

2035 VANS Street Skater Concept

When I think of the VANS apparel company – I imagine skateboarding, surfboarding, snowboarding, and BMX: action sports. Action sports have always been a fashionable way for adrenaline seekers to learn new skills and compete with likeminded individuals. The 1970s saw a surge in popularity of so-called ‘skate culture’ - where teenagers and young adults could be seen daily at local skateparks practicing the newest and coolest tricks. By the 1990s, this had evolved into a way of life for teens around the world, especially in the West Coast of America. It is estimated by the Northern Illinois University that, in the years after the first ESPN X Games, **6.5 million people** were regular skateboarders in the USA alone. They regard the ESPN X Games (a series of action sports events, broadcast live on television) as the spark that set off the late 1990s skating craze.

Since the grass roots of boarding in the mid-1970s, VANS have been a prominent figurehead of skate apparel. Famed for their grip, comfort and durability compared to other shoes of the era, VANS managed to capture a large part of the skating community. As well as this, they soon found that other action sports, such as surfing, needed stylish yet durable footwear; hence the VANS slip on shoes were created. Much like the classic and high-top styles popular with skaters, the slip-on shoes were perfect for surfboarders who needed a simple, aesthetically pleasing, and comfortable way to get down from carparks to the waves.

The vehicles used by action sports enthusiasts have not received many upgrades throughout the years. The typical vehicle used by them nowadays seems to be either a pickup truck or van style of car. In the 1970s when action sports were first seen on a global scale, the Volkswagen Kombi bus was a firm favourite in the USA, with the Volkswagen Caddy being dominant in the European markets, and the Holden Kingswood ute being Australian adrenaline junkies’ vehicle of choice. The most striking features about these automobiles are both the luggage capacity and the customisation abilities. It is well known that fashion is a big part of skate culture, so the ability to make their vehicles personalised seems to be important. This could have ranged from simple upgrades like larger chrome wheels, to more extreme options such as custom paint jobs, interiors or even engines. Skateboarders love to show off their skating skills at the local skatepark – so why wouldn’t they want to show off in their transport to the park too?

VANS began making footwear in the late 1960s and have evolved into making all sorts of clothing and fashion accessories to this day. I chose VANS for many reasons, including the personal affinity I have with the brand – owning many items of theirs throughout my lifetime - from shoes to rucksacks. As mentioned in my opening paragraph, VANS attempt to relate to the youth of today who are interested in action sports.

For many years, skating and BMX (and the culture that surrounded it) really interested me. Even through to the alternative fashion and rock music running through its veins to which I still enjoy and love to this day. These themes are reflected not only in VANS products, but in their advertising and community. VANS are known for their practicality too – whether that be the famous grippy waffle sole, the comfortable shape, or the personalisation of the designs.

The grippy ‘Wafflecup’ sole, inaugurated in their first footwear the #44 Authentic, was a hit amongst skateboarders due to the adherent nature of the vulcanised rubber. This allowed them to put more trust in the connection between their feet and the boards, meaning tricks became safer and easier to accomplish. As well as this, the waffle design – with a large white rubber surround encasing the tan coloured sole – meant durability was far superior to competitors. **According to the [vans.co.uk](https://www.vans.co.uk) website**, their sole designs give “the ideal combination of grip, comfort and durability” and allows

action sports enthusiasts “control and confidence without sacrificing the 'feel' of the board”. The comfortable shape is yet another part of VANS shoe design which makes them stand out from competitors, especially in the early days. VANS shoes were wider and taller than competition, allowing for people of all shapes and sizes to fit comfortably in their footwear. The high-top designs, made popular in the 1980s, were designed to increase comfort too: the raised and padded fabric, reaching over 2 inches above standard shoes, protected unsuspecting ankles from runaway skateboards at the skatepark. These high-top shoes were not only for practical purposes, however. They soon became a fashion statement, being seen sported by everyone from famous rock stars to young adults at the local half pipe. Lastly, I chose VANS because of the personalisation aspect. VANS are not only a sportswear brand, but a vogue icon amongst the younger generation. From the colour scheme (black, white and red primary, light blue secondary) which features in so many VANS products and marketing campaigns, to the famous checkerboard patterns, VANS has managed to keep a strong brand identity, whilst also allowing customers to customise their products, to really make them stand out. I am planning to use the previous points (namely grippy, durable, comfortable and customisable) in my design, to follow not only the physical design language of the brand, but also the philosophical design language too.

For many years, VANS have been encouraging and experimenting with sustainable production techniques. This could include materials; many new products created by the company come with the ‘VR3’ checkerboard globe insignia - this logo is a promise by VANS that the product will have at least 30% renewable, reused or regenerative materials. **As stated by VR3**, renewable means that materials must be “sourced from plants, animals, and microbes that can be replenished within a person's lifetime and are obtained from sources that have the intention of reducing potential impacts on the planet.” This means that it is not good enough just using plant-based materials, it means that those plants must be resowed by those who use them. Reused materials simply mean those which can be repurposed instead of going into the waste stream. Finally, regenerative materials must be “produced using agricultural practices that are intended to help promote biodiversity, enhance water cycles, improve soil health and/ or sequester carbon.” An example of a material which fits this brief is bamboo, as it can be grown without degrading land, without the use of fertiliser, all whilst producing less levels of **CO2 than a tree** over time. I will be sure to reference VANS’ VR3 scheme in my vehicle, by using at least 30% of these materials. I will use bamboo and hemp fibres on interior hard and soft parts respectively. I will also use recycled aluminium for the body material.

Bamboo has been used for thousands of years globally as not only a building material but for food and medicinal purposes too. It is fast growing, and native to many of the world’s climates. It is known for being strong, versatile and durable, owing to its popularity around the world. It has only recently been explored in an automotive setting, the Lexus 450h being one of the most popular consumer cars with bamboo elements. I would like to explore this in my interior to a greater extent, replacing all plastic, where possible, with a bamboo alternative.

Likewise, hemp fabrics have started gaining popularity recently, both for their sustainability aspect but also due to great natural insulation properties. This would be great in an automotive setting, especially in my vehicle which will spend a lot of its time in sunny car parks or by hot beaches with not much shade. The insulation properties will allow my interior to stay cool, and not be unbearable in scorching summer months.

The debate on whether extreme sports are good for mental health is a very popular one, with both sides making very valid points. I would like to see whether my car could encompass the mental health benefits of extreme sports, whilst also negating any of the downsides.

On one hand, the adrenaline rush that you get from competing in extreme sports is hard to beat and is scientifically proven to increase happiness levels. People find comfort in the triggered release of endorphins when doing action sports. According to **Mental Health America**, “A short surge of adrenaline when you're not actually in a life-or-death situation can feel pretty good to some people—so good, in fact, that they chase after that feeling by doing increasingly scary and dangerous things.” This, although perhaps originally directed more at dangerous sports such as skiing, links to the VANS target audience of young adrenaline junkies. On the other hand, however, this comes with a large risk of injury. If an injury were to occur, this could completely negate any improvements to mental health, and could make it worse if hospital is required. It is discovered in a study by e-therapy.uk that mental health levels can be “deeply affected by a hospital stay”. I think this could be down to being forced to stay in an unfamiliar environment for long periods of time. To nullify this downside, whilst also keeping the benefit, I will be sure to have safety as a priority in my vehicle. I will also make my vehicle sports-inspired to appeal to adrenaline seekers. It should have speed and drivability, but also safety in the event of an accident.

As well as this, action sports, especially the ones in which require intricate skill and precision such as skateboarding, is brilliant as a stress relief. When focusing on getting a trick right on a board, your mind zones out to everything, and complete concentration is given to honing the exact dexterity required. Contrasting to this is when these sports can increase stress levels. When competing or performing at a high level, the competitive nature can cause **lots of stress**. To stop this occurring to the owner and driver of my vehicle, I will make sure my car is not track-focused. This removes ‘competition’ from driving the vehicle, and purely concentrates on the experience of the driver. This could include any skilful and intricate fast driving on road, drifting or even just parallel parking correctly the first time!

Deciding the environment in which the car I will be designing will be used in is very important: it will determine the packaging and footprint of the vehicle. Skateparks are often in the city (either city centres, or suburban areas) whereas beaches are by the coast. Both suburban and coastal areas usually feature wide, smooth road surfaces. This allows for low ground clearances, low profile tyres and a wide track width. However, city centres often have lots of stop-start traffic. Coastal areas also can feature occasional single-track lanes. This would require a smaller track width.

These environments (suburban areas and coastal) require a new vehicle to traverse them. Many cars on sale will be able to deal with these terrains if required, but my vehicle needs to excel in these situations competently and comfortably. As it will be primarily road-driven and not track-driven, it must be driver focused and be able to be enjoyed to its limits on public freeway. To work well in the chosen environments, my car will...

- Have a low centre of gravity by using lower ground clearance
- Have a smaller track width
- Have low profile tyres

It will have a low centre of gravity to make it have appealing handling characteristics. To do this, the ground clearance will be lower than a normal car. I feel like this will improve the drivability of the vehicle (through road feel and positioning of the driver) but also make the design more aesthetically pleasing.

The reason for a thinner track width is mainly down to the environment the car will be used in. As previously mentioned, although cities and suburban areas often have wide roads, coastal roads are often thin. As well as this, parking spaces can be few and far between at busy skate parks and

beaches, so a thinner car that can fit into any free space would be a massive bonus for the prospective buyer.

Lastly my design will have low profile tyres – one of the reasons for this is visual appeal. According to **parkmuffler.com**, consumers think “low profile tyres can add a sporty or luxury feel”. As well as the aesthetic aspect, low profile tyres will help the performance of my vehicle: they allow for larger rims to be used, which in turn allows for larger brakes. The only downside to my vehicle having low profile tyres is that the ride can become stiffer and bumpier. To overcome this, I will be sure that both the suspension and interior seating utilised on the VANS car will provide the otherwise compromised comfort.

Who will use my vehicle? The main selling point of the VANS car I will produce is that it’s a good looking, sporty and practical vehicle. This links to the aim of the main target audience (skateboarders and surf boarders): style, tricks and transportation. (The latter applies mostly towards skateboarding). The ideal audience will use the car not only as a way of transportation between their home and the skatepark or beach, but also as a status symbol – the car will be a feature piece of the action sport enthusiast and will be used as such. It will stand out in a traffic jam, much like a skateboarder who dresses in the newest clothes and nails the perfect trick will stand out too. Although much of the sporting equipment can be expensive, many action sports enthusiasts are not rich, therefore my car should be affordable for the average skateboard rider.

These users are not solely about style and performance, however. As previously mentioned, my design must be practical too. For adventure sports fanatics, they must be able to carry their sporting equipment comfortably and easily. This means no convoluted stick-on roof boxes that ruin the exterior styling, and it also means not just shoving all the equipment in the passenger seat. My design must have sufficient room in the boot for skateboards and wetsuits. According to Element, a lifestyle fashion brand rooted in the heart of the hobby, the average length of a skateboard ranges “28 to 33” inches. Widths are between 8 to 9 inches too; however, this is not as important to the packaging of my vehicle as they can be stored both vertically and horizontally. As skateboards are long and thin, this allows me to maintain the low roofline of a GT car at the rear, whilst also having a deep enough load bay for the board.

The body style of my car will be a GT design. According to the book “GT: The World's Best GT Cars 1953 to 1973”, the author Sam Dawson (an editor at “**Classic Car Magazine**”), **states that** a GT car “should be able to transport at least two comfortably with their luggage and have room to spare — probably in the form of a two plus two seating arrangement.” Due to this, I will make my car in a two plus two configuration (with the front seats focusing on luxury, comfort and support, and the rear seats focusing on being there for storage primarily). Dawson continues by saying that the purpose of a GT is to “cross a continent at speed and in comfort yet provide driving thrills when demanded”. This is precisely the drivability I require from my vehicle. Due to the previously mentioned long but thin skateboards, the roofline can also follow a classic GT shape whilst maintaining the practicality required by the target consumer.

My VANS GT car will be benchmarked against other popular GT cars – focusing on the Maserati Gran Turismo, Bentley Continental GT and Lexus LC500h. The Maserati has 310 litres of the boot space, the Bentley has 358 litres but the Lexus only 172 litres. I will aim for my design to have between the upper two values here. I do not want to aim to have a larger boot than the Continental GT as that is a very large and wide car, and I do not want my car’s proposed thin track width to be compromised. In terms of power, the LC500h falls behind once again, with only 353hp compared to the other pair’s

joint 542hp. I will aim for my VANS vehicle to meet the higher end of this power spectrum as it must be agile and fun to drive. And, as mentioned earlier, it must “provide driving thrills when demanded”.

One thing that the Lexus excels at compared to the other two however is the efficiency. Due to the V6 Hybrid setup of the LC500h, a combined urban and highway mile per gallon rating comes in at 34.8mpg, 7mpg better than the similarly V6 (but not hybrid) Maserati Gran Turismo, and over 11mpg better than the throaty V8 of the Bentley Continental GT. Due to this stark difference, my vehicle will employ a mild hybrid system.

The mild hybrid system featured in my VANS GT car will be mostly combustion engine powered (for ease of use and increased driving emotion) but will feature part-time electric assistance at low speeds (for example in cities where there is lots of stop start traffic, and air quality is at it's worst) and with launching. This will allow my car to gain the benefits of the instant torque from the electric motors, combining it with the power from the V6 engine. The drivetrain, like the Lexus too, will be rear wheel drive. A positive side to rear wheel drive is better handling – due to the better weight balance and transient response. This is partly due to rear-wheel-drive systems being significantly lighter than all wheel drive systems, which require heavy differentials and driveshafts on not only the rear axle but on the front too. AWD (all wheel drive) systems can also be affected by understeer, much like front wheel drive vehicles. This is less common in rear drive cars (and can even be swayed the other way into oversteer, which is a much sportier feel, and is in fact sought after by many race drivers. The increased transient response on the steering from RWD cars can be accredited to the fact that there are not drive shafts in the front wheels, so steering is more direct. In terms of steering, my design will be using hydraulic power steering. This is much more direct than the alternative of electric power steering and should give the driver of my car more confidence in corners.

The width of the three benchmark cars (Bentley, Maserati and Lexus) ranges between 1920mm and 1966mm, with the Bentley being the widest and the Lexus being the slimmest. I will aim to have my car be thinner than the Lexus, aiming for between 1900mm and 1920mm. Length is not so much of a concern in my vehicle, but to keep proportions timeless and aesthetically pleasing, I will aim for around 4770mm, around the same as the Lexus LC500.

There are several chassis options I could use for my GT car, from ladder chassis to space frame. I will choose a monocoque design for my vehicle. This is because, compared to a ladder chassis, there is much higher structural rigidity. This means that the body flexes less in corners, making steering tighter, therefore safer and better to drive. Monocoque chassis also have extremely good crash protection. This is because the whole body is structural, whereas in ladder chassis cars only the thick steel frame chassis is structural, and the body is almost purely aesthetic. The main reason for not choosing a space frame chassis is due to costs – monocoque is much cheaper but provides many of the benefits of the space frame system. A negative of monocoque design would be the weight associated with it, however I think this weight is important in keeping the car safe, so this will not affect my choice.

Many suspension types have been used by automotive manufacturers over the past one hundred years, however most recently and most successfully “Macpherson Strut” and “Double Wishbone” are used. On one hand, the Macpherson strut is good as it is more spatially compact. It is also very cost effective, with simple units being very cheap to both manufacture and fit. On the other hand, the double wishbone setup is a lot better at performance, allowing better camber control and handling characteristics; this is the reason that it is utilised in many high performance and luxury exotic vehicles. My GT will inherently be based on a large footprint, so the compact nature of Macpherson

struts is not important, therefore I will be using double wishbone front and back. Double wishbone units use “two wishbone-shaped arms to locate and control the wheel. Each arm, one upper and one lower, connect the wheel assembly to the vehicle’s frame **and allows for precise control of the wheel throughout its range of motion**”.

The main types of brake systems available in production cars are disc brakes and drum brakes. The **benefits of drum brakes are...**

- Space efficiency – For an equal size of brake disc, drum brakes provide much higher stopping power.
- Longer life – Due to a larger friction contact area than a disc and calliper setup, drum brakes will need changing a lot less often.
- Price – drum brakes are cheaper to manufacture for a variety of reasons, mostly due to the lower number of parts required for them to be produced and maintained.
- Rust – less corrosion happens on sealed drum brakes than on disc brakes, where the steel rotors are exposed to road salt and water constantly.

However, drum brakes are not always the best option. Under heavy braking, the sealed nature of a drum brake means that heat builds up quickly, leading to less efficient stopping power and can also induce warping, causing vibration under braking. The extreme heat build-up on the pads can also lead to ‘glazing’ (a glazed brake pad surface) which can make braking almost impossible. Lastly, heat can cause the size of the drums to slightly increase (due to thermal expansion), and this requires the brake pedal to be pressed with increased force to normal, this can catch out novice drivers. As well as this, maintenance of drum brakes, although less frequent, is far more expensive than discs due to it all being enclosed.

As my car will be marketed as a performance car, and performance cars will be required to utilise heavy braking, I will be using a disc brake setup front and rear. All my benchmarked cars come with either 4 piston or 6 piston setups. Although 6 piston setups would provide better stopping power, I will choose 4 pistons for my disc brake setup due to the lower weight of my vehicle not requiring the higher performance option. This can help keep prices lower for my target customer.

As previously mentioned, my vehicle will be rear wheel drive. I will couple this setup with a limited slip differential (LSD); rear LSD’s have **many advantages to an open differential**, as they compensate for traction loss on one of the back wheels, assisting on slippery terrain or when pushing the car to its limits, for example on a wet day or on a track.

My vehicle will not be made in-house by VANS. Instead, it will be a collaboration with ItalDesign. This is a perfect matchup in my opinion, due to both companies having stark roots in simple yet functional design. Both companies provide a harmonious link between form and function, and I think this will suit my VANS Street Skater concept well. Due to this collaboration, many design features can be taken from some of Giugiaro (founder of ItalDesign) and other ItalDesign’s cars. Main striking features of these include a vivid side crease or feature line. This could be implemented in my concept, by using VANS’ equally famous side motif, to create an iconic yet timeless statement. Other parts of my design will show less obvious hints to VANS and ItalDesign heritage, for example a square and boxy inspired exterior hint to Giugiaro’s most famous design (the first-generation Volkswagen Golf) and checkerboard patterns on the grille or interior would link to the VANS brand identity. ItalDesign have produced and ideated many GT cars over the past 60 years, so I further think that they are a perfect fit for my product.

My design, due to both VANS and ItalDesign specialising in timeless products, must follow these criteria. To be timeless, my car must transcend trends, whilst embodying a lasting visual and functional appeal. Examples of timeless design often use clean and simple lines, avoiding excessive ornamentation or gimmicks. They manage to show a tasteful balance of proportion, ensuring aesthetic appeal from any angle. In terms of my car, it must show understated elegance, allowing my design to quietly command attention rather than relying on loud or aggressive styling cues that would look out of place.

The fashion surrounding skateboarding and surfing is timeless, so my product must reflect that.

The famous product designer Dieter Rams wrote a book called the '10 principles of good design' in the late 1970s, and I think some of the points are extremely important for me to convey in my product too. Here I have mentioned the three principles which I relate to most closely, and how I will convey it in my car.

- Good design is innovative. My VANS GT concept must be innovative functionally, aesthetically and sustainably. As previously mentioned, my car will be cheaper, better to drive, safer, use recycled and recyclable materials, and have more interior storage than competitors.
- Good design is honest. My design must not feature any 'fake' features, such as blanked off vents, or a fake exhaust trim. This is to ensure that my design looks purposeful and up to the task that it is advertised for.
- Good design is as little design as possible. All design will have a purpose in my car, there will be, for example, no large grille for the sake of vanity.

Recently, **VANS released their brand vision**. It states that VANS is "the original action sportswear company grounded in youth, authenticity, and individual style" with a purpose "to enable creative expression – and inspire youth culture – by celebrating and encouraging the Off the Wall attitude that comes from expressing your true self."

The words "grounded in youth" suggest that VANS know their target audience and want to conform to them entirely. It suggests the idea that if you do not like the products, then it is because you are not their target market anyway. I will use this idea with my vehicle and target it purely at youth skaters and surfers.

The words "individual style" cement the fact that VANS pride themselves in standing out from the crowd, and encourage their audience to do the same if they don't want to blend in. I will use the same tactic with my vehicle, leaning in on the fact that it is a perfect way for the youthful target audience to show off their individuality.

A scenario of how my vehicle will be used: A 20-year-old skateboarder from a seaside city, who surfs in his free time. He will pick my GT car due to the striking yet timeless looks. He likes the customisation options to stand out from the crowd. He can afford it on his average salary and is encouraged to use it daily. He can store his skateboard and longboard comfortably in the boot area and can put his wet clothes in the boot too after surfing, thanks to the waterproof rubber lining. After going to work, then going skateboarding, he drives to the local racetrack to do a few laps before returning home. The car performs well on track – it is not the fastest car there, but is easily the most fun to drive, being pushed to its limits comfortably without feeling dangerous or uneasy for the young driver. The car is designed to look timeless, so will not need to be replaced often. However, when it does reach the end of its product life, it will be able to be recycled almost entirely thanks to

both sustainable build materials and 'design for disability', which states that the product can be separated to its core parts to be recycled easily.

In summary, I will be producing a GT car for the year 2035, aimed at the target market of 18–25-year-old action sports enthusiasts. It will be produced as a collaboration between VANS and ItalDesign, and will feature brand identity from both companies. From VANS, it will use the identity of red, black and white primary and light blue secondary colour schemes. It will also use many physical features of VANS products such as the side pattern, wafflecup sole and white sole surround. Lastly it will use the ItalDesign philosophy of timelessness in the design, meaning it will stay aesthetically pleasing for years to come. The interior will be just as important as the exterior in this project. Aesthetically, it will feature many iconic VANS attributes such as suede materials or checkerboard patterns. However, it will also adhere to VANS' "VH3" scheme, by using bamboo as an alternative for plastic, and hemp fibres as opposed to cotton or polyester seat fabrics. The interior should also feature a large boot for the sporting equipment, being at least 33 inches in depth in order to fit an average size skateboard. The boot will also be lined with rubber, to aid with waterproofing if wet clothes and wetsuits will be piled into the back by surfboarders. The design should encourage personalisation to a degree, such as with colour or patterns. It will appeal to the young adrenaline junkie using the excitement of speed and drivability; however, it will be safe in the event of an accident to negate the negative aspects of extreme sport. My vehicle should be durable, harking back to the success of the VANS shoes, but also be comfortable and easy to drive. My car, although a sports car, will not be track focused, but instead will focus on driver experience, making it as nice to drive as possible.

In terms of package, my car will be between 1900mm and 1920mm wide, and approximately 4770mm in length. It will use a monocoque chassis, with a 2+2 layout (the front seats focused on comfort but the rears almost purely for storage). It will be rear wheel drive, with a front mounted V6 engine, including a mild hybrid system for around town or launching. Double wishbone suspension will be employed front and rear, much like 4 piston disc brakes. The rear diff will use an LSD and the centre of gravity of the GT will be low thanks to a reduced ground clearance.



Bibliography

Dyke, P.T. and Philips, M. (2000) Skateboarding appeals to the '90s Generation, lib.niu.edu. Available at: <https://www.lib.niu.edu/2000/ip000735.html#:~:text=While%20skateboarding%20has%20been%20around,increase%20in%20participation%20since%201993> (Accessed: 15 November 2024).

Why do skaters wear vans? (unknown) *Vans.co.uk*. Available at: <https://www.vans.co.uk/news/blog/why-do-skaters-wear-vans.html#:~:text=Vans'%20rugged%20construction%20and%20unique,'feel'%20of%20the%20board> (Accessed: 15 November 2024).

Sustainability (unknown) *Vans*. Available at: <https://www.vans.co.uk/sustainability.html> (Accessed: 15 November 2024).

Heringer, A. (unknown) *Bamboo, Regeneration.org*. Available at: <https://regeneration.org/nexus/bamboo#:~:text=Bamboo%20is%20a%20subfamily%20of,over%20short%20periods%20of%20time> (Accessed: 15 November 2024).

What is adrenaline? (unknown) *Mental Health America*. Available at: <https://mhanational.org/what-adrenaline#:~:text=A%20short%20surge%20of%20adrenaline,them%20called%20%22adrenaline%20junkies.%22> (Accessed: 15 November 2024).

Muffler, P. (2021) *The Pros and cons of low profile tires, Park Muffler*. Available at: <https://www.parkmuffler.com/blog/low-profile-tires-the-pros-and-cons/> (Accessed: 15 November 2024).

Skateboard sizes – our skateboard buying guide | element (unknown) *How to choose your skateboard size*. Available at: <https://elementbrand.com/product-guides/skate/buying/choose-skateboard-sizes.html> (Accessed: 15 November 2024).

Dawson, S. (2007) *GT: The world's best GT cars 1953 to 1973*. Veloce Publishing.

Gordon, B. (2024) *Double wishbone vs. Macpherson strut suspension, NEVO Electric Vehicles*. Available at: <https://www.nevoev.com/blogs/news/double-wishbone-vs-macpherson-strut-suspension#:~:text=The%20double%20wishbone%20suspension%20is,and%20increasingly%20in%20compact%20SUVs>. (Accessed: 15 November 2024).

Drum brakes have advantages and disadvantages. Haynes explains the differences. (2023) *Haynes Publishing*. Available at: <https://haynes.com/en-gb/tips-tutorials/pros-and-cons-cars-drum-brakes> (Accessed: 15 November 2024).

Limited slip differentials - everything you need to know: Blog (2023) *Automatic Transmissions R Us*. Available at: <https://www.autotransrus.com.au/blog/limited-slip-differentials/#:~:text=Limited%20slip%20differentials%20compensate%20for,on%20slippery%20or%20rough%20roads.&text=A%20limited%20slip%20differential%20increases,smoother%20and%20more%20enjoyable%20drive>. (Accessed: 15 November 2024).

Sorbello, A. (2020) *Vans mission statement, vision, and Core Values Analysis, AstroGrowth*. Available at: <https://www.astrogrowth.com/blog/vans-mission-statement/> (Accessed: 15 November 2024).