

Rob Heaton's HO Le Mans Tomy Turbo Chassis Tips



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ETFF

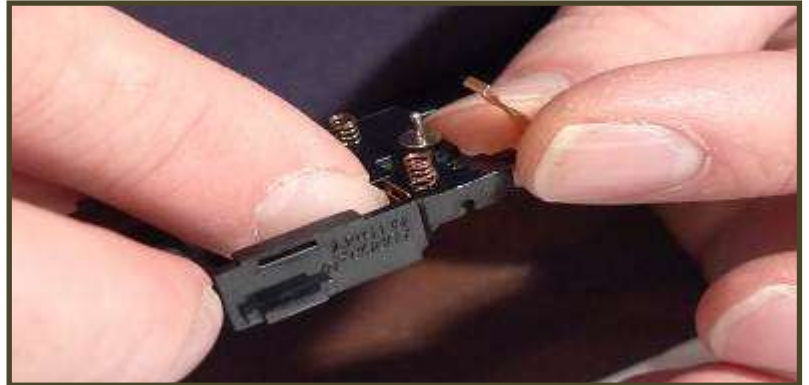
What's ETFF you may ask? Well it's the answer to getting your Tomy Turbo HO slot car Chassis to be better than it is out of the box. It's also the trick to getting a car that goes well at the biggest race of the year, Derby HO Racing Club's (DHORC) Le Mans 24hr race alternatively known as HOLM.

ETFF stands for **E**lectrically **T**ight **F**riiction **F**ree, or as some may know it "Blueprinting".

Now before the panic sets in this is not something you have to do to have a chance of winning, it's just a guide that will help if you like to tinker with the little toys we play with on a regular basis. Some of you will say "That's nothing new, I already knew that". Some will say "What, how, where do I start?"

Above all, like I said, don't panic. If you have no idea what you are doing and changing the pick-up shoes is about as far as you dare go, then here's a little tip: always remove the pick-ups from the rear first and put them on from the front first. It stops them from being bent out of shape.

It is little things like this that can make all the difference.

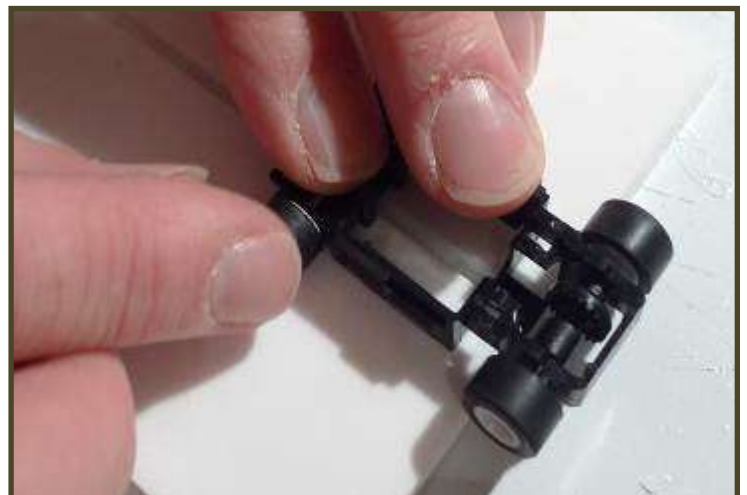
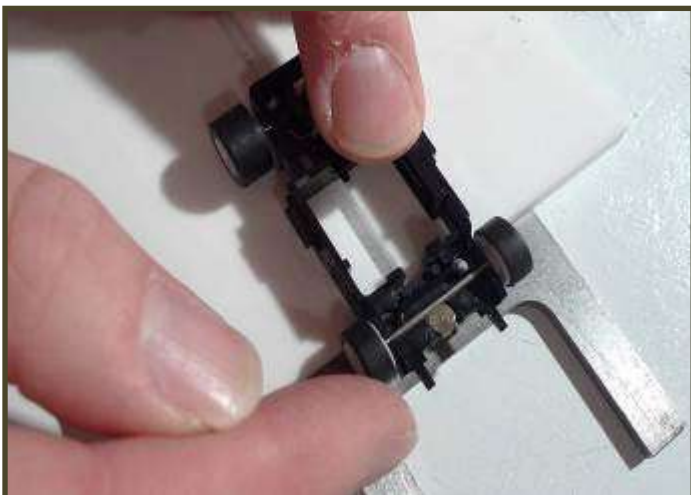


For those of you at any of the UK Clubs (as well as those overseas I am sure) there are always a few people at each Club who you can turn to who would be only too willing to help, many have turned out car after car to rival the best.

We'll start with the Chassis itself. We have used a Tomy Turbo Chassis as this is primarily to help those teams at HOLM, but it should still work for the other Chassis.

Starting with the bare plastic Chassis we will begin with the Friction Free part however I may drift into the Electrically Tight bit as we go.

So first things first, you have your bare Chassis. Fit both your front and rear axles and visually check to see if they are parallel in the Chassis and that they don't have too much, or an unequal amount, of movement forwards or backwards and are not warped.

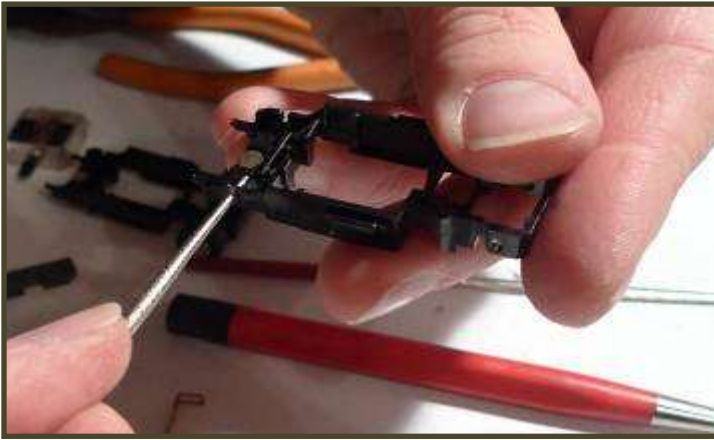


Good. Ok now remove them and put to one side

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All things injection moulded out of plastic have mould lines & slight imperfections on them, including burrs on openings and cut-outs so we are now going to try to make the Chassis as good as it can be by addressing these imperfections.

I'm not saying every little line or bump needs addressing but just where it is critical and could cause the car not to run as freely as it could.

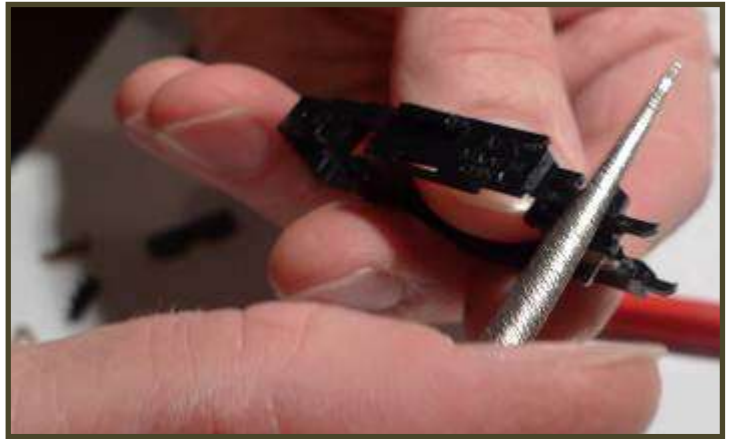


Let's start at the front with the axle holes. With a small round file (it needs to taper to a point) insert it into the hole on one side of the Chassis, don't force it just until it is in the hole now slowly twist it just once or twice to de-burr the hole. You only need to do this lightly, you're not trying to open up the hole or your axle will continuously fall out. Now do the same on the other side. Replace your front axle and see if it spins freely in the Chassis and check again that it is not too sloppy (technical terms abound).

Now remove the front axle again, I know it is tedious but that's how it goes, and with a small flat file gently run it over the side of the Chassis where the front axle hole is.

As you have de-burred the inside of the hole, a burr is probably now sticking out of the side of the Chassis. Ok all good, now do the other side as well.

You have probably guessed by now that whatever you do on one side needs doing on the other so I will try not to repeat myself.



Now refit the front axle and again check all is well.

We do basically the same to the rear axle holes in the Chassis but again refit the axle at each stage to check it is free spinning but not sloppy. The only difference with the rear axle hole is you also need to do the inside of the Chassis where the holes are located. Again just lightly with the file to remove those pesky burrs. **WHY BOTH SIDES ONLY AT REAR?**

Now on to the axles themselves, well the plastic hubs on the axles to be precise. Taking your flat file, run it round the inside edge of the plastic hub to once again de-burr any imperfections on them. It is no good doing all that work on the Chassis to find you have a lump of plastic on the hub that catches the Chassis with each rotation.



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I bet you can guess what I'm about to say next. Yes refit the axles and check they spin freely.

So you've done the Chassis you've done the axles & hubs but what about the bits that actually touch the track, the tyres?

We are all trying to build a car that runs free and smooth but it won't be smooth unless you true your tyres. As we are covering HOLM cars and we run on Silicone tyres, this is what we will concentrate on. Club cars usually run on ground down tyres, which is basically aggressive truing. But with Silicone tyres they come in various sizes to avoid the grinding process. But as you push the little blighters on to the hubs you will see they do not sit flat across the hubs as they should.



The trick is to true the tyres to get them to lay flat across the hubs giving a flat smooth ride.

You could just roll them back and forth on a flat surface doing both tyres at once saving time.

However a better way is to run one side of the axle at a time and run it on the outer edge only at about a 30 degree angle.

And that is about it with regard to getting a Friction Free Chassis. Just one thing for you HOLM'ers out there, don't shim your magnet it's slightly loose for a reason.

We now move on to the Electrically Tight part. In a nutshell, electricity needs a good connection from start to finish, ensuring it conducts properly.

Let's start at the front again and work back; first the pick-up shoes.

Dirty, worn pick-up shoes do not conduct electricity as well as nice shiny new ones; fact. Saying that, even brand new pick-up shoes can be improved upon; as I said earlier make sure you remove them and replace them without bending or twisting them.

Now for the fun part we are going to purposely bend and reshape them, "but you just said don't bend them!"

We are about to reshape them to improve the connection between the track and the motor.

The small tag at the back of the pick-up shoe (the bit that goes under the holder) has a slight bend in it, forming the hook that holds it in place under the holder. Close that gap slightly using a pair of long nosed pliers but be careful not to close the gap completely or the pick-up won't work.

Some use their thumb or finger nail to stop the gap closing completely, but you can use the blade of a craft knife or something similar to put in the gap, as you squeeze it with the pliers. Tip; might be good to practice on some old used pick-ups first till you get the knack.



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Ok now you've managed that we are going to clean that bit of the pick-up, the easiest way I know of doing it is with one of those fibre glass pens.

The pick-up shoe is connected to the pick-up shoe holder (or Busses if you prefer) so next on the list of things to tweak is the pick-up shoe holder.

This one is simple it's all about right angles.



If you look at the un-tweaked pick-up shoe holder, the right one shown in the left hand photo, from the side you will see what I mean. The majority of them are not angled correctly due to being put onto the Chassis and removed numerous times.

With your trusty long nosed pliers let's ensure those angles are a true 90 degrees (left holder). And of course give it a clean (insert), especially on the face that the motor touches.

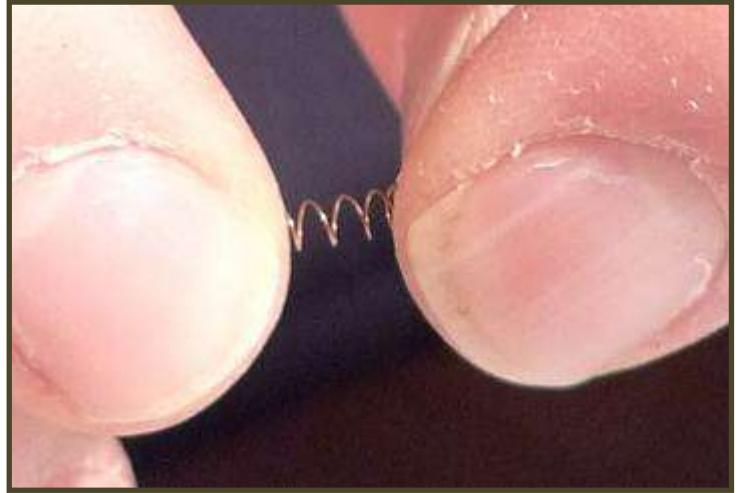
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Before we go onto the motor we just need to cover the spring that goes between the pick-up shoe and the holder.

There have been all sorts of theories over the years about how to improve these, from stretching to putting two in each side of the Chassis.

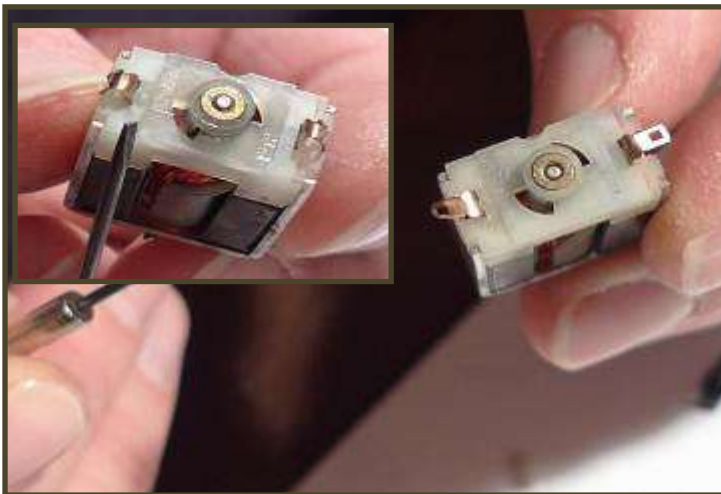
The general consensus is to stretch them, well if you stretch one of these springs to its fullest all you have is miniature barb wire.

The recommended stretching distance for these springs is 1.25 of its original length or in old money about a quarter more than its original length.



Finally we reach the motor, again we are working on a Tomy Turbo Car here so we are working with what's called a can motor but the principals apply to other motors too. On the can motor the endbell is an integral part, not separate, unlike Super G Plus or BSRT motors.

There are 2 small tags coming from the endbell that are the electrical connections that touch the pick up shoe holders mentioned above. These are quite small & delicate and therefore can be easily snapped off, so best to practice on old worn out ones if available.



We are going to shape these little tags to create the best contact we can. There are various ways to do this, some people like to fit the motor & tweak the contacts with a small screw driver forcing them against the holder to create the contact.

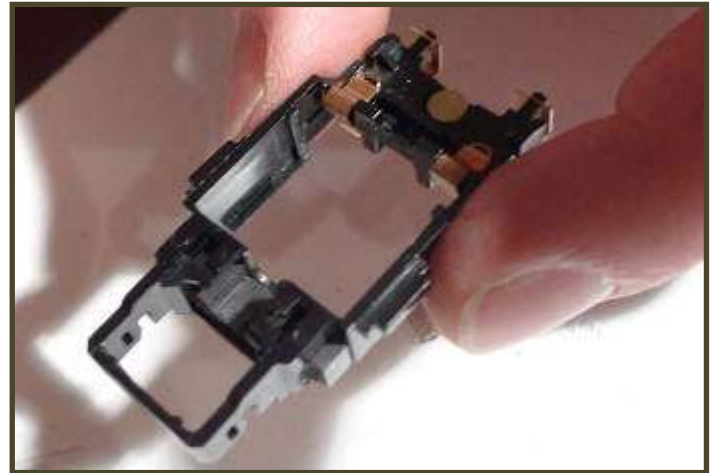
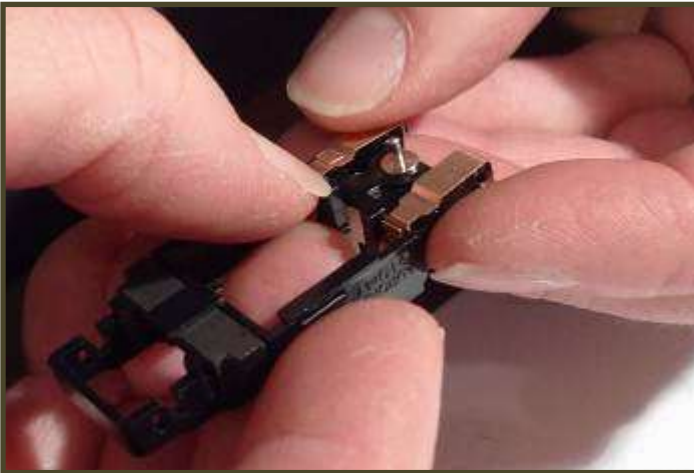
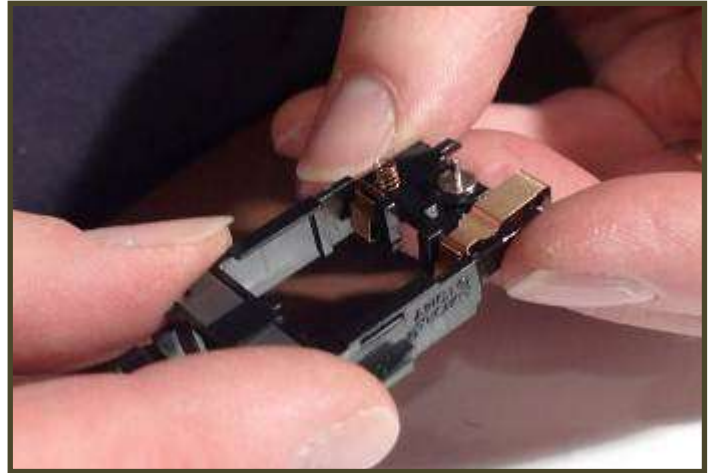
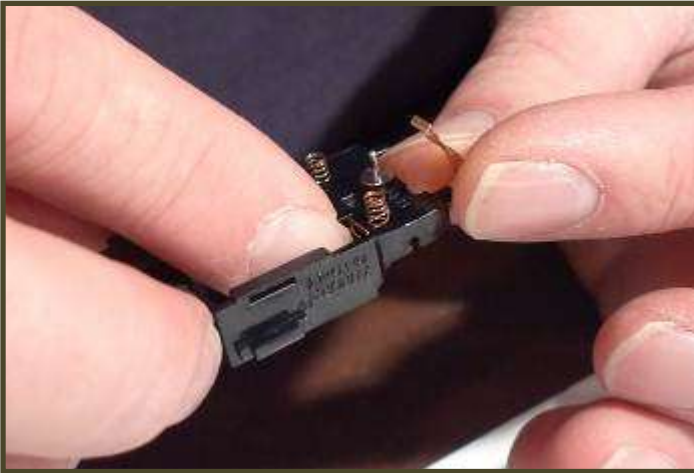
Another way is to roll the contact around a small needle or pin to create almost another spring (see insert left) that will then push its self against the holder. The only advice I can give is experiment to see which is best for you.

Now going back slightly to Friction Free, the Motor is basically an armature which turns through two bearings, one at the front and one at the back. These are metal to metal bearings so a light lubrication on them will allow the motor to run more freely.

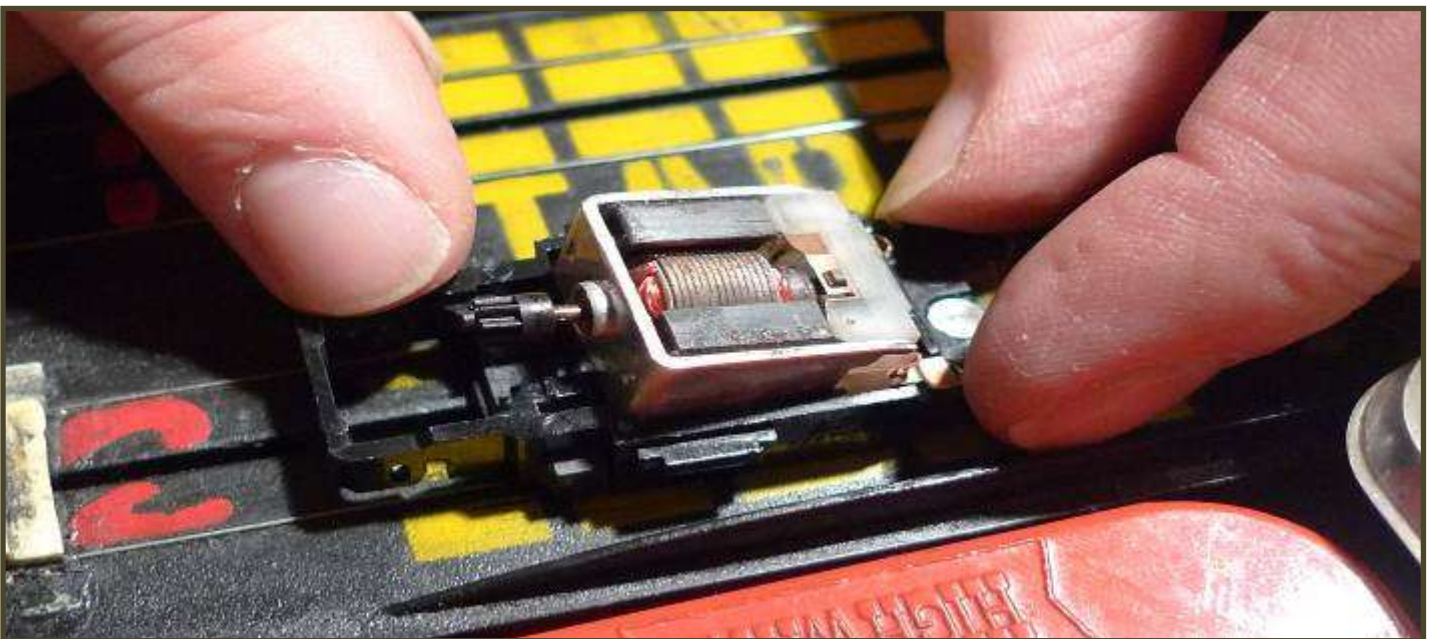


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Next, build up the Chassis to the point where you have the pick up shoes, springs and holders in place.



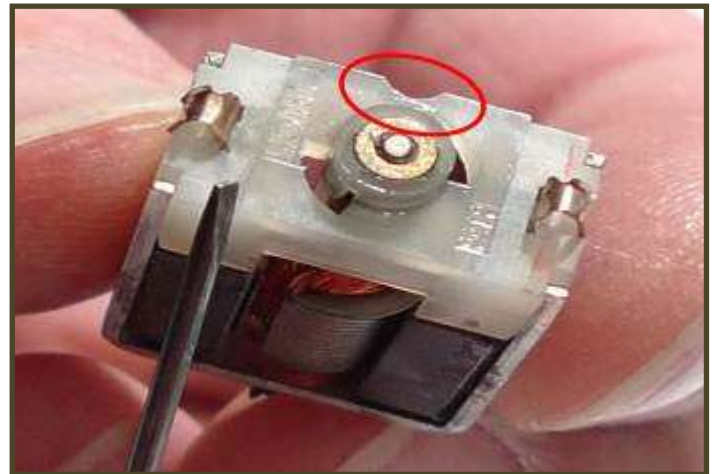
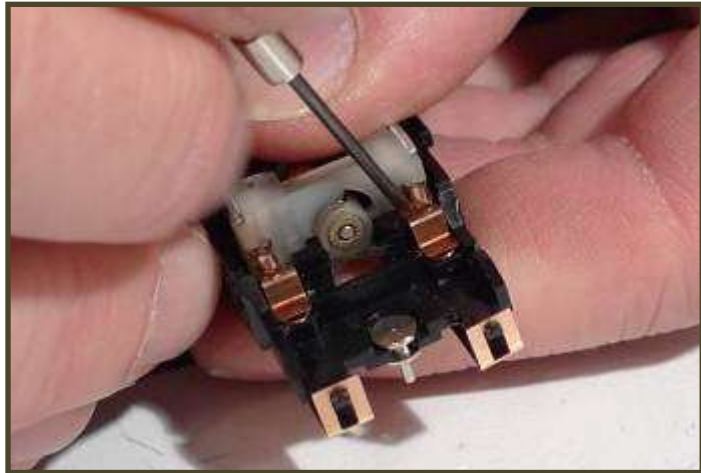
Then place the Chassis on a power track and rest the motor on the top of the Chassis so that it runs (do not fully insert the motor at this time). Listen to how it runs, remove it, turn it over and rest it back on the Chassis till it runs again. Does it sound better the first way or the second you may have to turn the motor a few times listening carefully to determine which way is best.



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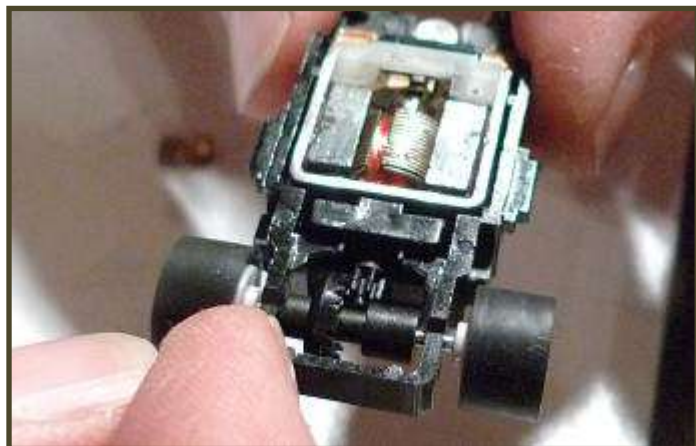
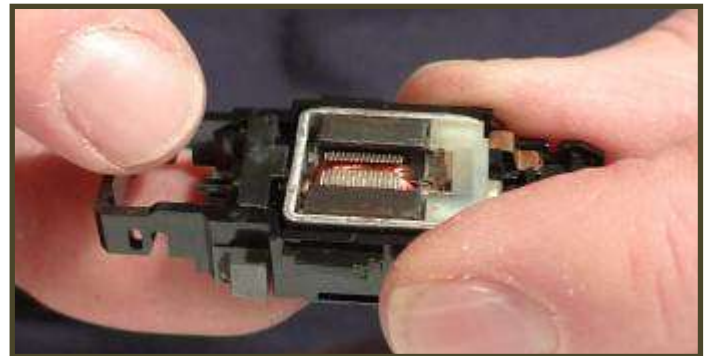
To help you to remember which way the motor runs best the manufacturers have put in a little cut out in the shape of a D in the Endbell of a can motor (highlighted by red circle).

Take a note of whether the D cut-out is facing up or down on the motor when it sounds its best.



Fully insert the motor into the Chassis, carefully using a small screwdriver to ease it into position so we don't ruin all the work we have put in to getting us this far. Make sure it is put in the way it was determined it ran the best.

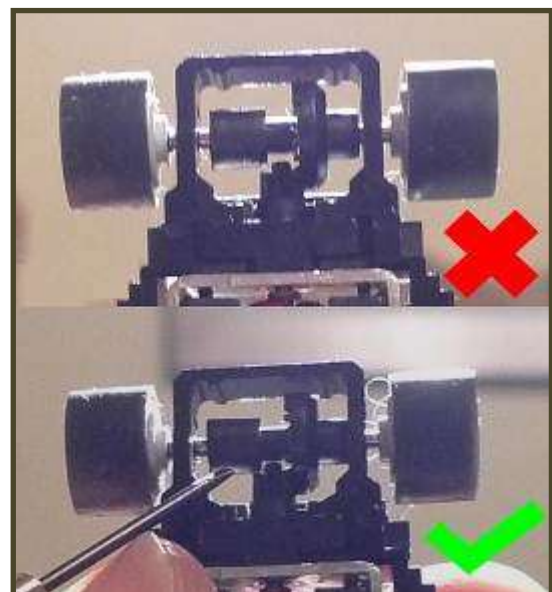
The T clip or retainer should be put in after the motor, making sure it is the right way round, the leg of the T pointing towards the motor.



To get the car to run in the right direction, looking down from the top of the Chassis the crown gear on the axle should be on the left if the motor is in the Chassis D down alternatively on the right if the motor is D up.

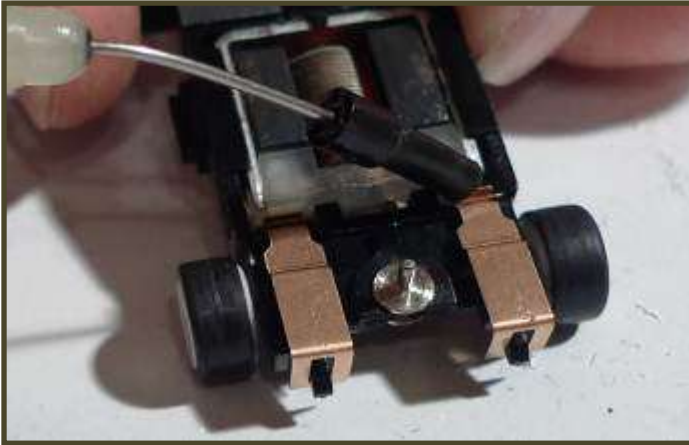
After installing the rear axle make sure the pinion is set correctly. The nipple on the pinion should be in the space formed between the crown gear and the spacer. Make sure the axle spins freely and no teeth on the gears are missing or catch.

Note: For you HOLM'ers you should be using the Medium Silicone rear tyres.



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Now the final bits to do. Re-install the front axle and check it spins freely

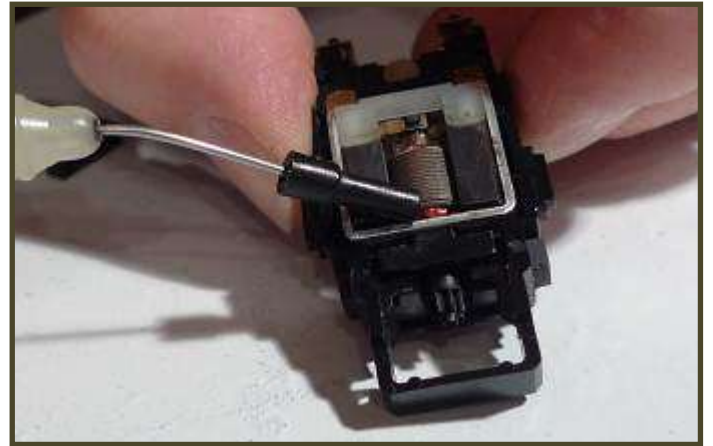
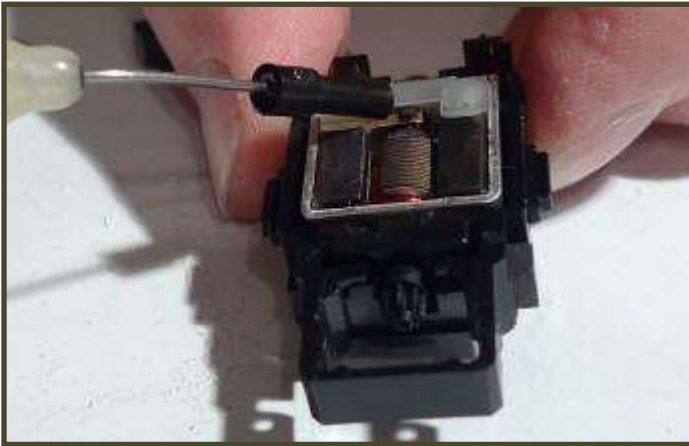


Oil slightly (by slightly I mean drops not baths) between the holders & the motor contacts also where the pick-up shoes attach to the holders.

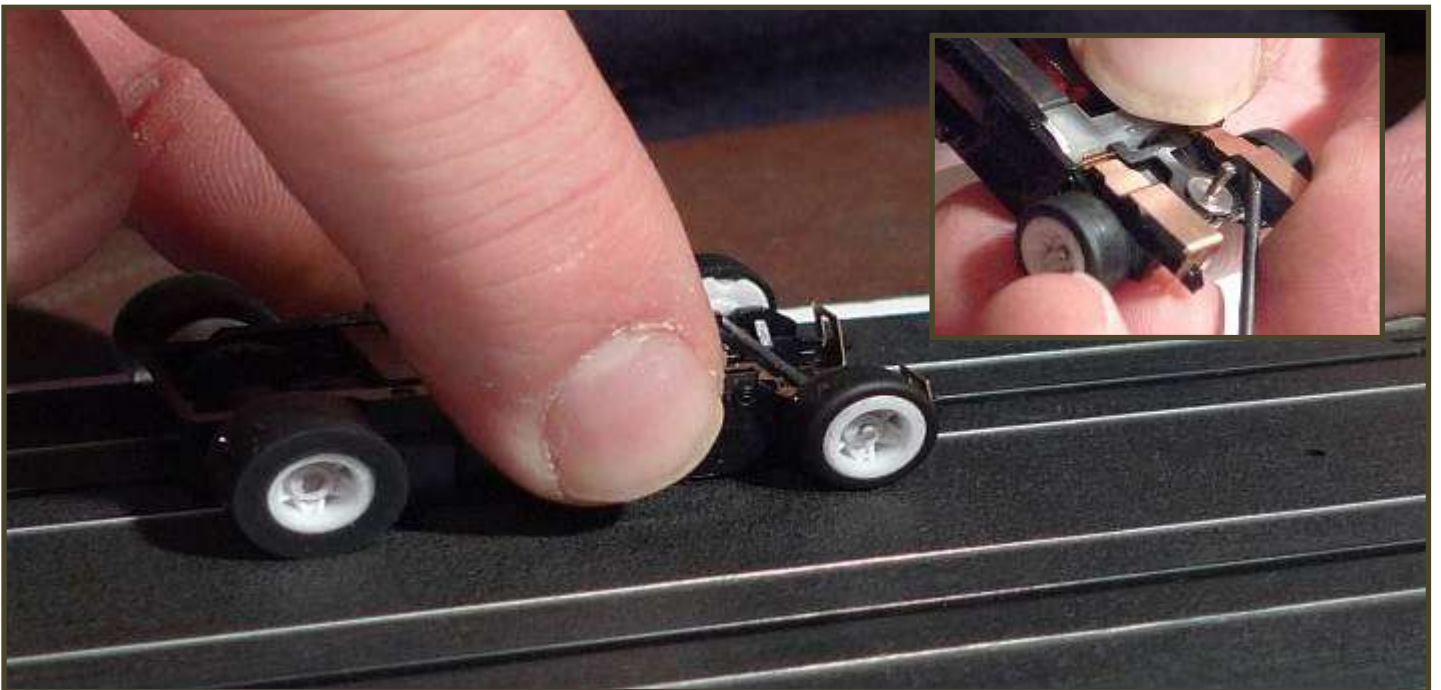
Wahl hair clipper oil is good for this but there are lots of other oils out there.

Also oil either end of the arm where it runs in the bearings

Have a cloth to hand to wipe off excess oil.

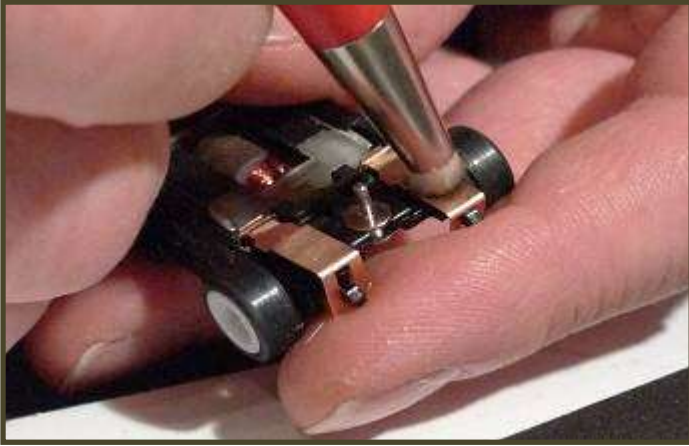


You can check to see if your pick up shoes are running level by running your car back and forth on a straight piece of track by hand (putting felt tip pen on the pick up shoes helps you see the effect better). If they need a slight tweak use the small screw driver to make the necessary adjustment.

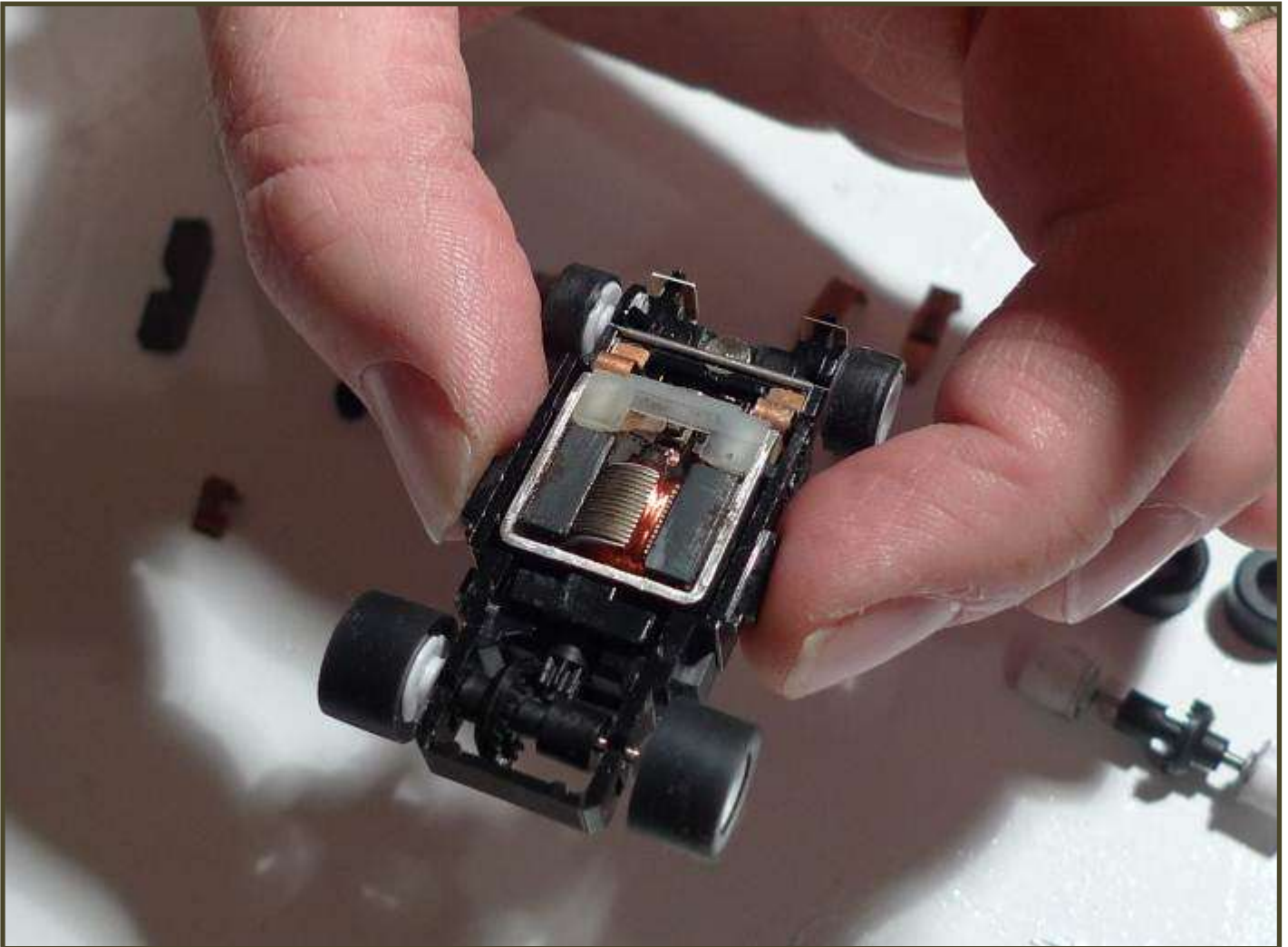


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Now clean those pick up shoes (fibre glass pen) and tyres (only using masking tape) and you should be ready to go.



Always remember pick the best bits you have to get the best Chassis.



I hope this has been of some help to all you budding HO slot car racers out there remember practice makes perfect. You will need to practice these techniques to get them perfect.

Written by: Phil Rees, Photographs: Nick Sismey, Expertise: Rob Heaton