

POWERFUL PROGRESS

V-ACT

**POWER. PERFORMANCE. DURABILITY.
FUEL EFFICIENCY. ENVIRONMENTAL CARE. V-ACT™**

The Volvo Way to high performance and reduced
emission levels – meeting Stage 3A / Tier 3 and beyond.

**VOLVO
PENTA**

MUSCLES ARE NO GOOD WITHOUT BRAINS

The electronic management system continuously monitors and gathers data from a number of sensors in the engine and adjusts the fuel supply and injection timing at lightning speed. This maximises fuel efficiency and engine output at any given workload and the response to throttle opening is improved. It also enables precise integration of the engine with the machine that it powers and provides enhanced engine protection.

When starting the engine, the electronic control system automatically carries out a check of all its functions.

More in-depth analysis can be performed with a PDA tool called Vodia that is easily linked into the electronic system. With this tool it is easy to diagnose system malfunctions and also program parameters related to the electronic system of the engine.

V-ACT

Vodia is an easy to use PDA tool for in-depth engine analysis and to program parameters related to the engines electronic system.

Engine Management System (EMS) links the engine's electronic control unit (ECU) to the machine's other electronic control units to form a highly efficient, interactive and real-time electronic communication system. The benefit is optimum and consistent engine/machine performance, whatever the application.



THE VOLVO WAY

Since 1907, always one step ahead

We build on 100 years of experience in engine development and manufacture. V-ACT – Volvo Advanced Combustion Technology – is the latest step in our refinement of the modern diesel engine.

Environmental care – a Volvo core value

Volvo applies a holistic view which encompasses every phase of the life cycle of our products – from design, procurement and manufacturing all the way to operation, maintenance and scrapping. Our environmental programs are characterized by pollution prevention, resource efficiency and cautious choice of materials. The result is products designed to create a low environmental footprint throughout their service life.

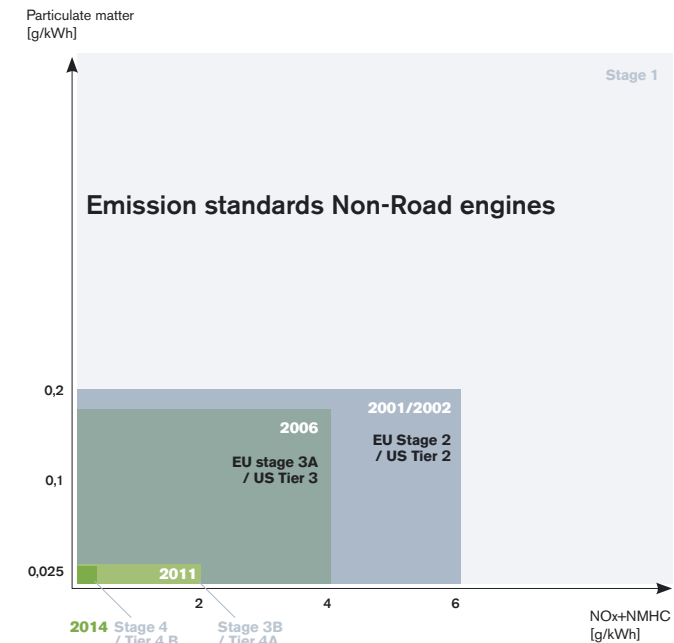
We meet the requirements of the new, stricter emissions legislation through state-of-the-art, innovative engine designs allied to well-proven Volvo Penta engine technology and components. What's more, we do this while still keeping a high performance and a low fuel consumption.

V-ACT. Volvo Advanced Combustion Technology

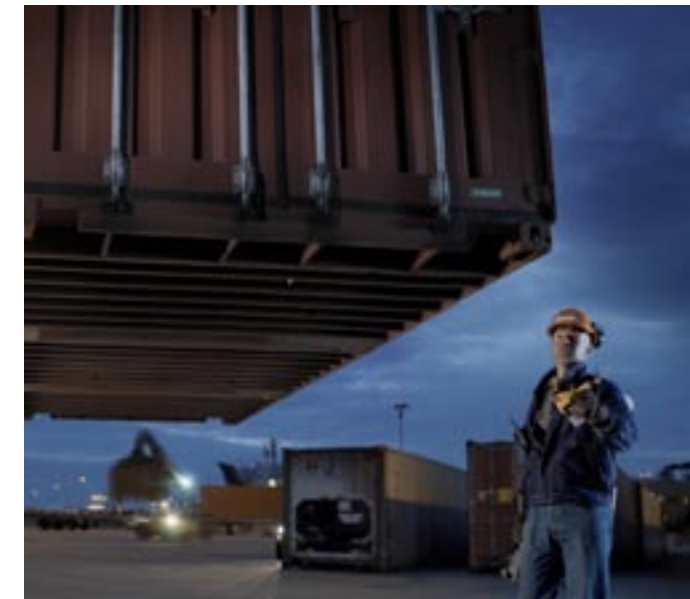
One secret behind our world-class engines is the new Volvo Advanced Combustion Technology, V-ACT. This unique combustion technology makes it possible to meet both your demands and those of society.

The new generation of Volvo Penta V-ACT diesel engines is tailored for use in demanding off-road applications and designed to meet the specific needs of our customers. They provide the combined virtues of excellent engine performance and Tier 3/Stage 3A-compliant emission levels. All this is achieved in an uncomplicated manner without the need for additional equipment or after-treatment of the exhaust gases.

Volvo Advanced Combustion Technology, V-ACT, meets the needs of today, with an eye on the future.



With V-ACT technology and the combined resources of the Volvo Group, we are well prepared to meet the requirements of the new, significantly stricter emissions legislation.



NEW GENERATION VOLVO PENTA ENGINES WITH V-ACT

Much of the development effort of our new engine generation has focused on precise control of the combustion process. Volvo's new advanced combustion technology, V-ACT, with internal exhaust gas re-circulation function, I-EGR, brings benefits to both the users and the environment. With the new V-ACT off-road engine generation, Volvo continues to be one of the world leaders in diesel engine design and emission control. By returning a controlled amount of the exhaust gases to the combustion

process, peak combustion temperatures are lowered which reduces the formation of NOx.

Common rail 6-7 litre engines

The new 6-7 litre engines feature advanced electronics, rear gear trains, and high-pressure common rail fuel systems. These engines are available with or without switchable I-EGR to suit different customer needs.

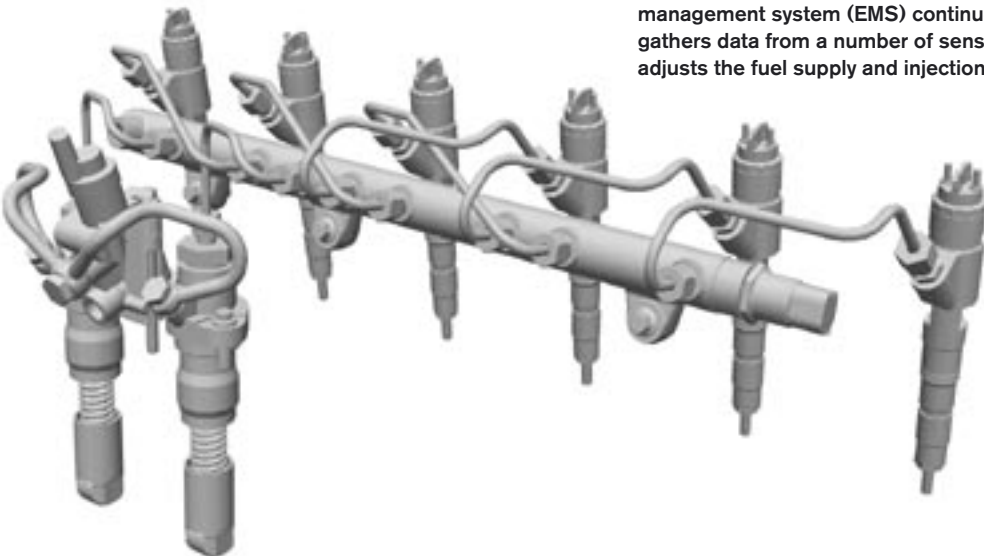
The switchable I-EGR system is electronically controlled by the engine

management system (EMS) based on machine and engine operating conditions. This advanced electronic control of the valve system results in high torque at low speeds and cleaner emissions.

9-12 litre engines with unit injectors

In the heavy-duty off-road Volvo Penta 9-12 litre engines, the exhaust rocker arm is fitted with a

High-pressure common rail fuel injection gives rapid engine response and efficient fuel utilisation. The electronic management system (EMS) continuously monitors and gathers data from a number of sensors in the engine and adjusts the fuel supply and injection timing at lightning speed.



Exhaust rocker arm fitted with a patented, switchable 'double rocker' device for Internal Exhaust Gas Recirculation, I-EGR.



A new generation of electronically controlled high pressure unit injectors for precise fuel injection timing and fuel quantity delivery for each combustion sequence.



patented, switchable 'double rocker' device that allows for a small second opening of the exhaust valve, whereby a controlled amount of exhaust gas is fed back into the cylinder during the inlet stroke. This is possible thanks to pressure pulses in the exhaust being higher than the in-cylinder pressure during part of the combustion process. The switchable I-EGR system is electronically controlled by the engine management system (EMS) based on machine and engine operating conditions. This integrated solution results in an extremely efficient performance and cleaner emissions.

The engine's own oil pressure system is used in an intelligent way to actuate the rocker arm device.

I-EGR - a second opening of the exhaust valve allows a controlled amount of exhaust gas to be fed back into the cylinder during the inlet stroke.



DRIVES THE TECHNOLOGY EVEN FURTHER

Volvo Penta diesel engines share a number of high-technology design features of benefit to you:

- Smooth, direct throttle response for best possible drive ability
- Excellent performance with peak torque at low engine speed
- Exceptional reliability
- Low emissions
- Low fuel consumption
- Long service life

This is a result of decades of evolutionary product development including the blend of traditional and proven engine technology with successive introduction of new technology, materials and production methods.

This document is not contractual. Volvo Penta reserves the right to modify any of the characteristics stated in this form without notice in a constant effort to improve the quality of its products. For specific information on a certain engine model, please ask your dealer or visit our website. All models are not available on all markets. The engines in the pictures may be fitted with extra optional equipment.



**VOLVO
PENTA**

www.volvopenta.com