

European standards for diesel engines – Russell Walsh

What are European (Euro) standards?

Euro standards or to give them their full name European Emissions Standards were introduced in 1970 as the European Economic Commission (EEC) set out to reduce the level of harmful emissions resulting from burning fossil fuels in internal combustion engines. Although originally introduced for the European market by default Euro standards have become the worldwide standard.

Standards exist for most types of internal combustion engine powered vehicles, petrol and diesel, including:

- Passenger cars
- Motorcycles (two and three wheels)
- Light commercial vehicles (vans and light trucks)
- Trucks and buses
- Large goods vehicles

Euro standards are not fuel efficiency standards; they are emission reduction standards.

Where a particular type of vehicle such as passenger cars can be either petrol- or diesel-powered separate standards exist for each engine type.

For trucks and busses the applicable standard is linked to the energy output of the engine fitted.

Prior to 2017 testing was predominantly undertaken in a laboratory environment however testing in real world driving conditions now takes place using portable emissions testing equipment

Emission control

Internal combustion engines produce a range of emissions during the combustion process, many of which cause health problems and harm to the physical environment.

Euro standards seek to control four principal types of emissions:

- Nitrogen Oxide (NOx) - gases formed during the combustion process and which can contribute to the formation of smog and acid rain.
- Total hydrocarbons (THC) – can be a mix of various gases including methane, propane and paraffin.
- Carbon monoxide (C) – a colourless and toxic gas also formed during the combustion process. Carbon monoxide is a significant contributor to climate change.
- Particulate matter (PM) – Microscope solid matter that may be present in exhaust gases.

Timetable for the introduction of Euro standards (Large goods vehicles)

Standard	Date
Euro I (I)	1992-1995
Euro 2 (II)	1995-1999
Euro 3 (III)	1999-2005
Euro 4 (IV)	2005-2008
Euro 5 (V)	2008-2012
Euro 6 (VI)	2012-2019

Vehicles that were manufactured prior to the introduction of Euro 1 are sometimes referred to as Euro 0.

Euro 7 (VII)

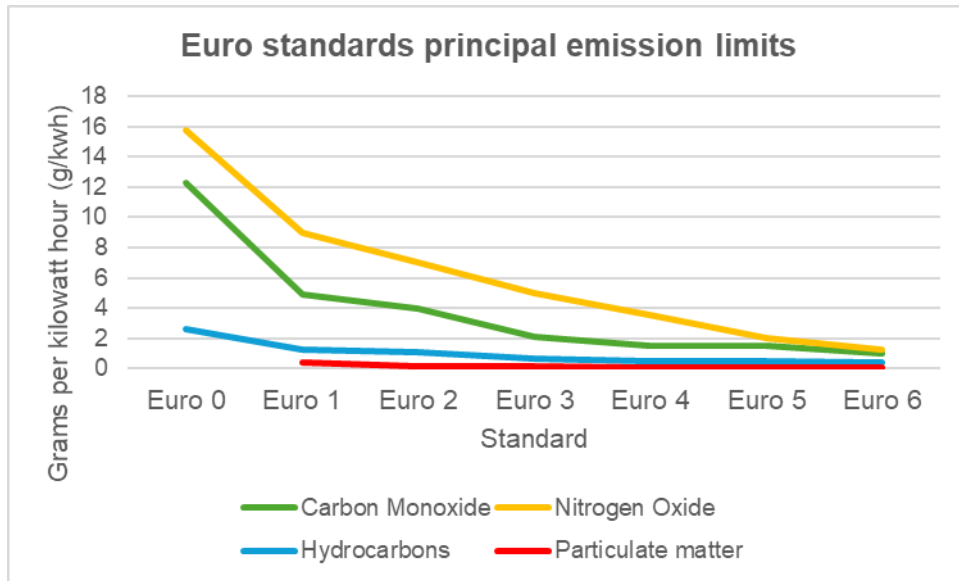
Due to come into effect from July 2025 Euro VII imposes greater emission control than Euro VI at the same time it introduces non-exhaust emissions these include tyre and brake emissions. For cars and vans the compliance period will increase from 100,000 kilometres to 200,000 kilometres.

Review of Euro standards

This table summarises the key points introduced by the various Euro standards.

Euro I	Swich to unleaded petrol and fitting of catalytic converters to reduce carbon monoxide
Euro II	Further reduced in emission limits for carbon monoxide, reduced the unburnt limits for NOx and introduced different emission limits for petrol and diesel engines.
Euro III	Modified the test procedure and reduced the permitted carbon monoxide and diesel particulate limits.
Euro IV	Concentrated on cleaning up emissions from diesel-powered vehicles further reducing particulate matter and NOx.
Euro V	Strengthened the limits on particulate matter requiring all diesel vehicles to have particulate filters. Further tightened NOx limits.
Euro VI	Even more strengthening of NOx limits and the introduction of exhaust gas recirculation which replaces some of the intake air with recycled exhaust gas.

Emission standards for large goods vehicles from Euro I to Euro 6



This above shows the progressive reduction in emission limits for large goods vehicles.

Conclusion

Euro standards will continue to influence the design and emission limits from internal combustion engines. As Euro VII has shown it expected that these standards will progressively move outside of the engine to other areas of vehicles that have been shown to produce harmful emissions.

Information sources

This article was compiled by reference to information available on a number of websites including but not limited to:

[Euro standards - ACEA - European Automobile Manufacturers' Association](#)

[What is Euro 7 emissions standard? | AutoTrader](#)

[Euro emissions standards | AA \(theaa.com\)](#)