

# NASA TECH BRIEF

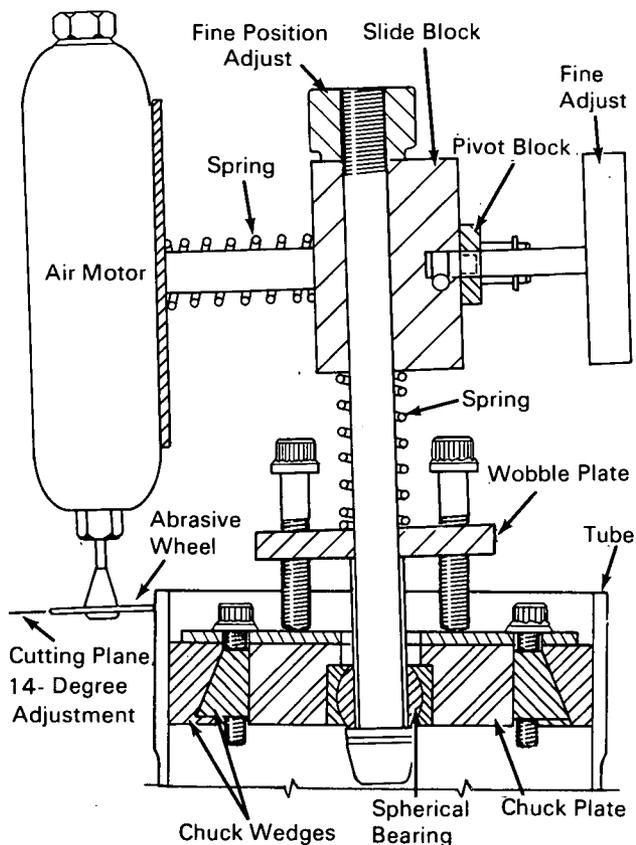


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## Low-Cost Orbiting Grinder for Cutting Ducts

### The problem:

To design a low-cost, simple, portable machine for straight and offset, "on-the-spot" cutting of ducts made from various heat-treated alloys, without the use of either jigs, fixtures, or hand tools.



### The solution:

An abrasive wheel, powered by a small, high-speed air motor mounted on an expandible plug against the

inner wall of a duct, which can orbit around its center for precise cutting (see figure). Prior to the development of this machine, such operations were carried out by using hacksaws and files.

### How it's done:

After the cutting plane has been established and scribed on the duct surface, a support plug is inserted into the duct and secured by means of expanding wedges. A small high-speed air motor with a directly-mounted grinding wheel is installed on the spherical-bearing supported tool arm in the approximate cutting location. The axial location adjustment is made by tightening or loosening a knurled nut at the end of the main support shaft. The angular adjustment is made by tightening or loosening the three screws in the wobble plate. To cut, the grinding wheel is fed into the duct by tightening the arm-mounted knurled nut and orbited around the duct repeatedly until separation occurs.

### Notes:

1. This device can be adapted to different size ducts by using various chuck plates and tool arms, and could result in considerable savings in both time and money.
2. Requests for further information may be directed to:

Technology Utilization Officer  
Marshall Space Flight Center  
Huntsville, Alabama 35812  
Reference: B70-10126

### Patent status:

No patent action is contemplated by NASA.

Source: E. J. Lang of  
North American Rockwell Corp.

(continued overleaf)

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