Safety Alert: Cardan Shaft (Driveshaft) Parking Brakes

Important Safety Information for Transport Operators and Drivers

What You Need to Know

Many light- and medium-duty trucks (especially Japanese models from 3.5 – 12 tonne) and some heavier vehicles use a Cardan Shaft Parking Brake (CSPB). This brake acts on the driveshaft—not the wheels—by locking the output of the gearbox. While this system may appear to hold the vehicle when parked, it has critical limitations that can make it unsafe in normal operations.

The Risk

Since 2010, CSPB failures have contributed to multiple fatal roll-away incidents and many near-misses. Drivers often believed the brake was secure—but vehicles later moved unexpectedly.

Why Cardan Shaft Brakes Can Fail

- Limited Holding Power – Braking strength depends only on how hard the lever is pulled. Heavier loads or steeper slopes may easily overcome the brake. A brake that holds when unladen may not hold once the truck is loaded.
- No Feedback to the Driver – There is no gauge or indictor showing how much braking power has been applied or what may be required, especially if weight is added to the vehicle through loading.
- Marginal Performance – Even if properly maintained and adjusted, the performance of a CSPB is marginal. The act of getting out of or into the vehicle or any other small disturbance to the vehicle may be sufficient to initiate a roll away.
- Mechanical and Environmental Issues – Oil leaks or contamination reduce effectiveness. Linkages stretch and go out of adjustment over time. Any driveline or differential slip can allow the vehicle to roll.
- Design Limitation – The brake acts before the differential; if one wheel loses traction, the other can roll freely. CSPBs are not designed for slowing a moving vehicle; using them that way can damage the gearbox or driveline.

Best Practice for Operators and Drivers

- Avoid parking on any slope. If unavoidable, **always use wheel chocks** on both rear wheels. Chocks should be about 25% of tyre diameter and fit snugly. Place chocks carefully (from the side) and, when moving off, move the vehicle to flat ground before recovering the chocks.
- Never rely on the CSPB alone. Treat it as a parking aid, not a primary safety brake. Leave the vehicle in gear where possible but note this does not guarantee holding.
- Do not apply while moving. This brake is not an emergency brake—using it on the move can destroy it.
- Inspect regularly. Check for leaks, contamination, or stretched cables. Report and repair issues immediately.
- Train all drivers. Ensure everyone understands that a CSPB can fail on any slopes or when the vehicle is loaded.

Maintenance and Testing

NZTA now requires Roller Brake Machine (RBM) testing, which gives a better measure of CSPB effectiveness. However, good maintenance and the improved testing regime, will not eliminate the inherent design limitations and dangers of these brakes.

The Bottom Line

Cardan Shaft Parking Brakes are a known hazard.
They can and do fail—sometimes with fatal results.
Awareness and careful parking practices are vital. However, these are only mitigation measures at the lowest level of the hierarchy of controls for managing hazards. This type of parking brake system will continue to present a substantial danger.

If a vehicle does start to roll away it will quickly gain speed. Drivers must not attempt to get back in the vehicle as that is very dangerous. Fatalities and serious injuries have resulted from drivers doing so.

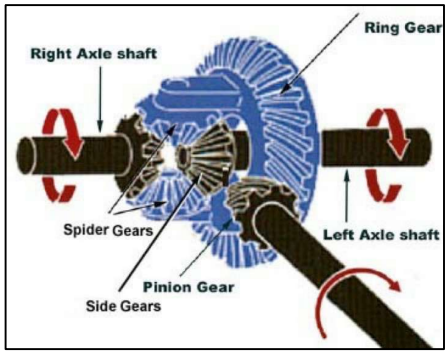
More Information

This type of parking brake acts by locking the driveshaft at the gearbox output shaft and may use either a single brake drum or a disc calliper, rotor and pad design.

The brake drum is the most common and universally used on trucks. Disc brakes are generally installed on off-road equipment such as JCB Telehandlers and the like.

Typically, a CSPB system uses a ratcheted handbrake lever and cable to apply the brake, like what you would find in your car. It can also be a 'pull' type lever next to the steering column.

Wheel chocks should be approximately 25% of the vehicle's tyre diameter and fit snuggly. Place chocks carefully (from the side) and, when moving off, move the vehicle to flat ground before recovering the chocks.



As the braking is applied through the differential, any slippage of one wheel will allow the other wheel to roll and the vehicle to roll away.
Similarly, if one wheel is jacked up, braking on the other wheel is lost and, if on a slope, the vehicle will move.