EGR - SCR

Reduce NOx, Maximize Fuel Economy

Combined use of Exhaust Gas Recirculation (EGR) with Selective Catalytic Reduction (SCR)

- Clean Diesel developed and patented the concept of combined EGR and SCR to minimize emissions and take advantage of the benefits each can bring in terms of NOx reduction
- Combined EGR-SCR allows users to meet strict NOx level requirements outlined by the US 2010 and Euro 6 emission standards
- The EGR system can be activated to reduce NOx when starting a cold engine
- The SCR operates at a higher temperature when the catalyst is fully active and at low EGR rates
- With both EGR and SCR in place, engines can be fine-tuned to deliver improved fuel efficiency and greater emissions reduction

Typical Applications

Any Diesel Application

- On-road
- Off-road
- Stationary

Markets

- OEM
- Retrofit

Clean Diesel Technologies

EGR vs. SCR

Historically, EGR and SCR were seen as competing emissions reduction technologies used to lower NOx emissions levels from diesel engines. EGR recirculates part of the exhaust gas stream to reduce engine-out NOx emissions. In contrast, SCR is an after-treatment process in which urea is injected into the exhaust streams to chemically react with NOx.

EGR-SCR

Clean Diesel filed for EGR-SCR patents in 1997, when few could imagine the need to meet NOx levels outlined by US 2010 and Euro 6. Since then, as a result of the combined solution, NOx levels have dropped from more than 95%, from over 6 g/kWh, to the new target of 0.2 g/kWh.

EGR and standard SCR, each with their relative strengths and weaknesses, were sufficient to reach US 2007 and Euro 5 emission levels. However, neither provide the performance required to meet new US 2010 and Euro 6 standards. While EGR provides NOx reductions in all operating conditions, the NOx reduction levels are not high enough. While SCR does achieve required NOx reduction levels when active, it only operates when exhaust temperatures exceed 240°C. The combined NOx reduction over all operating cycles (SCR on and off) is inadequate.

Clean Diesel's vision - to use SCR whenever possible and switch to EGR when SCR is not feasible - provides the best of both worlds.

Lowest Emissions

- Provides high NOx reduction from SCR with a fall back to EGR at lower temperatures
- Engages SCR during heavy-duty cycles when engines prodcue the most NOx; low-temperature EGR operation typically correlates to low exhaust mass flow rate and low NOx emissions
- Meets US 2010 and Euro 6 standards with a combined emission profile that is favorable

Best Energy Efficiency

- Minimizes EGR's fuel penalty significantly by limiting use of EGR to low-temperature operations
- Provides high emissions reduction and high performance
- Helps to solve the issues of escalating fuel prices, pending carbon legislation and increasing US CAFE and European mileage standards

Availability

- EGR-SCR licenses are available through a non-exclusive licence program with Clean Diesel Technologies
- If you are an engine manufacturer or OEM that uses or plans to use EGR in combination with SCR, you may require a license from Clean Diesel Technologies. Please contact us at by email at info@cdti.com or by calling +1 (203) 416-5290 in the Americas; +44 (0) 1883 629090 elsewhere.

Clean Diesel Technologies

the cleantech emissions reduction company

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