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Safety Drives Traction and Stability Control

By Erik Gaspar, Enterprise Fleet Management

It has often been said that "necessity is the mother of invention." This definitely is the case for the advent of electronic traction and stability control systems that are designed to enhance a vehicle's performance when driving conditions are less than ideal. In terms of adapting technology to improve safety, electronic traction and stability control systems deserve high marks.

Both systems represent the next generation of advances that began with the antilock braking system (ABS), a standard feature on most vehicles that works by sensing and preventing wheel lock-up, improving traction and steering during hard braking. Contrary to popular belief, antilock brakes don't help the tires stop a vehicle any quicker; they just stop them more safely because the driver can maintain steering control. Because an ABS allows drivers to steer while applying maximum braking, there is greater vehicle stability in an emergency and this can make a significant difference in avoiding obstacles.

Whereas ABS focuses on eliminating lock-up in braking situations, traction control, also called acceleration slip regulation (ASR), regulates wheelspin during acceleration. It is specifically designed to ensure maximum contact between the road surface and the vehicle's tires when accelerating from a complete stop or speeding up to pass another vehicle, particularly under less than ideal road conditions. The technology can monitor wheel speed, cut engine power or even apply the brakes to optimize contact between the tires and road surface.

Stability control incorporates ABS and traction control to increase traction during potential side-skidding situations. The stability control system utilizes speed sensors on each wheel, as well as steering-angle sensors and a hydraulic modulator. When sensors detect that the vehicle is about to travel in a direction different from the one indicated by the steering wheel position, it automatically brakes the appropriate wheel to help the driver maintain control. In many cases, engine power also is reduced.

These options are available on a wide selection of vehicles, including some economy cars. But it is important to note that these technologies may be marketed under a number of different names. Be sure to understand the features and ask questions to confirm that these options are offered when purchasing a vehicle.

Optimal brake performance also depends on selecting a vehicle with the right components. One of the most critical considerations is the gross vehicle weight rating (GVWR). The GVWR refers to the maximum a vehicle can weigh at any time. According to industry standards established by manufacturers, the GVWR includes the net weight of the vehicle, plus the weight of the driver and any passengers, as well as fuel, cargo and any aftermarket equipment or accessories added to the vehicle.

Exceeding the GVWR by regularly overloading a vehicle not only reduces its service life significantly, it can cause premature mechanical failures on various driveline components, including the brakes.

Because brakes are a normal wear item for any vehicle, sooner or later they will need to be repaired or replaced. However, proper brake maintenance will reduce these costs and possibly help avoid more expensive rotor or drum replacement by making sure brakes never get to the metal-to-metal point. How a vehicle is used and how it is driven have an enormous impact on brake life. The brakes on vehicles that are driven in heavy commuter traffic get hot and usually experience more wear than those on vehicles that are used mostly for highway driving. Recommended maintenance needs to be adjusted accordingly.

Still, the bottom line is that all the technological advancement in the world can't protect a bad driver. The best way to reduce stopping distance is to make sure drivers slow down and pay attention to the road at all times.

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