# Aircraft Engine Characteristics Summary

**Engine Designation:** J79-GE-10  
**Manufacturer:** General Electric Company  
**Location:** Cincinnati, Ohio  
**Spec:** E-2039-A  
**Date:** Dated 1 March 1967

## General Description

The J79-GE-10 is a turbojet engine featuring a high pressure ratio, single rotor compressor with variable inlet guide vanes and six stages of variable stator vanes, a can annular combustor, a high inlet temperature three stage turbine, a third stage turbine blade guard over the upper half of the turbine casing, and a high augmentation ratio afterburner with a variable area convergent-divergent jet exhaust nozzle. It is an advanced version of the J79-GE-8, providing increased thrust for improved take-off, climb and acceleration together with reduced fuel consumption for increased range.

## Availability

- **Engine Mock-up Inspection**: Not Applicable  
- **Experimental Engine**: June 1964  
- **Mock-up for Aircraft**: October 1964  
- **Installation Engine**: Not Applicable  
- **50 Hr. Preliminary Flight Rating Test**: January 1967  
- **150 Hr. Endurance Test (JP-5)**: January 1967  
- **150 Hr. Endurance Test (JP-4)**: January 1967

## Procurement

- **Final Price (CY 66)**: $185,173

## Status

- In production.

## Specific Features

- **Compressor**: Axial flow, single spool, 17 stages; inlet guide vanes and first 6 stages of stator vanes are variable  
- **Maximum Design Pressure Ratio (SLS)**: 13.5:1  
- **Maximum Allowable Air Bleed**: 9.5%  
- **Maximum Airflow (SLS)**: 170 lb/sec  
- **Combustion Chamber**: 30 unit, can-annular through flow type  
- **Turbine**: Axial flow, three stage, with integrated turbine impingement starting manifold at second stage  
- **Turbine Cooling**: First two stages of stator vanes air cooled  
- **Afterburner**: Core-annulus type  
- **Exhaust Nozzle**: Convergent-divergent, variable area guided expansion nozzle  
- **Maximum Allowable Exhaust Temperature**: 1270°F at max, intermediate and max continuous thrust  
- **Ignition**: Non-continuous capacitor discharge type, 14 joule main-7joule A/B  
- **Power Control**: Hydromechanical; integrated main fuel, afterburner fuel and nozzle area control system  
- **Fuel**: MIL-T-5624, Grade JP-5 (Alternate) JP-4  
- **011**: MIL-L-23699, MIL-L-7808 (below -40°F)  
- **Accessory Drive Provisions**: Seven  
- **Thrust to Weight Ratio**: 8.1

## Size & Weight

- **Length**: 208.7 inches  
- **Maximum Diameter**: 35.2 inches (engine), 39.1 inches (afterburner)  
- **Dry Weight**: 3855 lbs.

## Utilization

- F-6J Fighter, RF-6J Reconnaissance, NF-6J Special Test Aircraft (two engines each)

August 1968
## Performance

### Guaranteed Ratings at Standard Sea Level Static Conditions

<table>
<thead>
<tr>
<th>Rating</th>
<th>Thrust (lb)</th>
<th>RPM</th>
<th>SFC (lb/hr/lb)</th>
<th>Meas Gas Temp. (°F)</th>
<th>Airflow (lb/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum</td>
<td>17,859</td>
<td>7,660</td>
<td>1,957</td>
<td>1255</td>
<td>170</td>
</tr>
<tr>
<td>Intermediate (Military)</td>
<td>11,970</td>
<td>7,660</td>
<td>0,840</td>
<td>1255</td>
<td>170</td>
</tr>
<tr>
<td>Maximum Continuous (Normal)</td>
<td>11,110</td>
<td>7,635</td>
<td>0,810</td>
<td>---</td>
<td>169</td>
</tr>
<tr>
<td>90% Max. Continuous</td>
<td>10,000</td>
<td>7,160</td>
<td>0,780</td>
<td>0,760</td>
<td></td>
</tr>
<tr>
<td>75% Max. Continuous</td>
<td>8,330</td>
<td>6,900</td>
<td>0,760</td>
<td>0,760</td>
<td></td>
</tr>
<tr>
<td>Idle</td>
<td>50</td>
<td>5,600</td>
<td>1,130</td>
<td>1,130</td>
<td>1,130</td>
</tr>
</tbody>
</table>

### Guaranteed Ratings at Standard Altitude Conditions

<table>
<thead>
<tr>
<th>Rating</th>
<th>Altitude (ft)</th>
<th>Flight Mach No.</th>
<th>Thrust (lb)</th>
<th>SFC (lb/hr/lb)</th>
<th>Meas Gas Temp. (°F)</th>
<th>Airflow (lb/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum</td>
<td>35,000</td>
<td>2.0</td>
<td>18,600</td>
<td>2.05</td>
<td>1212</td>
<td>198</td>
</tr>
<tr>
<td>Intermediate (Military)</td>
<td>35,000</td>
<td>1.2</td>
<td>5,350</td>
<td>1.08</td>
<td>1255</td>
<td>97</td>
</tr>
<tr>
<td>Cruise</td>
<td>35,000</td>
<td>0.9</td>
<td>2,600</td>
<td>0.93</td>
<td>---</td>
<td>63</td>
</tr>
</tbody>
</table>

### Guaranteed Operating Limits

- Absolute Altitude (Feet): 75,000 at 2.46 ram pressure ratio
- Maximum Starting Altitude JP-6: 68,500
- Limiting Mach No. at Sea Level Std. Conditions: 1.13
- Maximum Starting Altitude JP-5: 60,000
- Absolute Altitude of A/B: 75,000 ft at 4.68 ram pressure ratio

### ARDC Model Atmosphere 1959

MS Ram Pressure Recovery, 10% Secondary Airflow

Guarantee Points:

- Sea Level Static, A/B
- 35,000 ft (1.6 Mₐ)
- Sea Level (0.8 Mₐ)
- 35,000 ft (0.6 Mₐ)
- Sea Level Static

### Notes

116

UNCLASSIFIED

August 1968