



THE RIGHT TECHNOLOGY



The Best Route to Euro 4

SCR OR EGR?

DETECTING THE TRUE FACTS ON



EURO 4



DETECTION LIMITED



SCR OR EGR?

WEIGHING UP THE BENEFITS

Cummins is by far the world's largest independent manufacturer of diesel engines. With over one million Euro certified engines operating in truck, bus, coach and specialist vehicle applications around the globe, Cummins brings a unique level of experience to every engine we manufacture, and the ability to provide the right engine for each installation. For vehicle manufacturers it offers a level of application expertise that few, if any, other engine companies can match. For the operator it offers world-class levels of performance.

Over \$200 million is invested annually in research and engineering to maintain our technology leadership across a power band extending all the way to 3,500 ps. With engine manufacturing in 8 countries and over 5,000 support locations worldwide, Cummins has evolved into a truly international engine company. An approach which reflects the needs of our global OEM partners.

Cummins is focused on providing the highest engine availability at the lowest possible running costs, whilst meeting the latest emissions regulations. Our strategy is driven by evaluating customer needs



and market conditions in order to provide the optimum products with the appropriate technologies wherever Cummins engines operate. Equipped with a full portfolio of technology options such as EGR (Exhaust Gas Recirculation), SCR (Selective Catalytic Reduction) and DPF (Diesel Particulate Filter), Cummins can provide every technology to meet global engine emissions requirements.

For North America, Cummins engines fitted with Cooled Exhaust Gas Re-circulation (CEGR) are installed in over 300,000 vehicles. These vehicles have accumulated experience of over 30 billion road miles

since their launch in 2002. CEGR together with a Cummins Diesel Particulate filter (DPF) will be the right technology for U.S. EPA 2007 due to emissions limits, test cycles and operational factors.

Based on this experience and our knowledge of the European market, Cummins knows that the advantages provided by using SCR technology far outweigh those of using EGR systems. Improved fuel economy, longer service intervals and higher vehicle uptime are why Cummins has chosen SCR to meet the Euro 4 and Euro 5 emissions standards.

Fuel Savings?

- FACT** Cummins has a history of delivery fuel efficient products.
 - FACT** Cummins SCR products in UK operation are showing a 7% or greater fuel economy improvement over comparable Euro 3 products.
 - FACT** Competitive EGR products are quoting 2-3% degradation of fuel economy.
 - FACT** There is a 10% fuel economy differential in favour of SCR
 - FICTION** SCR improved fuel economy is unproven.
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AdBlue?

- FACT** AdBlue is the trade-name for automotive urea solution required by Euro 4 SCR products.
 - FACT** Cummins Euro 4 products use approximately 5% Adblue.
 - FACT** AdBlue is odourless, non toxic, non flammable.
 - FACT** AdBlue costs less than half the price of diesel.
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Maintenance?

- FACT** There is only one serviceable component in the Cummins I.E.M. SCR filter system. This is an air filter for the dosing unit.
- FICTION** All of the components in the SCR system require maintenance to ensure compliance with emissions regulations.

System weight / Lost Payload?

- FACT** Both Euro 4 solutions whether EGR or SCR will add weight to vehicles
 - FACT** The full SCR system weight will range from 60-140kg depending on application, AdBlue tank size, engine displacement.
 - FACT** Euro 4 EGR vehicles will be impacted by the weight of:
 - EGR components ie. Cooler, valves, pipework & VGT
 - Up-rated cooler groups for higher heat rejection
 - Particulate control aftertreatment
 - FICTION** Only SCR products have a vehicle weight penalty at Euro 4
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Chassis Space?

- FACT** Both EGR and SCR solutions will provide installation challenges for vehicle manufacturers.
- FACT** Tank space issues for SCR trucks can be solved by having smaller fuel tanks without impacting vehicle range and providing space for the AdBlue tank.
- FACT** EGR solutions will have challenges around heat rejection, mounting of Particulate filters, and potentially larger fuel tanks to compensate for the loss of fuel economy.
- FACT** Cummins SCR catalyst has an integrated particulate filter, which is required as an additional unit on EGR engines.

Power Density?

FACT As they are optimised to run at their most efficient points, SCR engines can deliver 10% more power and torque without the need for increased displacement or additional technology changes.

FACT Some EGR products should be able to maintain Euro 3 power levels, but for increased performance other changes to architecture will be required.

Power Derates due to OBD (On Board Diagnostics)?

FACT Both EGR and SCR products need to comply with the Euro 4 OBD regulations.

FACT Both EGR and SCR engines will derate as required by the regulations if NOx levels go over threshold limits.

FACT Derates will happen at the next key off event. High emissions driven derates will not happen in operation due to safety concerns.

FACT SCR products will derate in power if AdBlue is not used.

FACT EGR products will derate if there is incorrect EGR flow or the system deactivates.

FICTION If SCR vehicles run out of AdBlue they need to be taken to a dealer to restore power.

FACT To restore power AdBlue just needs to be put back in the tank.

Euro 5?

FACT SCR has proved its capability of meeting Euro 5. The only Euro 5 heavy duty diesel products being sold today use SCR.

FACT More than one manufacturer is working on EGR for Euro 5. The work is still in progress and the solution has still to be proven.

Vehicle / AdBlue range?

FACT The AdBlue network is forming, new stations are opening every month.

FACT Most OEMs that are using SCR technology are designing the systems so AdBlue fill ups are required no more often than every other tank of diesel.



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