



## MACK TRUCKS EPA 2010 TECHNOLOGY EXPLAINED

The second in a series of five articles from Dave McKenna – Powertrain Product Manager

# THE GROWLER

### 2010 GLOSSARY AND OTHER PUZZLING ACRONYMS

**Active DPF Regeneration** The collected exhaust soot must be occasionally burned off or oxidized. With Granite, Pinnacle and Titan chassis we use a small amount of diesel fuel (~3L) per event, injected into the exhaust stream. This vaporized fuel wets down the ceramic catalyst and creates very high temperatures inside the DPF that actually oxidizes the soot. This soot is reduced to simple ash. We use the term “active” because we take some form of action to create an active regen event. The DPF system used on the TerraPro is strictly an active system. We use a small thermal generator (or burner) in the base of the DPF to create heat.

**Catalyst** We use this chemical reaction between the diesel fuel and exhaust hydrocarbons with a platinum coated ceramic wafer. The reaction between the fuel and the platinum creates a very high level of heat, without using a lot of fuel or consuming the precious metal in the process. Incidentally, Platinum cannot be recovered from the ceramic wafer.

**Diesel Exhaust Fluid (DEF)** This is the Engine Manufacturers Association (EMA) industrial term for aqueous urea. Windshield washer fluid and automatic transmission fluid are other industry terms.

**Diesel Particulate Filter (DPF)** A component of the EATS that filters the particulate matter (PM) from the exhaust gas before being released into the atmosphere. This is constructed of a ceramic honey comb material. If this filter is coated with precious metals it is considered a Catalyzed system.

**Exhaust After Treatment System (EATS)** This is a device or series of devices (we call it a system) that removes or strips the chemical compounds and or particulate matter from the engine out exhaust or after the engine.

**Exhaust Gas Recirculation (EGR)** A metered amount of exhaust gas is recirculated back into the engine, reducing the amount of available oxygen and thereby lowering the combustion temperature. This is one of the two methods we use to reduce NOxOxides of Nitrogen (NOx). These oxides are produced during high temperature combustion. NOx, when mixed with other organic compounds found in the atmosphere and then bathed in sunlight, creates smog. So we have reduced NOx output to near ZERO.

**Particulate Matter (PM)** These are the solid and visible particulates in the exhaust formed from incomplete combustion.

**Power Density** This is the amount of rated horse power relative to engine size or cubic displacement and is usually indicated as a ratio. Our MP7-395C is 35.9 HP per liter (35.9:1); the MP8-485C is 37.3 HP per liter (37.3:1).

**Passive DPF Regeneration** The collected exhaust soot must be occasionally burned off or oxidized. With the catalyzed DPF system there is enough hydrocarbons left in the engine out exhaust to support a passive event. The normal exhaust heat, plus the catalyst action, can support some DPF regeneration. There is never enough passive exhaust heat to accomplish a complete regeneration event. We are just using heat that is already available. So the reason for the term “passive” is that we take no action to create a regen event. Note – the refuse collection DPF cannot use passive heat as there is no catalyst.

**Selective Catalytic Reduction (SCR)** The process in which we convert engine out NOx by injecting diesel exhaust fluid (DEF) into the exhaust stream that is then absorbed over a catalyst and is reduced to water and nitrogen.

**Soot** Is the dark powder deposits (usually inside of the exhaust system) of unburned fuel residue. This is also known as carbon black. Look inside your car’s exhaust pipe. Nasty. Now look inside a US’07 Mack exhaust pipe – nothing. Amazing, huh?

**Ultra High Injection Pressure** Mack injects fuel directly into the cylinder close to 35,000 pounds per square inch. (PSI) This ultra high pressure atomizes the fuel to very small droplets for complete combustion.

**Ultra Low Sulfur Diesel Fuel** This is the new diesel fuel formulation for use with all US’07 compliant engines. The sulfur content has been reduced to 15 parts per million (ppm) from the previous 500 ppm. Note some off highway (red dye) non FHUT fuel is in excess of 1500 ppm or 100 times of what we require for use in Mack trucks.

**Urea** Before we go any further, I assure you urea is not some form of barnyard “fluid!” It is a nitrogen-containing chemical product that is produced from synthetic ammonia and carbon dioxide. If this sounds a lot like fertilizer – you’re correct. So it is readily available.

Next edition – 3rd of 5  
PERFORMANCE AND FUEL ECONOMY IMPACTS

### DATES TO REMEMBER

- American Truck Dealers, Grapevine, TX ..... **April 26-28**
- NPTC, Cincinnati, OH ..... **April 27-29**
- Waste Expo, Chicago, IL ..... **May 6-8**

