Engine Cylinder Deactivation

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Skyactiv Technology*Active Fuel Management | ACDelco AFM*

Lifters GM Cylinder Deactivation AFM/DOD/DFM

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What is cylinder deactivation, exactly? For the purposes of this article, cylinder deactivation refers to various strategies to deactivate some cylinders on V-type engines during light engine loads in attempts to meet ever-more stringent emissions regulations in some markets or jurisdictions, and most notably, in the state of California.

The Hit and Miss Nature of Cylinder Deactivation Systems

In a nutshell, cylinder deactivation is simply keeping the intake and exhaust valves closed through all cycles for a particular set of cylinders in the engine. Depending on the design of the engine, valve actuation is controlled by one of two common methods:

Cylinder Deactivation & Variable Engine Displacement

Deactivation is mostly used on V6 or V8 engines, where, in principle, it reduces the engine ’ s displacement when it functions: Bigger-engine power when all cylinders are activated, and...

How It Works: Cylinder deactivation | Driving

Except for Honda's V-6 engine, most cylinder deactivation is applied to domestically-built truck V-8 engines, though various GM V-6 engines also are benefitting from the technology. Still, the systems don't get nearly as much attention as some other methods of boosting fuel economy. Start/Stop operation

Cylinder Deactivation: How It Can Save Fuel | Shopping ...
Cylinder Deactivation, or CDA, is a technique in multi-cylinder engines where a combination of cylinders are systematically disabled, effectively reducing the engine ’ s displacement, improving overall engine efficiency and fuel economy. CDA is achieved by deactivating the intake and exhaust valves for the deactivated cylinder.

Cylinder deactivation | Valve train | Eaton
Active Fuel Management (AFM), otherwise known as Cylinder Deactivation is a General Motors engine technology that shuts down half of the engine ’ s cylinders in light driving conditions to improve...

GM Active Fuel Management Cylinder Deactivation Technology ...
Engine valves and valvetrain Our valve actuation technologies are designed to achieve the highest valvetrain dynamic performance, ensuring low friction losses, and minimal component wear. Our rocker arms, roller rocker arms, hydraulic lifters, and hydraulic lash adjusters maintain precise valve lash and enable low friction, maintenance-free ...

Engine valvetrain | Cylinder deactivation | Fuel ...
New Cylinder Deactivation System The base 5.3-liter V-8 uses an active fuel management system that deactivates cylinders to conserve fuel. It's similar to the setup in the 2018 Silverado and can either run the truck on four or eight cylinders. The new setup, also on the 6.2-liter V-8, uses what Chevy is calling Dynamic Fuel Management.

Chevrolet's New Cylinder Deactivation System Is a Game ...
Deactivating a single cylinder reduces engine torque generated, Other 3 injectors have to compensate for the torque loss, this affects Injector balance. It Does have an adverse effect on the engine life,

in the following ways. An engine designed and balanced for 4 cylinders will have poor balancing with 3 cylinders.

Does cylinder deactivation affect engine life? - Quora
The new cylinder-deactivation system can be found in the latest SKYACTIV-G 2.5-liter engine that delivers 187 horsepower and 186 lb-ft of torque. Available on the 2018 Mazda CX-5 and 2018 Mazda6, Mazda is the only automaker to offer cylinder-deactivation technology on a four-cylinder engine in North America.

Mazda ’ s New Cylinder-Deactivation Offers Improved Fuel ...
That's where cylinder deactivation comes in. Cylinder deactivation shuts down a number of the engine's cylinders when they're not needed. That means that when a car or truck is maintaining a constant speed and not accelerating, some cylinders aren't in use. Since they aren't in use, they aren't getting any gas either -- and that saves fuel.

5 New Gas Engine Technologies | HowStuffWorks
Cylinder deactivation is used to reduce the fuel consumption and emissions of an internal combustion engine during light-load operation. In typical light-load driving the driver uses only around 30 percent of an engine ’ s maximum power. In these conditions, the throttle valve is nearly closed, and the engine needs to work to draw air.

Variable displacement - Wikipedia
When cylinders are deactivated, the engine uses less fuel, but simply "turning off" the ignition source for the cylinders in question is only one of the operations that has to occur; the valves for...

What Is Hemi MDS?
When an engine fitted with cylinder deactivation detects the car is cruising, a solenoid valve opens and a system forces the valves shut,

preventing fuel and air from reaching some of the cylinders. This means combustion is only taking place in half of the engine and thus much less fuel is burned when cruising.

What is cylinder deactivation? | carwow
Cylinder deactivation provides owners with the best of both worlds – V8 power when it ' s needed, and four-cylinder fuel economy and emissions levels when it ' s not. Typically, when a cylinder is deactivated, the system closes its intake and exhaust valves. It also stops injecting fuel into the deactivated cylinder.

2021 Ford F-150 5.0L V8 Coyote To Get Cylinder ...
The net effect of cylinder deactivation is an improvement in fuel economy and likewise a reduction in exhaust emissions. General Motors was the first to modify existing, production engines to enable cylinder deactivation, with the introduction of the Cadillac L62 "V8-6-4" in 1981.

Active Fuel Management - Wikipedia
Available at engine speeds of up to 4,500 rpm, cylinder deactivation for the three-pot turbocharged unit represents the joint effort of Ford ' s engineers based in three countries: Germany, U.K., and...

Ford nearly runs out of cylinders to deactivate on 1.0 ...
Abstract: Cylinder deactivation (CDA) can be used to manage exhaust gas temperature in diesel engines. It allows to maintain the aftertreatment system temperature at idle and low load conditions without a fuel consumption penalty. When combined with other measures such as increased idle speed, it can also be used during warm-up.

In einer sich rasant verändernden Welt sieht sich die Automobilindustrie fast täglichmit neuen Herausforderungen konfrontiert: Der problematischer werdende Rufdes Dieselmotors, verunsicherte Verbraucher durch die in der Berichterstattungvermischte Thematik der Stickoxid- und Feinstaubemissionen, zunehmendeKonkurrenz bei Elektroantrieben durch neue Wettbewerber, die immer schwierigerwerdende öffentlichkeitswirksame Darstellung, dass ein großer Unterschiedzwischen Prototypen, Kleinserien und einer wirklichen Großserienproduktion besteht.Dazu kommen noch die Fragen, wann die mit viel finanziellem Einsatz entwickeltenalternativen Antriebsformen tatsächlich einen Return of Invest erbringen, wer dienotwendige Ladeinfrastruktur für eine Massenmarkttauglichkeit der Elektromobilität bauen und finanzieren wird und wie sich das alles auf die Arbeitsplätzeauswirken wird.Für die Automobilindustrie ist es jetzt wichtiger denn je, sich den Herausforderungenaktiv zu stellen und innovative Lösungen unter Beibehaltung des hohenQualitätsanspruchs der OEMs in Serie zu bringen. Die Hauptthemen sind hierbei,die Elektromobilität mit höheren Energiedichten und niedrigeren Kosten der Batterienvoranzutreiben und eine wirklich ausreichende standardisierte und zukunftssichereLadeinfrastruktur darzustellen, aber auch den Entwicklungspfad zum schadstofffreienund CO2-neutralen Verbrennungsmotor konsequent weiter zu gehen. Auch dasautomatisierte Fahren kann hier hilfreich sein, weil das Fahrzeugverhalten dann – im wahrsten Sinne des Wortes - kalkulierbarer wird.Dabei ist es für die etablierten Automobilhersteller strukturell nicht immer einfach,mit der rasanten Veränderungsgeschwindigkeit mitzuhalten. Hier haben Start-upseinen großen Vorteil: Ihre Organisationsstruktur erlaubt es, frische, unkonventionelleIdeen zügig umzusetzen und sehr flexibel zu reagieren. Schon heute werdenStart-ups gezielt gefördert, um neue Lösungen im Bereich von Komfort, Sicherheit,Effizienz und neuen Kundenschnittstellen zu finden. Neue Lösungsansätze,gepaart mit Investitionskraft und Erfahrungen, bieten neue Chancen auf dem Weg derElektromobilität, der Zukunft des Verbrennungsmotors und ganz allgemein für dasAuto der Zukunft.

Tribology, the science of friction, wear and lubrication, is one of the cornerstones of engineering's quest for efficiency and conservation of resources. Tribology and dynamics of engine and powertrain: fundamentals, applications and future trends provides an authoritative and comprehensive overview of the disciplines of dynamics and tribology using a multi-physics and multi-scale approach to improve automotive engine and powertrain technology. Part one reviews the fundamental aspects of the physics of motion, particularly the multi-body approach to multi-physics, multi-scale problem solving in tribology. Fundamental issues in tribology are then described in detail,from surface phenomena in thin-film tribology, to impact dynamics, fluid film and elastohydrodynamic lubrication means of measurement and evaluation. These chapters provide an understanding of the theoretical foundation for Part II which includes many aspects of the physics of motion at a multitude of interaction scales from large displacement dynamics to noise and vibration tribology, all of which affect engines and powertrains. Many chapters are contributed by well-established practitioners disseminating their valuable knowledge and expertise on specific engine and powertrain sub-systems. These include overviews of engine and powertrain issues, engine bearings, piston systems, valve trains, transmission and many aspects of drivetrain systems. The final part of the book considers the emerging areas of microengines and gears as well as nano-scale surface engineering. With its distinguished editor and international team of academic and industry contributors, Tribology and dynamics of engine and powertrain is a standard work for automotive engineers and all those researching NVH and tribological issues in engineering. Reviews fundamental aspects of physics in motion, specifically the multi-body approach to multi physics Describes essential issues in tribology from surface phenomena in thin film tribology to impact dynamics Examines specific engine and powertrain sub-systems including engine bearings, piston systems and value trains

The light-duty vehicle fleet is expected to undergo substantial technological changes over the next several decades. New powertrain designs, alternative fuels, advanced materials and significant changes to the vehicle body are being driven by increasingly stringent fuel economy and greenhouse gas emission standards. By the end of the next decade, cars and light-duty trucks will be more fuel efficient, weigh less, emit less air pollutants, have more safety features, and will be more expensive to purchase relative to current vehicles. Though the gasoline-powered spark ignition engine will continue to be the dominant powertrain configuration even through 2030, such vehicles will be equipped with advanced technologies, materials, electronics and controls, and aerodynamics. And by 2030, the deployment of alternative methods to propel and fuel vehicles and alternative modes of transportation, including autonomous vehicles, will be well underway. What are these new technologies - how will they work, and will some technologies be more effective than others? Written to inform The United States Department of Transportation's National Highway Traffic Safety Administration (NHTSA) and Environmental Protection Agency (EPA) Corporate Average Fuel Economy (CAFE) and greenhouse gas (GHG) emission standards, this new report from the National Research Council is a technical evaluation of costs, benefits, and implementation issues of fuel reduction technologies for next-generation light-duty vehicles. Cost, Effectiveness, and Deployment of Fuel Economy Technologies for

Light-Duty Vehicles estimates the cost, potential efficiency improvements, and barriers to commercial deployment of technologies that might be employed from 2020 to 2030. This report describes these promising technologies and makes recommendations for their inclusion on the list of technologies applicable for the 2017-2025 CAFE standards.

This Proceedings volume gathers outstanding papers submitted to the 19th Asia Pacific Automotive Engineering Conference & 2017 SAE-China Congress, the majority of which are from China – the largest car-maker as well as most dynamic car market in the world. The book covers a wide range of automotive topics, presenting the latest technical advances and approaches to help technicians solve the practical problems that most affect their daily work.

Due to their high efficiency and power, the transportation sector relies heavily on diesel engines. However, diesel engines face many challenges regarding their hazardous emissions and the different regulations for fuel economy which get more stringent over time. One of the main concerns is engine idling where the engine is consuming fuel and emitting pollutants without any utilized power output. In this study, the effects of cylinder deactivation accompanied by throttling and post injection on fuel consumption and emissions were investigated for a 4 cylinder diesel engine at idle conditions. Three different engine operating methods were used. In the 1st method, the engine operated on 4 cylinders, while in the 2nd method; fueling was deactivated for 2 cylinders without valve deactivation. In the last operating method, full cylinder valve deactivation was applied to 2 cylinders. Furthermore, the effects of rail pressure on emissions, IMEP and fuel consumption were investigated. Method 2 with deactivated fueling achieved a minor fuel savings compared to the 4 cylinders operation, between 4-16% depending on the throttling level where more fuel savings were accomplished at higher throttle positions. Method 3 with full cylinder deactivation resulted in 33% fuel savings at WOT compared to Method 1 and 40% at the heaviest throttling level. Pumping losses and fuel consumption were found to increase with throttling, while the net IMEP decreased with heavier throttle conditions. Both CO2 and hydrocarbons increased with throttling, while NO [subscript x] emissions increased with throttling until 65 kPa of manifold absolute pressure and then started to fall at lower MAP values. These trends correlated with the heat release rate results. Also, fuel consumption and net IMEP increased with a decrease in rail pressure, where the peak heat release rate was more retarded for the lower injection pressure. Finally, the effects of different operating methods and intake throttling on exhaust temperature was analyzed. The temperatures were measured at the exhaust port exits, and for Method 2 prior to any mixing with air from the non-fired cylinders. At wide open throttle (WOT), Method 3 achieved a 20 ° C increase in exhaust temperature compared to Method 1, and Method 2 resulted in an additional increase of 25 ° C. Exhaust temperature increased with throttling for all methods, where it rose by 80 ° C with maximum throttling in Method 1 and 95 ° C for Methods 2 and 3

Various combinations of commercially available technologies could greatly reduce fuel consumption in passenger cars, sport-utility vehicles, minivans, and other light-duty vehicles without compromising vehicle performance or safety. Assessment of Technologies for Improving Light Duty Vehicle Fuel Economy estimates the potential fuel savings and costs to consumers of available technology combinations for three types of engines: spark-ignition gasoline, compression-ignition diesel, and hybrid. According to its estimates, adopting the full combination of improved technologies in medium and large cars and pickup trucks with spark-ignition engines could reduce fuel consumption by 29 percent at an additional cost of $2,200 to the consumer. Replacing spark-ignition engines with diesel engines and components would yield fuel savings of about 37 percent at an added cost of approximately $5,900 per vehicle, and replacing spark-ignition engines with hybrid engines and components would reduce fuel consumption by 43 percent at an increase of $6,000 per vehicle. The book focuses on fuel consumption--the amount of fuel consumed in a given driving distance--because energy savings are directly related to the amount of fuel used. In contrast, fuel economy measures how far a vehicle will travel with a gallon of fuel. Because fuel consumption data indicate money saved on fuel purchases and reductions in carbon dioxide emissions, the book finds that vehicle stickers should provide consumers with fuel consumption data in addition to fuel economy information.

An HCCI engine has the ability to operate over a large load range by utilizing a lower cetane distillate diesel fuel to increase ignition delay. This permits more stable operation at high loads by avoidance of premature combustion before top dead center. During low load conditions, a portion of the engines cylinders are deactivated so that the remaining cylinders can operate at a pseudo higher load while the overall engine exhibits behavior typical of a relatively low load.

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