

Improving SpotWeld inspection results using Phased-Array (PA) capabilities

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Among the NDT methods, the ultrasonic (UT) method of SpotWeld inspection in the automotive industry is known to be very efficient and highly reliable. Results obtained using conventional UT solutions, which have been in use for decades, have proved highly comparable with those obtained using traditional destructive methods. In the past few years, the Phased Array (PA) method of SpotWeld inspection has become more popular in the automotive industry. This advanced UT method can analyze the quality of the weld based on the measurement of weld nugget diameter. However in some cases, weld diameter alone is insufficient for full judgment of weld quality. ScanMaster Systems, a leading vendor of SpotWeld inspection equipment, has invested much effort in developing a new generation of its famous SpotWeld Inspection instrument. Our latest development utilizes the most advanced PA hardware, propriety data collection and cutting edge analysis methods. Our new instruments provide a far more accurate classification of SpotWeld quality and geometry by providing not only the nugget diameter, but also the size of a good welded area. Real-time data analysis not only reduces inspection time, but also provides simple and intuitive operation tools, allowing even novice operators to perform the inspection. These operation tools include automatic classification of weld condition, automatic spot center recognition, quick interchanges between hard-delay line and flexible membrane, and the ability to use both PA and conventional probes in the same inspection plan. In this paper, we present our research and methods used, and expose the patent-pending concepts that we integrated into the ScanMaster PA instrument.