The NASA
LangleyEdge
NASA LANGLEY RESEARCH CENTER

Instrumented Crimping Tool for Critical Wiring Applications

Using ultrasonics to ensure integrity of wiring connections

NASA Langley Research Center is actively seeking partnerships and collaborations to commercialize its Instrumented Crimping Tool for Critical Wiring Applications Technology.

The Market Opportunities

Applications of this technology include critical crimped wiring connections in:

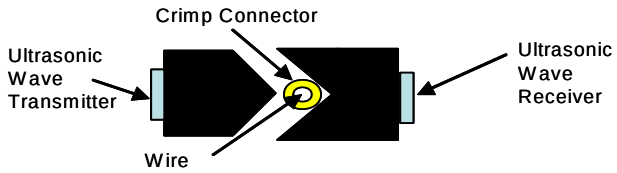
- Aircraft
- Marine vessels
- Automobiles
- Nuclear power plants
- Industrial plants
- Control centers

The Benefits

- Improved reliability of crimped connections to reduce costs
- Instant verification/ evaluation of wire-crimp connector-integrity before crimping process is completed
- Evaluation of possible connection deterioration during service life in critical function circuits before electrical malfunctions occur
- Extensive calibration processes/procedures currently required for crimping tools are obviated

The Technology

One of the critical problems in wiring is the verifiably successful installation of crimp connectors when splicing a wire segment into a cable, or attaching connectors to wiring blocks or to electronic circuits and sensors. This invention is an instrumented crimping tool that verifies sufficient contact between wires and the crimp connector to assure adequate conductivity through the crimp connector. This verification is accomplished by monitoring ultrasonic waves through the wire-connector bond and then analyzing the character and magnitude of the monitored ultrasonic wave through-put.



Cross-section--Top View of Crimping Tool Jaws

The quality of the contact between the connector and the wire is determined by sending an acoustic wave through the crimp assembly. As the applied pressure increases and the crimp connector deforms around the wire, the points of contact increase, allowing for increased ultrasonic transmission. The increased ultrasonic transmission across the crimp is an indication of the electrical conduction between the wire and the connector. This information can be used to provide a high quality estimate of electrical conduction characteristics across the crimp, thus giving a better profile prediction for the service life of the crimp.

Additional Information

To discuss in detail how this technology can profit you and your business, please contact:

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LAR-16575-1
U.S. Patent Application filed