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Extract taken: from NZTA Vehicle Portal > VIRMs > In-service certification (WoF and CoF) > Heavy trailers > Brakes > Service brake, parking brake, emergency brake and breakaway brake

5-1 Service brake, parking brake, emergency brake and breakaway brake

Reasons for rejection

Mandatory requirements

Service brake

1. A heavy trailer does not have a service brake.
2. A heavy trailer first registered in New Zealand **on or after 1 November 1990** does not have a service brake that is designed to act on each wheel.

Parking brake

3. A heavy trailer, other than a semi-trailer first registered **before 1 November 1990**, does not have a parking brake.
4. A parking brake of a vehicle first registered in New Zealand **on or after 1 November 1990** acts on less than 40% of the wheels.
5. A required parking brake of a heavy trailer cannot be applied by the driver from the normal driving position using one control only ([Note 2](#)).

Emergency brake

6. A heavy trailer, other than a semi-trailer first registered **before 1 November 1990**, does not have an emergency brake.
7. A required emergency brake does not act on at least one-third of the wheels.
8. A required emergency brake fails to automatically apply when the brake coupling is separated.

Hoses and other flexible tubing

11. A hose or other flexible tubing forming part of a compressed air or vacuum line does not comply with at least one of the standards in **Table 5-1-2** ([Note 3](#)).

Compressed air brake systems

12. The air brake of a vehicle first registered in New Zealand **on or after 1 March 2007** that has a towing connection to tow an air braked trailer (or a tow connection fitted **on or after 1 March 2007**) is not capable of being connected to the air brake of the trailer by means of a two-line system.
13. A required two-line system connecting a heavy vehicle to a heavy trailer, other than a semi-trailer, is not attached to the drawbar by a means that would prevent damage to the hoses or flexible tubing.
14. A vehicle that is certified to the New Zealand Heavy-vehicle Brake Specification (HVBNZ) does not have:
 - a) a drain valve fitted to the lowest point of each brake reservoir, specifically, the reservoirs of the service brake and park brake, and including the so-called 'wet tank', or
 - b) a drain valve fitted to an air-brake reservoir or to the reservoir of auxiliary equipment is not capable of being operated by a person standing beside the vehicle, without the need for a pit or hoist, or
 - c) an automatic drain valve does not have a means of manual operation.
 - Operation of drain valves must not require the use of tools.

Permitted equipment

15. An air-operated device is supplied air from a service brake reservoir (ie not from a separate reservoir) unless:
 - a) the operation of the device requires only a small amount of compressed air and it is supplied with compressed air by a hose or pipe with an external diameter not exceeding 8mm, or
 - b) the device is operated only when the vehicle is stationary, or

c) the vehicle manufacturer allows it.

16. An air-operated device is connected to the air brake system without a protection valve.

17. A trailer-brake hand control applies brakes other than the service brakes of the trailer(s).

Prohibited equipment

18. A heavy trailer, other than a heavy haulage trailer or military trailer, has a device fitted that allows the driver to adjust the service brake force distribution between the axles or between the vehicles that are used in combination.

Condition

19. Refer to [general trailer pages](#).

20. A brake is not capable of being easily adjusted.

21. An adjustment indicator rod is:

a) missing, or

b) seized.

22. A brake component has excessive travel or stroke (eg as shown by an adjustment indicator rod or similar device).

23. A brake actuator (including a slack adjuster and associated components):

a) is insecure, or

b) is leaking air, or

c) is cracked, or

d) does not operate, or

e) is excessively worn or corroded, or

f) is not seated correctly.

24. A brake valve or reservoir:

a) is missing, or

b) is insecure, or

c) is cracked, or

d) is leaking air, or

e) does not operate or operates incorrectly (eg due to corrosion, damage, incorrect fitment or excessive travel), or

f) contains excessive amounts of foreign fluids (eg water or oil).

25. A brake lining or brake pad:

a) has obviously been replaced **on or after 1 March 2007** without all the linings or pads on the axle being replaced at the same time, or

b) is obviously of a different make, type or grade from another on the same axle.

26. An air brake coupling device fitted to a heavy vehicle first registered in New Zealand on or after 1 March 2007 or fitted to a vehicle on or after that date:

a) is not robust, durable, or suitable for automotive application, or

b) is unable to prevent the incorrect connection of the control and supply lines, or

c) adversely affects the performance of the brake of either the towing or towed vehicle(s), or

d) does not have an effective break-away function, or

e) the coupling is not fitted as close as practicable to:

i) the centre-line of the vehicle, or

ii. the rear of the towing vehicle, or

iii. the towing connection by which the towed and towing vehicles are connected, or

iv. the front if the vehicle is a semi-trailer.

27. A brake pipe (including connections) is:

- a) leaking, or
- b) insecure, or
- c) deformed from its original shape, or
- d) chafed, or
- e) corrosion damaged, eg there are signs of pitting or a noticeable increase in the pipe's diameter, or
- f) damaged so the cross-sectional area is reduced, or
- g) fouled by moving parts.

28. A hose or plastic brake pipe (including connections):

- a) is leaking, or
- b) is insecure, or
- c) bulges under pressure, or
- d) is twisted or stretched, or
- e) is cracked or chafed, eg the reinforcement cords are exposed, or
- f) has metal components that are excessively corroded, or
- g) is fouled by moving parts.

29. A coiled nylon brake hose (suzie coil) does not have:

- a) a straight hose section at the connector that is at least 50mm long, or
- b) a spring guard adjacent to the end fittings capable of supporting and protecting the brake hose.
 - While spring guards can vary in design and length they must remain in good condition, ie not have broken or looped coils.

30. A full-trailer that uses a coiled nylon brake hose (suzie coil):

- a) does not have a cable of sufficient strength to disconnect/disengage the brake supply and control hoses from the towing vehicle, or
- b) the cable length will allow separation of the trailer towing coupling by more than 400mm before it disconnects/disengages the brake hoses to activate the emergency braking, or
- c) the suzie coiled hose is not suitably attached to the trailer drawbar so that it cannot be damaged by dragging on the road surface or pinched by any vehicle components.

Performance

Service brake (Note: 4)

31. The service brake is not able to be applied in a controlled and progressive manner.

32. When the service brake is applied and without assistance from the engine or other retarders:

- a) the vehicle does not stop within 7m from a speed of 30km/h (average brake efficiency of 50%) for a vehicle which has a service brake designed to act on at least four wheels, or
- b) the vehicle does not stop within 9m from a speed of 30km/h (average brake efficiency of 40%) for a vehicle first registered in New Zealand **before 1 February 1977** which has a service brake designed to act on fewer than four wheels, or
- c) the vehicle does not stop within 20m from a speed of 30km/h (average braking efficiency of 18%) or equivalent efficiency at its maximum speed for a vehicle manufactured **before 31 December 1918** and not capable of exceeding a speed of 30km/h.

33. When the service brake is applied:

- a) the vehicle vibrates under braking to the extent that control of the vehicle is adversely affected, or
- b) the brake fails to release immediately after the towing vehicle's brakes are released, or
- c) the directional control is affected (eg swerving to one side, or the brakes on one side apply more slowly than on the other

side), or

d) the brake balance, at anytime above the threshold value, varies by more than 30% between wheels on a common axle.

34. The ABS or brake system warning lamp or self-check system, if fitted, indicates a defect in the ABS or brake system (this does not apply to brake pad wear warning systems).

Parking brake (Note: 4)

35. When the parking brake is applied:

- a) the vehicle does not stop within 18m from a speed of 30km/h (average brake efficiency of 20%), or
- b) it does not hold all the wheels on a common axle stationary against attempts to drive the vehicle away.

Compressed air brake systems

36. A required drain valve cannot be operated manually.

Note Operation of drain valves must not require the use of tools.

37. On a vehicle that is certified to the New Zealand Heavy-vehicle Brake Specification (HVBNZ) the simultaneous application of the service brake and the spring parking brake results in the compounding of the two individual brake forces on that axle.

Modification and certification.

38. A vehicle in **Table 5-1-3**:

- a) has not been certified as required by that table, or
- b) has been modified so that recertification is required.

39. A modification that affects the brake system has not been inspected and certified by a heavy vehicle specialist certifier, unless the vehicle:

- a) is exempted from the requirement for heavy vehicle specialist certification (**Table 5-1-4**), and
- b) has been inspected in accordance with the requirements in this manual, including those for equipment, condition and performance.

Note 1 Definitions

Air brake means a brake, the operation of which requires the use of compressed air.

Anti-lock braking system (ABS) means a device that senses that one or more of the wheels is starting to lock-up during braking and regulates the braking forces automatically and effectively to prevent it.

Auxiliary brake means a device, other than a service brake or parking brake, fitted to a vehicle to enable the driver to control its speed, whether or not it is suitable to stop the vehicle.

Dedicated combination means a combination of vehicles certified for use in combination where both vehicles are affixed with a plate clearly and indelibly marked with the VIN or chassis number of the other vehicle.

Emergency brake *in relation to any vehicle, or combination of vehicles*, means the system that makes it possible to undertake a controlled stop of the vehicle or combination in the event of the failure of the service brake. (Emergency brakes must act as directly as practicable without any interposition of any differential gearing.)

Foundation brake means the basic brake assembly fitted to each axle or road wheel which produces the braking force necessary to bring a vehicle to a stop; and includes the complete drum or disc brake.

Hydraulic brake means a brake that utilises hydraulic pressure to activate the foundation brake, whether its operation is assisted by compressed air, vacuum or any other means.

Modify means to change the vehicle from its original state by altering, substituting, adding or removing any structure, system, component or equipment; but does not include repair.

Parking brake means a brake that is designed for keeping the vehicle stationary, and that is readily applicable and capable of remaining applied for an indefinite period without further attention. (Hydraulic locking devices are not acceptable as parking brakes. The parking brake must be applied by solely mechanical means.)

Repair means to restore a damaged or worn vehicle, its structure, systems, components or equipment; and includes the replacement of damaged or worn structures, systems, components or equipment with equivalent undamaged or new structures, systems, components or equipment.

Reservoir *for the purpose of the Heavy-vehicle Brakes Rule*, means a device designed and constructed to store fluid, compressed air, compressed gas, or vacuum; and does not include pipes, valves, hoses, or booster cylinders operated by vacuum or compressed air.

Service brake means a brake for intermittent use that is designed for the purpose of slowing down and stopping the vehicle.

Trailer brake hand control means a hand-operated control capable of applying the service brake of the trailer or trailers.

Wheel means a rotating load-carrying member between the tyre and the hub, which usually consists of two major parts, the rim and the wheel disc, which may be manufactured as one part, or permanently attached to each other, or detachable from each other; and includes the tyre fitted to the rim.

Note 2

The requirement for a parking brake of a heavy trailer to be applied by the driver from the normal driving position using one control only does not apply to:

a) a class TC trailer which has the parking control fitted to the trailer (eg a mechanical wind-on parking brake) provided:

i) it is part of a dedicated combination, and

ii) it does not have an air brake or a brake that is operated with the assistance of compressed air, and

iii) it is fitted with a device that can be operated by the driver of the towing vehicle from the driver's normal driving position to keep the trailer stationary temporarily, and

iv) the parking control of the trailer is fitted in a readily accessible position, and

v) the operating control of the device in (iii) above fitted to the towing vehicle has a label permanently attached displaying the words 'NOT FOR PARKING', or

b) a class TC or TD trailer that has a parking brake that is operated from the powered vehicle if the trailer also has a device that acts as a parking brake by applying the service brake indefinitely and that will apply the parking brake automatically if that service brake application fails. A trailer fitted with a WABCO Park Release Emergency Valve (PREV) or a trailer with EBS fitted with a Knorr-Bremse TEBS G2 electronic braking system would meet this requirement.

Note 3

For in-service inspections standards compliance must be verified when there is reason to believe a hose or flexible tubing does not comply or when it forms part of a brake modification or repair.

Note 4

For the purpose of testing the brakes, the vehicle shall be presented with a load at least 60 per cent of the road legal limit, or be subject to equivalent load simulation (refer to CoF and entry certification brake test protocol and procedure for specific requirements at www.nzta.govt.nz/resources/heavy-vehicle-brake-testing/)

Table 5-1-2. Approved vehicle standards for brake hoses and flexible tubing¹

All vehicles

SAE J844: Nonmetallic Air Brake System Tubing

SAE J1394: Metric Nonmetallic Air Brake System Tubing

SAE J1402: Automotive Air Brake Hose and Hose Assemblies

SAE J1403: Vacuum Brake Hose (supersedes SAE 40 R3)

British Standard AU 110: 1965, Specification for rubber hoses and hose assemblies for automotive air pressure brakes systems (withdrawn, revised)

British Standard AU 109: 1965, Specification for vacuum brake hose (heavy duty) of oil-resistant rubber (withdrawn)

Japan Industrial Standard D2606-80: Rubber hose for automotive air brake system

DIN 74324-1: 1996, Air braking systems – Thermoplastic tubing – Requirements and tests

DIN 73378: 1996, Polyamide tubing for motor vehicles

Federal Motor Vehicle Safety Standard No. 106: Brake hoses

SAE 40 R2 (A-E)

SAE 70 R3H

SAE 40 R3 L

SAE 40 R3 H

SAE R3 M

Nylon tubing of approved makes: Anson Plastics, Nylex, TWL

¹Hoses and tubing may comply with a more recent version of these standards if the safety performance of the vehicle is not adversely affected.

Table 5-1-3. Heavy vehicle brakes: certification requirements for class TC and TD vehicles

Conditions applying	Requirements
<p>Operated in a combination with a GM¹>39 ≤44 t, and</p> <ul style="list-style-type: none"> • first registered in New Zealand before 1 March 2007, and • not modified on or after 1 March 2007 (includes vehicles modified before 1 March 2007) 	<p>Existing applicable certification:</p> <ul style="list-style-type: none"> • IHVBS(1) Interim Performance Specification for Heavy Vehicle Braking • IHVBS(2) Heavy vehicle braking specification of 6 December 1998 • HVBC(1) Heavy Vehicle Brake Code, First Edition 1991 • HVBC(2) Heavy vehicle brake code, second edition
<p>Operated in a combination with a GM¹>39 ≤44 t, and</p> <ul style="list-style-type: none"> • first registered or modified² in NZ 1 March 2007–30 June 2008 	<p>Applicable certification:</p> <ul style="list-style-type: none"> • IHVBS(2) Heavy vehicle braking specification of 6 December 1998, or • HVBC(2) Heavy vehicle brake code, second edition, or • HVBNZ New Zealand heavy vehicle brake specification
<p>Modified² in NZ 1 March 2007–30 June 2008</p>	<p>Heavy vehicle specialist certification</p>
<p>First registered or modified² on or after 1 July 2008</p>	<p>Applicable certification:</p> <ul style="list-style-type: none"> • HVBNZ New Zealand heavy vehicle brake specification

¹ **GM** means gross mass (see definitions in the Introduction)

² **Modified** in this case means to change the vehicle or its braking system from its original state by altering, substituting, adding or removing any structure, system, component or equipment that may affect the brakes and includes, but is not limited to:

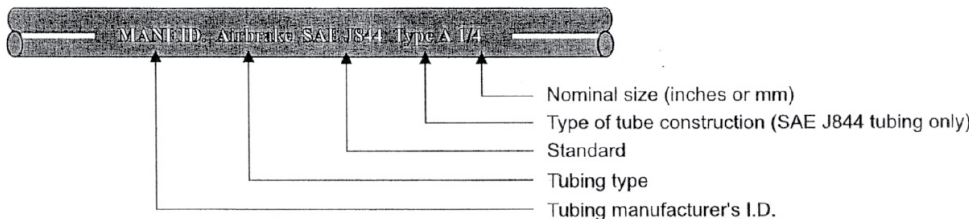
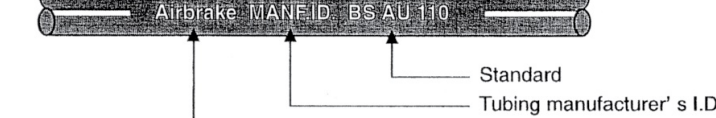
- altering a vehicle's wheelbase
- fitting a tow connection to tow a heavy vehicle.

Table 5-1-4. Modifications that do not require HVS certification

Fitting of or modification to:	HVS certification is not required provided that:
Air fittings (e.g. a connector, T-piece or an air reservoir drain valve)	<ul style="list-style-type: none"> • the air fitting: <ul style="list-style-type: none"> – does not affect the performance of the braking system, and – is suitable for the intended purpose, and – is unmodified (ie not welded, drilled or tapped), and – installed correctly to unmodified components.
Vehicle's wheelbase	<ul style="list-style-type: none"> • the vehicle has been certified as complying with the New Zealand Heavy-vehicle Brake Specification (CoL is marked with HVBNZ, and • the altered wheelbase is not outside the range specified by the vehicle manufacturer, or if no range is specified, is not altered by more than 500mm from original manufacture¹.
Any modifications for the purposes of law enforcement or the provision of emergency services	

¹ **Original manufacture** means, in this case, the state at manufacture, not the state after any subsequent modification/certification.

Brake hoses and flexible tubing information. Refer Table 5-1-2

<p>SAE</p>	
<p>APPROVED STANDARDS:</p>	<p>AIR BRAKE - SAE 40 R2 (A to E) Note: this standard was replaced by SAE J 1402 in 1985. SAE 70 R3H SAE J844 SAE J1402</p> <p>VACUUM - SAE 40 R3 L (light duty) SAE 40 R3 H (heavy duty) SAE R3 M (heavy duty, oil resistant) SAE J1403</p>
<p>PIPE MARKING:</p>	
<p>NOTES:</p>	<ol style="list-style-type: none"> 1. SAE J844 tubing must not be used; <ol style="list-style-type: none"> a) for flexible connections, <u>except as specifically approved</u> b) for compressor discharge pipes, c) above 93°C, or d) in any any area subject to attack by acid. 2. SAE J844 Type A tubing - has a single layer of nylon. SAE J844 Type B tubing - has two layers of nylon with an interlayer of braid.
<p>SMMT (Society of Motor Manufacturer' s and Traders) British Standards</p>	
<p>APPROVED STANDARDS:</p>	<p>AIR BRAKE - BS AU 110 VACUUM - BS VSAU 109</p>
<p>PIPE MARKING:</p>	

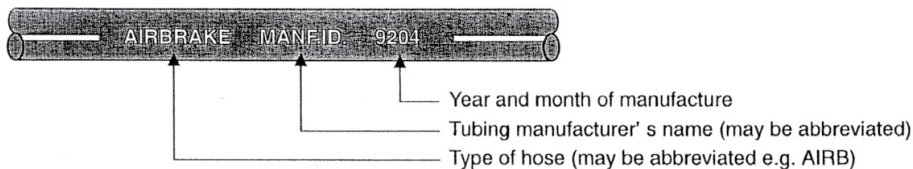
NOTES:

Marking colour	Hose type	
Red	1 & 2	For use between compressor and reservoir. Max temperature 135°C.
White	3 & 4	Synthetic rubber hose for use in other parts of brake system.
Blue	5 & 6	Natural rubber hose for use in other parts of brake system.

Japanese Industrial Standards

APPROVED STANDARD: AIR BRAKE - JIS D2606
 VACUUM -

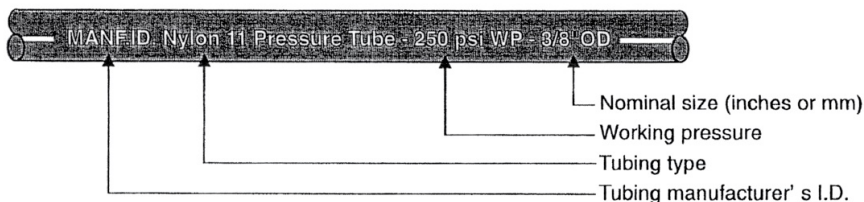
PIPE MARKING:



Nylon 11

APPROVED MAKES: AIR BRAKE - Anson Plastics
 Nylex
 TWL

PIPE MARKING:



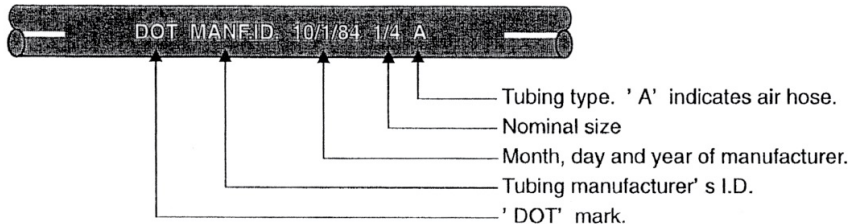
NOTES:

- Nylon 11 tubing may only be used in fail-safe applications such that:
 - its failure does not prevent the application of the brakes by the driver, or
 - its failure will cause the brakes to apply.

DOT (Department of Transportation, USA)

APPROVED STANDARDS: AIR BRAKE - FMVSS 106

PIPE MARKING:



NOTES:

- All lettering must be in capitals.
- The nominal size may be shown in fractions of an inch or millimetres:
 - if the size is shown in millimetres then the abbreviation 'mm' must follow.
 - if the nominal outside diameter is shown it must be followed by 'OD'.

Summary of legislation

Applicable legislation

- [Land Transport Rule: Heavy-vehicle Brakes 2006.](#)

Mandatory equipment

Service brake

1. A heavy trailer must have a service brake that acts on each wheel, except for a vehicle first registered in New Zealand before 1 November 1990 which may have a service brake that is designed to act on those wheels as determined by the

vehicle manufacturer.

Parking brake

2. A heavy trailer, other than a semi-trailer first registered **before 1 November 1990**, must have a parking brake.

3. A parking brake of a heavy trailer first registered in New Zealand **on or after 1 November 1990** must act on at least 40% of the wheels.

4. The parking brake of a heavy trailer must be able to be applied by the driver from the normal driving position using one control only, except for:

a) a class TC trailer which may have the parking control fitted to the vehicle if:

i) the vehicle is part of a dedicated combination and does not have an air brake or a brake that is operated with the assistance of compressed air, and

ii) the vehicle is fitted with a device that can be operated by the driver of the towing vehicle from the driver's normal driving position to keep the trailer stationary temporarily, and

iii) the parking control of the trailer is fitted in a readily accessible position, and

iv) the operating control of the device in (ii) fitted to the towing vehicle has a label permanently attached displaying the words 'NOT FOR PARKING', or

b) a class TC or TD vehicle that has a parking brake that is operated from the vehicle if the vehicle also has a device that acts as a parking brake by applying the service brake indefinitely and that will apply the parking brake automatically if that service brake application fails.

Emergency brake

5. A heavy trailer, other than a semi-trailer first registered **before 1 November 1990**, must have an emergency brake.

6. The emergency brake of a heavy trailer first registered in New Zealand **on or after 1 November 1990** must act on at least one-third of the wheels.

7. The emergency brake may be combined with the parking brake or the service brake.

8. The emergency brake of a heavy trailer must operate immediately and automatically to stop and hold the trailer stationary if it becomes disconnected from the towing vehicle.

Hoses and other flexible tubing

9. A hose or other flexible tubing forming part of the compressed air or vacuum lines of a heavy trailer must comply with one or more of the approved vehicle standards in **Table 5-1-2**.

Compressed air brake systems

10. A heavy trailer that is fitted with an air brake or a brake that is operated with the use of compressed air must be equipped with air receivers or other means of storing compressed air.

11. The air brake of a vehicle first registered in New Zealand **on or after 1 March 2007** or modified on or after that date that can be operated in a combination vehicle must be capable of being connected to the air brake of the other vehicle by means of a two-line system.

12. A two-line system must consist of:

a) a supply line that supplies compressed air from the towing to the towed vehicle; and

b) a control line that supplies a control signal, in the form of modulated air pressure, to regulate the intensity of the brake application on the towed vehicle or vehicles.

13. For vehicles other than those towing semi-trailers, the hoses are to be treated as part of the trailer and must be securely attached to the drawbar.

14. A vehicle that is certified to the New Zealand Heavy-vehicle Brake Specification (HVBNZ) must:

a) have a drain valve fitted to the lowest point of each brake reservoir, specifically, the reservoirs of the service brake and park brake, and including the so-called 'wet tank', and

b) a drain valve fitted to an air-brake reservoir or to the reservoir of auxiliary equipment must be capable of being operated by a person standing beside the vehicle, without the need for a pit or hoist, and

c) an automatic drain valve must have a means of manual operation.

Permitted equipment

15. An air-operated device may be connected to the air brake only if:

a) the brake is protected so that the operation or failure of the device cannot lower the pressure in any service or parking brake reservoir(s) below the pressure specified by the vehicle manufacturer or brake manufacturer, or, if such information is not available, two-thirds of its maximum operational pressure specified by the vehicle manufacturer or brake manufacturer, and

b) the supply to the device is drawn from a reservoir separate from the service brake or parking brake reservoir(s) supplying the brake, except that an air-operated device may be supplied with compressed air from the service brake or parking brake reservoir(s) if:

- i. the operation of the device requires only a small amount of compressed air and it is supplied with compressed air by a hose or pipe with an external diameter not exceeding 8 mm, or
- ii. the device is operated only when the vehicle is stationary, or
- iii. the vehicle manufacturer allows it.

16. A heavy trailer may be fitted with brakes when they are not required.

Prohibited equipment

17. A heavy trailer, other than a heavy haulage trailer or military trailer, must not have a device fitted by which the driver would be able to adjust the service brake force distribution between the axles or between the vehicles that are used in combination.

Condition

18. A brake must be easily adjustable to compensate for wear or have a means of automatic adjustment and be in good condition.

19. The brake friction material of a brake must be:

- a) secure, and
- b) in good condition, and
- c) free of defects that could noticeably and adversely affect the performance of the brake.

20. When a brake lining or a brake pad on an axle is replaced:

- a) all the brake linings or brake pads on that axle must be replaced, and
- b) all replacement brake linings and brake pads on that axle must be of the same make, type and grade.

21. A towing vehicle and a towed vehicle first registered in New Zealand **on or after 1 March 2007** or modified on or after that date must be fitted with a coupling device to connect the air brake to, and disconnect it from, that of the other vehicle, and that device must:

- a) be robust, durable, and suitable for automotive application, and
- b) prevent, either through the design of the coupling device or through its installation, the incorrect connection of the control and supply lines, and
- c) not adversely affect the performance of the brake of either the towing or towed vehicle(s), and
- d) have an effective break-away function.

22. The socket of a coupling device must be fitted as close as practicable to:

- a) the centre-line of the vehicle, and
- b) the rear of the towing vehicle, and
- c) the towing connection by which the towed and towing vehicles are connected, and
- d) the front of a semi-trailer.

Performance

23. A brake test that verifies that a vehicle complies with performance requirements must be carried out, and the test results evaluated, in accordance with methods and conditions approved by the NZTA by notice in the New Zealand gazette.

24. The service brake on a heavy vehicle must be able to be applied in a controlled and progressive manner.

25. Every brake which simultaneously applies the braking pressure on two wheels with a common axis must be adjusted or fitted so that the braking effect is approximately the same on both wheels when the brake is applied by the driver, except if the braking effect is modulated by a device to prevent the wheels locking or to improve stability (eg ABS or EBS).

26. When the brake on a heavy vehicle is applied:

- a) the vehicle or its controls must not vibrate to the extent that control of the vehicle is adversely affected, and
- b) the braking effort on each wheel must provide stable and efficient braking without adverse effect on the directional control of the vehicle, and
- c) if the vehicle is equipped with an anti-lock braking system (ABS), the vehicle's rotationally-sensed wheels must not lock, when the speed of the vehicle is above the ABS-activation parameters set by the vehicle manufacturer.

27. A brake warning system, if fitted, must function correctly (this does not apply to a brake pad wear system).

Service brake

28. The service brake of a vehicle or vehicle combination that is operated on a hard, dry, level surface that is free of loose material, and without assistance from the compression of the engine or other retarders must operate in the following manner:

- a) A service brake that is designed to act on four or more wheels must stop the vehicle within a distance of 7m from a speed of 30km/h (average brake efficiency of 50%).
- b) A service brake that is designed to act on fewer than four wheels on a vehicle first registered in New Zealand before 1 February 1977 must stop the vehicle within a distance of 9m from a speed of 30km/h (average brake efficiency of 40%).
- c) A service brake on a heavy vehicle manufactured before 31 December 1918 not capable of exceeding a speed of 30km/h must stop the vehicle within a distance of 20m from a speed of 30km/h (average brake efficiency 18%) or equivalent brake efficiency at its maximum speed.

Parking brake

29. A parking brake of a vehicle or vehicle combination that is operated on a hard, dry, level surface that is free of loose material, and without assistance from the compression of the engine or other retarders must operate in the following manner:

- stop the vehicle within 18m from a speed of 30km/h (average brake efficiency of 20%)

Compressed air brake systems

30. An air brake must have priority of supply of compressed air from the brake reservoir.

31. A vehicle that is certified to the New Zealand Heavy-vehicle Brake Specification (HVBNZ) and fitted with a spring-operated parking brake that is normally released by compressed air, the simultaneous application of the service brake and parking brake must not result in a compounded brake force on the axle or axles on which the parking brake acts. This may be referred to as an 'anti-compounding' requirement.

Modification and certification

32. The brakes fitted to a heavy trailer must comply with the certification requirements in **Table 5-1-3**.

33. A modification that may affect the brake system must be inspected and certified by a heavy vehicle specialist certifier of category HVEK or HMKD unless the vehicle:

- a) is exempted from the requirement for heavy vehicle specialist certification (**Table 5-1-4**), and
- b) has been inspected in accordance with the requirements in this manual, including those for equipment, condition and performance.