



Land Transport **NZ**
Ikiiki Whenua Aotearoa

Heavy-vehicle Brakes Rule

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Why rules are developed?

- To clarify existing requirements
- To consolidate existing requirements
- To CREATE new requirements as necessary

Reasons for new brake requirements

- Crash analysis showed that brake defects are the main technical problems causing heavy vehicle crashes
- NZ data suggests that 6 to 13% of heavy vehicle crashes are brake defect related
- More in-depth studies in the US suggest that this rate could be as high as 35%

Facts about heavy vehicle crashes

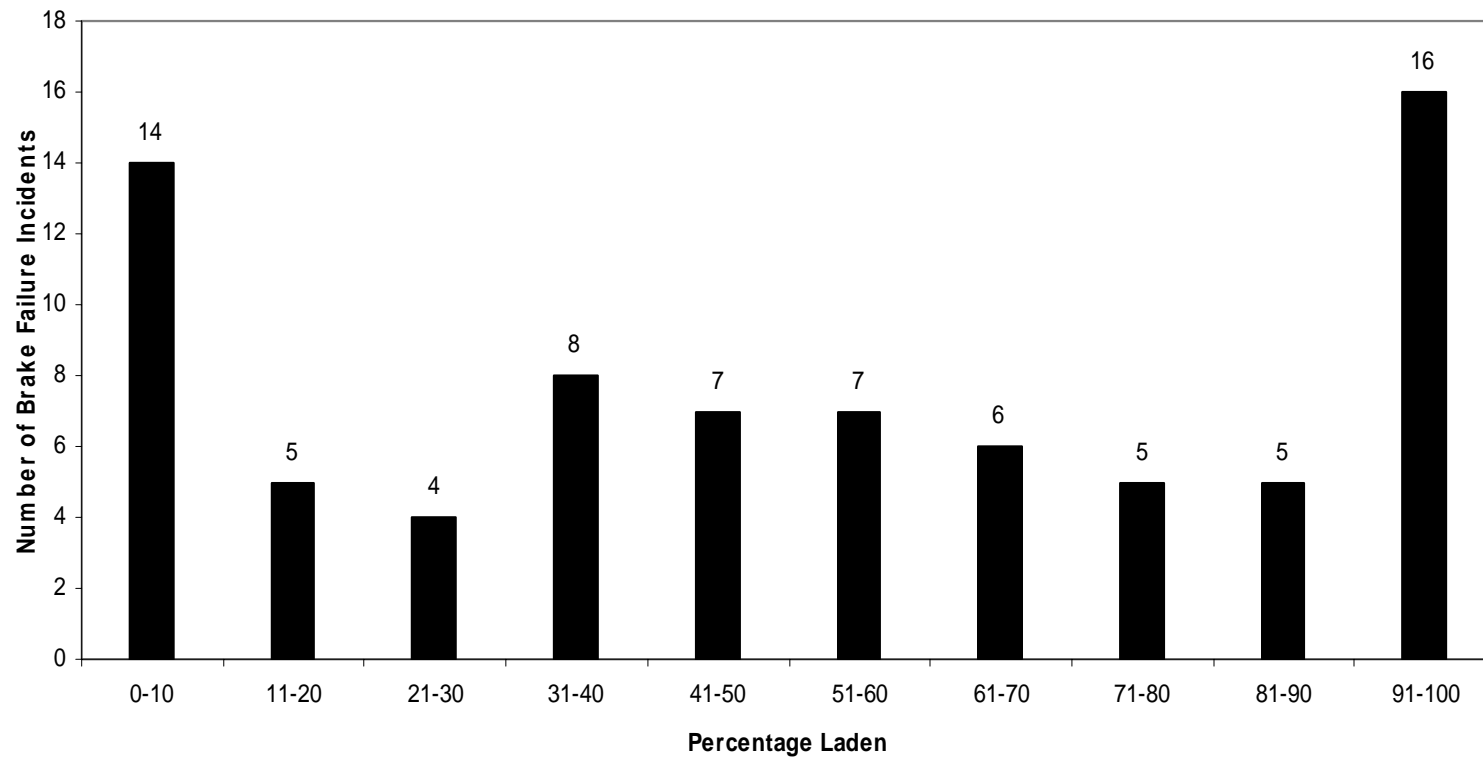
- Higher mileage – increased exposure rate
- Higher mass – increased impact energy
- More rigid construction – less “forgiving” during a crash, especially for other road users
- More complex brake systems for heavy vehicle combinations – higher probability of fault
- More complex dynamics during braking – less “feedback” for the driver

Sources of NZ heavy vehicles

- Powered vehicles are imported, mainly from the 4 main source markets (Australia, Japan, Europe, USA) – many of them are then modified
- Trailers manufactured mainly in NZ
- Varying load conditions from empty to fully laden
- Balanced brake performance for heavy vehicle combinations is more difficult to achieve with such a fleet and load conditions

Load condition vs. crash frequency

Relationship Between Incidents of Brake Defect Related Crashes and Laden Mass from 1997-2002



Identified safety problems

- Increased crash rate of lightly laden vehicles indicates directional stability problems during braking (jack-knifing, trailer swing)
- Increased crash rate of heavily laden vehicles indicates maintenance problems; the vehicles can't achieve the necessary deceleration

Problems identified and proposed solutions

- Two distinctive problems - two different solutions
- Directional control problems with lightly laden vehicles: better, more modern, sophisticated brake technology
- Performance problems with heavily laden vehicles: improved maintenance and tighter monitoring of performance

Proposal for directional control problems

- Mandate compliance with an approved standard (ADR, FMVSS, Japanese, UN/ECE) for imported vehicles
- Require them to have load sensing valves or a brake system that incorporates ABS
- Require NZ made trailers and modified vehicles to comply with equivalent technical specification (Schedule 5 in the Rule)

Implementation issues with the new brake technologies

- When new technologies are introduced they must co-exist with the current fleet
- This may prevent the maximum benefits from the new technologies; in the worst case safety improvements might not occur despite the costs of the new technologies
- The prohibition of mixing “old and new” brakes in vehicle combinations was considered

“New and old” brake technology in heavy vehicle combinations

- Prohibiting the mixing of “old and new” technologies in a vehicle combination would ensure full benefit of the new technologies in new vehicles
- But such prohibition may slow down market penetration of the new technologies
- Would introduce a segregation in the heavy vehicle fleet, reducing operational flexibility

The solution for this problem

- The potential safety problems with such “mixing” were investigated through tests carried out with strong industry support
- The safety risks are now better understood
- Mixing “old and new” brake technologies will be permitted
- Safety training for operators and drivers will be provided, with and by industry groups

Proposal to improve brake performance

- The maintenance of the vehicles and their brake systems is an **operator** responsibility
- The six-monthly CoF inspection is there as a **spot check** at the time of the inspection
- However, it must correctly and reliably assess brake performance

A CoF brake test:

- Is proposed to be able to verify, either directly or indirectly, that the vehicle can stop at any load condition as required in the law
- The primary focus must be on the achievable deceleration (or total brake force) of the vehicle when fully laden, but balance of the brakes will also be assessed to a reasonable extent

Options for CoF brake tests

- Testing the brakes with an actual load
- Simulating the load by means of:
 - axle pull-down
 - chassis pull-down
- Extrapolation method, mainly for air braked vehicles (some actual or simulated load may be required)
- Brake tests carried out by maintenance workshops prior to CoF inspection

Improved CoF brake test project

- An improved CoF brake test regime is likely to require significant investment
- A project group, with strong industry input, is preparing the implementation of the improved CoF brake test regime
- The draft rule is flexible on when the improved CoF brake test is to be implemented

Implementation of the rule

- The rule is scheduled to be signed during the first half of September 2006
- The rule is proposed to come into force on 1 March 2007.
- The requirement to comply with the new requirements (Standards, LSV, ABS, Schedule 5) is proposed to come into force on 1 July 2008.