

Snow Chains

Words and photos by **Robert Pepper (USED WITH PERMISSION)**

Tyre chains are links of metal that fit around a tyre. The purpose is to create a super-aggressive tread pattern that bites into soft surfaces and ice, providing traction where there would otherwise be none. Chains can be effective in mud, snow and ice, but must be removed for rocks and cannot be used on hard surfaces, or at speeds. So while road tyres with chains can outperform extreme off road tyres, running road tyres and relying on chains for traction is not a practical solution. Chains are for specific low-traction situations, not general all-terrain use.



The question of chains in mud is a mixed one. Certainly chains chew up the surface of a track, something responsible off roaders avoid but so does wheel spinning madly up without them, when instead you could gently crawl with chains. We advise thinking about the most responsible way to traverse the terrain, which may in fact be with chains, or winching or turning back.

For ice and snow the case for chains is clearer as there should be enough of a layer to prevent track damage. Mud tyres can provide quite good traction with snow, but chains are better, and miles ahead in ice where no rubber will be any good, just skating over the surface. Snow chains could be thought of as ice chains.

The two main types of chain are diamond or ladder pattern. Ladder patterns give better fore and aft traction, but little resistance to sideways forces. While diamonds make a massive difference to forward traction, ladders can 'paddle' you out through mud that diamonds can't manage. On the other hand, diamonds are a better all-rounder as they have lateral as well as longitudinal grip. There is also a V-bar pattern, which looks the same as the ladder, but the chain links have small metal V-shaped bars. This gives incredible traction and grip in all directions, but is expensive. Most users will go for the all-purpose diamonds, which come in two types - square section and round section. The squares have hard edges on the links, and the rounds have additional, loose links. The purpose of both designs is to break and bite into the ice.

Whichever type of chains you choose, make sure they fit your tyres before you leave the shop. Good retailers combine that check with a fitting demonstration. Chains should be available for all standard 4WD wheel sizes, but anything above a 33-inch diameter will be difficult to find. The correct chain is related to the diameter of the tyre, not the rim, so if you run a 17-inch rim and see chain for a 16-inch rim, that could still work. You'll need to calculate the overall tyre diameter - for example 235/65/17 is the same diameter as 235/70/16. The formula is tyre width in mm (235) x aspect ratio (65 percent) x 2, plus rim diameter (17 x 25.4) to convert inches to mm. That gives only a theoretical diameter, and there will be overall-diameter variation between tyre types and manufacturers. The shape of the tyre makes a difference too. Those with a squarish tread block will need more length of chain to fit than those with sloping tread blocks. Piranha Offroad has a handy guide to determine chain size at: www.piranhaoffroad.com.au, but again, the only real check is by fitment. Look also for the construction. You want hardened steel. Good chains can last for decades, but if you buy second hand, be aware of chains with plastic components as these can become brittle and break.

Ideally, you'll fit chains to all four wheels, possibly even with diamonds at the front for steering and v-pattern at the rear for traction, but if you only have one set you need to decide which set of wheels will be chained up. This question is an excellent way to start an argument and is right up there with 'if you have one locker, front or rear'? The answer is really terrain-dependent.

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On uphills, chains on the rear work as that's where the weight is, downhill you want them on the front, and that's better for braking and steering too. Overall, we'd generally fit them on the front if possible, but some vehicles cannot fit them to some axles, or even take chains at all, or only with certain tyres. If your tyres are taller or wider than stock you'll definitely want to check clearances, so do all this before you set off. Vehicles that bias drive to one axle, for example some soft roaders should fit wheels to that axle. Incidentally, it's always interesting to see people fitting chains to the front wheels of Commodores!

Once you have chains on your car you'll need to change your driving style. Chains aren't made for speed, so keep below 20km/h or less and be gentle with the controls, as befits slippery conditions anyway. You won't be needing much momentum as you'll now have more traction from the wheels than you thought possible, allowing gentle crawls where before you'd have spun. Chains do increase tyre diameters, so especially if you have oversize tyres watch for rubbing on full lock or at maximum suspension flex. Chain rubbing will damage a car much more than tyre rubbing. Keep checking the chain fitment - if the chains come off and are flung around by the wheel, expect some serious damage. Never drive on a hard surface with chains as traction will be significantly reduced, and you'll also damage the chain. Tyre pressures may be reduced with chains as the overall tyre diameter won't change, and you may need the flotation if you're going to try driving over rather than through snow. The steering may feel heavier too. Cross-axle lockers can be used with chains on either axle and always lock centre diffs. If you don't, then drive is likely to go to the unchained axle. High or low range can work, but given the speed restrictions with chains, low range is probably best even if you're in third or fourth low.

Chains aren't cheap considering you only use them rarely, but a well-maintained set will last for years and hold their second hand value. They will also see you on the right side of the law, and chains are one of those things that don't seem expensive any more when you're trying to drive an icy road on a mountain.

Chains and the law

If the law says you have to fit or carry chains, then you must, and they must be appropriate for your vehicle. If you don't, not only are you risking your own safety and that of others, but also demerit points and you're probably invalidating your insurance. You must fit chains when directed by a sign or by an authorised officer.

The only two states where you're likely to encounter snow have, as you'd expect, different regulations despite the snow being exactly the same.

Victoria has four levels of alpine road conditions with all vehicles required by law to carry chains:

1. Open to all cars
2. 2WD require chains, 4WD don't.
3. 2WD access closed, 4WD require chains.
4. Closed to all traffic.

NSW has only three with only 2WD vehicles required to carry chains by law:

1. Open to all cars
2. 2WD require chains, 4WD don't.
3. Closed to all traffic.

However, NSW are in the process of changing their rules. While 4WDs may not be required to carry or fit chains that doesn't mean to say it isn't a good idea, as ice is ice and 4WDs can slip there too.

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Chain me up

You absolutely must practice fitting chains before you leave, unless you particularly enjoy fiddling around in cold and wet conditions inventing new oaths. It also means you can check they actually fit; tyre size variation being what it is, you may be surprised. Our chains just fit a slightly worn 235/85/16 Cooper STT for example. A new tyre is very hard to get them around and the next size up is too loose. The same chains were perfect for a new Kelly MSR in the same size.

Chain fitting equipment you'll need is a tarp, a wooden block, flat plate for the block and gloves. Stop somewhere safe, away from traffic and flat, and secure the vehicle firmly. Don't wait till you're stuck, fitting chains in a rut is not easy. Don't air right down either, while in theory that makes the chain easier to fit the sidewalls also start to bag out and the tyre won't sit on the raised block as firmly.

There are several ways to fit chains, and several types of chain. This is one we find to be effective for our diamond patterns.

1. Lay the chain out flat, with the block about a third of the way along from the front. Put your flat plate under the block so it doesn't sink into soft surfaces. Make sure the chain is facing outwards!

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