Roland Taylor works out how to use his jack and takes a look at tyres...

Tyred and tested

The story of tyres began in the 1840's when a Scottish engineer, Robert William Thompson filed a patent for a pneumatic tyre. It states that the invention consisted of fitting elastic bearings to the wheels of carriages. This would lessen the power required to draw them; make the motion easier and reduce the noise the wheels made. Unfortunately his invention was not taken up commercially.

Ten years earlier a bankrupt hardware merchant from Philadelphia, Charles Goodyear, was taking a considerable interest in rubber. What had started out as a wonderful new substance was proving to be disastrous. Goods manufactured from rubber were appearing in vast numbers on the market, but the public soon discovered it was unstable as the items turned into a sticky mess in summer and froze hard in the winter. As a result the bottom fell out of the market and many investors lost considerable sums of money.

Between spells in jail for debt Goodyear began experiments to find a way of removing the stickiness. Initially he tried magnesia and quicklime and had some success. Then, like so many discoveries, an accident gave him the answer. He used some nitric acid to remove bronze paint from a piece of rubber. The result was a smooth surface completely dry. Unfortunately, this was not the total solution - underneath the surface there was still a sticky mess. It took another five hard years before, again through an accident, he resolved the problem. By then sulphur had been added to the mixture and one day, in a rage, Goodyear threw the rubber sample onto a stove. Instead of melting he discovered it had transformed into a completely new substance. He carried on experimenting and found that by using pressurised steam at 270 degrees Fahrenheit the best results were produced.

One of Goodyear's samples found its way into the hands of Thomas

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Hancock, an English pioneer of rubber. He noticed the yellow sulphur bloom on the surface and immediately set about reinventing vulcanised rubber, something Goodyear had achieved years earlier. By the time Goodyear got round to filing a patent he found Hancock had beaten him to it and he died virtually penniless.

Whilst all this was happening on the other side of the Atlantic, back here another Scotsman, John Boyd Dunlop, was busy reinventing the pneumatic tyre. This time, both the product and timing was right, and it took off. Steam-powered vehicles were found to be too heavy to have tyres fitted but the motor car had arrived and this new invention was ideal for them. In 1895, the Michelin brothers won the Paris to Bordeaux car race in a motor fitted with pneumatic tyres and the resulting publicity gave this French firm a competitive edge in the automobile industry.

Companies producing tyres began springing up around the world. Most had geared their production for either bicycles or cars. One manufacturer, in the city of Trelleborg in Sweden (they took the name from the city) realised there were other opportunities, in agriculture, forestry and much later the turfcare markets.

A tractor tyre was required to produce plenty of traction for hauling heavy machinery. While this was ideal for arable cultivation those engaged in forestry were experiencing problems. They required the traction but not the damage that occurred to the trees' surface root structure. In addition, the rough terrain caused a plethora of punctures and repairing these wasted a lot of valuable time. A further problem was that the ruts created in soft areas meant that the tractors became easily and quickly bogged down. An answer was needed. This materialised in the form of a wide section tyre, which could support a load at a low air pressure and reduce soil and root damage. The farmers also realised that this was beneficial to them and it was not long before the turf care industry also followed suit. Another plus was that tractors and machinery fitted with low ground pressure tyres could be used on wet and soggy ground without losing traction or making ruts. In the past it had been virtually impossible to use equipment in these conditions.

The introduction of more sophisticated self-powered turfcare machinery plus greater numbers of people taking up golf increased the worry over compaction. Greenkeepers were not the only ones with this headache. In France, winegrowers were concerned about the damage tractors were doing to the vines' shallow root system. Research was carried out and it was found that by changing the tyre's pattern, less damage occurred. While rounded shouldered tyres are ideal there is still the need for traction and this is achieved by using a cross bar tread.

It should be borne in mind that low ground pressure tyres do not completely eliminate soil compaction but help to minimise it.

Buying the correct tyre for your particular requirements is important. The ones that arrive on the machine are not necessarily always right for you. To ensure performance at its optimum with minimal damage to the turf it is worth consulting a tyre expert. He will be able to advise on the most suitable tyres and tread configurations.

In addition to the powered equipment in the fleet, trailers and any other towed machinery on pneumatics should be taken into consideration. A loaded trailer for instance, with the wrong tyres fitted can cause considerable damage to the soil structure.

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Maintenance

When it comes to maintenance, tyres are one of those items that tend to be overlooked until they go flat. Incorrect operating pressures can seriously affect a machine's performance as well as being a possible safety hazard.

Over inflation could cause:

- loss of traction
- excessive soil compaction
- rapid wear both on grass and hard surfaces
- higher fuel consumption
- lower performances
- an uncomfortable ride

Under inflation can lead to:

- side wall damage
- poor ride
- beading coming unseated
- increased wear

Like the other components of a machine, tyres need to be regularly checked.

- Inflation pressures should be checked at least every fortnight.
- The pressure must be correct for the load and the operations that are being carried out.
- Valve caps should always be in place
- Inspect the tread and side walls for signs of damage, wear or bulges
- Remove foreign bodies from the tread such as stones and repair any deep cuts.
- Were equipment is not used regularly the tyres need to be rested. To do this the whole unit can be raised up on jacks or blocks.
- Store any tyres or wheels with them fitted, in a dark place away from oil, petrol or chemicals. They should also be kept away from electric motors, which give of ozone that over a time will break down the rubber.

For the best performance and smoothest ride check your tyres regularly.