

Tech tyres – Whats right

TECH TYRES – WHATS RIGHT

There's plenty of misconceptions about tyres, here I will try to explain some facts and clear up some of these misconceptions following on from the tyre Failure Facebook site.

So is there something in tyre pressures and is this where the blame lies to certain failing tyres?

When we did our very expensive web site to plug and sell these German tyres and give information on them we gave loads of information on tyres for Scooters with our FAQ's. But we omitted to go down the tyre pressure route leaving it to 'refer to the manufacturers manual' for I guess 'legal reasons' and the fact that if I said a tyre pressure and a tyre went wrong or someone crashed because of it I didn't want a come back. But I guess its time to issue some rules and information to help Scooterists. I've been following the FB thing and I always keep an eye on the forums and I believe people really don't seem to have a clue when it comes to tyres and air pressures let alone how to ride a Scooter?

Lets look at our beloved Lambretta and Vespa Scooters, these are now very old and out dated glorified shopping trolleys. I'm sorry if this offends you but it's true! What we put on little Scooters through these days is nothing like they were ever designed for. The highest powered of the lot was probably the GP200 at around 10bhp..... today we are seeing 40+bhp on the same little wheels. Ok 40bhp is not a common occurrence but doubling the bhp is quite normal, there's hundreds with 20+bhp and a small amount with 30+bhp and customers expect them to be as reliable as a bog standard Li150 at 6bhp!

When you make a faster bike you need to stop it better and you need to be able to put that extra power onto the road and get good traction and if your going to ride as the engine wants to, you are going to, at some point ride around corners faster than before. And IF you are going to use your motor as it should be you need better tyres and you need to look after them so they look after you.

Lets look back a few years to the 40's, 50's and 60's. Tyre manufacturers were asked, 'please make us tyres for our little Scooters' 'Ok how fast will they go?' 'Oh not above 100kph' that's 62mph! And that's the basis of how Scooter tyres were made to have a speed rating of 'J' 62mph! But today things have improved.

THESE SPEED RATED TYRES ARE NOW AVAILABLE FOR VINTAGE SCOOTERS

J – 62mph
L – 75mph
M – 82mph
P – 93mph

TYRE PRESSURES

Read the old manuals and check the tyre pressures and you will find they vary from around 16 – 20 Psi (pounds per square inches) in the front and 24 – 30 Psi in the rear with a bit more if riding two up. Ok that's fine as a simple rule that we have all followed over the years. This is usually quoted as 20 front 30 rear one up and say 22 front 35 rear two up. Remember these are figures are stated with cold tyres, this is because when they warm up the air pressures will increase and come to what they considered a working tyre pressure.

BUT how heavy were we in those days? Much lighter than we are now! I see customers today who I remember 35 years ago at school, they are now massive, not just fatter, but taller, wider, beefier and much heavier and the same would be said of the mods at Scarborough sea front in 1980 just look at old photos and then there are the women who are also bigger! Take the Italians they've always been smaller and lighter than us. And where did the manuals come from? Italy I guess!

So lets presume these Scooters were made in Italy by little light weights who may have rode around with a little girly on the back and these people have told us what tyre pressures to use. Back to the Italian shopping trollies, they weren't designed to tour the UK or Europe with a 20+bhp TS1 engine at a steady speed of 70mph fully loaded with the bird or mate on the back with bags and tent for the weekend away. They weren't made to top the ton, they were designed for nipping to the shops and work, used through a city on cobbled streets or a dusty one track road at 15mph and maybe a little ride into the hills or out to the coast for a ride out in shorts and tee shirt with no helmet.

The good old days have gone, we all don't live in that idilic little village in the back woods of Italy living on a diet of coffee, Lemonchello and fruit with all the time in the world and we'll do it tomorrow there's no hurry kind of attitude!

We're in a totally different world today, we've moved on and pushed the limits of these shopping trolleys. Speeds have increased and we expect to at least keep up with traffic, including our motorways!

What we haven't done is think about our poor old little tyres! We're asking so much more than when the manuals were written and because there's been no new modern Lambrettas made in the way we do them now, no manual has addressed the tyre issue.

Lets look at the way I see it, I'm no super tyre expert, I wasn't privy to information on how tyres are made. Don't get me wrong I asked, and if you've ever known me you will know I never stop. I could be in some restaurant, pub, cafe bar or hotel room at any time of the night and I would ask questions to get answers to questions I needed to know. Some of the time I got answers and had a long winded conversation in a drunk English – Euro – German mix. Sometimes bits of paper or beer mats would appear to do drawings to understand and sometimes more often than not I was told 'hey go to sleep or

hey we are away from work, there is time for work and time for beer'

What I did do was give feedback to how a Scooter would handle one up or two up and I would point out complaints and problems I was seeing or hearing. I'm one to use my engines power to it's limits as I do with my brakes and if the bike floats, wobbles, skids or lets go then I know something is not quite right. For those who don't know, I've done my time on a Scooter and have ridden my thousands of miles to work and rallies in the UK and across Europe. I push every bike I've ridden to the limits of my ability and the ability of the engine, brakes and tyres so I know what I'm on about and I've used some crap tyres in my time.

The first bike I restored used new Cheng Shin tyres, these taught me to ride a Scooter speedway style round corners without falling off. I've ridden on Deadly Dunlops, Slippery Swallows, wheel barrow tyres and ditch finders left overs from the 60's and 70's and I've ridden square sectioned Michelins and most of the time these were nearly all bald, cracked, second hand tyres and I rode throughout the year in all conditions! You could say I've worked my way up from the bottom like everything in life and I've remembered and learnt as I've gone on.

I've had my fair share of blow outs and flat tyres, one up and two up. There were no tubeless rims in those days and not even tyre sealers! I've always carried a spare wheel or at least enough to strip my rims and repair them at the side of the road. This is one of the main advantages of the Scooter design. I remember coming back from Yarmouth in the early 80's, we stopped and a lad was sunk down by a wall looking deflated and well pissed off with a stripped Vespa tyre and wheel rims between his legs. I asked whats up? And he said I can't mend this bloody puncture! I just looked, picked up the push bike repair patch that he had and did it in seconds and he said 'how did you do that I've been here for hours trying to do that'. Easy when you know how and that comes from riding push bikes! And today 35 years later I'm still finding people haven't got a clue to very simple things when it comes to Scooters tyres and tubes.

With all the thousands of engines I've tuned over 30+ years I've picked up a lot of information about how these Scooters run and behave.

So whats the answer to air pressures? Well we've got to re-think a little. It's got to be a fact that Scooterists in the main are a lot heavier than we were and we sometimes ride with a passenger and just sometimes we will ride fully loaded pushing the limits of the design of a tested tyre! This is all presuming we're not taking our Scooter in a van to a rally or function then you need to read the owners manual for the van your in!

Ok right we are heavier! The engines have increased power and on the whole we have improved the brakes. So what pressures should we use?

Hold on, it's still not that simple. If your really going into it, it really depends on how fast you ride and what type of crazy riding you do. If your like me you will push your bike to the limits where engine mounts and tyres are wobbling to give a tank slapper feel then you will require a tyre for the

job. If you ride bolt upright, knees in, bollocks in your stomach with a open faced helmet and stick to the speed limits and never thrash your motor then you are not pushing the tyre to the limits and the older traditional square sectioned classic Scooter tyre may do you.

Ride very irresponsibly with a little knowledge and you will find certain tyres are just not up to the job. When we were the main suppliers of that tyre I tested each model before we sold them. Pushing the all weather tyre into fast corners I found the rear would just let go where the back end would skip or drop the bike, only to recover just as fast! It was even worse two up doing the same style of riding! It wasn't grip these tyres use a very grippy rubber.

I also found the same with their race tyre, it could be fine for an hours riding, hit a fast roundabout and flick in and out and again a front would slip out and recover with your heart in your mouth. But why? Tyre pressures were to the OLD books, I wasn't over weight but I did push the limits, but these were their race tyres they shouldn't have done that. We discussed it, cut tyres apart and measured side walls and plies and compared them to known race tyres. I found the side wall to be thinner from the side wall to the start of the tyre tread which I felt needed increasing in thickness. It was this area which I felt would momentarily let go and push the tread away from the back end and sag onto the sidewall and recover! In racing on short twisty car park tracks where these tyres were tested and used would be on this edge all the time. Tyres are designed to do this but in a controlled manner. But I found as did Guy Topper if used on a large track with long straights or used on the road these tyres seemed to let go but recovered with a shimmer and a wobble, which if you had the bottle you could ride through it..... but it wasn't right.

Other makes of tyres are very similar, are they copying each other or is it the way a tyre should be designed? I don't know! I asked for this area to be strengthened and eventually this was done as we were pulling out of the tyres but we were told it was done to help to paint a white wall tyre.....! Was the simple answer these tyres needed more air to stop the side wall becoming weak? When I say weak it's like the tyre deforms and loses strength. Even at 35psi in a rear two up it would still do the same thing! So it's was a case of increasing at 2psi at a time until you get to what you like. 38 – 40psi in the rear would have been the normal to make the tyre work. But do this and the center line of the tyre would wear if you sat for long distances on a motorway.

It's always going to be a compromise as with all things Scooters.

Ok so what should we pump our tyre to? Tyres vary in side wall design and structure, some are super soft and pliable in your hand, like Pirelli SC28/30, Michelin S83, S1, SM100 and some of the standard Sava range and some of the standard Conti range. These will squirm around if they don't have enough air in to stiffen up the side wall, so expect to put more air into these types of tyres. Some have a really good thick strong side wall like the Sava, Conti and Heidenau race tyres, these can use less air and still not squirm around. Then imagine a blow out, a stronger side wall should give you

a bit more time to come to a stop. A weak side wall will collapse instantly.

Whatever the tyre, you will have to add air to suit you. If you are a little skinny light weight you won't need as much air. If you are a heavy weight then you will need more air and if you ride two-up think what is the total riding weight. So if we go back to the 20psi front and 30psi rear as a standard then this suits the lighter rider, I'm 14 stone and it usually suits me with good tyres on my own. But you need to tweak the tyre pressures 2psi at a time to suit you and your weight. You should end up somewhere near the usual quoted 22-24psi front and 34-38psi rear to suit the heavier rider or 2 up. I used this for two up at around 25 stone and if you are heavy two up and fully loaded try 23- 25psi front and 38 – 40psi rear. This is only an indication as I've said tyre strength and type will also effect this as does the weather and of course how you ride.

I've seen some people say 25 – 30psi in the front..... where do they get this from? I've even known a very clever person tell me this! Are people comparing a larger heavier motorcycle tyre which needs more air? This is totally wrong you don't need that much air in the front with a smaller tyre! The effect of too much air in the front will mean you don't get any suspension feel from the front. The front of the scooter needs some feel, even though we have springs and shock absorbers the tyre needs to absorb some road shock. Too much air and the front end becomes solid and will bounce the headset into your face and will have a mind of it's own and on corners it will bounce and over steer! Too little air in the front and turning becomes hard and stiff and under steers into corners. It's the same for the rear, we can handle high pressures in the rear as all the weight is over it but not enough air and the tyre will drag let alone squirm and wobble on corners. Too little air will have a larger foot print and create heat..... yes we need heat in a tyre but this is bad heat and some say it's pointing towards these German tyre failures.

Not sure? Then have you ever tried to pedal a push bike with little or no air in the rear..... it's zaps the power from your legs, you have to down gear and stand up, add air and cycling is easier, add more air and the foot print becomes smaller and there is less drag and even easier to pedal. Little or no air in the front and you can't steer and it will have a mind of it's own. This is the same for a Scooter!

Tyres and rubber have improved since the 60's. Today we have super sticky race tyre compounds like the Dunlop TT92, Sava MC31, Sava wet MC20, Heidenau K61 and K58 and the Conti Twist race tyres. These warm up very quickly compared to normal standard road tyres. The Savas are designed to warm up into the 1st two corners of a race track – say comparing to the super reliable Dunlop TT92 race tyre which takes a bit more warming up. Any of these tyres can be use on a road bike, but remember a race bike will be on the edge all the time. They will be into a corner every few meters, they will be on the brakes all the time and they will be under maximum acceleration and deceleration constantly. They don't get time to cool off and as a result a racer will probably use less air in them cold as the tyre pressures will increase as the tyres warm straight up.

Also consider a racer will fit tyres warmers to get air pressure and make the rubber soft ready to go. Fly into a corner flat out with cold tyres and your in trouble, not only is there no grip even with race tyres but the rims don't warm up and grip the tyre and I've personally done this and spun tyres on rims and ripped a inner tube valve out not only on a Scooter but an Enduro bike with tyre grippers within $\frac{1}{4}$ mile on the IOM TT course! So now I never just blast a bike from cold especially on a very torquey motor. Watch a F1 race, they have the best race tyres that can be offered in the world, they preheat tyres, they pre use them and scrub them in and they still have to keep the tyres on the boil non stop on corners, slow down with a safety car at 100mph and they loose heat and grip, that's why they snake around to keep them warm behind the safety car.

Ride these Scooter tyres on a normal road bike, pottering around and suddenly fly into a corner or two and even though it's a race tyre it may let go. For instance in the 90's when I did the odd scooter sprint on my 40bhp engine the only tyre I could get to grip was the old Michelin S1, ten years later I found them death traps they were so hard and had no grip, you could race around 5 twisty corners not quiet on the edge and on the next corner – wow a slide from the front or rear! I think the problem is, some tyres cool down too quick as you are riding they don't hold the heat in the side walls when driving in a straight line, use them in a race situation and the heat stays there and keeps the rubber soft and grippy, but we can not ride like this all the time.

Add some of this information from the race circuit and think about the road riding you do. Very few of us will ride as a racer on the road. For one it's very difficult to find clear roads with multi corners to race flat out and hammer on the brakes and lift the back wheel and get the tyres super hot and at 100% full grip. Ok don't let me scare you, we all know tyres work and these days work very well and better than they ever have. Even the fastest of us, who can win a coast to coast race won't bank with a knee sliding on the road and get to the chicken nobbles on the edge of the tyres. But we would race flat out at faster speeds for longer non stop working the tyres to a point just before the chicken nobbles. We may not be creating sparks on the runner boards but we are using these tyres to full effect. And I'm not talking full race spec tyres here, most wouldn't use a full race spec tyre for this job. If your doing it right a round weekend trip can be 600 miles + and under the right conditions a race tyre may not do that mileage. Ok we can take a spare but that's down time with spanners out.

So lets talk about the so called normal road tyres like the Sava MC18, MC20, Conti Twists Road or Sport, Heidenaus K61, K58 or the Michelin range S1, S83 and SM100 but of course there are others and some of these are ex old race tyres with a pedigree from the track but developed for higher mileage. These used in a normal road riding style are perfectly happy going slow as there are flat out, it's when you push a Scooter beyond a joke where there could be a problem and that's why these are not full race tyres used on the track. They are made with a harder compound to grip but last longer.

But please don't let me pull the wool over your eyes that tyres are the be all and end all to Scooters handling – it is very important but it is not

everything. Forks, fork springs, front and rear damper suspension is everything providing the frame is straight in the first place and don't forget engine mounts, seats and riding positioning these are all part of a good Scooters handling. Get this combination right and the tyres come into their own.

And it's the same for bikes, it's no secret I like to do high mileage across Europe on my BMW GS 1200 Adventure. It's a 105bhp monster which can ride through rivers, through snow over the highest peaks, it rides off road as it does on road. It can sit on a motorway at 100mph fully loaded all day and all on one type of tyre. It's got bigger tyres on the front to the rear and the rear is wider than the front, It's one of the best handling bikes I've ever been on and fully loaded in the right conditions can still run rings around a Sports bike. But in the right conditions it's far too heavy and big to keep up with a good Scooter rider until it hits the open road! You can race it one up or two up, I've pushed it beyond its limits, I've had my toes down, hit the stand on the floor going over bumps, I've locked up the rear wheel into the mudguard and bottomed out the suspension. I've tested 5 different makes of tyres and ended up on a tyre that doesn't skip out on hair pins and surprisingly it's a tyre make I personally wouldn't use on a Scooter! I've ridden across Europe with the carcass showing, I ridden tyres with cracks, rips and tyre repairs fully loaded at 130mph. You could say I know my bike it's my middle leg. Luckily for me it's got tyre valve pressure gauges and a warning light which flashes which is scary when it comes on going into some fast corners. This bike has 3 adjustable settings as you ride and you can set it for one or two people or fully loaded and you can set it for different road conditions, it comes with ABS and traction control, It's ten times better than a well set up Scooter and I can still tell when I've lost a couple of Psi of air in either tyre! And I can tell when a tyre has lost its tread and worn out. When it's lost air in the rear as with a Scooter you can feel this slide, skip, give way or wobble because of lack of air as the tyre lets go with no strength in it. And when the tread is worn out the tyre loses strength and on bumps it feels like a wobble which starts big and works smaller. Imagine a perfect still pond, drop something in the middle and the ripples will start big and slowly get smaller, I can feel this riding. Ok this is not an article just on how I ride, but it does show I've had the experience to write an article that may well help some of you to understand what us Scooter riders are up against when riding. What I'm getting at is..... so much effects how a bike or Scooter handles if your going to use it for fun!

A mad ex Group 4 racer was once following me on my Scooter, he once said to me 'how do you go round corners like that? It's like you are on rails, you dropped into a pot hole on a 90 degree corner and just rode straight over it it, it nearly killed me!' Another time I did a coast to coast race with another ex team racer who followed me all the way because I had a sat nav and complained I went into corners different to him and he wanted to pass me. I replied 'couldn't you see my back end skipping and sliding all over the place?' He couldn't see anything but I could feel everything and had to ride through it with a tank slapper on every corner. When your in a race you don't stop to adjust suspension or jetting you just keep going. Under normal riding

it was fine, in a race it was a death trap and I had all on getting round a corner without killing myself. At the half way finish point I adjusted the rear shocker one turn!. On the final leg we came down a big hill into a massive roundabout, I was leading and hardly shut off only dropping into 3rd and was miles in front coming out of the straight on the other side, it had no wobble and was back to riding on rails. When we stopped he asked 'how did you do that, your riding has totally changed, why didn't you do that in the race?' And the answer was very little adjustment in the rear shocker. Little can be so much and it allowed me to use the suspension and tyres to a point where an ex Group 5 champion was left for dead and he was on a tuned Gilera 180 Runner with bigger and better tyres! And that's the difference between a well set up Scooter to a pig of a Scooter.

Tyres are not just made to trash round a track, they are not just made to grip they are also made to get some mileage before they wear out. As I say it's always a compromise..... this time grip over mileage! If you make a tyre which is hard wearing to get high mileage then they don't grip, they maybe ok on a really hot day but on a cold day they will slip and slide, they maybe ok if you ride like a granny and never go fast enough to do an emergency stop. As I've said a race tyre will grip but may only last a few hundred miles, not good enough to get to a Euro rally and back.

So we have tyres which are in-betweenies and most tyres fit into this category as this is the main area where sales are for the manufacturers as the customer demands mileage but with grip but at a price! Check out the Sava race tyres, these are the ultimate Scooter tyres offered in Medium, Soft and Super Soft, the quality is like no other and these are not mass produced, this comes at a price as you would expect. Compare them to say the Michelin S1, a very common tyre and used by thousands over the years and an ex race tyre. The quality is no where near in terms of grip, tyre tread and side wall design. But they are half the price and as the S1 is much harder you will get a few thousand miles more, saving the customer money long term.

Or do you?

I look at it like this. If you pick a tyre to last for say 5000 miles on the rear it will be so hard it will have little grip, but you get 5000 miles from a tyre and it saves you money, lets say the tyre cost £25. But if you just happen to slip on a corner or under extreme braking and you take a tumble. Well..... you know how much a new paint job and body panels can cost – say £2000! Pick and use a tyre costing – say £60 which under extreme circumstances allows you not to slide and have a tumble you have saved..... £2000! So I always say 'pick a tyre to suit you' 'pick one that suits your style of riding and pick one to suit the mileage you do'. Most can not handle a Scooter correctly so at some point you may take a tumble, it happens to us all. Personally for me its the best gripping tyre to suit your riding regardless of price, a tyre is much cheaper than rebuilding a Scooter or the wait to repair broken bones or even worse! It's only 30 minutes to swap a tyre over with a few more quid!

Tyres vary in terms of the mileage you will get from them. If you do as you should and keep an eye on tyre pressures and swap a front to the rear and

bring into the mix a spare tyre then you will see thousands of miles out of a set. If you are like me, I can't be bothered to swap tyres I just change a rear when it's needed then you can see 600 – 4000 miles depending on tyre type. Some are better than others and some makes of the same model can give different amount of miles for many reasons!

SPEED RATINGS

In days of old we were stuck to a 'J' rated tyres which is 62mph which is all ready explained. Today tyre manufacturers have improved speed ratings through better tyre design and I guess from demand from the public as we have made our engines faster. When we took over the German tyres they all had high speed ratings, which sold themselves, we just made everyone aware of the higher speed ratings and rightly so everyone switch over thinking they were safer. BUT as time has gone on this hasn't proved correct. When we jumped ship we researched other tyre brands to look at having our tyre designs made or stock other tyres and was quite amased how manufacturers have played catch up with speed ratings. As we found out we really did ruffled some feathers with the big players, which suited us as we built our new Scooter tyre store. Today we have more 75, 82 and 93mph speed ratings for our Vintage Scooters than ever before.

Does a high speed rated tyre mean it's a super safe tyre and will never go wrong? We know it doesn't, it maybe piece of mind to use higher rated tyres. Buts lets consider the race tyres of recent years, the main one's have been the Dunlop TT91/92 the chosen tyre of champions which has a speed rating of..... 62mph!

Today we've done our research and found Sava make a tyre on par if not better than a Dunlop with a speed rating of 93mph. These really are a great tyres and offer – Medium, Soft and Super Soft to suit different bikes, different tracks, different rider weights, different riding styles and front and rear fitment. To my knowledge no tyre manufacturer has done this for Scooters before.

As you know we have been driving around at silly speeds and some of us have topped the ton on 62mph rated tyres! Do you think a manufacturer wants to sell a tyre which will fall apart at 63mph? No! They build in a safe working limit and it maybe a 62mph tyre could still be safe at double it's tested speed. But it's nice to know some manufacturers can hopefully be trusted when they say 93mph is safe and could safely go faster!

So what is best for a road going rally Scooter I'm hearing you say? Ok, there are other things to think about first.

What type of Scooter do you ride? Is it a vintage restoration and do you want it to look period? Is it a street sleeper? Is it a custom bike? Is it race bike? Is it bog standard or is it a mile crunching tuned rally goer?

Then ask yourself how fast do you really travel? If it's standard then a tyre with a 62mmph speed rating will do. If it's a tuned bike then a 75, 82 or 93mph rated tyre may suit you. And of course do you ride bolt up right or do

you sling it around or do you travel 2 up and loaded everywhere you go? Or it maybe you have an old timer with smaller wheels and that's it, your basically stuck to what tyres are made these days.

And you can also throw into the mix what gear ratios do you have and is it right to suit you and do you need to alter gearing with a different tyre size?

You don't know how lucky you are, there are lots of different tyre sizes to suit Vintage Scooters and we can use these to our advantage to either change gearing or handling.

What is the best set up to make a good handling bike? Well it depends on you, some are happy with a tyre set which is totally wrong and others can't stand how the bike works.

HANDLING AND TYRE SIZES

Whats best? Well it depends, lets look at the standard Lambretta Series 1, 2 and 3 these all came with 350:10 tyres. This combination works and works well enough for most of the racers on the track. But throw into the mix different tyres sizes. The older 400:10 tyres which are rare these days and you are limited to what you can get. The Conti K62 is the most popular but Sava also do a Classic version with the B14. These are nothing special just 62mph tyres with a Classic style tread but they are much better than the 60's – 70's versions and only really good for raising the gearing and straight line riding BUT their load ratings do increase so they can be used as an advantage for touring. Take away the very rare 400:10 and bring in the modern popular 100/90:10, 100/80:10, 90/90:10 and what do we have? Well the wider tyres like the 100/80 – 90 tyres can improve grip on the back end and also increase the load rating of the rear tyre and will also increase the tyres footprint, the down side is you loose ride height.

TYRE FOOTPRINT

The tyres footprint is the area of tyre which contacts the road. This footprint will depend on tyre size, the tyre pressures and heat and the weight on the bike. A larger tyre footprint is an improvement to grip and we want the best grip all the time on a road bike. A good tyre with a strong side wall on cornering will deflect slightly increasing the foot print and grip when its needed. A bad tyre will try to do this and if the wall isn't strong enough will let go, if your good you can hold it, control it and push on, but this doesn't always happen and you can take a tumble.

But do we want lots of grip all round including the front? Of course we do but at what expense? The track racers as I've said prefer the 350:10 tyres front and rear, Why? Well the tyres on standard rims are as thin and as tall as you can get which means as you go into a corner the Scooter will tip in and re-act and drop into the corner faster! Think of the tyres cross sectional shape as a V, riding upright you have a standard foot print, drop the bike into a corner and on the side of the V shape and you get more area. Indeed some motorcycle race tyres are designed in a very deep V shape as they

will be more on the side wall on corners and corners are where you want more grip. Think of a wider metric tyre as a U or square shape, in a straight line there is more contact but it's like riding on a flat wide tyre and it's hard to hit the side tread so its slower to react into a corner. Because the tyre is not as tall the foot print will increase as the side of the tyre increases and grip is improved. Fit the wider tyre on the rear and the reaction is slower or harder to instigate, but in most circumstances on the road it is an improvement. Fit a wider tyre to the front and turning into the corner is even harder and the tyres will try to make the bike right it's self up right. Add to the fact you could fit a wider wheel rim on the front and back this will make the tyre wider and flatter and it will then make it harder to turn into a corner because the tyre is flat with no side wall shape that would be the same with a taller squarer imperial tyre as a wide rim effectively flattens a tyre.

What is preferred and what should I use?

Personally I see the best way is to either fit a 350:10 front and rear, or improve it to suit the heavier rider and fit a 100/90 on the rear which has a higher load rating. These are very similar in tyre diameters so works well but you gain 10mm in width. Use a 100/80:10 on the rear this has a lower profile so is fine for straight line riding but not great for cornering, you get the extra 10mm but loose the tyre shape as the tyre is flatter and the frame is lower to the floor. Some have tried to improve handling by fitting a big rear tyre and a smaller front tyre, this can improve the Scooter as it will push the Scooter into the corner..... but this can effect ride height which a Scooter doesn't have and also messes up the stand. So if you fit a standard 350:10 rear tyre and say a 300:10 tyre front you loose ride height in the forks area and its been known to grind dampers studs because you have lost 12.7mm off the height of the tyre. This becomes even worse if you fit the smaller 300 or 90/90 to the rear to alter the gearing. So it's not really an advantage to fit a smaller 300:10 or a 90/90:10 to a Lambretta Series 1,2,3. But a 90/90 can be used to good effect as a spare wheel with a inline leg shield carrier and is useable in an emergency.

Whats the difference between a modern metric and an old style imperial tyres?

Imperial sizes are from the old days. 3.50:10 means the tyres width is 3½ inches wide (88.9mm) the tyre profile on an imperial tyre is 100% of the width which is 3½ inches tall (88.9mm) so they are square. And the ten is a 10 inch wheel rim which is 254mm in diameter. An Imperial tyre will show on the side wall 350:10 the speed rating letter and the load rating number. There loads of other numbers but we don't need to know about these.

Modern metric tyres. Lets use the popular 100/90:10 this means the tyre width is 100mm, and has a tyre profile of 90% of the tyres width, in this case it would be 90mm tall and has a 10 inch wheel rim (254mm).

For example a 100/90:10 61 P

100 = Section width in mm's

90 = Height ratio, shown as a percentage of tyres width

10 = 10 inch tyre diameter
61 = Load index
P = Speed rating

Why do metric tyres give a wheel rim diameter in inches? Probably from the old days in the 50's and 60's I don't know. 10" = 254mm. Add the tyres height to this and you can work out the diameter/circumference and this will help with gearing and work out speeds with known revs which is covered at the end.

Because a tyre has the same size markings doesn't mean that from one manufacturer to another the tyre will be identical in size. A 350:10 tyre can be up to 25mm difference in total tyre height. That is; a tyre fitted to a standard rim with one make of tyre can be taller than another make of tyre fitted to the same rim..... this will totally effect the the rolling circumference which will totally effect the gearings final ratio so you can use this to great effect. But it does mean you need to compare new tyres blown up to the same pressure and measured side by side. Then throw into the mix the metric tyre sizes which again can alter from manufacturers and you have a big mix of tyres to alter gearing. For a reasonable price you can simply alter gearing to suit you and the pillion by a quick swap in tyres. Don't forget a worn tyre will have a different diameter to a new tyre. A tyres thread depth new is around 6mm so a worn tyre could be 12mm smaller effecting gearing and this will alter as you do more mileage. And as I've said a worn tyre will loose strength so more air maybe needed to stop the wobble ripple effect on bumps. Also a tyre used at speed when it's warm will expand increasing the diameter and rolling circumference effecting gearing and it's speed. And any one who's fitted a 400:10 will know this, it may clear the bump stop on the stand but will expand and lock at speed!

LOAD RATINGS

Load rating is a standardised test to find a safe load rating for a tyre. A tyres diameter, width and construction of carcass will dictate the final load rating.

Can you over load a scooter based on the tyres load rating? The load rating shown on the side wall is the load of one tyre. Two tyres of a motor vehicle effectively doubles the load rating of a Scooter. These load ratings are more than adequate spreading the load over two tyres even fully loaded with two people and baggage. Should you worry about load ratings when buying a tyre? No not really, load ratings are over safe and its doubtful you could over load a scooter and safely ride it anyway. A low load rating is code 50 which is 190kg per tyre, 380kg total weight. This could equate to two fat blokes of 20 stone each and the Scooter, can two 20 stone blokes fit on a scooter? If they could the tyres can still take the load.

SCOOTER LOAD RATING TABLE

51 = 195kg
52 = 200kg
53 = 206kg
54 = 212kg

55 = 218kg
56 = 224kg
57 = 230kg
58 = 236kg
59 = 243kg
60 = 250kg
61 = 257kg
62 = 265kg
63 = 272kg
64 = 280kg
65 = 290kg
66 = 300kg
67 = 307kg
68 = 315kg
69 = 325kg

TYRE SIZES WE CAN USE ON A LARGE FRAME LAMBRETTA?

Here I'm listing tyre sizes which suit Vintage Lambrettas in order of tyre size/circumference from smallest to largest which can help alter gearing. Not all tyres fit, too small a tyre and a Lambretta will lose that all important ride height and the exhaust, stand and runners will hit the ground on cornering. Too big a tyre and things don't fit or will over gear the engine.

300:10

Don't use a 300:10 on either the front or the rear unless it's a spare in emergency. These are only 76.2mm tall and will make the ground clearance really bad.

90/90:10

Don't use a 90/90:10 on either the front or the rear unless it's a spare in emergency. These are only 81mm tall. Some do use a 90/90 front but this alters the speedo drives and readings!

100/80:10

100/80:10 loses ride height like a 300 or 90/90 but some use these to alter gearing. Fitting a 100/80:10 is like fitting a smaller front sprocket. These are 80mm tall.

350:10

350:10 are perfect fitting front and rear providing you set up your engine and gearing to suit. 350:10 are perfect front and rear. These are standard at 88.9mm tall.

100/90:10

Add a 100/90:10 and it only slightly alters gearing but improves handling on road bikes and improves the load rating for the rear for passengers or adding luggage. But 100/90:10 tyres are difficult to fit between the hub and rear

mudguard and mag housing. So either fit it with no air and pump it up fitted which is a pain or as I do alter the hub fins, mudguard and mag housing so they slide in fully pumped up. Once fitted a 100/90:10 may rub on some casings once warm or under use. This comes around from differences in rear hub bearing sizes, cones, layshafts and rear hub dimensions. You can add a thicker 2mm rear hub cone spacer to space the wheel/tyre away from the casing, this won't effect handling. These are 90mm tall.

400:10

A 400:10 can be very tall and most likely needs the bump stop removing or grinding away. These will totally alter the gearing so a sprocket or gear box will need changing to make them work. Ride height increases and the bike may wobble on the stand. Handling is not so great if using these on the front as well. These will alter the speedo readings and because these are taller they tend to squirm around on corners. But loading ratings are high so can be used to an advantage for a loaded Scooter on long hauls when riding in a straight line. In theory a larger rear tyre is like adding a higher ratio gearbox this puts drag on the clutch ideally you should alter the gearbox and front sprocket to help putting this high load on the clutch. In practice, proving you do it right with the right parts there should be no reason why an engine can't be set up ok. These are 101.6mm tall.

There are other wider tyres in the metric range but don't fit and there are no advantages even though some have fitted them.

The difference between a 300:10 tyre and a 400:10 in terms of rolling circumference is

WHEEL RIMS

We are lucky we now have a few wheel rims to choose from both to improve handling and safety with split and tubeless rims. All original Lambretta rims are the same in width 2.50 inch which suit all tyre sizes. In the 90's the wide rim was introduced, based around using a Vespas wide rim doubled up, it kept the center line but allowed a bigger rubber foot print by spreading the tyre wider whether it was a 350 or a 100/90 tyre. If you fit a wide rim on the front and rear the bike will act like it is tram lining or riding over white lines all the time, it really is not worth doing. But fit a thinner front rim with a wider rear and this is a nice combination where handling is perfect. Quality of wheel rims vary, genuine are usually perfect but are impossible to get apart from second hand. Today Italy, India and Vietnam re make rims which can be very suspect, some are ok and others are crap where studs fall out or strip or the rim runs so far out you can see it and is usually seen when dynoing a Scooter. BGM have made some excellent stainless spit rims and are the best on the market with no run out and come in standard width. All Lambretta rims are split and use an inner tube.

A good rim will have the tube valve hole at 10mm off set to the near side. Pattern rims can move the valves centerline, sometimes a tyre may need a little curved nick carefully cutting out of the tyre side wall so the inner tube valve fits perfect once assembled, always worth checking when building

any wheel with tubes see split wheel assembly.

INNER TUBES

Lambretta inner tubes are special and quite difficult to find if you don't know what you are looking for and they are best bought from a Lambretta shop. The inner tube ideally needs the valve offset 10mm to the center line, but an inner tube with an inline valve will also fit as the valve can be deflected the extra 10mm with no problem and actually helps in positioning the valve better once the tyre is assembled.

The Lambretta valve needs to be a 90 degree short version or one which is at 30/45 degrees but always make sure these valves do not hit the hub fins and always check them with the dust cap fitted. Don't use the Vespa type inner tube with the long valve these can hit the front fork bolt and can shear you have been warned! Most tubes are made in the Far East and are usually fine. We use and recommend these tubes, Continental or Kings we no longer stock the other German one which I designed on principle reasons even though they were excellent and used the Vespa tube but we moved the valve 30 degrees so in rotation it trailed and didn't try to flex the valve.

TYRES AND GEAR RATIOS

Tyres vary in sizes and widths. Widths don't effect gearing but effect handling and load a tyre can take. Tyre sizes will effect gearing and gear ratios. Knowing some simple rules can help the Scooter rider to improve the bike or you can find out how fast you are really going and not what the Lambretta speedo thinks you are going. Or you can find out what gear ratio your bike has if you don't know what gears/gearing you have.

To find the WHEEL RATIO (tyres rolling circumference)

You will need to know this for gearing and setting up digital speedos.

To find the wheel ratio, measure your wheels distance in inches in one complete revolution with correct tyre pressure and the driver sat on the Scooter. Divide this figure into 63360 this will give the Wheel Ratio. Or mark the ground and the tyre and measure in mm's the distance of one complete turn. Or you can measure the tyres diameter in mm's and x 3.14 this equals the Wheel Ratio.

To find GEAR RATIO

For this you will need to know your revs per minute using a rev counter and also your speed using a GPS or Digital speedo

$$\text{rpm} \times 60 \text{ divided by mph} \times \text{wheel ratio} = \text{gear ratio}$$

To find REVS PER MINUTE

You will need to know this if you want to know what your engine is revving to if you have an accurate speedo (GPS/Digital) but no rev counter.

Gear ratio x wheel ratio x mph divided by 60 = RPM (revs per minute)

To work out speed per revs per minute

1000 x 60 divided by Overall gear ratio x wheel ratio = speed per 1000 RPM

For example if your Scooter is pulling 8500rpm. Take 8.5 x speed per 1000 = the speed of your Scooter. I have done this at 108.50mph clocked by a speed gun and my revs to speedo was as near dam on. Ok tyres can expand with speed and heat and you can get clutch slip. If you have a good tyre and clutch this works quiet well.

There is also much more information to help the Scooterist out [here](#)

- Tyres – FAQ's
- Tyres – Types and Styles
- Tyres – Tubeless rims
- Tyres – Split rims
- Tyres – Fitting Tubeless
- Tyres – Tyre store

That's it or is it, this article and the linked articles have taken me around 80 hours to write at least. I'm seeing double and feel like I'm going round in circles so I expect something maybe wrong or I've over looked something. I don't mind if people ask questions if something doesn't make sense or you feel is incorrect and I will try to re- address it.

Mark Broadhurst. If you have any questions email mark@mbsscooters.co.uk