Anti-Lock Brakes

If you don't already own a car or truck equipped with an anti-lock braking system (ABS), chances are you will before long. Industry analysts estimate half of all new cars and light trucks will be ABS equipped by 1995.

A potential lifesaver, ABS helps keep your car under control should you jam on the brakes on a slick road or under emergency conditions. The safety benefits will be reduced, however, without proper preventive maintenance and care. Neglecting ABS can also lead to expensive repairs down the road, according to the brake experts at AlliedSignal.

"Too many drivers, whether their cars have conventional brakes or ABS, make the mistake of thinking that replacing brake shoes and pads is all there is to proper Maintenance," explains Tony Lux, ASE certified Answer man for AlliedSignal's Bendix brakes. "What they need to be more aware of is the system needs regular -- and proper-- maintenance to prevent expensive damage down the road."

What ABS Does

According to Lux, in vehicles with ordinary brakes, simply standing on the pedal under poor traction conditions is likely to cause one or more wheels to lock up, probably resulting in a skid. To avoid skids, expert drivers rapidly "pump" the brake pedal (releasing and re-applying it) when they sense wheel lockup.

"ABS provides a similar pumping action," Lux explains. "It automatically re-applies brake pressure under stopping conditions that make wheel lockup likely." But, he adds, ABS adds an advantage. "Unlike someone letting go of the brake pedal and stepping back on it, ABS can do it much faster, sensing impending skids and directing its `modulated braking' to whichever wheel, or wheels, would have locked otherwise."

How ABS Works

Lux says most of the brake parts in a car equipped with ABS is similar to those on cars without it.

"Although there are many similarities, cars with ABS have several additional parts," he explains. "ABS brake systems have speed sensors that measure wheel speed and relay this information to an onboard electronic control unit. This unit calculates vehicle speed and during a lockup, signals a hydraulic actuator which in turn applies and releases the brakes as many as 10 times per second."

Lux says speed signals from the wheels are sent to a central ABS computer. The computer compares wheel deceleration rates to the programmed vehicle while the car is braking. If any of the wheels are slowing more rapidly than the others, the computer can tell it's about to lock up. If the computer determines that a wheel is approaching lockup, it then sends a signal to the hydraulic valve block for that wheel.

"The hydraulic unit valve block contains a quantity of brake fluid under very high pressure," Lux explains. "it also has valves that can bleed off brake line pressure to any wheel(s) that may be about to lock up, while the other brakes keep working. Once the danger of wheel lock up has passed, pressurized brake fluid is again allowed to reach that brake, which resumes slowing the car. The process takes place very quickly and may be repeated several times each second."

Maintenance/Service Implications

Lux says most routine brake maintenance on ABS equipped cars and trucks shouldn't cost much more than servicing ordinary brakes.

"Anyone used to working on conventional disc and drum brakes can handle many routine brake jobs on a car with ABS," he says. "They require essentially the same procedures for replacing brake pads and shoes, and for resurfacing rotors and drums."
"Too many drivers, whether their cars have conventional brakes or ABS, make the mistake of thinking that replacing such 'friction material' as brake pads and shoes is all there is to brake maintenance," Lux adds. "They need to be aware that it isn't and that all brakes -- with or without ABS -- need regular maintenance to prevent expensive damage. Skimping on maintenance with ABS can lead to even more extensive and expensive problems than with ordinary brakes."

AlliedSignal's car care expert explains that the hydraulic side of ANY car's braking system needs preventive maintenance. For example, regularly flushing out a car's or truck's brake fluid and replacing it with fresh fluid goes a long way toward preventing brake problems as the vehicle ages.

"That's even more important for a car with ABS," Lux adds. "The ABS modulator unit isn't just complicated and expensive, it will get damaged if the fluid in it is either dirty or moisture-contaminated. Since most brake fluid naturally absorbs moisture from the atmosphere, the only way to fight this problem is to regularly flush and replace the fluid every 2 years or 24,000 miles."

Lux emphasizes that anyone planning to work on the brakes of an ABS equipped vehicle must check service procedures before starting. Specifically, he recommends consulting the appropriate shop manual for the vehicle, and taking whatever precautions it lists.

"There are several types of anti-lock systems being offered on today's vehicles and it's important to know and understand what type you have," explains Lux. "The Bendix system, for example, has a modulator that contains brake fluid under pressure and must be depressurized before any work can be done. Other systems such as the Kelsey-Hayes and Teves, operate under little or no pressure but still require use of a manual specific to that vehicle."

Since ABS systems are relatively new, Lux suggests making sure that your mechanic is up-to-date on ABS service procedures. Fortunately, the extra steps needed to do certain ABS jobs are not complicated and don't cost much more than other break work, and the benefits of properly maintaining your ABS brakes are worth the effort.