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NASA TECH BRIEF



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Two-Axis Winch Installer for Heavy Ducts in Confined Space

Installing liquid-propellant rocket-engine fuel and liquid oxygen suction ducts between the valves and the rocket engine on a test stand has required extensive rigging and handling. These ducts must be installed in very close quarters in a vertical attitude and with the bellows on one end in a compressed condition to permit duct insertion into a tight area. The ducts, which weigh 2600 pounds, must be lifted to a height of 26 feet without the benefit of overhead crane clearance.

A special winching and traversing device was designed to raise and maneuver a duct into the required position where it can be safely and easily installed by mechanics. The device includes a pneumatically driven winch and positioning arm. The winch drum is capable of hoisting a 2600-pound load at 8 feet per minute. The duct is supported by two steel cables, each driven by the winch. The positioning arm is used to move the duct in and out of installation position. A hydraulic piston drives the positioning arm. Hydraulic pressure is supplied by a pneumatic motor which provides slow, easily controllable motion. The entire winch and positioning arm assembly, together with power supply

and control system, is mounted on a frame hung from an overhead I beam. Traverse motion of the assembly is effected manually, requiring a maximum effort of 160 pounds under full load.

This type of equipment can be used by riggers for installation of delicate equipment. It may also be useful on ships and in plants for repair and maintenance operations in close quarters such as engine and boiler rooms.

Note:

No additional documentation is available. Questions may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
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Patent status:

No patent action is contemplated by NASA.

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