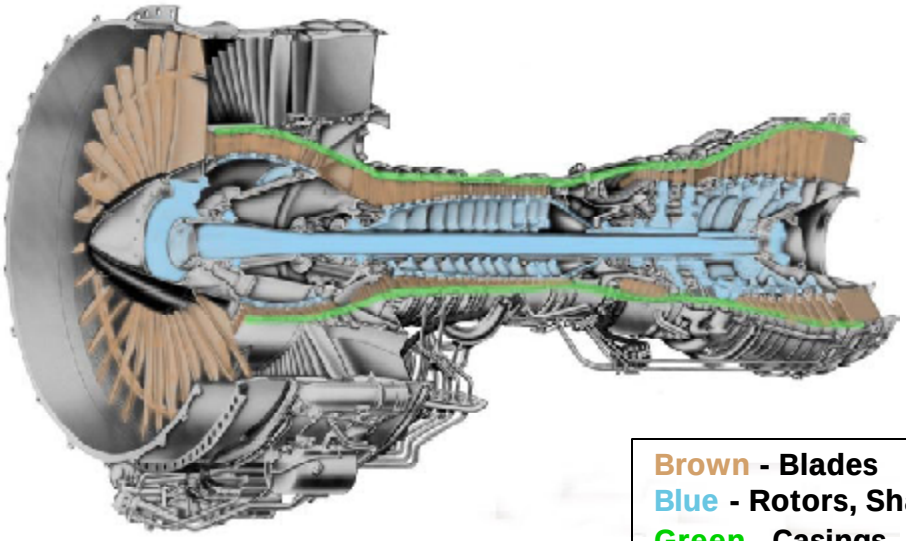
GEOMETRIC BALANCE
ENGINE CORE ASSEMBLY PROCESS

"Optimization of Engine Core Builds for Performance"



Brown - Blades
Blue - Rotors, Shafts & Bearings
Green - Casings

Mathematically Balanced Rotors Using Blades

Engine Core Built to Actual Centerline of Rotation at Each Rotor Stage

- All Rotors, Casings, Shafts, Bearing/Seals & Blades
- Mating of Compressors, Turbines & Shafts
- Blade Distribution to Balance Each Disc
- Each Rotor Stage Built to Actual Centerline of Rotation
- Entire Engine Core Built to Actual Centerline of Rotation
- Optimization of Blade-Tip Clearance at Each Rotor Stage

Engine Performace Improvement

SFC 2-6%
EGT Margin 40+%
Vibration 30+%

Engine Core Assembly Time Reduction by Two-Thirds

Cost Reduction: Maintenance & Operating

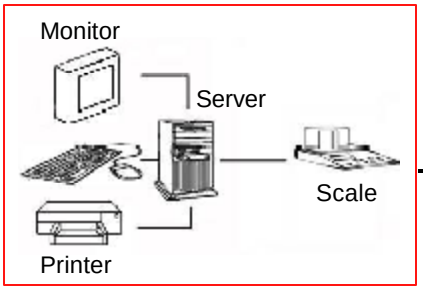
AXIAM INCORPORATED

ENGINE CORE ASSEMBLY PROCESS

Improve Engine Performance Through Optimized Engine Core Builds

- Straight engine core build about common centerline
- Optimal build always on first pass
- Consistency
- Minimize time to get balance within limits

BLADE SUPPLY BIN



DATA LINE

Operational Excellence

You get the immediate support to build your engine core optimally and operating at peak efficiency.

Lower Cost of Ownership

Improve turn time, wing time, part life, fuel burn, EGT margin/stability and vibration.

Axiam Geometric Balance Solution

- Compute each bladed-disc centerline & angular location to coincide with rotor and engine core centerline.

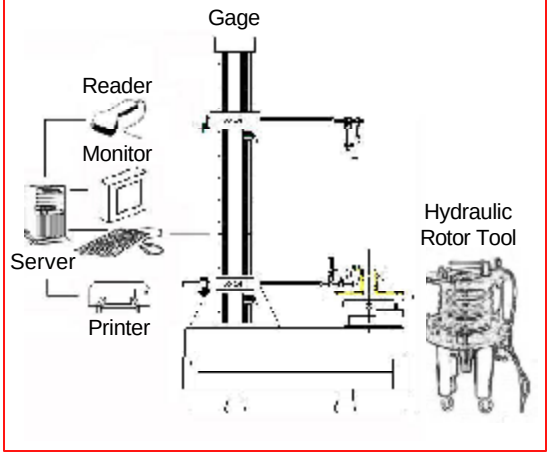
- SuperStack™ software generates a rotor and blade distribution predictive model that is straight & balanced in multiple planes. If rotor assembly is made up of IBRs/BLISKs, balancing will be accomplished by adding washers/weights to the bolted joint based on the predicted rotor unbalance computation.

- ShaftMate™ software generates an optimal rotor to shaft mating model.

- SmartCase™ software generates a casing model to enable concentricity to coincide with rotor/shaft centerline and identify any "out of spec" condition.

- Rotors are built using Axiam's repeatable assembly procedures and hydraulic tooling for all engine types. Engine core: rotors, blade distribution, shafts, bearings/seals and casings are built to the stacking axis for the integrated, predictive build models.

ASSEMBLY AREA



Using a consultative, collaborative approach, together we develop a repeatable engine core assembly solution that aligns with your unique operational requirements. Our one-pass, integrated assembly process brings lower cost and greater operational efficiency.

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