

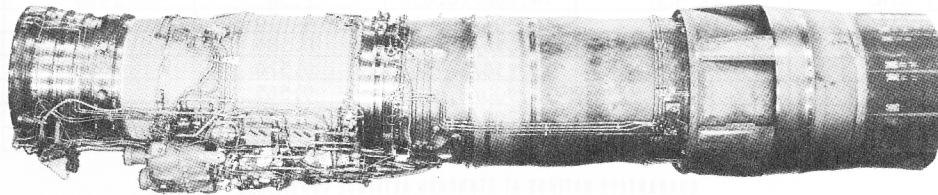
AIRCRAFT ENGINE CHARACTERISTICS SUMMARY

MFG. DESIGNATION
JTF10A-20

TURBOFAN

TF30-P-1,-1A

Pratt and Whitney Aircraft
East Hartford, Conn.
Spec. A-1795-A (Approved)
Dated 14 March 1967



GENERAL DESCRIPTION

The TF30-P-1 engine is an axial flow gas turbine engine with an annular burner having eight through flow combustion chambers, a nine stage low pressure compressor unit including a three stage fan, and a seven stage high pressure compressor unit. The low pressure compressor unit is connected by a through shaft to the three low pressure turbine wheels and the high pressure compressor unit is connected independently by a hollow shaft to the high pressure turbine wheel. The fan and compressor air inlets are common and both airflows are combined in a common afterburner and are discharged through a single variable area convergent jet nozzle. The engine is equipped with a blow-in-door ejector.

AVAILABILITY

Development Contract Awarded. October 1962
 Engine Mock-up Inspection July 1963
 Experimental Engine February 1964
 Mock-up for Aircraft. August 1963
 Installation Engine February 1965
 60 Hr. Preliminary Flight Rating Test. June 1964
 150 Hr. Endurance Tests - A and B . . July 1965

PROCUREMENT

Final Price (CY65). . . . \$673,184 (P-1)
 Final Price (CY65). . . . \$677,161 (P-1A)

STATUS

Production completed in April 1967.

SPECIFIC FEATURES

Compressor---Axial flow, twin spool
 LP Rotor - 9 stages (includes 3 fan stages)
 HP Rotor - 7 stages
 Maximum Design Pressure Ratio (SLS)---17.0:1
 Bypass Ratio---1.1:1
 Combustion Chamber--8 unit, can-annular, through flow
 Turbine---Axial flow, 4 stage
 LP Rotor - 3 stages
 HP Rotor - 1 stage
 Turbine Cooling---High pressure turbine blades and vanes air cooled
 Maximum Allowable Turbine Inlet Temperature---2030°F

Exhaust Nozzle---Convergent, variable area, with blow-in-door ejector
 Ignition---Two 4 joule exciters, engine driven alternator, two igniters, automatic relight
 Power Control---Hydromechanical main and A/B fuel controls
 Fuel---MIL-T-5624, Grade JP-4 or JP-5
 Oil ---MIL-L-23699, MIL-L-7808 (below -40°F)
 Maximum Oil Consumption---0.2 gal/hr avg.
 Accessory Drive Provisions---Six
 Thrust to Weight Ratio---4.78:1 (P-1)
 4.74:1 (P-1A)

SIZE & WEIGHT

Length---235.5 inches
 Maximum Diameter---48.0 inches
 Maximum Radial Projection---31.0 inches
 Dry Weight (P-1)---3869 lbs.
 Dry Weight (P-1A)---3899 lbs.

UTILIZATION

F-111A Fighter Aircraft (two P-1 engines) (USAF)
 F-111B Fighter Aircraft (two P-1A engines) (USN)

PERFORMANCE

GUARANTEED RATINGS AT STANDARD SEA LEVEL STATIC CONDITIONS

RATING	THRUST (lb)	RPM N ₂ /N ₁	SFC (lb/hr/lb)	MEAS. GAS TEMP. (°F) (Turb. Inlet)	AIRFLOW (lb/sec)
MAXIMUM (45 min)	18,500	14,200/10,050	2.50	1970	240
INTERMEDIATE (Military) (45 min)	10,750	14,200/10,050	0.630	1930	235
MAXIMUM CONTINUOUS (Normal)	8,500	13,450/9,100	0.580	1680	213
90% MAX. CONTINUOUS	7,650	13,250/8,750	0.570	1600	202
75% MAX. CONTINUOUS	6,375	12,900/8,250	0.565	1500	184
IDLE	645 (Max)	8,200/2,850	900 lb/hr		

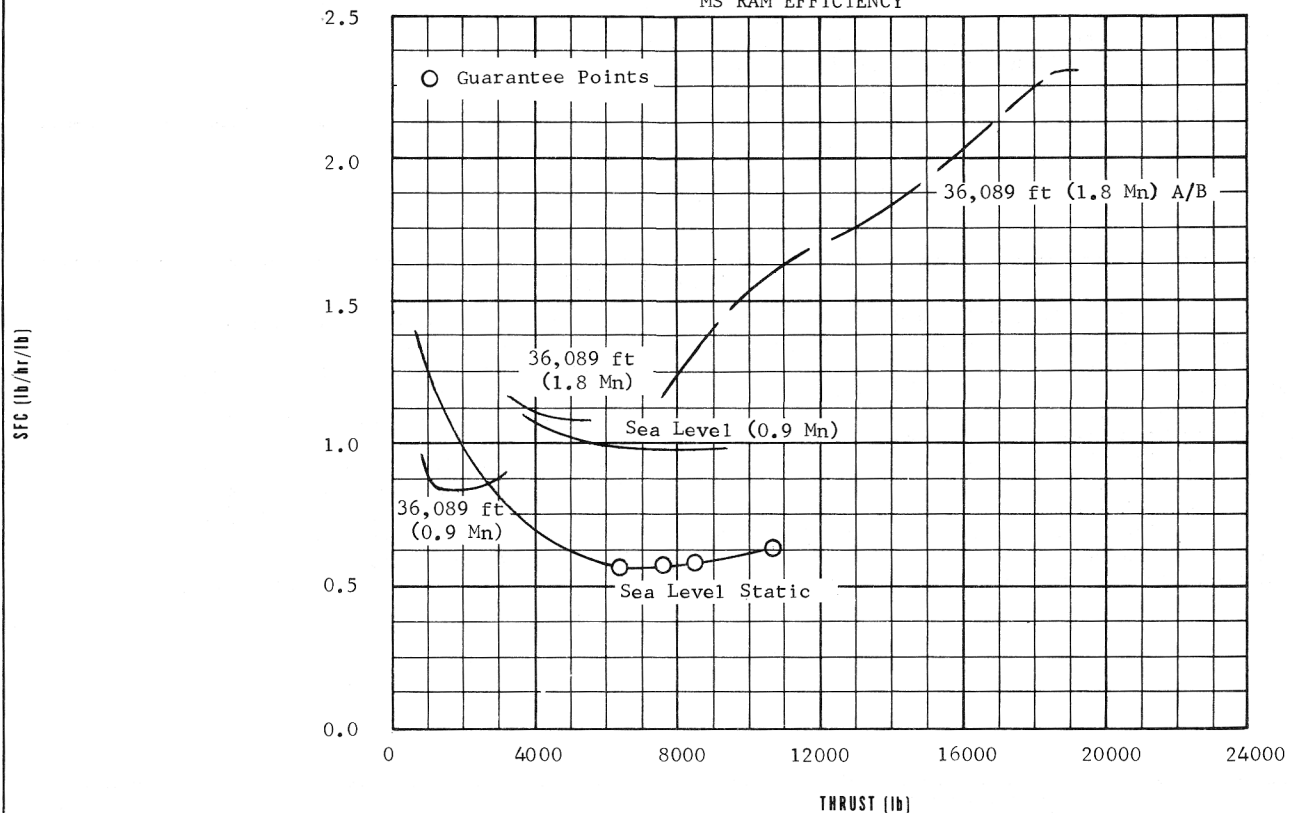
GUARANTEED RATINGS AT STANDARD ALTITUDE CONDITIONS

RATING	ALTITUDE (ft)	FLIGHT MACH NO.	THRUST (lb)	SFC (lb/hr/lb)	MEAS. GAS TEMP. (°F)	AIRFLOW (lb/sec)
MAXIMUM (45 min)	65,000	2.2	5,030	2.92	1970	72
INTERMEDIATE						
MAXIMUM CONTINUOUS (Normal)	36,089	0.9	2,470	0.87	1630	95
Partial Aug. (45 min)	S. L.	1.2	19,100	2.10	1970	455

GUARANTEED OPERATING LIMITS

ABSOLUTE ALTITUDE (FEET)	75,000 at 3.18 ram pressure ratio	MAXIMUM STARTING ALTITUDE JP-4	45,000 ft
LIMITING MACH NO. AT SEA LEVEL STD. CONDITIONS	1.2	MAXIMUM STARTING ALTITUDE JP-5	45,000 ft

ARDC MODEL ATMOSPHERE 1956
MS RAM EFFICIENCY



NOTES

Afterburning is accomplished by use of spray rings and V-gutter flameholders in the main engine gas stream. Spray rings, used in conjunction with an aerodynamic flameholder, are used to accomplish afterburning in the fan air stream. The afterburner is canted 2½° to accommodate aircraft installation requirements. The -1A is identical to the -1 except that it incorporates a fuel filter-heater instead of a fuel filter.