A GUIDE TO SETTING UP AND RACING SLOT CARS

In memory of Ronald D Lane 1956 – 2024

I had numerous conversations with Ron with a view to providing a definitive 'Guide' on the preparation and setting-up of slot cars for racing. Ron was the Master and shared his knowledge and expertise freely – often sorting out cars for fellow racers. Whilst he relayed information verbally, getting something written down was pure gold. I've set out the tips he sent me or gave verbally together with images of various cars. We had talked about photographing his cars although never got around to doing so. These pictures are for guidance – they are primarily but not entirely my cars – some of which benefitted from his magic touch and are reproduced to assist both new and existing racers.

Ron invariably concluded the most important element was tyre preparation although things like body rock, motor-pod float, suspension, guide choice and front axle height remain a black art that he understood better than most. His cars invariably ran silently and were assembled with the precision of a Swiss watch maker – that they were fast and reliable was a constant … RIP Ron

Tyres:

For painted wood the default tyre choice is NSR – either Supergrip or Ultragrip with Zerogrip for the front wheels (ideally coated with Superglue / Nail varnish).

Supergrip are more durable whilst as the name suggests, Ultragrip offer better high-speed grip and are ideal for GT / LMP / Group C but don't last so well.

Tyre preparation:

Don't rush - Make sure wheels are clean and the mounting surfaces have a 'key' using fine wet and dry or emery paper. Remove any surplus moulding from the tyres and check they sit evenly on the rims – Superglue applied with a cocktail stick seems to be the method of choice but do not use too much.

Once glued allow 24 hrs to set fully before trueing them to achieve the desired size – this should be done little by little taking care not to overheat the rubber.

Once your tyres are trued to the size you want:

Use a solvent (lighter fluid or similar) to really deep-clean the rubber. Maybe 3/4 times so that the cloth you apply it with starts to wipe clean. When you first do it, it will be very black and gradually go to a light grey.

Allow tyres to dry then use a cloth to apply oil into the tyre surface and let it absorb.

When the tyre is going dry add some more oil. Don't flood the tyre with oil it will just remain wet.

This assumes you are doing this manually but can be speeded up if the wheels are mounted on an axle and driven by a motor where you hold an oil-soaked rag against a spinning tyre to build up some heat.

If you plan to use the tyres the next day you may have to accept that the tyres may not switch on straight away as I find that running the tyres at near race pace and then repeating the process will further improve performance.

Mike L oils his tyres for the first race and thereafter 'cleans' them with tape and wipes them with lighter fuel before each race.

At the end of racing I (PC) try to clean the tyres with Blanket Wash and put the car in polyseal bags.

A day or two before racing check the tyres are secure and if not re-glue as necessary – Wipe them lightly with a rag using 3 in 1 or similar.

Front tyres – these should be trued and coated with Superglue or Nail varnish even when using 'Zerogrip' with the tyres trued and / or axle height set to allow the wheels to just clear the track surface.

Set-up Notes: These should be read in conjunction with the applicable R&R's – Grateful thanks to Mike L who has also contributed various pearls of wisdom …

Front Axle – (with grub screws) – Set bottom ones so that wheels barely touch the set-up plate / track surface. Tighten top left grubscrew so that axle is clamped – then slacken off a smidge. Repeat for top right hand grubscrew. You should then have an ideal amount of 'rock'. Ensure axle has minimal (but sufficient) sideways movement to rotate freely – Use nylon washers if needed.

Rear Axle – Adjusting the amount of sideways 'slop' is best achieved using a gool old metal feeler gauge – I use the ones that come with the Slot.it SIPA47 or 52 Spacers and Bushings.

Weight:

The most important aspect with any car is getting the centre of gravity as low as possible so that the car will flow through the corners without becoming unstable.

Aside from the small button magnets in the motor pod weight on Anglewinder cars, it is best to place weight on the side in front of the motor – if rear end is loose, the weight should be concentrated towards the back (but in front of the motor). Usually circa 10 gms should be sufficient – particularly on sidewinder – a little more may be required for higher torque motors – NSR King. Ensure it is secure – Gorilla double sided tape works well – Superglue doesn't!

Generally, it is not recommended / necessary to add weight ahead of the front axle although it is personal choice so BY ALL MEANS experiment – it seems to work on some Group 5 cars and a small amount behind the guide may reduce the tendency to de-slot under acceleration although if front lifts, first try reducing sensitivity and power – then add a small amount of weight if necessary.

Guides:

Other than the NSR 60's Classics which have to run with the 'standard' guide (as do the Club Abarths), all the other categories allow the substitution of deeper 'wood' guides. When using these it is as well to chamfer the leading edge (and sometimes file the base) so that it runs smoothly over the joins. If it is also longer than standard it may be necessary to trim the length to ensure it doesn't 'stick' in the tightest corner – if so it is generally best to trim the back edge …

Wheels:

Slot.it W15810215AF (Ex PA49-Alf) –
15.8x10.1.5mm wheels
This is the (rear) wheel I use on most of my cars with NSR Porsche 917 tyres in Ultragrip spec (Part No NSR 5242)
(RL)

In my experience these are certainly ideal for Grp C, LMP, DTM and Grp 5. (PC)

NSR cars invariably need NSR wheels – not least because the NSR axles are fractionally larger than the Slot.it equivalents.

Axles:

As noted above, whilst 3/32 is the 'standard' axle diameter these vary between manufacturers.
In consequence I (PC) tend to use **Slotting Plus** axles for many of my cars as these seem to take all the various wheels irrespective of supplier – I find their Auto-Centring axles are useful for the rear – particularly (but not solely) for In-line configured cars as they make it easy to achieve an optimum set up and they are useful for AW cars too.
They are available in two widths: 50mm Ref: SP049996 & 55mm Ref: SP049997.

General maintenance:

– keep inside body clean.
– ensure good gear mesh – use toothpaste (Corsodyl is ideal) as a grinding paste and thereafter keep pinions and gears clean and lightly lubricated.
– oil (but don't over oil) the pinion end of the motor – do not oil the other end where the wires are as this will cause the motor to 'pop'.
– always replace worn / short braids as these ensure consistent power delivery
– ensure the guide self-centres – a little lubrication can be useful.

Slackening off the body screws allows body rock / float which is a prerequisite.

Using a set-up block or plate will enable you to check the car is flat / level with sufficient clearance. Remember the rear will rise and fall with acceleration and through the corners (particularly with suspension) requiring a degree of rake.

Remember too that there is no 'right way' for all …

Top tips: One thing not mentioned hitherto is the importance of ensuring when you assemble / re-assemble your cars the various grub screws and body screws are secure. It is advisable (and should perhaps be mandatory) that wherever possible tape is placed over the screw holes in the chassis so that should one come undone it doesn't fall into the slot and end up potentially damaging your or another competitor's car.

As for grub screws, I tend to align these across the axle so that a quick glace will confirm they haven't moved - if one is no longer aligned it can be easily spotted.

Slot car dynamics:

Along with allowing some body rock, getting the centre of gravity as low as you can is the key to carrying speed into, through and out of the corners. The effect of accelerating tends to lift the nose and therefore as with a road car, it is best to accelerate progressively and ideally when on the straights. The opposite torque effect - exerts downward pressure on the front axle when braking. If you brake too early, and let the car coast into the bend, you lose this 'reverse torque' effect and if you then use a short burst of acceleration this will invariably unsettle the car lifting the guide and cause you to de-slot.

The EDSRC track was designed so that every corner requires a slow in approach with almost every corner opening up – this is why some weight behind the front axle / guide is necessary to counteract the inevitable 'lift' as you accelerate.

Choosing a slower motor is quite often easier to handle and therefore ultimately faster whilst if you consistently de-slot when exiting a corner, you are almost certainly trying to accelerate too early and / or too aggressively – try reducing the controller sensitivity.

Racecraft and Track Etiquette:

The best results are usually achieved by running consistently at a pace you are comfortable. With experience you will gain confidence and consistency - your lap times will come down and distances achieved increase. Ultimately you are primarily only racing yourself, seeking to improve on previous results so … **when a faster racer catches you in the next lane don't try to race them** – ease off (on a straight <u>not the middle of a corner</u>) and allow them to pass cleanly. This will likely prevent an off with minimal time loss for one or both cars.

Marshalling:

The primary aim is to ensure the track is kept clear – if you cannot get a car back into the slot without jeopardising other racers lift it clear holding it by the cockpit sides – check the lane colour and return it to the correct lane nose first to ensure the guide goes cleanly into the slot – your fingers should not be near the rear wheels …

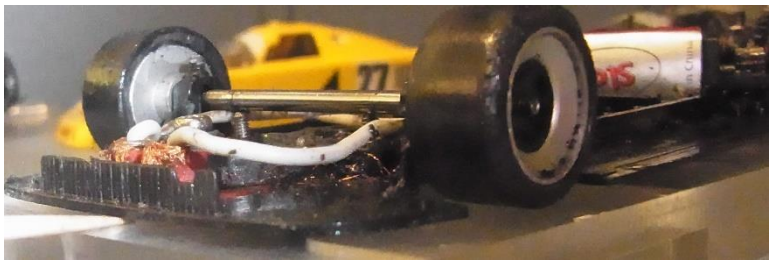
Remember too that as a wise man once said; "It's only toy cars!".
In the heat of racing, adrenaline flows and it is all too easy to say or do things in haste however unintended – don't take umbrage! When you share any hobby involving cars it's safe to assume accidents will happen and are not intentional.

GROUP C – Slot.it Nissan R89C / R90CK

All Slot.it Group C cars need to be converted from 'Inline' to 'Anglewinder' configuration as illustrated and will be broadly similar irrespective of model -

this XJR-9 was prepared by Ron for a club member.

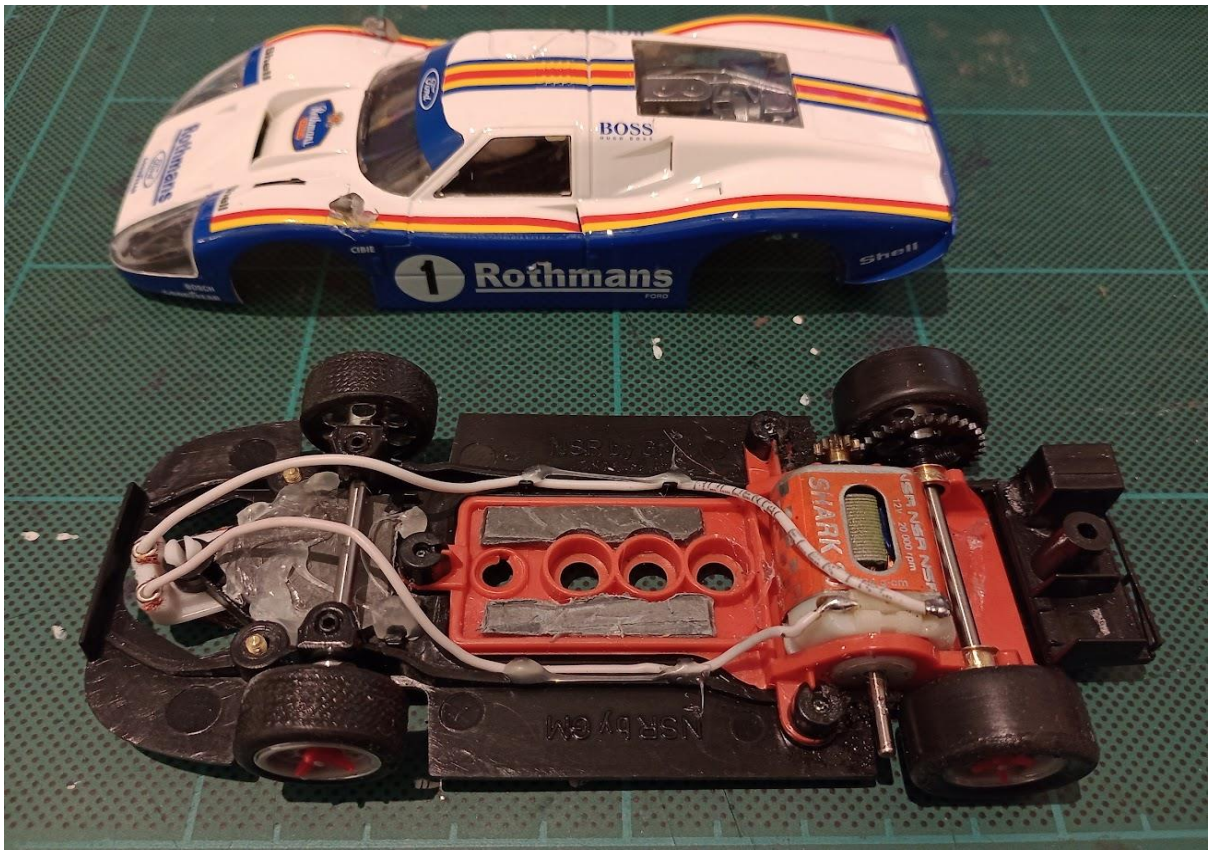
NB. NSR braids and silicone motor wire are used together with Slotting Plus axle stoppers at rear.



Note suspension at the rear of the motor-pod and the front axle adjustment which allows the wheels to rotate freely with just enough upwards travel to stabilise the car in the corners.

It is standard / accepted practice to secure the motor to the motor-pod using glue (Araldite or similar) as well as screws where there is provision to do so. This is particularly important with any motor-pod – particularly Anglewinders.

NSR 60's Classic Endurance – NSR Ford Mk IV



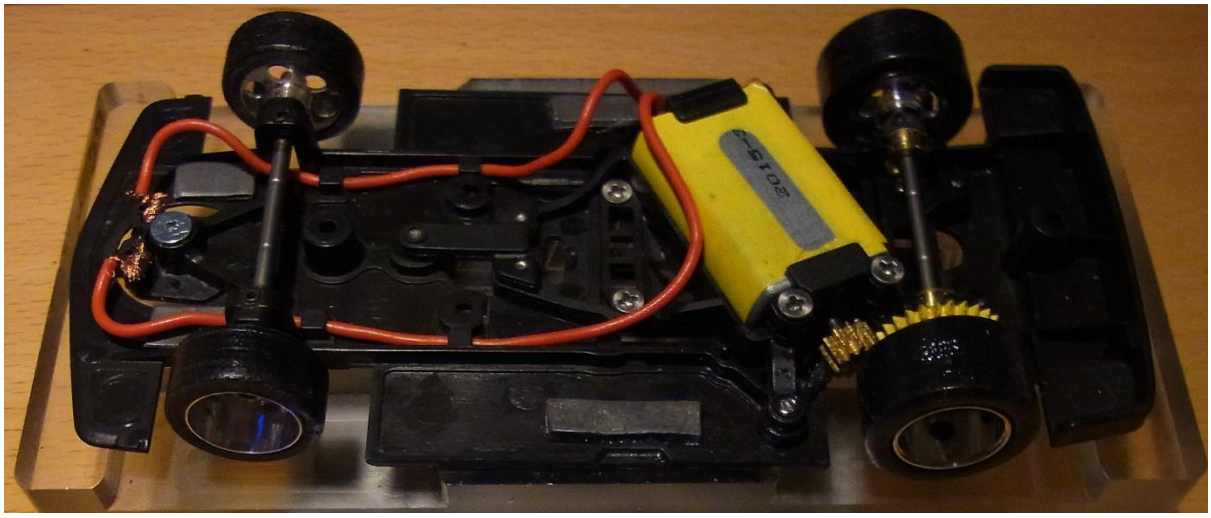
These cars are run pretty much as they come out of the box – the only changes permitted are adding weight / glueing and trueing the tyres (including coating the fronts with Nail Varnish or Superglue) and substituting the body screws for Metric type. Tyre size must be correct for the car. Wheel Inserts should be fitted and the standard Racing Pickup guide (NSR Part No. 4841) must remain as supplied.

▲ More recent models have the NSR Shark 21.5K motor and come with screws to set / adjust front axle height.

NB. The Porsche 917/10K and Lola T280/290 are not eligible for this category.

Racer Sideways Group 5

Cars are run virtually box standard with the Yellow Flat-6 AW motor and 28z / 11z gearing. Substituting a Slot.it zero offset motor pod is permitted (recommended – see left) but not imperative. Wheels and Tyres are free choice as is Guide but the one it comes with is usually fine.



▲ This BMW 320 was set up by me – the front weights would probably be better centrally under the front axle whilst using a Slot.it motor mount would allow the side ones to be placed on the mount ahead of the motor.

LMP (Le Mans Prototypes) from 1992 onwards

The ScaleAuto Radical SR9 is the most popular car together with the Toyota GT-One which uses the same (or almost identical) chassis. Slot.it also have various models as do Avant Slot.

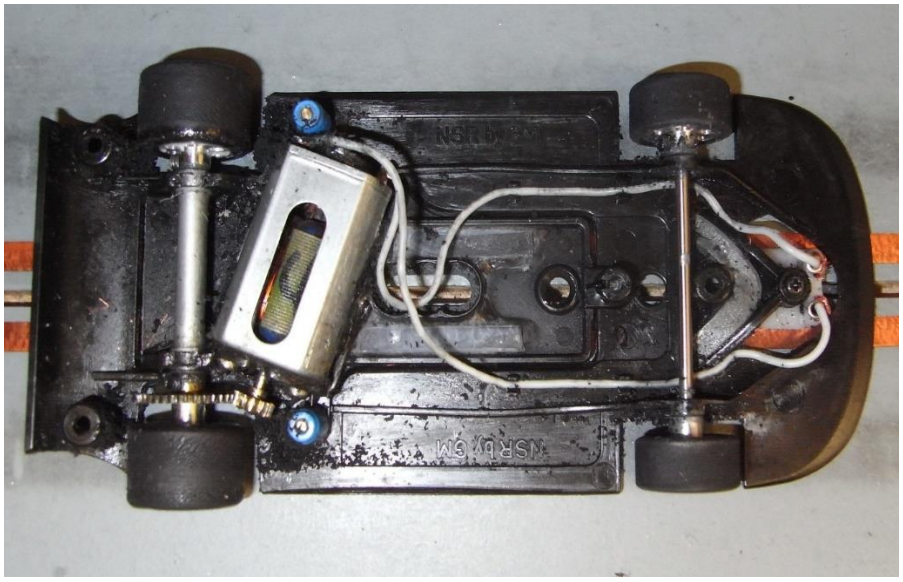
The Slot.it AW motor-pod with Flat-6 motors is the most common choice.

There are exciting new cars available from ScaleAuto, Slot.it and SRC – the former two already have a number of AW cars that various members are racing with the ScaleAuto Pro series LMP Hypercars such as the Porsche 963 pictured below proving to be particularly competitive.

GT – NSR Mosler

Generally, the aim is to run cars as close to the track as possible – the NSR Mosler is a particularly good example of how low cars run. It has also been the default choice in this category virtually since it was launched.

There is a Sidewinder and two AW configurations and these are what most people run – the original AW shown below and a triangular (EVO 6) motor pod (shown below right in an NSR Chevrolet Corvette C7R GT3 car)



Note weight placed within the motor pod with a small amount in front of the front axle above the guide. A Slotting Plus Axle tube is used here – presumably to prevent flex although this is not common.

NB. The above is also applicable to the NSR GT3 cars which are eligible but not as quick as the Mosler.

Remember the rear will rise and fall with acceleration and through the corners (particularly with suspension) so this will require a degree of rake.

Open Wheel

I will limit this to the **NSR Formula 86/89** as this seems to have become the default choice. The cars shown were prepared by Ron who initially considered some lead weight necessary at the rear of the sidepods – see above.
I persuaded him to set up one for me when I bought a surplus Red 5 Williams Livery car from him a year or two ago and by then he had concluded the only weight needed was some BluTack behind the front axle.

N.B. These cars require a more delicate trigger approach in order to carry speed rather than accelerate over aggressively …

Aside from the obligatory Glueing and truing of the tyres (the rears being particularly critical) and a degree of motor and body float, and setting up the front axle height to allow a little upward travel in the corners the main changes from standard are the use of;

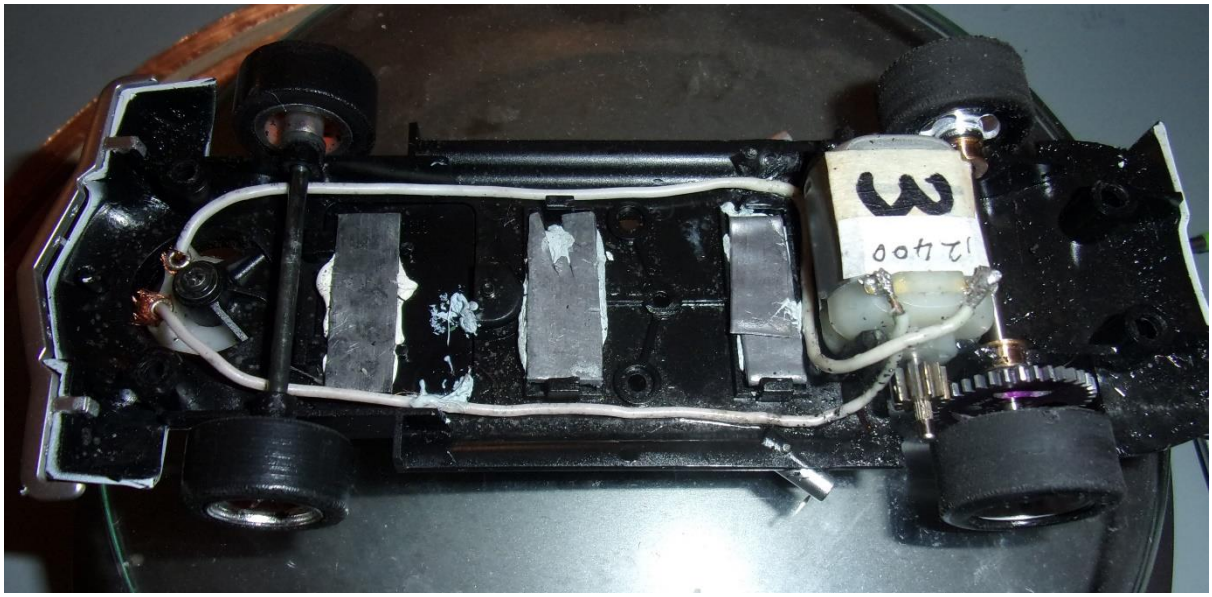
- Brass Metric Screws in place of the standard steel ones
- A more durable Crown Gear (I think Ron used a Slot.it 27z which may have necessitated a Slotting Plus axle)
- Deeper and longer guide – Slotting Plus in my case

NB. Mike L uses all four motor-pod fixing screws which seems to help…

Historic Road

The default choice has been the Scalextric Chevrolet Camaro Mk II as pictured above and whilst there are other options both from Scalextric and Pioneer to name two, this is the car that I will base this guide around.

The set up is very simple using a Slot.it (or equivalent) rear axle – an 11z pinion and 36z gear – ideally Slot.it W15808215AF 15.8 x 8.2 x 1.5 wheels with NSR Supergrip Tyres which should be glued and trued – but NOT OILED – EVER – just clean with tape before each race.



▲The optimum set-up; Rear track should ideally be 60 mm and the overall weight circa 86 gms with the chassis as above weighing 55 gms±

Front wheels should be trued to just clear the track and coated with superglue or nail varnish – Change the front guide and wires and you're ready to race.

DTM Carrera / 3D Printed Chassis

Steve B uses a black pod and no weight, and no suspension, it goes like a rocket. His controller uses very little brake.
I use a white pod with nose weight, also no suspension and it goes quite well. I also use a lot more brake than Steve. It all depends on the driving style … (RL)

This is Ron's chassis for the Audi A5 ►

NB. Slot.it Metric Screws M2.5x6mm required for Carrera – Part No: SIHC89 whilst Ron recommended substituting the (front) Motor pod fixing screws with Slot.it Metric Screws 2.2x5.3mm Tapered Large Head – Part No: SICH54B – this was his recommendation for all cars using Slot.it Motor pods.

Availability of the original printed chassis from Shapeways has become problematic but other producers have emerged – best to check with the Club as to which are acceptable / recommended.

The only category I have not covered is **Rally** and this will have to wait as there are differing cars, manufacturers, motor configurations and rather more R&Rs to satisfy but from the foregoing it should be possible to arrive at something that works with a car you like.

This 'Guide' is intended to help you tune your cars and driving – I've used images of various cars that have been set up by people far better at it than I am – where possible Ron Lane. If you need further advice don't be afraid to ask.

Finally, a reminder that "It's only toy cars!". In the heat of racing, adrenaline flows and it is all too easy to say or do things in haste and / or out of frustration. When you share any hobby involving cars it's safe to assume accidents will happen and are not intentional. Don't take umbrage and have fun!