Anti-lock Braking System Explained

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You might have heard of latest cars that have ABS feature in them. What is ABS? ABS stands for Anti-lock Braking System. You know what ABS stands for, but is it worth the extra mark-up? Does it really add to the safety of the drive? Under what conditions does it work? Is it a must?

An ideal scenario is when you are traveling at a moderate speed, decide to brake, apply the pressure on your brake pedal and your car gradually comes to a halt. There is no cause for worry here. Now, assume you are cruising at high speed and need to slow down very quickly. You press the brake pedal really hard!

What happens is that when you try to stop your car at a rate faster than is possible by the friction between the tires and the road, the wheels stop rotating due to the application of the brakes (the wheels lock) but the vehicle still continues to move forward due to its momentum and causes what is known as skidding. In this case, the friction between the wheels and the road is not sufficient to stop the vehicle and the driver has minimum control over the vehicle. This may also happen when the initial speed is very high or when the road is slippery. Another scenario that can result in a skid is when the driver loses control of the car is when he looks to steer the car and apply brakes at the same time. ABS prevents the wheels from locking, thus retaining the driver's ability to steer.

The ABS has a set of speed sensors that monitor the speed of the wheel and thus recognize beforehand if the wheel is close to locking when the brakes are applied. The controller of the system uses the information collected by the speed sensors to control the braking force going to the wheel. When the controller recognizes that the wheel is about to lock, it releases the pressure on the wheel to keep it rolling. Once the wheel gains speed, the controller reapplies the braking pressure on the wheel, slowing it down until just before the point that it locks. It repeats this exercise at a very high frequency (over 10 times a second) and thus provides the most efficient and effective braking.

ABS is available in quite a few variants. The systems with a sensor for each wheel are the most complex and the ones with a single central sensor are the simplest. Over the years, like with most new features, the advantages of ABS have been misunderstood. ABS does not guarantee safety against all speed- and braking-related emergencies. ABS can only assist the driver by preventing a skid and retaining the ability to steer while braking. If you are at an unreasonablly 'high speed to immediate braking' situation no system can guarantee complete safety. In India, ABS is usually an optional feature only on the top-

end variants whereas abroad it is standard, sometimes by law. In the future, this will be the case in India as well.

Remember that a safety feature does help, but only up to a point. It by no means takes any responsibility away from the driver towards his own safety, the safety of his passengers and of others on the road.