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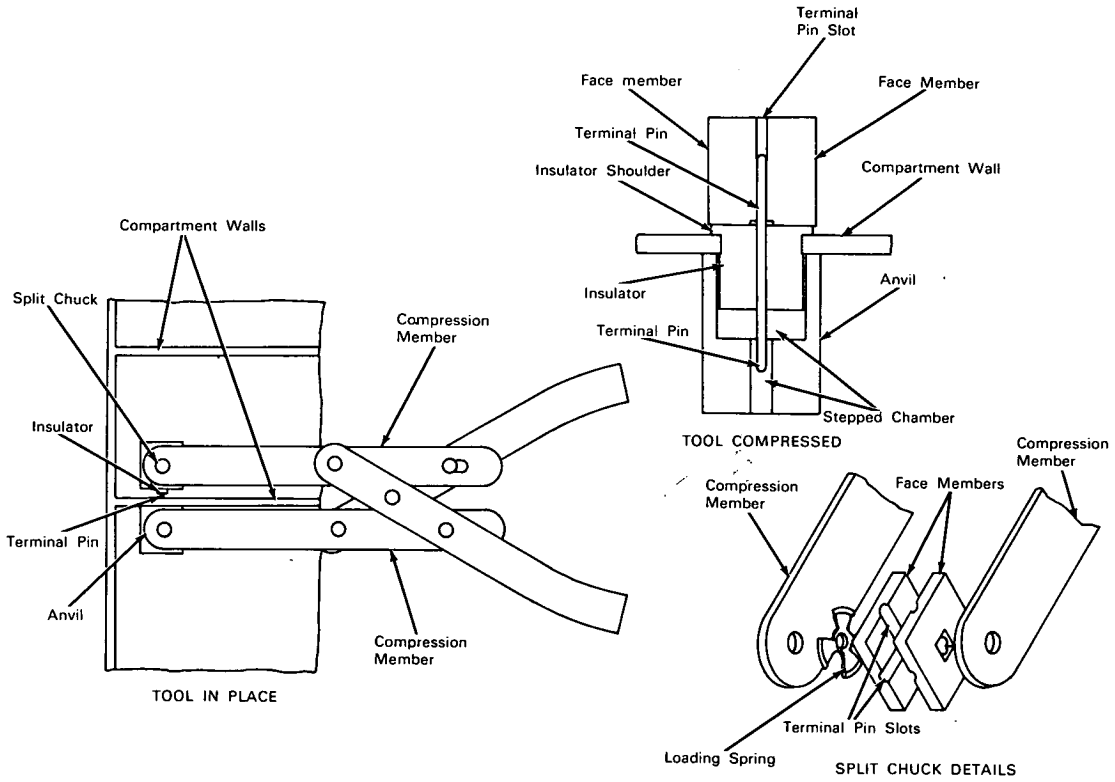
Standoff Tool Speeds Placement of Friction-Fit Electrical Terminals



The problem: Present electronic equipment is being designed with subsystems and stages shielded from one another in fully enclosed compartments. This requires that interconnections use feed-through terminals reaching through compartment walls. Because these terminals must remain insulated from the walls while maintaining good mechanical positioning alignment, they incorporate plastic insulators larger than the holes they enter, and must be inserted with considerable force. Pliers are poor tools for placing the terminals because they cause deformation of the prongs, damage to the surfaces, and are very clumsy to use in restricted places. Special machine tools can be used but are obviously limited in the compartment configurations and sizes they can accommodate without time-consuming tool setup changes.

The solution: A hand operated tool with opposed jaw members, one a split chuck for holding the terminal, and the other an anvil that holds against the back side of the compartment wall, opposite the hole into which the chuck drives the terminal as the handles of

(continued overleaf)

the tool are pressed together.

How it's done: The standoff tool is in the configuration of a modified pair of pliers whose jaws, consisting of a split chuck and anvil, move toward each other in a straight line, rather than in a slight arc as with pliers jaws, when the handles are pressed together. The split chuck consists of matching face members that are slotted to receive the terminal pins and a loading spring to force the face members together and hold the pin in place. This assembly may be rotated and is held by a rivet between the ends of two of the compression members actuated by movement of the handles. The anvil is held by a rivet between the ends of the other two compression members and incorporates a stepped chamber to receive first the terminal pin and then the plastic insulator.

In operation, a terminal is pushed into the split chuck to the insulator shoulder. The tool is then placed about the compartment wall with the anvil chamber aligned with the hole that is to receive the terminal. The hole is 0.003- to 0.005-inch smaller than the diameter of the plastic bushing. The tool handles are pressed together and the force is transferred to the compression members which force the clutch and anvil toward each other in a straight line. This causes flowing and deformation of the plastic insulator and it enters the compartment wall hole until stopped at its shoulder.

Notes:

1. The split chuck can be made with different size terminal pin slots to accommodate a variety of terminal sizes. The chuck may also be made in hexagonal form to accommodate six different terminal sizes.
2. This device is an effective production tool and will appreciably speed up the fabrication of electronic systems.
3. Title to this invention (covered by U.S. Patent No. 3,111,750) has been waived, under the provisions of the National Aeronautics and Space Act [42 U.S.C. 2457(f)] to the Space Technology Laboratories, Inc., One Space Park, Redondo Beach, California under the provisions of the NASA Patent Waiver Regulations.

Source: Donovan J. Moore and Walter W. Skifstrom
of Space Technology Laboratories
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