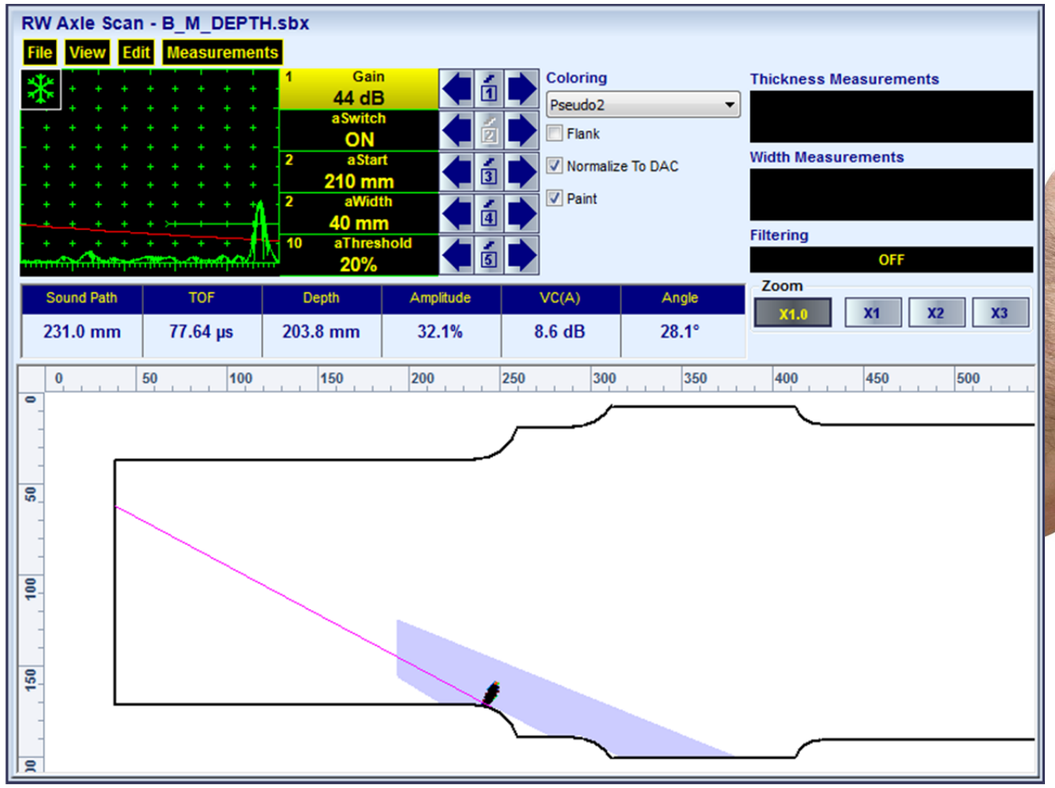
Item	*Order Code (Part ##)*
Inspection SW Application for ISONIC 3510 - Phased Array Modality: **RW Axle Test - Inspection of the Solid Railway Axles for the Transversal Cracks** ⇨ True-To-Geometry Axle Overlay Volume Corrected Imaging - Cross Sectional Along the Axle / Unfolded C-Scan / 3D ⇨ Sector-Scan Cross Sectional Along the Axle Coverage with Probe Placed on the Outer Side Surface ⇨ Intuitive Image Guided PA Pulser Receiver with Beam Forming View ⇨ DAC / TCG Normalization ⇨ Built-In Axle Geometry Editor and Ray Tracer - Scanning Pattern Design ⇨ Independent on TCG Angle Gain Compensation / Gain Per Focal Law Correction ⇨ Encoded and Time based Unfolded C-Scan ⇨ 100% Raw Data Capturing ⇨ Automatic Defects Alarming Upon C-Scan Acquisition Completed ⇨ Automatic Creation of Editable Defects List ⇨ Comprehensive Postrpocessing Including: → Recovery and Evaluation of Captured A-Scans from the Recorded Cross Sectional Along the Axle Views (Sector Scan) and C-Scans → Recovery of Cross Sectional Along the Axle Views from the Recorded C-Scans → Converting Recorded C-Scans or their Segments into 3D Images → Off-Line Gain Manipulation → Off-Line DAC Normalization of the Recorded Images / DAC Evaluation → Numerous Filtering / Reject Options (by Geometry / Position / By Amplitude / dB-to-DAC / etc) → Defects Sizing → Creation of Defect List and Storing it Into a Separate File → Automatic creating of inspection reports - hard copy / PDF File	SWA 3510022



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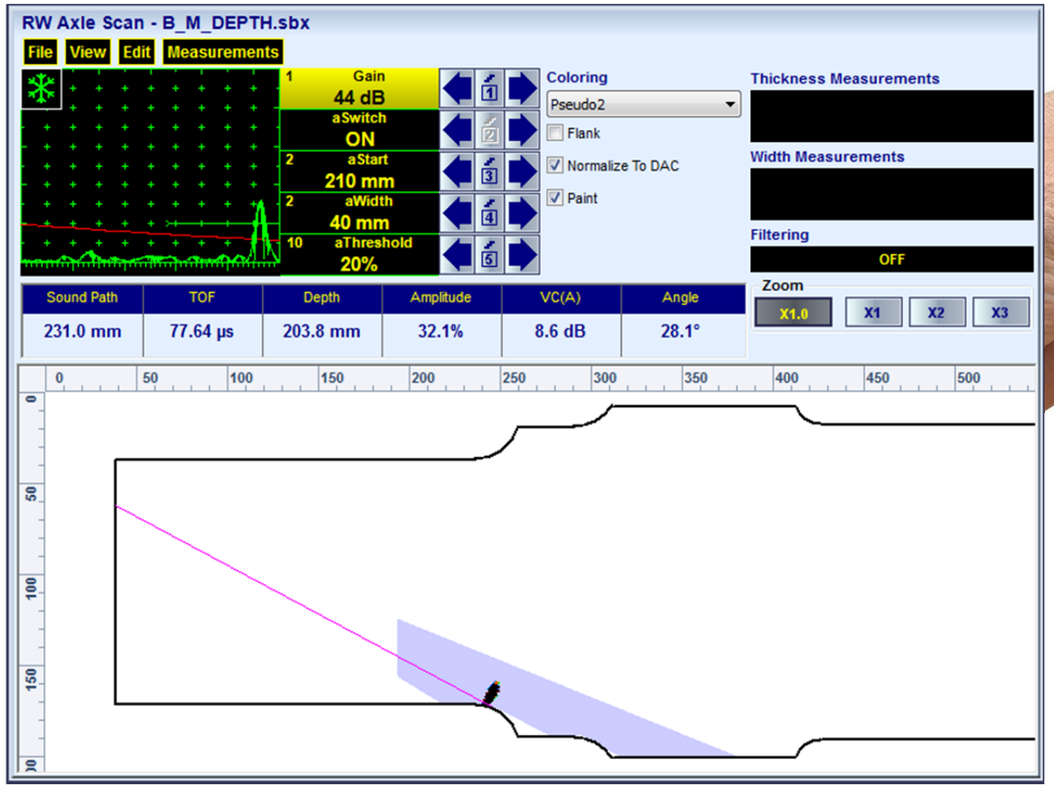
Item	*Order Code (Part ##)*
Inspection SW Application forISONIC 2010 / ISONIC 2010 EL - Phased Array Modality: **RW Axle Test - Inspection of the Solid Railway Axles for the Transversal Cracks** ⇨ True-To-Geometry Axle Overlay Volume Corrected Imaging - Cross Sectional Along the Axle / Unfolded C-Scan / 3D ⇨ Sector-Scan Cross Sectional Along the Axle Coverage with Probe Placed on the Outer Side Surface ⇨ Intuitive Image Guided PA Pulser Receiver with Beam Forming View ⇨ DAC / TCG Normalization ⇨ Built-In Axle Geometry Editor and Ray Tracer - Scanning Pattern Design ⇨ Independent on TCG Angle Gain Compensation / Gain Per Focal Law Correction ⇨ Encoded and Time based Unfolded C-Scan ⇨ 100% Raw Data Capturing ⇨ Automatic Defects Alarming Upon C-Scan Acquisition Completed ⇨ Automatic Creation of Editable Defects List ⇨ Comprehensive Postrpocessing Including: → Recovery and Evaluation of Captured A-Scans from the Recorded Cross Sectional Along the Axle Views (Sector Scan) and C-Scans → Recovery of Cross Sectional Along the Axle Views from the Recorded C-Scans → Converting Recorded C-Scans or their Segments into 3D Images → Off-Line Gain Manipulation → Off-Line DAC Normalization of the Recorded Images / DAC Evaluation → Numerous Filtering / Reject Options (by Geometry / Position / By Amplitude / dB-to-DAC / etc) → Defects Sizing → Creation of Defect List and Storing it Into a Separate File → Automatic creating of inspection reports - hard copy / PDF File	SWA 910822



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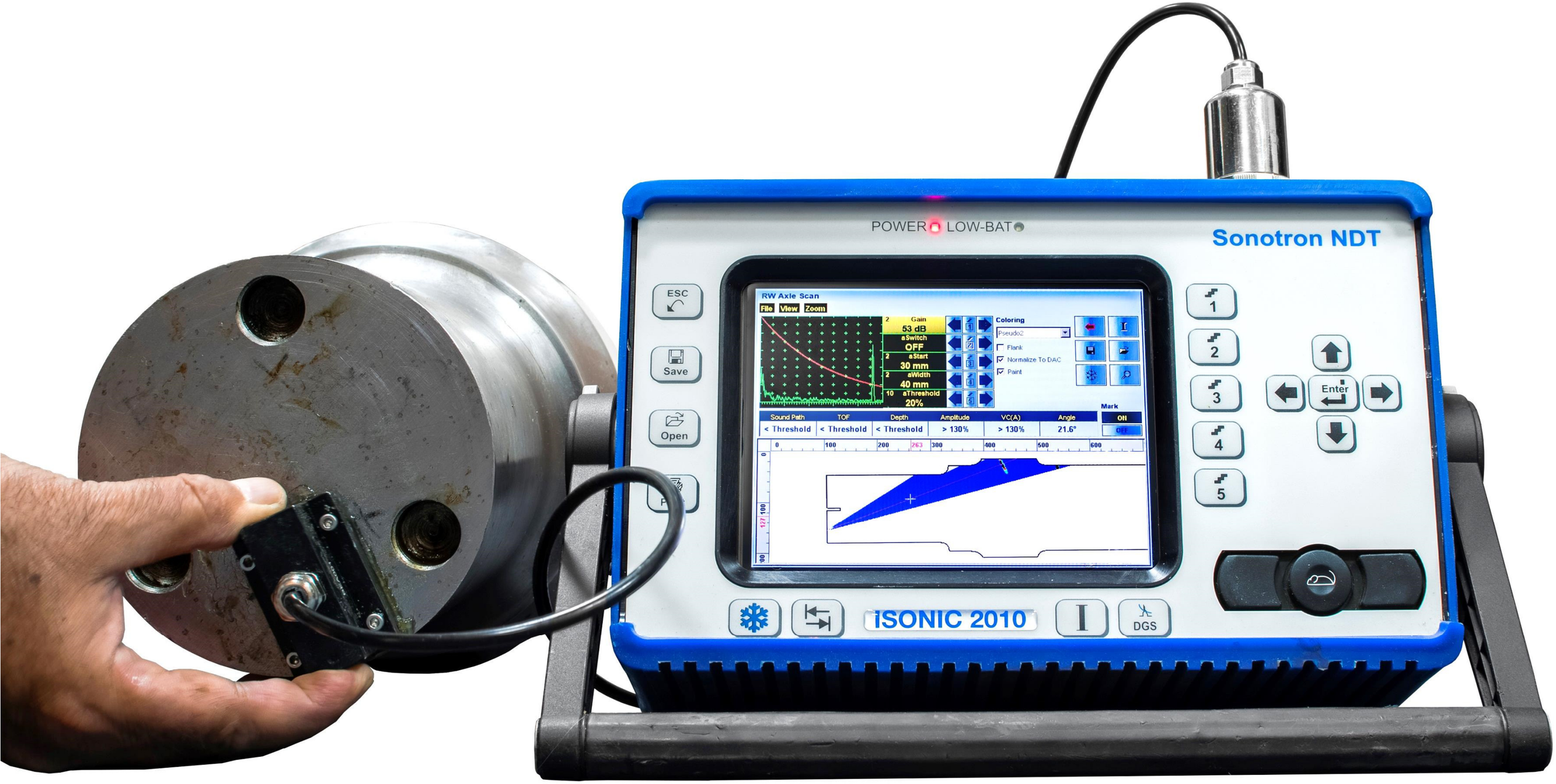

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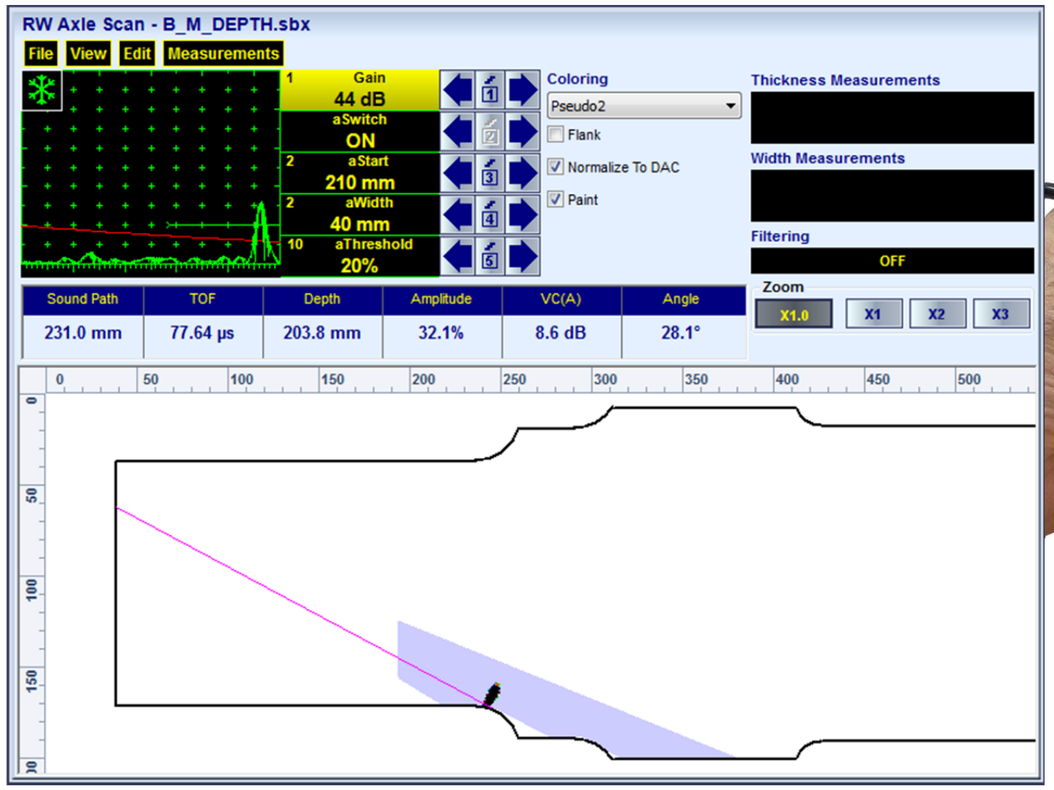
Item	*Order Code (Part ##)*
Inspection SW Application for ISONIC 2009 UPA-Scope - Phased Array Modality: **RW Axle Test - Inspection of the Solid Railway Axles for the Transversal Cracks** ⇨ True-To-Geometry Axle Overlay Volume Corrected Imaging - Cross Sectional Along the Axle / Unfolded C-Scan / 3D ⇨ Sector-Scan Cross Sectional Along the Axle Coverage with Probe Placed on the Outer Side Surface ⇨ Intuitive Image Guided PA Pulser Receiver with Beam Forming View ⇨ DAC / TCG Normalization ⇨ Built-In Axle Geometry Editor and Ray Tracer - Scanning Pattern Design ⇨ Independent on TCG Angle Gain Compensation / Gain Per Focal Law Correction ⇨ Encoded and Time based Unfolded C-Scan ⇨ 100% Raw Data Capturing ⇨ Automatic Defects Alarming Upon C-Scan Acquisition Completed ⇨ Automatic Creation of Editable Defects List ⇨ Comprehensive Postrpocessing Including: → Recovery and Evaluation of Captured A-Scans from the Recorded Cross Sectional Along the Axle Views (Sector Scan) and C-Scans → Recovery of Cross Sectional Along the Axle Views from the Recorded C-Scans → Converting Recorded C-Scans or their Segments into 3D Images → Off-Line Gain Manipulation → Off-Line DAC Normalization of the Recorded Images / DAC Evaluation → Numerous Filtering / Reject Options (by Geometry / Position / By Amplitude / dB-to-DAC / etc) → Defects Sizing → Creation of Defect List and Storing it Into a Separate File → Automatic creating of inspection reports - hard copy / PDF File	SWA 909822



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RW Axle Scan - RW_AXLE_006A.sbx

File View Edit Measurements

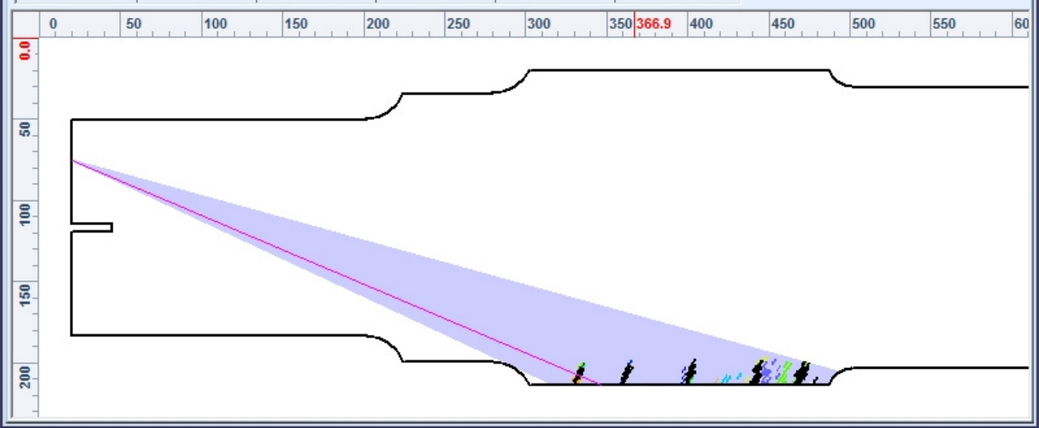
1 Gain 38 dB
aSwitch OFF
2 aStart 30 mm
2 aWidth 40 mm
10 aThreshold 20%

Coloring: Pseudo2
Flank
Normalize To DAC
Paint

Thickness Measurements
Width Measurements
Filtering: OFF

Zoom: X1.0 X1 X2 X3

Sound Path	TOF	Depth	Amplitude	VC(A)	Angle
< Threshold	< Threshold	< Threshold	> 130%	> 130%	23.0°



RW Axle Scan - RW_AXLE_006B.sbx

File View Edit Measurements

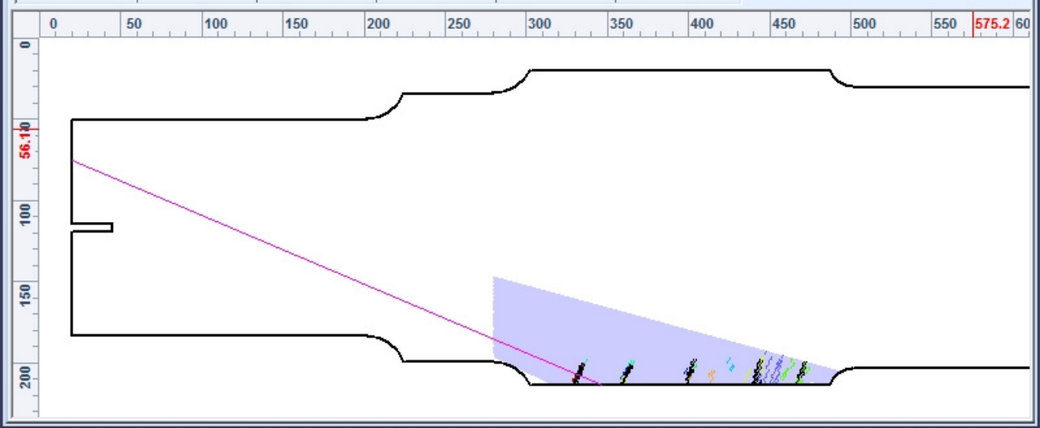
6 Gain 38 dB
aSwitch OFF
2 aStart 30 mm
2 aWidth 40 mm
10 aThreshold 20%

Coloring: Pseudo2
Flank
Normalize To DAC
Paint

Thickness Measurements
Width Measurements
Filtering: OFF

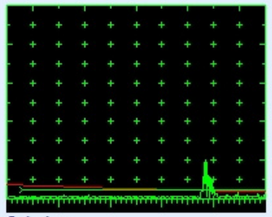
Zoom: X1.0 X1 X2 X3

Sound Path	TOF	Depth	Amplitude	VC(A)	Angle
< Threshold	< Threshold	< Threshold	> 130%	> 130%	23.0°



CScan Postprocessing - RW_AXLE_006.scx

File View Edit Mark Measurements 3D View



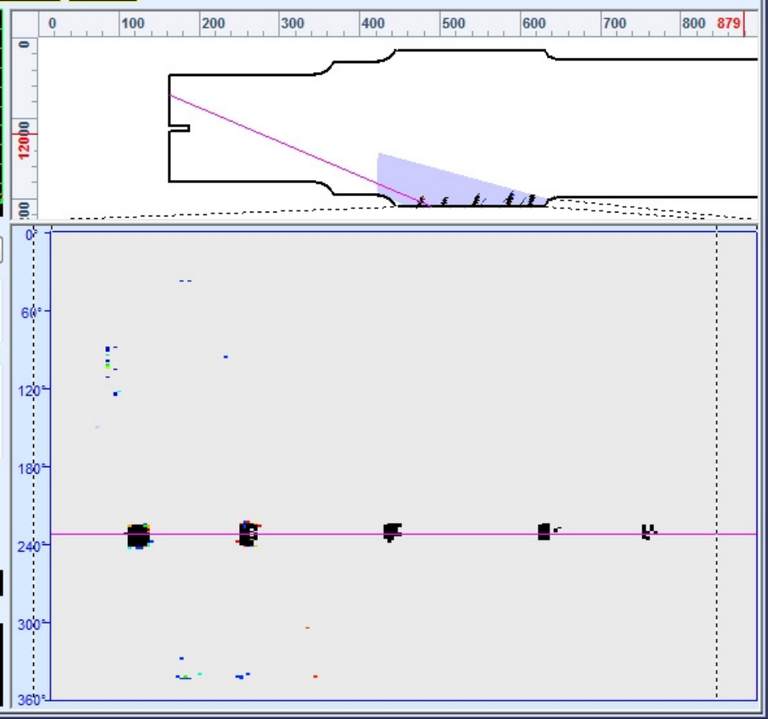
Coloring: Pseudo2

Mapping: Amplitude / Distance

Mark: CScan ON OFF / BScan ON OFF

Filtering: OFF

Measurements: Length Width Height

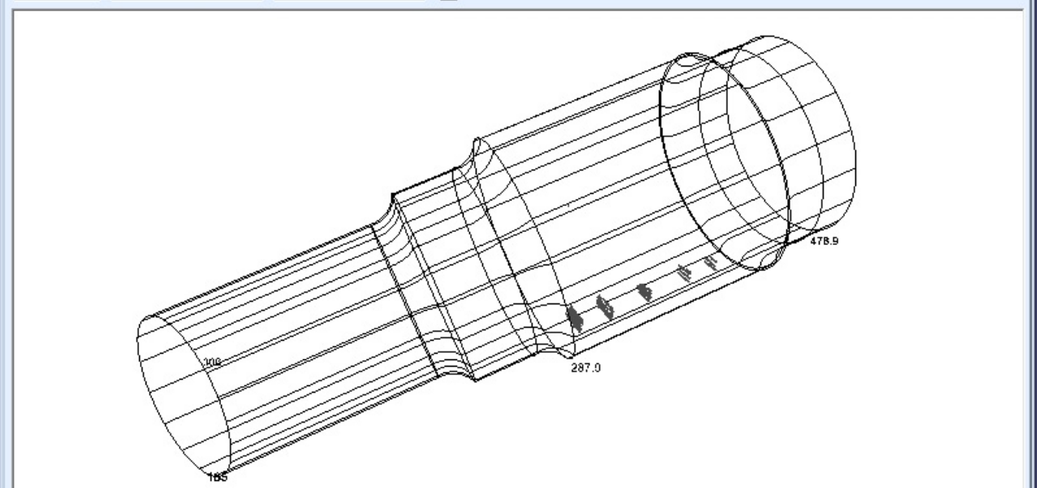


3D View

Zoom | Navigation | Rotate | Mapping: Amplitude / Distance

Show Grid
Show Dimensions

Save Print Close
Reset View



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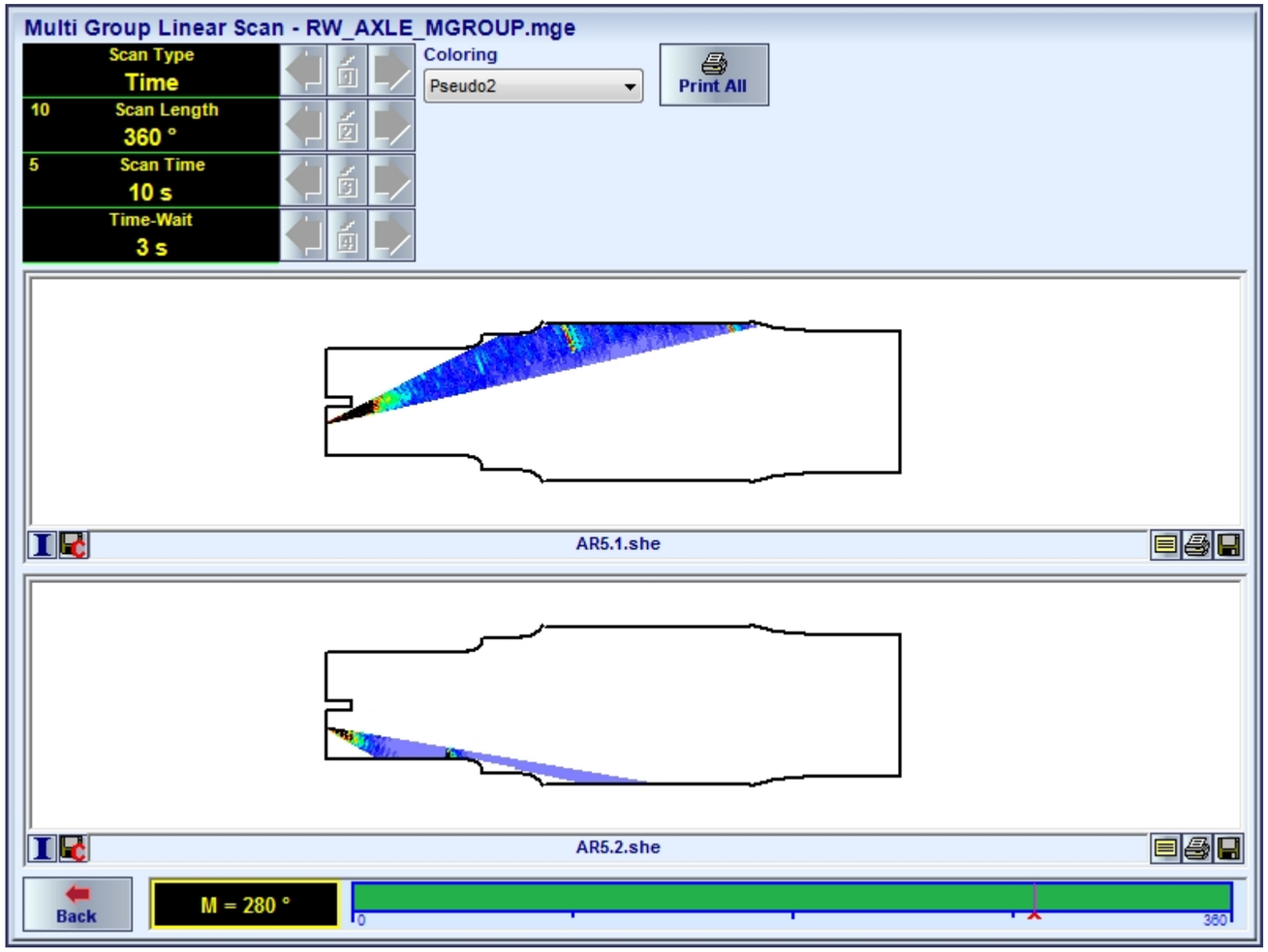
Item	*Order Code (Part ##)*
Inspection SW Application for ISONIC 3510 - PA Modality: **Multi-Group D – Implementation of Several (up to 4) Linear Scan Insonification Schemes Simultaneously with Use of One Linear Array Probe with / without Delay Line**	SWA 3510020
Inspection SW Application for ISONIC 2010 - PA Modality: **Multi-Group D – Implementation of Several (up to 4) Linear Scan Insonification Schemes Simultaneously with Use of One Linear Array Probe with / without Delay Line**	SWA 910820
Inspection SW Application for ISONIC 2009 UPA-Scope - PA Modality: **Multi-Group D – Implementation of Several (up to 4) Linear Scan Insonification Schemes Simultaneously with Use of One Linear Array Probe with / without Delay Line** ⇨ Multi-Group Cross Sectional Coverage - Built-In Intuitive Material Coverage Composer ⇨ Straight Beam and Inclined B-Scan (Linear Scan), and Combined Cross Sectional Coverage ⇨ DAC / TCG Normalization ⇨ Independent on TCG Gain Per Focal Law Correction ⇨ Encoded and Time Based Recording ⇨ 100% Raw Data Capturing ⇨ Automatic Creation of Editable Defects List for Each Group Scanning ⇨ Comprehensive Postrpocessing Including: → Recovery and Evaluation of Recorded Cross Sectional Views (Straight Beam and Inclined B-Scan) for all Groups Simultaneously → Exporting Every Desired Group Inspection into a Separate C-Scan File → Recovery and Evaluation of Captured A-Scans from the Recorded Cross Sectional Views (Straight Beam and Inclined B-Scan) and C-Scans for Each Group Inspection → Recovery of Cross Sectional Views from the Recorded C-Scans → Converting Recorded C-Scans or their Segments into 3D Images → Off-Line Gain Manipulation → Off-Line DAC Normalization of the Recorded Images / DAC Evaluation → Numerous Filtering / Reject Options (by Geometry / Position / By Amplitude / dB-to-DAC / etc) → Defects Sizing → Creation of Defect List and Storing it Into a Separate File → Automatic creating of inspection reports - hard copy / PDF File	SWA 909820

MULTIGROUP_D – Scanning of 2 regions simultaneously



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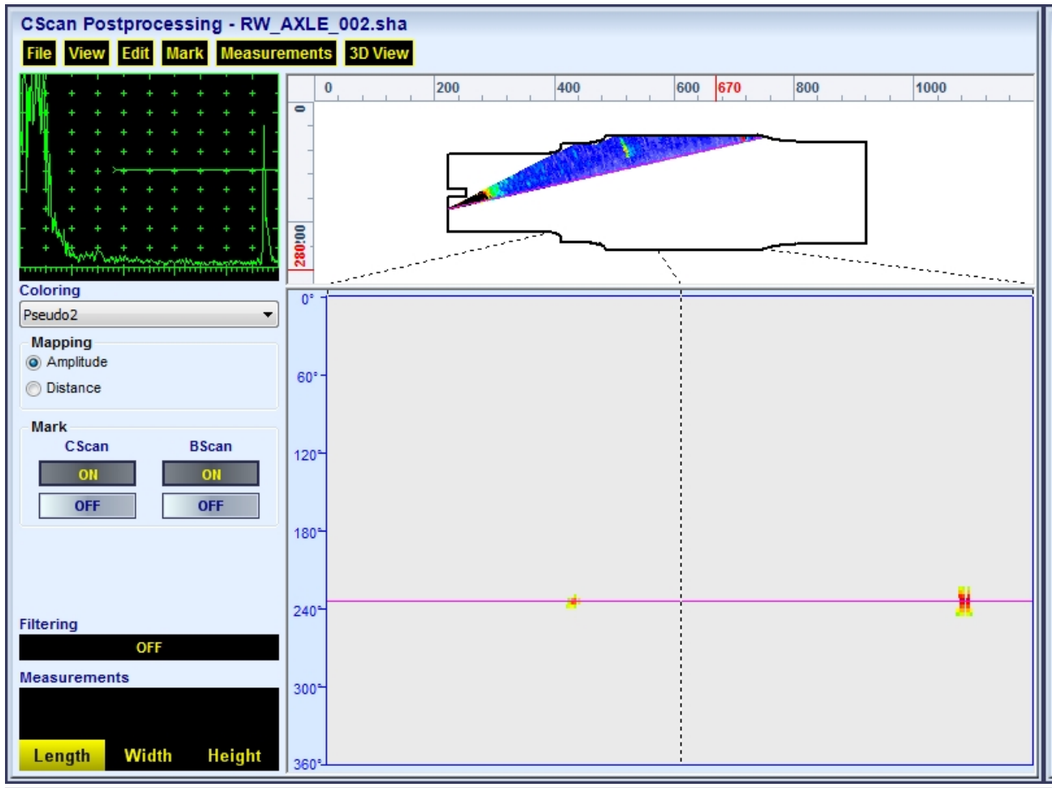

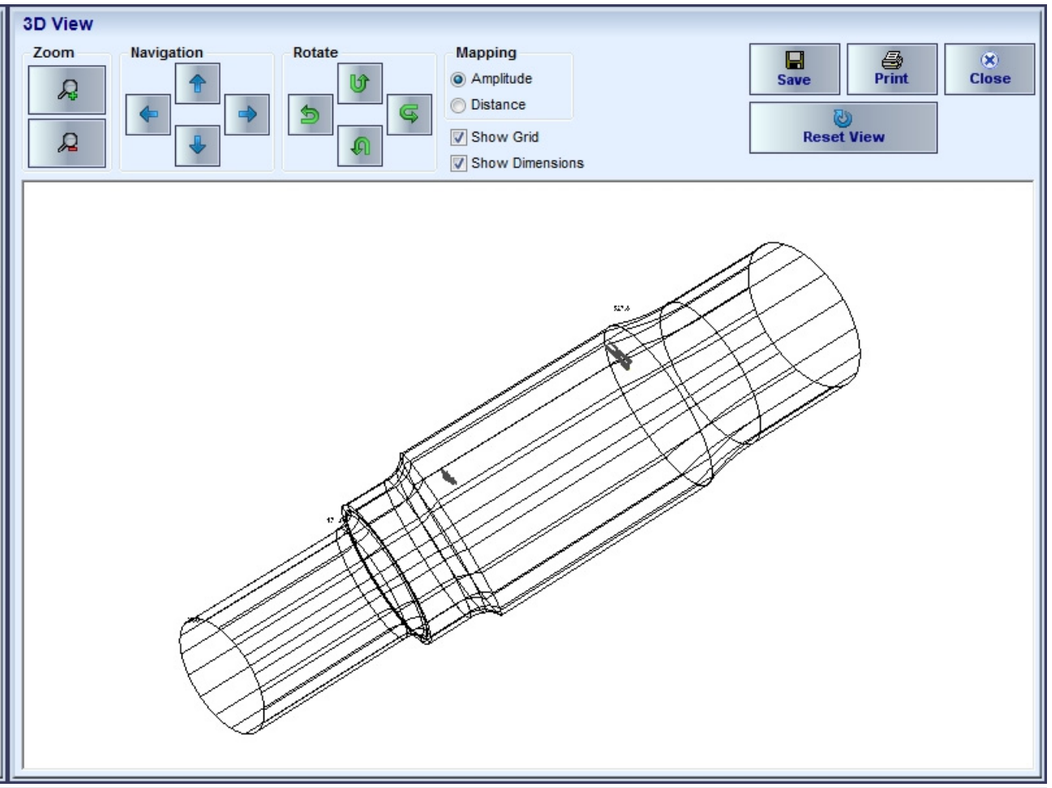

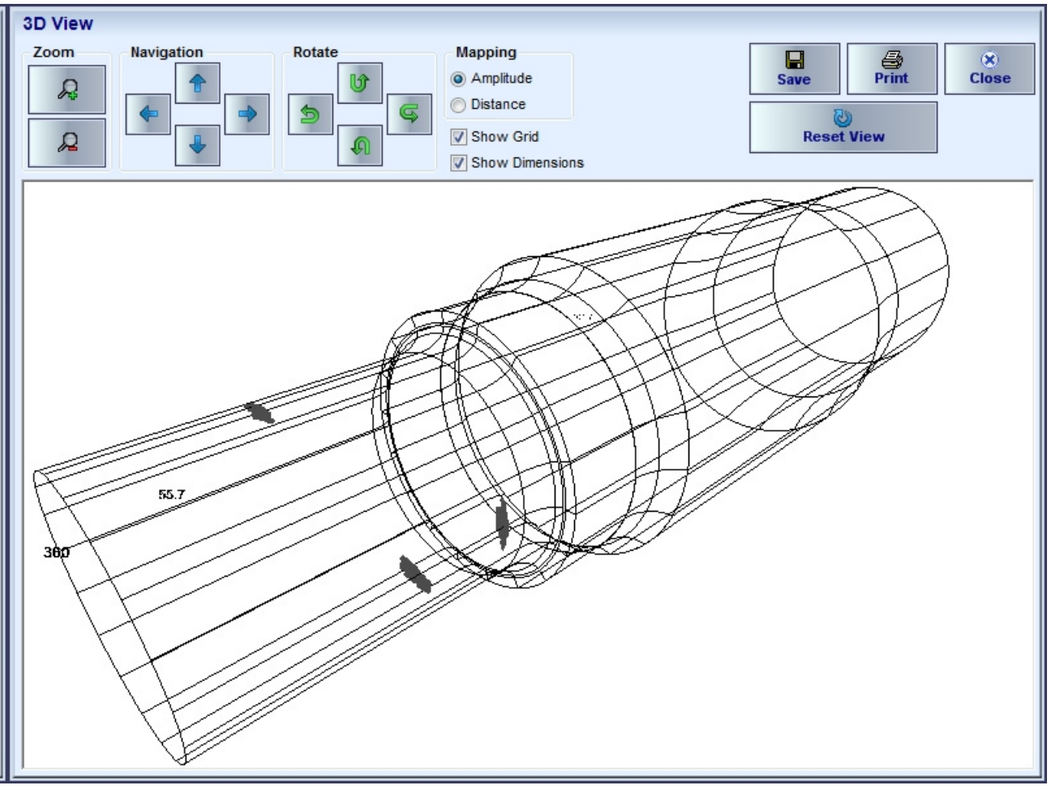

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On the next 7 pages – the International Case Study for the

Detection and Precision of the Imaging of the Small Defects in the Journal to Dust Guard Radius

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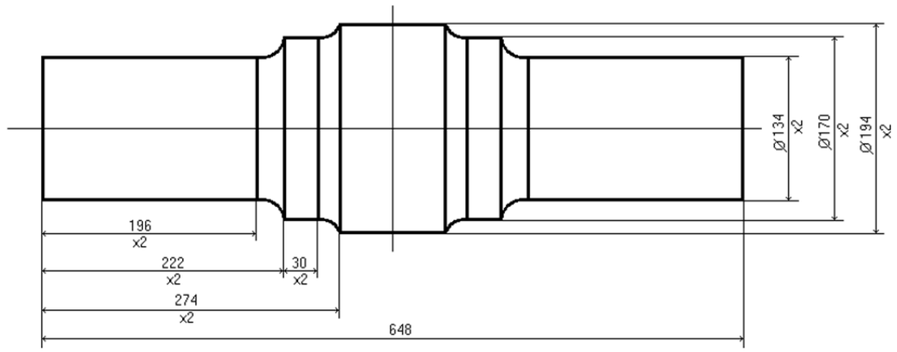
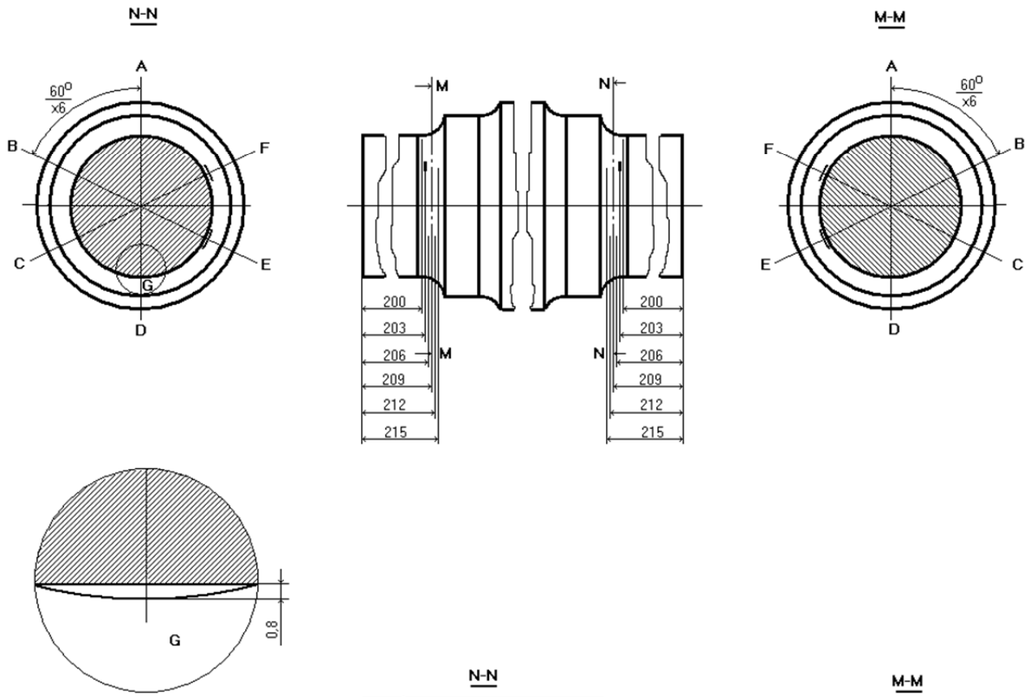
Dimensioned sketch of the shaft sample and notches in the journal to dust guard radius (6 at each side)
Образмеренный эскиз образца оси с пропилами в галтельном переходе между шейкой и предподступицей (по 6 пропилов с каждой стороны)





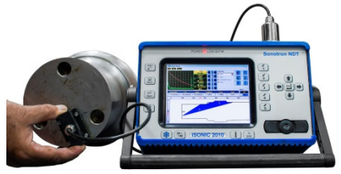
N-N

Cuts	Width	Depth	Location
A	0,2mm	0,2 mm	200
B	0,2mm	0,4 mm	203
C	0,2mm	0,5 mm	206
D	0,2mm	0,8 mm	209
E	0,2mm	1,0 mm	212
F	0,2mm	1,2 mm	215

M-M

Cuts	Width	Depth	Location
A	0,2mm	0,5mm	200
B	0,2mm	0,8mm	203
C	0,2mm	1,0mm	206
D	0,2mm	0,5mm	209
E	0,2mm	0,2mm	212
F	0,2mm	0,5mm	215

Shaft Sample and placement of the PA probe (Образец и расположение ФР-преобразователя при обнаружении пропилов)



File naming policy (наименование файлов):

X_Y.sbx – cross-view along the shaft (sectorial scan) for the cut **X** (**A** through **F**) at the side **Y** (**M** or **N**) of the sample with the recovery of the maximal echo A-Scan from the plurality of A-Scans composing the image and the corresponding beam trace

X_Y_DEPTH.sbx – cross-view along the shaft (sectorial scan) for the cut **X** (**A** through **F**) at the side **Y** (**M** or **N**) of the sample with the recovery of the cut root echo A-Scan used for the determining of the distance between the cut and shaft end

File naming policy (наименование файлов):

X_Y.sbx – разрез вдоль оси (сектор скан) для пропила **X** (**A** … **F**) со стороны **Y** (**M** или **N**) образца с отображением А-Скана, содержащего максимальный эхо-сигнал, выбранного из совокупности А-Сканов, формирующих изображение, и соответствующего хода по лучу

X_Y_DEPTH.sbx – разрез вдоль оси (сектор скан) для пропила **X** (**A** … **F**) со стороны **Y** (**M** или **N**) образца с отображением А-Скана, содержащего эхо-сигнал от корня пропила, используемого для определения расстояния от пропила до торца

Insonification has been performed through the beam steering whilst the focal point travels along the outer surface of the shaft

Прозвучивание осуществляется способом качающегося луча, причем фокальная точка перемещается вдоль внешней поверхности оси

The following PA probe was used / Применялся снижеуказанный ФР преобразователь:

PA-5M32E1P - LINEAR ARRAY PROBE / ЛИНЕЙНАЯ РЕШЕТКА Frequency / Частота: **5 MHz** Pitch Size / Шаг решетки (размер элемента): **1 mm** Number of Elements / Количество элементов: **32** Elevation / Ширина: **10 mm**	Sonotron NDT part # Sonotron NDT артикул: S 4922214381

The aperture composed of all 32 elements was recieved for the emitting / receiving whilst performing pulse echo sectorial scan coverage (Апертура излучения / приема, состоящая из всех 32 элементов, применялась для реализации прозвучивания способом качающегося луча)

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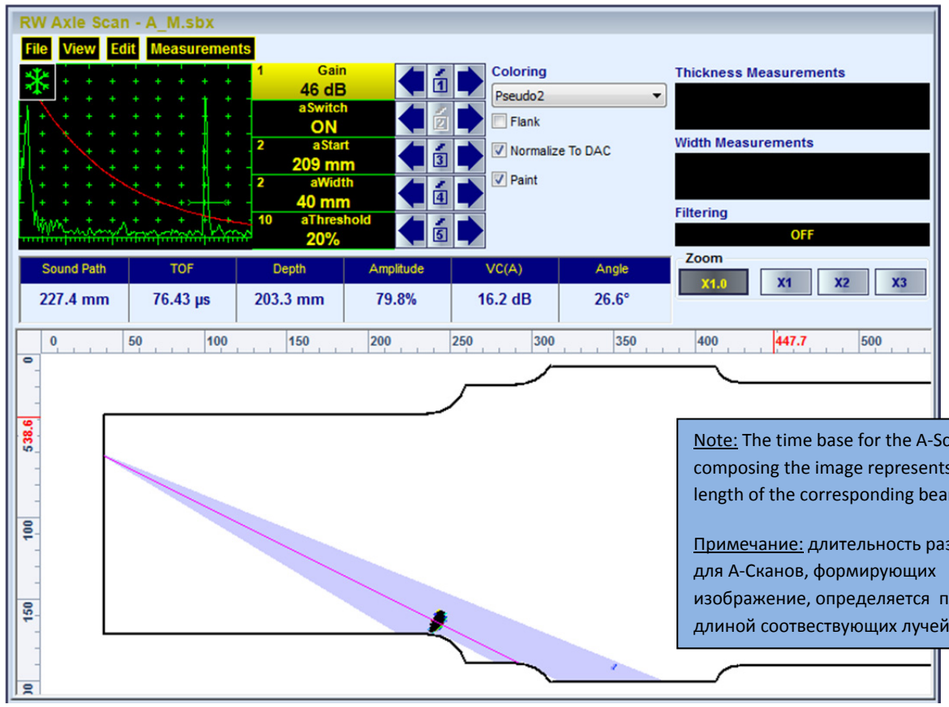
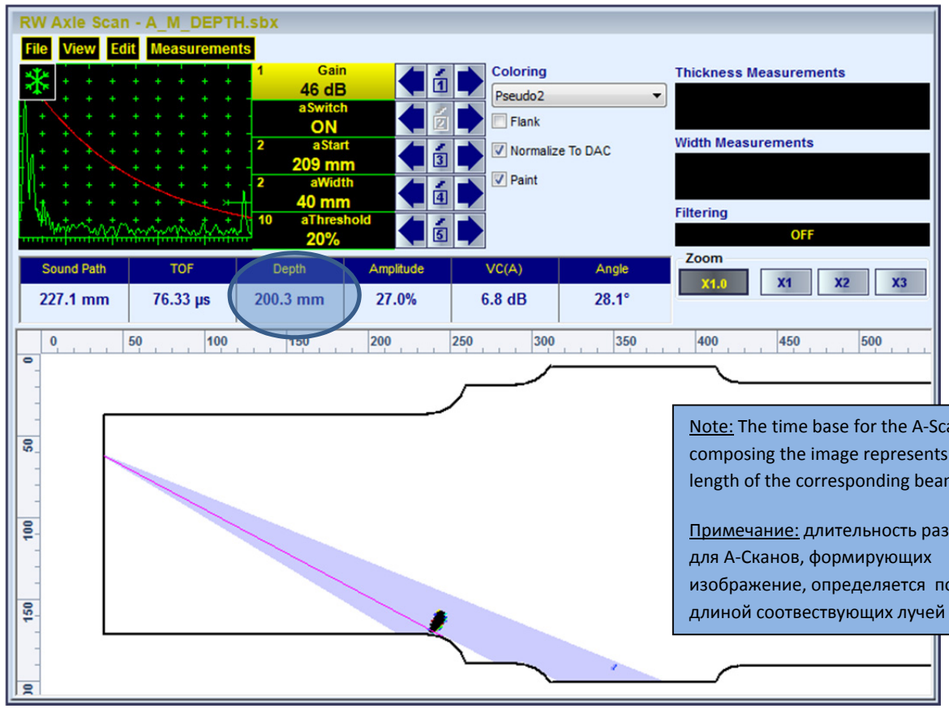
A_M.sbx



Note: The time base for the A-Scans composing the image represents full length of the corresponding beams

Примечание: длительность развертки для А-Сканов, формирующих изображение, определяется полной длиной соотвествующих лучей

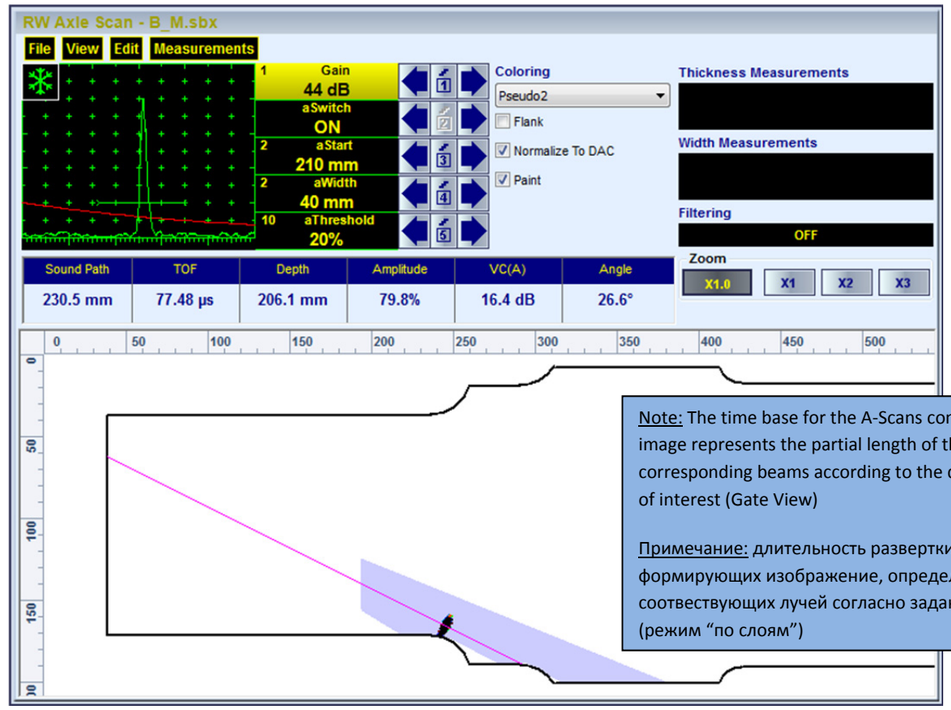
A_M_DEPTH.sbx



Note: The time base for the A-Scans composing the image represents full length of the corresponding beams

Примечание: длительность развертки для А-Сканов, формирующих изображение, определяется полной длиной соотвествующих лучей

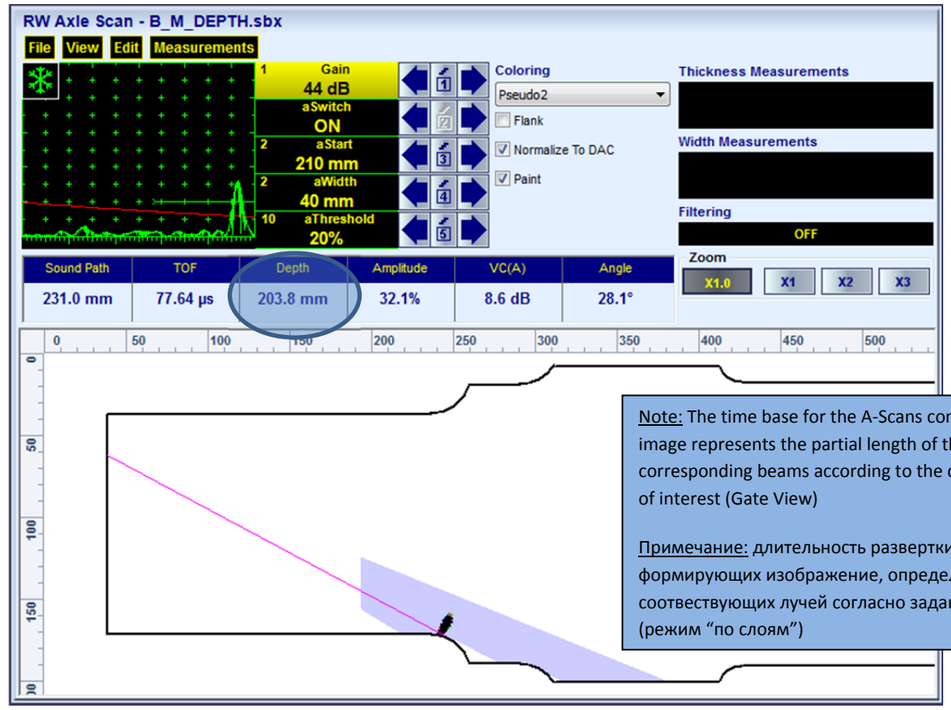
B_M.sbx



Note: The time base for the A-Scans composing the image represents the partial length of the corresponding beams according to the desired region of interest (Gate View)

Примечание: длительность развертки для А-Сканов, формирующих изображение, определяется длиной соотвествующих лучей согласно заданному “слою” (режим “по слоям”)

B_M_DEPTH.sbx



Note: The time base for the A-Scans composing the image represents the partial length of the corresponding beams according to the desired region of interest (Gate View)

Примечание: длительность развертки для А-Сканов, формирующих изображение, определяется длиной соотвествующих лучей согласно заданному “слою” (режим “по слоям”)

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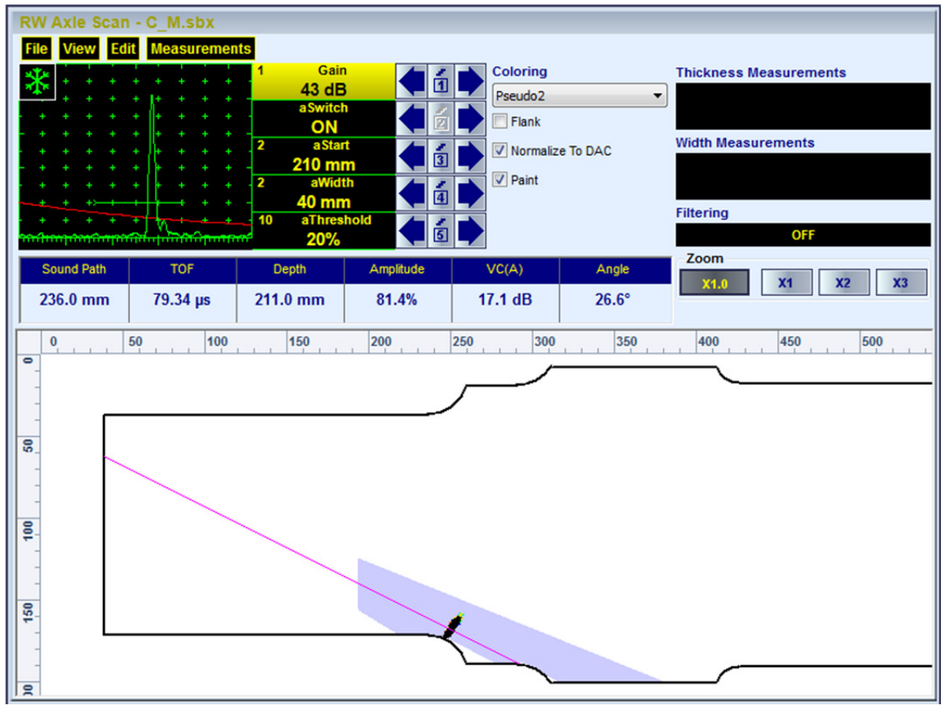
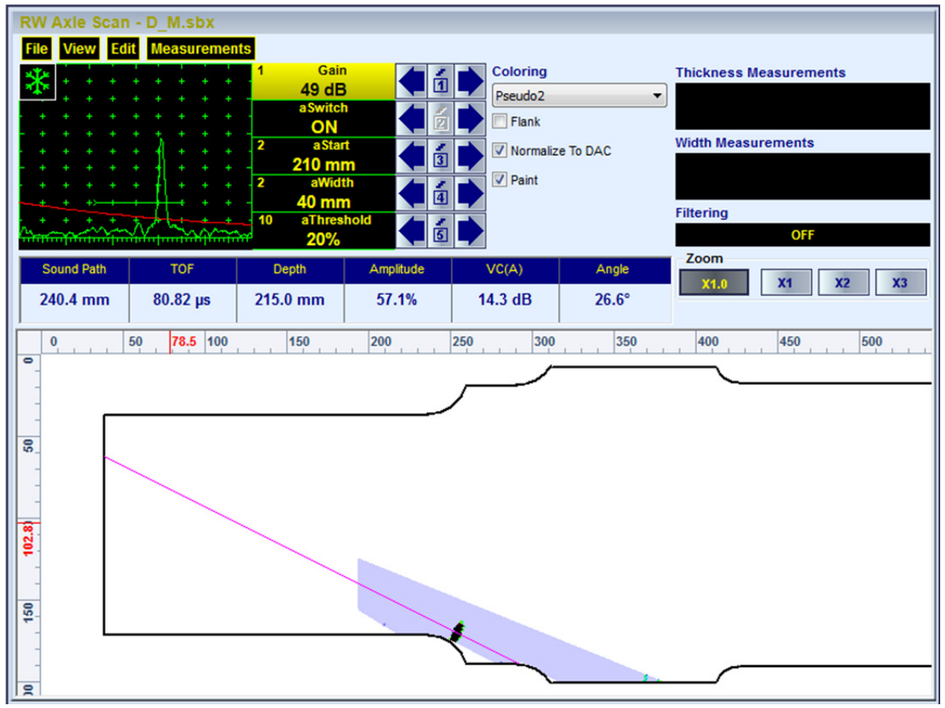
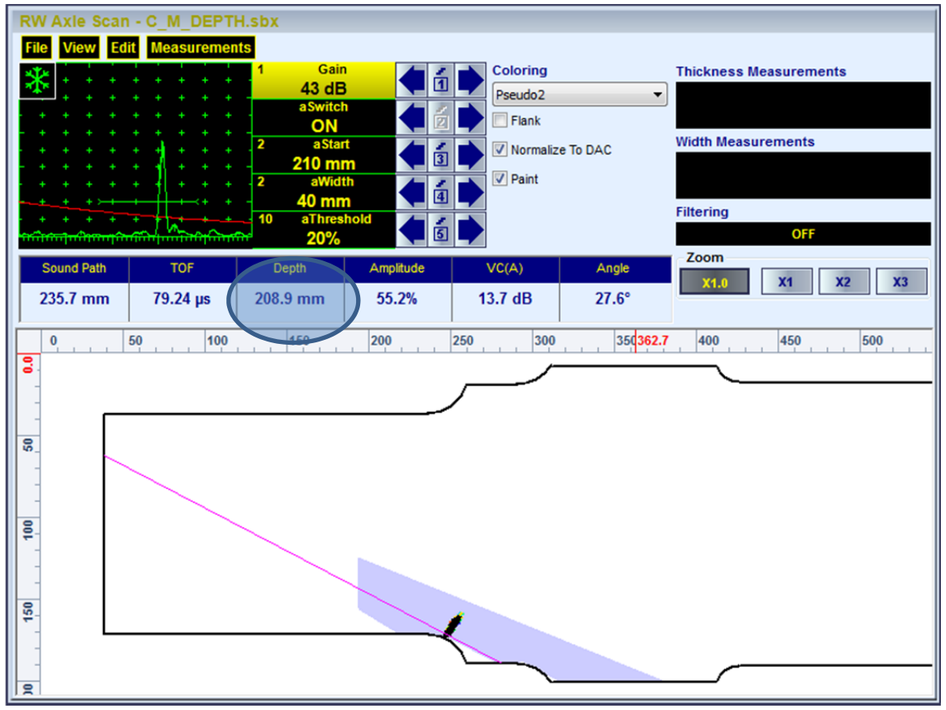
C_M.sbx



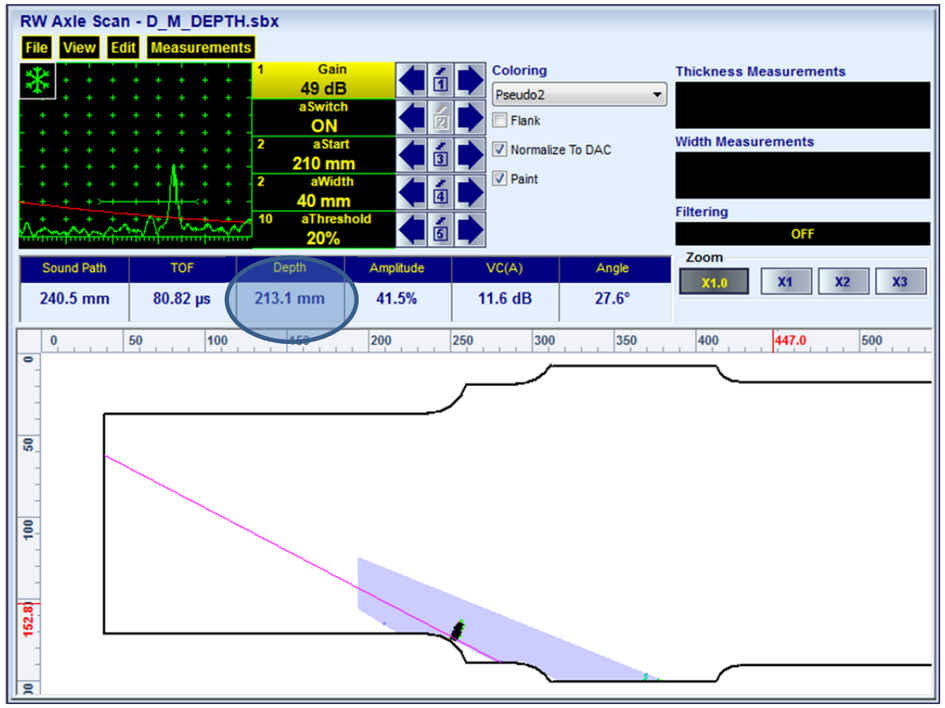
D_M.sbx



C_M_DEPTH.sbx



D_M_DEPTH.sbx



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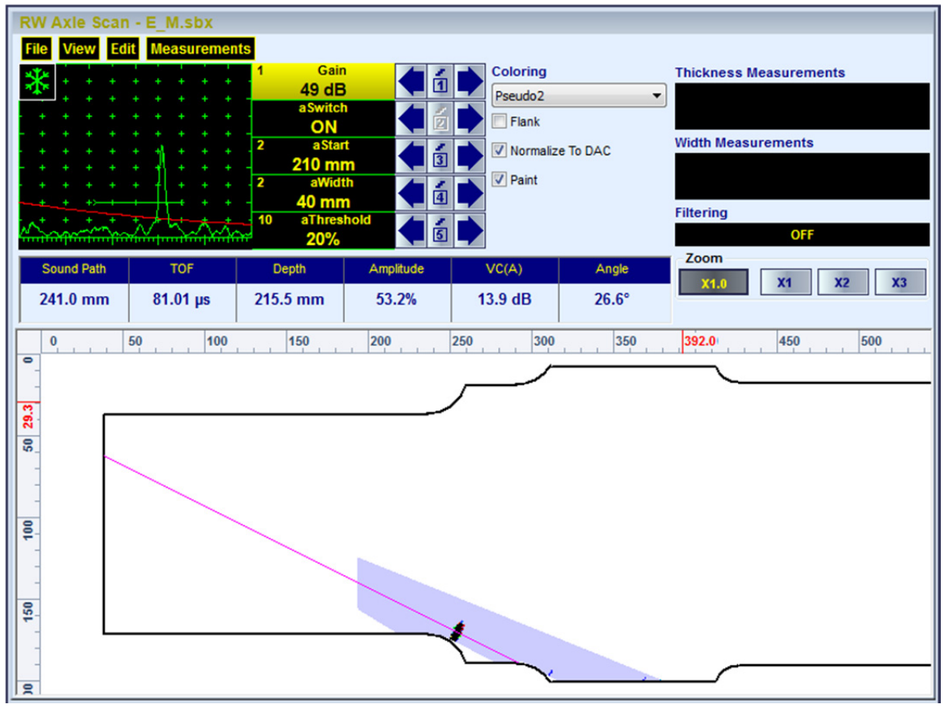
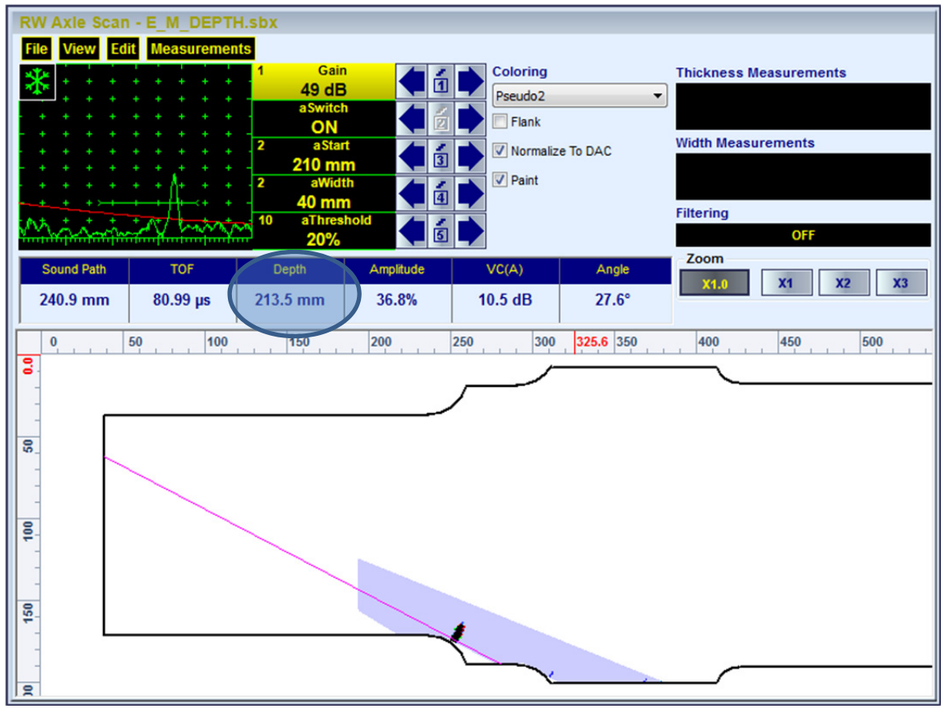
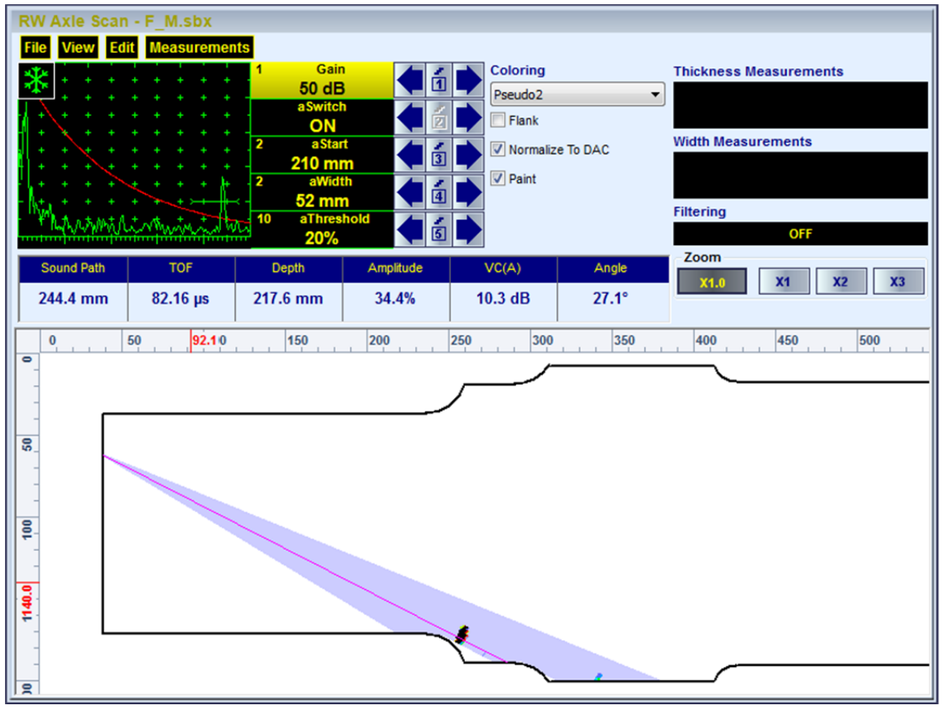
E_M.sbx



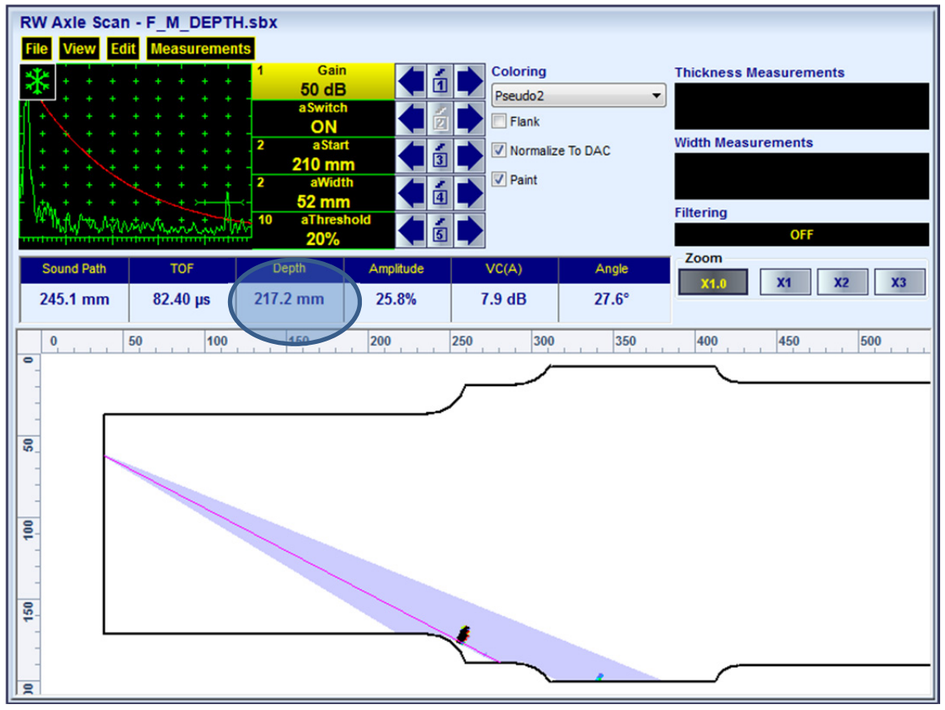
E_M_DEPTH.sbx



F_M.sbx



F_M_DEPTH.sbx



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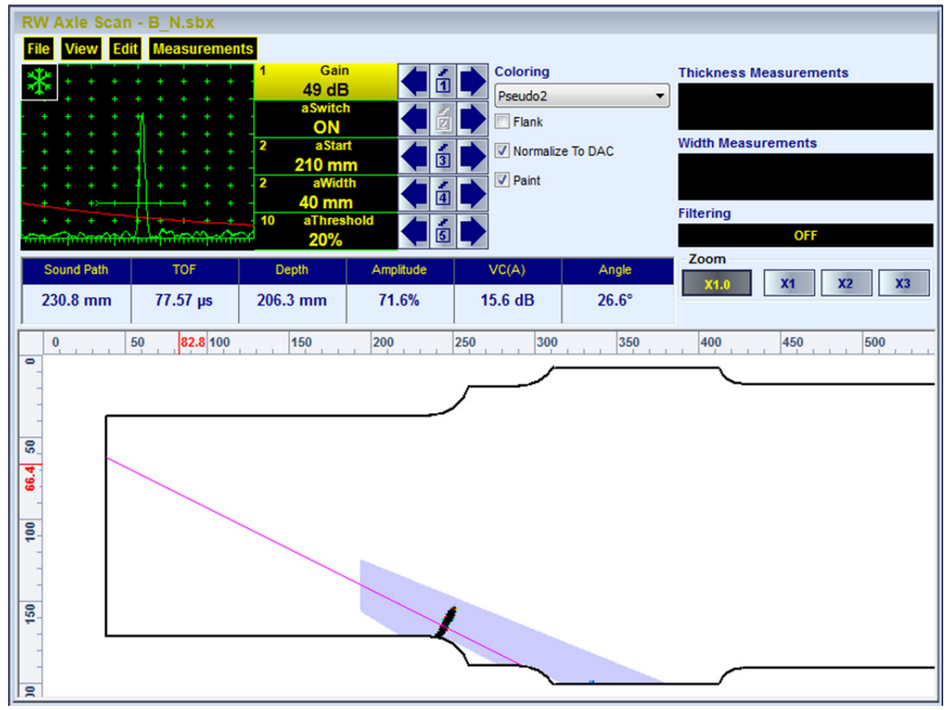
A_N.sbx

A_N_DEPTH.sbx

B_N.sbx



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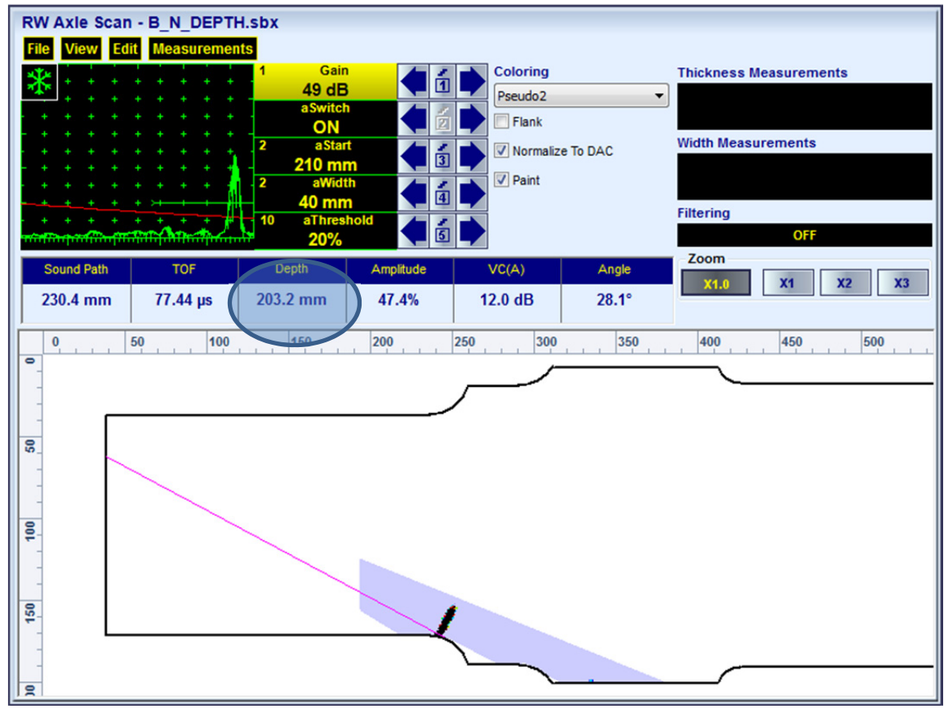

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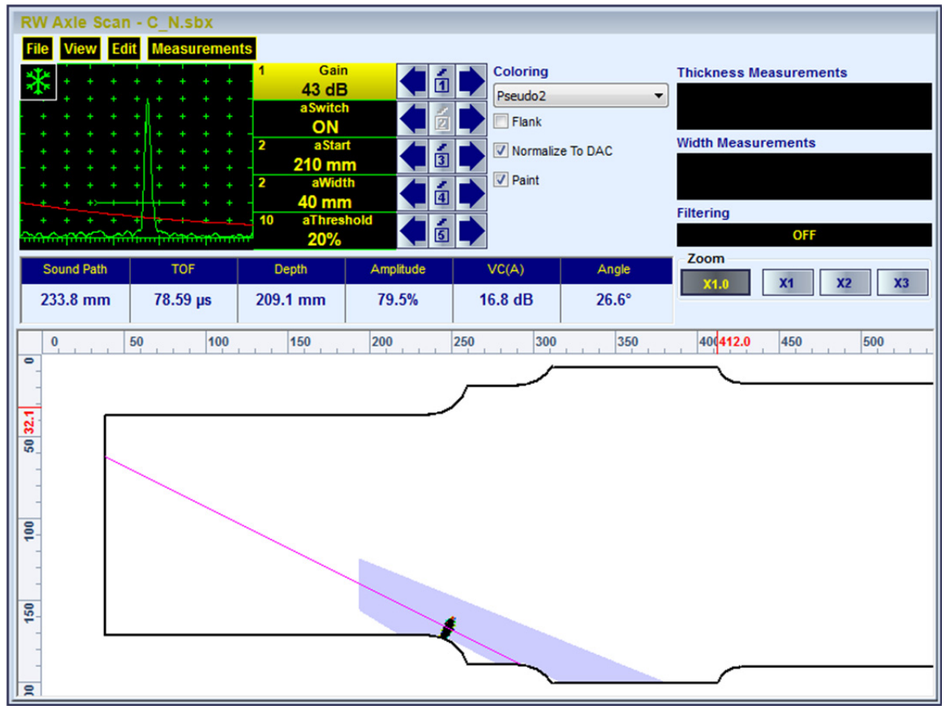
C_N.sbx



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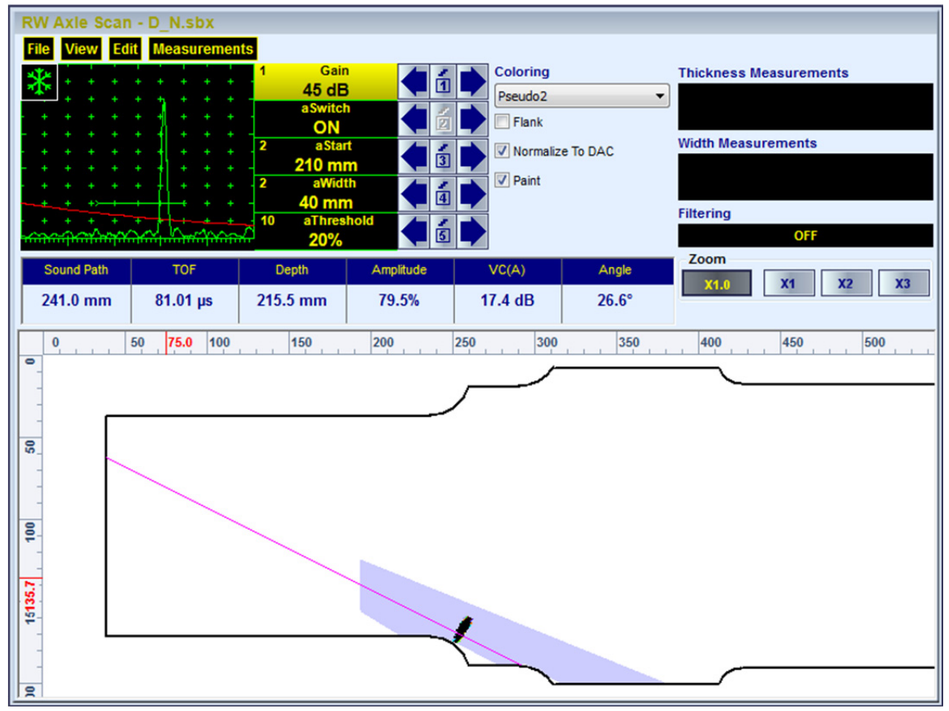

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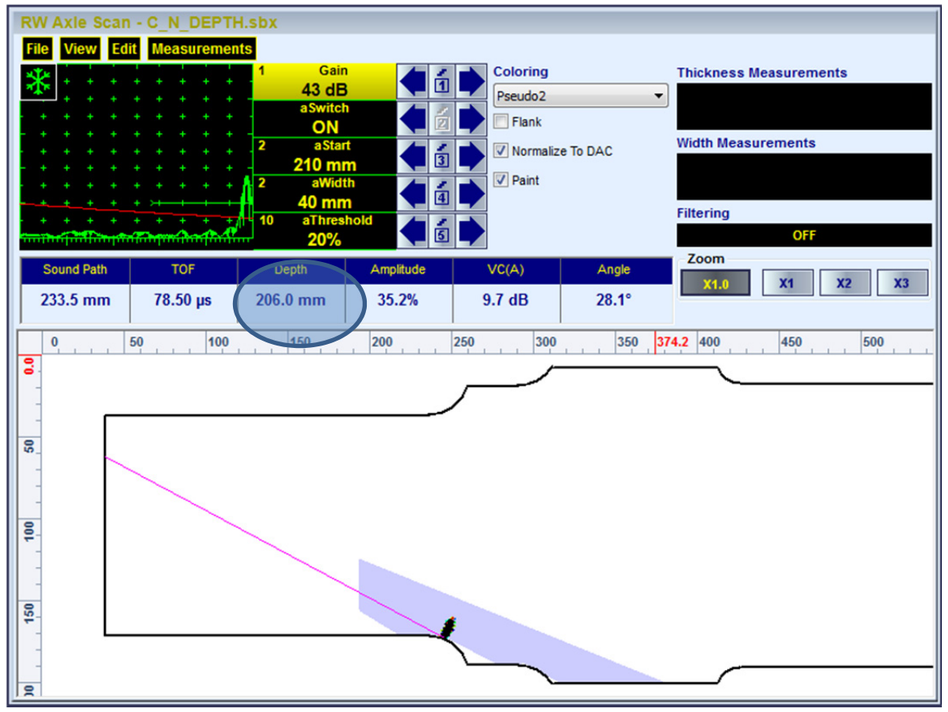

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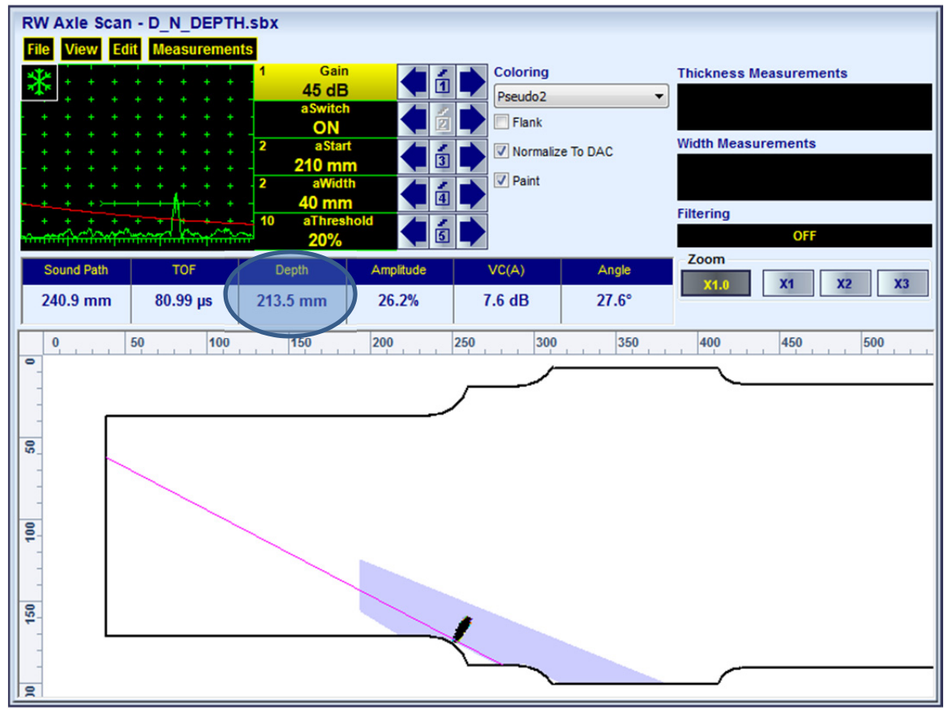

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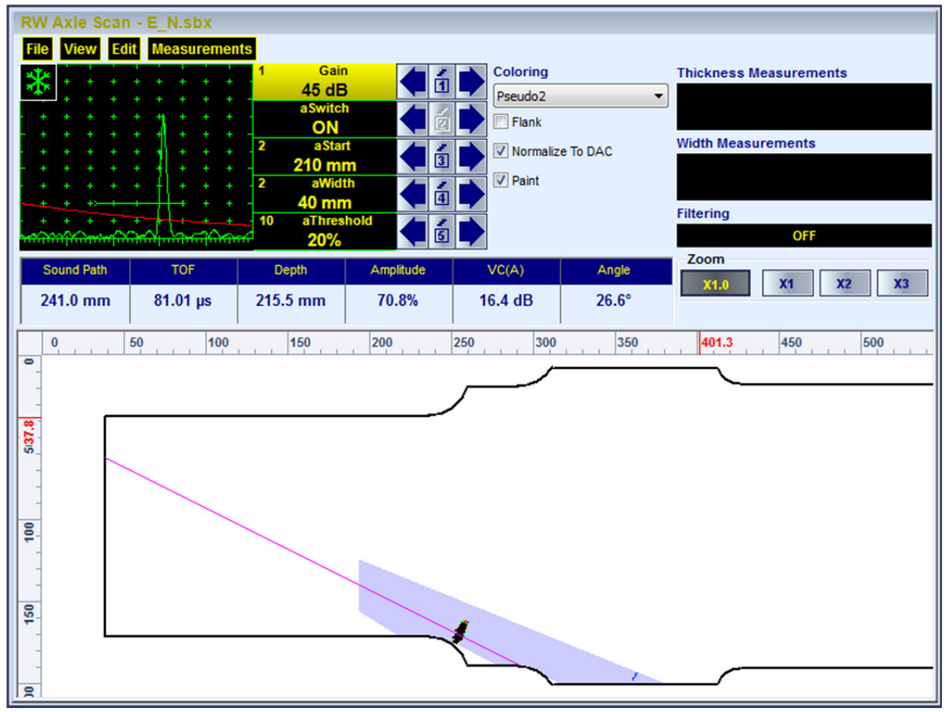
E_N.sbx



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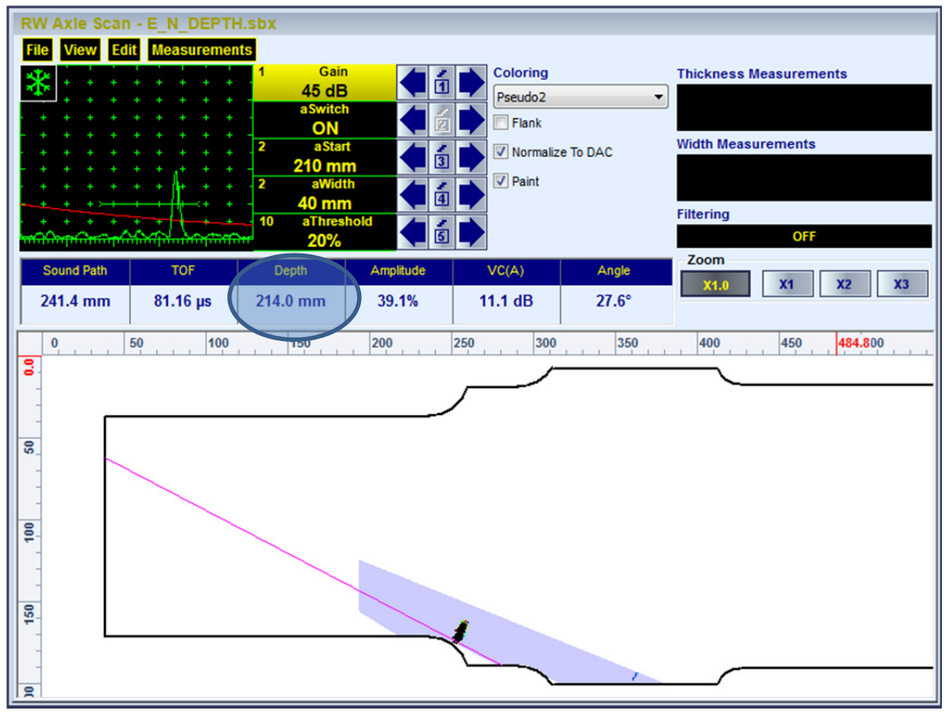

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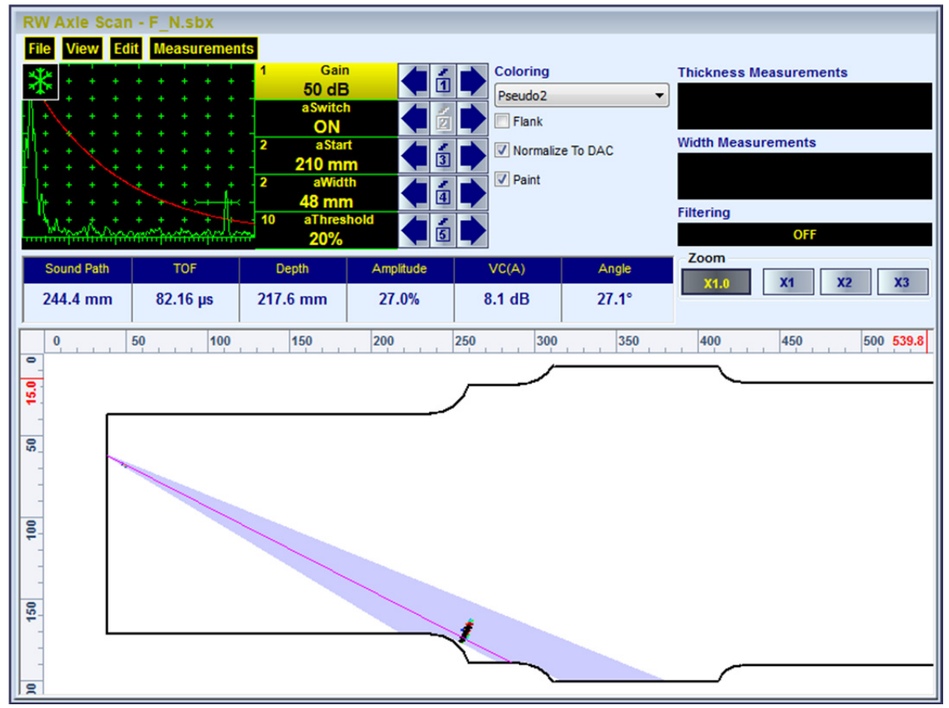

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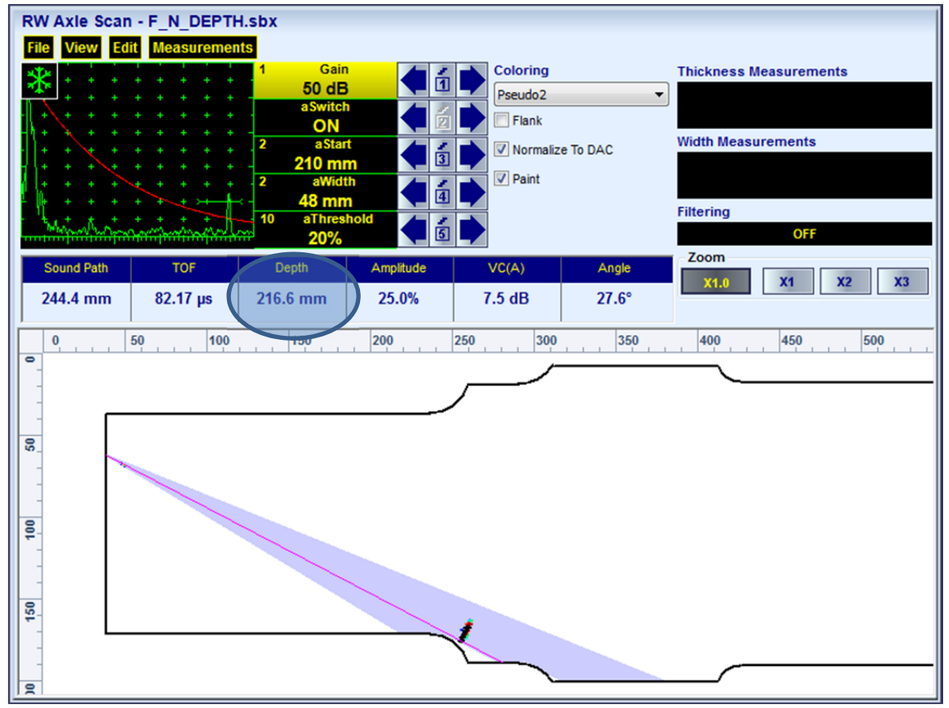

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