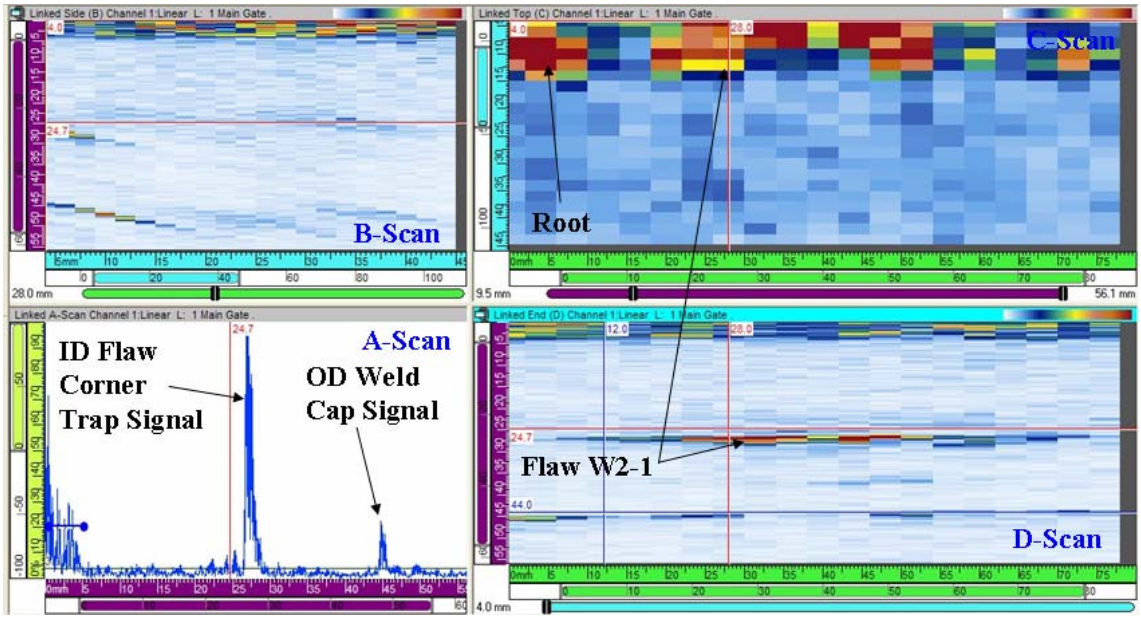
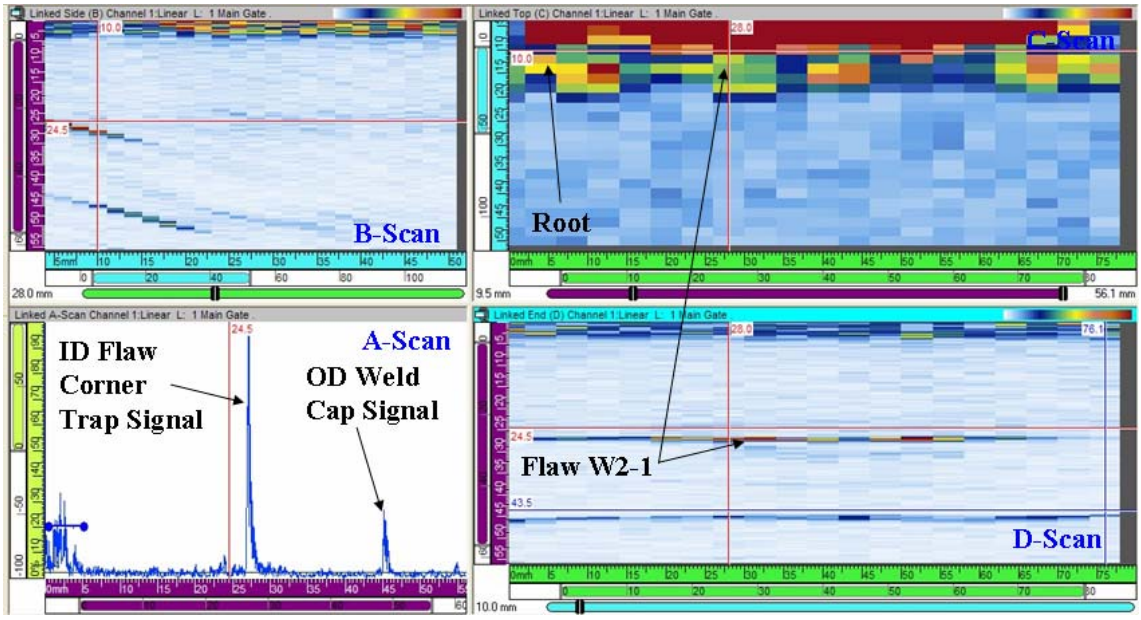
Appendix A1.6.4

UT Scan Images of Root Fatigue Cracks in 16 in. (40.6 cm) Diameter Pipe

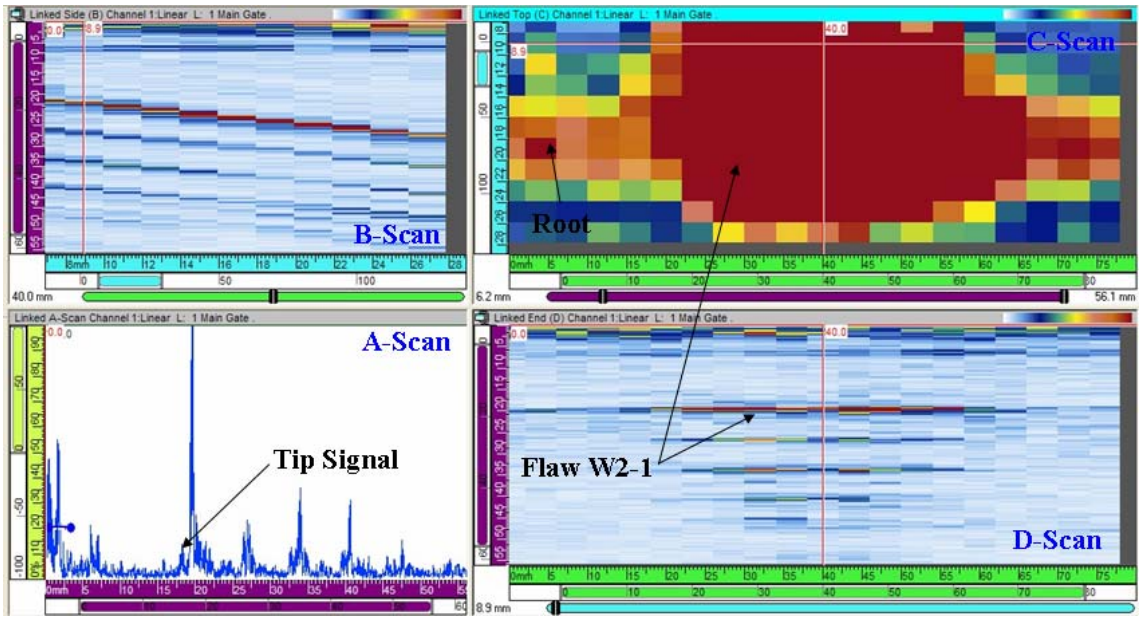
Flaw W2-1



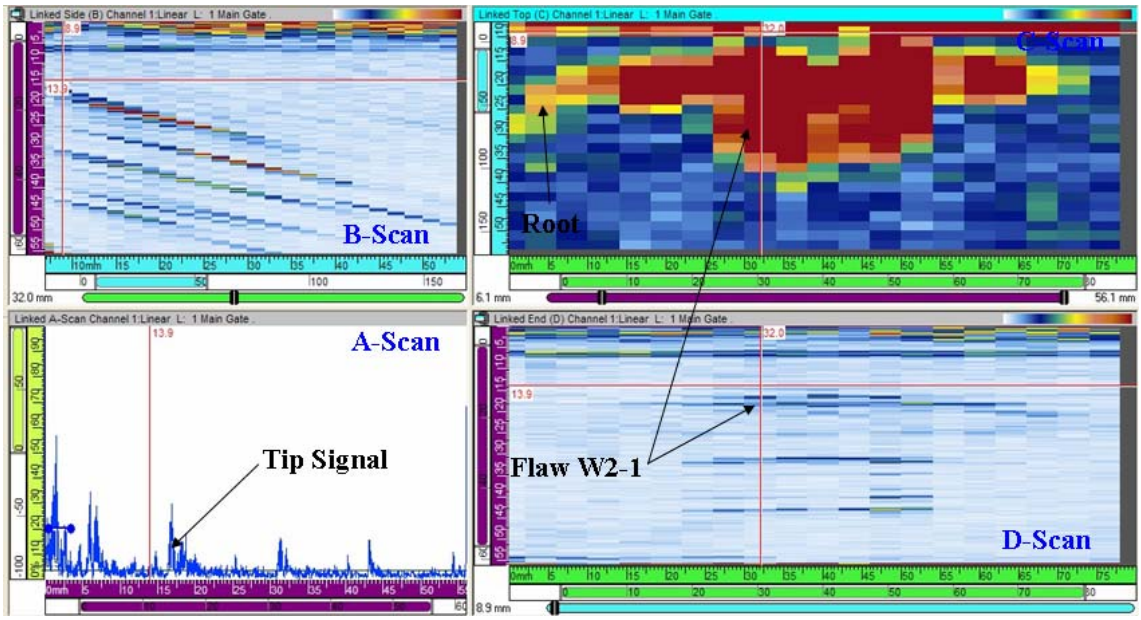
Flaw W2-1 from US Side; SE 12mm Dia. 5 MHz 45 Deg.



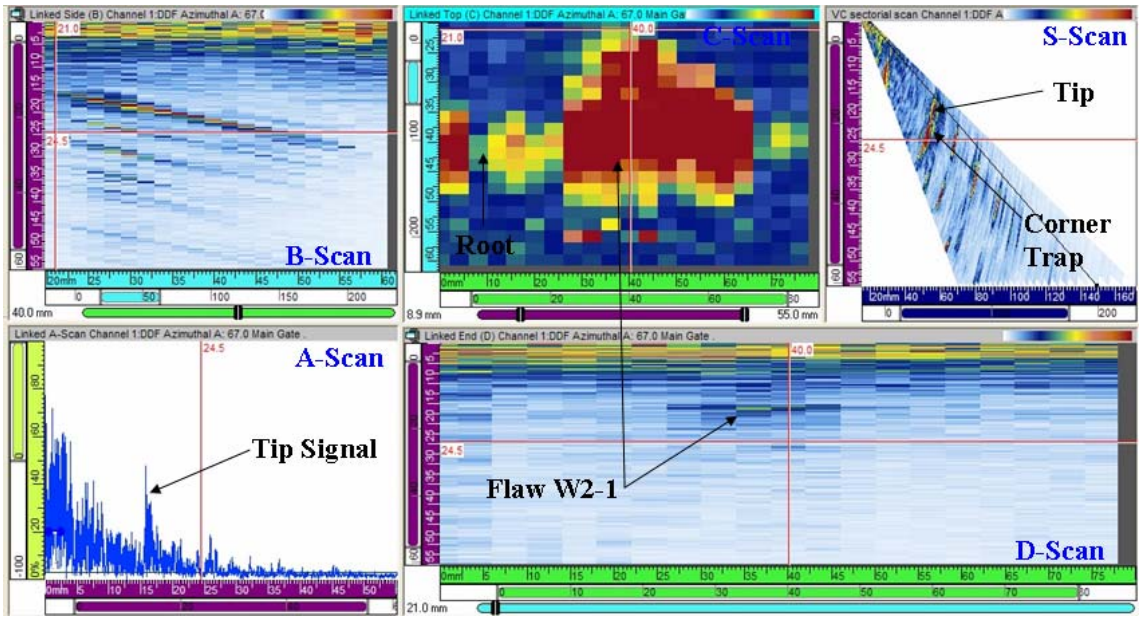
Flaw W2-1 from DS Side; SE 12mm Dia. 5 MHz 45 Deg.



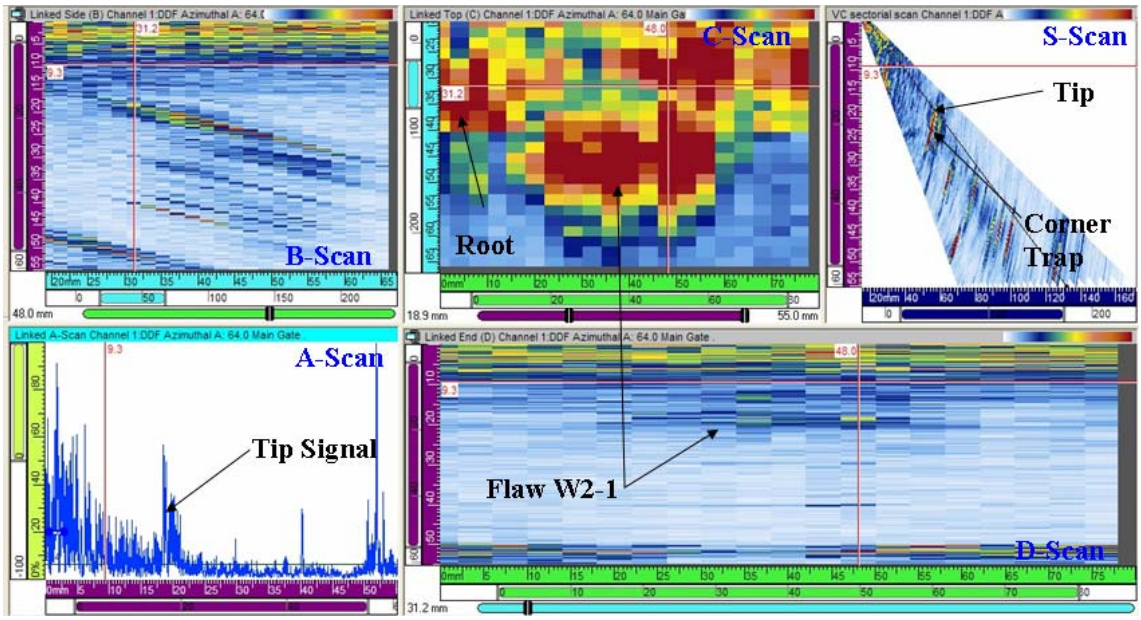
Flaw W2-1 from US Side; SE 12mm Dia. 5 MHz 60 Deg.



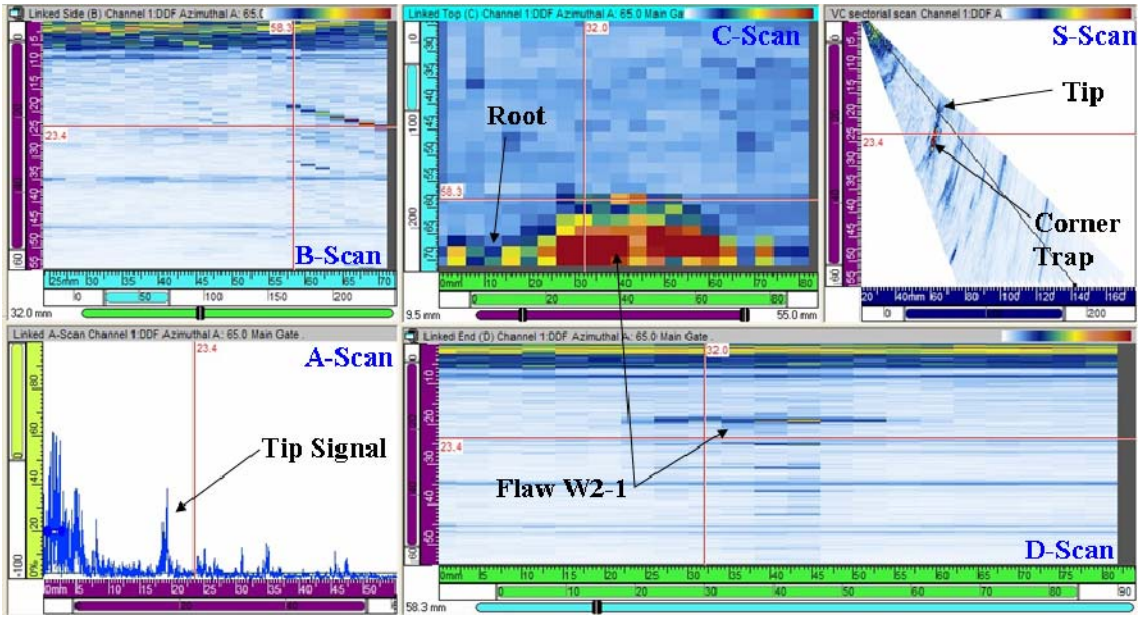
Flaw W2-1 from DS Side; SE 12mm Dia. 5 MHz60 Deg.



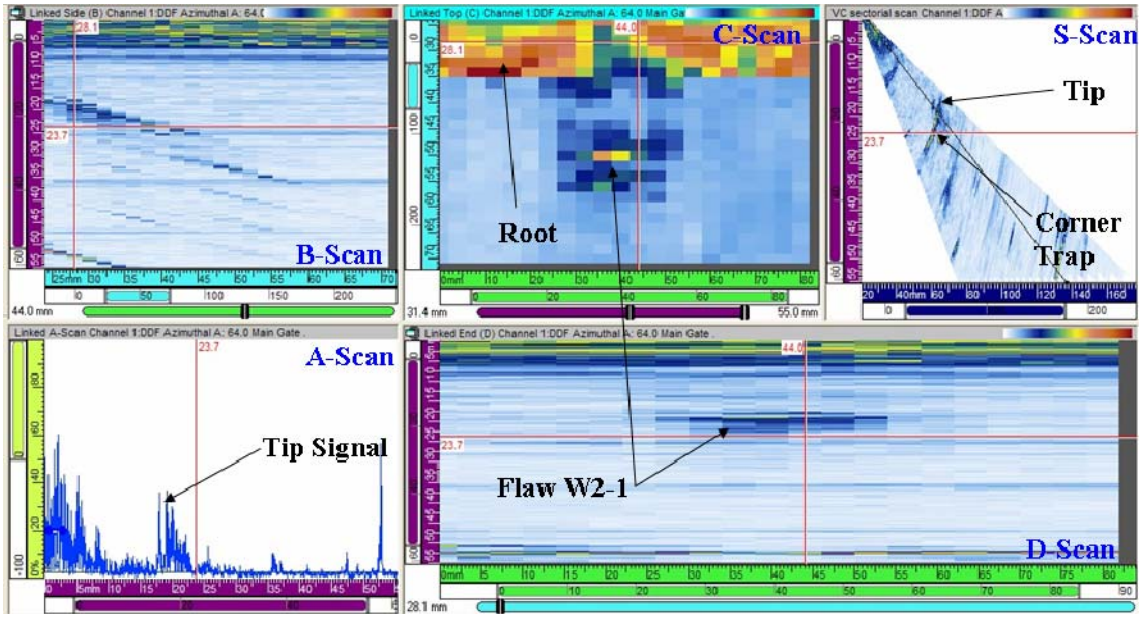
Flaw W2-1 from US Side; PA16 5 MHz DDF



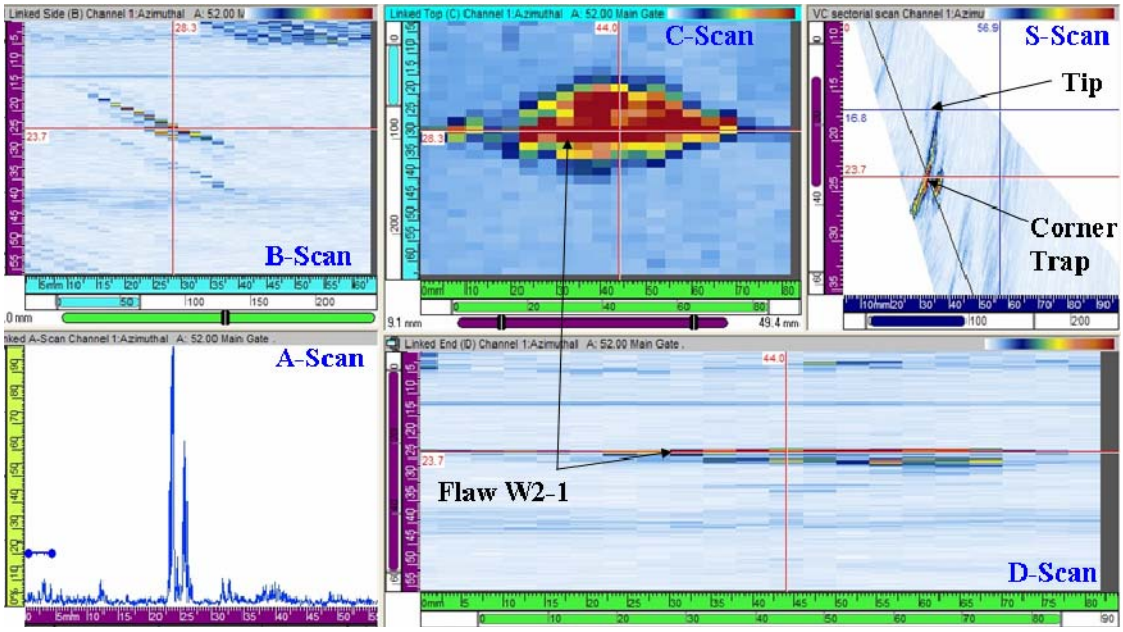
Flaw W2-1 from DS Side; PA16 5 MHz DDF



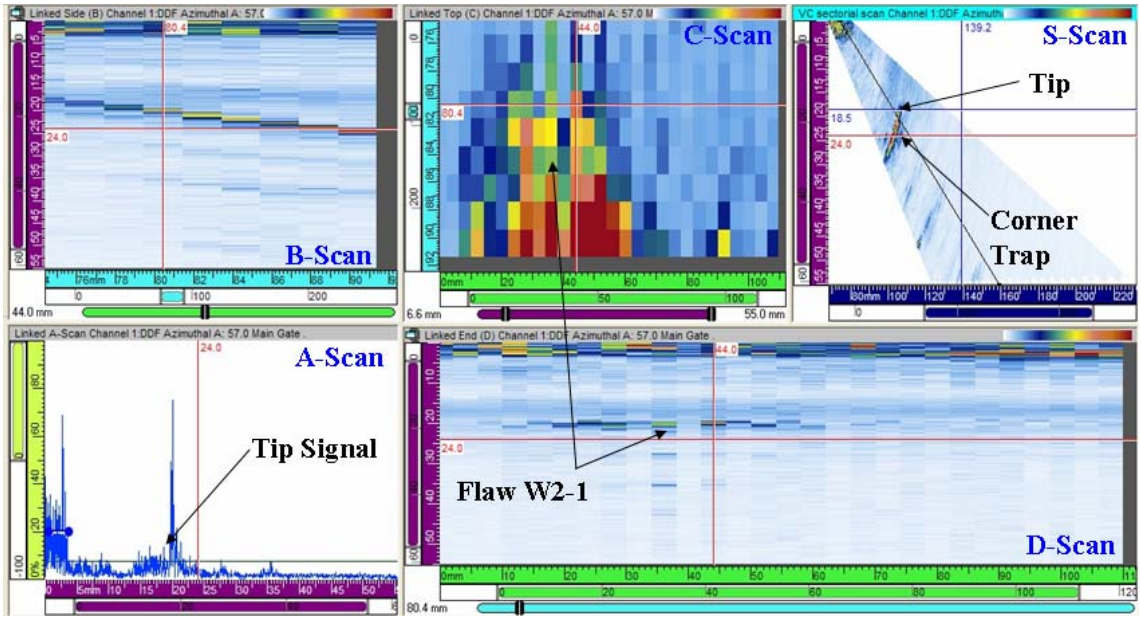
Flaw W2-1 from US Side; PA32 5 MHz DDF



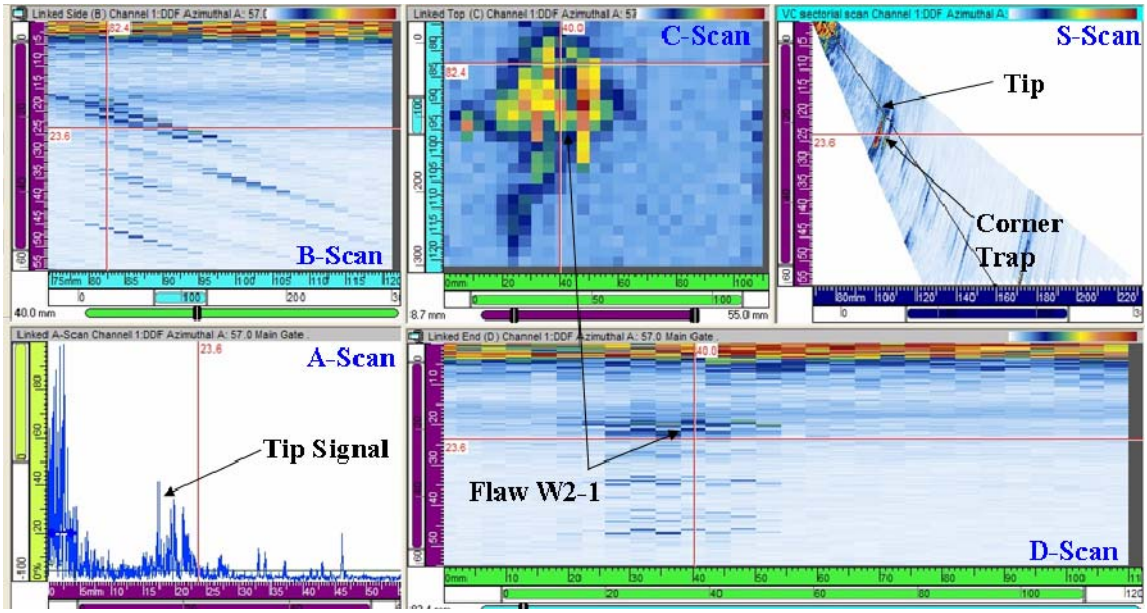
Flaw W2-1 from DS Side; PA32 5 MHz DDF



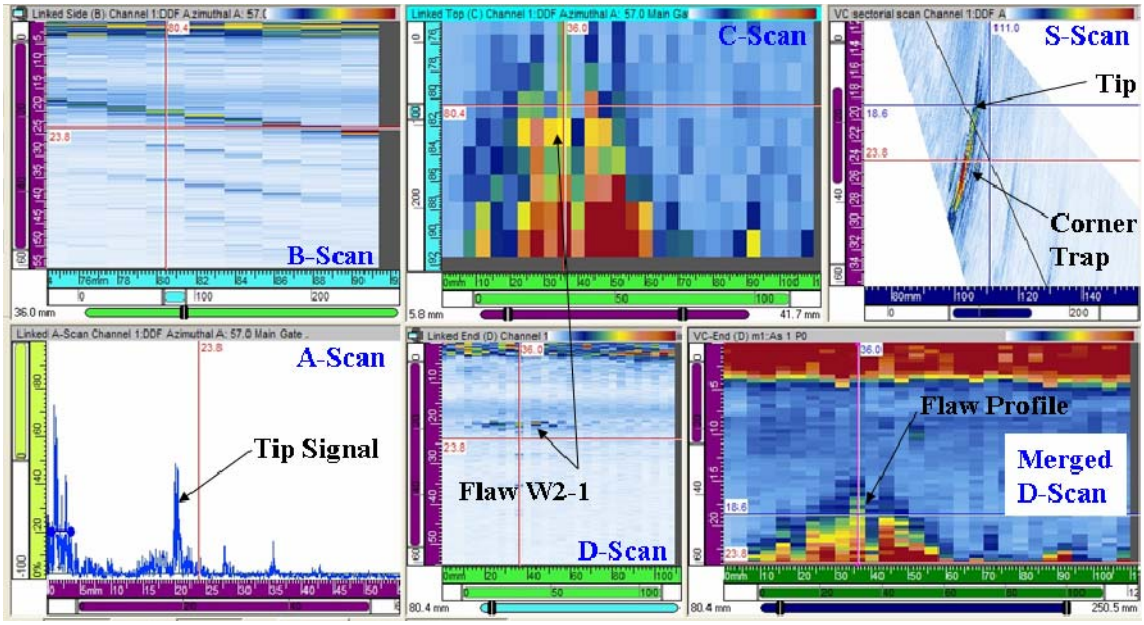
Flaw W2-1 from DS Side; PA64 4 MHz 25FD Using 32 Elements



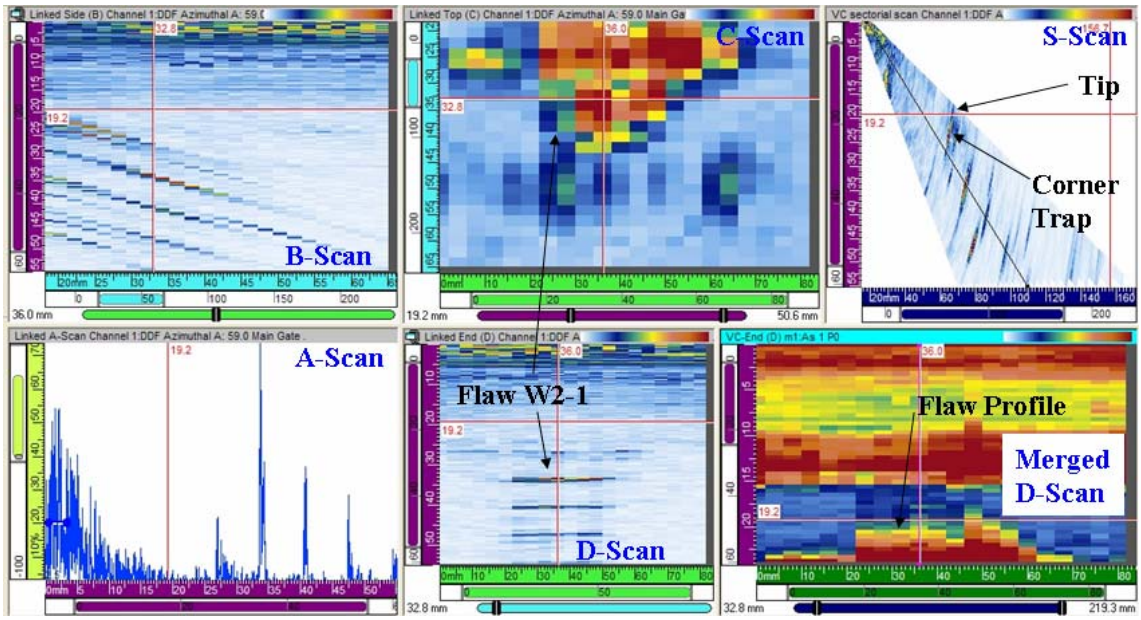
Flaw W2-1 from US Side; PA60 7.5 MHz DDF Using 17 Elements



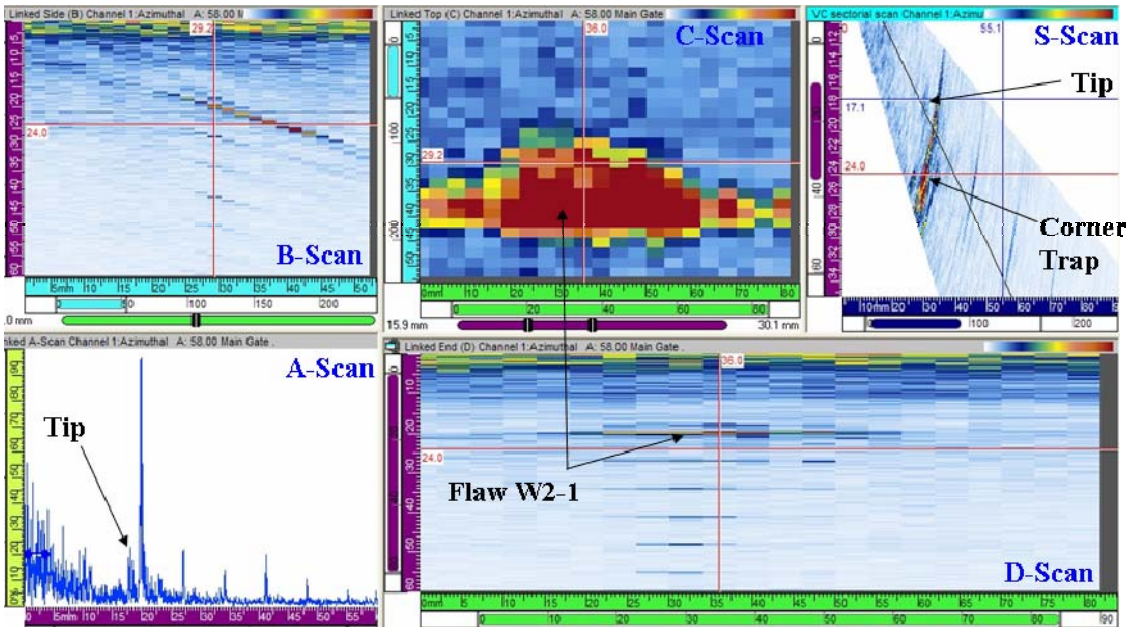
Flaw W2-1 from DS Side; PA60 7.5 MHz DDF Using 17 Elements



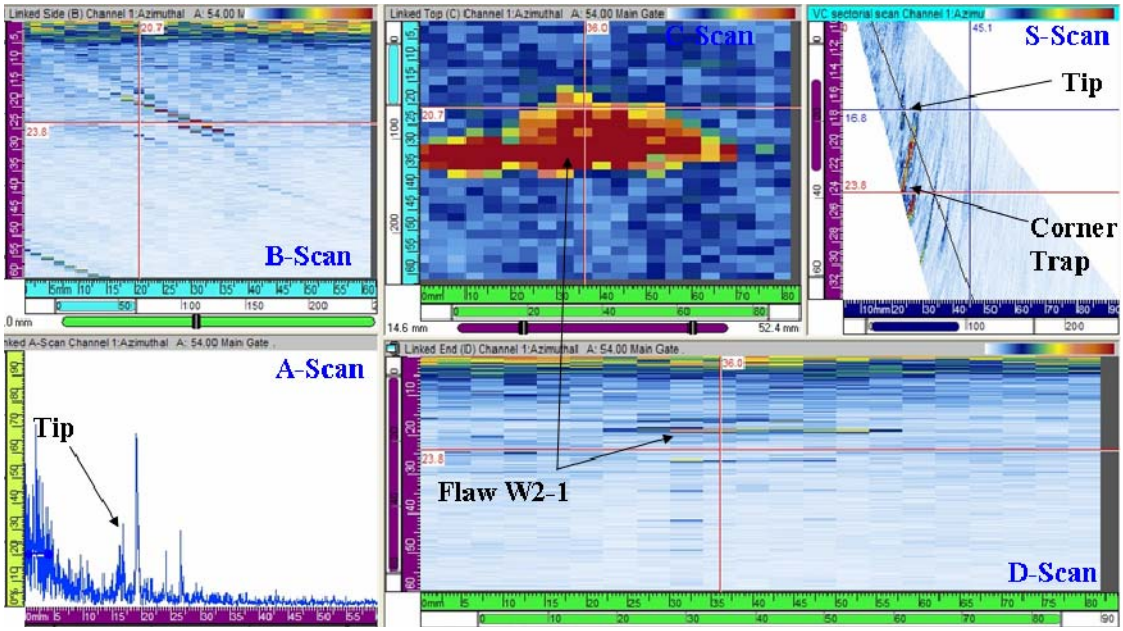
Flaw W2-1 from US Side; PA60 7.5 MHz DDF <u>Merged View</u> Using 17 Elements



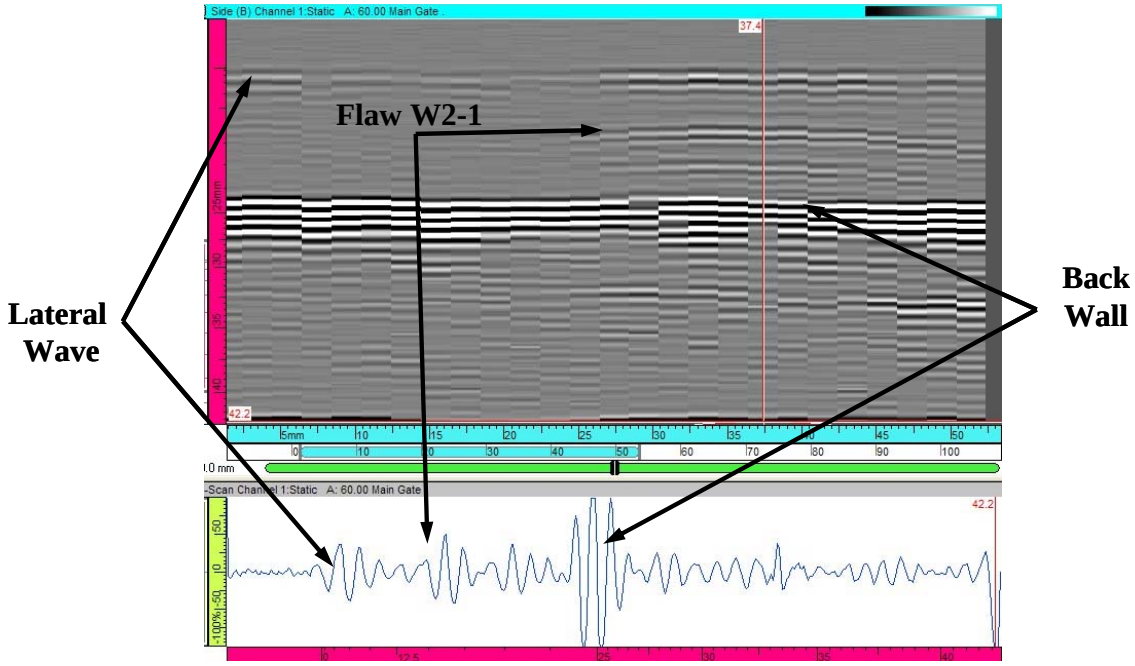
Flaw W2-1 from DS Side; PA60 7.5 MHz DDF <u>Merged View</u> Using 17 Elements



Flaw W2-1 from US Side; PA32 10 MHz 25FD Using 32 Elements

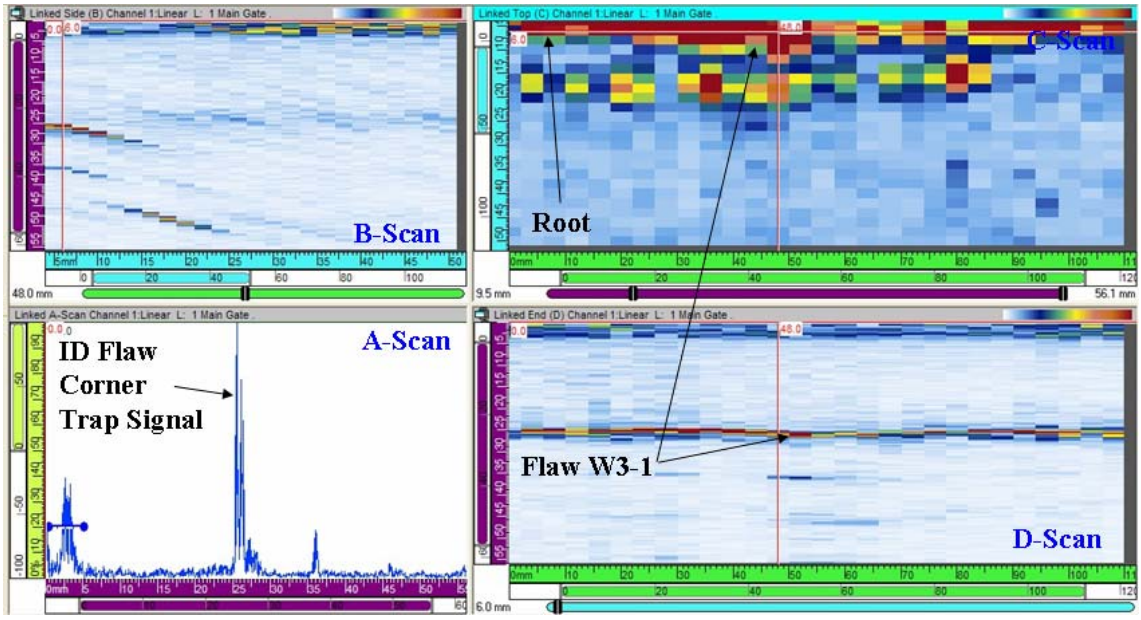


Flaw W2-1 from DS Side; PA32 10 MHz 25FD Using 32 Elements

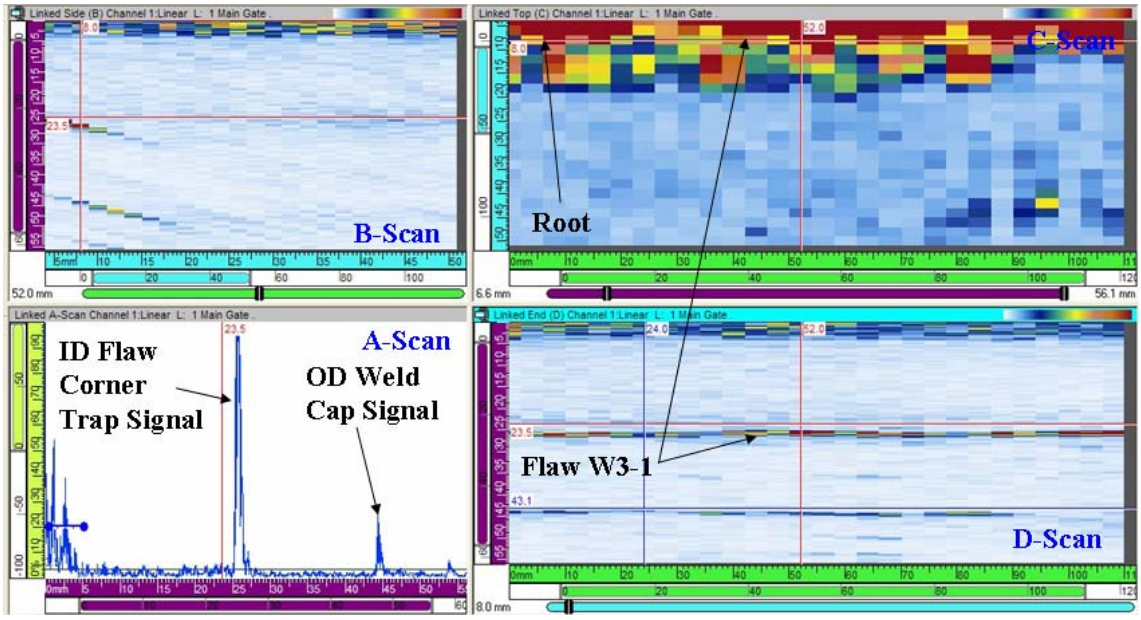


Flaw W2-1 TOFD Scan

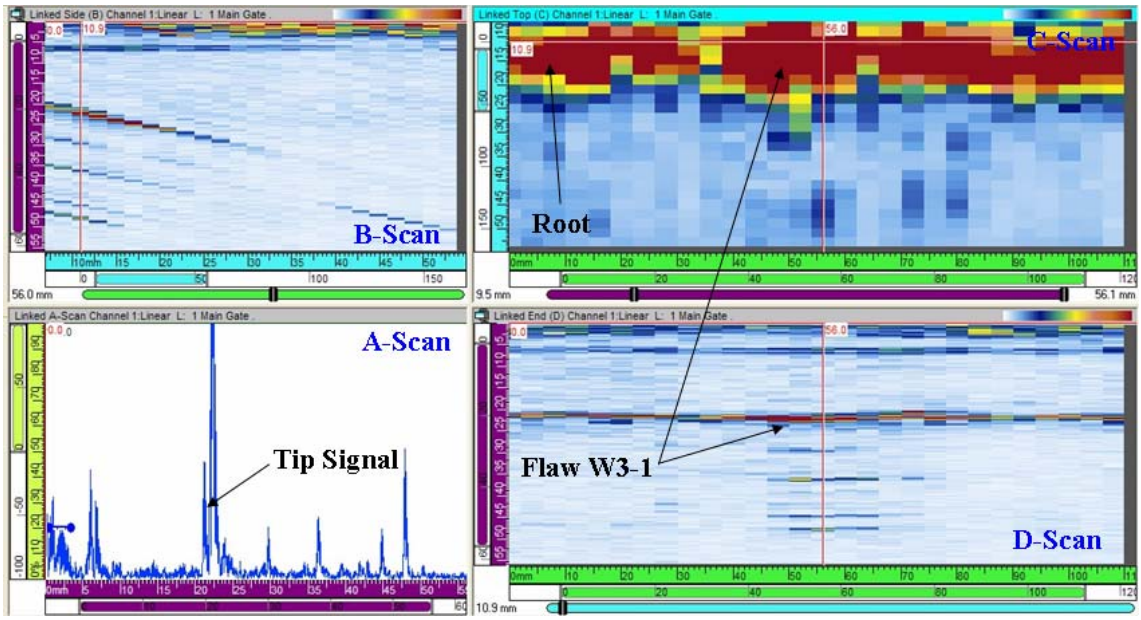
Flaw W3-1



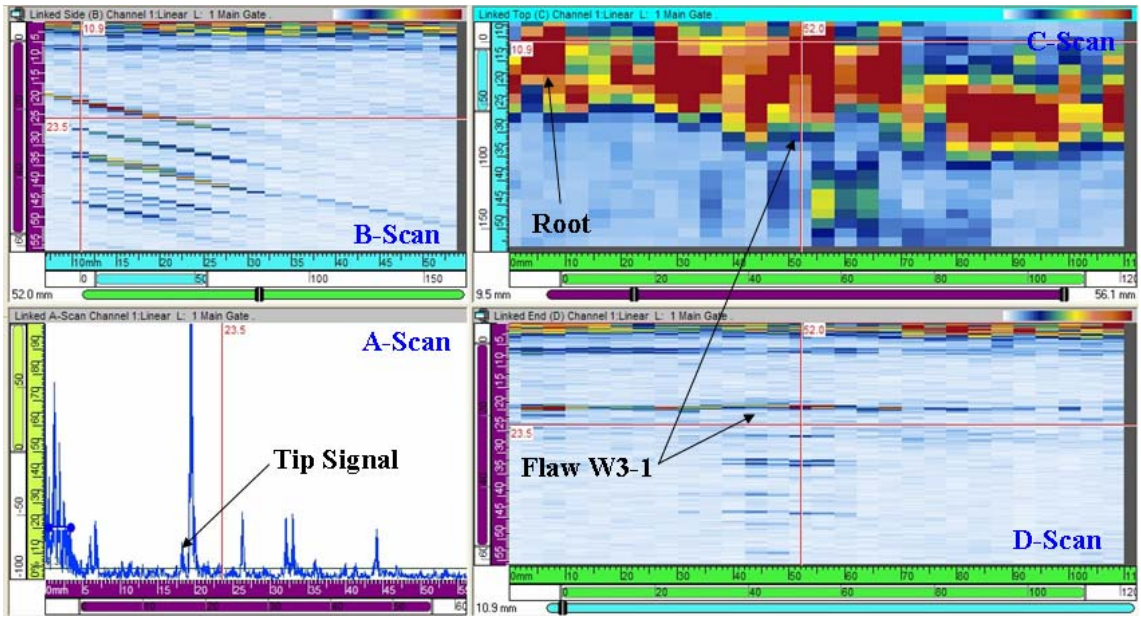
Flaw W3-1 from US Side; SE 12mm Dia. 5 MHz 45 Deg.



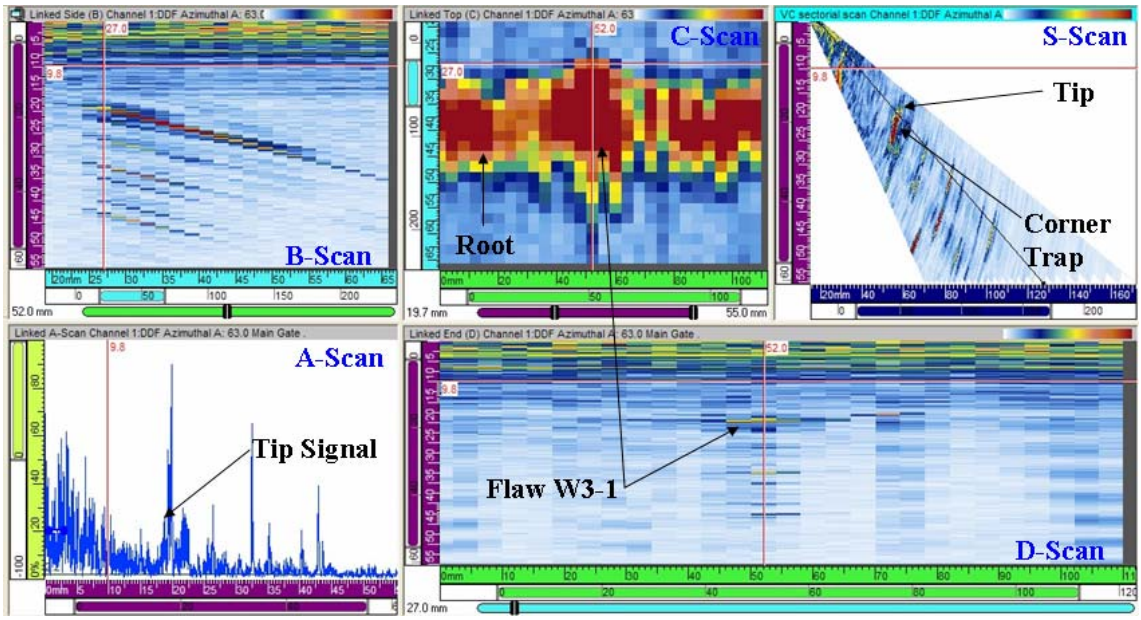
Flaw W3-1 from DS Side; SE 12mm Dia. 5 MHz 45 Deg.



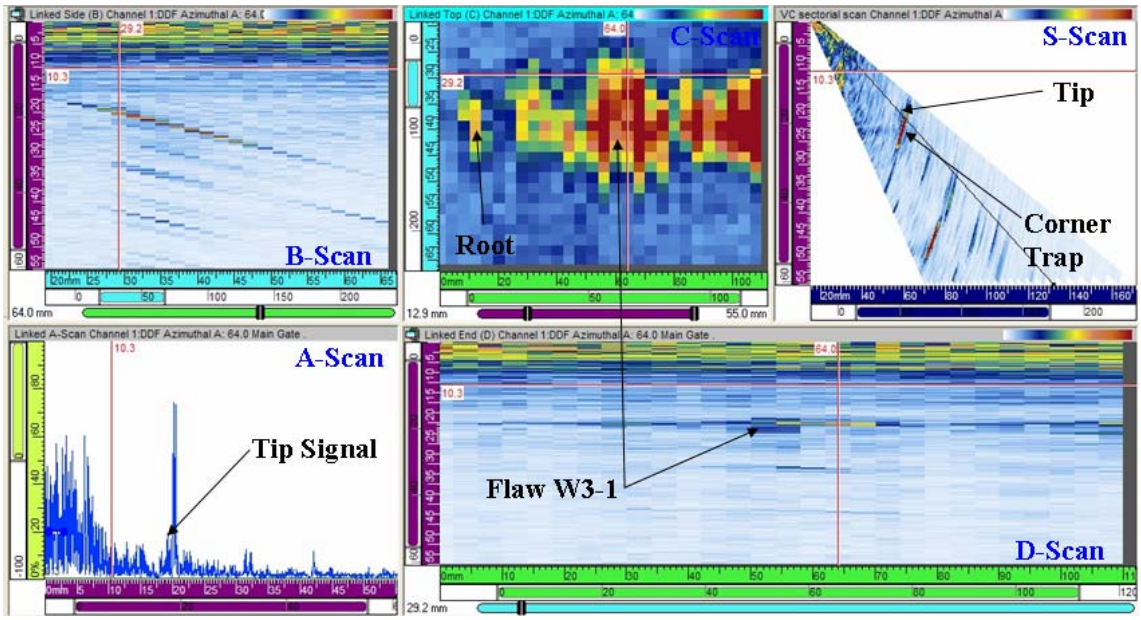
Flaw W3-1 from US Side; SE 12mm Dia. 5 MHz 60 Deg.



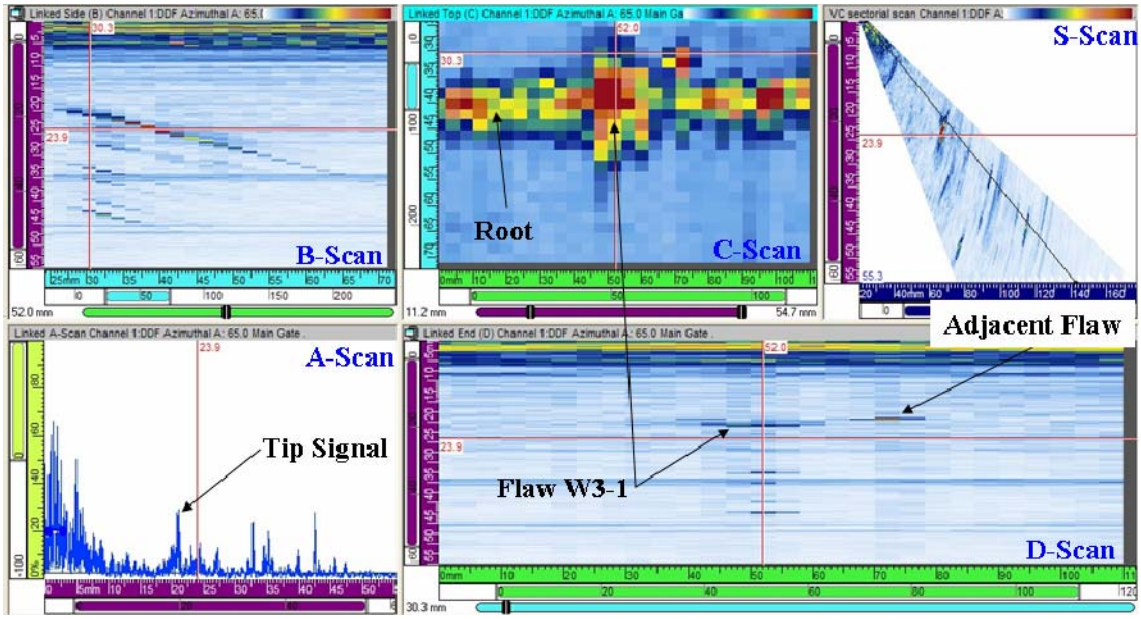
Flaw W3-1 from DS Side; SE 12mm Dia. 5 MHz 60 Deg.



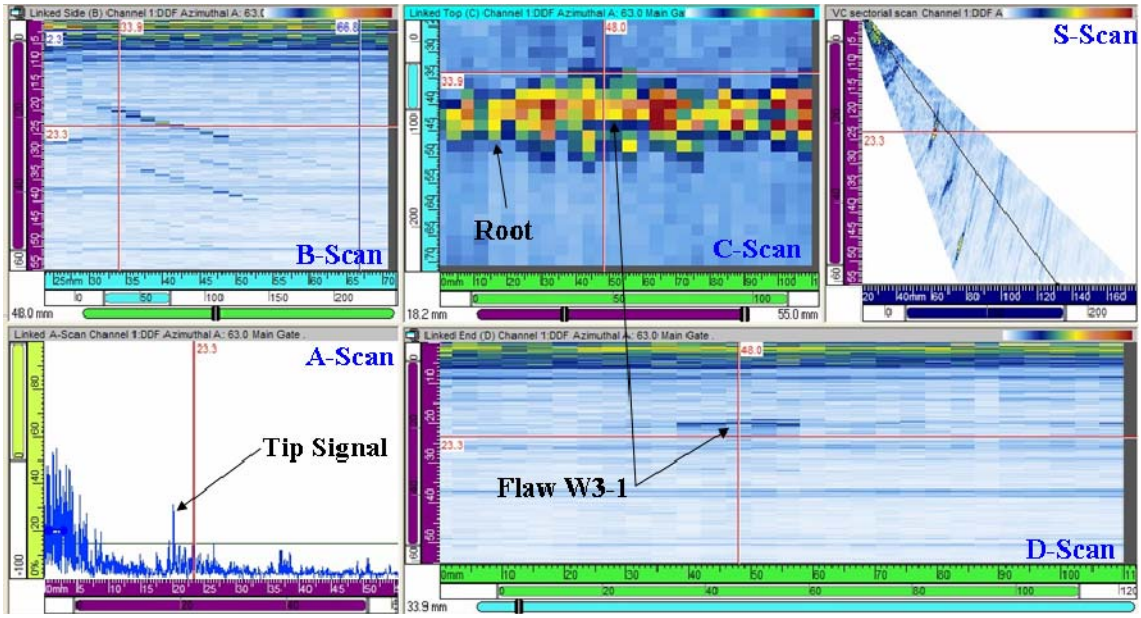
Flaw W3-1 from US Side; PA16 5 MHz DDF



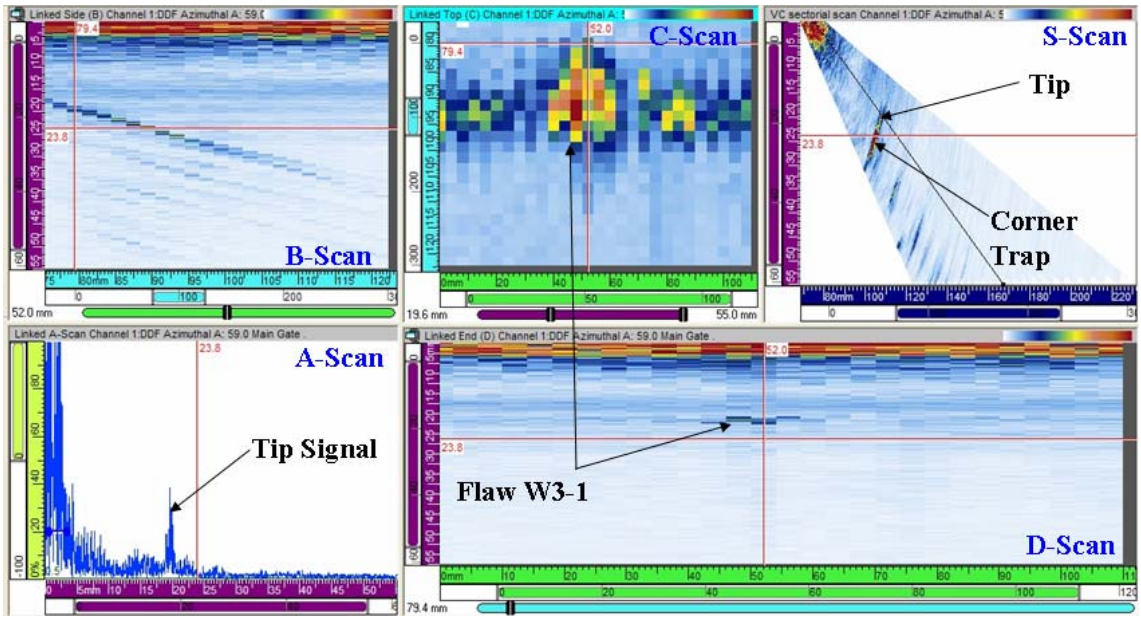
Flaw W3-1 from DS Side; PA16 5 MHz DDF



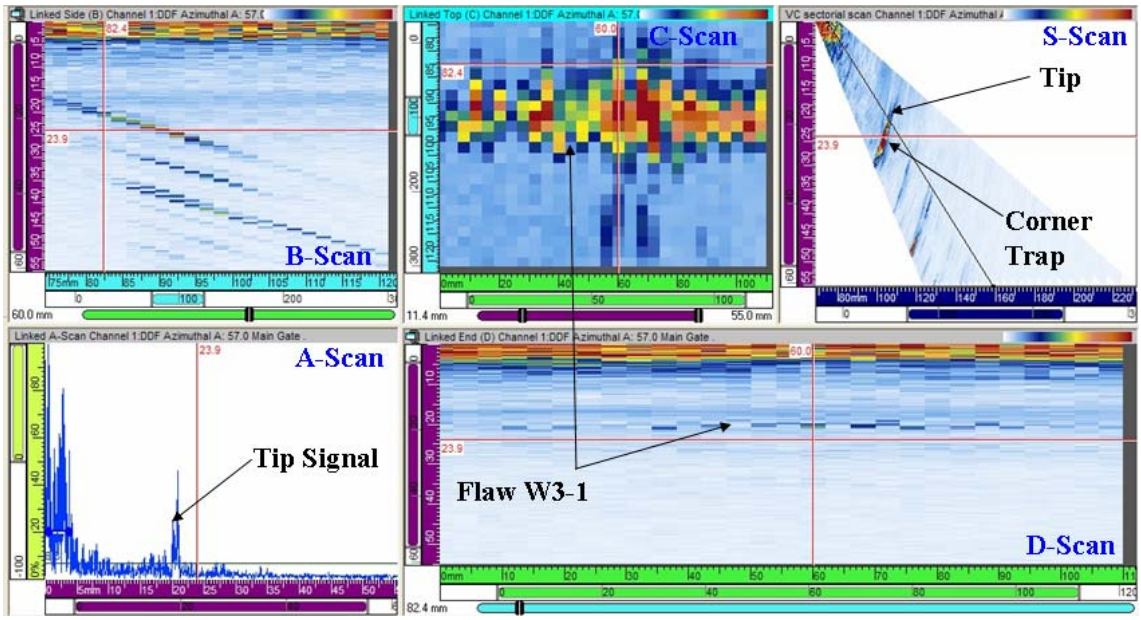
Flaw W3-1 from US Side; PA32 5 MHz DDF



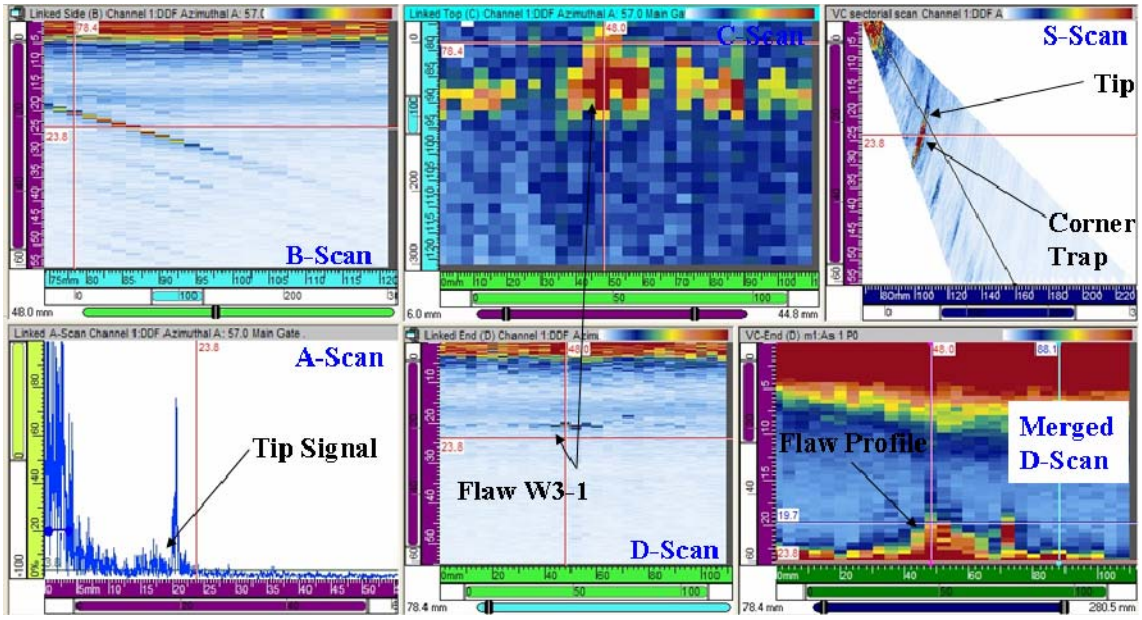
Flaw W3-1 from DS Side; PA32 5 MHz DDF



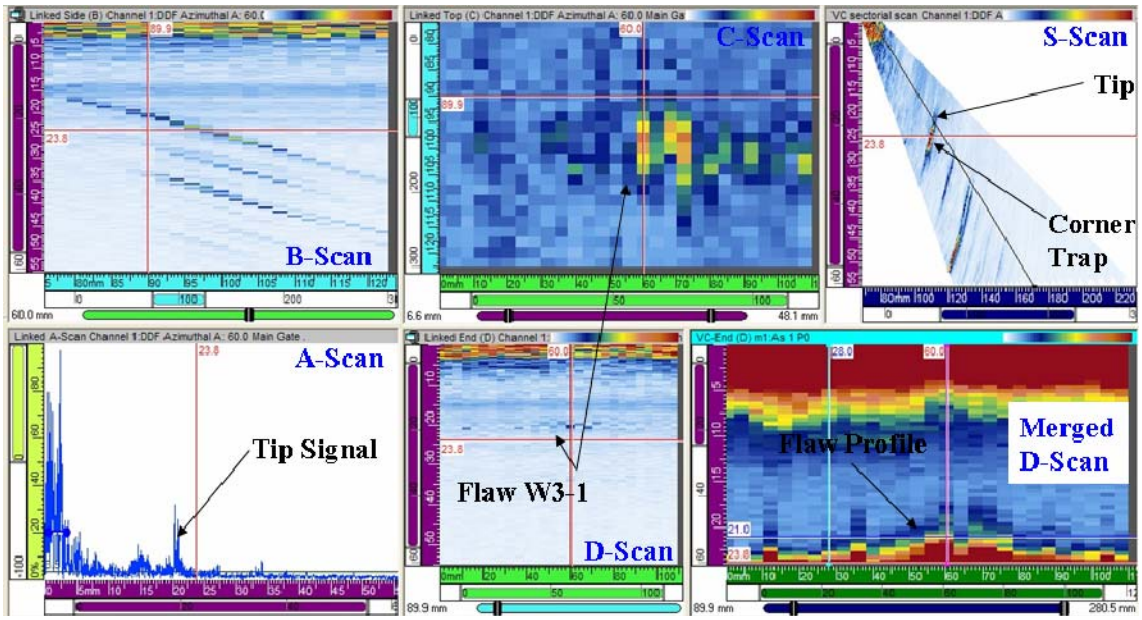
Flaw W3-1 from US Side; PA60 7.5 MHz DDF Using 17 Elements



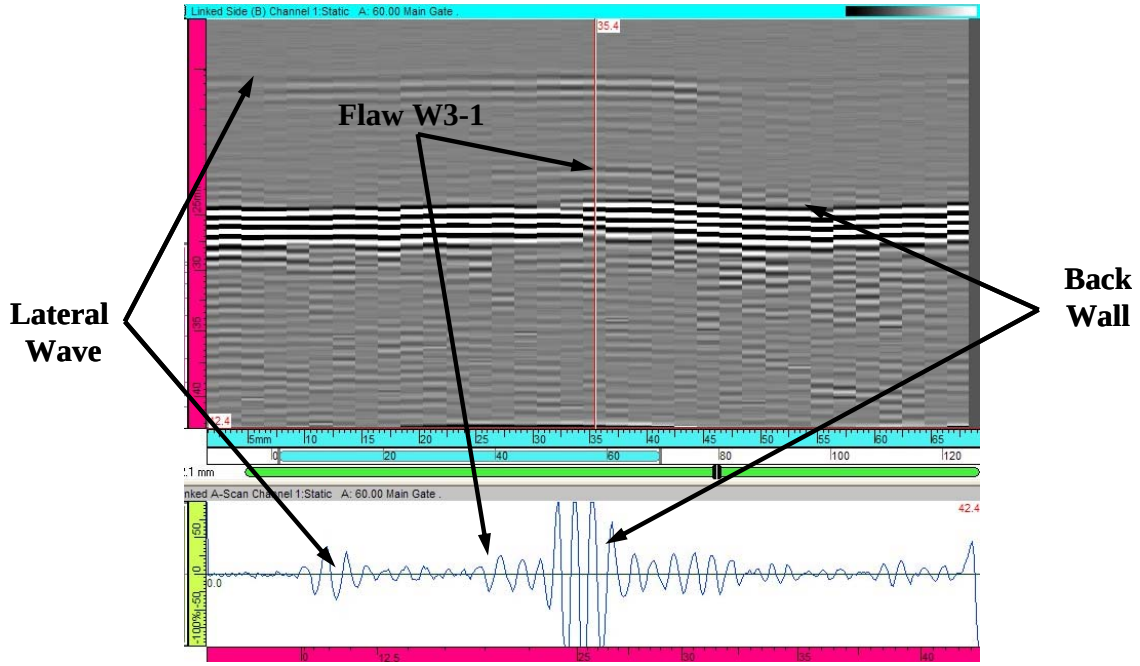
Flaw W3-1 from DS Side; PA60 7.5 MHz DDF Using 17 Elements



Flaw W3-1 from US Side; PA60 7.5 MHz DDF <u>Merged View</u> Using 17 Elements

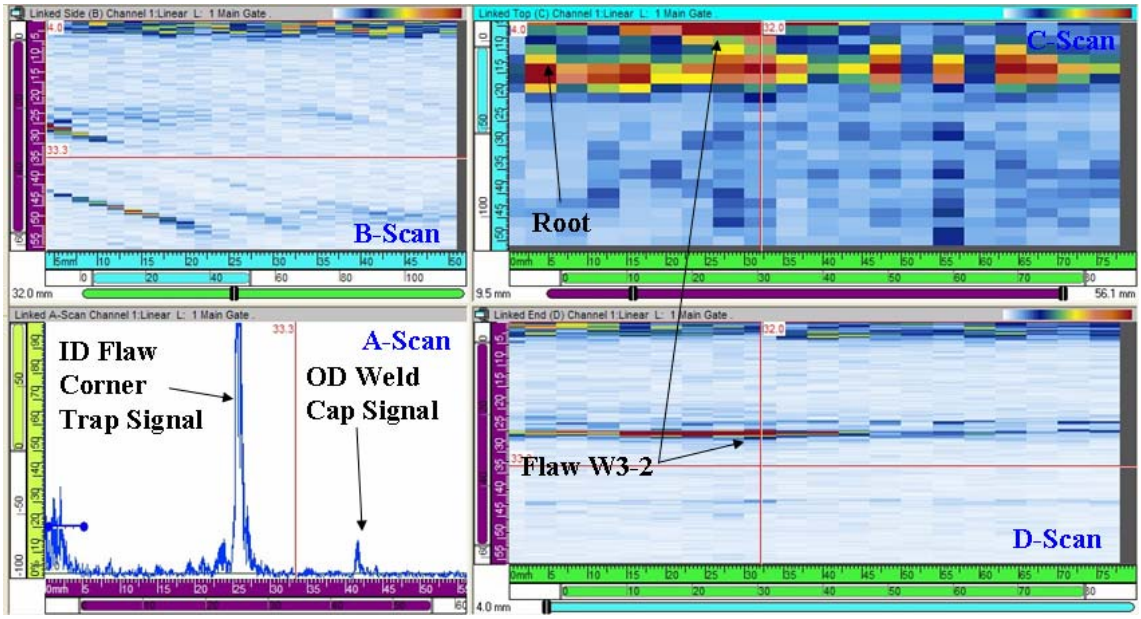


Flaw W3-1 from DS Side; PA60 7.5 MHz DDF <u>Merged View</u> Using 17 Elements

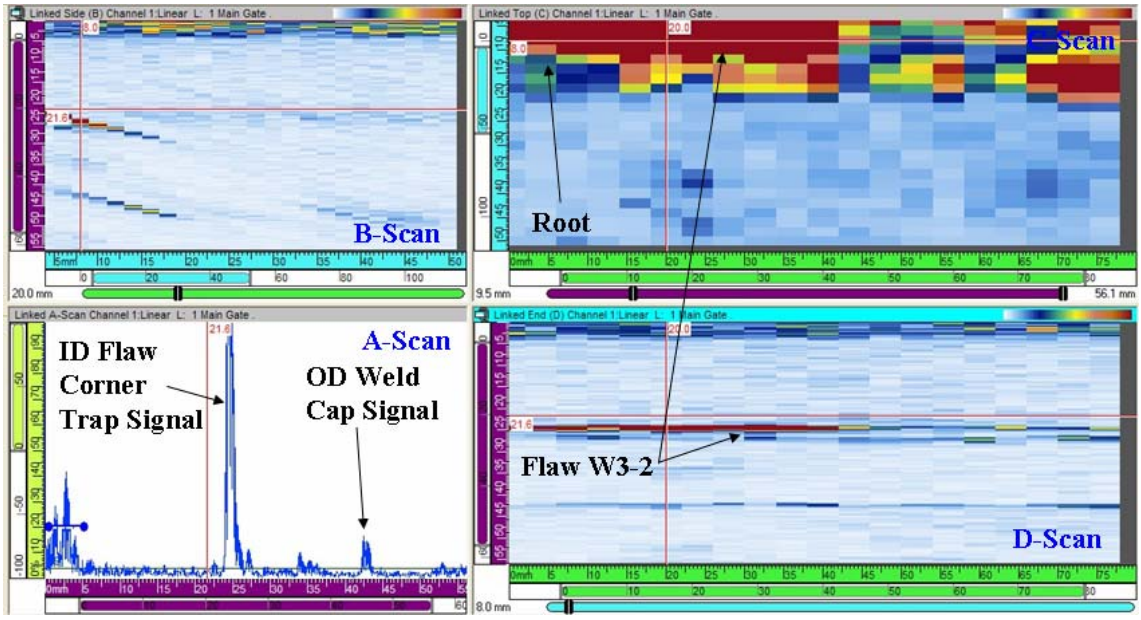


Flaw W3-1 TOFD Scan

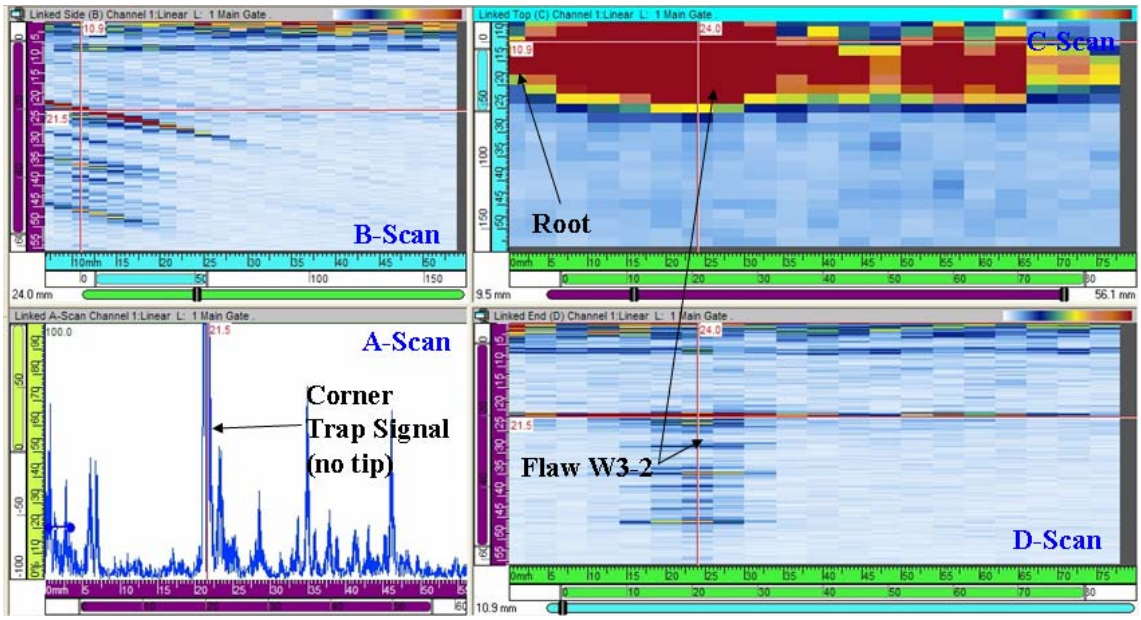
Flaw W3-2



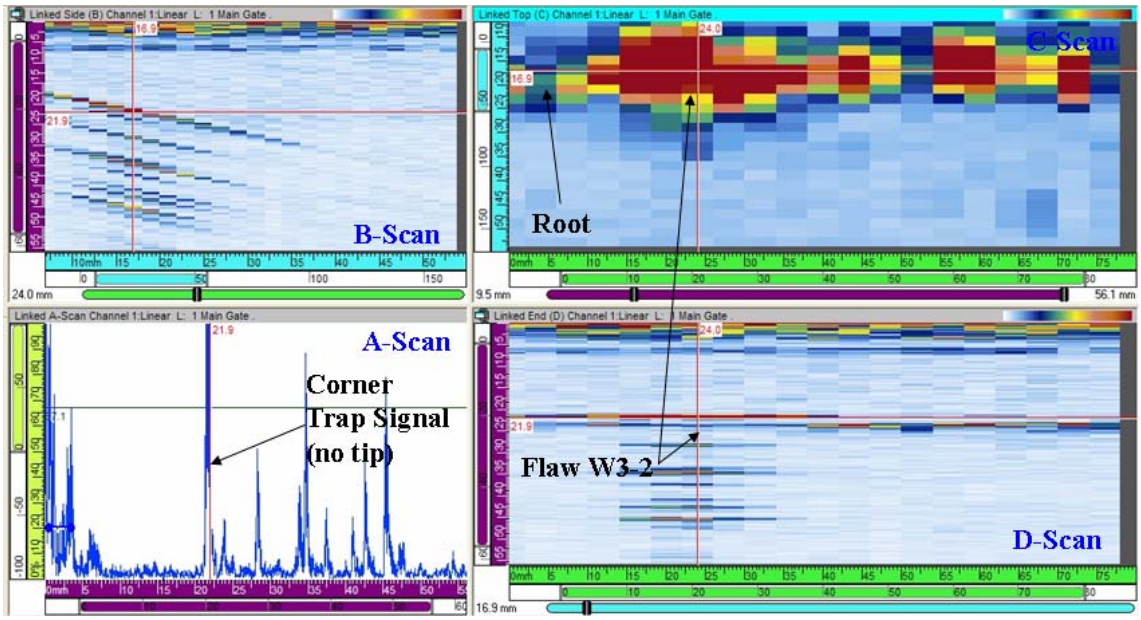
Flaw W3-2 from US Side; SE 12mm Dia. 5 MHz 45 Deg.



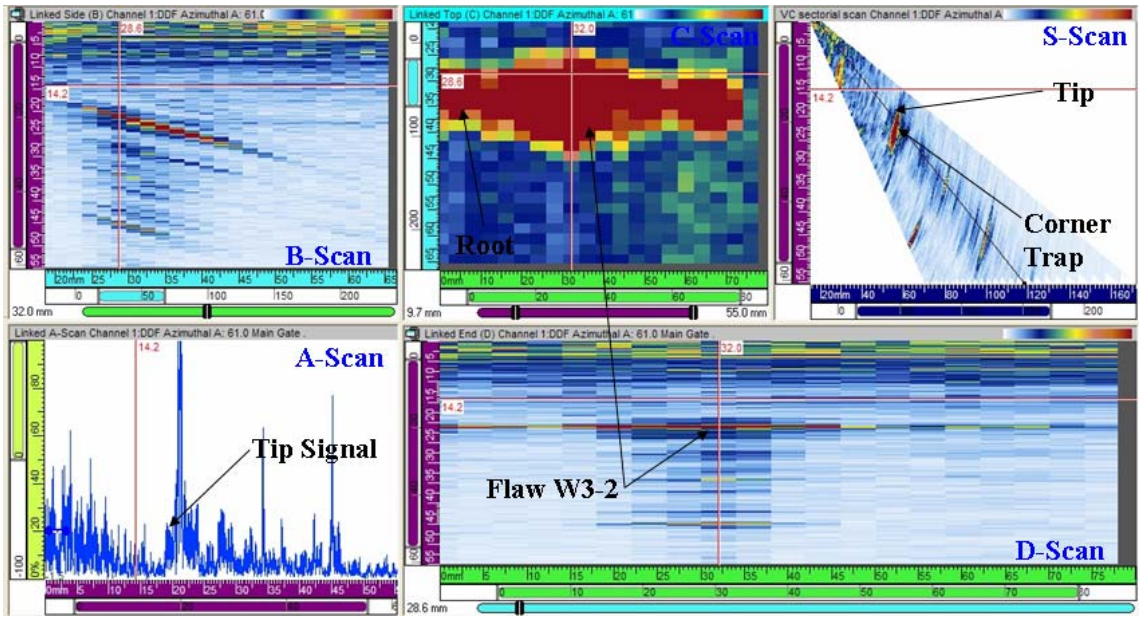
Flaw W3-2 from DS Side; SE 12mm Dia. 5 MHz 45 Deg.



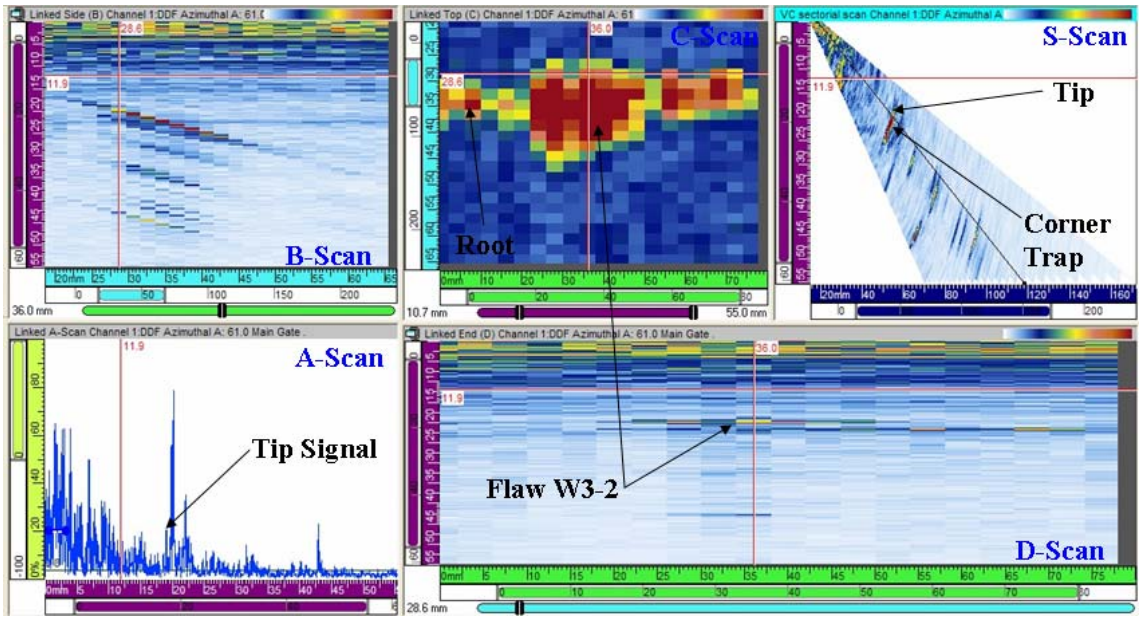
Flaw W3-2 from US Side; SE 12mm Dia. 5 MHz 60 Deg.



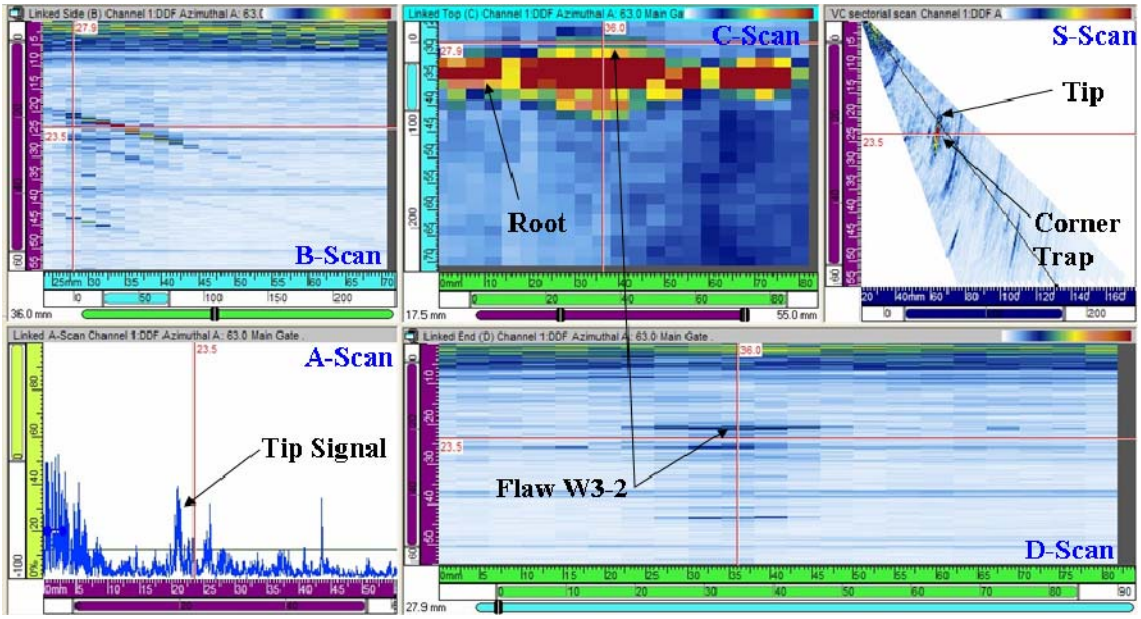
Flaw W3-2 from DS Side; SE 12mm Dia. 5 MHz 60 Deg.



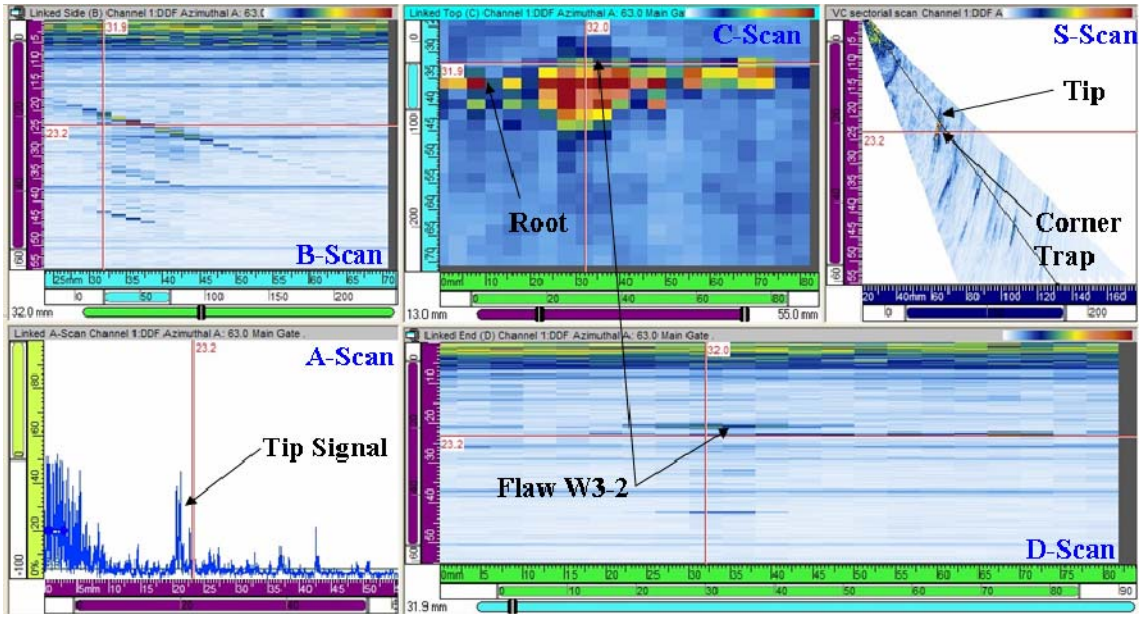
Flaw W3-2 from US Side; PA16 5 MHz DDF



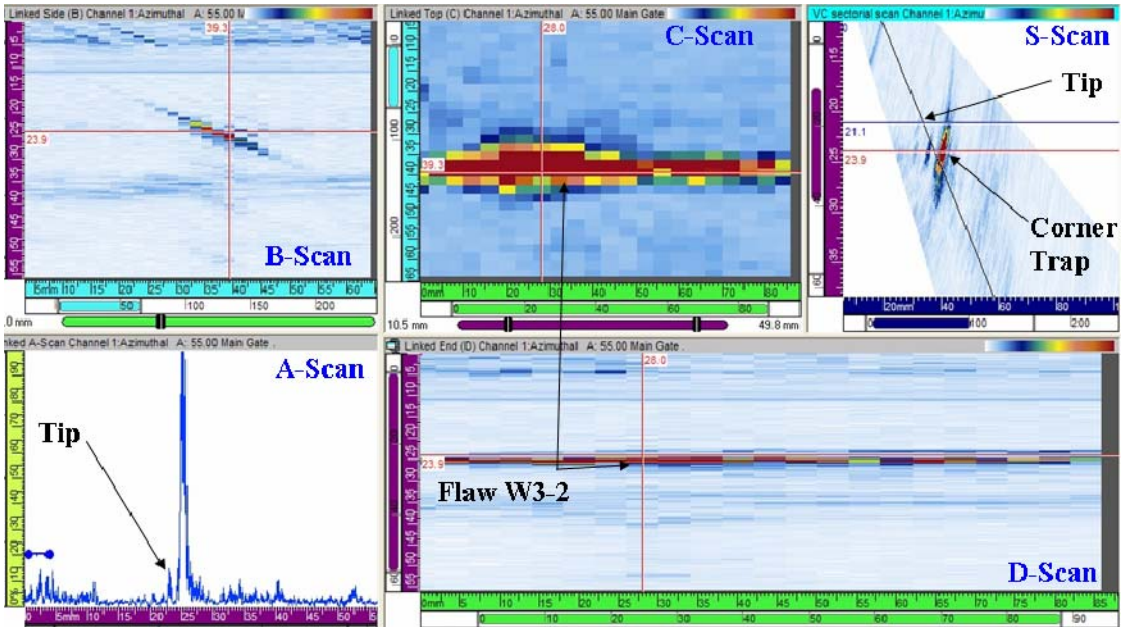
Flaw W3-2 from DS Side; PA16 5 MHz DDF



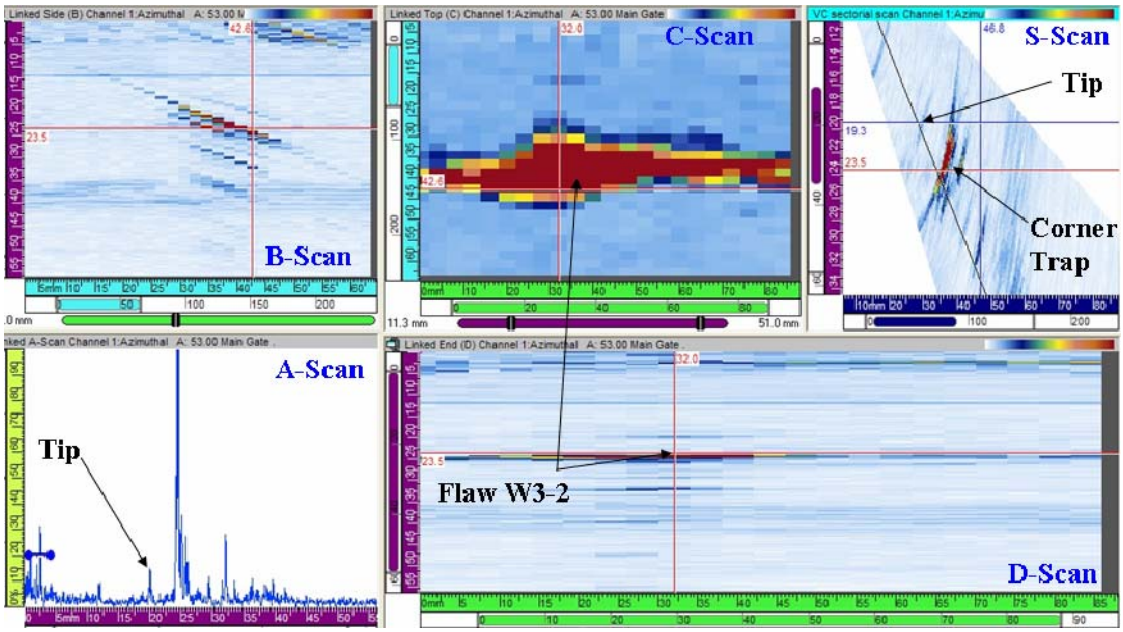
Flaw W3-2 from US Side; PA32 5 MHz DDF



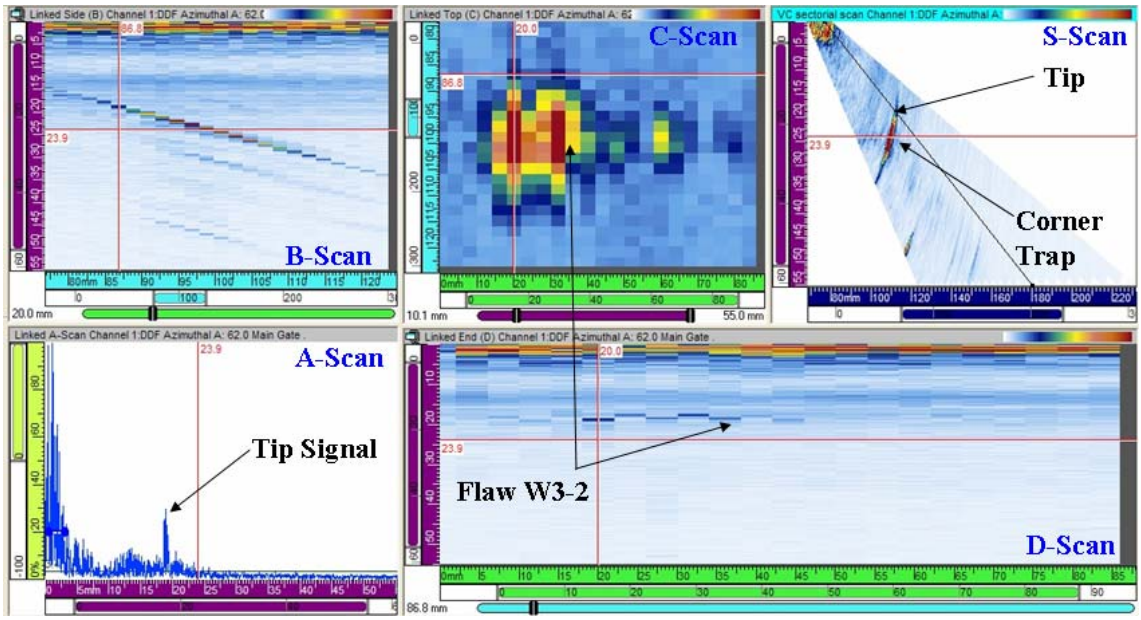
Flaw W3-2 from DS Side; PA32 5 MHz DDF



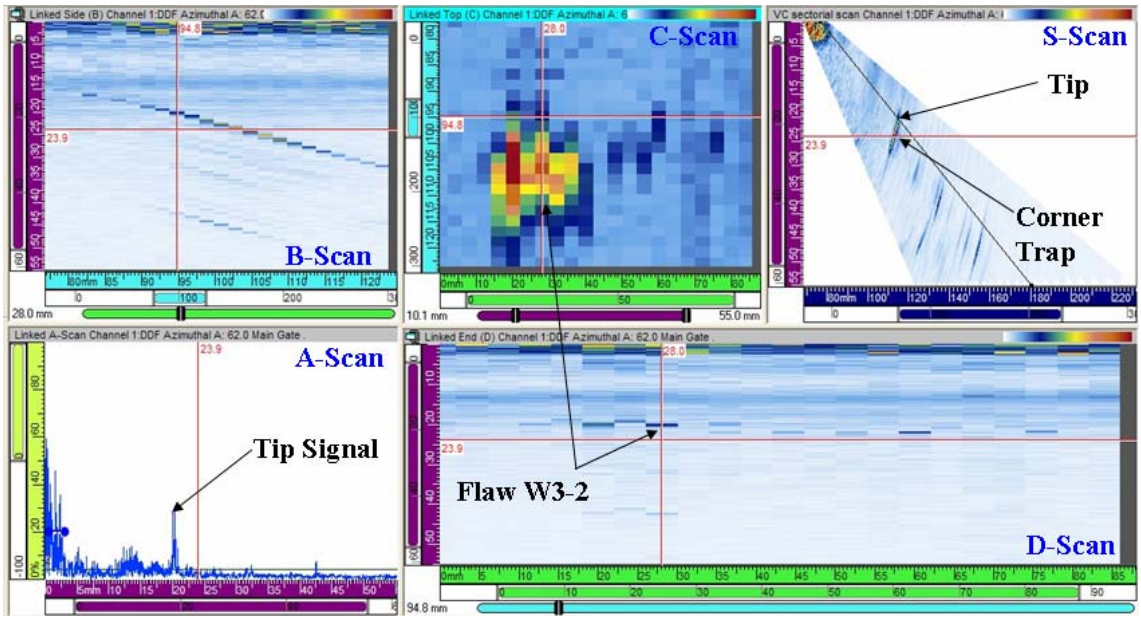
Flaw W3-2 from US Side; PA64 4 MHz 25FD Using 32 Elements



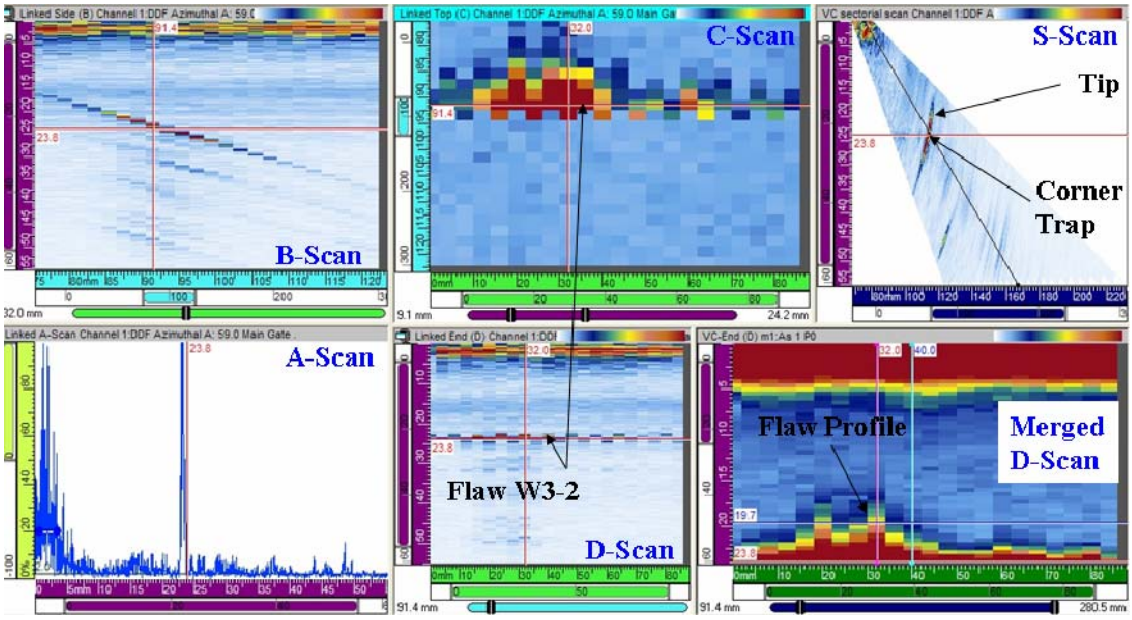
Flaw W3-2 from DS Side; PA64 4 MHz 25FD Using 32 Elements



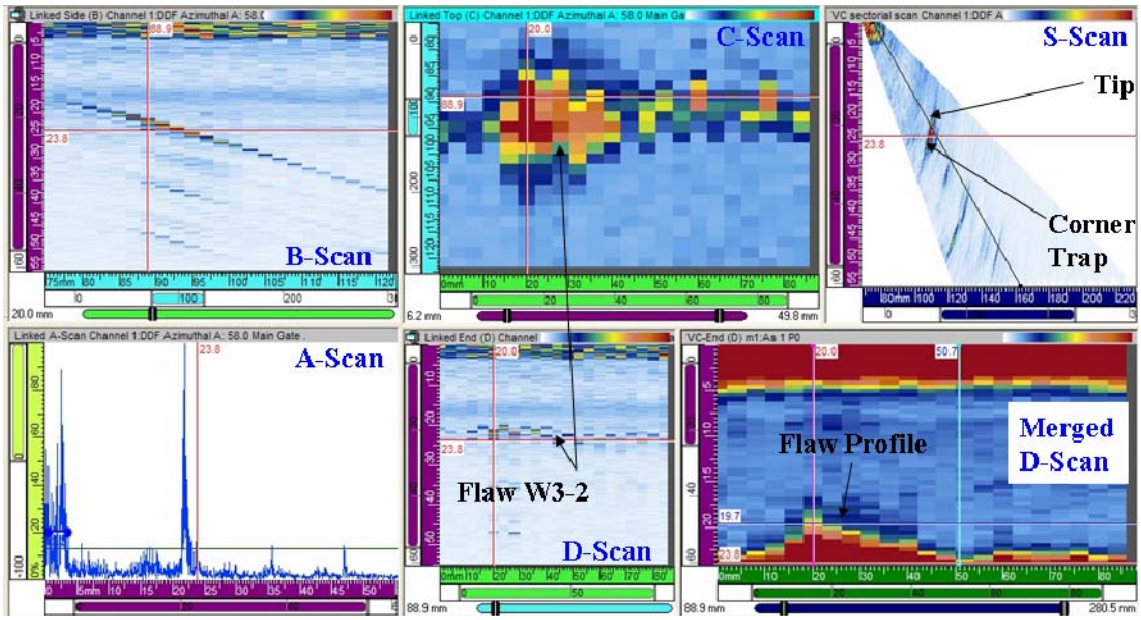
Flaw W3-2 from US Side; PA60 7.5 MHz DDF Using 17 Elements



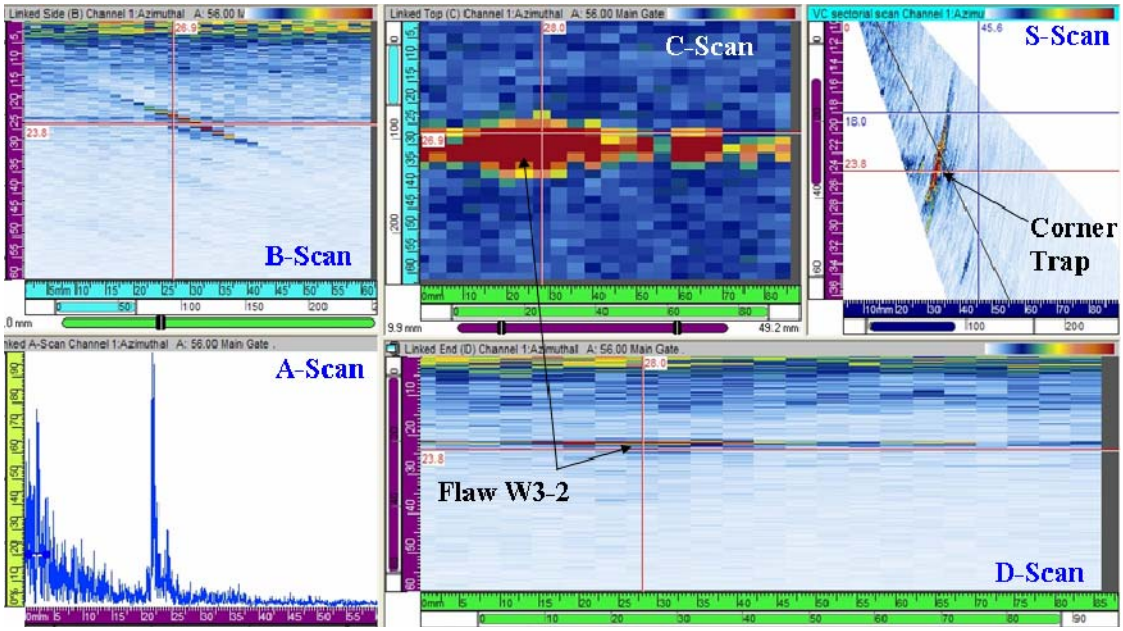
Flaw W3-2 from DS Side; PA60 7.5 MHz DDF Using 17 Elements



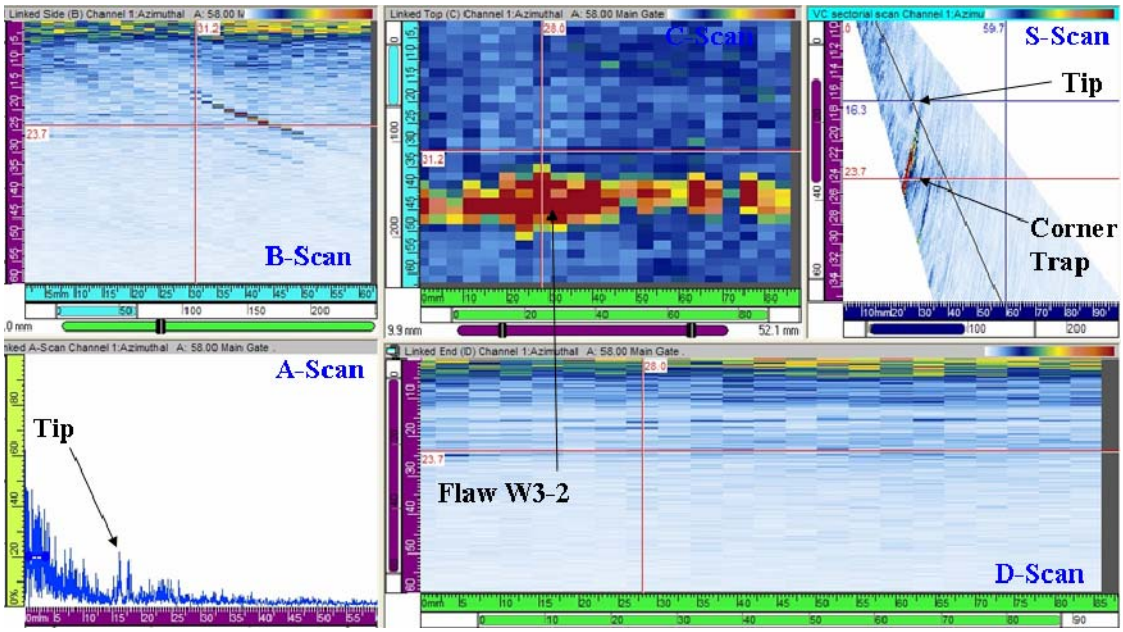
Flaw W3-2 from US Side; PA60 7.5 MHz DDF <u>Merged View</u> Using 17 Elements



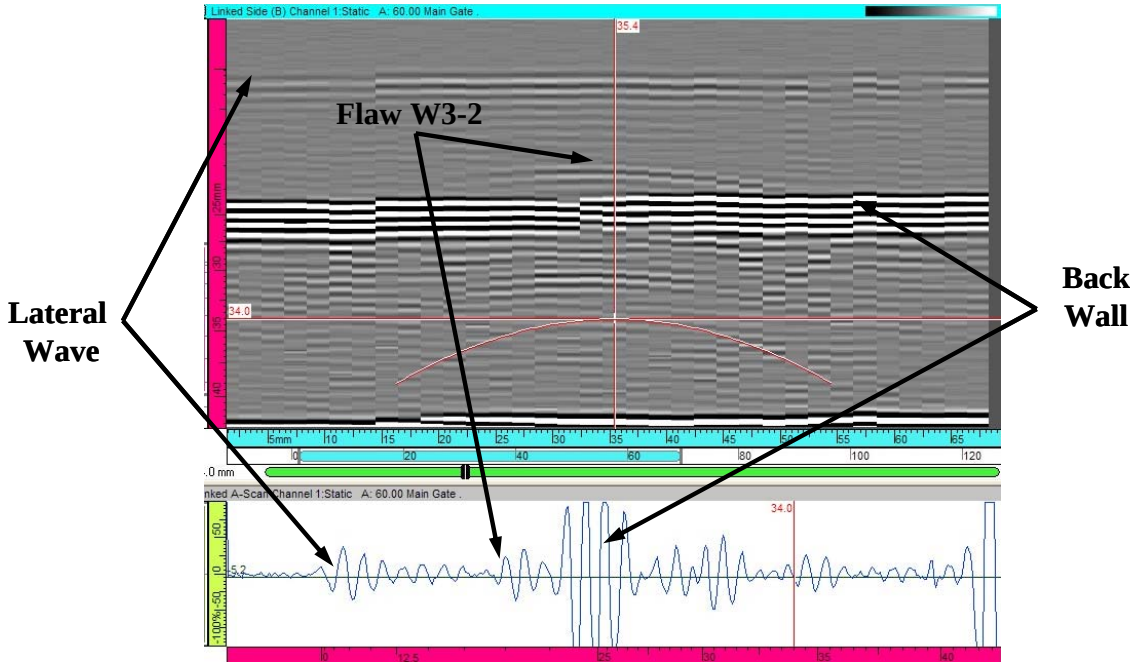
Flaw W3-2 from DS Side; PA60 7.5 MHz DDF <u>Merged View</u> Using 17 Elements



Flaw W3-2 from US Side; PA32 10 MHz 25FD Using 32 Elements



Flaw W3-2 from DS Side; PA32 10 MHz 25FD Using 32 Elements



Flaw W3-2 TOFD Scan