HomeLand

carXray

and

Digital Colour UVSS

(Under Vehicle Screening System)

Proposal by:

HomeLand Technology Sdn. Bhd.

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1. Basic System Overview

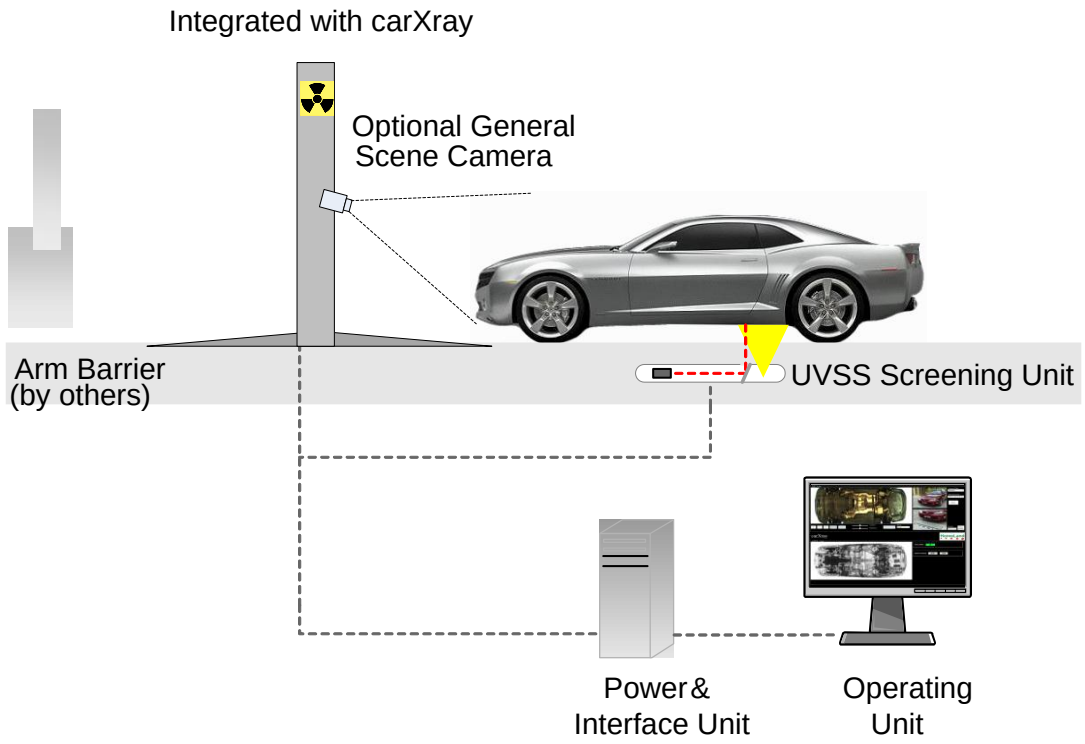

Fig 1: Configuration Digital Colour UVSS Integrated with carXray

System Architecture

Digital Colour UVSS comprises a Screening Unit, a Power & Interface Unit, an Operating Unit, triggering sensor (a pair of loop sensor for fixed system). Depending on requirement, Digital Colour UVSS can be operated with various additional items.

The Screening Unit consists of a high-resolution colour camera with protective housing and LED illumination units. It is available in flushed, surface mounted or portable design.

The Power and Interface Unit is a junction for all the cables and power supplies. It also houses an interface controller to process the undercarriage image to be sent to the Operating Unit.

The Operating unit is equipped with the vehicle's undercarriage image capturing unit and system integration software for image consolidation which allow the user to inspect the complete vehicle's undercarriage image through the LCD screen.

HomeLand carXray is capable to be integrated with HomeLand Digital Colour UVSS series as a complete physical inspection solution or working as a standalone system.

System consisting a Scanning Gantry which houses the X-ray Source and the Detector. Connecting to a Power and Interface unit which supplies power to the system and acts as a connecting point between the Screening Unit and the Operating Unit (computer system)

Operation

UVSS:

The triggering sensor of Digital Colour UVSS will detect the incoming vehicle and send signal to trigger ON the camera system for screening activities. The Screening Unit captures and transmits the captured undercarriage image to the Power and Interface Unit via cables.

The camera system will be back to standby mode when the subject vehicle leaves the Screening Unit and ready for the next screening.

HomeLand carXray:

Activated immediately as the vehicle approach the carXray drive-through gate. Vehicle continue to drive through the gate at a speed up to 20 km/h. Developed to thoroughly inspect the subject vehicle. Dual energy technology is applied to differentiate low density contraband, such as explosives and narcotics from high density materials, such as steel by displaying different colour code.

All the captured undercarriage and X-ray images are displayed on the Operating Unit monitor screen. It requires only one security officer to perform visual inspection by comparison between the current and the reference image of the undercarriage displayed on the LED monitor screen. After the inspection is done, the vehicle will be cleared to enter the premises.

Optional Items

License Plate Recognition System (Automatic System):
An OCR system designed to capture and recognise the plate number of the in-coming vehicle, and display on the monitor screen automatically. This system will speed up the timing and accuracy of recording the vehicle license plate. However, this application is subjected to the surrounding environmental factors and design of the local license plates in each country.

License Plate Capturing System (Manual System):
The License Plate Capturing System will capture the image of the approaching vehicle by focusing at its license plate. The UVSS user interface displays the license plate image and enables the operator to manually key in the numbers in the absence of the License Plate Recognition System. The vehicle's information such as its car plate number, date and time of entry would be saved within the UVSS database. In future, users can search for images based on the car plate numbers or date and time of entry.

General Scene Camera:
The General Scene Camera is used to capture the external front-end image of entry vehicle to record its makes, model and colour. The captured image will be also displayed on the LCD screen. The image along with date and time of entry would be saved into the UVSS database.

2.1 carXray Capabilities

1) **Penetration**
   Using X-Ray energy strong enough to penetrate up to 25mm steel, and at the same time complies with the stringent safety limit listed in the ANSI N43.17-2009 (American National Standards Institute).

2) **Low Radiation Dosage**
   Radiation dosage as low as below 0.05µSv, very much lower radiation one could get as compared to taking an airplane.

3) **Dual Energy**
   Separate the materials by displaying different colour to identify low density material such as contraband, explosives and narcotics from high density materials, such as steel.

4) **Automatic Detection**
Suspicious and foreign objects to be automatically detected and high-lighted in RED to attract immediate attention of the inspection officer.

5) **High Throughput**
Capable to handle high volume of vehicle scanning. High throughput of 300 vehicles scanning per hour.

2.2 carXray Safety Features

1) **Visual/Audio Alarm** – Flash lights / Siren indicating that a scan is in progress.

2) **Vehicle Speed Sensor –** System will be shut down automatically when the vehicle speed falls below 5km/h

3) **Interlock Mechanism –** System will be shut down automatically in the event of any system problem that could result in abnormal or unintended radiation emission

4) **Emergency Switches –** One located at the Drive Through Gate, and another at the Operating Unit

2.3 Digital Colour UVSS Capabilities

1) **Advanced Technology**
Digital Colour UVSS is applying Digital Imaging technology to view and inspect the underside of vehicles. The System is capable of screening vehicles of all sizes, from motorcars to container trucks.

2) **State of The Art Software**
The propriety HomeLand Screening Software is developed to enable a fast and effective inspection to the security personnel. The undercarriage image can be captured in just 3 seconds.

3) **High Quality Colour Image**
Digital Colour UVSS uses a high-resolution linear CCD to capture a full-length undercarriage and display high quality colour image of at 5000 x 4096 pixels per line ready for inspection. The clear details facilitate easy, fast and accurate inspection in the shortest possible time.

4) **Capturing of Fast Vehicle's Speed**
Vehicles need not to stop when screened by Digital Colour UVSS. High quality images will be captured and displayed with vehicle travelling speed up to 60km/h.

5) **Comparison with History Record**
History record of the same vehicle's underside image can be displayed together with the current entry image for visual comparison. This enables foreign objects or any significant modification at the underside of vehicles can be identified accurately.

Automatic comparison function is available to assist by identifying any changes/differences between the two images. This function is to be used as assistance to the operator during inspection. The final inspection result is to be determined by the Operator.

6) **User Friendly GUI**
The GUI of Digital Colour UVSS offers a variety of functions. Scroll, zoom-in and roam-about functions around the complete undercarriage still image for quick analysis or scrutinized inspection. Brightness and contrast control level is also provided.

7) **Data Retrieval & Archival**
Images can be archived and retrieved into a database server or any USB drives. All images are automatically saved with date & time stamping for post event analysis and report generation. Images can also be printed on colour printer as and when required.

8) **Security Feature**
Digital Colour UVSS requires two different passwords for Administrator and Operator log-in and information retrieval respectively to ensure authorized access and to avoid violation on the system.

9) **Integration with Complementary Systems**
Integrating other scanners or security equipment with Digital Colour UVSS is possible to enhance the level of protection. For example, Automatic Number Plate Recognition can be included to provide a comprehensive security solution.

10) Region of Interest

Operators are able to mark out any suspicious locations on the undercarriage image and input remarks accordingly. This function enables the management or any other personnel in position to take note of the marking when they were referred to.

3. Technical Specifications

3.1 HomeLand carXray

carXray	
Material	Galvanized Mild Steel
Mounting Option	Surface; Fixed Mount
Drive-Thru Gate Dimension	3000mm(W) x 2500mm(H)
Detection Technology	X-Ray
Vehicle Speed	Up to 20 km/h
Throughput Rate	12 Seconds per car
Penetration	25mm Steel
Zooming on Image	Up to 12 Times
Storage Capacity	500 GByte (Expandable)
Environmental Standard	IP 65
Operating Temperature	-5 °C to +55 °C
Radiation Dosage	Below 0.05µSv
Compliance	ANSI (N43.17-2009)
Operating Software	HL carXray Software

** Specifications are subject to change without notice*

3.2 Flush Mounted Digital Colour UVSS

Screening Unit		
Pit Cover Material (Flush Mount)		Galvanized Mild Steel
Camera	- Type	High Resolution Digital Colour Camera
	- Resolution	4096 pixels
	- Iris	Fix
	- Field of View	120°
	- Protective Housing	IP 67 (Flush Mount), IP 65 (Surface Mount)
Illumination	- Type	LED Lights
Operating Unit		
Operating System		MS Windows 10
Processor		Intel® Core™ i3 processor
RAM		2 GB
Hard Disk		Min 500 GByte
Display		21” LCD Monitor
Operating Software		HL Digital Colour Screening Software
Others		Keyboard & Mouse
GUI Application		English
Others		
Operating Temperature		-5 °C to +65 °C
AC Voltage		110 - 120V 60Hz / 220 - 240V 50Hz

** Specifications are subject to change without notice*

4.1 Sample UVSS GUI

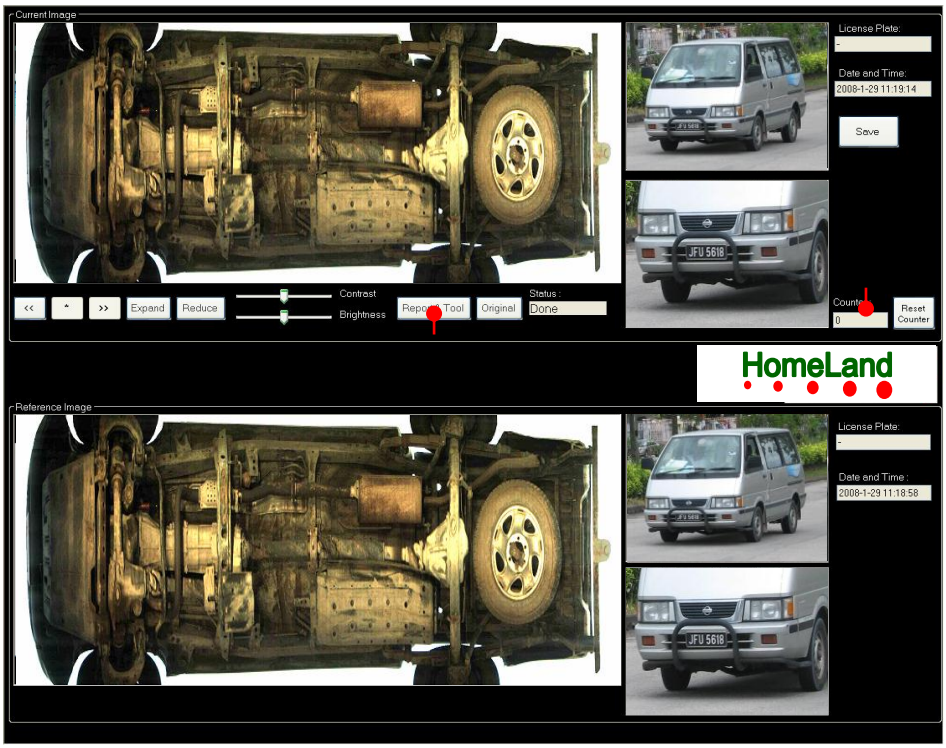

Fig 2: Sample UVSS User Interface

4.2 Sample carXray GUI

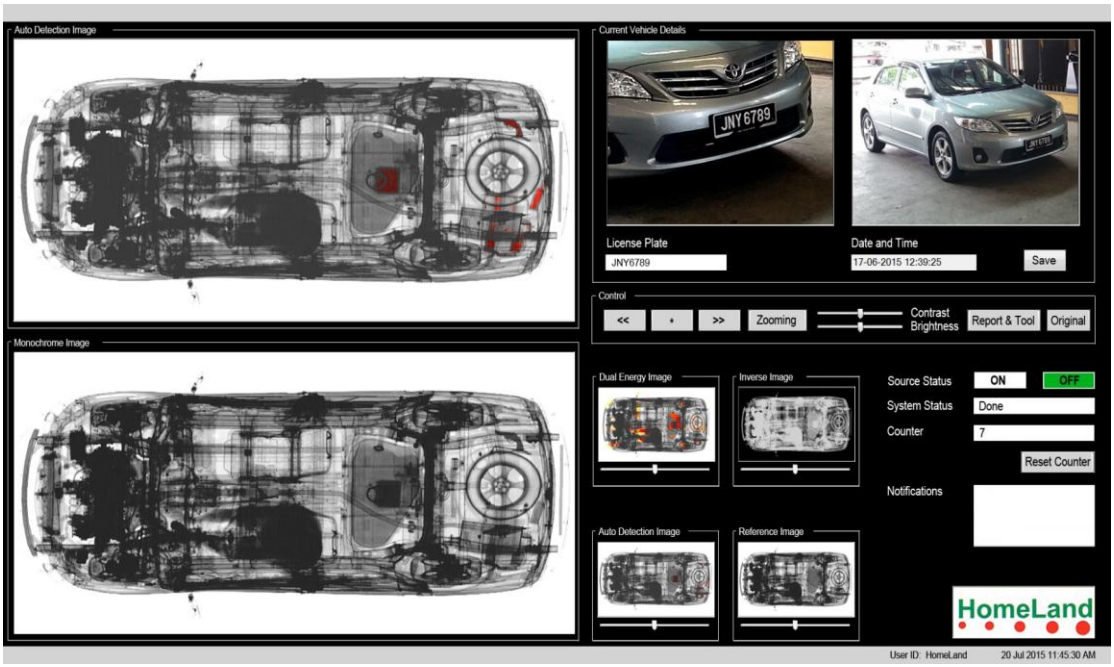

Fig 3: Sample carXray User Interface

5. Sample Images

5.1 Sample UVSS Images

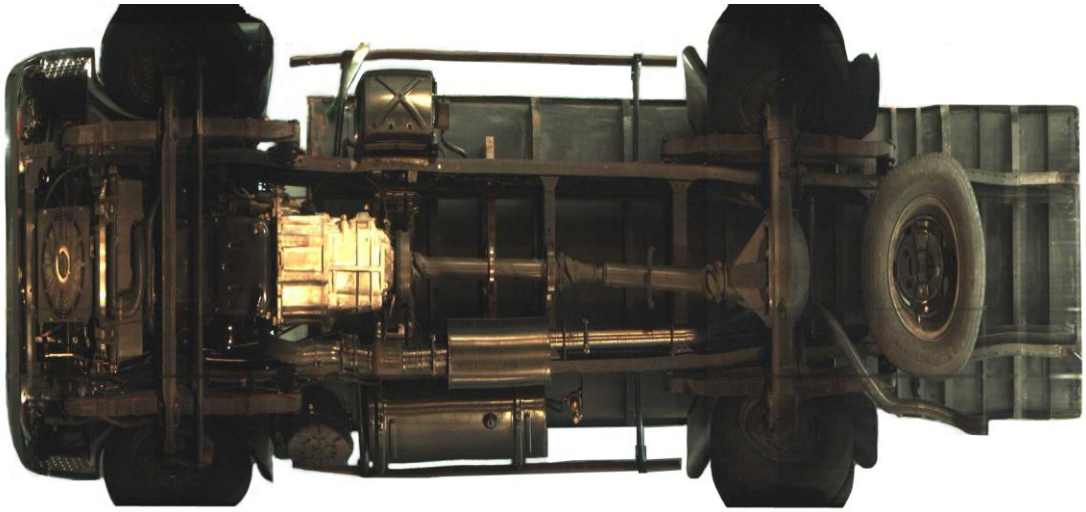

Fig 4: Undercarriage image - Truck

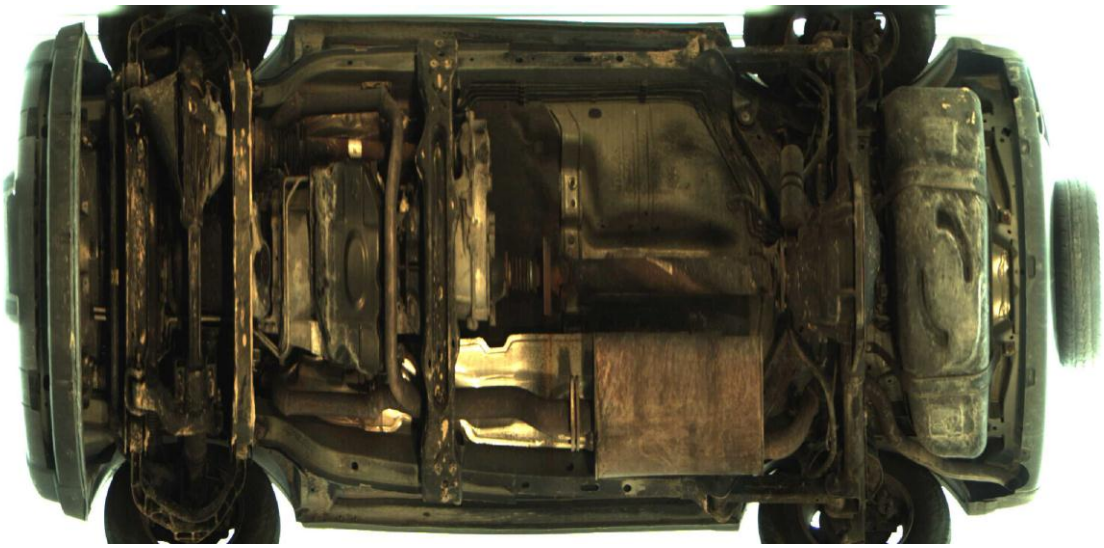

Fig 5: Undercarriage image – Saloon Car

5.2 Sample carXray Images

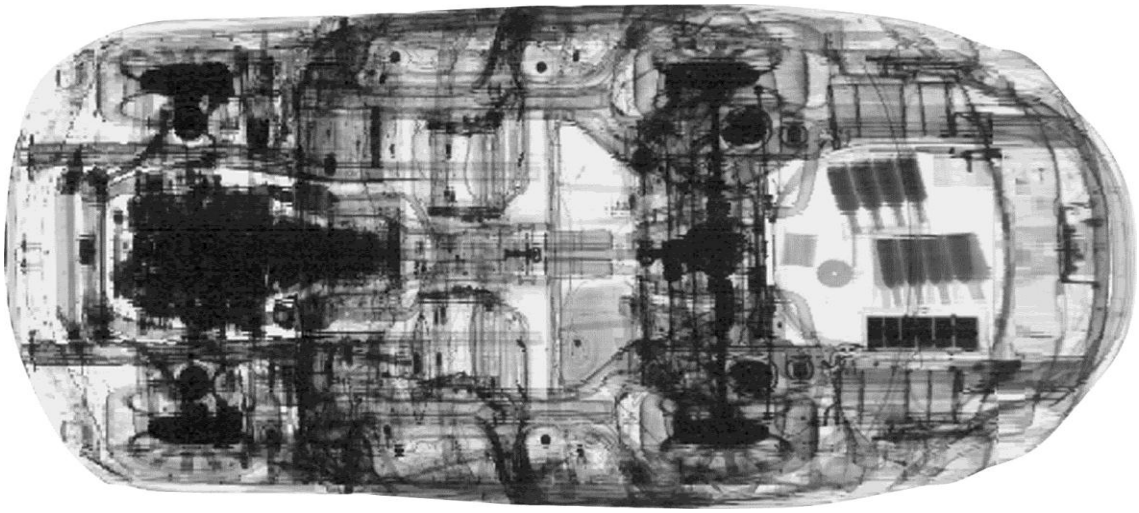

Fig 6: Sample X-ray image – Monochrome Mode

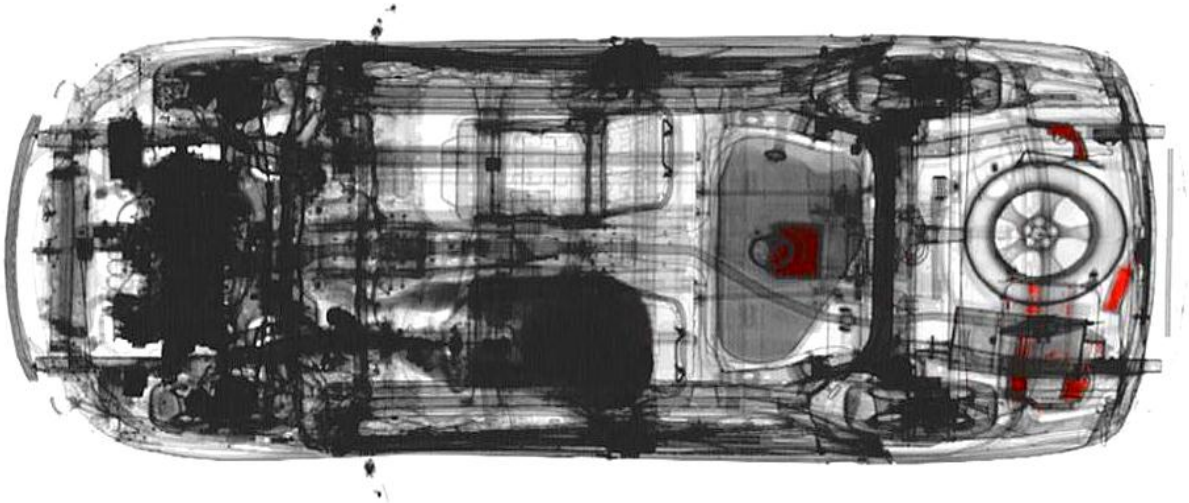

Fig 7: Sample X-ray image – Automatic Detection Mode

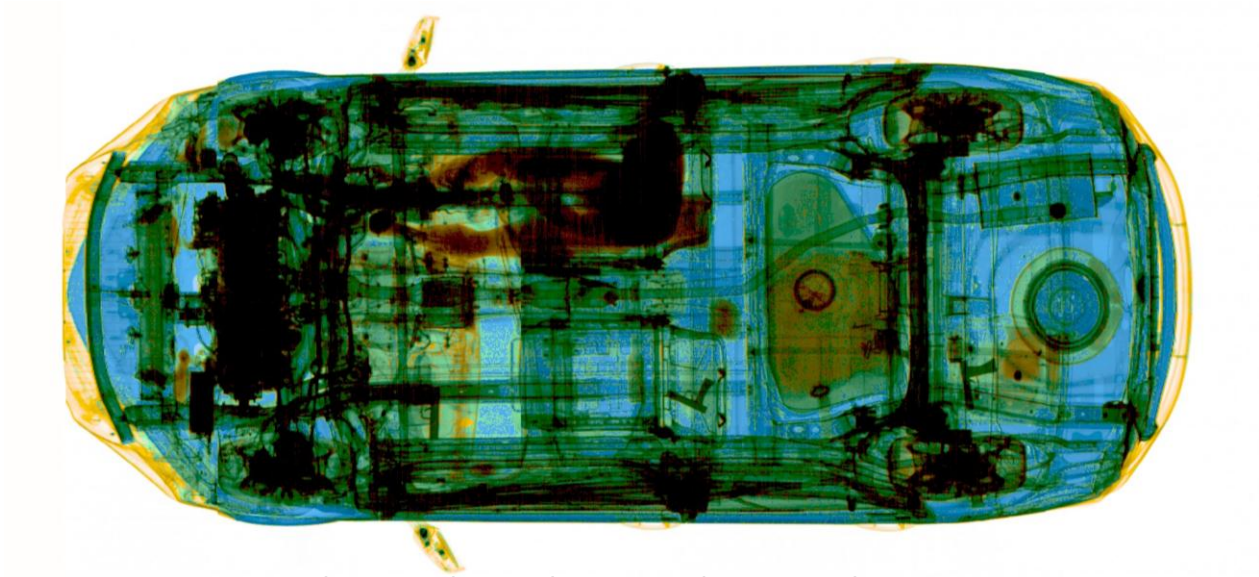

Fig 8: Sample X-ray image – Dual Energy Mode

6. HomeLand References

Established since 2005, HomeLand has gained reputation and strong network worldwide with more than 100 successful projects of our flagship product, Under Vehicle Screening System (UVSS). Its quality and reliability are proven with references in many extreme and harsh locations. Our UVSS is currently used by some of the Government Organizations mentioned below:

Asia

1) Attorney General Office in Jakarta, Indonesia
2) High Court of Law, Jakarta, Indonesia
3) Military Camp, Indonesia
4) Power Plant, Indonesia
5) Army HQ, Indonesia
6) National Cryptogram Agency, Indonesia
7) ONCB Bangkok, Thailand
8) Commercial Installation, India
9) Nuclear Power Plant, Moscow, Russia
10) Rostov-na-Donu, Central of Administrative, Russia
11) Palace Malaysia
12) Prime Minister's Office, Bangladesh
13) Prime Minister's Residence, Bangladesh
14) President's Office, Bangladesh
15) DGFI, Bangladesh
16) Army HQ, Bangladesh
17) The Bangladesh Navy
18) Army Military Police Unit, Bangladesh

Africa

1) Hotel Panafaric, Nairobi, Kenya
2) Hotel Stanley, Nairobi, Kenya
3) African Development Bank
4) Bank of Nigeria
5) Tanzania Communications Regulatory Authority

Middle East

1) Bahrain International Airport
2) US Navy, Bahrain
3) Ministry of Interior, Kuwait
4) Special Police Force, Kuwait
5) UN House, Kuwait
6) King Abdullah Project 4, Saudi Arabia
7) Ministry of Defence, Saudi Arabia
8) Office of Royal Family, Saudi Arabia
9) Royal Palace in Jeddah, Saudi Arabia
10) Oman Embassy in Riyadh, Saudi Arabia
11) Court of Law, Abu Dhabi, UAE
12) Detainee Building, Abu Dhabi, UAE
13) Commercial Installation, Jordan
14) Red Sea Port Authority, Egypt

Others

1) Sheriff Office Building in California, USA
2) Court House, Australia
3) Prison, Australia

FLUSH MOUNT –
DIGITAL COLOUR UVSS

HOMELAND
carXray

SURFACE MOUNT –
DIGITAL COLOUR UVSS

PORTABLE –
DIGITAL COLOUR UVSS