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Media Release

Bendix discusses different park brake pros and cons

The park brake plays an important role in a vehicle, including holding it in place when parked, and as a back-up braking system should the primary brakes fail. Owners of vehicles with traditional manual transmissions can also call on the handbrake to prevent roll back during hill starts.

Types of parking brakes

While all park brakes perform similar functions, the type of park brake and actuation can differ. Some have a mechanical lever – especially older or more entry level vehicles – where a pull handle or foot pedal located to the far left of the driver's footwell is used to apply the park brake. Increasingly though, manufacturers are equipping their models with Electronic Parking Brakes (EPBs), which are normally engaged either automatically when the vehicle is placed in 'park' or through a dash-mounted push button.

Mechanical

Mechanical parking brakes remain the most widely used in passenger vehicles. They rely on a lever – usually between the front seats – that connects to steel cables that when levered, apply the rear brake shoes or pads. This system offers simple and reliable operation that also works without engine power.

From a maintenance perspective, the main downside is that the cables can stretch over time or become frayed, leading to reduced holding power. A telltale sign that adjustment is needed, is when the action on the lever is 'long' before the resistance comes on. Depending on the model of car, some periodic manual adjustment may also be required along with lubrication of pivot points and linkages. This work is something best left to the professionals.

"Increasingly though, manufacturers are equipping their models with Electronic Parking Brakes (EPBs)"

Electronic

EPBs have become more common in recent years and there are a couple of types available. One uses a stepper motor on the back of the caliper to actuate the piston. There are also cable actuated EPBs; in this type of EPB cable engagement remains, however, an electric motor replaces a lever or pedal action in the cabin.

EPBs have several benefits compared to traditional park brakes. Many are configured to apply automatically once the vehicle has been placed in park, eliminating the chance that the driver accidentally forgets to engage it. It can then be released at the press of a button, or in some vehicles, it also disengages once the accelerator is pressed – no driver input is needed, so it's easy and fool-proof.

Additionally, an EPB frees up cabin space, with the traditional hand lever

Traditional (mechanical) park brakes continue to be widely used and are actuated via steel cables that are levered to apply the rear brake shoes or pads.

EPBs are becoming increasingly popular. Benefits include automatic actuation under certain conditions (such as when vehicle is placed in park), and they also free up cabin space.

being replaced by a small button on the dashboard. The benefits are even greater in commercial vans or light trucks where removal of the hand brake lever from the floor area allows easier movement throughout the cabin. This is particularly useful if the driver needs to unload in a busy area, as they can slide across to the passenger side and exit the vehicle by the sidewalk.

When it comes to maintenance, many EPBs with cable actuation feature sensors that detect brake pad wear and can adjust any cable slackness, meaning that manual adjustment isn't needed. Similarly, fully electric systems can also detect brake wear and advise when pad replacement is needed. When it comes time to change pads, the full electric EPB will also need a scan tool to safely and efficiently retract the brake pads for replacement. A downside to this sort of EPB is incidents such as flat or dead batteries may result in the park brake staying on and requiring a scan tool to disengage.

Driveline

Some older commercial vehicles, agricultural and construction equipment and early model four-wheel drives (including certain Series Land Rovers, early Land Cruisers, Jeeps and Suzukis) are equipped with transmission or driveline park brakes rather than mechanical park brakes or EPBs.

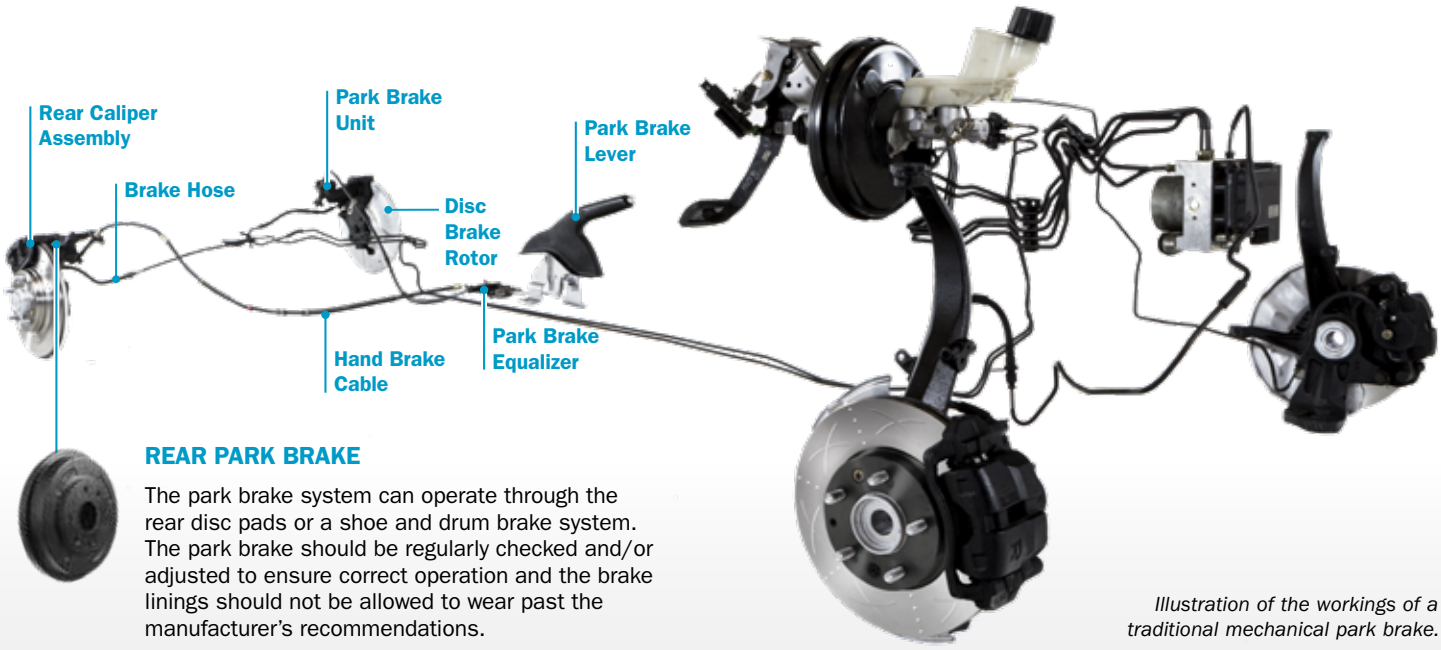
Instead of clamping at the wheels, a driveline park brake is mounted on the driveshaft or on the output shaft of the transmission, locking the entire driveline in place. Once engaged via a lever (or hydraulically in trucks), the brake shoes or pads clamp on the drum or disc preventing the driveshaft from rotating, in turn stopping the wheels from moving.

A downside of the driveline park brake is that it's designed as a static holding brake and can't be used to slow a moving vehicle. It's also not as effective as wheel mounted park brakes at holding heavy loads. On the plus side, their location higher up on the drivelines means that they're better protected from mud, rocks and other debris in demanding off-road

Driveline park brakes are mounted on the driveshaft or transmission output shaft and lock the entire driveline in place. They were once used on certain older four wheel drives (Range Rover Classic pictured), agricultural and construction equipment.

environments. Their simple mechanical design and easy adjustability via adjuster screw also make maintenance straight forward.

Although all parking brakes have a similar end goal, as modern vehicles continue to evolve the EPB will likely continue increasing in popularity thanks to its ease of use and convenience.



REAR PARK BRAKE

The park brake system can operate through the rear disc pads or a shoe and drum brake system. The park brake should be regularly checked and/or adjusted to ensure correct operation and the brake linings should not be allowed to wear past the manufacturer's recommendations.

Illustration of the workings of a traditional mechanical park brake.

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