EGR VALVES/SYSTEMS

What is EGR

Exhaust Gas Recirculation (EGR) is a nitrogen oxide (NOx) emissions reduction technique used in internal combustion gasoline and diesel engines. EGR works by recirculating a portion of an engine's exhaust gas back to the engine cylinders. This dilutes the O2 in the incoming air stream and provides gases inert to combustion to act as absorbents of combustion heat to reduce peak in-cylinder temperatures. NOx is produced in a narrow band of high cylinder temperatures and pressures.

In a gasoline engine, this inert exhaust displaces the amount of combustible matter in the cylinder. In a diesel engine, the exhaust gas replaces some of the excess oxygen in the pre-combustion mixture.

Since harmful NOx are mainly produced at high temperatures, it is possible with the EGR system to lower the fuel combustion temperature, and reduce these pollutants by up to 50% and resulting in reducing soot particulates on diesel engines by up to 10% (though at some loss of engine efficiency).

Properly recirculated fuel results in cooler and fuller burning, along with a reduction in the quantity of harmful gases, especially nitrogen oxide (NO). Gasses re-introduced from EGR systems will also contain near equilibrium concentrations of NOx and CO; the small fraction initially within the combustion chamber inhibits the total net production of these and other pollutants when sampled on a time average. Most modern engines now require exhaust gas recirculation to meet emissions standards.

EGR system

The configuration of an EGR system depends on the required EGR rate and other demands of the particular application. Most EGR systems include the following main hardware components:

- One or more EGR control valves
- One or more EGR coolers
- Piping, flanges and gaskets

Other specialized components are possible in certain types of systems.

How the use of Xp3 affects the EGR system

The use of Xp3 will reduce the temperature of the exhaust gases which will improve the effectiveness and operation of the EGR.

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