**Federal-Mogul Powertrain Valve Rotator Technology Reduces Wear and Increases Durability in Stationary and Marine Engines**

***Controlled valve rotation on medium speed applications ensures even temperature distribution on the valve seat and minimises the risk of combustion deposits accumulating on the sealing surface***

**Friedberg, Germany, 28 June 2016** …Federal-Mogul Powertrain, a division of Federal-Mogul Holdings Corporation (NASDAQ: FDML) offers a comprehensive range of valvetrain technologies for large stationary and marine engines, with components such as valves, cotter and valve rotators developed by the company in service globally in engines with bore diameters of up to 640 mm.

While much of the technology is shared with engines of other types, valve rotators are mainly applied to engines operating below 2500 rpm and with bore sizes from in the region of 150 mm upwards, as typically found in power generation and marine applications. The high valve mass and low dynamic effects of these engines means adequate valve rotation does not occur naturally and must be supplemented in order to keep valve seats clean and equalize wear.

“Engines for power generation and marine use are fuelled by a range of different oils and gases, requiring valve rotation to minimise the risk of combustion deposits accumulating on the valve seats,” commented Gian Maria Olivetti, Chief Technology Officer, Federal-Mogul Powertrain. “Rotation also ensures an even distribution of temperature and wear around the seat, increasing durability by reducing local distortion and avoiding blow-by and crack formation across the sealing surface.”

Federal-Mogul Powertrain’s Rotocap® imparts a controlled rotation to the valve as it opens, using a compact and well-proven arrangement of balls and ramps within a self-contained assembly. The balls sit in individual pockets within the body of the rotator, each pressed towards the upper end of its sloping track by a small coil spring and covered by a ball ring and a single large Belleville spring. As the valve opens, increasing valve spring forces cause the Belleville spring to load the balls, moving them along their tracks. The relative rotation between the Belleville spring and the rotator is transmitted to the valve stem through the valve cotter.

The durability of the Rotocap is aligned with the service overhaul schedule of the engine and also the lifetime of the other valvetrain components, themselves the subject of continuous customer demand for service life to be increased. Implementing between two and six valve rotations per minute at 500 strokes per minute, the Rotocap is manufactured in sizes up to 200mm in diameter, but can be specified to a larger dimension. The Rotocap can be configured for mounting above or below the valve spring pack.

Although well established, the Rotocap technology continues to be evolved by Federal-Mogul Powertrain in order to meet new technical challenges and changing market requirements. “Trends in the market are towards higher valve spring loads and reduced package space allowance, with customers also continuously demanding increased component life,” explained Guido Bayard, Director Global Technology, Federal Mogul Valvetrain, Federal-Mogul Powertrain. “Our latest evolution of Rotocap saves space by integrating and combining the ball race ring and Belleville spring into a single component.” This specific design feature allows Federal-Mogul Powertrain to deliver product lifetime in excess of 30,000 running hours, depending on the application.

The company’s long experience with valve rotators allows it to produce the component with the necessary accuracy using specific manufacturing processes relative to unit size. New applications for valve rotators are initially proven through test rig development then prototype tests by customers on firing engines, either single or multi-cylinder. Several thousand hours of durability testing are completed prior to the start of series production. For lower-loaded applications, Federal-Mogul Powertrain offers an alternative design, designated Rotocoil. Using a single garter spring in place of the balls and ramps, the Rotocoil is applicable for rotator sizes up to in the region of 60mm in diameter.

Federal-Mogul Powertrain will exhibit a range of valvetrain core products, including valves, cotters and valve rotators for stationary and marine engines at SMM, the Shipbuilding, Machinery and Marine technology trade show that takes place in Hamburg, Germany, from 6 – 9 September, 2016. The company will be located at Booth 205, in Hall A3.

**About Federal-Mogul**

Federal-Mogul Holdings Corporation (NASDAQ: FDML) is a leading global supplier of products and services to the world’s manufacturers and servicers of vehicles and equipment in the automotive, light, medium and heavy-duty commercial, marine, rail, aerospace, power generation and industrial markets. The company’s products and services enable improved fuel economy, reduced emissions and enhanced vehicle safety.

Federal-Mogul operates two independent business divisions, each with a chief executive officer reporting to Federal-Mogul's Board of Directors.

Federal-Mogul Powertrain designs and manufactures original equipment powertrain components and systems protection products for automotive, heavy-duty, industrial and transport applications.

Federal-Mogul Motorparts sells and distributes a broad portfolio of products through more than 20 of the world’s most recognized brands in the global vehicle aftermarket, while also serving original equipment vehicle manufacturers with products including braking, wipers and a range of chassis components. The company’s aftermarket brands include ANCO® wiper blades; Champion® spark plugs, wipers and filters; AE®, Fel-Pro®, FP Diesel®, Goetze®, Glyco®, Nüral®, Payen® and Sealed Power® engine products; MOOG® chassis components; and Ferodo®, Jurid® and Wagner® brake products.

Federal-Mogul was founded in Detroit in 1899 and maintains its worldwide headquarters in Southfield, Michigan. The Company has more than 53,000 employees globally. For more information, please visit [www.federalmogul.com](http://www.federalmogul.com).

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**CONTACT:**

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| Paul Chadderton Market Engineering +44 (0)1295 277050 paul.chadderton@m-eng.com | Ursula Hellstern Federal-Mogul Powertrain Communications +49 (611) 201 9190 ursula.hellstern@federalmogul.com |

**IMAGES:**

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| cid:image004.jpg@01D1B67F.40127BB0 | Federal-Mogul Powertrain’s Rotocap® imparts a controlled rotation to the valve as it opens, using a compact and well-proven arrangement of balls and ramps within a self-contained assembly |
| C:\Users\paul\Desktop\FE image Rotocap.jpg | Combining the ball ring and Belleville spring into a single component allows Federal-Mogul Powertrain to deliver Rotocap® product lifetime in excess of 30,000 running hours, depending on the application |
| cid:image002.jpg@01D1B67F.40127BB0 | The Rotocap® is manufactured in sizes up to 200 mm in diameter, but can be specified to a larger dimension. The Rotocap® can be configured for mounting above or below the valve spring pack |