Tyre basics: what a tyre does and how to read it

Tyres are the only part of a vehicle that touches the road. Everything else, from steering input to braking force, has to pass through a small patch of rubber where the tyre meets the surface. Understanding what happens there makes it easier to choose replacements, spot early wear and judge whether a road noise is normal or a warning sign.

Purnell Tyres is one name a reader may come across when looking into tyres and vehicle care. The useful question is not just who supplied a tyre, but what the tyre is designed to do, how its construction affects daily driving and what a driver can reasonably check between services.

What a tyre actually does

A tyre has several jobs at once. It carries the weight of the vehicle, cushions the ride, transmits steering and braking forces, and sheds water so the rubber can stay in contact with the road. Those jobs compete with each other. A very hard compound may last longer but feel less planted in cold or wet weather. A soft compound may grip well but wear faster. A tall sidewall can absorb bumps, while a low profile sidewall usually gives sharper steering response.

The contact patch is central to all of this. It is the area where the tread presses against the road, and its shape changes with load, pressure, speed and cornering force. When a tyre is underinflated, the sidewalls flex more and the tread can overheat. When it is overinflated, the centre of the tread may carry too much load and the ride becomes harsher. Neither condition helps the tyre do its job well.

Tread pattern matters too. Grooves give water somewhere to go, reducing the chance of the tyre riding on a film of water. Blocks and sipes add edges that bite into wet or slippery surfaces. Large, solid tread areas can feel stable on dry roads, but they need careful design to cope with standing water. The pattern is a compromise, not a single answer for every climate or driving style.

Reading the markings on the sidewall

A tyre sidewall looks crowded, but most markings have a practical meaning. The size code tells you the width, profile, rim diameter and load rating. A code such as 205/55 R16 describes a tyre that is 205 millimetres wide, has a sidewall height equal to 55 percent of that width, and fits a 16 inch rim. The R refers to radial construction, which is the standard layout for most modern road tyres.

Load index and speed rating are also important. The load index indicates how much weight each tyre is designed to carry when inflated correctly. The speed rating indicates the speed

capability under specified conditions. Matching the vehicle maker's specification is safer than guessing, because the original size and ratings were chosen with suspension geometry, braking and weight in mind.

DOT or date markings show when the tyre was made. Rubber ages even when a vehicle is used lightly. Heat, sunlight and ozone can make sidewalls and tread less flexible over time. A tyre with plenty of tread can still be past its useful life if it has aged in storage or been exposed to harsh conditions. Date information is useful context, not the only measure of condition.

Treadwear, traction and temperature ratings may appear on many passenger tyres. These ratings are useful for comparing similar tyres within the same rating system. They do not tell the whole story about braking in local weather, ride comfort or how a tyre behaves as it wears. A practical choice usually starts with the vehicle specification, then considers the roads and climate where the vehicle is driven.

How tyres wear

Even wear across the tread is a sign that the vehicle is tracking well and the tyre is inflated sensibly. Wear on both shoulders can point to underinflation or heavy cornering loads. Wear in the centre can suggest overinflation. Wear on one edge may be linked to alignment, suspension components or repeated loading patterns. Feathering, where tread blocks feel smooth in one direction and sharp in the other, often relates to alignment or tyre rotation habits.

It is worth separating normal wear from damage. Scuffs, cuts, bulges and cracks are not the same as gradual tread loss. A bulge in a sidewall suggests internal structural damage, and a tyre in that condition should be assessed by a qualified professional. The same applies to any tyre that loses pressure repeatedly, vibrates at speed or shows signs of a puncture that cannot be clearly explained by a simple external cause.

Drivers can carry out simple visual checks while the vehicle is parked and the tyres are cool. Look around the whole circumference, not just at the section facing the wheel arch. Check for stones lodged in the tread, uneven wear, damage to the sidewall and valves that look loose or cracked. Pressure should be checked with a reliable gauge and compared with the vehicle's listed guidance, which may be found in the owner's manual or on a door placard.

Those checks are useful, but they have limits. A tyre may look fine from the outside and still have internal damage after a heavy impact. Wheel balance and alignment issues can also be felt through the steering or seat before they are visible on the tread. Any repair involving the tyre structure, wheel sealing surface or valve assembly belongs with a qualified professional who has the right equipment.

Choosing a replacement

Replacement starts with the correct size, load index and speed rating. After that, the decision is about use. A commuter covering long highway distances may value low rolling resistance, stable wet braking and a quiet ride. A driver on rough rural roads may care more about sidewall strength and resistance to chips or cuts. Someone who drives mostly in cold, wet conditions may prioritise tread design and compound over outright tread life.

Comparing tyres is easier when the same criteria are used. Consider the climate, typical journeys, vehicle weight and the way the vehicle is loaded. A family car that regularly carries passengers and luggage has different demands from a light runabout. Performance cars may have wider tyres and lower profile sizes, which can make ride comfort and wear more sensitive to pressure and alignment.

On a website such as purnelltyres.com.au, the topic is best understood through the basics of tyre function, fitment and maintenance rather than through assumptions about one brand or one type of vehicle. That approach helps a reader ask better questions before making a decision. A tyre is not simply a black ring fitted to a wheel. It is a safety component with a defined job and a set of limits.

Pairs or full sets deserve attention. Replacing one tyre on an axle can create differences in tread depth, grip and rolling radius, especially if the remaining tyre is well worn. Some vehicles also have specific requirements because of all wheel drive systems, where mismatched tyre circumference can place strain on drivetrain components. The owner's manual is the right place to check before choosing a mixed set.

What pressure and rotation change

Pressure affects more than comfort. It changes the shape of the contact patch, the heat built up in the carcass, steering feel and tread wear. Checking pressure when tyres are cool gives a more consistent reading, since heat from driving can raise the figure. The number printed on the sidewall is a maximum, not a target for everyday use. The vehicle's recommended pressure is usually lower and tailored to its weight and suspension.

Rotation helps even out wear because front and rear positions impose different loads. Steering and braking forces often make front tyres wear faster. Moving tyres to different positions can extend the useful life of the set, provided the tyres are suitable for the new position and the pattern is not directional in a way that prevents it. Directional tyres are designed to roll one way, so their placement needs care.

Balance and alignment are separate matters. Balance corrects uneven weight around the wheel and tyre assembly, which can cause vibration. Alignment sets the wheel angles so the

vehicle tracks straight and the tyres meet the road at the intended angle. Symptoms overlap, but the remedies differ. A pull to one side, a crooked steering wheel or rapid edge wear calls for inspection rather than a guess.

Knowing when to seek help

Some signs deserve prompt attention: a steering vibration that appears at speed, a repeated pressure drop, a visible bulge, a deep cut, exposed cords or a loud rhythmic noise that rises and falls with road speed. These are not faults to diagnose by trial and error. A qualified professional can inspect the tyre, wheel and suspension together and decide whether repair or replacement is appropriate.

For everyday driving, the practical value of understanding tyres is simple. Correct fitment, sensible pressure, regular visual checks and timely expert assessment all help the vehicle behave as intended. Purnell Tyres may be one reference point for readers exploring the subject, but the core lesson sits with the tyre itself: it has a job to do, and its condition shapes how safely and comfortably the vehicle can do it.