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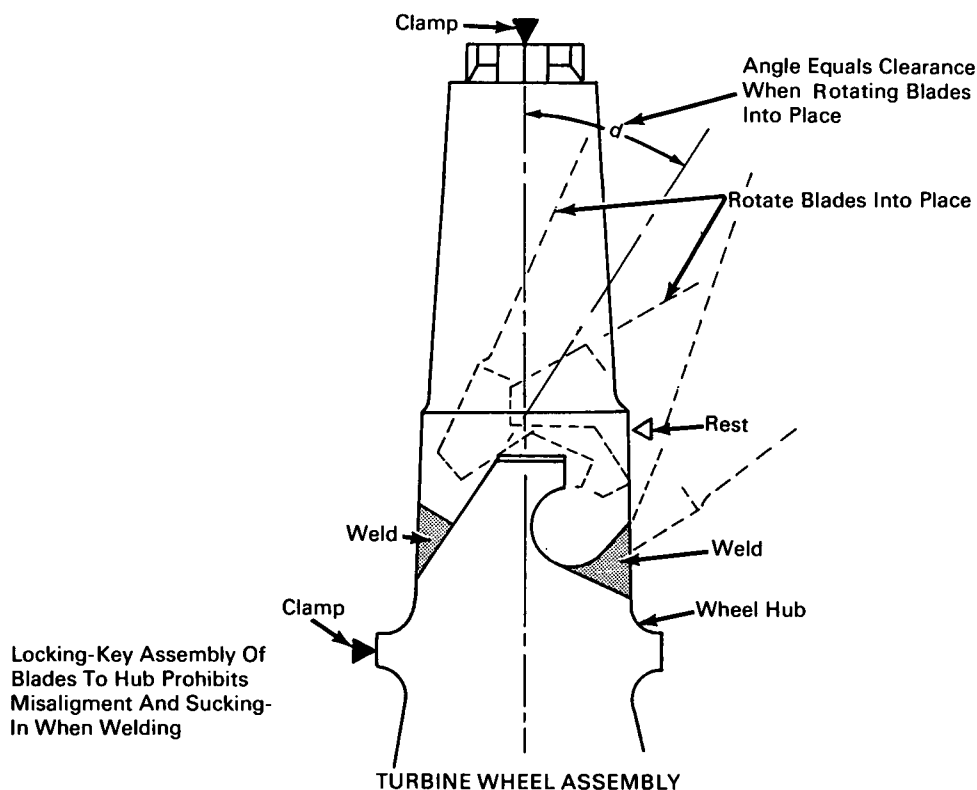
Brief 66-10620

NASA TECH BRIEF



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Turbine Blade Root Design Concept Promises Superior Alignment



The problem:

Turbine wheels used in turbopump applications are assembled with minimum tolerances. Minor misalignment of blades or slight warpage results in expensive reworking or scrapping of wheels or blades.

The solution:

A blade-to-hub mounting concept that should assure excellent alignment integrity and result in elimi-

nation of some welding problems associated with present designs.

How it's done:

The turbine wheel is designed with a semisocket at its outer perimeter and on one side only. The opposite side of the wheel outer perimeter is machined off into an inclined plane. The blade roots are designed with their bases machined out to form a semiball on one side and angular projection on

(continued overleaf)

the other. In assembly, each blade has its semiball segment pressed into a wheel's mating semisocket with the blade at about a 60° angle to the plane of the wheel. The blade is then rotated upward to the vertical, at which point its angular projection is in intimate contact with the wheel's inclined plane opposite the semisocket. The blade is then clamped firmly in this position and welds are made on each side to lock it firmly in place.

Notes:

1. With this design, if rework is required, blade removal and replacement may be readily accomplished without damage to blade positioning media on the wheel hub.
2. This development is in conceptual stage only, and as of date of publication of this Tech Brief, neither a model nor prototype has been constructed.

3. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
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Patent status:

No patent action is contemplated by NASA.

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