

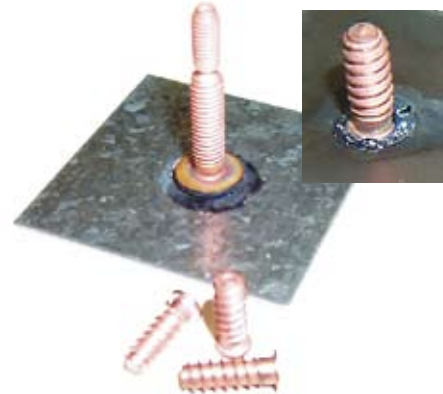
■ Stud Weld Monitor: Waveform Signature Analysis of Arc Weld Process

**Highlights:**

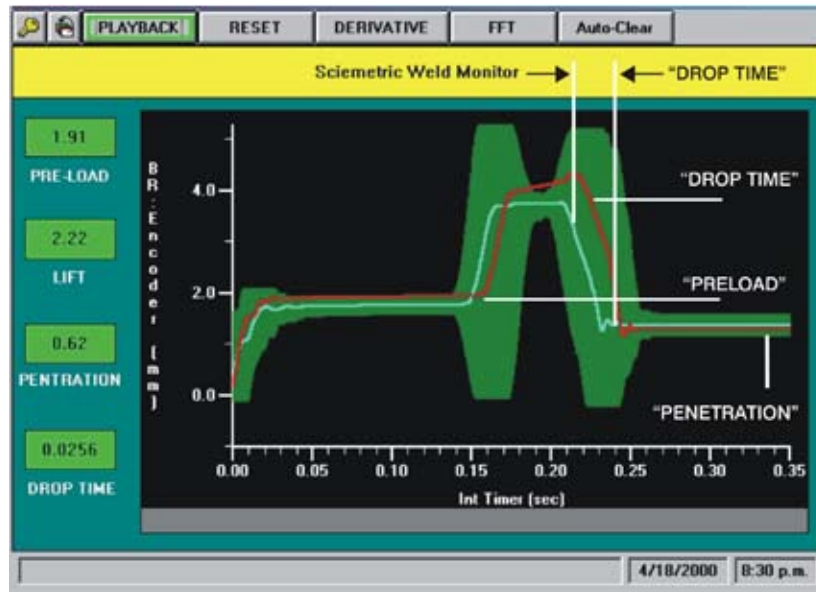
- Encoder based linear precision
- Verifies for each weld:
  - Preload
  - Lift
  - Penetration
  - Drop time
- Amps and Volts monitor
- Graphical operator interface
- PLC communications
- Production SPC trending
- Virtually unlimited stored setups
- Direct "Go-No-Go" control outputs
- Traceable data (limit liability risk)

The bonding of metal parts often leads to complications in the production process. Vehicle assembly requires numerous threaded studs to be mounted at various locations on sheet metal parts ultimately providing tie points for electrical wires and small metal support brackets.

Historically, studs have been pressed through a hole in the host part and then welded into position. While mechanically strong, this approach can compromise the surface integrity of the host metal thereby increasing the ultimate risk of electrical corrosion or rust.



Recent advances in weld technologies now allow a "one side approach" in which the stud is initially pressed to the surface (PRELOAD). The weld current is then applied while the stud is simultaneously raised a precise distance off the surface (LIFT) thereby creating an arc which cleans the two surfaces. As the arc continues, a metal puddle forms and the stud direction is then immediately and precisely reversed to "plunge" it into pool of molten metal to a final position (PENETRATION). Ultimate integrity of this weld relies on precision setup and monitoring of the process parameters. Sciometric's high speed Test and Analysis System combined with InspecXion® Test and Analysis Software provides the ideal instrument platform for observing and maintaining the weld process using waveform Signature Analysis techniques.



InspecXion® Screen showing key features of Unique Signature Waveforms that identify PASS/FAIL parts.

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