**HEMI Engines**

**INTRODUCTION**

**[](http://en.wikipedia.org/wiki/File:Active_Chamber.jpg)** Engines are the major components of any automobile. [](http://en.wikipedia.org/wiki/File:NEWHemi_Chamber.jpg)

**HISTORY**

**[](http://en.wikipedia.org/wiki/File:1903_premier.jpg)**

Hemispherical combustion chambers, which had been used for centuries in mortars and cannons  were introduced on some of the earliest automotive engines, shortly after proving the concept of internal combustion engines themselves.

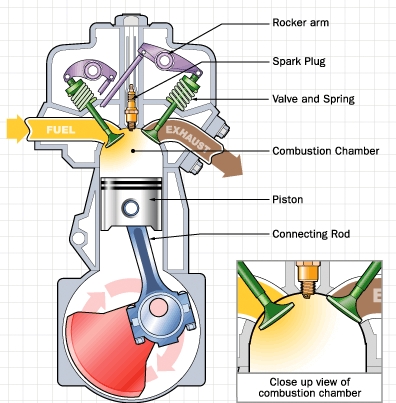
Hemispherical cylinder heads have been used since at least 1901, they were used by the Belgian car maker Pipe in 1905, the Peugeot Grand Prix Car of 1912, the Alfa Romeo GP car of 1914, Daimler, and Riley. Stutz built four valve engines, conceptually anticipating modern car engines. The BMW double push rod design, taken over by Bristol Cars, the Peugeot 403, the Toyota T engine and Harry Arminius Miller racing engines are other examples.

In automotive engineering, an **overhead valve** internal combustion engine is one in which the intake and exhaust valves and ports are contained within the cylinder head.

The original overhead valve or **OHV** piston engine was developed by the Scottish-American David Dunbar Buick. It employs pushrod-actuated valves parallel to the pistons, and this is still in use today. This contrasts with previous designs which made use of side valves and sleeve valves.

Nowadays, automotive use of side-valves has virtually disappeared, and valves are almost all "overhead". However most are now driven more directly by the overhead camshaft system, and these are designated OHC instead - either single overhead camshaft (SOHC) or double overhead camshaft (DOHC).

**WORKING**

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A hemi engine refers to the way the pistons, heads and block are designed.  This style of engine claims to provide a better flow of air inside the cylinder by creating more room for larger valves in turn providing more power.  The chamber on a hemi is hemispherical instead of being flat like traditional engines.  This shape provides more surface area on the block allowing room for the larger valves.  When the engine can breath better there is less friction and more clean air / fuel mixture providing more power.  However, this chamber is very tall so the pistons must be domed to provide adequate compression.  While the engine provides larger valves, the new design of the piston actually interferes with the air flow.  With the domed pistons it is less likely to evenly distribute the air / fuel mixture, and to adequately remove the exhaust.

**BENEFITS**

Although a wedge-head design offers simplified valve actuation, it usually requires the air/fuel mixture to make sharp turns en route to and from the chamber. With a hemispherical chamber, larger valves are possible and a straighter, less restrictive flow path can be provided for the air/fuel mixture. This improves engine breathing. Placing the spark plug near the center of the chamber aids in achieving complete combustion of the fuel/air mixture, though it is not mandatory.

**USAGE**

Many of today's engines use active combustion chambers designed to tumble and swirl the fuel/air mix within the chamber for the most efficient combustion event possible. These active chambers usually look like kidney beans or two merged small 'hemi' areas surrounded by flat quenching areas over the pistons. By the end of the 1970s, development of engines utilizing true hemispherical chambers had ceased around the world; it had been gradually displaced by dramatically improved newer engine designs. Today, "hemi" is more of a trademark than a description of a combustion chamber.

The valves of a two valve-per-cylinder engine to be angled rather than side-by-side due to the hemispherical combustion chamber. more space in the combustion chamber roof is thus created for the use of larger valves and also straightens the airflow passages through the cylinder head the engine's airflow ("breathing") capacity is significantly improved thus improving the high power output from a given piston displacement. With a hemi combustion chamber, there is minimal quench and swirl to burn the fuel-air mix thoroughly and quickly.

**OVERHEAD VALVE**

An **overhead valve (OHV) engine**, also informally called **pushrod engine** or **I-head engine**, is a type of piston engine that places the camshaft within the cylinder block (usually beside and slightly above the crankshaft in a straight engine or directly above the crankshaft in the V of a V engine), and uses **pushrods** or *rods* to actuate rocker arms above the cylinder head to actuate the valves. Lifters or tappets are located in the engine block between the camshaft and pushrods. The more modern overhead camshaft (OHC) design (still literally overhead valve) avoids the use of pushrods by putting the camshaft in the cylinder head.

In 1949, Oldsmobile introduced the Rocket V8. It was the first high-compression I-head design, and is the archetype for most modern pushrod engines. General Motors is the world's largest pushrod engine producer, producing both V6 and V8 pushrod engines.

Few pushrod type engines remain in production outside of the United States market, and even American manufacturer Ford no longer offers pushrod engines in new vehicles. This is in part a result of some countries passing laws to tax engines based on displacement, due to the fact that displacement is somewhat related to the emissions and fuel efficiency of an automobile. This has given OHC engines a regulatory advantage in those countries, which resulted in few manufacturers wanting to design both OHV and OHC engines.