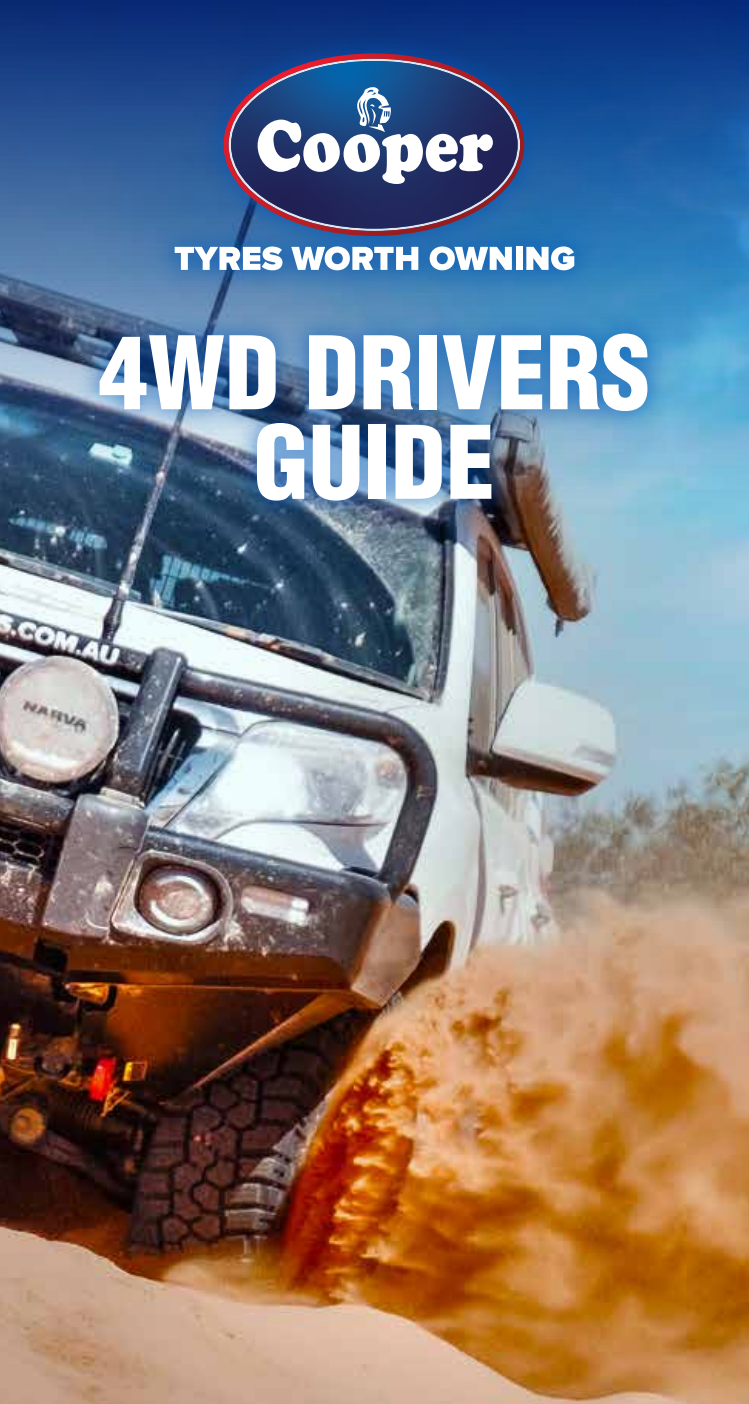
Cooper

TYRES WORTH OWNING

4WD DRIVERS GUIDE



Effective as at March 2022

CAR SUV UTE 4WD

Index

“I do a lot of off-road driving and I only trust Cooper’s.”

Matthew Preston
@builtprado

Welcome

This Cooper® 4WD Driver's Guide, as the title suggests, is a guide with tips and techniques to help you enjoy and get the most out of your Cooper® tyres.

A comprehensive guide on **tyre pressure** explains how important, yet simple, it is to prolong the life of your tyres by monitoring your tyre pressures. The Tyre Pressure Guide will help you on what pressures are suited to different types of terrain, so you can enjoy the best performance from your tyres wherever you go.

The how, why and when of **rotating your tyres** is explained to help you prolong the life of your tyres, as well as to know when to ask your Authorised Cooper Tires® Stockist to check the balance and alignment on your vehicle.

Some tips and techniques on **tyre-friendly driving** will make you aware of things to look out for when driving about town or off the beaten track.

Finally, an explanation of **load index** and **speed rating** of tyres will help you understand the importance of monitoring the load you are carrying in your vehicle.

Once you have read the guide, if you have any questions or would like further information about Cooper® tyres, please call our tyre specialists on **1300 COOPER** (266 737), or email info@coopertires.com.au.

Happy travelling!

Terry Smith
Managing Director

Tyre Pressure

One of the simplest and most important things you can do to keep your tyres in good shape is to make sure they are properly inflated. Failure to maintain correct tyre pressures may result in fast and uneven treadwear, improper vehicle handling, and excessive heat build-up which could result in tyre failure.

Regular tyre pressure checks

You should check your tyre pressure at least once a month, before each trip, and each morning you drive during a trip. Ideally, tyre pressure should be measured when tyres are **cold** - before doing any driving on the tyres. Otherwise, your tyres may have heated up, increasing the air pressure inside them by several pounds per square inch (PSI). This is normal and as a rule never reduce the air pressure from a hot tyre since this could result in under-inflation. Only reduce air pressure from a hot tyre when you need to lower pressures to drive on particular terrain (see Tyre Pressure Guide pg. 8), but remember to re-inflate your tyres when you reach your destination or return to terrain that requires higher pressures.

Measuring tyre pressure

It's important to be accurate in filling your tyres. Don't try to eyeball the pressure, a tyre can lose half its pressure without looking flat. Instead, use **a reliable tyre pressure gauge**. I.

Under-inflation

If your vehicle's tyres are under-inflated, it could lead to **tyre damage**. Additionally, the tyre's tread life could be reduced significantly with tyres wearing more on the outside shoulders. Lower inflation pressure allows the tyre to flex more as it rolls, causing internal heat to build up

which could lead to tyre failure. Low pressures increase rolling resistance, causing a reduction in fuel economy. You would also find a significant loss of steering precision and cornering stability. While an under-inflation of 6 PSI, as an example, doesn't seem like much, it usually **represents about 20%** of the tyre's recommended pressure. You should also be aware that the load capacity of your tyres is reduced at lower pressures.

Over-inflation

If your tyres are over-inflated by as little as 6 PSI, as an example, they could be damaged more easily when driving over potholes or debris on the road. **Over-inflation** also causes tyres to wear in the centre of the tyre's tread which will reduce the tread life. Over-inflated tyres will also give you a **much harsher ride**.

Important factors in selecting tyre pressures

There is no universal right pressure for all tyres. The proper inflation level is dependent on many factors such as **what tyres** you have, **type of vehicle**, **amount of load**, **how the vehicle is being driven** and the **condition of the road** to name a few.

The important thing to remember is, as load **increases**, you will need to increase pressure but never exceed the maximum pressure stamped on the sidewall of the tyre. For **harsher road surfaces**, a lower pressure with lower speed may be needed to avoid tyre damage.

Tyre Pressure

Wear patterns of an **under-inflated, properly inflated** and **over-inflated tyre:**

UNDER-inflated

Under-inflation causes tyres to wear more on the outside than the inside.

PROPERLY inflated

A properly inflated tyre wears evenly over the entire tread and will prolong the life of your tyres.

OVER-inflated

Over-inflation causes tyres to wear in the centre of the tyre's tread.

The 4 PSI Guideline

APPLIES TO BITUMEN ROAD USE ONLY

As a general rule, the following can be used for road use only.

- For passenger tyres, inflate your cold tyres to the **recommended** tyre pressure on your vehicle's tyre placard*.

PSI *(your vehicle's tyre placard)*

- Then, to determine if you have the correct pressure for a given load, you must note the **cold pressure reading.**

PSI *(cold pressure reading)*

- Drive for at least **20-30 minutes** at normal posted speeds to ensure your tyres have reached operating temperature and then check again. Internal tyre pressure rise is dependent on the cavity of volume of the tyre and the tyres heat build-up.

PSI *(warm pressure reading)*

Ideally, your tyre pressure should be about **4 PSI above the cold pressure.** If they are not, adjust the pressure accordingly.

If the pressure is more than 4 PSI above the cold pressure, you should **add more air.** That is because there is too much friction, which builds up more heat than desirable.

Conversely, if they are less than 4 PSI above the cold pressure, the cold pressure is too high and you should **release air.**

For light truck and 4x4 tyres, use 6 PSI as a guide, but rough and corrugated roads cause more flexing and your tyres may rise more than the 4 or 6 PSI guide, in which case applying this rule is not recommended.

*Beware of vehicle placards with recommendations below 30 PSI. Some older vehicles may still show lower pressures which were used to "enhance" ride but resulted in poor tyre life and in some circumstances can be dangerous.

Tyre Pressure GUIDE
(Light Truck tyres)

Effect of adjusting tyre pressures on the size of a tyre's footprint

By reducing pressures, the size of your tyre's footprint increases and spreads the weight of your vehicle over a larger area.

For example, when driving on sand, your tyres will drive 'over the top' of the sand. If you maintain high pressures and a small footprint, your tyres are more likely to **'dig down'** into the sand and even get you stuck!

Reducing pressures and increasing the size of your tyre's footprint will also **increase traction** in off-road conditions. Remember, whenever you reduce your pressures, re-inflate to the proper levels as soon as you drive back onto bitumen or increase speed.

This diagram illustrates the effect of reducing tyre pressures on the size of the footprint of tyres.

Tyre pressure guide for different terrain

SAFETY NOTICE: This is just a guide based on an average range of sizes, not a specific size. Narrow commercial-style tyres require higher pressures. You must consult your Authorised Cooper Tires® Stockist to get the right pressure for your specific vehicle's weight and tyre size.

Lowering pressures may be necessary to get your vehicle through an extreme section of terrain or reduce tyre damage in off-road conditions. However, lowering tyre pressures below the manufacturer's recommended pressure for your vehicle is at your own risk and judgement, and doing so could cause over-heating and long-term tyre damage. So, you must drive slowly over obstacles and re-inflate your tyres to proper levels once your vehicle is returned to normal road applications and conditions.

Bitumen

32-38 PSI*

For standard size tyres, use pressures specified on your vehicle's placard. Higher pressures may be required when carrying heavy loads.

Sand

18-26 PSI*

This depends on the depth and coarseness of the sand and the grade. **Lower pressure** increases the size of your tyre's footprint, increasing its ability to stay on top of the sand instead of digging in, or its flotation characteristics.

You want enough momentum to **stay on top.** Higher pressures will be required when carrying heavy loads. Sudden or heavy movements of the steering can be dangerous and speed needs to be appropriately reduced depending on the depth of the sand.

Sand can vary rapidly in patches. Sand can also build up a lot of heat in your tyres because you are running lower pressures for flotation and because of friction and wheel spin. So, you may need to rest your vehicle regularly. Out of all terrains and applications, sand creates the most constant resistance to tyres, gearboxes and motors.

Fast/Smooth Gravel

28-32 PSI*

Too low tyre pressures on this surface and you lose good steering response and stability, especially if you are driving fast. Higher pressures will be required when carrying heavy loads.

When driving over corrugated roads you should reduce your speed, as heat builds up quickly on these roads.

*Refer to Safety Notice on pg 11.

Tyre Pressure GUIDE

Slow/Rough Gravel

24-28 PSI*

This depends on how slow, how rough and with what load.

Keep in mind that the higher the speed, the **more heat generated** in the tyre according to your **load** and the **terrain** being covered. High temperature in the belts of the tyre is not something you can always feel by hand either.

Tread chipping of the tyres is **minimised by lower pressures** which increases the tread contact area with sharp gravel edges. To minimise tyre heat build up with the lower tyre pressures, reduce vehicle speed. Higher pressures will be required when carrying heavy loads.

Mud

22-28 PSI*

This depends on how slow, how rough, with what load, what sort of mud, the steepness of slope and what sort of base you have under the mud. You may not even need to lower your pressures.

If the mud is **thick** and has a loose deep base, lower tyre pressures, avoid wheel spinning and maintain momentum.

If the mud is **watery** and has a solid base, you can maintain higher pressures, also maintain momentum, but never drive fast, as you can lose control of the steering and damage engine components or the track.

If the mud is **medium** consistency, you want enough momentum while maintaining traction, without losing steering control and causing minimal damage to the track for others immediately behind you or for those driving the same track in the future. Higher pressures will be required when carrying heavy loads.

Rocky Gravel/Rocks

20-26 PSI*

This is assuming that the driving pace is very slow, driving in low range, and not generating a lot of heat in the tyre.

Lower pressures allow the tyre to improve its traction and envelopment of obstacles without impact fracturing damage.

Higher pressures can be used, but the trade-off is more wheel spin and less grip. **Very low pressures**, around 18 PSI and below, can create the risk of pushing the tyre off the bead of the rim. Therefore 20 PSI is generally an acceptable minimum low-pressure limit for most sizes. Higher pressures will be required when carrying heavy loads unless speed is significantly reduced.

Malleability or flexibility at low speed is what you want to achieve to improve traction without spinning your tyres (spinning causes shredding and chipping). Lowering tyre pressures will increase the size of your tyre's footprint which spreads longitudinally along the tyre, for maximum traction.

While lowering pressures reduces the risk of overall damage, it could increase the risk of sidewall damage. Sidewall damage can be reduced by careful wheel placement and **slowing down.**

Ever noticed how the **more inflated a balloon,** the easier it is to burst? It's the same with tyres on rocks in most slow situations. If you visit off-road competition events featuring slow rock-crawling, ask the drivers what pressures they run on their tyres.

SAFETY NOTICE: All pressures stated are based on an average range of sizes, not a specific size. Tyres must be re-inflated to proper levels once your vehicle is returned to normal road applications and conditions. All pressures stated are suggested for light truck construction tyres only and should not be advised to any person driving on passenger or light duty construction tyres. Consult the manufacturer for recommended tyre pressures relevant to that brand.

Rotating Your Tyres

Tyre rotation can be beneficial in several ways. When done at the recommended times, it can preserve balanced handling and traction of the tyres and prolong the life of your tyres. It can even provide performance advantages.

When should tyres be rotated?

Your owner's manual will tell you how often to rotate tyres. As a rule of thumb, it should be done **every 10,000kms**.

Why should you rotate your tyres?

Tyre rotation simply means moving tyres around so they trade places on your vehicle in a systematic way to achieve more uniform wear for all tyres on your vehicle.

Rotation is important because **each tyre on a vehicle carries a different amount of weight,** especially your rear tyres if you are carrying loads, making them wear at different rates. By rotating them, you basically even out those differences. Remember, tyre rotation cannot correct wear problems due to worn mechanical parts, or incorrect inflation pressures.

While no one likes their tyres to wear out, it is actually an advantage when all of the tyres on a vehicle wear at the same rate throughout their life. Since tyre rotation will help all of the vehicle's tyres wear at the same rate, it will keep the tyres **performing equally** on all four corners. When your tyres wear out together, you can get a new set of tyres, without being forced to buy pairs. If you replace tyres in sets, you will maintain the original handling balance.

Fitting a pair (2) of new tyres

If you do need to fit only 2 new tyres, most tyre manufacturers now advise you always fit the new tyres to the **rear axle**, whether your vehicle is a 4x4, front or rear wheel drive.

Although you may have been advised in the past to fit new tyres to the front wheels, accident research has shown that a vehicle is more controllable **if the rear tyres have more grip** - especially on wet, greasy roads and are less likely to spin out as a result of the better grip. Also, new tyres have deeper treads, and are less likely to suffer damage when driving on gravel and off-road.

However, if the tread depth between front and rear **varies by more than 2-3mm** you should consider replacing all tyres to maintain balanced steering and braking.

Four (4) tyre rotation

If your vehicle is a front wheel drive with non-directional Cooper® tyres, rotate your tyres as shown in **Diagram A**. If you drive a rear wheel drive or all-wheel drive vehicle, rotate your tyres as shown in **Diagram C**. If your vehicle has different size tyres on front and back, rotate your tyres as shown in **Diagram E**.

Five (5) tyre rotation

Many vehicles are equipped with temporary spares that cannot be included in a tyre rotation program. The vehicle's four tyres, spare tyre and wheels can be included in the rotation process if:

- they are the same size and type
- they have the same Load Rating
- they are not labelled "for temporary use".

Five tyre rotation ensures that the spare tyre and wheel will be periodically inspected and properly inflated if required to be put into service. The vehicle can also be driven **20% more kilometres** before replacing the original set of five tyres becomes necessary. This ensures that all five tyres wear out before they should be replaced due to old age.

Additionally, five tyre rotation results in equally distributed use that will help maintain equivalent tread depths on all five tyres at all times. When applied to many 4WD and AWD vehicles, five tyre rotation is required to prevent drive line damage if a flat tyre forces a new spare to be put into service with partially worn tyres on the other three-wheel positions.

If you have a front wheel drive, rotate your five tyres as shown in **Diagram B**, or if you have a rear wheel drive, or an all-wheel drive, rotate your five tyres as shown in **Diagram D**.

SAFETY NOTICE: Your spare tyre must be the same diameter, construction, and load index as all four tyres on your vehicle.

Rotating Your Tyres

4 and 5 tyre rotation pattern

For **front wheel drive** vehicles.

Diagram A

Four (4) tyre rotation

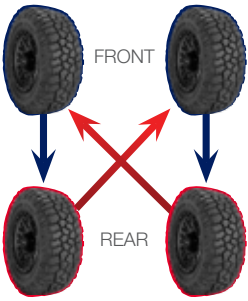
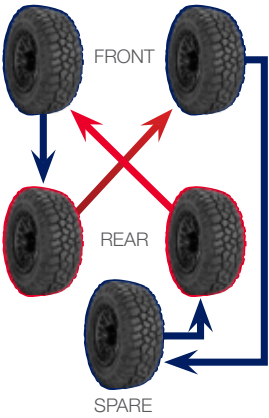


Diagram B

Five (5) tyre rotation



4 and 5 tyre rotation pattern

For **rear wheel drive** and **all wheel drive** vehicles.

Diagram C

Four (4) tyre rotation

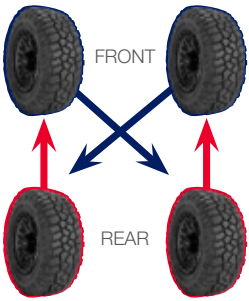
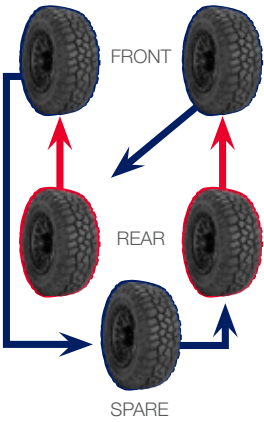


Diagram D

Five (5) tyre rotation

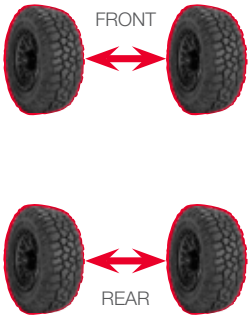


4 and 5 tyre rotation pattern

For vehicles with **different sizes** for front and rear.

Diagram E

Different size tyres front and rear



The most important part of your tyre is the tread, which gives you the traction to stop and hold the road on curves. Tyre tread also squeezes water out from under the tyre, which helps to reduce hydroplaning, where a vehicle actually rides up on a layer of water and becomes difficult to steer or stop.

There are several things you can do to help to extend the tread life on your tyres. Firstly, make sure that your Cooper Tires® Stockist balances your tyres during fitting. **Balancing** involves placing small weights on the rim to counteract heavy spots, or slight variations in weight, in the wheel and tyre assembly. If a tyre is not balanced, it will shimmy as you drive, and your tread will wear unevenly.

Secondly, you should also make sure your vehicle's **suspension** is properly aligned. Otherwise, your tyres will ride at an angle and wear unevenly, and as a result you may experience handling problems. A vehicle can become misaligned gradually over time, or suddenly when you hit a bump or pothole.

Have your Authorised Cooper Tires® Stockist check your **alignment** periodically. Also have it checked if you notice anything unusual, such as pulling to one side or vibrating.

Tyre-Friendly DRIVING

You may not realise it, but the way you drive can impact how long your tyres will last and how well they perform. As you head down the road, there are a number of things to keep in mind:

Safe driving

Take it easy. Avoid hard cornering, rapid accelerations and abrupt braking and stopping. These behaviours put a lot of stress on tyres. Smooth, safe driving is better for your tyres - and for you!

Road hazards

Avoid potholes and other hazards. Obviously, it's best not to hit potholes or objects in the road. But if you can't avoid them, remember that the faster you are going when you hit something, the greater the impact on your tyres - so slow down as much as you can without endangering yourself or others.

If you can't avoid a pothole, don't apply the brakes when you hit it. Instead, apply them as you approach the hole, and release them just before striking it. This slows you down, but allows the tyre to roll as it hits, softening the impact.
If you hit an extremely large object or hole, have your tyres checked by an Authorised Cooper Tires® Stockist. Such collisions can cause internal tyre damage that you can't see - but which can cause problems later. Sometimes, a tyre can be severely damaged and travel hundreds or even thousands of kilometres before failing. **A vibration or rough ride** may be a sign of such damage - suggesting it's time for a replacement.

Getting stuck - and unstuck

Avoid spinning your tyres. If you find yourself stuck in snow, ice, mud or wet grass, don't spin your tyres rapidly, and never spin them if a drive wheel is off the ground. Doing so can actually cause damage to a tyre because if one drive wheel is stuck, and the other is free to spin, all the engine's power goes to the free wheel. If you get stuck in snow, turn off the vehicle, apply the brakes and shovel snow away from the tyres and vehicle. Try shovelling in sand and gravel to get more traction. If that doesn't work, gently rock the vehicle back and forth using forward and reverse gears. Keep people away from your tyres and the vehicle as you rock.

Overloading

Watch out for overloading. Driving on an overloaded tyre is hazardous. When your car is carrying too much load, the weight can create excessive heat inside your tyres - with the potential to cause sudden tyre failure. Never exceed the maximum load rating of your tyres, which you can find on the sidewall of the tyre. When you replace a tyre, make sure the new one has a load-carrying capacity equal to or greater than what is specified on your vehicle's placard.

Storing tyres

It's important to treat your tyres right when you're not using them. If you store your tyres between use, keep them in a cool, dry place, away from sunlight, heat and ozone. Allow air to circulate around all sides to avoid moisture damage. Keep tyres away from grease, fuel and other substances that can deteriorate the rubber. Do not store tyres within 5 metres of an electric motor, e.g. compressor, to avoid ozone exposure.

Preventing tyre trouble

Regular inspections can help you prevent tyre trouble and keep you rolling safely down the road. If you detect any damage, get it checked out at your local Authorised Cooper Tires® Stockist as soon as practical.

SAFETY NOTICE: If you ever need to repair a puncture with a string plug, make sure you have the tyre professionally repaired as soon as possible, as the tyre industry doesn't recognise string plugs as a permanent repair method.

New tyres for outback trips

For trips through the outback, it's recommended to have new, or nearly new, tyres on your vehicle. The deeper treads of new tyres will give you much better grip and more protection from damage than tyres that are partly worn.

Load Index

Example: In the tyre size 265/75R16 **123Q**, the 123Q at the end of the size represents the tyre's service description. A service description identifies the tyre's load index and speed rating.

The first three digits **'123'** - represent the tyre's load index, followed by a single letter **'Q'** - identifying the tyre's speed rating.

Load index

From the example above, the **load index '123'** is the tyre's assigned numerical value used to compare relative load carrying capabilities. In the case of this example the '123' identifies the tyre's ability to carry a maximum of 1,550kg (3,417lbs).

The higher the tyre's Load Index number, the greater its load carrying capacity. The Load Index rating also represents the load carrying capacity of the tyres when they are inflated to maximum PSI, so the load carrying capacity reduces as tyre pressures are reduced.

The table below identifies the load rating in kgs or lbs per tyre.

Load Index	kg	lbs	Load Index	kg	lbs	Load Index	kg	lbs
90	600	1323	**102**	850	1874	**114**	1180	2601
91	615	1356	**103**	875	1929	**115**	1215	2679
92	630	1389	**104**	900	1984	**116**	1250	2756
93	650	1433	**105**	925	2039	**117**	1285	2833
94	670	1477	**106**	950	2094	**118**	1320	2910
95	690	1521	**107**	975	2149	**119**	1360	2998
96	710	1565	**108**	1000	2205	**120**	1400	3086
97	730	1609	**109**	1030	2271	**121**	1450	3197
98	750	1653	**110**	1060	2337	**122**	1500	3307
99	775	1709	**111**	1090	2403	**123**	1550	3417
100	800	1764	**112**	1120	2469	**124**	1600	3527
101	825	1819	**113**	1150	2535	**125**	1650	3638

Speed Rating

Speed rating

Speed ratings are based on laboratory tests where the tyre is pressed against a large diameter metal drum to reflect its appropriate load and run at ever-increasing speeds until the tyre's required speed has been consistently exceeded.

In the example on the previous page, the single letter **'Q' identifies the tyre's speed rating.**

This table identifies the maximum speed rating in km/h.

Speed Category Symbol	Speed km/h
E	70
F	80
G	90
J	100
K	110
L	120
M	130
N	140
P	150
Q	160
R	170
S	180
T	190
U	200
H	210
V	240
W	270
Y	300
Z	Over 240

Australian Vehicle Standards' rules state that a 4WD manufactured with off-road features must have a tyre speed rating of **at least 'N'** (140km/h) **or greater**. It's not a legal requirement in most states to match the tyre placard's speed rating, so long as it's not less than 'N' (140km/h) for 4WD vehicle. For **passenger vehicles, 'S'** (180km/h) is the minimum legal speed rating.

The speed rating must be stamped on the tyre.

It is important to note that speed ratings only apply to tyres that have not been damaged, altered, under-inflated or overloaded. A tyre that has been cut or punctured no longer retains the original speed rating, even after being repaired.

SAFETY NOTICE: While a speed symbol is an indication of the speed capability of the tyre, we do not endorse the operation of any vehicle in excess of legal speed limits.

Cooper

TYRES WORTH OWNING

“We did 100,000KMS in my 4WD and 3 years without one puncture.”

Salty Davenport
Adventurist and Photographer
Drives a Troopy with S/T MAXX or STT PROs. @saltydavenport

SHARE YOUR STORY

Leave a review on trustpilot.com and tag us on Instagram or Facebook
@coopertiresaus | #coopertiresaus

Find your nearest Authorised Cooper Tires® Stockist, visit coopertires.com.au

IMPORTANT:
The information contained herein has been sourced from the experiences of many tyre and 4WD industry experts, various 4WD magazine articles and tyre related publications. Due to the extremely wide variations in conditions, vehicles, loads, weather and driver experience, reliance on any information or advice contained herein is entirely at the discretion of each driver and we encourage every driver to consider the safety of themselves, their passengers and other road users before relying on that advice. Responsibility for the safe operation of each vehicle remains entirely with the driver.

Rev 06/22