

## *Daimler-Benz DB 601 engine.*

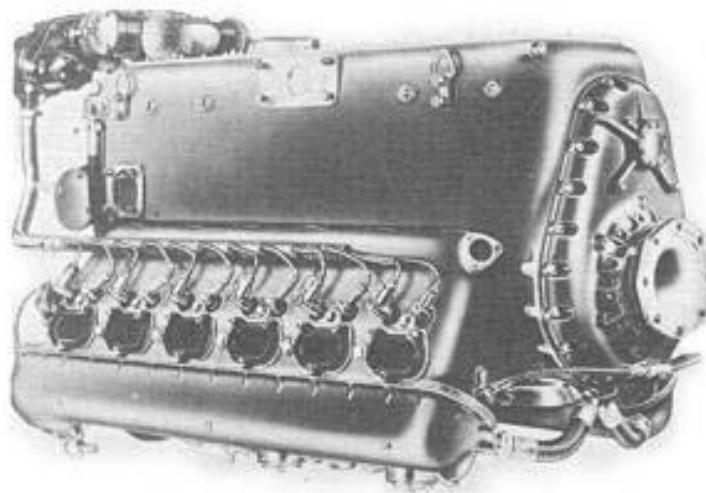
Daimler-Benz DB 600 series engines was one of those designs, that turned out to be right from the very start. It was an inverted vee, and the original engine displaced 2069 cu in (33.9L). It had three main features; it had roller bearing connector rods, it used dry cylinder liners and had a unique system of attaching the cylinders to the crankcase. It was used in several aircraft such as the **Heinkel 111** and [Messerschmitt Bf 110](#), but its classic use the [Messerschmitt Bf 109](#). The Bf 109E-5 used the DB 601A, The Bf 109E-6 used the 1,200 hp DB 601N and the Bf 109F used the DB 601E.<sup>1</sup>

The DB 603's weight of 2,002 lbs. (910 kg) restricted its use primarily to larger aircraft such as the **Me 410**, the **Do 271M** bomber, the **He 219** night fighter and the experimental **Do 335** push-pull twin.

The DB 605 was a development of the DB 601 and was very similar in basic construction to that power unit. It was enlarged to 2,179 cu. in. (35.7 L) and the main improvements allowed an increase in the maximum permissible rpm. Altered valve timing increased the inlet period and improved the scavenging to give greater volumetric efficiency at higher rpm. A complete redesign of the cylinder block obtained the maximum possible bore with existing cylinder centers. The new design also repositioned the spark plugs. The crankshaft big-end bearings were also modified.

The DB 606 was two DB 601 engines that were joined, and inclined so that the inner banks were almost vertical, which drove a single shaft. It was a 24-cylinder, liquid-cooled inline engine, of double inverted V or W configuration. The engine was supercharged, with direct fuel injection and geared 0.413 to 1.

The DB 610 was similar to the DB 606, but was a combination of two DB 605s used on the **He 177 Greif (Griffin)**. It comprising of two inverted vee-12 liquid-cooled engines geared to one propeller. It was extraordinarily fire prone and its experimental use in the **He 177** was one of the Luwaffe's worst fiascos. Heinkel himself attributed the trouble as to the placement of the oil lines, too close to the exhaust system.<sup>2</sup>



*Sectional view of the Daimler Benz DB 601N*

**CONSTRUCTION DB 605:** Cylinder barrels of steel are screwed and shrunk into the cast Silium-Gamma-alloy cylinder blocks. These dry liners project beyond block providing attachment by means of threaded rings which pull the liners against the finished face of the crankcase. This feature helped to save the weight of the studs and avoided the possibility of distortion.<sup>3</sup>

Two inlet and two exhaust valves per cylinder operated by rocker arms directly from a single camshaft carried upon the head. Stellited valve seats, exhaust valve sodium cooled, ball joints interpose rockers and valve stems.

Forged light-alloy pistons have concave heads, each piston has a floating pin and three compression and two oil-scraper rings with one below the pin. Forked type connecting rods with serrated joints at big ends, roller bearing at big end has three tracks of 24 rollers each. Forked rod is keyed to outside of roller race, plain rod runs on lead-bronze bearing over race.

One piece forged steel crankshaft carried in seven plain lead-bronze bearings. Eight balance weights attached to crank webs, splined forward end to receive splined sleeve of reduction gear pinion.

Deep light alloy crankcase with webs at main bearings, tubular mounting at rear below crankshaft for installation of cannon which can fire through propeller shaft, light top cover.

Centrifugal supercharger on port side of engine driven through a fluid coupling by a shaft at right angles to crankshaft. This shaft is driven through bevel gears from the crankshaft, variation in propeller speed secured through variable filling of fluid coupling by two-stage engine driven pump receiving lubricating oil from the main pressure filter.

First stage delivers oil direct to coupling and second stage delivery is passed in varying proportions between crankcase and coupling by piston valve controlled by a capsule which is sensitive to inlet pressure. Second stage cuts in at approximately 5,000 ft. and full delivery occurs at approximately 11,500 ft.

Butterfly throttle which is capsule controlled regulates supercharger delivery, second throttle which is pilot operated controls air supply to engine and manifold pressure, first throttle subjected to pressure between two throttles, increased boost for take-off controlled by clockwork mechanism, mixture delivered by supercharger to looped manifold by large diameter pipe, dry-sump pressure-feed lubrication, gear type oil pumps, spray of oil directed upon reduction gears, main oil pressure line feeds crankshaft bearings, secondary line feeds supercharger fluid pump.





Specifications:					
Daimler-Benz DB 600 Series					
<b>Model:</b>	DB 600	DB 601	DB 603	DB 605	DB 610
<b>Cylinders:</b>	12	12	12	12	24
<b>Configuration:</b>	Inverted V, Liquid cooled	Inverted V, Liquid cooled	Inverted V, Liquid cooled	Inverted V, Liquid cooled	Inverted W, Liquid cooled
<b>Horsepower:</b>	1,000 hp (1,000 kw)	1,360 hp (1,000 kw)	2,830 hp (0,000 kw)	1,475 hp (1,099 kw)	2,450 hp (0,000 kw)
<b>RPM:</b>	2,400	2,600	2,830	2,800	2,800
<b>Bore and Stroke:</b>	5.9 in. (150 mm) x 6.3 in. (160 mm)	5.9 in. (150 mm) x 6.3 in. (160 mm)	6.4 in. (162 mm) x 7.1 in. (180 mm)	6.1 in. (154 mm) x 6.3 in. (160 mm)	6.1 in. (154 mm) x 6.3 in. (160 mm)
<b>Displacement:</b>	2,069 cu. in. (33.9 liters)	2,069 cu. in. (33.9 liters)	2,715 cu. in. (44.5 liters)	2,179 cu. in. (35.7 liters)	5,438 cu. in. (71.4 liters)
<b>Weight:</b>	1,510 lbs. (686 kg)	1,540 lbs. (700 kg)	2,002 lbs. (910 kg)	1,663 lbs. (756 kg)	3,476 lbs. (1,580 kg)

