

Allison J33

J33



Allison J33-A-35 Turbojet Engine

Type	Turbojet
Manufacturer	General Electric Allison Engine Company
First run	1942
Major applications	Lockheed P-80 Shooting Star Lockheed T-33 Shooting Star Lockheed F-94A/B Starfire
Developed from	General Electric J31

The **General Electric/Allison J33** was a development of the General Electric J31, enlarged to produce significantly greater thrust, starting at 4,000 lbf (18 kN) and ending at 4,600 lbf (20 kN) with an additional low-altitude boost to 5,400 lbf (24,000 N) with water-alcohol injection.

The J33 was originally developed by General Electric as a follow-on to their work with Whittle's designs during World War II. Their first engine was known as the I-A, but after major changes to adapt it to US

production and to increase thrust, it started limited production as the I-16 in 1942, the 16 referring to its 1,600 lbf (7,100 N) thrust. Full production started as the J31 when the United States Army Air Forces introduced common naming for all their engine projects.

Along with the I-16, GE also started work on an enlarged version, known as the I-40. As the name implied, the engine was designed to provide 4,000 lbf (18 kN). The development cycle was remarkably rapid. Design work started in mid-1943 and the first prototype underwent static testing on January 13, 1944.

Lockheed was in the midst of the XP-80 project at the time, originally intending to power their design with a US-produced version of the Halford H-1 of about 3,000 lbf (13 kN). Production of the H-1 ran into delays, and since the I-40 would dramatically improve performance, plans were made to fit the prototypes with the I-40 instead.

The I-40 became important to the USAAF's plans when the I-16 powered P-59 was skipped over in favor of the I-40 powered P-80 as the US's first production jet fighter. In 1945 the license to actually produce the engine was not given to General Electric, but Allison instead. Allison, working largely from government-owned wartime factories, could produce the engine in quantity more quickly and cheaply.

By the time the production lines were shut down Allison had built over 6,600 J33's, and General Electric another 300 (mostly the early runs).

Variants

- J33-A-21: 4,500 lbf (20.0 kN) thrust
- J33-A-23: 4,600 lbf (20.5 kN) thrust
- J33-A-35: 5,400 lbf (24.0 kN) thrust
- J33-A-33: 6,000 lbf (26.7 kN) afterburning thrust
- J33-A-24: 6,100 lbf (27.1 kN) thrust

Applications

- Convair XF-92
- Lockheed P-80 Shooting Star
- Lockheed T-33 Shooting Star
- Lockheed F-94A/B Starfire
- MGM-1 Matador
- MGM-13 Mace

Specifications (J33-A-35)

General characteristics

- **Type:** Non-afterburning turbojet
- **Length:**
- **Diameter:**
- **Dry weight:** 1,795 lb (815 kg)

Components

- **Compressor:** Double entry centrifugal compressor

Performance

- **Maximum thrust:**
 - 4,600 lbf (20.4 kN) at 11,750 rpm
 - 5,400 lbf (24.0 kN) with water-alcohol injection
 - **Thrust-to-weight ratio:** 2.56 (25.1 N/kg)