

CARDAN SHAFT BRAKES

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I want to draw your attention to a critical safety hazard affecting vehicles and plant in many operations: the use of **cardan-shaft (also known as driveshaft or transmission) parking brakes**. Both WorkSafe New Zealand and Waka Kotahi NZ Transport Agency (NZTA) have issued bulletins, alerts and investigations regarding these systems, following multiple roll-away incidents — some of them fatal. There have been 6 known deaths involving vehicles where these brakes failed since 2010.

A recent news article further highlighted the risks around these parking brake systems after a worker was killed by a roll-away telehandler. Read the article [here](#).

Why it matters

Cardan shaft parking brakes are fitted as parking brakes on many small to medium commercial vehicles (and some off-road plant) and they differ from traditional wheel-mounted parking brakes.

The mechanism acts on the driveshaft rather than directly on the wheels. Because of this, the system has inherent limitations under certain conditions (e.g. slope, load change, traction differences) which can cause the vehicle to roll away even when the brake is apparently applied. They are inherently unsafe in the context of relying on them as the sole parking brake. Investigations have found many systems fail to hold under 'pull test' conditions simulating a slope.

What are the risks?

- **Roll away** especially if on a slope or uneven ground.
- **Load change risk.** If the vehicle is parked and loaded/unloaded after the park brake is applied, the brakes might be overloaded, exceeding the brakes holding capacity
- **Contamination and wear** because the brake is mounted on the driveshaft/gearbox output, it may be more susceptible to contamination (oil leaks), mis-adjustments, linkage stretch, which is not always visible.
- **False Confidence** Relying purely on the parking brake without additional controls like chocks, may give a false sense of safety.
- **Training gaps** many drivers/operators may not be aware that the vehicle has a cardan brake, or the implications or its limitations.

What if you service vehicles with cardan brakes?

- Follow NZTA Heavy Vehicle Brake Test Protocols found [HERE](#)
- Train workers to correct servicing procedures, ensure they are competent– useful videos can be found [HERE](#)
- Follow manufacturer and NZTA specifications
- Inspect beyond adjustment – check linkages, leaks, cables, friction, actuators etc.
- Test & document properly – advise the client in writing of the results of the tests. ‘
- Do not sign off or return it to service as ‘safe’ until all defects have been remedied.



Manawatu Health & Safety Ltd
Consultancy Services

Brigid Holmes

Phone: 027 298 2911

brigid@manawatuhealthandsafety.co.nz

www.manawatuhealthandsafety.co.nz

What if you have off-road plant that does not need a CoF?

- You are still legally obligated under the Health & Safety at Work Act 2015 to identify and control risks associated with cardan brakes.
- WorkSafe's technical bulletin applies to **any** vehicle or mobile plant fitted with this brake. Not just registered ones.
- Follow the same processes and safety inspections that would be expected of a road registered vehicle.

What more could you do?

Retrofit vehicles with audible alarms, secondary braking systems or anti-rollaway brake systems – available through [Autokraft Palmerston North](#).

Ensure regular servicing and inspections of braking systems through providers such as [Robertson Isuzu](#)

What the Regulator says:

WorkSafe NZ released a technical bulletin that identified:

- Operators must **identify all vehicles fitted with driveshaft parking brakes** and ensure a maintenance regime is in place (cleaning, inspection, lubrication, correct adjustment).
- Ensure drivers/operators are trained and understand the limitations of the system (e.g. on slopes, when load changes, when traction is uneven).
- Use **wheel chocks** when parking on slopes, servicing/altering the load or parked on unstable surfaces – never rely solely on the park brakes.
- Recognise that the hand lever or actuator may require significantly more force (especially when the vehicle is laden) to engage fully.

[Read the WorkSafe NZ technical bulletin HERE.](#)

NZTA released a Safety Alert stating:

- Vehicles with cardan brakes must have their parking brake tested via **a roller brake machine** during Certificate of Fitness (CoF) inspections (instead of only a stall test).
- A warning sticker must be displayed on the cab of any vehicle fitted with cardan brakes.
- Owners/Operators must ensure that the brake is regularly maintained, adjusted and that incorrect assumptions are not made – for example 'Because there is a current CoF, the brake is adequate'

[Read the NZTA Safety Alert and more HERE.](#)

WHAT YOU SHOULD DO:

Asset Registers:

- Identify all vehicles and plant in your fleet that are fitted with cardan-shaft parking brakes.
- Include telehandlers, truck mounted equipment, vans, trucks and any off-road equipment where applicable.

Maintenance & Inspection regimes:

- Ensure each vehicle has a documented, scheduled maintenance program for the parking brake covering: clean, inspect, adjust, check, test.

Operator Training & Awareness:

- Ensure driver/operator are made aware that the vehicle uses a cardan brake, know the limitations, and how to apply it correctly and when to use the wheel chocks.
- Provide specific instructions that wheel chocks must be used when parking on a slope, when loading/unloading, when parked on unstable ground.
- Ensure drivers are physically capable of engaging the brake fully as it may require significant force.
- Keep a copy of the Safety Alerts in the vehicle

Parking & Operating Controls:

- Avoid parking on sloped or uneven surfaces – use wheel chocks as a secondary controls.
- Ensure that if the load of the vehicle will change while parked (unloading/loading), you are aware the brakes holding capacity may change – plan for that! Ensure exclusion zones are established.
- Monitor for oil leaks or other contamination sources near the brake.

Inspection/test compliance:

- Ensure the regular servicing and in-service tests (brake rollers).
- Ensure that the cab warning sticker is in place and that your service records show the brake type and maintenance evidence.

Document your risk management – keep records.