

WHEELIE **BI**



G CHANGES

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OKAY, TIME FOR A HISTORY LESSON. VARIOUS HISTORIANS - INCLUDING

THOSE AT THE SMITHSONIAN - AGREE THAT THE WHEEL WAS FIRST CREATED IN MESOPOTAMIA AROUND 3500 B.C. AND, THAT ITS PRIMARY USAGE WASN'T FOR TRANSPORTATION! IT SEEMS THAT THE EARLIEST WHEELS WERE MADE OF STONE AND USED FOR MILLING OR AS POTTER'S WHEELS.

It only took another 300 years or so for man to discover some of its other more indispensable uses, like for chariots and such.

We know that the Greeks are generally credited with creating Western philosophy and that they threw in the wheelbarrow as a bonus. Somewhere in Greece between the sixth and fourth centuries B.C., their wheelbarrow began its long trek across China on its way to medieval Europe. Remarkably, the original wheel design hasn't really changed in over 6000 years.

The early wheel design was as simple as it was useful. It was just a solid curved piece of wood. Man of course – as he's wont to – eventually added leather to it, just to cushion the ride.

Over time, the wheel was composed of solid rubber which eventually led to the pneumatic, or air inflated radial tire.

There are numerous anonymous individuals whose valuable contributions steered us to the tires that we use nowadays.

TODAY'S TYPES OF TIRES

Keeping a vehicle can sometimes prove to be an ongoing major expense to its owners. Putting on different tire types, may be a bit like changing your footwear in order that you participate in different types of activities. There seems to be a tire type for every driving climate or mood! East coasters know that you wouldn't drive in the winter on summer or all season tires.

Incidentally, according to a 2017 Tire and Rubber Association of Canada (TRAC) report, 83 per cent of vehicles in Atlantic Canada operated on winter tires. This rate was only bested by the province of Quebec, where 100% of its vehicles used snow tires. Of course, Quebec does have its winter tire law in effect. The report also doesn't stipulate whether the vehicles were running on studded or non-studded winter tires. Currently, there are many winter tires that are regularly described as studdable. This chiefly means that these winter tires have very grippy treads or have sipes – thin slits cut into the rubber surface to improve traction in wet or icy conditions – and are made up of a rubber compound that won't freeze up or get hard when it's truly cold out.

Today's tire types roll out in many forms; summer, winter (these tires are embossed with the Alpine Symbol), all-season, on/off road tires and there are also low & high performance tires. Additionally, there are tires manufactured, that have tread wear indicator bars built right into the tire itself. The nearly invisible bars gradually appear as the tire's tread wears down with usage.

With sufficient funds and a real passion for getting the most from where your rubber hits the road you could, conceivably, rotate your vehicle through any number of tire combinations. The rotation could be based on seasonality and your personal driving tastes and habits.

THE TIRES OF TODAY MEET TOMORROW'S TIRES

It was around 1844 that Charles Goodyear – who is widely credited with

creating the vulcanization process – patented the procedure for vulcanizing rubber and in 1846 the first solid rubber tire was produced. It was closely followed by vulcanized rubber pneumatic tires. Rolling forward the tire industry segued into bias-ply tires, steel-belted radial tires, non-pneumatic tires, carbon fiber wheels, etc.

Knowledgeable tire companies, always with one eye firmly focused towards future sales, are developing innovative ways and means to regularly expand their tire lines. These same manufactures are working towards achieving better safety, fuel economy, handling capabilities while addressing social, economic and environmental concerns.

Surendra Chawla, Goodyear's senior director of external science and technology programs, during his keynote address at last September's ITEC in Focus: Reinforcements for Tire Performance conference, stated that the tire industry must deal not only with technical issues but also with environmental, economic, social and political issues as well.

The Tire and Rubber Association of Canada (TRAC) director of operations, Barry Yutronkie, feels that there have been many advances in tire technology over the last several years and that there are a couple of key focus areas that occupy the tire developers time. "The auto and truck manufacturers' attention of late is related to Green House Gas reductions, so fuel efficient tires are becoming the new norm at the OE levels."

He states that, "These tires incorporate new materials and treads designs which help reduce rolling resistance and therefore consume less fuel. Tire manufacturers are developing various biogenic technology to create materials in tires that will be more sustainable with the goal of recycling more material back into new tires. Overall, tire manufacturers are continuing to make advancements in the key areas of performance, handling, wear and traction to meet the varying needs of the consumer."

Aggressive tire manufactures are determinedly working towards continually

surpassing themselves as they 1) develop and innovate while continuously striving at improving existing tire technologies and 2) coining ever innovative designations for their constantly growing competitive array of innovative and upgraded products.

These companies are depending, more than ever, on their researchers and ad men to concoct just the right catchy label for its new products. Designations like: Run-flat Tires or Run on Flat tires (RFT), Low Rolling Resistance (LLR) tires, ContiSense, Contiadapt, Infinicoil, Tire Fill Alerts, Self-Inflating Tire (SIT), Electronic Tire Information System (eTIS), etc., just to drop a few names.

Manufacturers and similarly individual tire retailers are being directly impacted by the ever rising cost of selling and servicing the newer trending tire technologies. TRAC's Barry Yutronkie believes that, there are many things that the retailers are doing to adapt to the technology changes. "A tire is installed by similar methods that have been used in the industry for years, yet there are more complications such as wheels with TPMS sensors, varying types of run flat tires, and new generation wide base single tires on trucks."

"The tire dealer must be aware and know the procedures for handling these cases, so training is an important aspect to keep up to date. There are advances in tire changing equipment as well, which can be of benefit to the dealer." He adds that, "The entire process of maintaining the right inventory has evolved with the internet and ordering tools that enable the retailer to be responsive to the consumer needs."

Moving forward, our tires of today can actually communicate with the vehicle's driver via newly de-

veloped sensor tire management systems. These systems employ miniature sensors that are built into the tire walls, whose sole purpose is to collect and transmit data. They continually provide driver updates on tire pressure, temperature, torque, tire mileage and wear. These systems are either currently available, or very shortly will be available from a manufacturer near you.

MANUFACTURES ADVANCING TOWARDS TOMORROW'S TIRES

Many individual tire manufactures are developing, are close to, or have already released tires, that are made comprised of new and advanced technologies:

General Motors of Canada Company (GMC) is promoting its new Tire Fill Alert convenience feature. It was developed to work hand in hand with their Tire Pressure Monitoring System and alerts drivers when they are developing a lowering of the air pressure in a tire. It also provides visual and audible alerts outside the vehicle, to warn drivers that they may be under or over inflating their tire. The technology is intended to help drivers determine how much air has been added to an inflated tire without having to use an air pressure gauge.

Michelin North America Inc. Some of Michelin truck tires now come with its Infinicoil technology. This technique employs a giant steel cord -- up to 400 meters long -- that's wrapped underneath the rubber layer. The steel increases the rigidity of

the surface of the tire, and allows them to be made wider than before. This technology leads to a longer lasting tire.

Continental has developed a tire noise-reducing technology that they named ContiSilent. It is designed to reduce interior noise on all road surfaces. These tires are equipped with an inner tyre absorber. Polyurethane foam is attached to the inner surface of the tread area with an adhesive. Continental maintains that regardless of the temperature, the structure of the foam stays intact. The tires use the same mounting, storage as standard tires and there will be no change in any other driving performance characteristics.

Continental also has ContiAdapt tires. It combines micro-compressors that are integrated into the wheels to adjust the tyre pressure with a variable-width rim. The system can modify the size of the contact patch, which under different road conditions is a decisive factor for both safety and comfort. There are four different combinations that should allow perfect adaptation to wet, uneven, slippery and normal conditions.

Goodyear is using new technologies, such as its Radio-Frequency Identification (RFID), to allow tires to become increasingly intelligent through the use of embedded electronics. Individually programmed coded microchips are built into the tires and will permit readers to identify a tires size and type by its unique identifying number.

Manufactures are producing more and more run-flat tires, self-supporting tires, and just around the corner, 3D tires are waiting in



the wings. TRAC's Barry Yutronkie maintains that the tire we envision for the future will look very similar to the tire of the today, but internally it will be constructed with materials that are much more sustainable.

"Car sharing, electric vehicles, autonomous vehicles are all on the near horizon, yet tires will remain a constant requirement as those few small patches that make contact with the road still must transmit the ability for the vehicle to move, stop and turn on the road surface." He adds that, "The tire is a very effective way of enabling vehicles to move people, goods and services as it performs its duty to get you from point A to B in a multitude of weather and road conditions."

ENTIRELY FUTURELY

It may take quite some time for what we now consider as concept tires, to be totally road worthy. Many manufacturers are definitely eyeing the future. Goodyear's R&D employees for example, are visualising that it will be entirely possible that magnetic levitation could be used to connect spherical tires to vehicles. The tires tread pattern would stiffen in dry weather and the car would be able to drive sideways to make parallel parking a snap. Steering the vehicle would be possible via the rear wheels.

Researchers at the Goodyear's Innovation Center have discovered that by utilizing soybean oil in tires, they can potentially increase tread life by 10 percent. This would reduce Goodyear's use of petroleum-based oil by up to twenty six million liters each year. Once landfill fodder, rice husk waste – ash left over from the burning of rice husks – will begin being used to produce electricity as an environmentally friendly source of silica for use in its tires.

Not to be left behind, Michelin has also unveiled its 3D printed Visionary Concept tire. Unlike traditional air-pressurized tires, the 3D printed prototype doesn't need to be in-

flated. Instead, the tire employs Michelin's own honeycomb pattern based on generative design models found in nature, such as coral and the air sacs in human lungs.

Michelin declares that this design will diminish the risk of a blowout or flats due to tire punctures. While traditional rubber tires gradually lose their tread as a result of friction, this prototype uses 3D printers to replenish its tread as needed. A series of sensors built into the tire will monitor tread wear and provide real-time information about performance and maintenance.

Drivers will use an app to receive tire info and will also be able to then pre-emptively order 3D printed tread replacements. The Vision tire will be made from bio-sourced and biodegradable materials, including (but not limited to) natural rubber, bamboo, paper, tin cans, wood, and plastic. Michelin plans to minimize the amount of rubber in each of its organic tires, thus further reducing the tires overall environmental impact.

And, very possibly coming soon to a dealer near you, Omnidirectional Wheels, or more specifically Liddiard Wheels – which were conceived by Canadian inventor William Liddiard – are specialized rims and tires that give any car the ability to move sideways, consequently making parallel parking a breeze. Liddiard claims that these wheels can be bolted onto any car without modification.

Rapid technological advancement is bringing us closer and closer to a world traveling on Buck Rogers or the Jetsons type of vehicles. Tires and tire technology is evolving at such an expedient rate that it's exceedingly tough to keep pace with all the changes. One has to but wonder what the near future will bring us, never mind what's going to appear 25 years from now! 🚗

LOOKING BACK AT SOME ODD WHEELIE BIG LITTLE USES

Originally the Wheel of Fortune was NOT a TV gameshow. Historically, it has made many appearances as; a medieval philosophy concept that symbolized fate, where the goddess Fortuna spun the wheel to decide the fates and misfortunes of mortals. Ancient scholars Cicero and the Greek poet Pindar both reference the Wheel of Fortune in separate works. Such immortal writers as Geoffrey Chaucer and William Shakespeare also reference the Wheel of Fortune in separate works.

Used as a Torture Device - During medieval times persons were stretched across the face of a wheel and were tortured or bludgeoned to death with blunt hammers. Also some unlucky lawbreakers were strapped to the spiked rim of a large wheel and then it was rolled along the ground.

Used for Gaming & Toys - Archaeologists in Vera Cruz, Mexico discovered ceramic toy animals with wheels for legs. This allowed the children to play with the toy by pushing it along the ground. In the 18th century the French combined several existing games to come up with the idea for the roulette wheel.

The Fifth Wheel - By definition was not really a fifth wheel. Rather, it was a portion of a wheel that had two parts rotating on each other that sat on the front axle of a carriage and added extra support so that the carriage didn't tip over. But it really proved no useful purpose and that's supposed why, calling someone a "fifth wheel", is a way of calling them superfluous, or naming them as a tagalong! 🚗

