



# GE90 turbofan engine

The next generation turbofan



# GEnx – technology features

The GEnx is GE's next-generation engine family designed for medium-capacity long-range aircraft. Based on the proven architecture of the GE90, the GEnx succeeds GE's highly successful CF6 series, the best-selling engine family for wide-bodies.

MTU Aero Engines is Germany's largest aero engine manufacturer. MTU participates in the GEnx program as a Risk and Revenue Sharing Partner with 6.65 percent. MTU is responsible for the design, manufacturing and assembly of the turbine center frame (TCF). MTU could further develop its experience gained by GP7000 TCF design, which proved to be a very reliable and successful component.

The turbine center frame is one of the major structural components of the engine and contains one bearing of the engine rotor. Besides this structural task it fulfills an aerodynamic function: it is the transition duct for the hot gas stream from the high pressure turbine to the low pressure turbine. These different functions (high stress areas and hot environment) lead to high requirements towards materials and design.

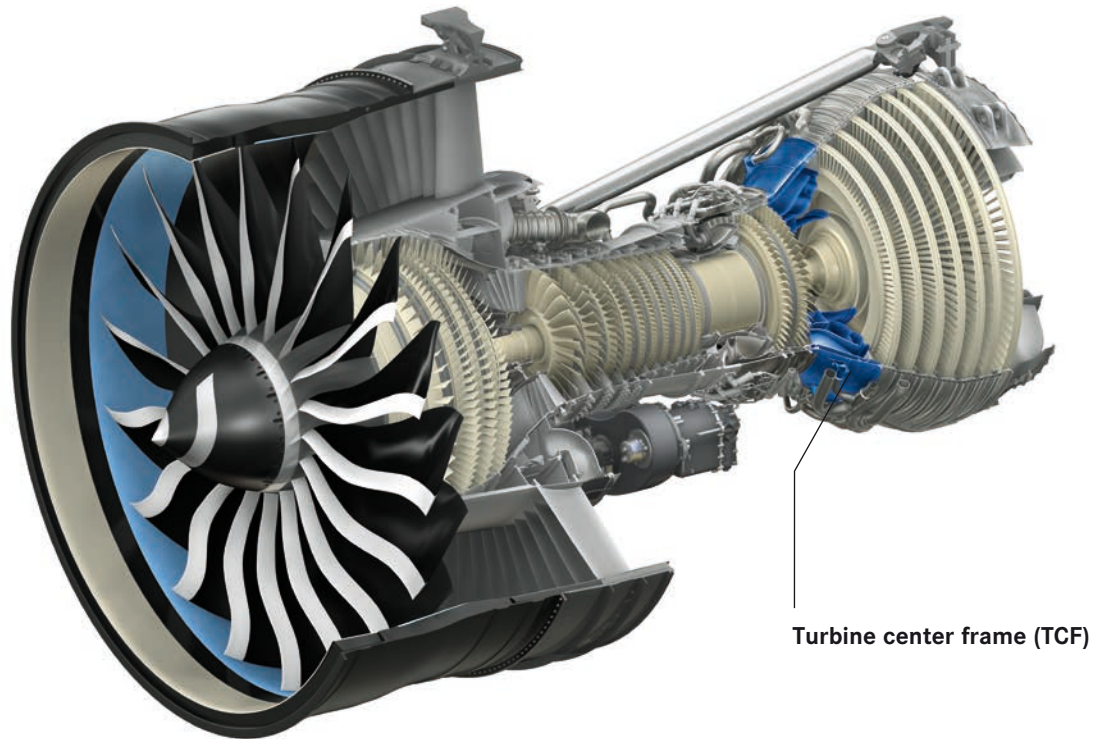
With latest generation materials and design processes the turbine center frame could be designed with reduced weight compared to previous generation engines, which makes its contribution to the success of the GEnx engine, especially in terms of reduced fuel consumption by lower weight. Compared to the CF6, the GEnx engine offers an overall 15 percent improved fuel efficiency, which also means 15 percent less CO<sub>2</sub> emissions.

## Key Features:

- Up to 76 klbs takeoff thrust
- Built on proven GE90 architecture
- Best fuel efficiency, lowest emissions
- Superior materials, lowest weight
- Lowest noise level
- Lowest maintenance cost

## Engine models/Planes powered:

- GEnx-1B/Boeing B787-8, B787-9, B787-10
- GEnx-2B/Boeing B747-8F (Freighter Aircraft), B747-8I (Passenger Aircraft)



Turbine center frame (TCF)

Currently GE offers the GEnx engine with the following specifications:

GEnx engine specifications	-1B70 (B787-8)	-1B74/75 (B787-9)	-1B76 (B787-10)	-2B67 (B747-8)
Takeoff thrust (lbs)	69,800	74,100	76,100	66,500
Bypass ratio (takeoff/top-of-climb)	9.3/8.8	9.1/8.6	9.1/7.9	8.0/7.4
Overall pressure ratio (takeoff/top-of-climb)	43.8/53.3	46.3/55.4	47.4/58.1	44.7/52.4
Air Mass Flow (takeoff, lbs-mass/sec)	2,559	2,624	2,658	2,297
Fan Diameter (in)	111.1	111.1	111.1	104.7
Base Engine Length (in)*	184.7	184.7	184.7	169.7
Compressor Stages (Fan/Booster/HPC)	1/4/10	1/4/10	1/4/10	1/3/10
Turbine Stages (HP/LP)	2/7	2/7	2/7	2/6
Combustor	SAC/TAPS	SAC/TAPS	SAC/TAPS	SAC/TAPS
Control	FADEC III	FADEC III	FADEC III	FADEC III
Bearings	2B+4R	2B+4R	2B+4R	2B+4R

\*Forward flange of forward fan case to the aft outer flange of the turbine rear frame



MTU Aero Engines AG  
 Dachauer Straße 665  
 80995 Munich • Germany  
 Tel. +49 89 1489-0  
 Fax +49 89 1489-5500  
 info@mtu.de  
 www.mtu.de