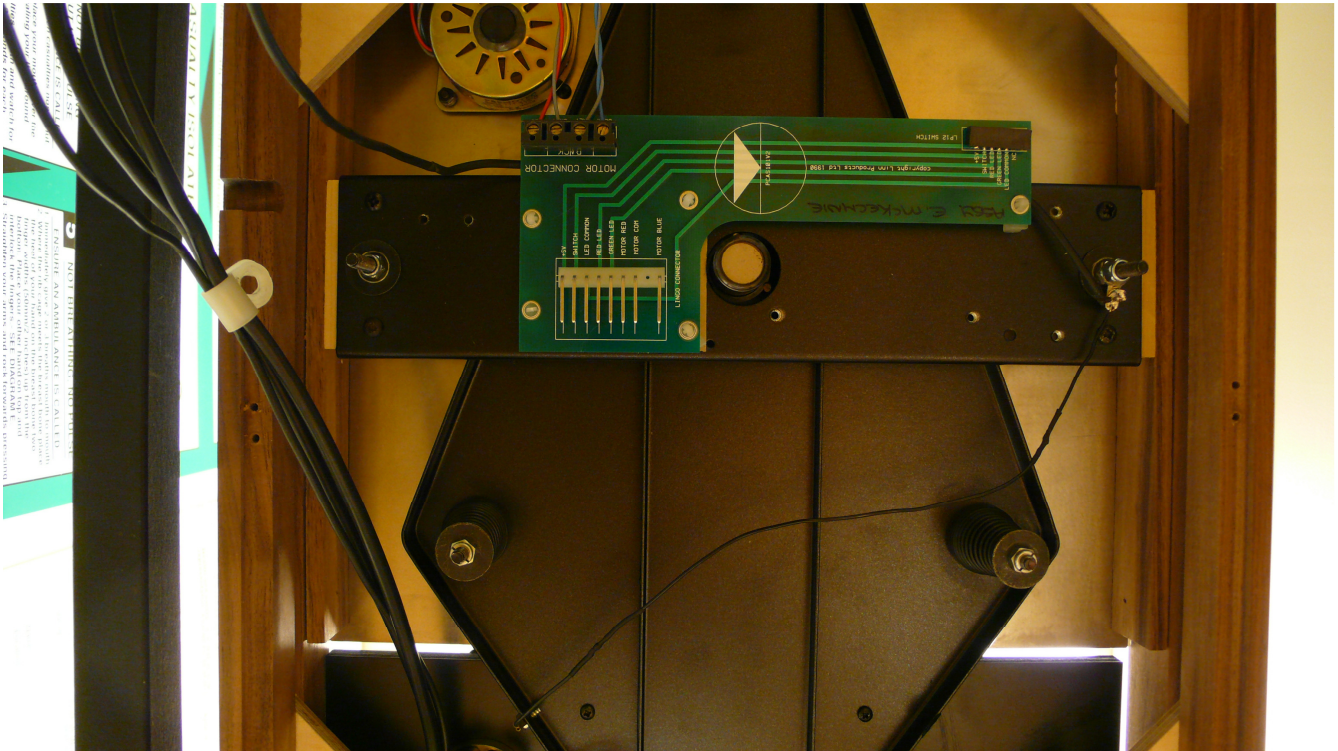


Figure 23 – Lingo 1-3 motor connection.

The fully connected item should look like [Figure 24](#) below...

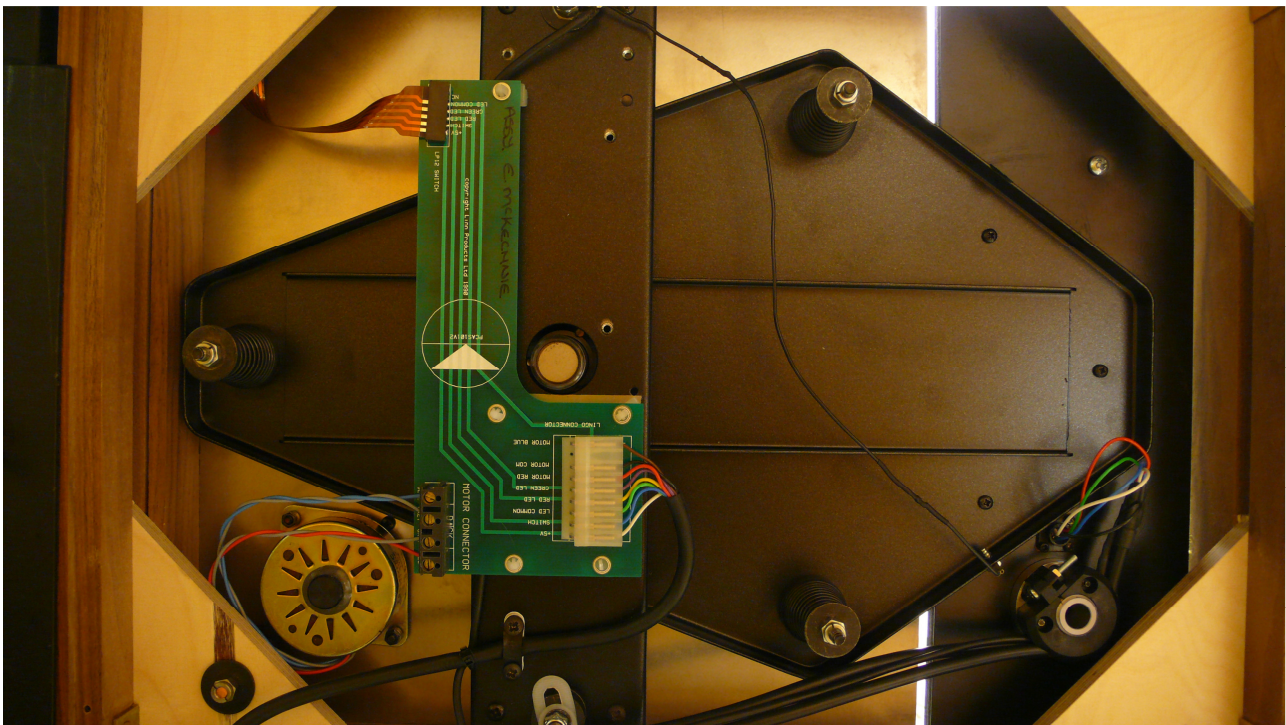


Figure 24 – Completed Lingo connections

With the Armageddon that some owners use, you can see that there is a very small connecting board locating onto just four of the stand-offs. There are no instructions on the board as to which wires from the motor go where, these are provided on a fitting sheet that's supplied. However, it's very simple if you follow the tracks on the board: Blue connects to blue, Red to brown and the two grey motor wires to the black and these two central connectors are joined as you can see as there are only three tracks.

All the earth wires are connected to the top-plate bolt securing the cross-member in one place as you see. The arm earth and supply earth can rattle about and even come into contact with the chassis or the bottom of the main bearing if one does not dress them with care. Personally, I find them contained and held in place using the two stand-offs and tie wraps to be my preference.

However, if you wish to have them hanging loosely under the cross-member as per the manufacturers fitting sheet, I suggest you remove the two (now unused) stand-offs.

Likewise, I prefer to secure the power feed cable to the cross-member, just like a Lingo umbilicus whereas the fitting sheet advises just fitting a cable clamp at the cable exit through the plinth. Personally, I prefer to minimise the potential for rattling/vibration as far as is practically possible underneath an LP12 with these particular wires.

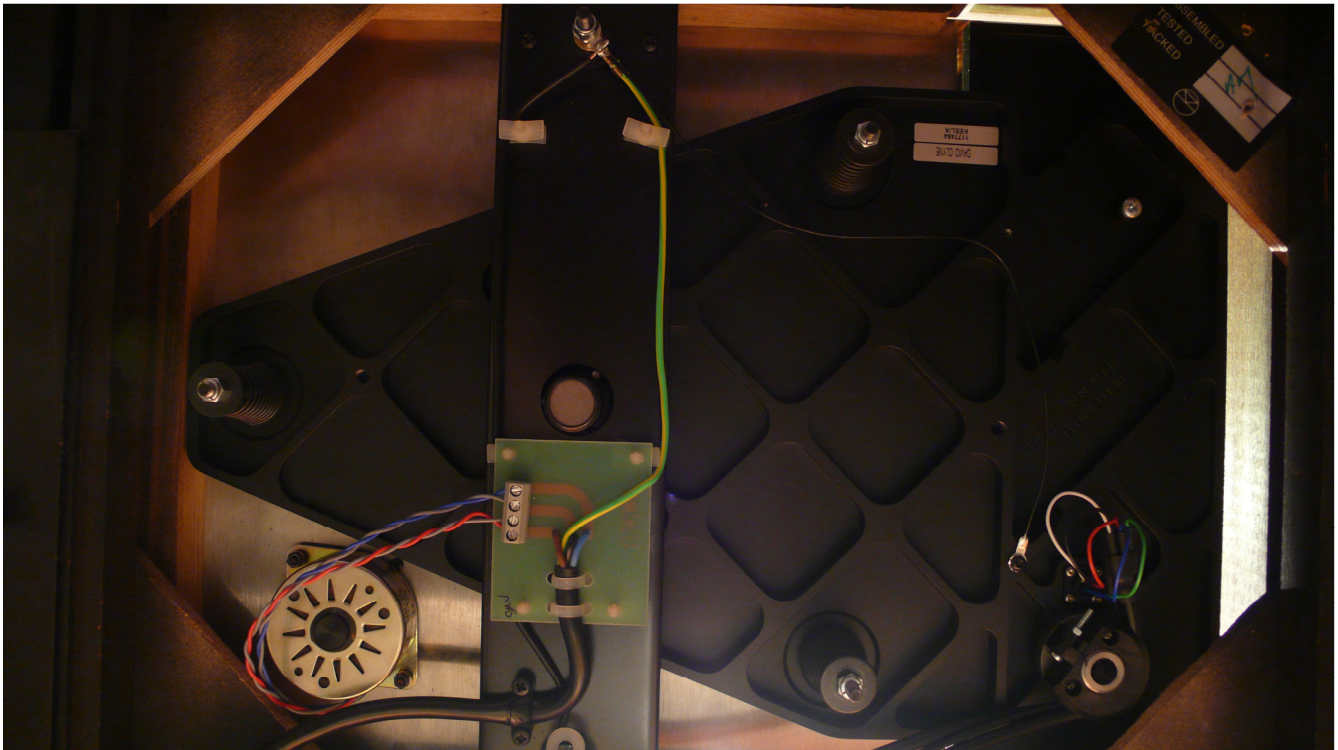


Figure 25 – Completed Armageddon connections

With the chassis earth, and this applies to all LP12s, please ensure it cannot rattle against anything anywhere underneath the top-plate and sub-chassis, so dressing this cable, so as it's free to move with the suspension and not touching/rubbing against anything is essential. Please note that I even remove the rather bulky part number identification tags on this thin black wire too, as again this means less chance of anything rubbing or rattling.

The dressing of the AC motors wires into twisted pairs is a subject for debate elsewhere if required, but suffice to say, acting on a tip-off from David Williams himself, I would suggest you put the wires into twisted pairs, I believe there is a small improvement in sound by doing this, However, please just twist as in the Lingo example and not the Armageddon photo. (This is an early archive photo used and I was experimenting on one of my demo decks at this time) I believe a slightly gentler twist is preferable.

The Lingo 4 installation is somewhat different as you can see in [Figure 26](#). The brains of the Lingo 4 are mounted inside the LP12 plinth, attaching to the modern cross-member with four M3 screws to four of the six inserts present. The power supply is boxed separately and remains outside the LP12 plinth. It is connected to the Lingo 4 main board via an umbilicus terminated with XLR plugs. N.B. It is essential when fitting a Lingo 4 that firstly you always take anti-static precautions and wear an anti-static strap at all times, as failure to do so could damage sensitive components on the Lingo 4 main board!



Figure 26 - The Lingo 4 installation is very different as seen here – Note orientation of the sub-chassis earth wire!

If you are installing a second-hand Lingo 4 I would expect the red and blue sensor wires to have already been inserted into and along the length of the motor wire sheathing. If not, I recommend doing this before attaching the 12v motor to the top plate. The cables should be cut to length and stripped and tinned at their ends. If not, just strip and tin the ends which will connect to the main board.

Before attaching the Lingo 4 board to the cross-member, it is essential to firstly connect the red and blue sensor wires to the colour coded connectors on the board. Then the green motor wire connector plug can be attached to the board (it will only fit one way round). The main board can then be secured to the crossmember using the four supplied metal stand offs and the M3 Torx screws (two long and two short) with integrated washers. See [Figure 27](#).

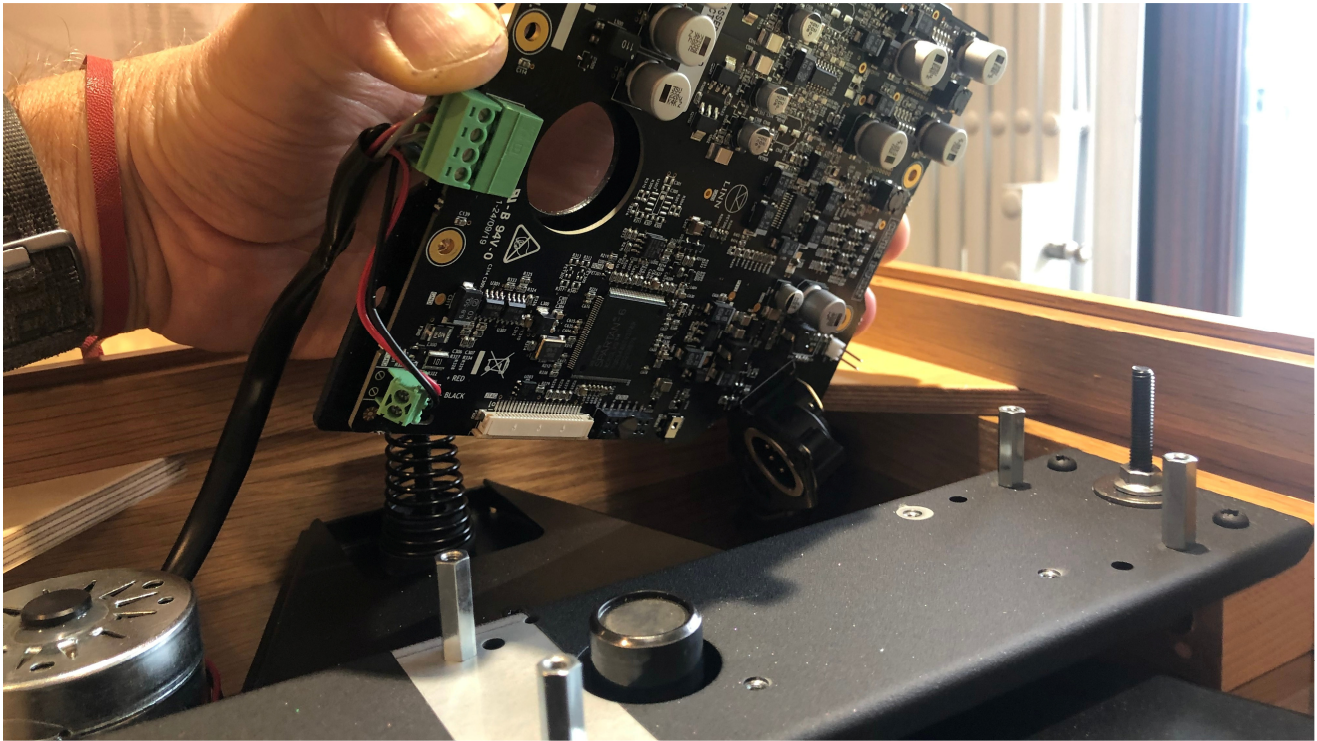


Figure 27 - attaching the Lingo 4 board to the cross-member – Note I'm using an anti-static strap

Once fitted, you need to ensure the motor and sensor wires don't foul the sub-chassis and so dress/contain these wires using a tie wrap threaded around them and looped through the attachment hole on the edge of the Lingo 4. See [Figure 28](#).



Figure 28 – dressing/containing the motor and sensor wires so as to avoid contact with the sub-chassis

The switch, having been pushed through the cut-out in the top-plate, then attaches to the main board using a short 3.5mm jack lead. The power cable connects via the XLR plug to the main board and the wire should be dressed as shown in [Figure 29](#) with the power cable retained in the slot in the plinth (Note. It's the same cable dressing as for the Radikal speed sensor wire shown in [Figure 32](#) below) and secured with a cable grip at the plinth exit.



Figure 29 – Lingo 4 power and switch wire dressing

Connection of the speed sensor wires is basically the same as described below with the Radikal excepting if new or not previously done, pull any excess wire through the top plate hole adjacent to the sensor, trim them to length, strip, tin the ends and attach the wires as shown in [Figure 34](#).

Last but certainly not least, the Radikal power supply. You will remember from earlier in the guide that we have the motor already attached to the top-plate on my main subject deck, so on to the motor wiring needs to be secured and the sensor and switch need to be fitted.

Remember, if you have an older deck please check page 1 of this thread to ensure that the speed sensor can be fitted to your top-plate.

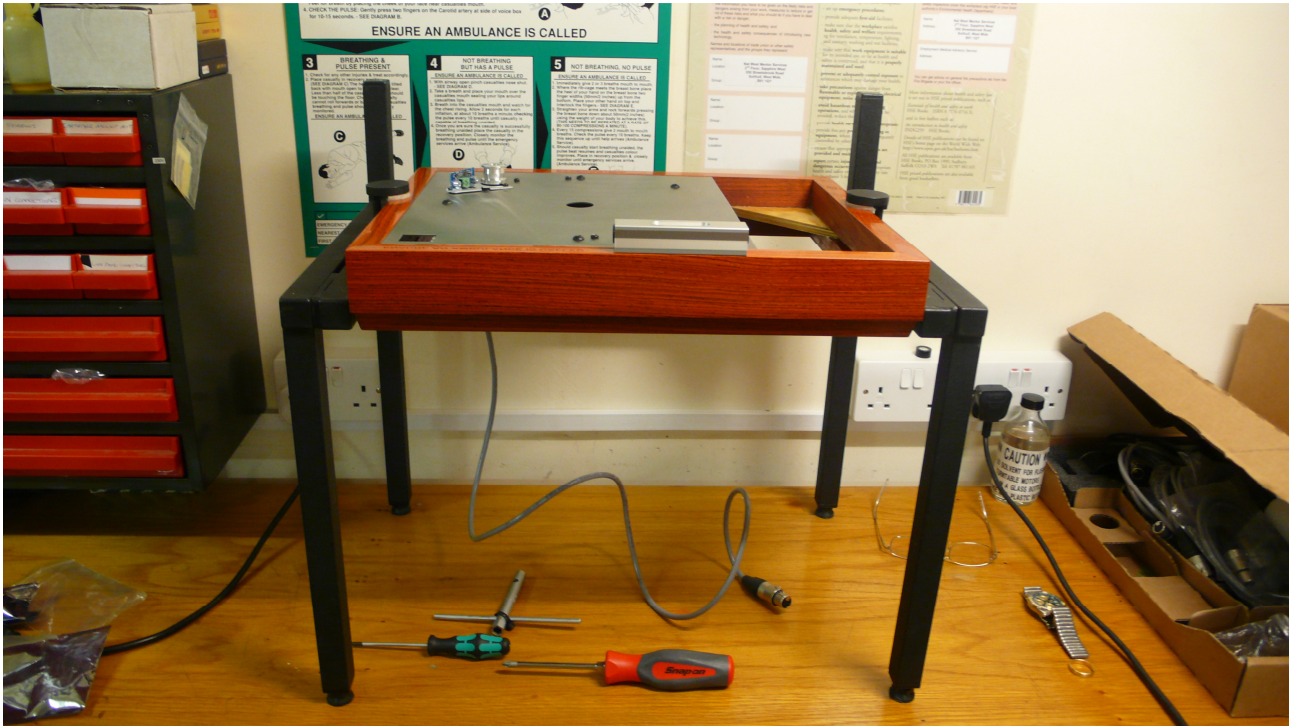


Figure 30 – Radikal motor mounted on top plate

The speed sensor attaches to the top plate with the two small M3 Torx head screws using the two threaded holes where previously the two AC motor speed adjustment screws were located. Once fitted to the top-plate, proceed to the wire dressing and securing.



Figure 31 – Threading the wires for and the fitting of the Radikal speed sensor (same layout for the Lingo 4)

Firstly, I secure the motor cable to the plinth, ensuring that the cables are not tangled and not under tension between the motor body and plinth clip. The plastic shrouding over the switch cable (the one with the jack plug attached) and please note, the sensor cables do have a habit of pulling out from the heat-shrink at the junction before the motor. Just ensure they are pushed fully back into the heat-shrink when you have finished the cable dressing. The switch cable can be arranged so it sits neatly into the slot in the plinth as shown in [Figure 32](#) below.



Figure 32 – Radikal motor cable dressing

You will notice the plastic shroud on the speed sensor cable has pulled away a little in the picture, this is no problem, as it's generally too long and has the potential to foul on the Keel (or any other sub-chassis) when installed if left like this, and so I shorten this cable on early Radikals by about 12mm if required. Once the sensor cables are threaded through the hole, they can be trimmed to the correct length. N.B. modern Radikals from about 2014 onwards seem to have pretty much the right length shroud and sensor cables and probably will not need shortening.

Below in [Figure 33](#) you can see the path the sensor shroud should take between the motor and the sub-chassis and as you can see. If there had been excess length in the shroud, it would have very likely rubbed/fouled against the Keel (shown) thus impeding free suspension movement – not good!



Figure 33 – Radikal speed sensor wires must be dressed round the motor to avoid contact with the Keel

Equally, the shroud length if adjusted, does not want to be cut too short, as otherwise it would come into heavy contact with (strangulate) the motor housing! So, a balance between too loose and too tight must be found so as it passes cleanly through the small gap between motor and sub-chassis.

Once the sensor wires pass through the only remaining open hole in the top-plate near the motor they can be trimmed to length and dressed as I mentioned previously. Ensure these wires are not left too long or are loose as if they slacken off; this would allow the sensor wire shroud to sag and then they could possibly contact the Keel!

I also suggest that once shortened, the ends of the wires are re-tinned before insertion into the sensor and tightening of the fixing screws (very small screwdriver required). The wires can be kept under tension if required by gently pushing down the small metal flap on the sensor body where the wires pass underneath it and it can be gripped as seen in [Figure 34](#) below...

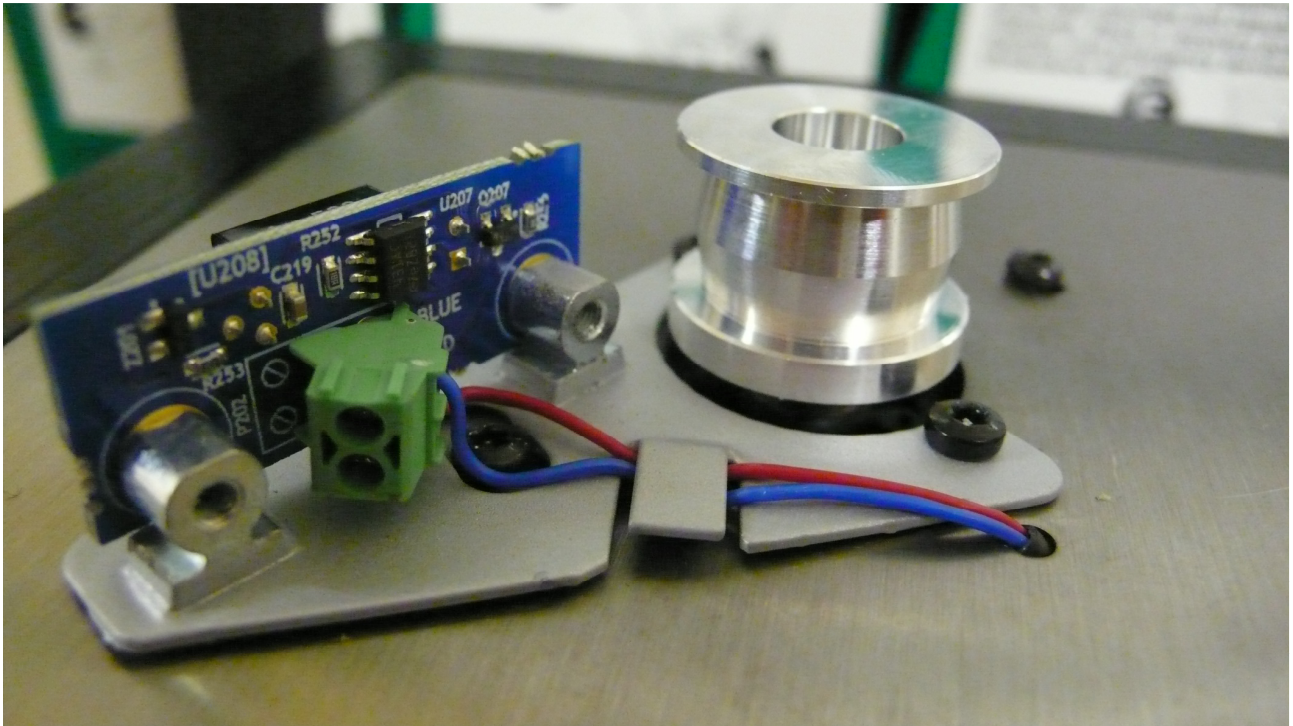


Figure 34 – Completed speed sensor installation

The final thing to mention here as many of you know is that the Radikal and Lingo 4 sensors need a marker to be applied to the underside of the outer platter. This is so as the sensor and the electronics can clock it as it goes round, hence adjust and ensure the deck is running at exactly the right speed.

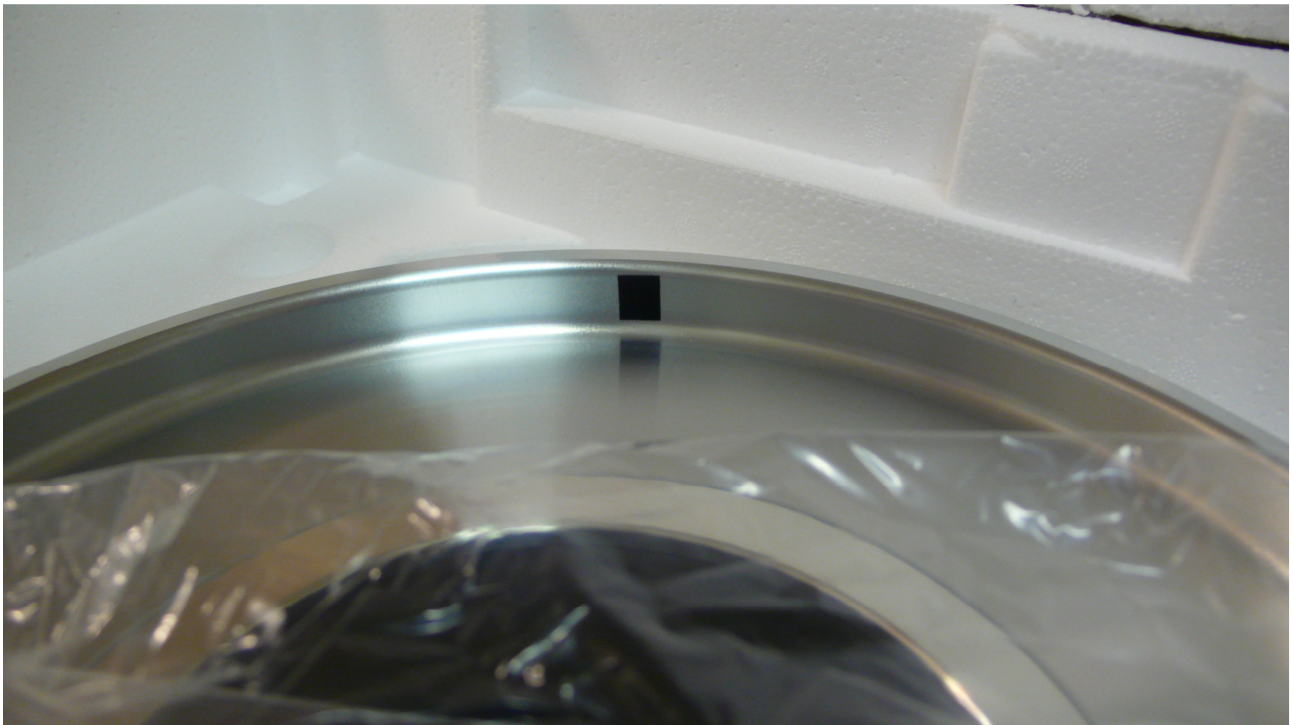


Figure 35 – Position of marker for speed sensor. Only a small marker is necessary

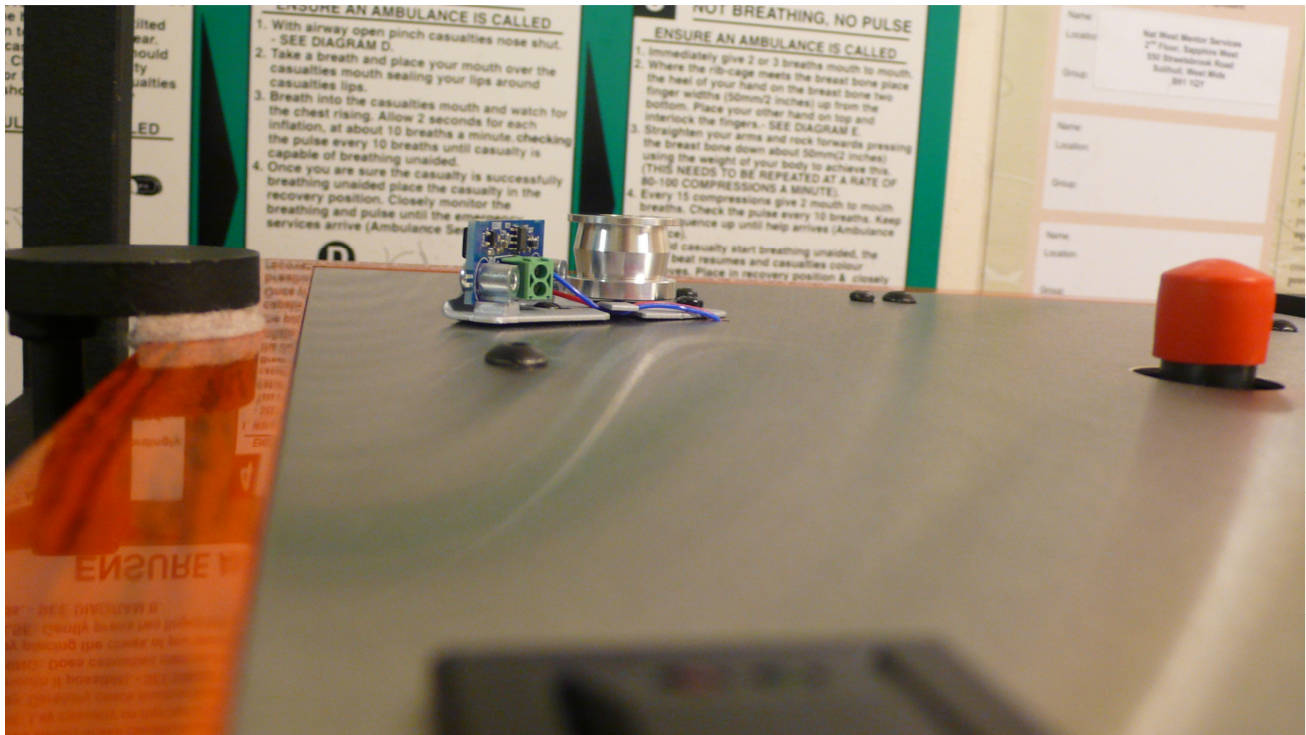


Figure 36 – Radikal installation completed

Continued in Volume II with the assembly of the LP12 suspension with cartridge alignment and VTA.