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NHTSA-2000-8572-27

Mr. Joseph Scott, Safety Standards Engineer
National Highway Transportation Safety Board
NTS-22
400 Seventh Street, S.W.
Washington, D.C. 20590

Re: Docket 8572: Tire Pressure Monitoring System

July 16, 2001

Dear Sir:

As we discussed in our phone conversation today, there may be a tire safety hazard posed by poorly-maintained tire air pressure pumps at service stations. This came to light when I noticed a tire on my car seemed to be low on air, and I stopped at an Exxon station at the corner of Glebe Road and Lee Highway in Northern Virginia to inflate the tire. The tire pump was one where the compressor is in a metal box, activated by pushing a button on the box, with a handle on the air hose that is squeezed to permit air to pass into the tire. Squeezing the handle before I attached the nozzle to the tire valve, I was surprised to observe that a white mist of water vapor came shooting out, rather than pure air. I continued to depress the handle for about a minute, and the water vapor, while lessened, continued to spray from the nozzle. I informed the station cashier of the problem.

If water sprays from a tire-inflation hose and winds up inside a tire, after being inflated several times, the tire could hold a fair amount of water. If the vehicle is driven at sustained high speeds of 60 m.p.h. or more for several hours in hot weather, say 80 degrees or more in direct sunshine, the pavement is hot and -- with continual flexing over bumps in the road -- the tire can become very hot.

So this is the safety issue: could water inside a tire be heated until it turns to steam, creating pressure that would cause the tire to explode?

The origin of the problem lies in the way air compressors work. A typical compressor, of course, draws in ambient air and forces it into a metal tank. In so doing, humidity that's always present in the air condenses out in the tank, eventually forming a pool of water at the bottom of the tank. This is why air

compressor manufacturers install a petcock valve or other device at the bottom of the tank, to permit the water to be drained out of the tank frequently. If this isn't done, water builds up in the tank and mixes with the compressed air emitted through the pressure hose. A maker of air compressors, Campbell Hausfeld, provides a notice to compressor operators that "Tanks rust from moisture build-up, which weakens the tank. Make sure to drain tank regularly and inspect periodically for unsafe conditions." The firm also warns of "Excessive moisture in discharge air" if the tank isn't kept properly drained of water. However, as a practical matter, many service stations don't own the tire air compressors on their parking lots, which may be coin operated and owned by a concessionaire which assigns service personnel to visit each air pump only occasionally to remove deposited coins. Therefore, there is no one continually on site to drain the tanks regularly. Clearly, at several stations I visited that evening, there was water in the tanks. I visited four service stations/stores on Lee Highway and on Route 7 that each had water vapor in their compressed air, before finding clean air at a fifth station.

To see how compressor tanks should be maintained, visit major chain tire dealers. At intervals during each day, an employee will open the drainage valve on the compressor tank, with a very loud hissing or blasting noise. They clearly are aware that water in tires is unwanted.

Your additional comment that water in tires can work its way into the rubber through centrifugal force and rust/weaken the steel belts in the tire was another interesting point, especially in light of the Firestone tread separation issue. When steel belts rust, they often lose adhesion with rubber elements in the tire.

I hope this comment letter is helpful. Please call if you have questions..

Best regards,

Dave Ahearn