

Traffic Note 19 – Revision 1

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From Safer Roads
Authorisation Peter Croft, Manager Safer Roads

Signature _____

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Engine braking controls - Guidelines

1 Purpose

Engine brakes can produce a very distinctive impulsive noise when activated which can annoy residents near major heavy vehicle routes. This Traffic Note provides information relating to the performance and use of engine brakes. It provides legal opinion on engine brake restrictions and describes a sign recommended to reduce unjustified use.

2 Supplementary brakes

Supplementary braking systems are provided on heavy vehicles to assist the service brakes in maintaining safe speeds travelling down hills. In practice, however, heavy vehicle drivers use the supplementary brakes not only for this purpose but to generally retard speed and provide some braking required in normal slowing and stopping.

It should be noted, when travelling down a grade, it is considered safe driving practice for drivers to select the gear corresponding to the gear they would use if climbing the grade. This inherently means the vehicle is using the engine to maintain speed.

In urban areas a supplementary braking system is generally unnecessary to maintain control because of low operating speed and usually short lengths of grade.

Generally, for grades less than 2%, rolling friction, air resistance and drive train losses provide sufficient retardation to maintain constant downhill speed at a legal or safely controllable limit.

Application of supplementary braking systems should be unnecessary.

On grades up to about 3% and speeds generally less than 30km/h, intermittent use of the service brakes (intermittent to allow for cooling or to recover from brake fade) can provide sufficient braking power, in association with rolling friction and other retarding factors, for long periods of time.

For long grades exceeding 4%, a heavily laden truck or bus without a supplementary braking system generally could not be operated safely at higher speeds.

There are three main types of supplementary braking systems, namely:

- *exhaust brakes* - a device using engine exhaust back pressure as the retarding medium;
- *engine brakes* - a device using engine compression as a retarding medium; and
- *retarders* - (electric or hydrodynamic) which are installed in the driveline.

3 Engine brakes

The most commonly used supplementary braking systems are engine brakes. While some of the following do apply to other supplementary braking systems specific points about engine brakes to note include:

- engine brakes are unsuitable for emergency situations although they do provide smooth retardation on wet or icy roads and are independent of existing air brakes;
- some drivers consider a noisy engine brake is functioning better than a quiet one;
- as well as providing a safety buffer for aspects of the vehicle's service brakes the engine brake allows longer brake lining and drum life, better fuel economy and provide a cost advantage;
- engine brakes are most efficient at high engine speeds;
- manufacturers claim their 'new generation' engine brakes are very quiet;
- the muffler design and condition is fundamentally linked to the noise level and noise characteristics of the engine brake; and
- engine brakes provide some environmental advantages through reduction in pollution from brake lining fibres and heavy metals from drums or disc wear.

4 Legal and enforcement issues

Earlier legal advice indicated that, unless a bylaw prohibiting the use of engine brakes was made before 1 October 1989, any regulatory control of noise generated by engine brakes would have required application of the *Resource Management Act 1991*. To effectively impose and enforce a restriction under this Act is problematical.

Now, *Section 145 of Local Government Act 2002* gives road controlling authorities power to make bylaws "*protecting the public from nuisance*". Application of this power may be appropriate to prevent the use of engine brakes.

Any bylaw prohibiting or controlling the use of engine brakes would be required to follow the special consultative procedures set out in the *Local Government Act 2002* and the road transport industry and NZ Police could be expected to comment on any such proposal.

The specific provisions contained in any bylaw may determine who might enforce it. If the bylaw were simply a ban on the use of engine brakes by heavy motor vehicles it would normally only be enforceable by NZ Police reinforcing the need to ensure they are consulted.

Sub-clauses 7.4(1) and (3) of the Land Transport (Road User) Rule 2004 state:

- (1) A driver must not operate a vehicle that creates noise that, having regard to all circumstances, is excessive.*
- (3) In determining whether any noise is excessive, regard may be had, in addition to all other relevant matters, to –*
 - (a) the manner of operation of the vehicle:*
 - (b) the condition of the vehicle:*
 - (c) the time of the day when the noise is created:*
 - (d) the locality where the noise is created:*
 - (e) the likelihood of annoyance to any person:*
 - (f) any relevant standard or specification that applies under the [Land Transport] Act.*

Enforcement of this provision does not require passing of a bylaw but places onus on the prosecution to demonstrate how the noise created was “excessive” in regard to any of the tests described in *sub-clause 7.4(3)*. As the provision creates a “moving” offence, enforcement would normally be carried out by NZ Police.

5 Voluntary observation of restrictions

The Road Transport Forum (RTF) is aware of the local concerns and has been encouraging its members to avoid use of engine brakes in urban areas. In a number of locations, signs have been erected asking heavy motor vehicle users to voluntarily refrain from using engine brakes. Reports from these sites indicate good levels of compliance and consequent reduction in noise and complaints from residents.

- Before attempting to ban or control engine brake use the RCA should consult with the local representative of the RTF.
- There may be good reasons why engine brakes are used on a particular route and it is essential these reasons are identified and options explored. If drivers believe they cannot reasonably comply with a request not to use engine brakes, expectations of the local community will not be met.
- The actual source of noise or annoyance may not be engine brakes and effort to ban their use will not bring about any reduction in annoyance at the site but may reduce the impact of such bans elsewhere.

- The RTF, once it understands the local concerns, may be able to assist the RCA in effecting the desired outcome.
- The presence of advisory signs with supporting documentation detailing the nature of the concerns and level of community complaint leading to the installation of the signs may assist NZ Police in any prosecution taken under *sub-clause 7.4(3)* of the *Land Transport (Road User) Rule 2004*.

6 Advisory traffic sign format

In terms of the *Land Transport Rule: Traffic Control Devices 2004* a sign recommending non-use of engine brakes should be in the form of an *A45-5 Heavy vehicles please no engine braking next [distance] km* described in *Schedule 1 (IG-17 of the Manual of Traffic Signs and Markings)*.

The use of the term 'heavy vehicles' rather than 'trucks' recognises that buses are also equipped with engine brakes and the request applies equally to them. Use of the term is considered necessary to overcome any confusion to other road users.

Signs not conforming to the recommended sign or where the wording implies a legal ban (unless covered by a by-law made before 1 October 1989 or pursuant to the *Resource Management Act 1991* or *Local Government Act 2002*) should be replaced.