Aircraft Engine Characteristics Summary

RAM-JET

(TJ32C5)
(TJ67-W-3/XRJ55-W-1)

Wright Aero.
Spec. 922
22 Apr 55
(Not approved)

FEATURES

A supersonic variable geometry ram-jet used with the YJ67-W-3 turbo-jet to form a double cycle propulsion system for the XF-103. The turbo-jet using the ram-jet as an afterburner powers the aircraft for take-off and speeds up to Mach 2.24. At this point the turbo-jet is bypassed and the ram-jet is utilized for higher flight performance. (See NOTE 1).

AVAILABILITY

Experimental Engine .......... May 1955
Installation Engine .......... Nov 1957
(See YJ67-W-3)

PROCUREMENT

NUMBER TO BE DELIVERED DURING FISCAL YEAR

CONTRACTUAL

Contract* Funds FY
AF-9000 $26,600 1951
AF-8733 817,831 1952
AF-22960 7,900,000 1953
AF-30241 6,300,000 1955
AF-33589 6,520,000 1956
AF-33589 17,200,000 1956
*Includes both YJ67-W-3 and XRJ55-W-1

STATUS

Experimental, currently undergoing development and testing at both sea level and altitude operation.

GENERAL

Diffuser Bottom Entry
Area Variable Yes
D.P. Total Pressure Recovery (See NOTE 2)
Combustion Chamber Annular piloted gutters
Inside Dia at Combustion Chamber Entrance 46 in.
Ignition Limits ---
D.P. Combustion Efficiency (See NOTE 3)
Exhaust Nozzle Variable

D.P. Nozzle Efficiency 97%
Ignition ---
Fuel Injection Variable area nozzles
Thrust Control ---
Fuel JP-4
Accessory Drive Provisions Fuel pump

SIZE & WEIGHT

Length (overall, w/turbo-jet) 534.0 in.
Diameter (turbo-jet or ram-jet) 56.0 in.
Weight (dry, incl turbo-jet, and accessories) 7600 lb

UTILIZATION

One XRJ55-W-1 planned for use with one YJ67-W-3 to form a double cycle propulsion system for powering the XF-103 Aircraft.
ESTIMATED DESIGN POINT PERFORMANCE

Mach number ....................... 2.24 - 3.0
Altitude ........................... 35,000 - 75,000 ft.
Net internal thrust ................. (max) 32,500 lb.
                                                (at Mach 3.0 at 45,000 ft)
Specific fuel consumption .......... 3.2 lb/hr/lb
                                               (at max thr condition)

NOTES

NOTE 1: The aircraft utilizing the turbo-jet, with ram-jet as afterburner, has a max operating speed of Mach 2.24 due to compressor air temperature limitations set by the engine manufacturer. These limitations are overcome by by-passing the turbojet and using the ram-jet to obtain higher thrust. Transition from turbo-jet to ram-jet operation occurs between 35,000 and 40,000 ft. At termination of ram-jet requirement, return to turbo-jet operation is accomplished. For performance below Mach 2.24 see the YJ67-W-3 summary.
NOTE 2: Estimated diffuser total pressure recovery is 87% at Mach 2.0 and 64% at Mach 3.0.
NOTE 3: Combustion efficiency is 86% at Mach 3.0 at 60,000 feet.