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Road speed limitation for commercial vehicles



VDO

Mobility shapes our life – moving ahead is our passion

A passion for mobility drives us to achieve new goals, to push further and to move boundaries. As a global supplier, we are concentrating on our core competencies: On innovations and technically demanding solutions. And implementing them. Faster, more efficiently and more successfully than others. Our claim reads: We want to be the best in the industry – we want to make future mobility safer, more convenient and sustainable.

We have been developing a wide range of products and solutions for commercial and special vehicles for over 80 years. And the requirements are constantly changing. Increasingly heavier traffic, the ever-decreasing availability of raw materials and our increasing sense of safety and environmental awareness mean that we are constantly facing new challenges.

We seize on these tasks, seeing them as an opportunity to place trust in the knowledge of our many specialists in a lot of different fields of business, particularly in the commercial vehicles sector. As market and technology leader for tachographs, and with our control and monitoring systems for drive and on-board electronics, the on-board units for toll collection, the telematic units and display instruments, we are securing the economic and ecological progress of the commercial vehicle industry for today, tomorrow and the future.



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General information

Excessive speed in driving heavy vehicles has been a social and governmental issue around the world for many years, primarily from the perspective of road safety. With increased engine power and long axle ratio, attainable speeds for trucks are currently much higher than the speed limits on highways and secondary roads in many countries.

Excessive speed in trucks has numerous consequences, including:

- Higher rates of accidents involving fatalities and serious injuries
- Increased operating and maintenance costs for the transport industry
- Increased costs for insurance companies
- Greater environmental pollution



One effective solution to prevent speeding in commercial vehicles is to equip them with a road speed limiter system, which restricts maximum road speed to the required speed limit without loss of engine power. This is realized by limiting the required fuel demand according to a set speed limit. The maximum speed limit is set using an electronic control unit.

Information about the current speed of the vehicle is measured with a speed sensor that supplies an electronic speed signal to the control unit. The control unit limits the fuel output in different ways, depending on the fuel injection technology of the engine. In addition to its main function, limiting the maximum speed, the system offers a variable speed limiter as an option. The driver can activate this feature below the maximum speed limit in areas with lower speed limits.

Furthermore, the speed limiter includes additional speed limit inputs to preprogram smaller speed limits than the maximum speed. This functionality can be used to prevent fast driving if any special function in the vehicle is activated (like open doors on a city bus or people on the platform in the back of a garbage truck).

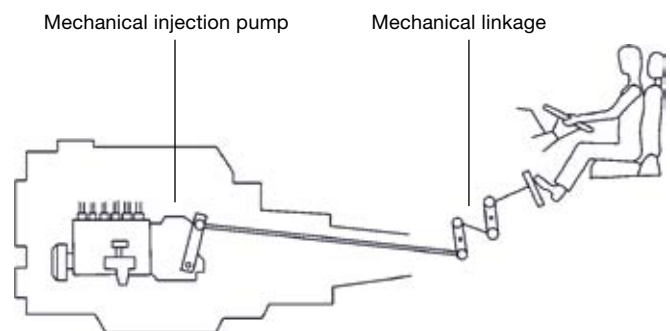


Technical conditions

Two different engine technologies used in vehicles require different speed limiter device applications.

Mechanically controlled engines

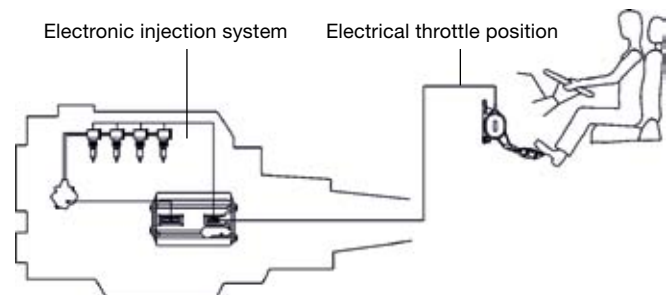
Engine revs are regulated with a mechanical throttle pedal, which transmits the pedal position mechanically via a throttle cable or rod to the injection pump (or throttle body). The fuel demand on the injection pump is adjusted via a mechanical injection pump lever or a mechanical throttle plate. To realize a speed limiting system on a mechanically controlled engine, an electromechanical speed limiter is used to decouple the driver's demand from the injection pump in order to limit the maximum speed. In this application, the vehicle must be equipped with a separate speed limiter system.



Example of a mechanically controlled engine

Electronically controlled engines

Engine revs are regulated with a mechanical throttle pedal which converts the mechanical pedal position to an electrical signal, and transmits it via an electrical wire to an electronic control unit. The control unit regulates the fuel demand via electronic injection such as electronic diesel control (EDC), a pump line nozzle system (PLD) or common rail direct injection (CDI). In this application, the speed limiter function could be one of numerous functions managed by the engine's or vehicle's electronic control unit.



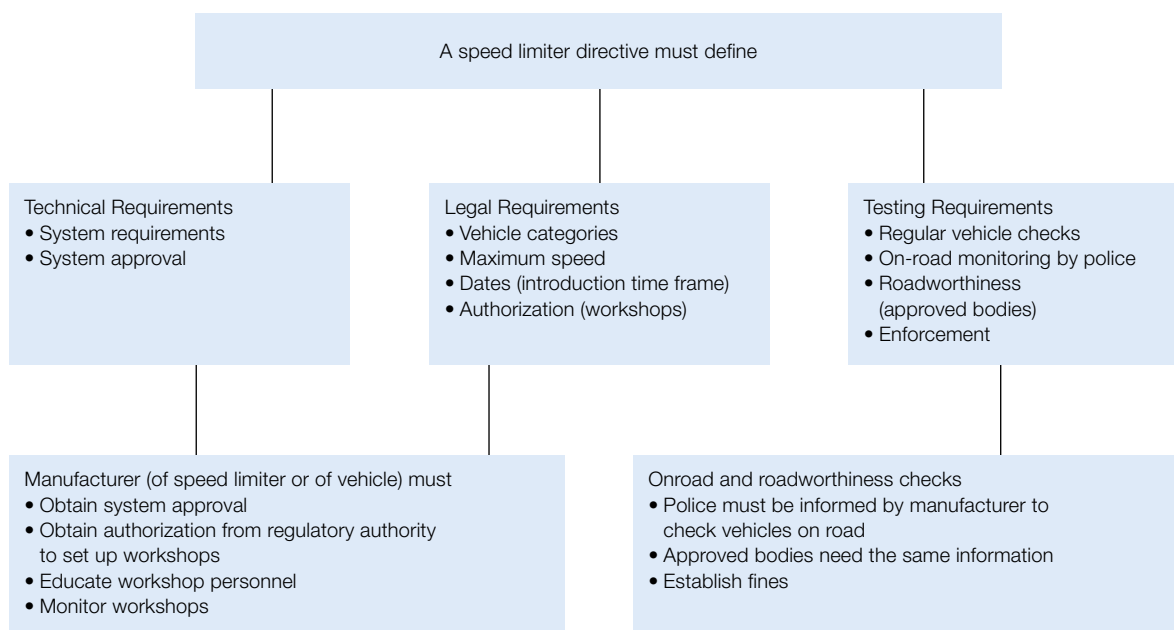
Example of an electronically controlled engine with speed limiter function in the engine or vehicle ECU



Legal requirements

Experience from different countries and regions of the world has shown that successful implementation of a speed limiter directive rests on three major pillars:

- Technical requirements for speed limiter systems
- Legal requirements for implementation
- Testing requirements (vehicle monitoring in traffic)



Compile statistics after law has come into effect in order to make corrections

Graphical depiction of implementation of a speed limiter directive

Solutions

VDO OEM solutions for commercial vehicles

VDO offers a wide range of vehicle controllers and electromechanical actuators for commercial vehicles, most of which include functionality for a road speed limiter. These devices are specially designed in co-operation with truck manufacturers. The product spectrum consists of various controllers including:

- Power train master control unit
- Transmission and retarder control unit
- Rear axle control unit

VDO Pedal Interface II Retrofit solution for electronically controlled engines

Pedal Interface II consists of an electronic control unit that is installed between the pedal sensor and the engine management system, and can be custom programmed. Three versions of Pedal Interface II are available: Standard, Enhanced and Premium (See functionality comparison). The setting signals are easy to manage effectively according to how the system is programmed, and fixed additional functions may also be activated. The special configuration of the Pedal Interface II makes it unnecessary to adjust the hardware and software associated with standard engine management system. This makes Pedal Interface II suitable for use on nearly all types of vehicles. It can be configured by authorized personnel to meet the needs of a wide range of applications.

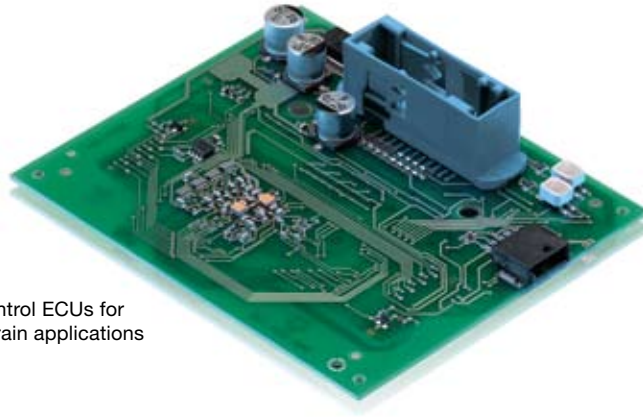
Configuration Diagram



Pedal Interface II configuration diagram

Functions	Standard	Enhanced	Premium*
Tempostat® cruise control Flexible speed limitation and speed selection	•	•	•
Variable road speed limiter Custom setting of max. speed between 30 and 200 KPH	•	•	•
Road speed limiter Define maximum top speed		•	•
Additional road speed limiter Program up to 7 additional speed limitations on control unit (Premium)		•	•
Engine speed limit Define a maximum top engine speed		•	•
Fixed engine speed control facility Program up to 7 additional engine speed limitations on control unit (Premium)			•
Variable engine speed control facility Custom engine speed options via remote control handset up to a defined max. engine speed			•
Fuel limitations Program up to 7 fuel limits via the status inputs (Premium)			•
*A maximum of 7 limits may be set in total.			

Functionality of the three Pedal Interface II versions

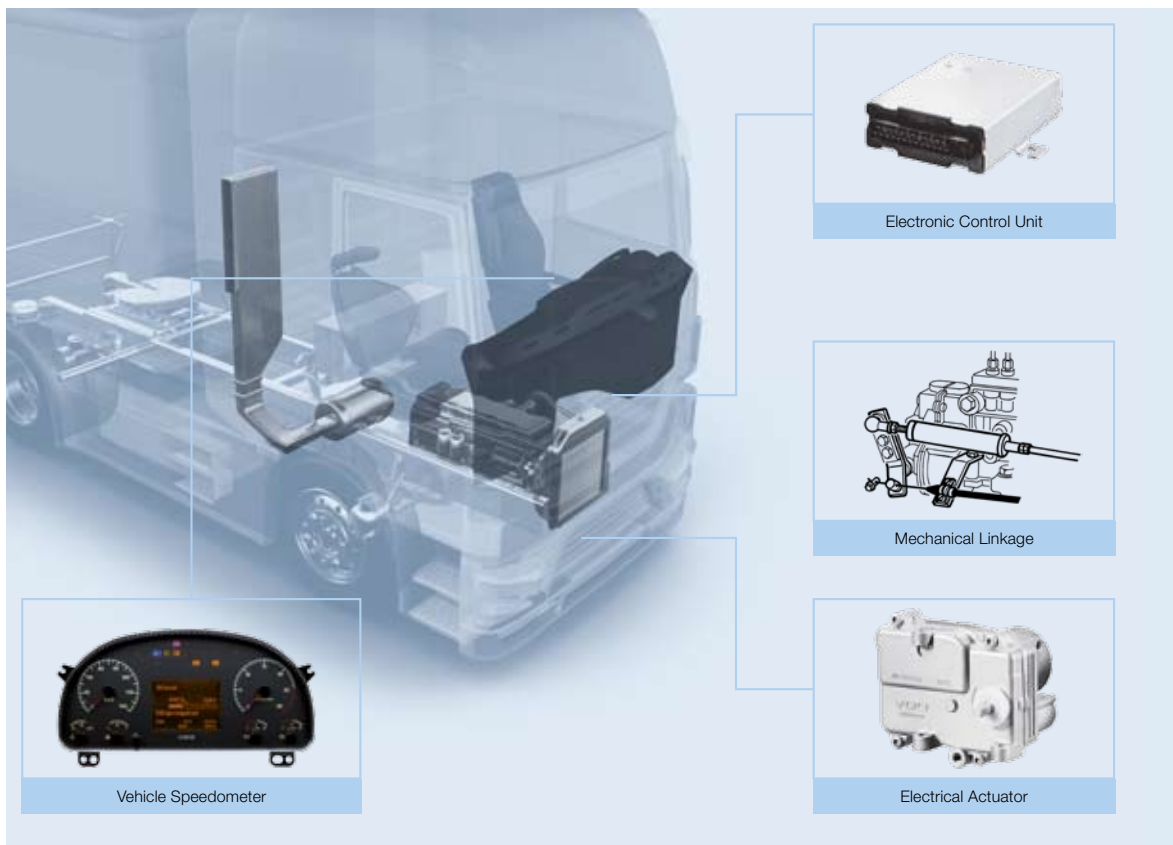


VDO control ECUs for power train applications

VDO AGB III Retrofit and OEM solution for mechanically controlled engines

AGB III is the third generation of automatic speed limiters. Its construction corresponds to European regulations. In addition to the top speed limiter, which limits vehicle speed to a preprogrammed value, the unit includes a variable speed limiter for use at speeds between 30 KPH and the maximum speed limit. By pressing the variable speed limiter switch, the driver can choose any speed within this range, and the con-

troller limits the speed according to the driver's demand. Alternatively, the unit can be preprogrammed for a second speed limit below the maximum speed limit. The electronic control unit is self-diagnosable. The electrical actuator is a device that has been tested and proved over years of operation in everyday use. Various application sets are available.

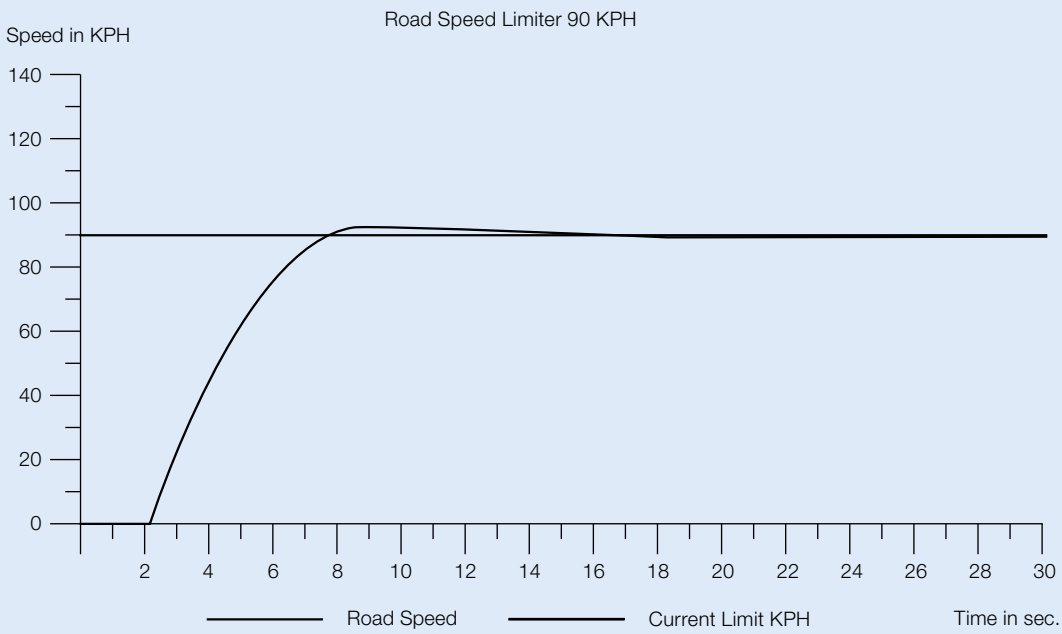
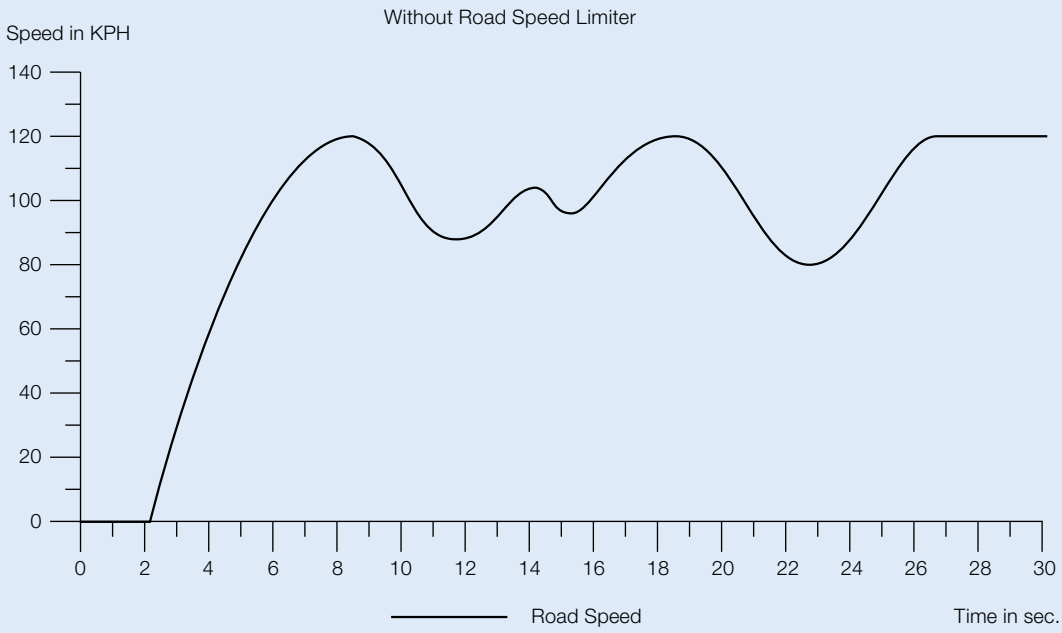




Advantages

The advantages of VDO road speed limiter systems are their own best advertisement:

- Reduced accident risk due to limitation of the maximum vehicle speed
- Decreased environmental pollution due to minimized pollutant emissions
- Driver is able to devote full attention to the traffic environment, because there is no need to monitor speed visually
- Easy installation of retrofit systems
- More than 30 years experience in speed limiter devices and directives worldwide
- Lower operating costs as a consequence of
 - reduced wear
 - reduced fuel consumption
 - lower service costs
 - longer vehicle lifetime
 - elimination of fines for speeding



Vehicle speed monitoring with and without Road Speed Limiter

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