What is a spool and why does it matter?

Using 21st century technology instead of mechanical complexity

“Spool” is engineering shorthand for the combination of an engine compressor and high-pressure turbine that drives it using a connecting drive shaft. In a single-spool engine, the high-pressure turbine drives the entire compressor. In a dual-spool engine, the compressor and high-pressure turbine are both split into two segments. Each compressor segment is driven by its corresponding turbine using two separate drive shafts, with one inside the other.

Better compression (a higher pressure ratio) is required for an engine to deliver 50% more power and 25% better fuel efficiency in an engine the same size as the current T700. GE Aviation evaluated single-and dual-spool engine designs to meet this challenge and determined that the required performance could be met through 21st century technologies without adding additional spools. Additional spools—and subsequent mechanical complexity—are only necessary when performance cannot be met through technology.

SINGLE-SPOOL

- Single core drives power turbine
- Simple, efficient, proven approach
- Lower pressures, temps, stresses
- Optimal operating environment

<table>
<thead>
<tr>
<th>Single-spool benefits</th>
<th>Dual-spool drawbacks</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️ Reliability</td>
<td>✗ Reliability Complex, more parts. Never installed on a DoD helo</td>
</tr>
<tr>
<td>✔️ Efficiency</td>
<td>✔️ Efficiency 2nd spool to meet performance</td>
</tr>
<tr>
<td>✔️ Maintainability</td>
<td>✗ Maintainability Limits modular design ... drives depot visits</td>
</tr>
<tr>
<td>✔️ Weight</td>
<td>✗ Weight Additional frame &amp; bearings ... adds weight</td>
</tr>
</tbody>
</table>

DUAL-SPOOL

- Core split into two spools
- More moving parts, complexity, cost
- Higher pressures, temps, stresses
- Additional burden on system, more parts

Achieve superior readiness with a simpler, lighter, more maintainable single-spool engine

LIGHTER WEIGHT

COMBAT FLEXIBILITY
Modular design

LESS COST
10% acquisition 45% maintenance

PERFORMANCE
Equal or better

GE T901 FOR 1REP

GEAVIATION.COM/T901