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Mercedes Benz Charged Gasoline Injection (CGI) - paultan.org

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Mercedes Benz was the first car manufacturer to use direct fuel-injection in its road cars, putting a direct-injection engine into the 1955 300SL Gullwing. Back then, things like fuel economy and emissions were not really an issue, but it is today. So car manufacturers everywhere are taking a look at gasoline direct injection to improve fuel efficiency and emissions.

Mercedes Benz has had four-cylinder CGI engines (stratified Charged Gasoline Injection), but recently they have just launched a new V6 CGI engine in the Mercedes Benz CLS 350 CGI. Mercedes Benz's CGI allows extremely lean air-fuel mixtures rather than the normal 14.6:1 air-fuel mixture that normal injection engines use.

In a CGI engine, the air and fuel mixture is not mixed until they reach the combustion chamber. The intake ports are carefully engineered to provide optimum flow and swirl, making combustion as fast and as complete as possible. The fuel is injected into the cylinder at a degree of 42 degrees and a pressure between 50-120 bar.

While Mercedes Benz's previous version of CGI has a flap in the intake to use direct injection at low engine load and switch to a normal air-fuel mixture at high engine load, this new version of Mercedes Benz's CGI allows an ultra lean mixture at all RPM and engine load ranges. There are new fast and high-precision piezo-electric injectors. This allows the injectors to deliver multiple injections per compression stroke.

Fuel consumption for the Mercedes Benz CLS 350 CGI is rated at 31mpg (9.1 litres per 100km), which is not bad considering Audi's V8 turbodiesel is rated at 37mpg. And that's a diesel. My Proton Satria averaged about 10 litres per 100km. So the 272bhp engine in the CLS 350 CGI on average uses less fuel than my comparatively ancient in terms of technology 120bhp 1.8 SOHC engine. It's amazing what technology can do.