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Marshall Space Flight Center

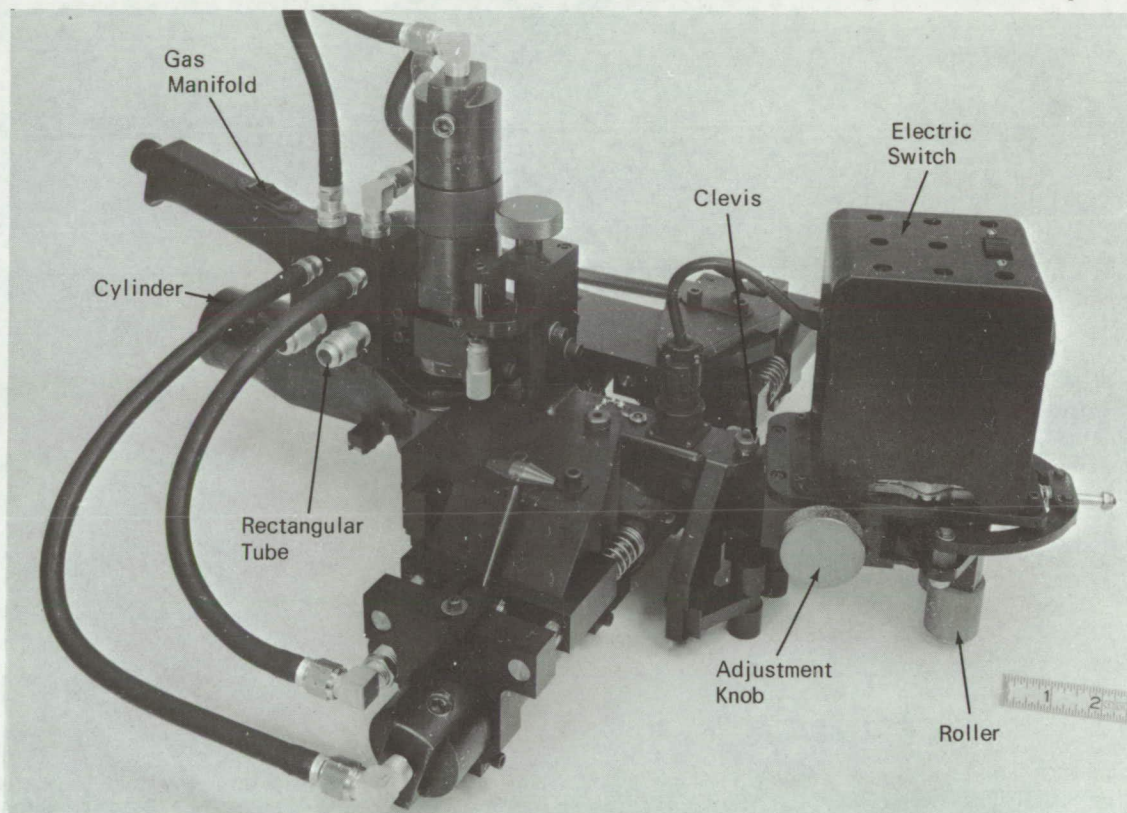


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Device Prepares Aluminum Surfaces for Welding

A practical system for preparing the welding surfaces of aluminum components is successful in obtaining the desired surface cleanliness. Surface contamina-

In the new technique, dry machining removes the original surface to a depth sufficient to assure a contamination-free welding surface. The prototype is



tion contributes significantly to weld defects in aluminum structures by causing undesirable porosity and permitting nonmetallic inclusions within the weldment. Current practices, such as chemical cleaning followed by wire brushing or scraping, do not always produce surfaces with minimum defect potential, i.e., maximum cleanliness.

designed to straddle the edge being prepared, and to align with the existing edge and adjacent surfaces of the workpiece. Depth of cut is regulated by a sensing device riding on the workpiece surface; therefore, reasonably smooth existing surfaces and a uniform thickness are necessary requirements.

The prototype, shown in the photograph, is com-

(continued overleaf)

prised of a drive unit and a cutting unit, joined by a clevis that allows the unit to traverse both straight and curved aluminum components. An electric switch mounted on top of the drive unit activates the traversing drive motor. A gear train drives two polyurethane-coated rollers held in firm contact with the workpiece weld edge. A knurled knob located near the bottom of the drive unit is used to adjust the drive rollers, and plates ranging in thickness from 0.2 to 2.5 cm (0.1 to 1.0 in.) can be accommodated. The cutting unit consists of a rigid body containing the air-driven milling motors, depth-of-cut controls, alignment rollers and edge-breaking tools. The cutting unit body is a rectangular tube that provides air passages for a vacuum system for waste removal. A cylinder welded to its rear provides an attachment for a shop-type vacuum cleaner. A handle is mechanically fastened to the body and can be removed when it is desirable to mount the cutting unit in a stationary position and move the workpiece. The handle incorporates a gas manifold to

handle the milling motor supply and exhaust. The switch on the handle operates a solenoid valve at the milling motor air supply outlet.

Note:

Requests for further information may be directed to:
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No patent action is contemplated by NASA.

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