

REAL

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Torque

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Cardan Shaft Parking Brakes

Cardan shaft parking brakes (CSPB) are a type of parking brake that acts by locking the driveshaft at the gearbox output shaft and may use either a drum or shoe or a disc caliper, rotor and pad design.

They are designed to hold the vehicle and its load, but drivers must be aware of their limits, and ensure they are used, tested and maintained correctly to prevent vehicles rolling away incidents.

What Is A Cardan Shaft Handbrake?

In New Zealand these are generally fitted to smaller trucks under 10 tonnes GVM, but they can also be found on some heavier imported trucks.

A CSPB usually uses a ratcheted handbrake lever and cable to apply the brake, similar to a passenger vehicle. Vehicles fitted with a CSPB can often be identified by the ratchet feel of the handbrake lever or a pull-type lever located near the steering column.

It is important that drivers can recognize when a vehicle is fitted with a CSPB, as these systems have different operating characteristics to conventional parking brake systems. The handbrake should always be fully applied when parking and fully released before driving to ensure the system operates correctly and to avoid unnecessary wear.



Typical handbrake lever of Cardon Shaft park brake equipped truck. You will notice the "ratchet" type feel.



Cardan shaft park brake assembly fitted onto rear of gearbox.

Understanding CSPB Limitations:

Cardan Shaft Parking Brakes are designed to be used only when the vehicle is completely stationary and are intended to hold a parked vehicle, not to stop a moving one.

Because a CSPB acts on the driveline rather than directly on the wheels, it has a lower holding capacity than wheel-end parking brake systems, particularly when the vehicle is fully loaded, parked on a steep gradient, or on a low-traction surface.

The park brake should always be fully applied, and when parking on steep slopes or uneven ground, additional precautions such as leaving the vehicle in gear and using wheel chocks should be considered to reduce the risk of vehicle movement or roll-away.

When Extra Care Is Required:

- On steep gradients.
- On loose gravel, mud, grass, or uneven surfaces.
- When the vehicle is heavily loaded.
- When parking for extended periods.
- When there is any doubt about the effectiveness of the parking brake.

In these situations, wheel chocks provide an additional safeguard against vehicle movement. Where appropriate, the vehicle should also be left in gear.

Why Wheel Chocks Are Important:

When parking on a steep gradient or uneven surface, wheel chocks are recommended as an additional precaution against roll-away.

It is important to ensure both rear wheels are parked on a similar surface due to the natural action of the differential. If one wheel loses traction while parked on a steep gradient, the truck may still move.

Because the parking brake acts on the driveline, the differential can still allow wheel movement if one wheel loses traction. Wheel chocks provide an additional layer of protection against unintended vehicle movement.



Scan the QR codes below to learn more about Cardan Shaft Parking Brakes. The left QR code links to a TR Group video on the correct operation of a CSPB, while the right QR code directs you to the NZTA website for further information.



Vehicle Identification:

Any truck fitted with a Cardan Shaft Parking Brake will display a windscreen identification sticker. This is a Certificate of Fitness (CoF) requirement and provides a quick visual indication that the vehicle is fitted with a CSPB. Operators should familiarise themselves with this sticker so they can identify vehicles that require additional parking precautions.



Keeping CSPBs Maintained:

Keeping Cardan Shaft Parking Brakes in good working order is essential for safe operation. During routine servicing, TR Group requests an additional inspection of the CSPB system to check for correct operation, wear, adjustment, and any signs of contamination or damage. Regular inspection and maintenance helps ensure the brake remains effective and reliable throughout its service life.

Tips and Tricks

- ▶ Always ensure the park brake is fully applied. More force may be required than you are used to.
- ▶ Ensure the park brake is fully released before driving to prevent premature wear of the brake components.
- ▶ Leaving the vehicle in gear and/or turning the front wheels towards the kerb can provide additional protection against vehicle movement.
- ▶ Be aware of any fluid leaks under the vehicle and report them immediately. A leaking gearbox output seal can contaminate the CSPB linings and reduce brake effectiveness.
- ▶ Never apply the park brake while the truck is moving. This can severely damage the brake assembly, gearbox, or driveline. Always ensure the vehicle is stationary before applying the park brake.
- ▶ Always double-check the vehicle is secure before walking away.

TR Tips

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