HF118 Turbofan Engine

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In 1986, HONDA started a research on a gas turbine engine for an aircraft. Development of Honda's HF118 turbofan engine for a business jet that has been focused on critical customer requirements, affordability, compactness, lightweight, fuel-efficient and low-emission began in 1999. **Figure 1** shows a picture of the HF118 engine. Comprehensive testing, including required tests such as the 150-hour endurance test and the bird ingestion test were carried out. The engine has now logged more than 200 hours of flight-testing on FTB (Flying Test Bed), confirming its reliability. **Figure 2** shows the HondaJet, a new experimental compact business jet, equipped with the HF118 engines. It successfully completed the first flight in North Carolina, December in 2003. The engine specifications are shown in **Table 1**. It is noticeable that low SFC of 0.75 at cruse conditions is achieved. One of the reasons for the higher performance is due to the high efficiency in HPC. **Figure 3** shows an efficiency trend curved for single stage centrifugal compressors. We can see the compressor of the HF118 engine compares favorably with the world's best.

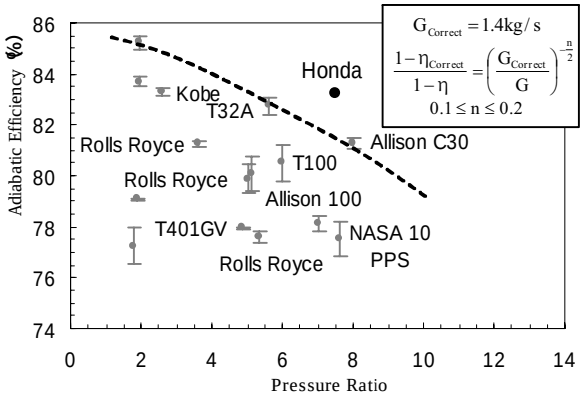

Fig. 3 Efficiency trend curve for single stage centrifugal compressors[1)]

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Fig. 1 HF118 turbofan engine

Fig. 2 HondaJet, equipped with HF118 engines

Table 1 Engine specifications

Engine Type	Two-spool turbofan
Components	1F+1LPC+1HPC+1HPT+1LPT
Take-off thrust	757 kgf (1,670 lbf)
Cruise thrust	191 kgf (420 lbf)
Take-off SFC	0.49 kg/hr/kgf
Cruise SFC	0.75 kg/hr/kgf
Bypass ratio	2.9
Dry weight	178 kg (392 lb)
Fan diameter	441 mm (17.36 inch)
Total length	1,384 mm (54.5 inch)

References

1) Oana, M., Kawamoto, O., Ohtani, H., and Yamamoto, Y., Journal of Propulsion and Power, Vol. 20, No. 1, pp. 164-170, 2004.