5 Connecting the WP2

This section presents the connections between the Sonatest WP2 wheel probe to Sonatest test instruments and instruments from other manufacturers.

The Sonatest test instruments include:

- **veo**
- Prisma
- RapidScan2

5.1 Connecting the WP2 to Sonatest Test Instruments

To connect the WP2 to the **veo**, the Prisma, and the RapidScan2, connect the wheel-probe side of the cable to the WP2 and connect the instrument side of the cable to the test instrument.

To connect the cable to the WP2:

1 Connect the phased array connector to the Samtec connector and fasten it using the thumbscrews.

2 Connect the 10-pin Lemo to the Encoder/GPIO connector located next to the Samtec connector.

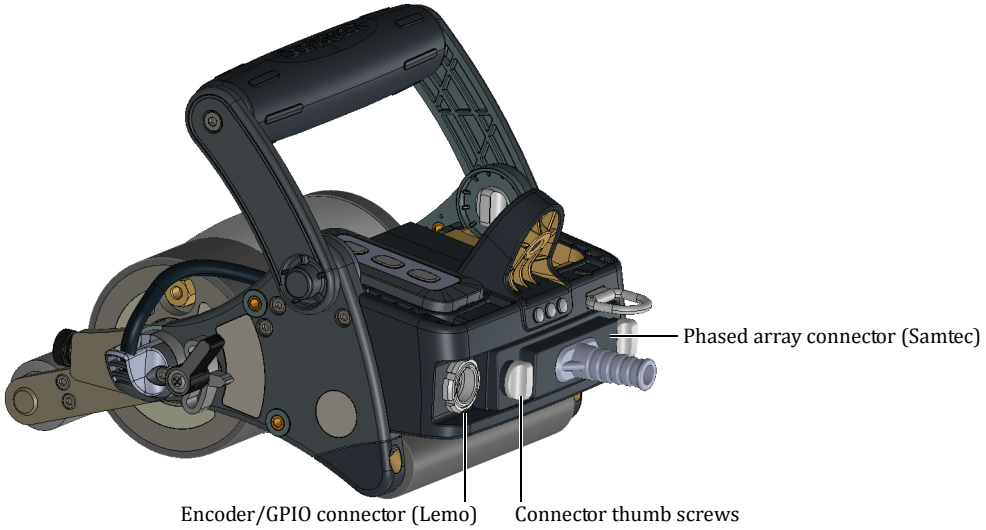

Figure 5-1 WP2 connectors

To connect the cable to the veo:

1 Unscrew the protective cap on the right side of the instrument and place it on the back of the unit (over the CE markings).

2 Connect the phased array connector to the Samtec connector and secure it with the hand screws.

Figure 5-2 Connectors on the right side of the veo

3 Connect the 8-pin Lemo connector to the encoder input (S connector on the right side of the **veo**).

4 Connect the GPIO, 8-pin, Lemo to the I/O input (I/O connector on the right side of the **veo**).

5 Turn on the **veo** and, on the **Inspection** tab, select **Wheel Probe 2** in the **GPIO** list.

To connect the cable to the Prisma:

1 Unscrew the protective cap on the right side of the instrument and place it on the back of the unit (over the CE markings).

2 Connect the phased array connector to the I-PEX connector and secure it with the hand screws.

Figure 5-3 Connectors on the right and back sides of the Prisma

3 Connect the 8-pin Lemo connector to the encoder input (E connector on the back side of the Prisma).

4 Connect the GPIO, 8-pin, Lemo to the I/O input (I/O connector on the back side of the Prisma).

5 Turn on the Prisma and, on the **Inspection** tab, select **Wheel Probe 2** in the **GPIO** list.

To connect the cable to the RapidScan2:

1 On the multi-way connector, turn the black handle to the open position.

2 Connect the multi-way connector on the RapidScan2 panel.

The connector should offer no resistance. If the connector does not easily fit, verify the condition of the connector pins.

3 Once the multi-way connector is installed, turn the black handle to lock it in place.

4 Connect the 7-pin to 8-pin Lemo adaptor to the multi-way connector.

5 Connect the 8-pin Lemo (encoder) connector to the adapter.

Figure 5-4 Connection to the RapidScan2

5.2 Connecting the WP2 to Instruments from Other Manufacturers

To connect the WP2 to the Olympus OmniScan MX2 or MX, connect the wheel-probe side of the cable to the WP2 and connect the instrument side of the cable to the test instrument.

To connect the cable to the WP2:

1 Connect the phased array connector to the Samtec connector and fasten it using the thumbscrews.

2 Connect the 10-pin Lemo to the Encoder/GPIO connector located next to the Samtec connector.

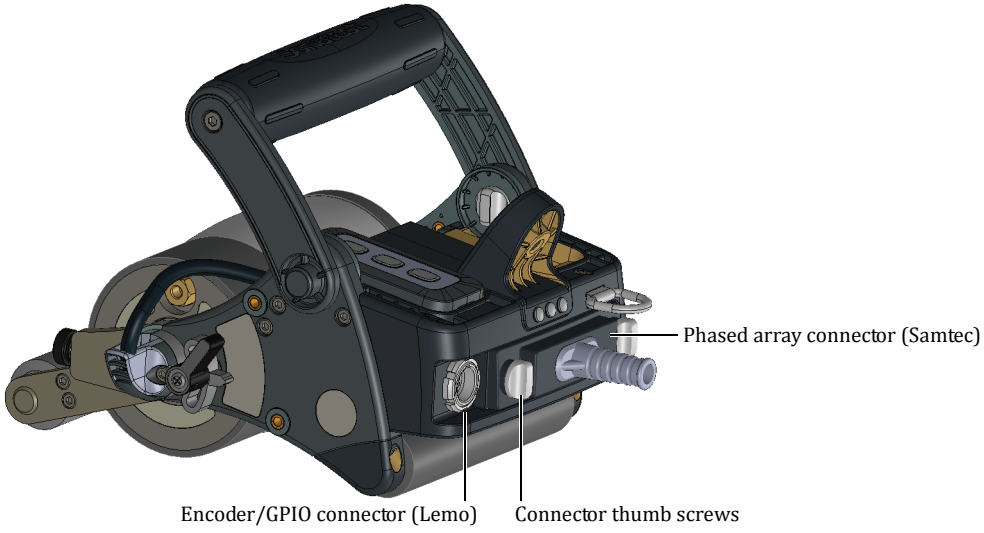

Figure 5-5 WP2 connectors

To connect the cable to the OmniScan:

1 Connect the phased array connector to the I-PEX connector and secure it with the hand screws.

2 Connect the Lemo GPIO and Encoder connectors to the adaptor box.

3 Connect the GPIO DB-9 to the Olympus instrument.

4 Connect the encoder HD-15 to the adaptor output box.

With the OmniScan MX2, the HD15 to Lemo-16 adaptor is required.

Tips for a basic setup in OmniScan

Set the inspection plan to raster scan.

Select the encoder 1 as quadrature.

Select the encoder 2 as a clicker and steps as your index step.

In **Preferences**, set **Din1** for the **Reset Scan** position.

Set **Din2** to **None** because it is a clicker.

Set **Din3** to **Acquisition Enable**.

In the **Gate/Alarm** settings, set alarm 1 for gate A and alarm 2 for gate B.

On the **Output** menu, set gates A and B as outputs 1 and 2 respectively.

6 Performing an Inspection

This section presents the procedures to perform an inspection using the WP2 wheel probe and Sonatest **veo**, Prisma, and RapidScan2.

Figure 6-1

7 Acoustic Recommendations

This section presents the acoustic recommendations while scanning with the WP2. It provides information about settings, calibrations and data extraction for both **veo** and Prisma test instruments.

7.1 Interface triggering (Zero Synchronization)

The interface triggering is used to modify the reception of ultrasound signals. When set to **Yes**, the **IFT Active** item enables the part interface triggering for this scan. It is available for the following types or primary scans:

- A-scan (mono)
- L-scan (phased array)

Once enabled, a new gate (white named "I") is made available in the A-scan view.

Interface triggering is used to synchronize signal interface when it varies from one beam to another. This corrects the distance between the probe and the part when the wedge does not have a fixed height. This feature overcomes delay variations due to the tyre deformation.

To set the interface triggering:

1 On the test instrument, press the MENU key.

2 Select the **Scan** tab and, on the **Scan** menu, select **Rx**.

3 In the list of RX parameters, select **Yes** for **IFT active**.

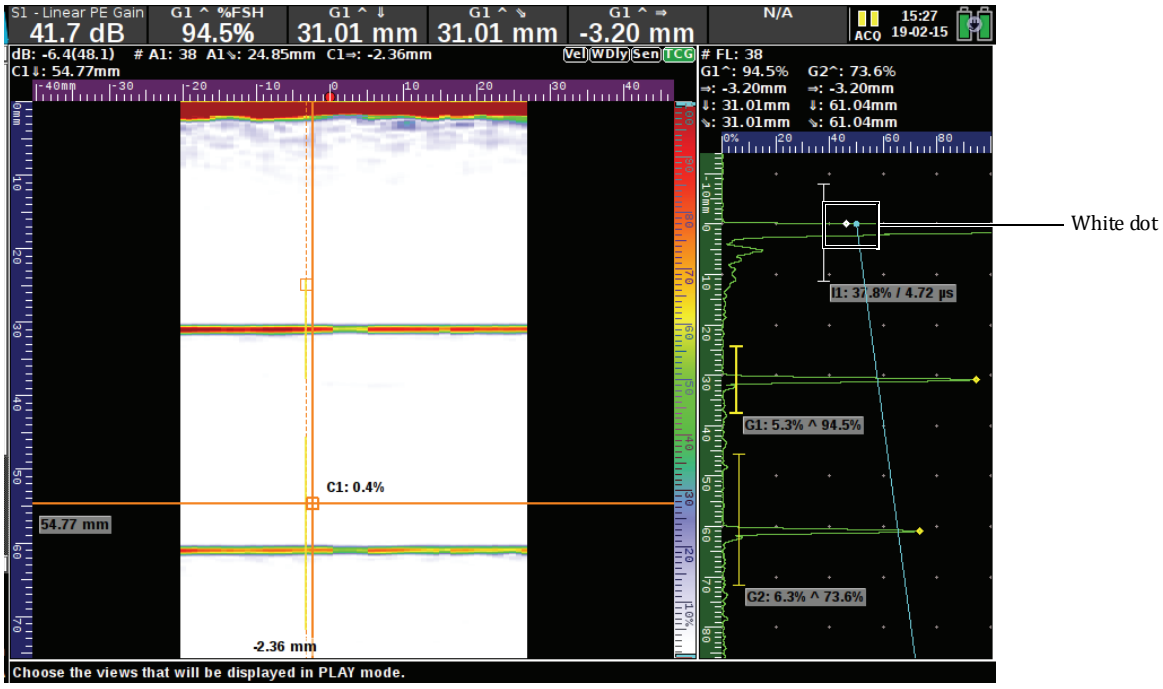

Figure 7-1 Inspection with the IFT Active parameter enabled

In the A-scan, the white dot appearing on the first peak indicates where the 0-mm part starts.

NOTE : The height of the wedge determines where the raw acquisition begins. Reduce the wedge height if you do not see the interface echo.

NOTE : The range of the interface gate defines the time duration of the search for the part interface.

7.2 Material Velocity Calibration

This section presents the material velocity calibration for the **veo** and Prisma test instruments. The Velocity & Zero Wizard calibrates the material velocity and sets the probe zero.

NOTE : While calibrating the material velocity, try to apply more or less the same pressure on the probe handle.

To calibrate the velocity:

1. Select the correct calibration block according to the material to inspect.
2. On the test instrument, press the MENU key.
3. Select the **Calibrate** tab and, on the **Calibration** menu, select **Velocity & Zero Wizard**.
4. Select a thickness reference.
5. Select 2 back-wall echoes.

   The signals from these reflectors determine the velocity of the longitudinal wave in the material.

NOTE : The zero calibration is not used since the IFT gate has been activated.

7.3 TCG and Sensitivity Calibration

The TCG (time corrected gain) sets variable receiver gains over the time base of the A-scan. The primary function of TCG is to compensate for signal attenuation as well as variations in the energy of the sound field through the depth of a material. Therefore, the amplitudes of echoes from reflectors of equal size at different depths in the same material are display at the same full screen height.

Figure 7-2 presents the signal when no TCG has been calibrated. Compare this images to the three others that follow.

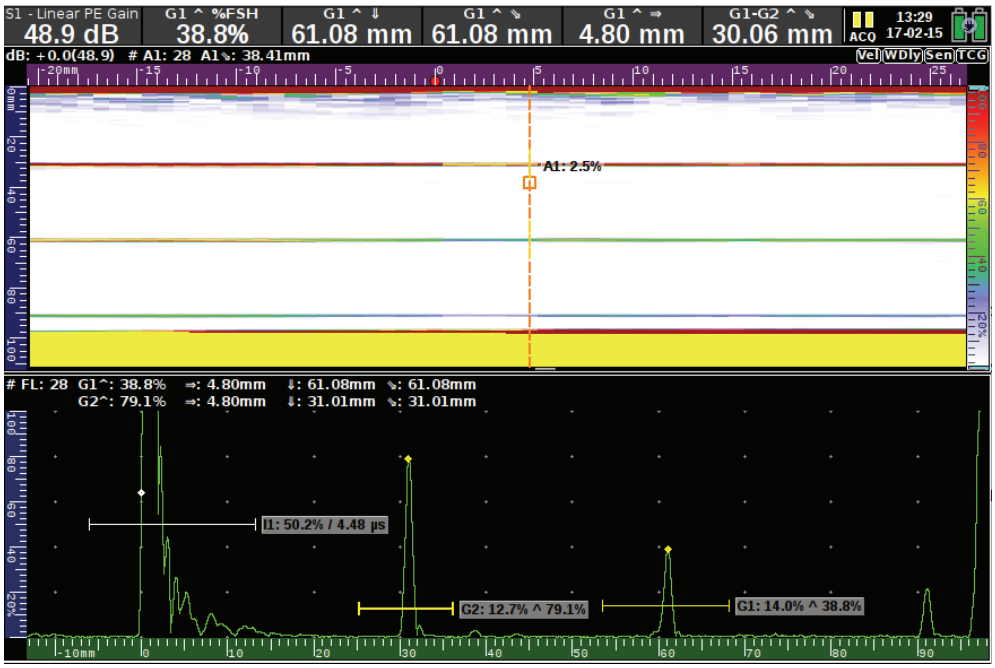

Figure 7-2 Signal without the TCG

There are three types of TCG curve: automated, manual, and constant dB.

Automated

With the automated TCG, each beam is calibrated at 80% full screen height. When using the automated TCG calibration, there is no need to perform the sensitivity calibration.

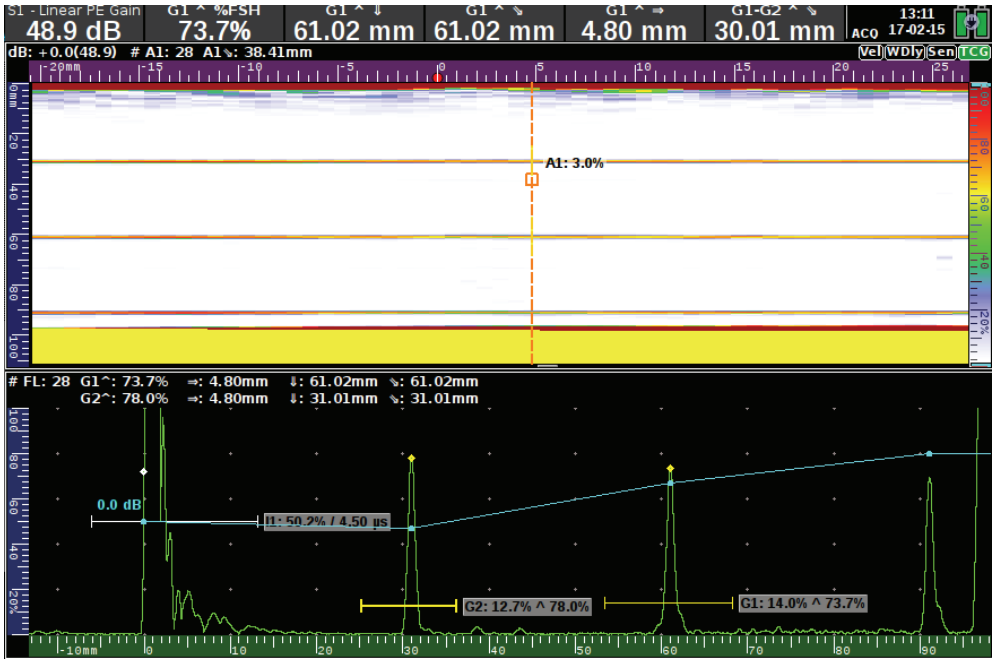

Figure 7-3 Signal with the automated TCG

Manual

With the automated TCG, only one beam is calibrated and then the setting is interpolated to the others.

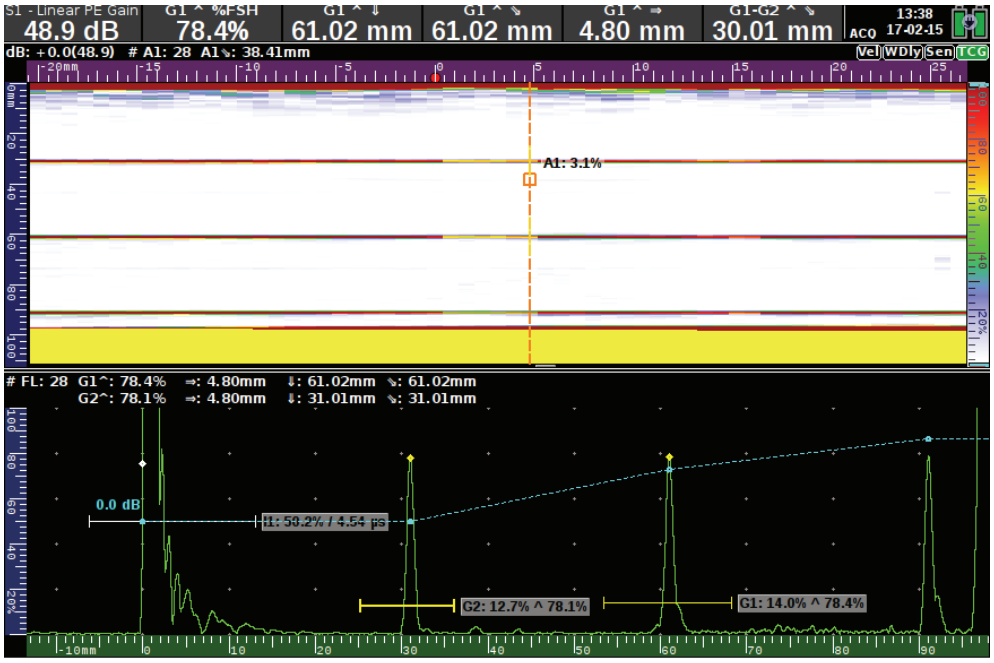

Figure 7-4 Signal with the manual TCG

Constant dB

With the constant dB curve, the gain is adjusted at a fixed gradient (dB/mm or dB/in). The A-scan is amplified from the triggering point and then the setting is interpolated to the others.

Alternatively, the user can setup a custom curve using a calibration block with points set at specific depths. It is possible to create an editable custom curve from a logarithmic curve. The interface gate may be used to trigger both curve types, locking the gain level to the interface.

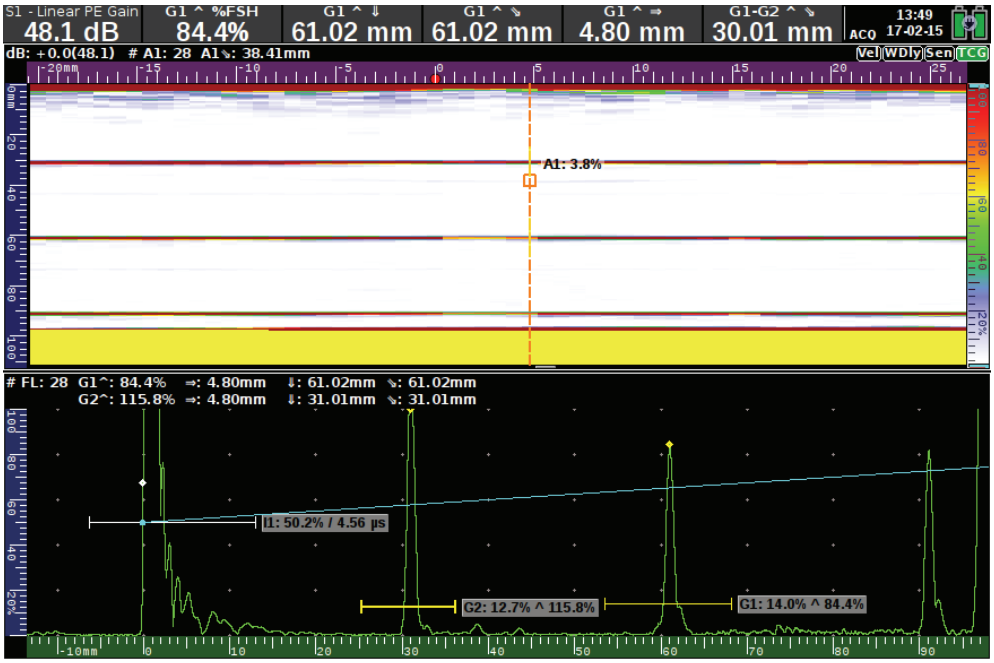

Figure 7-5 Signal with the constant dB TCG

7.4 Extractor Box Function

The Extractor Box is a cursor used to determine the area for the extraction of the Top and End views from L-scans and S-scans. This is very useful as it can limit the area to be included in the projection, allowing the user to cut out any noise from the projection. It limits the range of the view to give a faster rendering that otherwise would require browsing through a lot of data.

The use of the Extraction Box for the **veo** and Prisma test instruments is explained in their respective user manual.

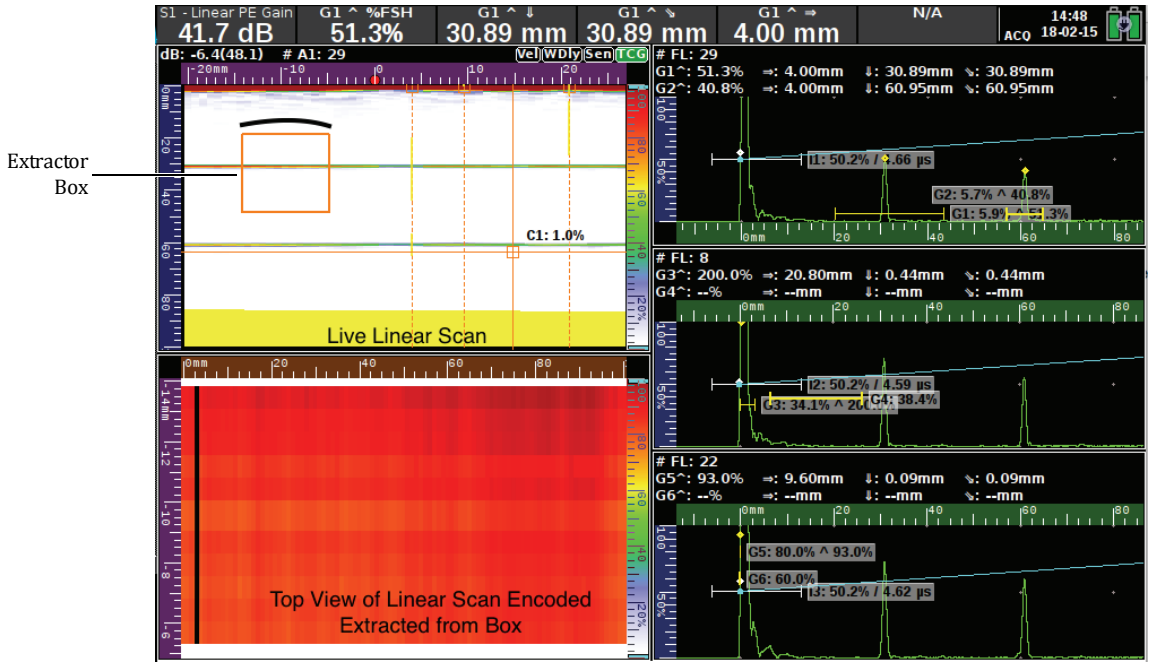

Figure 7-6 Bottom left view shows data extracted from the L-scan in the top left view

7.5 Extracting C-scans from Gates

The C-scan is a view generated from a 0-degree linear scan. It can be described as a two-dimensional graphical representation displaying the gate information obtained relating to signal features in a top, plan view of the part under test. The specificity of the C-scan is that gates are used to extract information from the A-scan (for example the amplitude of a specific echo).

To extract a C-scan:

1 On the test instrument, press the VIEW key.

2 On the View menu, select the view content (amplitude or depth).

3 In the A-scan view, select the gate from which the C-scan will be extracted.

4 Select if the measurements will be relative to the interface or to other gates.

For example, the sound path between G1 and G2 (G being the gate number).

5

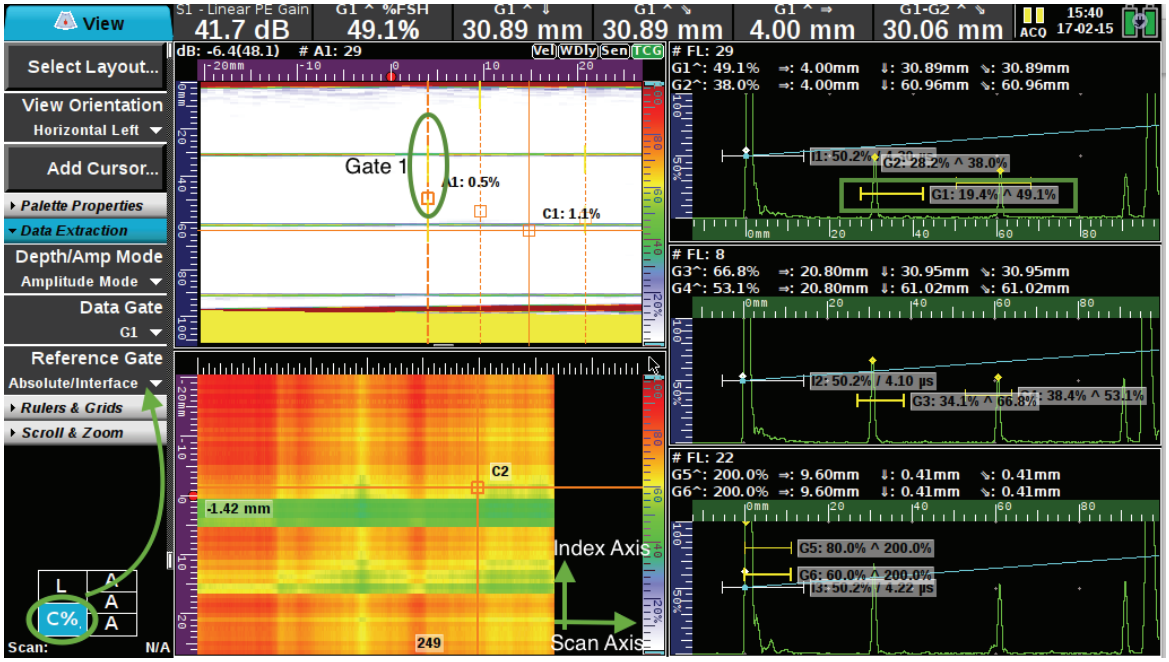

Figure 7-7 C-scan built from all amplitude in G1 of the L-scan

One L-scan is required to build one strip in the scan axis of the C-scan. All amplitude in G1 of the L-scan beams are used to build the C-scan. Gate is positioned beam # 29 to see the current A-scan at #29 but C-view combines all beams. And so on, C-scan is being built when L-scan is encoding forward (or timed based). It looks like extraction box on all L-scan width and its height is Gate Range.

8 Maintenance

This chapter presents what users should do to protect and maintain their WP2 wheel probe in good working condition.

8.1 Refilling the Wheel with Water

This section explains how to verify the water level in the WP2 wheel and how to add water if the level is low.

To verify if the water level is optimal, place the WP2 on the side with the side of fill valve and purge screw facing up.

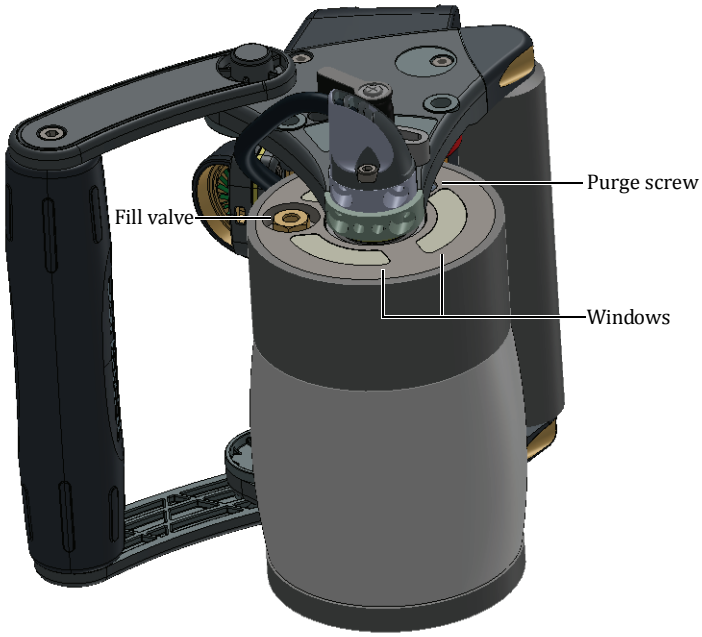

Figure 8-1 Wheel end plate of the side for water refill

Using the windows, verify the presence of bubbles in the water. If there are bubbles, you must remove them to insure the highest performance.

To remove air bubble and refill the wheel:

1. Unscrew the purge screw.
2. Fill the pressurized water pump with preferably distilled water or tap water with Sonatest's PolyHib wheel probe water additive.
3. Place the WP2 in a position to ensure that the bubbles are moving toward the purge screw.
4. Inject water in the tyre through the fill valve until the tyre is filled and all bubbles are expelled from the wheel.
5. Screw back the purge screw while making sure to hold the WP2 in a way that no air enters the purge screw.

8.2 Verification of the Tyre

This section explains how to verify the tyre of the WP2 wheel and how to take care of it.

- Periodically verify the condition of the tyre for damage.
- The tyre should be cleaned with isopropyl alcohol if required.

- Do not expose the tyre to extremes of temperature for long periods of time, as this will cause material deterioration.
- Do do apply excessive pressure on the tyre to avoid water leakage and bubbles from forming.
- Always fill the tyre with distilled/deionised water.
- Add the Sonatest Polyhib water treatment to reduce biological/corrosion issues (30 drops/fill).
- For long term storage, the tyre should be emptied and allowed to dry.

NOTE : Spare tyres can be ordered from Sonatest, refer to the accessory list ordering information.

8.3 Replacement of the Remote Control Battery

This section explains how to replace the battery of the wireless remote control of the WP2 wheel probe.

The remote control is powered by a 20-mm, user-replaceable CR2032 coin cell battery.

Whenever the reaction time of the commands made with the remote control buttons is slow or the range seems limited, the battery should be replaced.

To replace the remote control battery:

1 Unscrew the 4 screws accessible on the bottom cover of the remote control using a T 10 x 4 screwdriver.

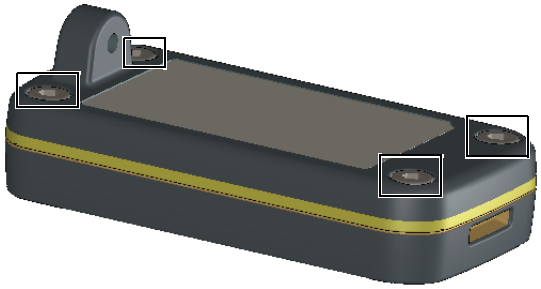

Figure 8-2 The 4 screw at the bottom of the remote control

2 Remove the bottom cover, including the yellow side molding.

IMPORTANT : Make sure not to touch any electronic components or use a grounding wrist strap to protect electronic components against electrostatic discharge.

3 Remove the battery by sliding it close to the golden tab and then lift it.

You can use a finger or a non conductive device to manipulate the battery.

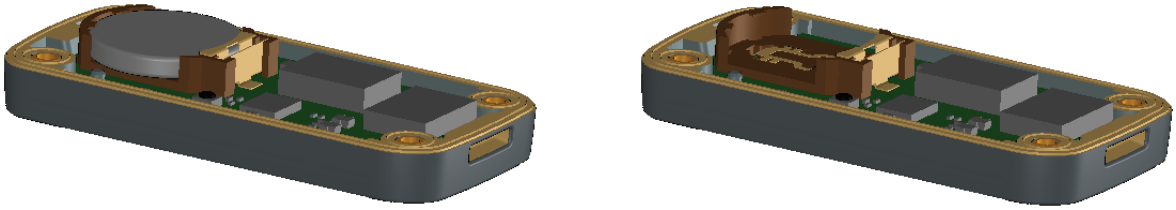

Figure 8-3 The remote control with the battery (*left*) and without (*right*)

4 Slide one side of the new battery under the golden tab and then press on the other side to fully insert it into the its holder.

IMPORTANT : Make sure to place the battery negative tab toward the printed circuit board and positive tab away from the board.

5 Replace the bottom cover making sure to respect the correct orientation as the side of the cover that fits over the battery is different from the other side.

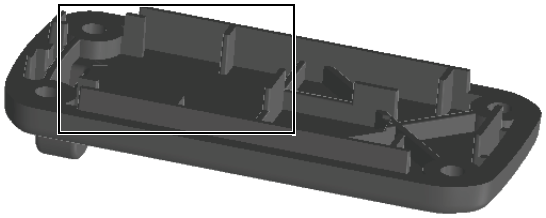

Figure 8-4 The battery side the bottom cover

6 Screw back the 4 screws.

8.4 Pairing the Remote Control with the WP2

This section explains how to pair the wireless remote control with the WP2 wheel probe.

When purchasing a WP2 with a remote control, the two are already paired. However, if you buy the remote control later on or replace it, the two units have to be paired in order for the WP2 to accept commands from the remote control.

Any WP2 can be paired with several remote controls. It is possible to remove one or many pairs from the WP2 memory without affecting the remaining pairs.

To pair the remote control with the WP2:

1 Connect the WP2 wheel probe to the test instrument (refer to chapter 5 “Connecting the WP2” on page 17).
2 Start the test instrument.
3 On the test instrument, press the MENU key.
4 Select the **Inspection** tab and, on the **Inspection** menu, in the **Probe** list, select **WheelProbe 2 Remote Sync**.
5 Load a wheel probe default configuration file and, for the **WheelProbe 2 Remote Sync** parameter, select **Add remote**.
6 While scanning a part, press any button of the remote control.
7 Continue to sequentially press the remote control buttons while verifying that the button commands, on the test instrument screen, match the required action.
8 On the test instrument keypad, press the OK button.

To remove a remote control to WP2 pair:

1 Connect the WP2 wheel probe to the test instrument (refer to chapter 5 “Connecting the WP2” on page 17).
2 Start the test instrument.
3 Select the **Inspection** tab and, on the **Inspection** menu, in the **Probe** list, select **WheelProbe 2 Remote Sync**.
4 Load a wheel probe default configuration file and, for the **WheelProbe 2 Remote Sync** parameter, select **Clear all remotes**.
5 On the test instrument keypad, press the OK button.

Once the bar graph indicating the progress disappears, press the Cancel button or select **Add remote** to pair a new remote control with the WP2.

8.5 Replacing the Tyre

This section presents the procedure to replace the wheel tyre.

To replace the tyre:

1 Disconnect the WP2 from the test instrument.

2 If the front roller is installed, unscrew the two thumbscrews holding the front roller bracket and remove it.

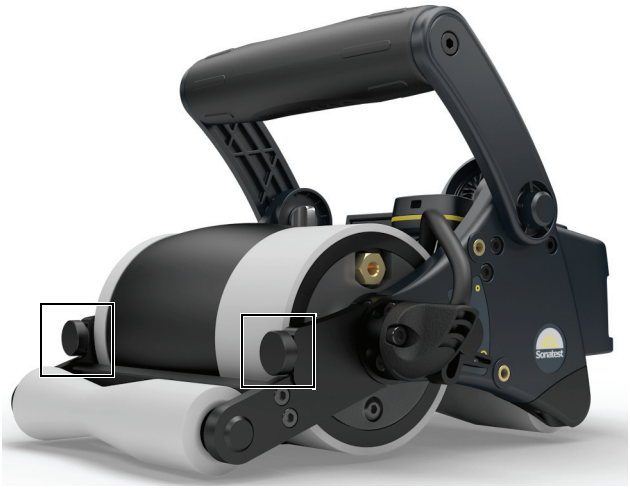

Figure 8-5 Front roller thumbscrews

3 Unscrew the purge screw and empty the water from the wheel (refer to Figure 8-1 on page 33).

4 Using a 2.5-mm Allen key, remove the two screws that secure the cable protector of the phased array connector and remove the cable.

5 Using a 2.5-mm Allen key, remove the indexing arm C strap.

Figure 8-6 Indexing arm C strap

6 Remove both chassis C straps that hold the wheel shaft on both side of the WP2.

IMPORTANT : Make sure that you do not damage the phased array cable while pulling the wheel out of the WP2 assembly.

Figure 8-7 Chassis C strap

7 Unscrew the lock ring that hold the narrow-end plate.

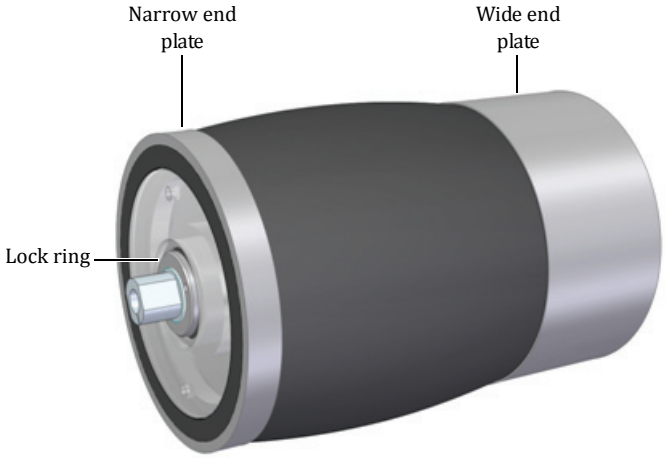

Figure 8-8 Lock ring of the narrow-end plate

8 Remove the narrow-end plate.
Make sure to apply a uniform force when pulling the plate along the axis.

9 Pull the tyre out of the wheel in install the new one.

10 Re-install the narrow-end plate by pushing it in place while applying an axial force.

11 Re-install the lock ring to lock the narrow-end plate.

IMPORTANT : Do not overtighten the lock ring.

12 Re-install the assembled wheel back in place and screw both chassis C straps.
Do not tighten them yet.

NOTE : Both chassis C straps have an alignment mark to help align the phased array probe.

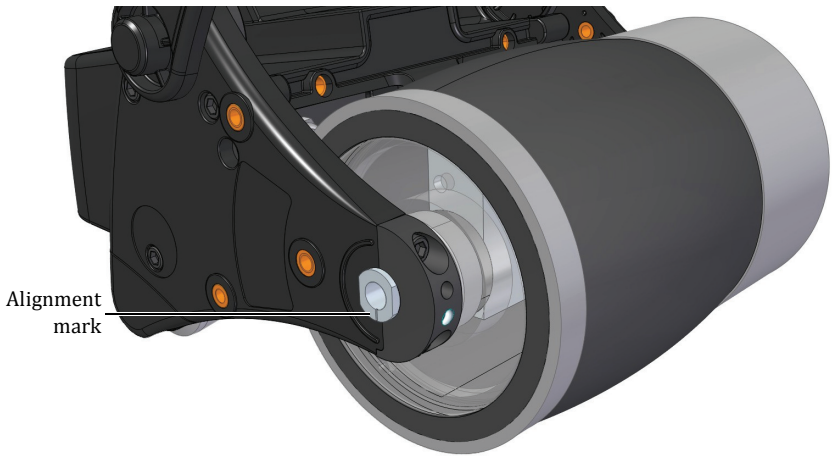

Figure 8-9 Alignment mark on the wheel shaft

13 Make sure you set the indexing arm to its flat setting (yellow circle over the straight line).

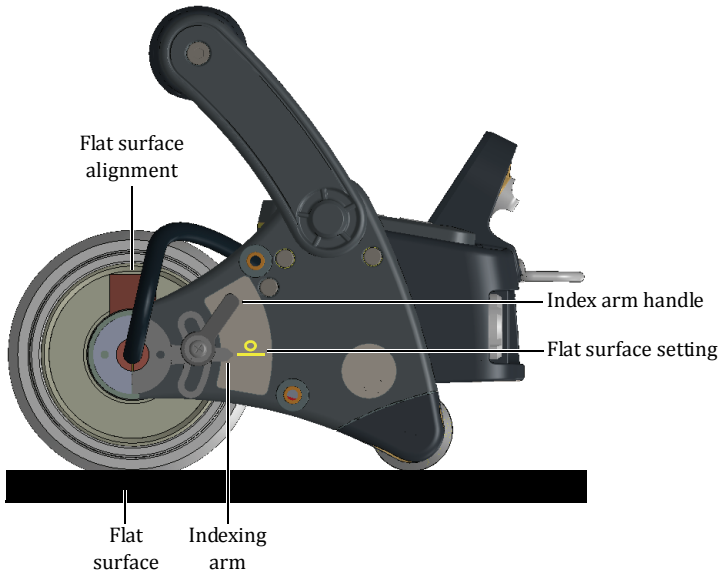

Figure 8-10 Alignment mark on the wheel shaft

14 Turn the wheel so that the phased array probe is perpendicular to the flat surface and tighten the chassis C strap screws.

15 Re-install the indexing arm C strap, the protector of the phased array cable, and the front roller if required.

16 Fill the wheel as indicated in section 8.1 “Refilling the Wheel with Water”.

8.6 Contact Support

For additional support or training, please contact your local distributor.

Visit our website or e-mail us at:

www.sonatest.com
sales@sonatest.com

Contact information

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Website URL: http://www.sonatest.com		

9 Product Specifications

This section presents
