

Klimov VK-1

VK-1



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Type	Turbojet
Manufacturer	Klimov
First run	1947
Major applications	Mikoyan-Gurevich MiG-15 Ilyushin Il-28
Developed from	Rolls-Royce Nene

The **Klimov VK-1** was the first Soviet jet engine to see significant production. It was developed by Vladimir Yakovlevich Klimov and first produced by the GAZ 116 works. It was derived from the British Rolls-Royce Nene. The engine was built under license in China as the **WP-5**



Klimov VK-1 cut-out.



Klimov VK-1 cut-out.

Immediately after World War II, the Soviet Union manufactured copies of first generation German Junkers 004 and BMW 003 engines, which were advanced designs with poor durability, limited by Germany's availability of rare metals at wartime. However in 1946, before the Cold War had really begun, the new British Labour government under the Prime Minister, Clement Attlee, keen to improve diplomatic relations with the Soviet Union, authorized Rolls-Royce to export 40 Rolls-Royce Nene centrifugal flow turbojet engines. In 1958 it was discovered during a visit to Beijing by Whitney Straight, then deputy chairman of Rolls-Royce, that this engine had been copied without license to power the MiG-15 'Fagot', first as the **RD-45**, and after initial problems of metallurgy forced the Soviet engineers to develop a slightly redesigned (and metallurgically closer) copy, the engine had then entered production as the

Klimov VK-1 (Rolls-Royce later attempted to claim £207m in license fees, without success).

The comparatively simple RD-45 proved troublesome due to Soviet inexperience with engineering and materials, but was further improved to produce the VK-1 which differed from the Nene in having larger combustion chambers, larger turbine, and revised airflow through the engine. The Soviets partially tackled the metallurgical issue by touring the Rolls-Royce plant in specially-designed shoes intended to pick up metal shavings for later analysis. The **VK-1F** added the afterburner.

The engine featured a centrifugal compressor, unlike the more progressive axial flow compressor designs appearing in WWII Germany and Britain, requiring a larger-diameter fuselage than aircraft featuring axial flow compressors.

Applications

The VK-1 was used to power MiG-15 'Fagot' and MiG-17 'Fresco' fighters, as well as the Il-28 'Beagle'.

General characteristics (VK-1)

- **Type:** Turbojet
- **Length:** 2,600 mm (102 in)
- **Diameter:** 1,300 mm (51 in)
- **Dry weight:** 872 kg (1,395 lb)

Components

- **Compressor:** Centrifugal compressor

Performance

- **Maximum thrust:** 26.5 kN (5,955 lbf)
- **Specific fuel consumption:** 109.1 kg/(kN·h) (1.07 lb/(lbf·h))
- **Thrust-to-weight ratio:** 41.4 N/kg (4.27:1)