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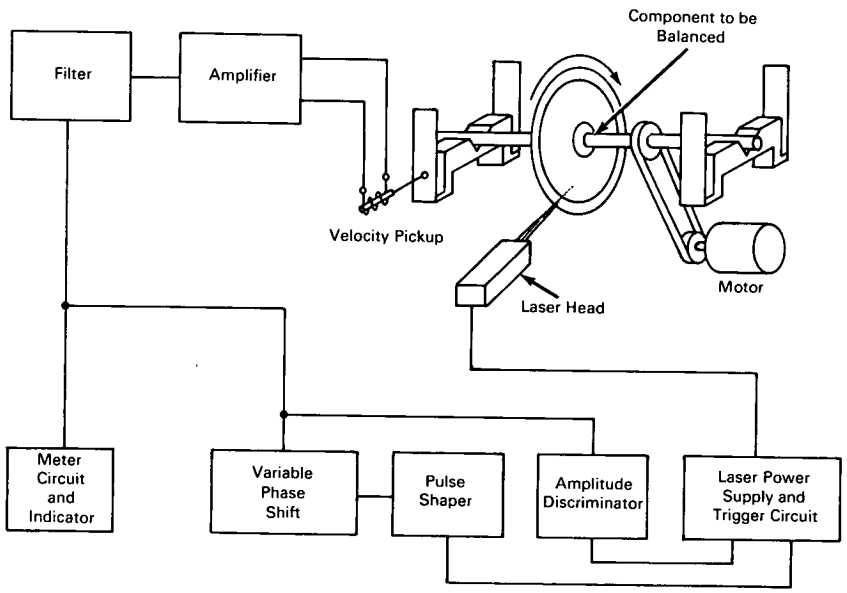
NASA TECH BRIEF

Proposed Method of Rotary Dynamic Balancing by Laser



The most common present method of rotary dynamic balancing is to place pieces of adhesive tape, numbered consecutively, around the periphery of a component. The component is then cradled in a suspended floating carriage and rotated at some convenient speed. The carriage is coupled to a velocity pickup which produces a voltage output as a result of an unbalance. This output is used to trigger a strobe lamp focused on the numbered tape. The number occurring in coincidence with the strobe rate is an indication of the component's heavy side. By adding wax pellets directly opposite this point, balance can be obtained. The component is then removed from the balance machine and material is removed equivalent to the weight of the wax pellet. This method may require rechecking the balance and removal of material several times before desired balance is obtained.

The state of the art and application of the laser has developed to a point where high energies of monochromatic light can be precisely collimated to perform welding and machining processes. It is proposed that the present balancing machines and method of detecting unbalance be utilized more efficiently by replacing the strobe lamp with a laser head. The unbalance, as detected with the velocity pickup, would trigger the laser system which would emit high energy pulses directed at the component's heavy side. (The component is retained in place, eliminating the need to remove the component from the suspended floating carriage for mechanical removal of excess material.) The voltage amplitude from the velocity pickup could control the amount of energy emitted from the laser, and be used to control the trigger phase shifting to achieve ultimate balancing.

(continued overleaf)

Note:

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.

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D. C. 20546.

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