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## Tyre Technical Advisory Committee

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### Nitrogen inflation for car tyres

Nitrogen inflation for passenger car tyres is widely promoted in the aftermarket. However, the British Tyre Manufacturers' Association cannot endorse many of the claimed benefits as they are based on the experience of nitrogen inflation in specialist applications such as aircraft, earthmover and mining machinery, and in motor racing.

Although in terms of a tyre's performance there are no disadvantages to using nitrogen for inflation, the consumer should be aware of the origins of the claims being made and the practicalities of using nitrogen inflation when applied to passenger car tyres.

The air available at most garage forecourts is mechanically compressed air, made up of 78% nitrogen, 21% oxygen and a small percentage of various inert gases. Moisture may also be present; the amount will depend of the nature of the compressor equipment.

The attraction of nitrogen as an inflation medium for tyres in use on aircraft, heavy plant and in motor sport is that nitrogen contains no moisture and does not support combustion. In the case of aircraft tyres the fact that nitrogen is dry eliminates the danger of ice forming within the tyres when flying at high altitude. Ice can contribute to wheel imbalance during landing.

Moisture within the air in a tyre is also a major factor in causing the inflation pressure to increase as the tyre gets hot. This is critical within motor racing where varying tyre pressures can influence overall performance. However, normal road tyres are designed to accommodate pressure increases through temperature rises.

Nitrogen will not support combustion and as a result applications where high brake temperatures may be experienced - aircraft landing and big earthmoving machinery - the close proximity of a large volume of nitrogen reduces the risk of fire should the tyre burst as a consequence of extreme temperatures.

However, it is unlikely that the average motorist will benefit from these two properties of nitrogen inflation.

Of greater concern are claims that tyre maintenance periods can be extended with nitrogen inflation. Although the diffusion rate of pure nitrogen is lower than for air, pressure loss can also occur though the value or due to slow punctures. The tyre industry recommendation for regular checks (at least monthly and before any long journey) applies regardless of whether the tyre is inflated with nitrogen or air.

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The claimed reduction in pressure loss is often accompanied by claims of cost savings linked to better fuel economy and improved tread wear performance. Provided tyre inflation pressures are maintained at the levels recommended by the vehicle manufacturer there should be no appreciable difference in performance whether the tyres are inflated with air or nitrogen.

Users of nitrogen must accept that tyre pressure maintenance will require a visit to a tyre dealer that has nitrogen equipment so that any pressure adjustments maintain pure nitrogen as the inflation medium. 'Topping up' using conventional compressed air will reduce or even negate the benefits being claimed, and hence bring into question how effective and practical a nitrogen inflation policy for passenger car tyres might be.

Some very high performance road car manufacturers do promote the use of nitrogen tyre inflation. With such highly tuned vehicles the claimed benefits may be more apparent and hence owners of such cars should follow the vehicle manufacturer's recommendations.

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