

Vehicle Standards Guide 34 (VSG-34) - Installation of alternative fuel systems

This guide provides advice to operators and modifiers about the requirements for modifying or installing alternative fuel systems.

Background

The heavy vehicle industry in Australia has always been at the forefront of developing solutions to complex issues. Being proactive in exploring new and innovative alternative fuel systems is just one example of this.

Some of the benefits of converting to alternative fuels or adding fuel enhancement and supplement systems may include, environmental (reduced greenhouse gas emission, reduced pollution emission), energy security and lower operational cost for the vehicle's operator.

Generally, for heavy vehicles to operate on alternative fuel systems, modifications will be required. These can include, but are not limited to, the engine, body, and even the chassis in some cases.

Modifications to a heavy vehicle without proper design and approval can cause significant safety risks to the driver, other road users and the public. In addition, they can also cause adverse impacts on infrastructure, the environment and community amenity concerns.

Despite the dangers that unapproved modifications to fuel systems can present, the National Heavy Vehicle Regulator (NHVR), road transport authorities and work health and safety regulators continue to see heavy vehicles operating with these unapproved fuel system modifications.

Installing or modifying these systems requires approval from the NHVR.

Modifications requiring approval

A person must not modify a heavy vehicle unless the modification has been approved.

- Common modification must be approved an Approved Vehicle Examiner (AVE) under [section 86](#) of the *Heavy Vehicle National Law* (HVNL)
- Complex modification must be approved by the Regulator under [section 87](#) of the HVNL.

Alternative fuels

Energy sources besides diesel and petrol are typically considered alternative fuels. These are typically categorised into groups including, or a combination of:

- electric
- hybrid electric
- hydrogen
- liquefied petroleum gas
- natural gas; and
- alternative fuels such as bio-diesel, ethanol, etc.

Alternative fuel systems

Alternative fuel systems can be employed in many ways, including:

- single fuel
- multi-simultaneous fuels
- dual fuel; or
- add on enhancement and supplement systems.

Modification of an existing fuel system to an alternative fuel system can include, but is not limited to:

- add-on fuel enhancement and supplement systems
- full replacement of fuel systems
- changes to original equipment manufacturer (OEM) system to operate on alternative fuels like biodiesel, etc.

Common Modifications

Vehicle Standards Bulletin 6 (VSB6): National Code of Practice Heavy Vehicle Modifications (VSB6) is the national standard for the most common modifications made to heavy vehicles.

While *Modification Code A1 – Engine substitution*, allows for conversion of petrol engines to diesel and vice versa, it does not cover the installation or conversion of alternative fuel systems.

This means that the alternative fuel conversion cannot be completed in accordance with VSB6, and approval from the NHVR must be granted for a complex modification.

In some cases, there may be related modifications required as part of the alternative fuel conversion. Where these modifications are carried out in accordance with the relevant sections of VSB6, an AVE may approve the relevant component of the modification.

All related modification approvals should be included with the complex modification approval.

Complex Modifications

As there is no dedicated modification code for the installation or modification of alternative fuel systems, approval must be granted by the NHVR to carry out the modification.

This includes the use of hydrogen in any of the above-mentioned alternative fuel systems and any modifications that change in the vehicle power train to no longer comply with OEM specifications. For example, modifying a vehicle to be electric/hybrid cannot be approved under section 86 of the HVNL.

Applying for Complex Modification approval

Applications for complex modifications are completed through the NHVR portal. [Approval to modify a heavy vehicle](#).

Applications for complex modification must include evidence in support of the modification. In addition to a completed engineers report, documents should include but are not limited to:

- Requirements of DT80
- NHVR simplified emissions test procedure* or
- ADR 80/.. Emission Rates
- UNECE R134, R100 etc
- Gas certificates
- Support from the Department of Climate Change, Energy, the Environment and Water (DCCEEW) Fuel Quality Regulator.

*For more information on the simplified test, refer to [Vehicle Standards Guide \(VSG\) 28](#).

Chain of Responsibility

Under the Chain of Responsibility (CoR) laws, relevant parties in the transport supply chain have a duty to ensure the safety of their transport activities.

Parties in the chain have an obligation to eliminate or minimise potential harm or loss (risk) by doing all that is reasonably practicable in their business to ensure safety.

Implementing a system to ensure you are informed of changes to the vehicle safety standards and apply these to your business can support transport safety.

Complying with the Heavy Vehicle National Law

The operator of a heavy vehicle must ensure their vehicle complies with the *Australian Design Rules* (ADRs) and *Heavy Vehicle (Vehicle Standards) National Regulation*. Using or permitting another person to use a defective heavy vehicle on a road is an offence.

A defective heavy vehicle is a vehicle that:

- does not comply with the heavy vehicle safety standards; or
- has a part that does not perform its intended function; or
- has deteriorated to an extent that it cannot be reasonably relied on to perform its intended function.

Penalties can include on-the-spot fines or prosecution. Formal warnings or a defect notice may also be issued. For more information about vehicle defects, see [Heavy vehicle defects](#).

For more information:

Visit: <http://www.nhvr.gov.au/hvmodifications>
 Email: vehiclestandards@nhvr.gov.au
 Phone: 13 NHVR (13 64 87)*

*Standard 1300 call charges apply. Please check with your phone provider.
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