

Evaluation of Influence Due to Reflection Point Shift on Axle Surface in Ultrasonic Flaw Detection

Kazunari MAKINO

For ultrasonic flaw detection of axles, an inspection technique in which a shear wave is emitted into an axle at certain angles is widely applied. However, when a shear wave is obliquely incident on a boundary surface, sound beam displacement may shift a geometric reflection point parallel to the boundary surface. In this study, two types of boundary surfaces, that is, an axle body and a wheel seat, are targeted. The relationship between a shear-wave incident angle and sound beam displacement is derived theoretically and then reproduced using finite element calculations. The propagation behavior of ultrasonic waves while inspecting surface flaws on an axle is discussed from the viewpoint of sound beam displacement.