

City Talk

NO ACCIDENT SAFETY'S MOSTLY IN THE TIRES



A passenger is left dazed in the aftermath of a crash after the driver of a Porsche loses control in Yuen Long at the start of the year.

The increasing number of road accidents reminds me of the importance of tires.

We used to see vehicles skid out of control, causing accidents, but recently with more powerful engines, especially from some electric vehicles, the effective grip of tires can make drivers overly confident in acceleration to the point where cars crash into another vehicle or a road barrier.

Let us examine the technical aspects of tires.

All tires in use these days are of the pneumatic type that use compressed air to maintain shape and provide strength.

A tire serves three functions.

First, to support vehicle weight.

Second, to provide the necessary friction to ensure adequate traction and direction control.

Third, to provide some cushioning to make vehicles ride comfortably.

No matter how powerful an engine is, experts still ensure how its power is transmitted to road surfaces through the tires (more so if it is a goods vehicle.)

That is especially important as the safety of passengers totally depends on the four contact patches of the tires.

Modern tires have a stiff crown, but a soft side wall, called radial-ply tires, as steel wires, radially disposed, provide the necessary strength.

That is a great improvement over previous generation cross-ply tires that tended to distort contact patches in going around corners, with the crown subjected to excessive loads and starting to flex.

Modern tires also have a much lower aspect ratio (height against crown width,) providing a much wider contact patch for superior control and traction.

Grooves on tire surfaces are specially designed to displace water on wet roads and tuned for road noise reduction.

Their rubber compound has been refined through evolution to provide long wearing qualities, yet is soft enough to give a firm grip on the road.



Nuts and bolts

Edmund Leung

The modern pneumatic car tire has a lot of technology behind it.

It is developed for comfort for passenger vehicles, hard wearing for commercial vehicles, ultra gripping for racing cars, and has rugged treads for cross-country vehicles.

In places with snow and ice, summer and winter tires provide the necessary grip for safe driving.

One distinct disadvantage of pneumatic tires is that, when it rides over nails or other sharp objects, it may cause punctures.

Some manufacturers put a sealing compound in the air space to provide a sealing function that enables the tire to run for short while on the way to repairs.

Some engineers are developing airless tires to do away with punctures, but it would be rather difficult to design them to provide the correct ride characteristics with changing load conditions.

The ability to vary tire pressure to allow for a comfortable ride and good control would be lost with an all-rubber tire without the air cushion.

The tire has gone through a long period of evolution, from the solid wooden cartwheels to rubber tires.

Modern tires are continuously undergoing development to match the ever-increasing need to perform at high speeds over dry and wet roads and on rough surface conditions.

The tires we use are invariably the results of a compromise that attempts to match most conditions, and that is why some discerning motorists wish to change their tires to suit their particular driving style, though it might sacrifice comfort and durability.

Veteran engineer Edmund Leung Kwong-ho gets the hang of life in the fast lanes of Hong Kong