SLOTRACESHOP
QUALITY SLOT PRODUCTS TO THE WORLD

www.slotraceshop.nz

********** NOVEMBER 2018 NEWSLETTER **********

NEWS

It has been one very busy year as I rebuilt the slot shop. The web work just swallows time. Different people appreciate different parts, most will never notice the bits that aren't important to them.

I have (I think) now brand identified about 600 spare parts items like motors, wheels, inserts, tyres, which appear in within general product type categories as well as under the category within of their brand, added extra technical detail on motors, pods and axle kits, and a whole host of other things to make parts selection easier.

I am gradually adding the technical articles from past newsletters into a separate area in the drop down menu of **links**.

The shop is not perfect, and I am aware of a bug affecting some users of Mac PCs during checkout. If you have a problem with chopped of screen display at step two of checkout – please tell me. The problem is that we use a generic website base, from which you buy and install the "skin" which is your display layout. Since mid 2015 I have purchased 3 skins which make the site "mobile friendly" and all three have severe bugs. My support guy has spent many hours corresponding with the authors, fixing bugs which are now known widely to affect each of these skins, and growing as time passes and new browser updates from all makers cause more. It is like throwing money down a hole!
If we install yet another, we are likely to go backwards three steps before we start making headway.

The December newsletter will be very short as we will be packing for the big move early next month. I don't have an exact date yet, but the shop will be down for about a week early in December, so if you need anything urgently, try to plan for shipment by 1st December to be safe.

You can still order during that time, I just won't be shipping, as the stock at our current house, plus the bulkier items stores at our lockup unit will all be moved to the new location, at which I first have to build the shelving after dismantling from here. I am already in the early stages of packing, but it won't affect dispatches. The upside is that I also get "Oakland Raceway" back up and running, and will be able to do more technical and track test articles.

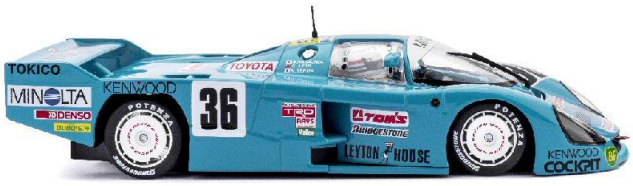
Help Please

Someone at the DTM Classic who used one of my IEC (jug plug) to XLR adapters appears to have left with it still plugged into their controller. It was the one with the silver XLR plug. Could folk who were here, and used an adapter, please check their controller boxes – thanks.

New Cars (and a totally new model)

Slot.it - Group C Toyota 86c CA41a

These will arrive late November

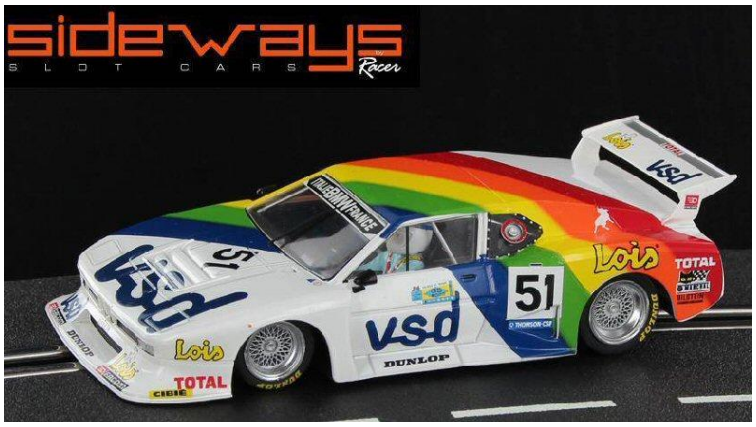


Chassis: Podded
Motor: Slot.it V12/3 MX16 23,000rpm 170g/cm torque 9.8 watts @12 volts dc mounted as Inline
Axle & Gears – 2.38mm (3/32nd)
Gearing: Crown 28t – Pinion 9t brass
Has adjustable height front axle – this requires optional M2.0 Hex screws not supplied with car
Hubs front: Plastic 15.8mm x 8.3mm
Hubs Rear: Alloy 16.5mm x 8.3mm
Tyres Front: PT1159C1
Tyres Rear: PT1167C1
M2 allen key under box for rear hubs and for optional screw for front axle adjustment
SSD Upgradable: Yes, use Slot.it chip SP15b

BMW M1 Group 5 VSD Livery by Sideways SW39

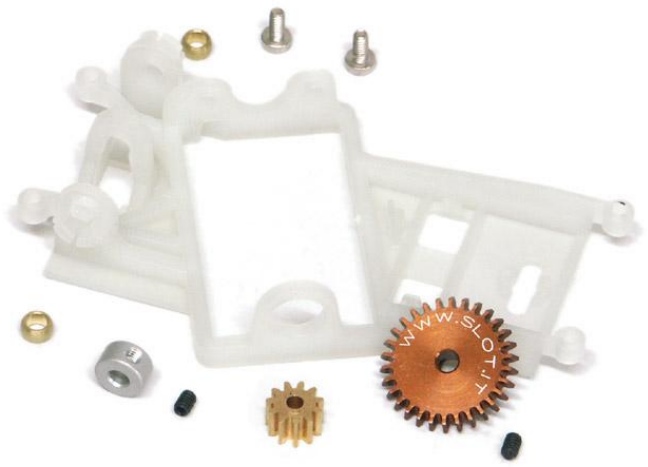
Available now

This was a very pretty car we missed when I was overseas, and the only BMW M1 livery currently available, so I thought we better grab some for stock



Chassis: Podded – Rigid Sideways 5 point pod.
Chassis can also take any Slot.it Pods
Motor: Slot.it Flat-6 20,500rpm 200 g/cm torque 10.25 watt, mounted a/winder with adaptors for 0.5mm and 1.0mm offset
Axle & Gears – 2.38mm (3/32nd)
Gearing: Crown 28t (GA1628-pl) – Pinion 11t brass
Has adjustable height front axle – requires optional M2.0 Hex screws, not supplied with car
Hubs front: Plastic 16.5 x 8.2mm
Hubs rear: Alloy 16.5mm x 8.2mm
Tyres front: Product code PT1152
Tyres rear: Product code PT1152
Accessories supplied with car: M2 allen key under box, adaptors for 0.5mm and 1.0mm offset of rear axle
SSD Upgradable: Yes, use Slot.it SP15b

Tech Article – Gearing



I suspect that much of the time, we stick with the gear ratios our car came with. Why mess about with something that is working fine. But if you drive your car on a variety of tracks, you may find that it feels "right" on one, but is too slow on a longer track, or just too twitchy to drive on a smaller track, and you find yourself fiddling with your controller knobs trying to get it into that sweet range where it flows well and is a pleasure to flow around the track with.

The answer may be in adjusting the gear ratio, so the car has the right amount of brake, and/or accelerates down the straight nicely, without running out of poof – or being too slow to pull up at the next corner.

First we better define our terminology.

Slotters use the same terminology in two opposite ways. My default is to use words the same as we do for real cars ie "tall" gearing means the car has a higher top speed, shorter gearing means the same as "lower" gearing, meaning the car has a lower top speed.

As the number of revolutions from the motor are much more than we want at the rear wheels, we are always reducing these by the ratio between the pinion and the crown or spur gear.

Typically for inline motors, we see about a 9 tooth pinion and a 28 tooth crown gear. So if the RPM of the motor is 20,000. The axle will turn

20,000 x 9 ÷ 28 = 6,429 rpm

But if we replace that 28 tooth crown with a 24 tooth

We get 20,000 x 9 ÷ 24 = 7,500rpm

So with the rear axle spinning 7,500rpm instead of 6,429rpm, the car has a theoretical top speed which is (7,500 ÷ 6,429 x 100[%]) – 1 = 16.7% higher than previously.

That would suit a longer, more flowing track, but probably give be hideous to drive, with poor acceleration and weaker brakes than the original ratio.

You can achieve the same sort of result by leaving the crown gear the same, but increasing the pinion by one tooth.

20,000 x 10 ÷ 28 = 7,142 rpm

We commonly refer to the gear ratio by the multiple of reduction eg 9:28 is a 3.11 ratio 10:28 = 2.8 ratio

Here is a chart you can use for an overview

Slot.it gears guide and Gear Ratios Chart

compiled by slotsnz

LH = Long Hub Angle Winder gears				*	Crown	Crown	Crown	Crown	Crown	Crown	Crown	Crown	18mm SW	18mm SW	18mm SW	18/19mm SW	18mm SW	18/19mm SW		19mm SW
				**		AW & LH Spur	AW & LH Spur	AW & LH Spur	AW Spur	AW Spur	AW Spur	AW Spur		AW Spur		AW Spur		AW Spur		
SIPI 5.5mm PINION	SIPI 6mm PINION	SIPS 6.5mm Pinion	SIPI 6.75mm		23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
8					2.88	3.00	3.13	3.25	3.38	3.50	3.63	3.75	3.88	4.00	4.13	4.25	4.38	4.50	4.63	4.75
9					2.56	2.67	2.78	2.89	3.00	3.11	3.22	3.33	3.44	3.56	3.67	3.78	3.89	4.00	4.11	4.22
10	10	10			2.30	2.40	2.50	2.60	2.70	2.80	2.90	3.00	3.10	3.20	3.30	3.40	3.50	3.60	3.70	3.80
11	11	11	11		2.09	2.18	2.27	2.36	2.45	2.55	2.64	2.73	2.82	2.91	3.00	3.09	3.18	3.27	3.36	3.45
		12	12		1.92	2.00	2.08	2.17	2.25	2.33	2.42	2.50	2.58	2.67	2.75	2.83	2.92	3.00	3.08	3.17
		13			1.77	1.85	1.92	2.00	2.08	2.15	2.23	2.31	2.38	2.46	2.54	2.62	2.69	2.77	2.85	2.92
Not made by Slot.it but provided for reference purposes			14		1.64	1.71	1.79	1.86	1.93	2.00	2.07	2.14	2.21	2.29	2.36	2.43	2.50	2.57	2.64	2.71
			15		1.53	1.60	1.67	1.73	1.80	1.87	1.93	2.00	2.07	2.13	2.20	2.27	2.33	2.40	2.47	2.53

*	**Gear Colour Index**
**	*Top line colour is for inline Crown gears up to 30 tooth. (Offset crown gears come in same tooth numbers but are all white in colour) From 31 tooth upwards the colour represents that of sidewinder gears where available*
***	*Second line colour is for anglewinder gears where available.*
	Slot.it use the same gear colours for sidewinder spurs in both 18 and 19 mm nominal diameter where both are available [34, 36 tooth]

Which gear you choose to change is often a case of *"what parts do I have in my war-chest that might do the job"*

But there are considerations to make with swapping out gears than just the ratio – gear diameter and meshing.

Firstly, for inline crown gears, almost all manufacturers produce these to be mated with pinions which are 5.5mm diameter; whereas for sidewinder and angle-winder setups, they are most often 6.5mm diameter.

– Some angle-winder setups may require smaller 6mm or larger 6.75 – 7.5mm pinions, as the contact point changes, the further the pinion sits along a motor shaft to "reach" the teeth of the angle-winder spur.

Another definition we need to know is "Pitch"

Pitch refers to the fineness or coarseness of the teeth. In older terminology it was how many teeth laid out in a straight line would to take to cover a distance of one inch. 64 pitch, which was common for steel chassis slot racing means 64 teeth per inch, but most RTR slot racing uses nominally 48 pitch – 48 teeth per inch. This is pretty much standard across all the slot car manufacturers.

We still commonly use this terminology but the makers actually use a different one with slightly different implication called "modulus" 48 pitch is ALMOST the same as 0.5 modulus.

If you asked Slot.it or NSR what pitch their gears are, they will tell you "metric 0.5 modulus" which is actually about 50.8 pitch. Here is a comparison chart for the geeks.

Diametric, module and circular pitches Conversion.

Diametral Pitch	Circular Pitch in Inches	Circular Pitch in Millimeters	Module In Millimeters
20	.1571	3.990	1.2700
24	.1309	3.325	1.0583
25.3995	.1237	3.142	1.0
31.4159	.100	2.540	.8085
31.7653	.0989	2.513	.8
32	.0982	2.494	.7938
36.2857	.0856	2.199	.7
42.3333	.0742	1.885	.6
48	.0654	1.661	.5288
50.8348	.0618	1.571	.5
63.5950	.0494	1.256	.4
64	.0491	1.247	.3969
72	.0436	1.107	.3524
80	.0393	.998	.3177
84.6198	.0371	.943	.3
96	.0327	.831	.2645
101.6697	.0309	.785	.25
120	.0262	.665	.2116
127.1899	.0247	.628	.2
200	.0157	.399	.127

But I will stop that dark alley right there, as this is getting very technical. Left and right columns if you must, ignore the two in the middle. RTR slot car people still "think" in pitch and think 48, It will do us.

So back to "48 pitch" Because as well as this, there is a nifty but slightly tricky and dark secret in why it is even possible to have gears which are the same diameter, but a different number of teeth, and they actually mesh properly.

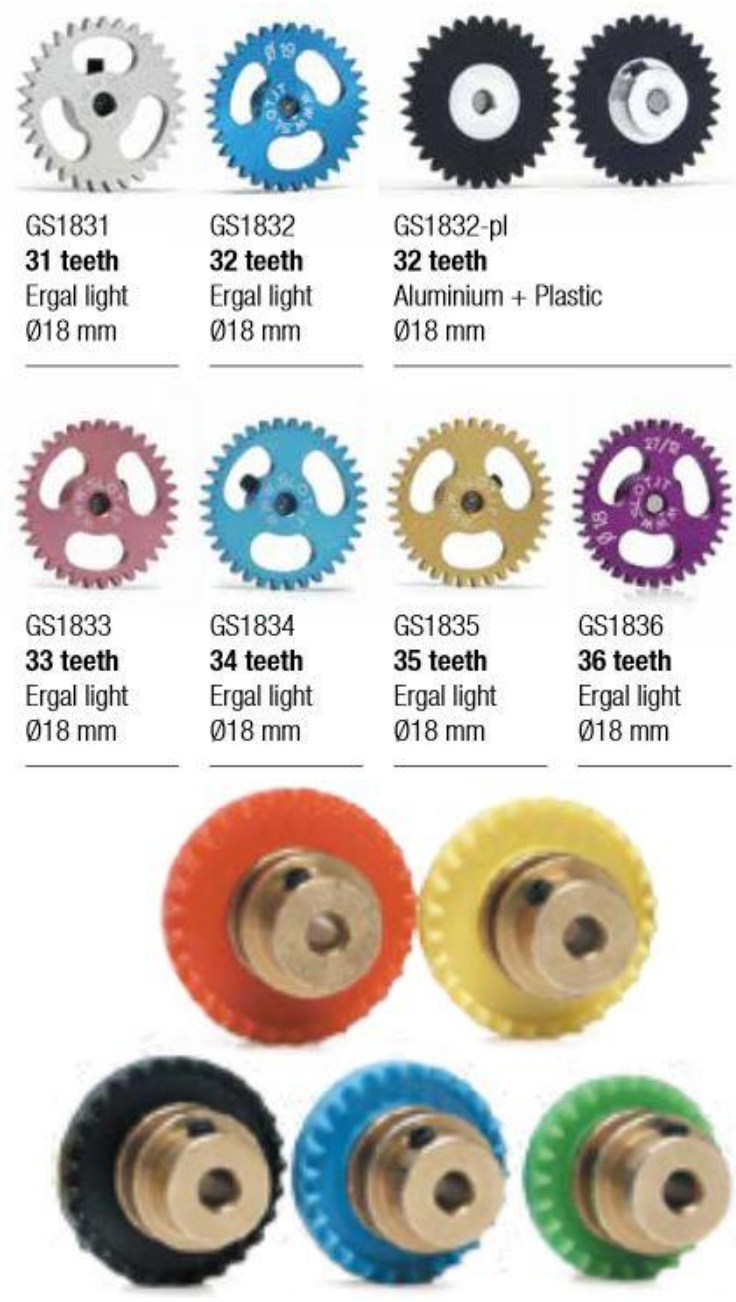
Think about it – a 6.5mm 10 tooth pinion and a 6.5mm 13 tooth pinion cannot both be 48 teeth per inch. They just can't. So how do they do it?

The truth is hidden in plain sight. Look at the shape of the teeth on each of those gears. They are all very different. Each of those shapes causes the teeth on the pinion to only contact with the teeth of the spur gear at one main point along the edge of the teeth – The more teeth, the further INSIDE the tips of the teeth the contact between the pinion and spur is

made. The gears THINK they are different diameters.. As Blackadder would put it *"a plan so cunning you could pin a tail on it and call it a weasel"*

But it isn't perfect, as you get to the extremes of ratio on each of the pinion and spur, the theory begins to break down, and the ratios are not as smooth, the gears noisier.

For that reason I would normally stay with the one of the two centre pinion ratios 11 and 12, and change a spur gear rather than try and achieve an extreme ratio by changing only one gear.



For inline crown gears, well they DO increase in diameter as tooth numbers increase, to keep the pitch/modulus constant, so there is more latitude in changing the pinion if needed, while maintaining a smooth mesh.

In most cases, we really only NEED to change one gear a up or down 10 – 15% ratio, to get the desired result.

A great way to experiment, is a simple switch around of a sidewinder spur in a car you are very familiar with driving. The different feel you get from changing gear ratios will give you a practical understanding of how you can use gear ratios as part of the car tuning and setup process. There is a printed chart of gear ratios in the Slot.it parts and accessories catalogue which most of you have. If you don't have, and want a catalogue, just ask. I still have a few of the current one left. These are free.

Q & A

Q. *Is the Scalextric PCR available? and is it only for a handful of cars,the Slot.it. catalogue makes it sound universal, which would be great for us Scalex' guys to use Slot.it racing parts*

A. Scalextric PCR is not strictly a Slot.it product. They are a 3D printed chassis designed by Slot.it and sold solely through the world's leading marketer/printer of 3D "everything" called Shapeways.

But before I go into that, there are cheaper alternatives than replacing the entire chassis as a start point. You can make a significant improvement to the running quality of Scalextric cars just by adding an axle kit, you just have to determine which diameter hub, and which width of hub in combination with whether it is a sidewinder or inline car – and whether the body is wide enough to actually take alloy hubs, which have a "boss" for the grub screw, usually making them a 1.5 – 2.5mm wider than the plastic wheel.

https://www.slotraceshop.nz/index.php?main_page=index&cPath=3_217

Another good improvement comes from replacing the Scalextric guide with a Slot.it universal guide CH07 or CH85, and lowering the front a little to make it sit deeper in the slot – simply achieved by sanding down the original tyre or fitting a lower profile front tyre.

Okay, on to 3D chassis. A couple of links for you from Scalextric.https://www.scalextric.com/uk-en/news/testtrack/pcr

https://www.scalextric.com/uk-en/shop/themes/pro-chassis-ready.html

Slot.it highlight PRC in their own parts catalogue as something that makes it possible to install Slot.it running gear

We don't sell them ourselves through the distributor network, they only come via the Shapeways 3D printing and distribution system.

The cost of a PCR or other 3D chassis plus all the Slot.it running gear, makes for a pretty expensive car, but is sometimes an investment worth the reward of better running

Here is the Slot.it shop for the PCR chassis. https://www.shapeways.com/shops/slotit

Also worth checking out are some other 3D shops making Slot.it compatible chassis for a range of slot cars. Among these, some of the most prominent are Olifer, Nacional Racers 3D, Prospeed, Amato and CG Slotcars.

https://www.shapeways.com/shops/3d_olifer

https://www.shapeways.com/shops/nacional-racers-3d

https://www.shapeways.com/shops/prospeed-slot-racing

https://www.shapeways.com/shops/amato-slot-car-design

https://www.shapeways.com/shops/slotcars

I don't know a lot about the latter three, the first two both have good reputation. Olifer are probably the pack leader. Cars with their chassis underneath keep winning proxy racing (car constructor) events around the world, and a fair number of driver build and race events where the base car needed mechanical transplant to be competitive. – They are also really nice guys, I raced in a 24 hour event with/against them about 18 months back, and we spent some time chatting.

Shapeways sometimes do free freight deals – worth locking into, as the postage from Europe is a killer, and the prices for chassis via Shapeways went up sharply a few months back.

Q *Which NSR tyres best fit the Slot-it Group C cars and also which one for the Sideways group 5 ones?*

A If you go to my page of NSR tyres I stock, you will see that I have made up a small chart.
https://www.slotraceshop.nz/index.php?main_page=index&cPath=90_92

On that chart the 5206 and 5207 are the same size in Supergrip and Ultragrip formulas They will fit the Group C 16.5 x 8mm hubs perfectly.
They will also stretch onto the 17.2 x 8mm Group 5 hubs, but being only 10mm wide, I prefer to use Ultragrip 5215 or 5231

When you get to a GT car with 17.2 x 10mm wide hubs, such as the Slot.it GT and LMP cars, the Sideways Lamborghini Huracan or ScaleAuto Race Series GT cars, you definitely need the 5215

But don't discount the Sideways own brand tyres. I am now stocking the 11mm wide Sideways GT tyres in both the Hi-Grip and Pro-speed formulas, and they are 18 shore, a little easier to true than Ultragrip and very grippy.
https://www.slotraceshop.nz/index.php?main_page=index&cPath=199_249

https://www.slotraceshop.nz/index.php?main_page=product_info&cPath=199_249&products_id=2332

I need to update my tyres article to include the Sideways tyres. https://www.slotraceshop.nz/Tyres.pdf

As comparison
NSR Supergrip - 22 shore
NSR Ultragrip - 16 or 18 shore - depending upon whose tech data you read

Slot.it N22 - 22 shore
Slot.it F22 - 22 shore (it is a different, quite sticky compound with great grip but you need patience and expertise to true them, whereas N22 is almost as easy to true as a Urethane tyre which is one reason why they are now so popular)
Slot.it N18 - well 18 shore of course

Sideways Prospeed soft 18 shore - slightly easier to true than Hi-Grip
Sideways Hi Grip soft 18 shore - slightly grippier than Pro-speed
The same two formulas from Sideways in "Medium" are 22 shore, but I don't need to stock them, as the N22 work so well