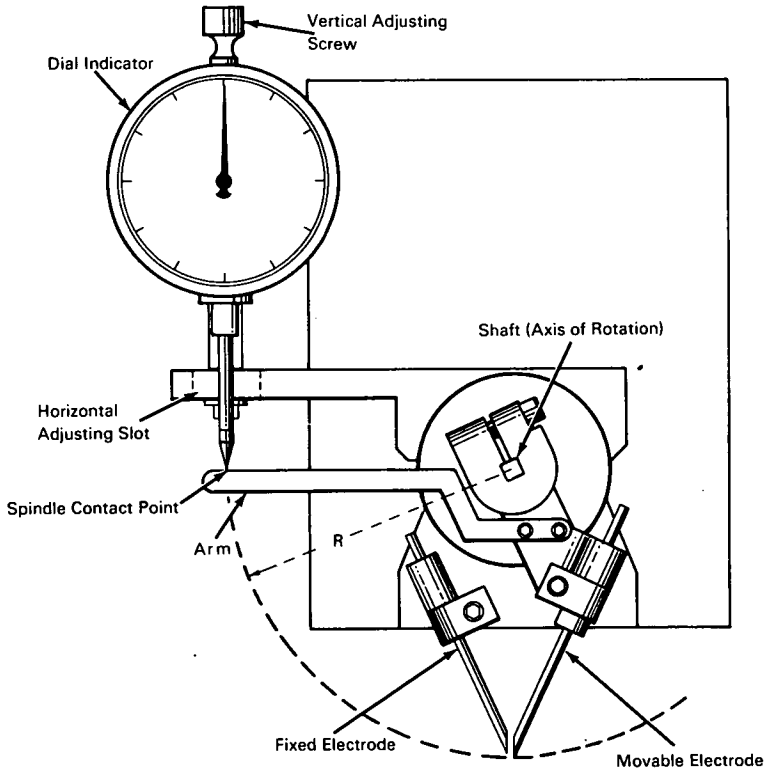
NASA TECH BRIEF

Gage Monitors Quality of Cross-Wire Resistance Welds



The problem:

To devise a reliable nondestructive means of monitoring the quality of cross-wire resistance welds during the welding operation. Determinations of weld quality are conventionally made by destructive tests on production line samples.

The solution:

A gage that gives a dial indication of the relative embedment of the cross wires during the actual welding operation. Previous work has established a direct relationship between the depth of embedment and both weld strength and consistency.

How it's done:

The gage incorporates a dial indicator (graduated in mils) and a spindle with a contact point. In one type of welding machine (the pincer type, illustrated), an arm fixed to the rotating shaft of the welding head bears against the spindle contact point. The tip of the movable electrode and the arm at the position of the spindle contact point have the same radius (R) with

(continued overleaf)

respect to the rotational axis of the shaft of the welding head. During the welding operation, the movable electrode tip in contact with the wire workpiece and the spindle contact point are displaced by the same amount. The dial reading is then proportional to the electrode displacement, or wire embedment, during the welding operation.

Notes:

1. The device can be varied to fit other types of welding heads (e.g., the press type, which uses opposed electrodes).
2. This displacement (embedment) can be measured electronically, using a differential transformer or a linear potentiometer in conjunction with a direct or recorded digital readout.
3. Inquiries concerning this gage may be directed to:
   Technology Utilization Officer
   Goddard Space Flight Center
   Greenbelt, Maryland 20771
   Reference: B68-10002

Patent status:

No patent action is contemplated by NASA.

Source: J. Etzel and A. Piltch
(GSC-90549)