

Event Data Recorder Bosch CDR Technician Non Bosch Tools SUBARU Data Retrieval

Version Dec 2018



Subaru Direct to Module

- A direct to module cable, Subaru part # 98299FJ040, with TWO ends on it, that fits MOST models, is sold separately by the Bosch Diagnostics Kent Moore division (800-345-2233) for \$1100. Rick Ruth has that cable. Cables can be home made much cheaper if a vehicle side mating connector can be obtained.
- Cable 98299AL040 is required for 2015+ Legacy/Outback. Kent Moore division sells that cable for \$2800.

SUBARU

- SUBARU is now 3.8% of the US new car Market. They put an EDR into the 2012 Impresza and expanded it to other models as they made major changes to them.
- Subaru EDR's must be accessed using their standard dealer diagnostic tool. This is sold as a DLC only tool.

Subaru Files

- SSM3 Raw data is saved as a Subaru Select Monitor (.SSM) file. Modules can store up to 6 events: Front New, Front Old, Side New, Side Old, Rollover New and Rollover Old events.
- Frontal and side events have 4 files per record, Precrash, Delta V detail, Delta V summary, and Key cycles/other. Rollovers have a 5th record for roll rate. All events record X and Y Delta V.
- Front and Side events typically come in pairs. Delta V data is very similar but has slight differences due to different wakeup times.

Subaru Files Cont'd

- Once saved as an SSM, the file can be reopened in the software.
- SSM 3 files (2015 and earlier) can be saved as a CSV (excel) file.
- SSM4 (2016 and later) does not support CSV, data must be screen shot or written down manually. **If you have a choice, USE SSM3!!!!**
- There are no data limitations.
- There is no “PDF” report.

Subaru EDR Tool Coverage (not CDR)

Denso DSTi Interface

Hitachi HDS-3000

<u>Model</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>
SUBARU	<----Yellow=Old Hitachi SSM3 or new Denso w SSM4-----> Blue = SSM4 ONLY New Denso Tool								
BRZ	n/a	n/a	Yes (Scion FRS sister)	Yes	Yes	Yes	Yes	Yes	Yes
Impreza	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
WRX/STI	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Legacy	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Outback	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Forester	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Tribeca	No	No	No	No	Discontinued				
Crosstrek	n/a	n/a	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NOTE: The Subaru tool is a dealership fault code tester made to work in thru the DLC in vehicles with functioning electrical systems only.									
Instructors may be able to fabricate a direct to module cable from a vehicle side connector									
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Sample SSM3 Data saved as CSV

System	Comment	Base extensions										
'Airbag												
System	'	'ssm										
		Accelerator										
Sampling	Event name	Vehicle	Opening	Service		Engine	Motor	ABS	Stability	Steering	Steering	
time		Speed	Angle %	brake	on/off	Speed	RPM	activity	control	input	input (%)	Mark
sec		km/h	%		rpm	rpm			deg	%		
	0 Frontal Crash New Data	21	0	OFF	1300	invalid	OFF	ON		0	0	0
	0.5 Frontal Crash New Data	21	0	OFF	1200	invalid	OFF	ON		0	0	0
	1 Frontal Crash New Data	20	5	OFF	1100	invalid	OFF	ON		0	0	0
	1.5 Frontal Crash New Data	21	0	OFF	1500	invalid	OFF	ON		0	0	0
	2 Frontal Crash New Data	21	0	OFF	1300	invalid	OFF	ON		0	0	0
	2.5 Frontal Crash New Data	21	0	ON	1000	invalid	OFF	ON		0	0	0
	3 Frontal Crash New Data	20	0	ON	1100	invalid	OFF	ON		0	0	0
	3.5 Frontal Crash New Data	18	0	ON	1100	invalid	OFF	ON	-2.5	0	0	0
	4 Frontal Crash New Data	17	0	OFF	1100	invalid	OFF	ON	-2.5	0	0	0
	4.5 Frontal Crash New Data	16	0	ON	1100	invalid	OFF	ON	-7.5	-1	0	0
	5 Frontal Crash New Data	11	0	ON	900	invalid	OFF	ON	-2.5	0	0	0

Some labels have errors, this is only a column off

Some labeling errors, this is one column off

Sample Data Subaru labeling issues

		Column Headings generated as found in CSV file										
Sampling time sec	Event name	Vehicle Speed km/h	Accelerator Opening Angle %	Service brake	Engine on/off rpm	Engine Speed rpm	Motor RPM	ABS activity	Stability control deg	Steering input %	Steering input (%)	Mark
		Corrected Column Headings based on other data views available in software										
		Vehicle Speed km/h	Accelerator Opening Angle %	Service brake on/off	Engine Speed rpm	Motor RPM rpm	ABS Activity	Stability Control	Steering input degrees	Steering input %	Mark?	
0	Frontal Crash New Data	21	0	OFF	1300	invalid	OFF	ON	0	0	0	-5
0.5	Frontal Crash New Data	21	0	OFF	1200	invalid	OFF	ON	0	0	0	-4.5
1	Frontal Crash New Data	20	5	OFF	1100	invalid	OFF	ON	0	0	0	-4
1.5	Frontal Crash New Data	21	0	OFF	1500	invalid	OFF	ON	0	0	0	-3.5
2	Frontal Crash New Data	21	0	OFF	1300	invalid	OFF	ON	0	0	0	-3
2.5	Frontal Crash New Data	21	0	ON	1000	invalid	OFF	ON	0	0	0	-2.5
3	Frontal Crash New Data	20	0	ON	1100	invalid	OFF	ON	0	0	0	-2
3.5	Frontal Crash New Data	18	0	ON	1100	invalid	OFF	ON	-2.5	0	0	-1.5
4	Frontal Crash New Data	17	0	OFF	1100	invalid	OFF	ON	-2.5	0	0	-1
4.5	Frontal Crash New Data	16	0	ON	1100	invalid	OFF	ON	-7.5	-1	0	-0.5
5	Frontal Crash New Data	11	0	ON	900	invalid	OFF	ON	-2.5	0	0	0
												Suggested time label

There are no data limitations given

Subaru EDR Assistance Policy

- Subaru has assisted parties in the past with signed owner consent on Subaru's release form, or with sufficient legal authority such as a court order or police search warrant, for a fee. There are new reports they have stopped helping private parties
- Subaru asks that the vehicle be towed to a Subaru dealer.
- The dealer will use its dealer diagnostic tool if the electrical system is working. If it is not working, the dealer cannot do anything.
- The dealer does not know what buttons to push to get the EDR data, take this tutorial with you.

Publicly Available Tools

- The first publicly available tool to read Subaru EDR's was Hitachi HDS-3000 with "Subaru Select Monitor III" software. This tool services 1998-2015 Subaru's.
- The tool was sold by Blue Streak Electronics for \$2999 hardware and a software subscription of \$1999/year (detail on next slide).
- This is not an EDR-only tool. You could be in the vehicle repair business with it.

<http://www.bsecorp.com/images/HDS-order2012-V2.pdf>

Hitachi HDS Order Form

Blue Streak Electronics
45 Basaltic Road unit 1
Concord ON L4K 1G5
Canada

Tel (905) 669-4812 Fax (905) 669-5179
www.bsecorp.com/hds.php
info@bsecorp.com



Qty	Part #	Description	Price	Canadian orders subject to 13% HST
	HDS-3000 **	Subaru/Saab Diagnostic Scan Tool	\$2,999	
		Includes <ul style="list-style-type: none">✓ Select Monitor III Interface (software required)✓ Diagnostic Cable✓ USB Cable✓ Compact Flash CF Memory Card✓ Carrying Case✓ 1 Year Parts & Labour Warranty (Warranty shipping not included)		
Select Choice and Quantity of Software(required with tool purchase)				
	HDS-3051 **	Subaru Diagnostic Software (1yr subscription)	\$1,999	
	HDS-3052 **	Saab Diagnostic Software (1yr subscription)	\$1,999	
<i>Subaru CD updates are quarterly and Saab CD updates are biannual.</i>				
	1B120XZ0	Pulse/Analog Kit	\$478	
Optional Accessories				
	BABD350 61	Optional AC to DC power adapter	\$35	
Please Select Preferred Method of Shipping				
	UPS Ground	Ground Ship - USA lower 48 / Canada	\$35 / \$30	
	UPS Air	Express Air Ship - USA all / Canada	\$70 / \$65	
**In stock lead time 1 week. Out of stock lead time 12 weeks Your credit card will be charged upon shipment from BSE				

What should you do if you have a Subaru case?

- If the vehicle electrical system is functioning, you can make arrangements to take the vehicle to a Subaru dealer after getting Subaru approval that you have proper authority
- If the vehicle electrical system is not functioning, you can put it into another vehicle, or take the ACM out of the vehicle and send it to Rick Ruth or Brad Muir.
- For law enforcement, with nonfunctional electrical system, talk to your instructors about making or borrowing a custom wiring harness and taking it with you to the dealer.

Non Bosch EDR Tools

Manufacturer	12 months Sales end 2/16	Market Share	2016 EDR?	Tool?
GM	3,079,772	17.6%	YES	Bosch CDR
Ford	2,634,491	15.0%	YES	Bosch CDR
Toyota	2,498,889	14.3%	YES	Bosch CDR
Chrysler Group	2,273,230	13.0%	YES	Bosch CDR
Honda	1,598,383	9.1%	YES	Bosch CDR
Nissan	1,499,020	8.6%	YES	Bosch CDR
Hyundai	762,720	4.4%	YES	GIT tool co.
Kia	631,531	3.6%	YES	GIT tool co.
Subaru	583,617	3.3%	YES	Denso 2016+, was Hitachi
BMW	400,064	2.3%	2015	Bosch CDR
Mercedes-Benz	380,690	2.2%	2014	Bosch CDR
Volkswagen	342,626	2.0%	2015	Bosch CDR
Mazda	314,510	1.8%	YES	Bosch CDR
Audi	202,774	1.2%	2015	Bosch CDR
Mitsubishi	95,450	0.5%	YES	OTC/Bosch SPX
Tata (Jag, LR)	87,120	0.5%	YES	OTC/Bosch SPX
Geely (Volvo)	71,744	0.4%	YES	Bosch CDR
Porsche	52,532	0.3%	NO	N/A
Industry Total	17,509,163	100.0%	99.3%	Bosch CDR 87.0%
updated April 4 2016				Non CDR 12.3%

**3.3% for \$6895
DLC only**

Subaru EDR Tools and Software

- The Subaru dealer diagnostic software for models up to 2015 model year is known as the Subaru Select Monitor III. The software comes on a disk and is loaded onto a laptop, and creates an icon on the desktop.
- The software and hardware thru 2015 MY is made by Blue Streak Electronics in Ontario, Canada. **DLC only.**
- Subaru has changed dealer diagnostic tool suppliers effective 2016MY to NuSpire. The software is known as Subaru Select Monitor IV. This tool will be discussed later in the chapter.

Only Published Reference – ARJ May 2015

Great article, but implies data in all 2013+

MAY/JUNE, 2015

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SUBARU E.D.R. – A Case Study

By Wade Bartlett, PE

Subaru is one of the few vehicle manufacturers that records “event data” in the Airbag Control Module (ACM) which is not readable with the Bosch CDR Tool.¹ It is understood that model year 2012 Subaru Imprezas included event data recording (EDR) functionality, and that all 2013 and newer Subaru models have it.² This article will serve to recount what was learned during a recent benchtop download of a 2013 Subaru Legacy. The car involved in this case had been in a severe frontal crash, causing massive front end damage and necessitating extrication of the occupant. It was decided to go directly to the ACM to image the EDR data.

The ACM on this car was between the seats underneath the center console, as shown in Figure 1. The ACM was set down over 2

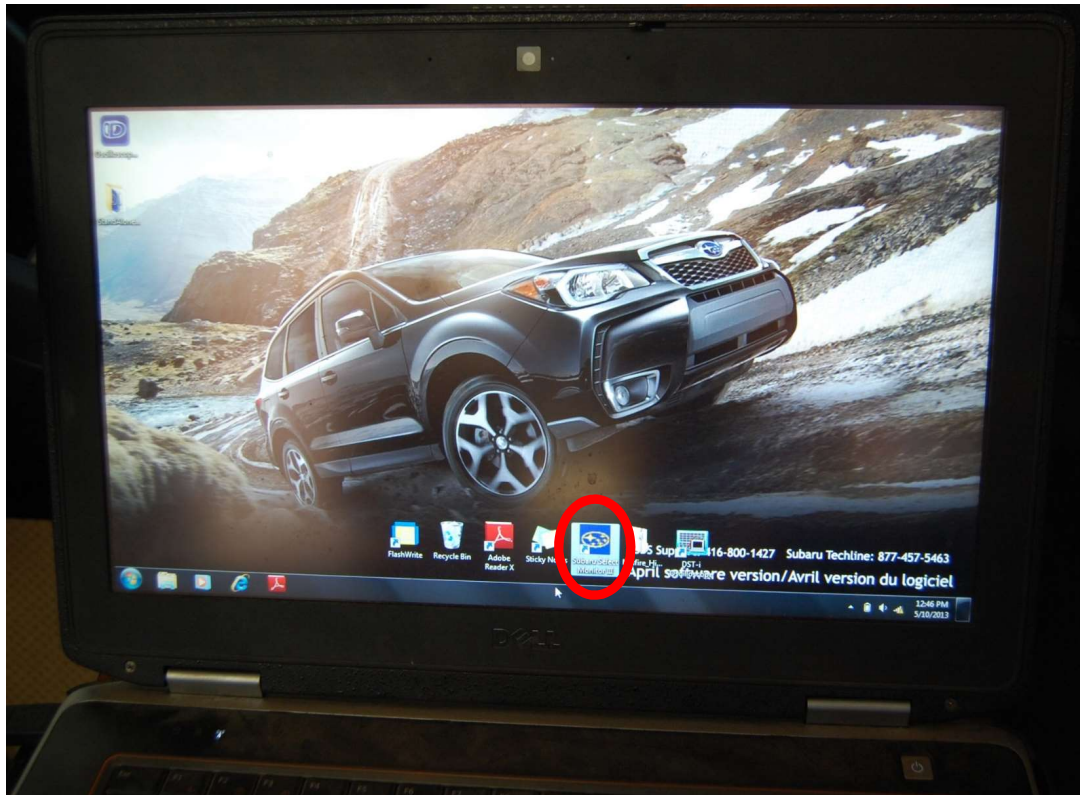
tion bases were covered. The local Subaru dealer, with whom arrangements for the download had been made in advance, asked for copies of the consent forms, and was generally quite helpful. Other dealers may or may not be as accommodating, with some reportedly declining to participate in cases like this.

The tool to image Subaru ACMs is part of each dealer’s proprietary diagnostic scan-tool suite, the “Subaru Select Monitor III” package. This diagnostic system is installed on a dedicated computer, an older Panasonic Toughbook model in this case. Once the VIN is entered and the vehicle identified, one selects “Airbag system” from the menu of systems to be accessed, where you can then access the “Event Record Data”.

Once connected to the ACM, four records were available to check with the software: Frontal Crash Old Data, Frontal Crash New Data, Side Crash Old Data, and Side Crash New Data. In the immediate case, reading the “Old” records (where there was no data stored) got the following message: “*Event record data are not recorded.*” The two “New” records contained identical data, each consisting of four subsections:

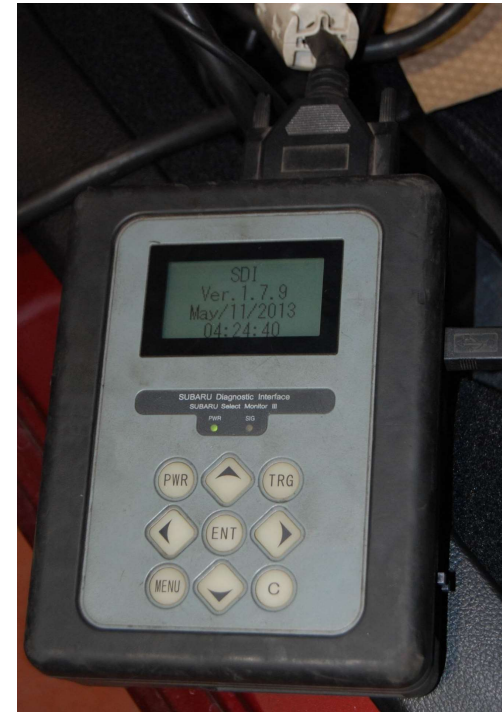
“*Event data (-5.0 to 0.0sec)*” – containing 9 elements: the vehicle speed, accelerator opening angle %, service brake ON/OFF, RPM, ABS Activity, Stability Control, Steering input (degrees), Motor RPM (invalid for our non-hybrid car), and steering input percent. Data is recorded every ½ second. out

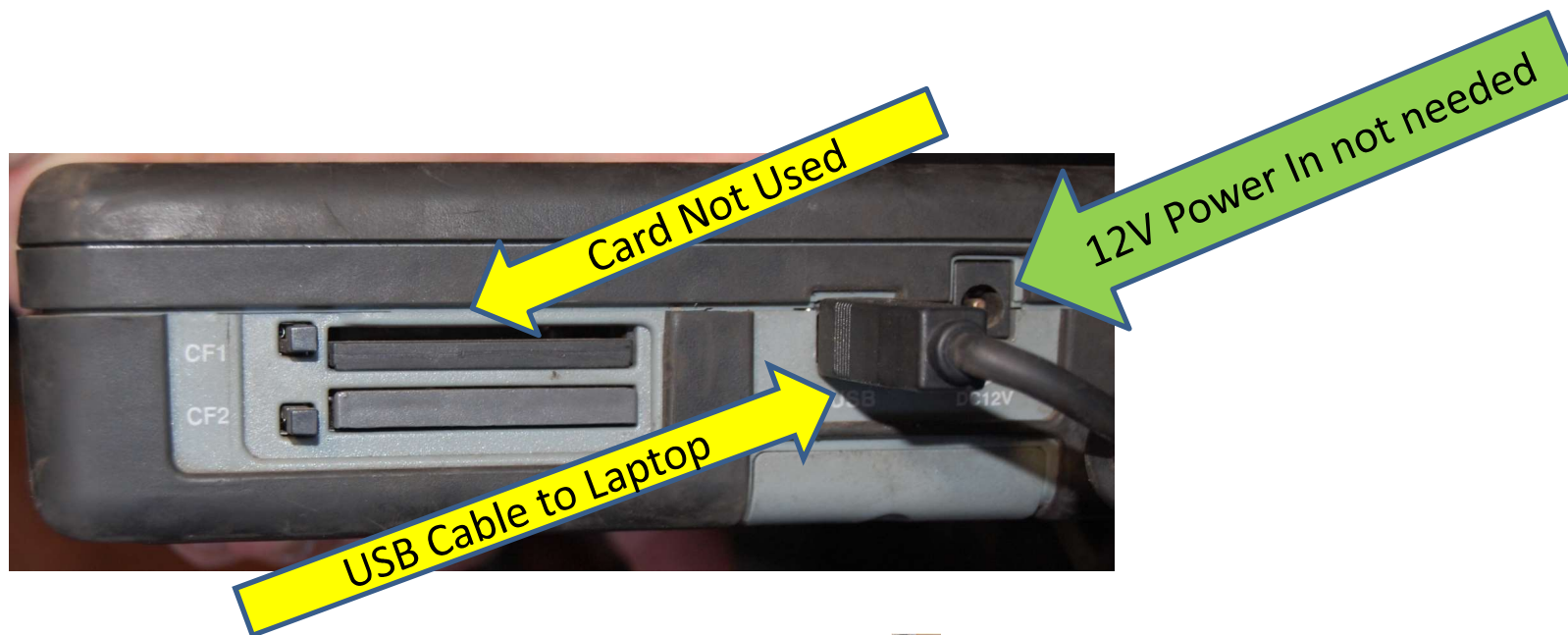
Subaru Select Monitor III Software



Subaru Diagnostic Interface 2012-15 (Based on a Hitachi HDS-3000) by Blue Streak

- The tool is primarily a service tool – dealer techs can use it without a laptop for some diagnostics
- For EDR it is always used with the SSM3 Software on a laptop, connected via a USB cable





Scan Tool Edge Views

Cable
from
Interface
to DLC.
No direct
to
module
cables
(unless
you build
them!)



Newer SSM3 may require picking which interface is used

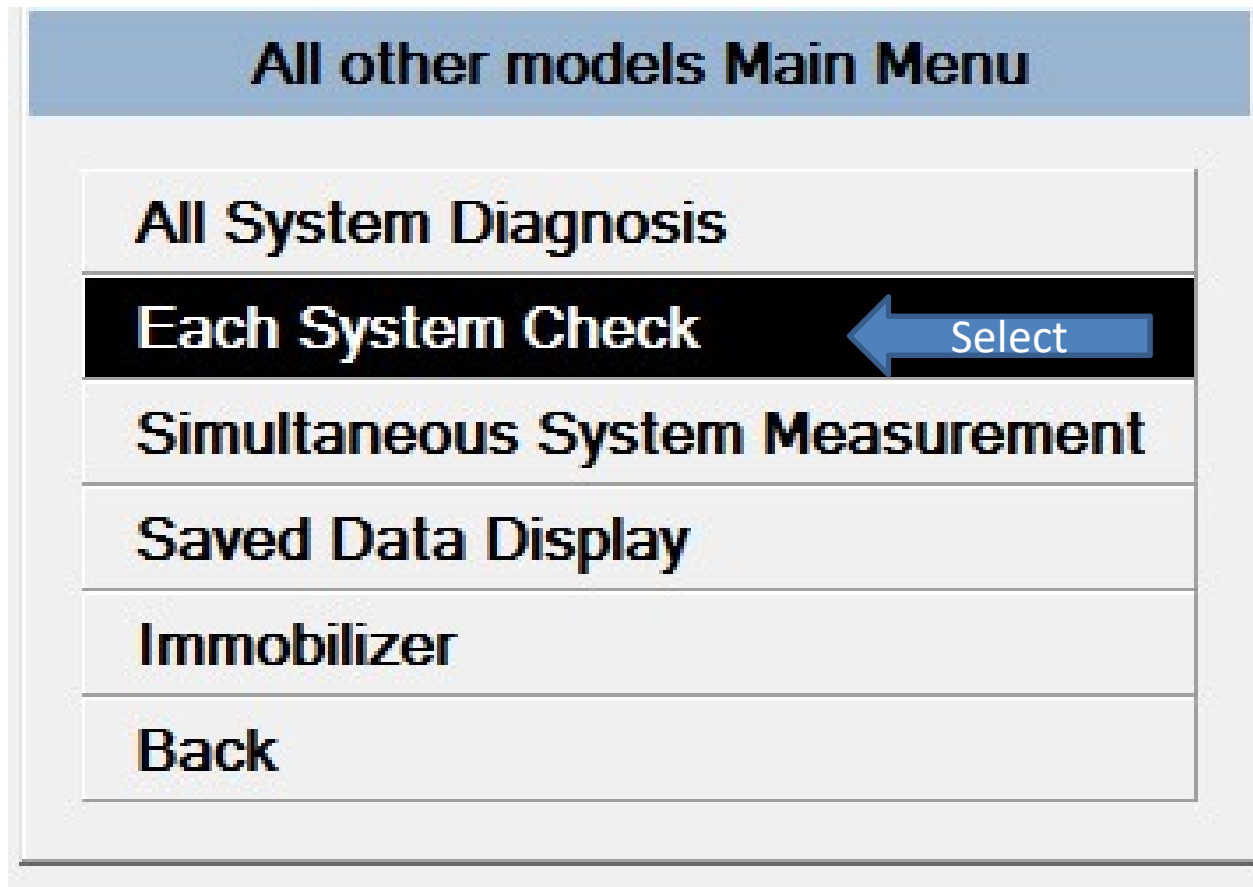
- When the DST-I came out, Subaru added a button in SSM3 to select which interface was being used. The default setting was the old Hitachi interface.

Order of Powering

- Power the ACM first
- Then turn on the interface
- Then open the software
- We don't understand why it has to be done in this order, but if we do it in any other order, there is no communication from the laptop to the ACM. The laptop will talk to the interface, the interface will talk to the ACM, but the Laptop won't talk directly to the ACM.

Main Menu	
All other models	
Inspection of BRZ	
Saved Data Display	
Reprogram	
Reprogram VDC (BRZ only)	
Alliance Vehicle Inspection	
Read CF application measurement data	
Convert/Save measurement data on driving recorder	
Oscilloscope	
Others	
Quit	

Main
Menu:
Select “All
Other
Models”
(Unless
you have a
BRZ)



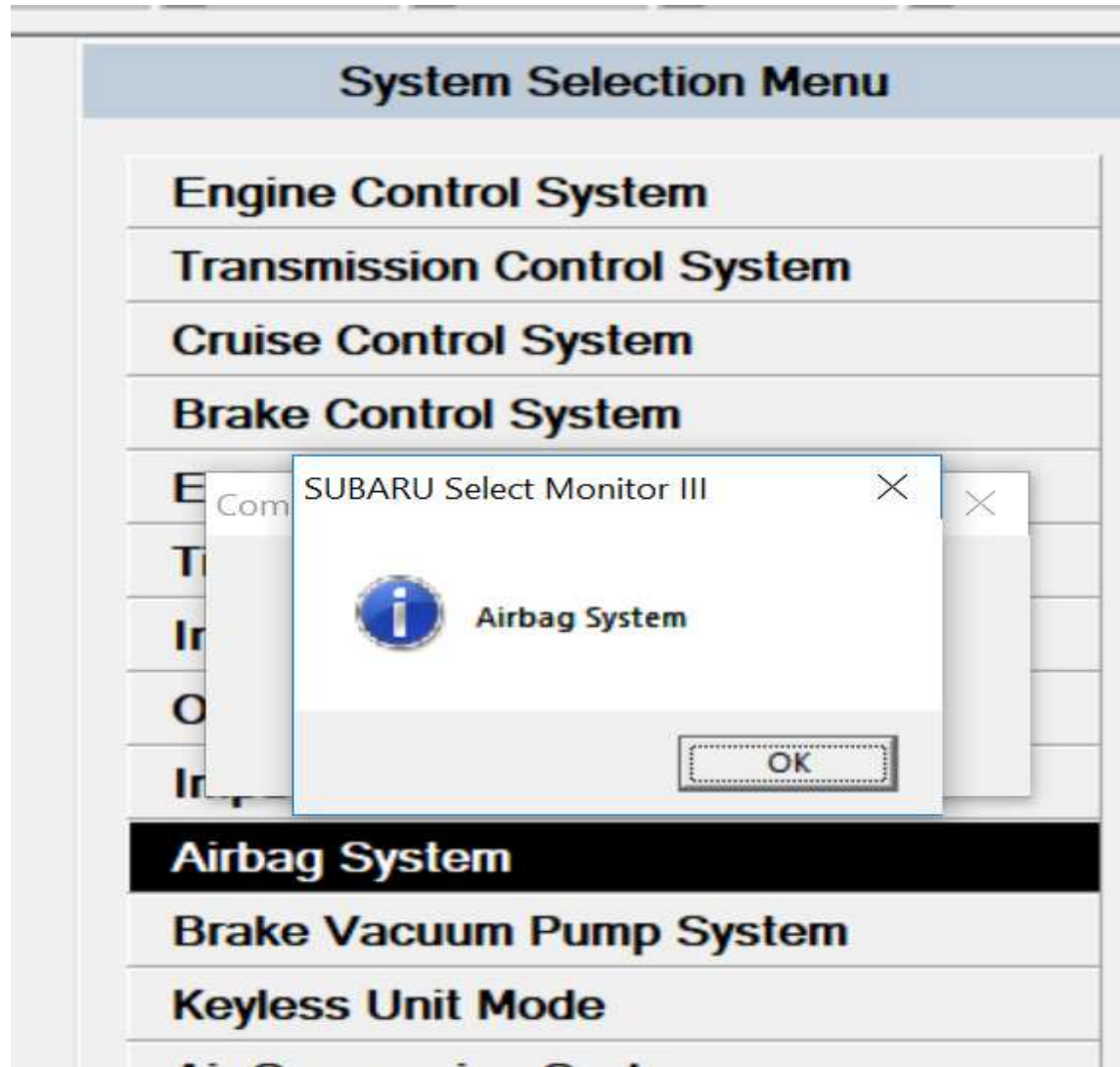
Select
“Each
System
Check”
below the
All System
Diagnosis

System Selection Menu	
Engine Control System	
Transmission Control System	
Cruise Control System	
Brake Control System	
Entry VIN	
Tire pressure monitor	
Integ. unit mode	
Occupant Detection System	
Impact Sensor	
Airbag System	
Brake Vacuum Pump System	
Keyless Unit Mode	
Air Suspension System	
Air Condition System	
Power Steering System	

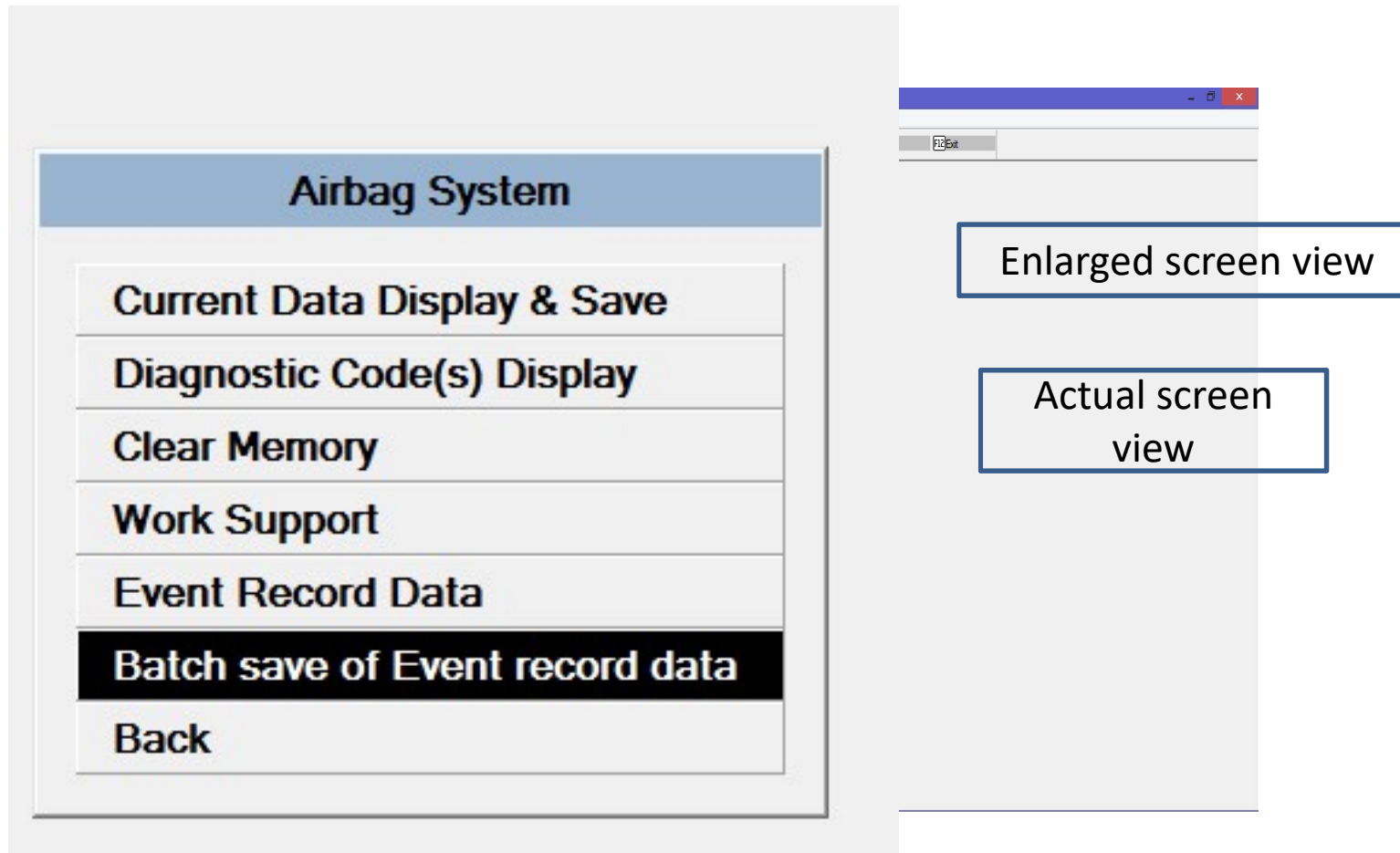


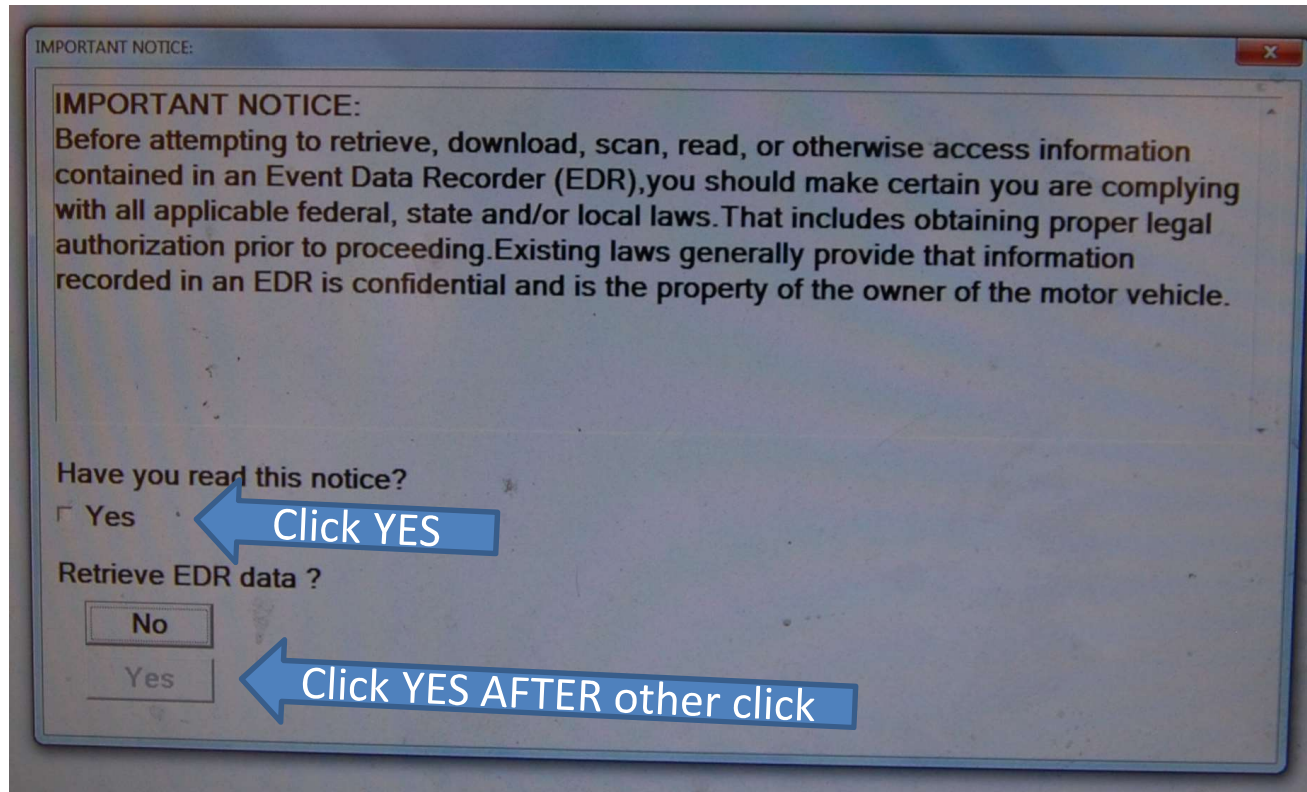
Select “Airbag System”

System acknowledges communication with airbag module



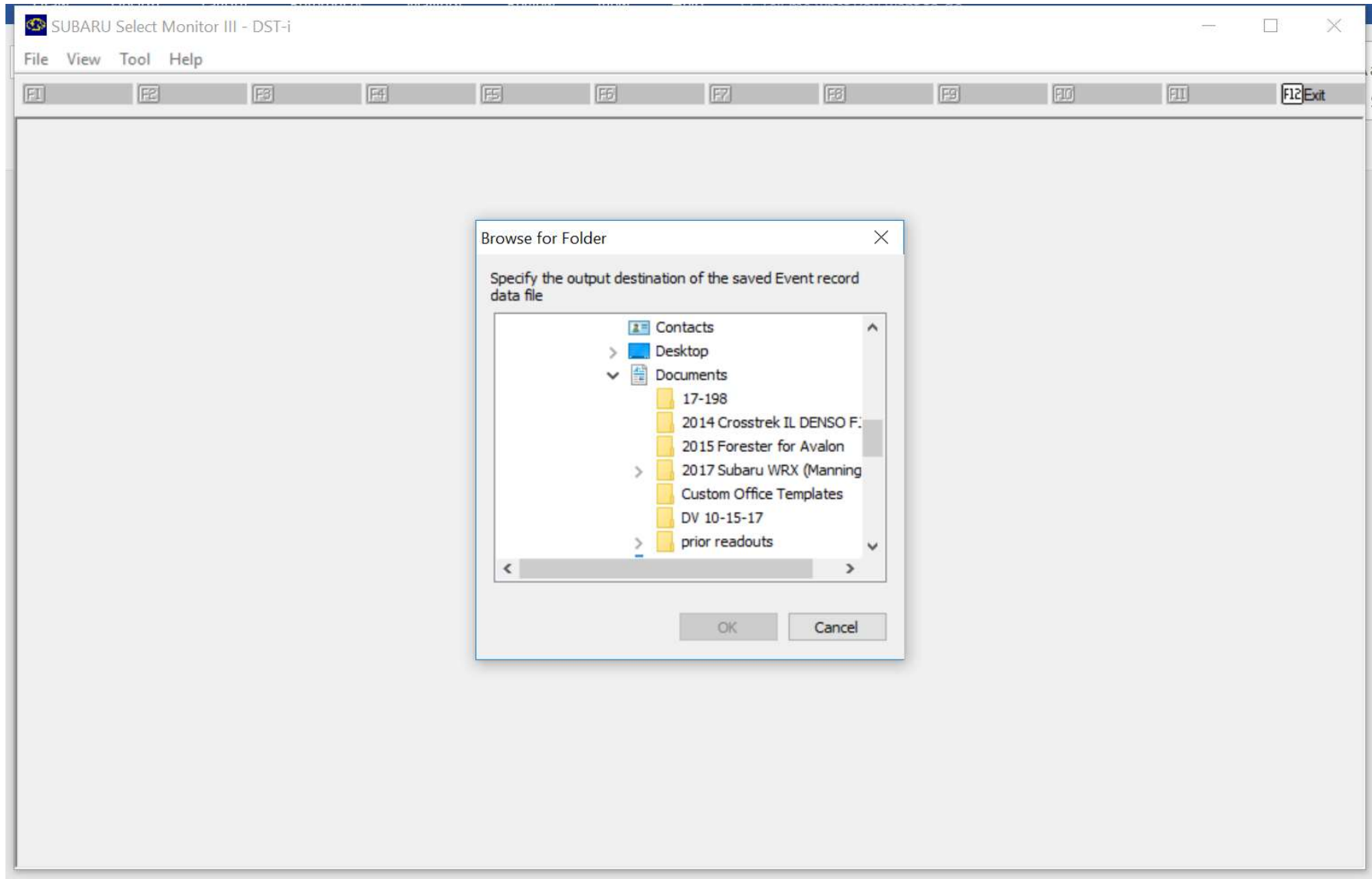
First – Batch Save the File

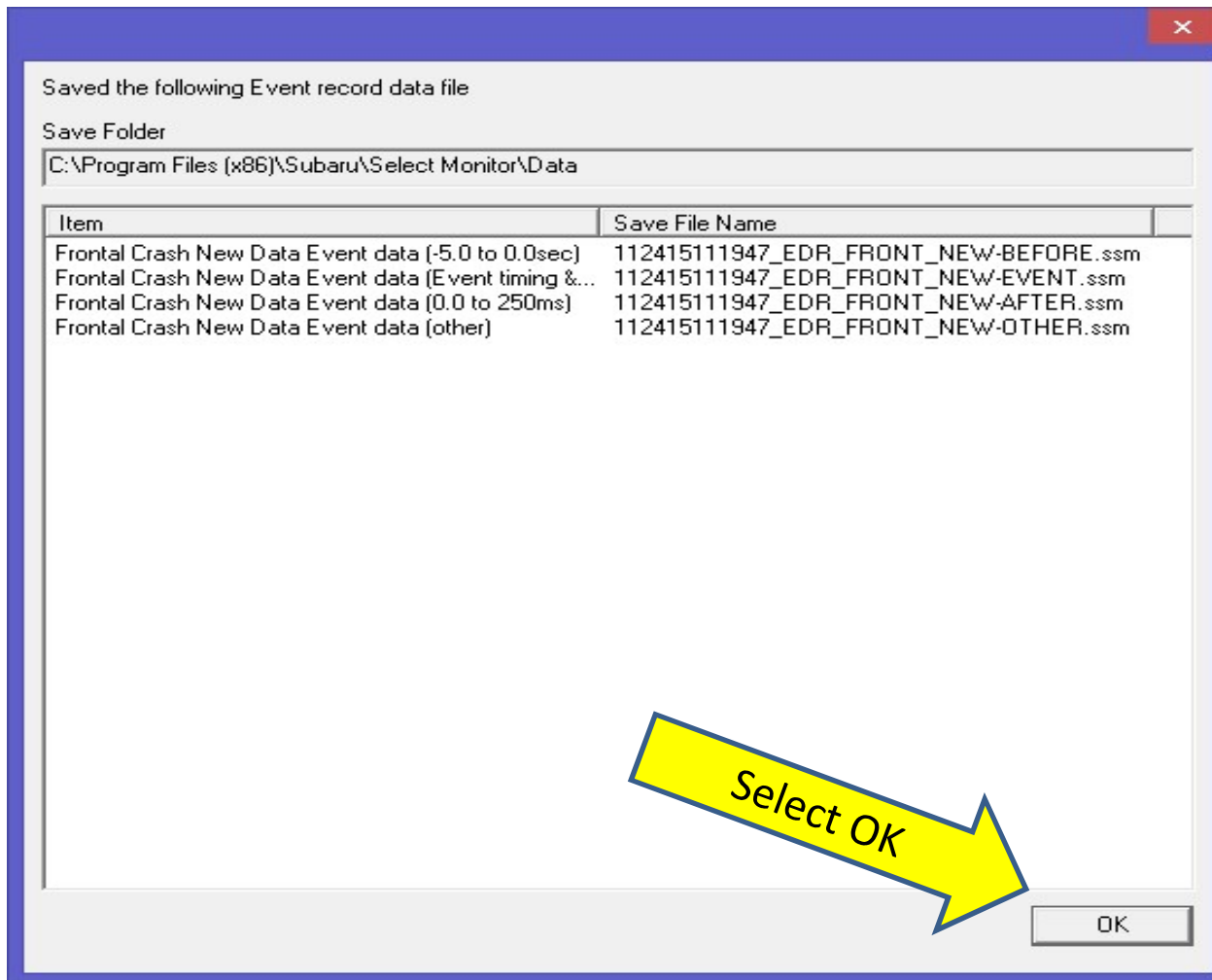




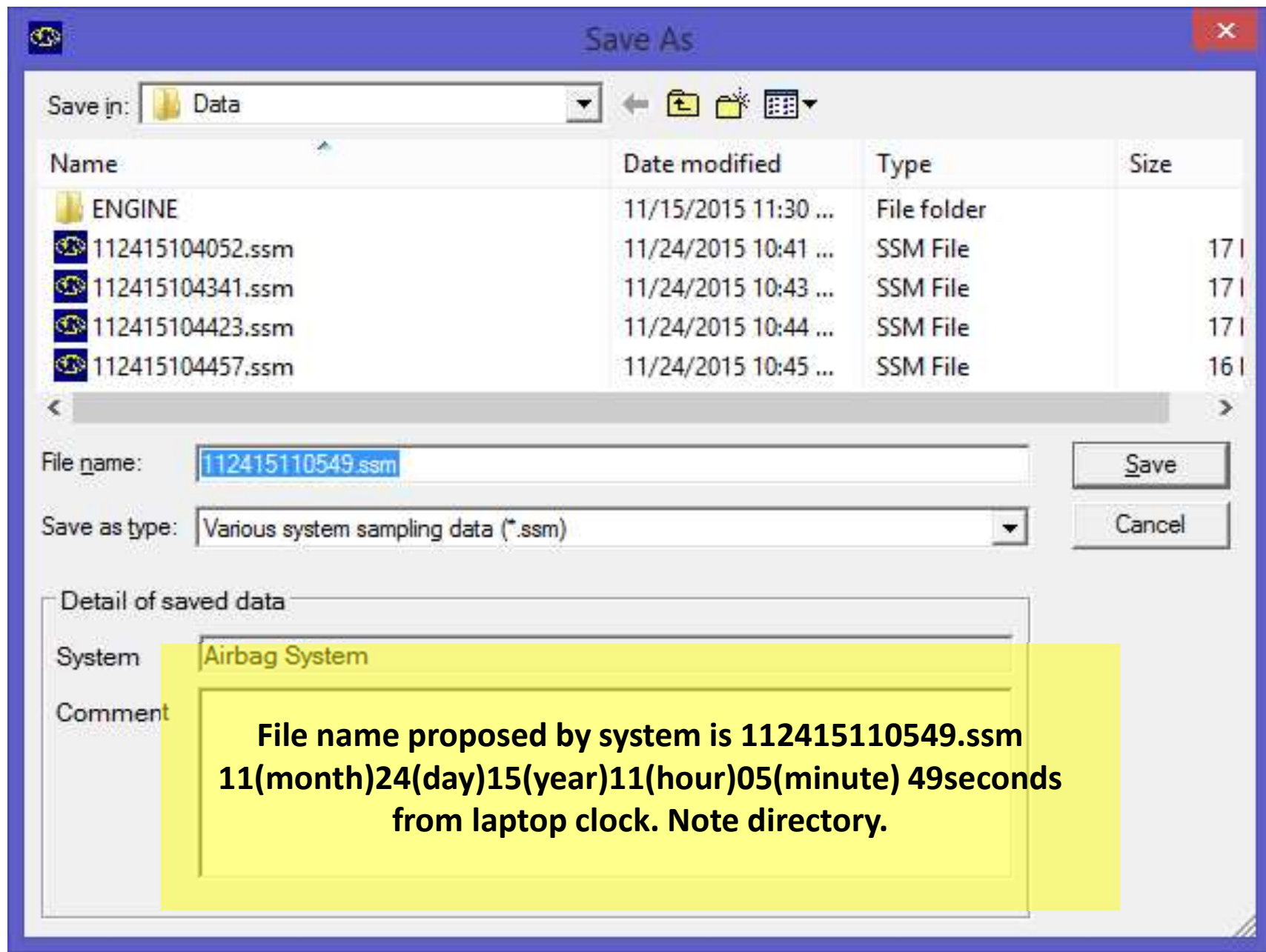
Legal
Notice –
click top
yes, then
bottom
yes goes
live,
select it

Choose folder to save files

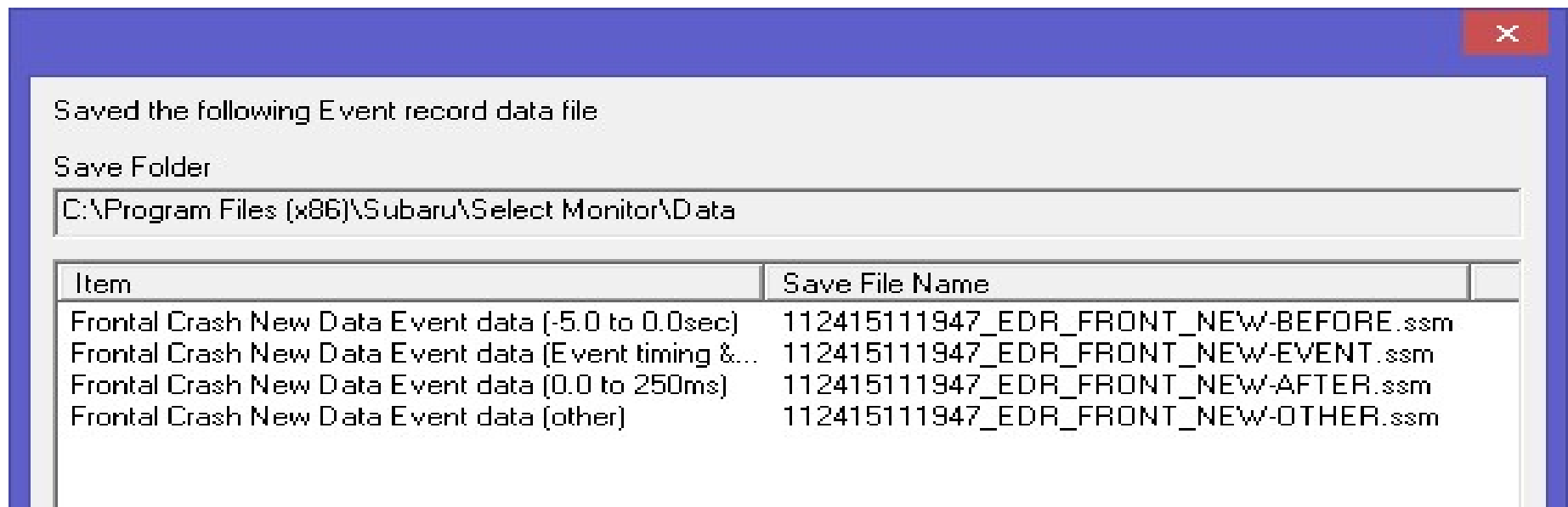




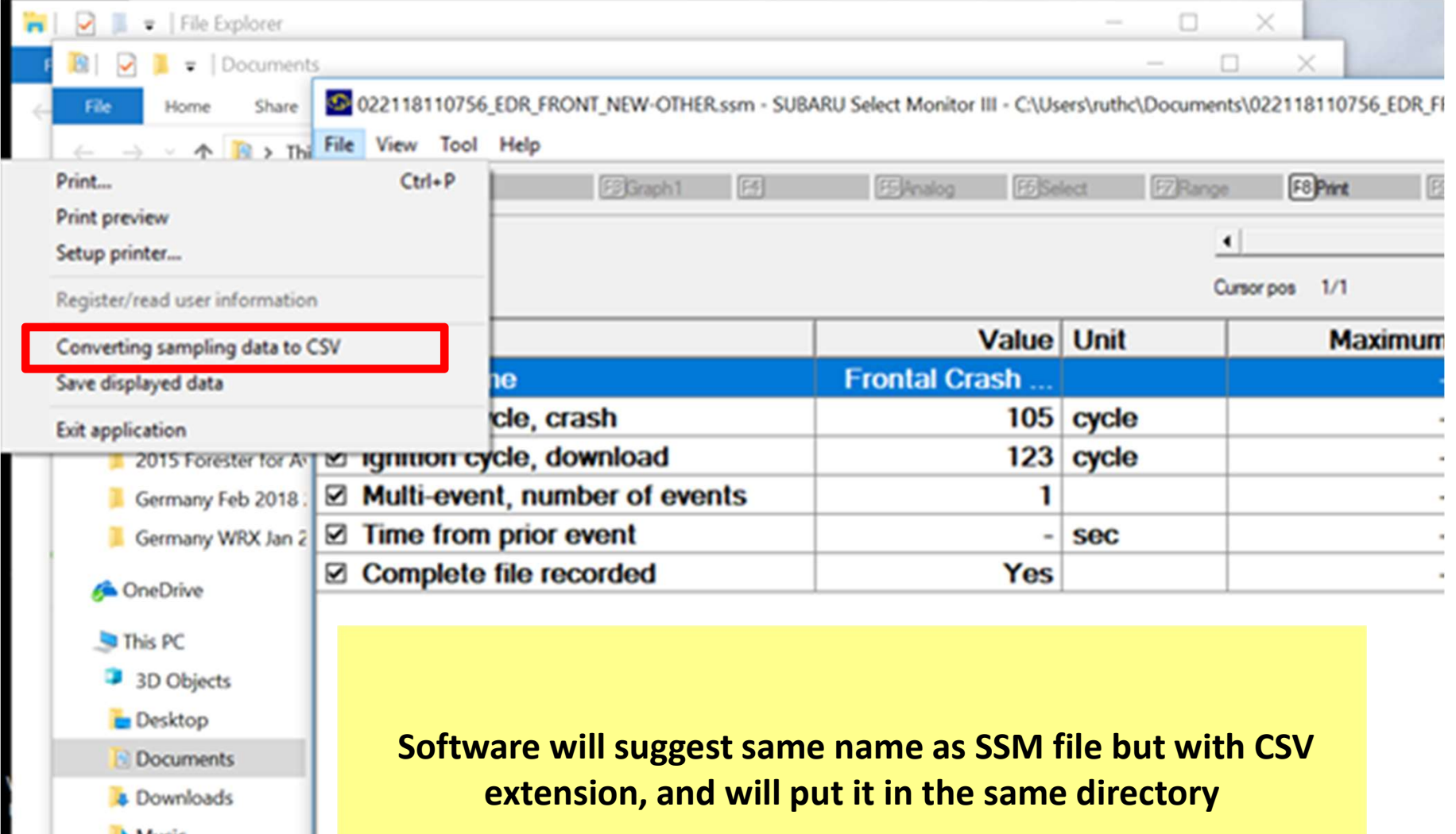
Software
prompts
with 4
files/event



Navigate to the directory the SSM files are saved in. Click on the SSM files one at a time. Click on file menu and select save as CSV.



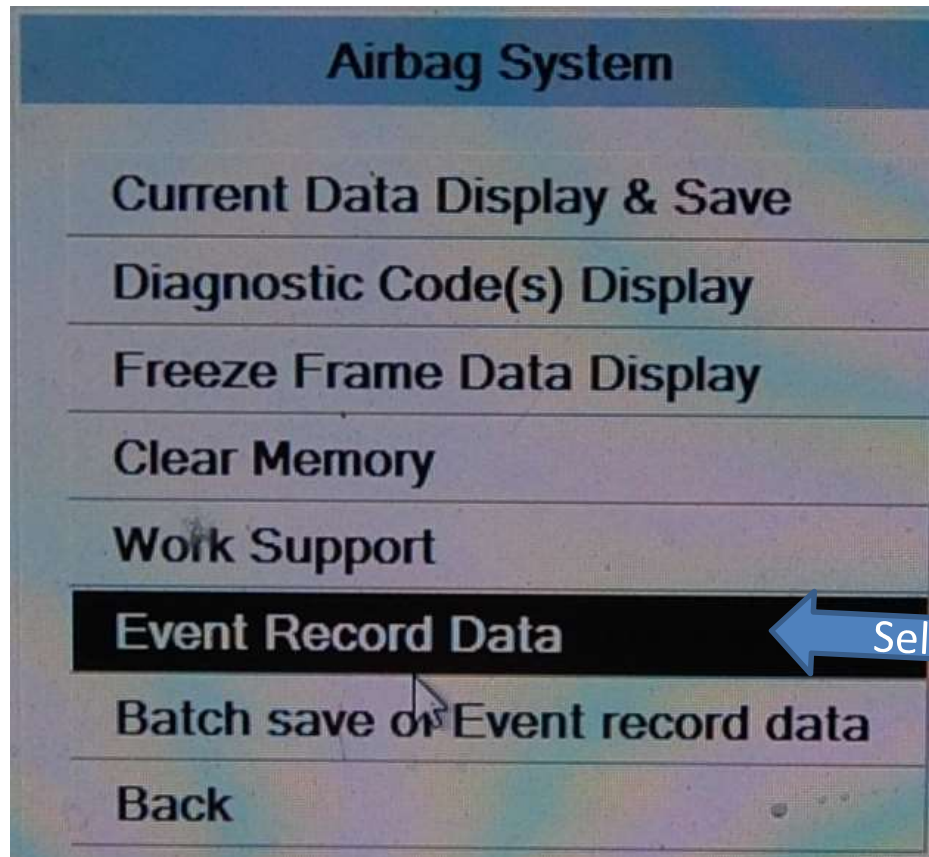
Converting SSM to CSV – File Menu



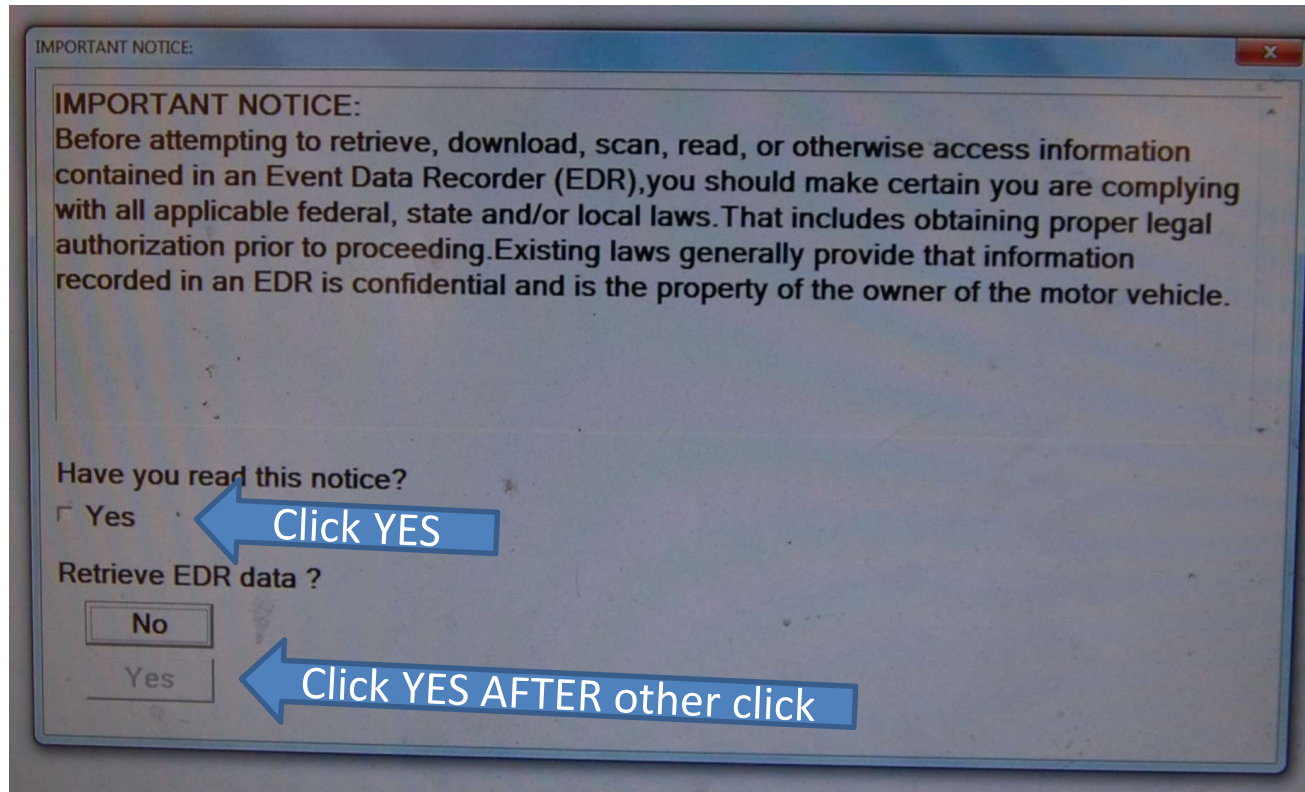
The screenshot shows the SUBARU Select Monitor III software interface. The File menu is open, and the option 'Converting sampling data to CSV' is highlighted with a red rectangle. The background displays a table of data with columns: Value, Unit, and Maximum. The table contains several rows of data, including 'Frontal Crash ...', 'Ignition cycle, download', 'Multi-event, number of events', 'Time from prior event', and 'Complete file recorded'.

	Value	Unit	Maximum
Frontal Crash ...			
Ignition cycle, download	105	cycle	-
Multi-event, number of events	123	cycle	-
Time from prior event	1		-
Complete file recorded	-	sec	-
	Yes		-

Software will suggest same name as SSM file but with CSV extension, and will put it in the same directory



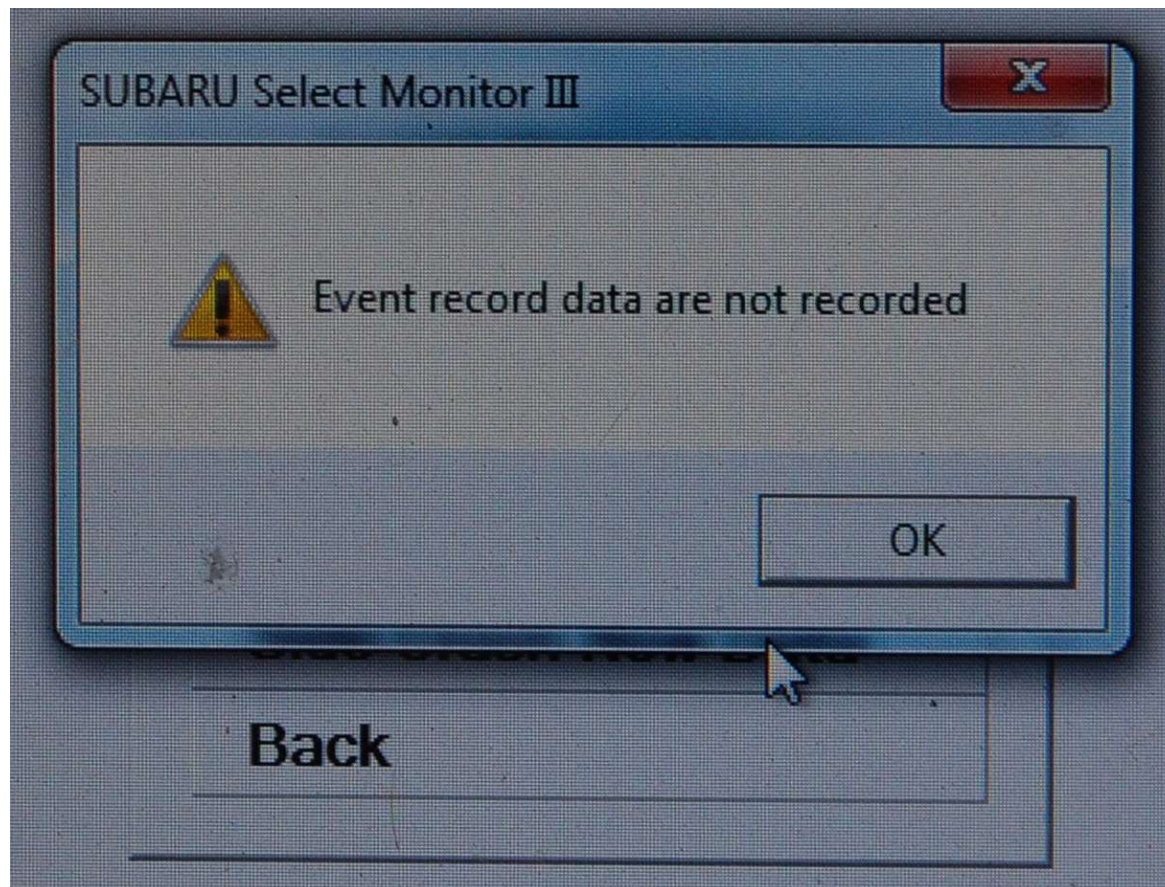
If you want to view data on screen, then Select “Event Record Data”. The on screen view is NOT user friendly but some may want to look anyway. The CSV files are easier to view.



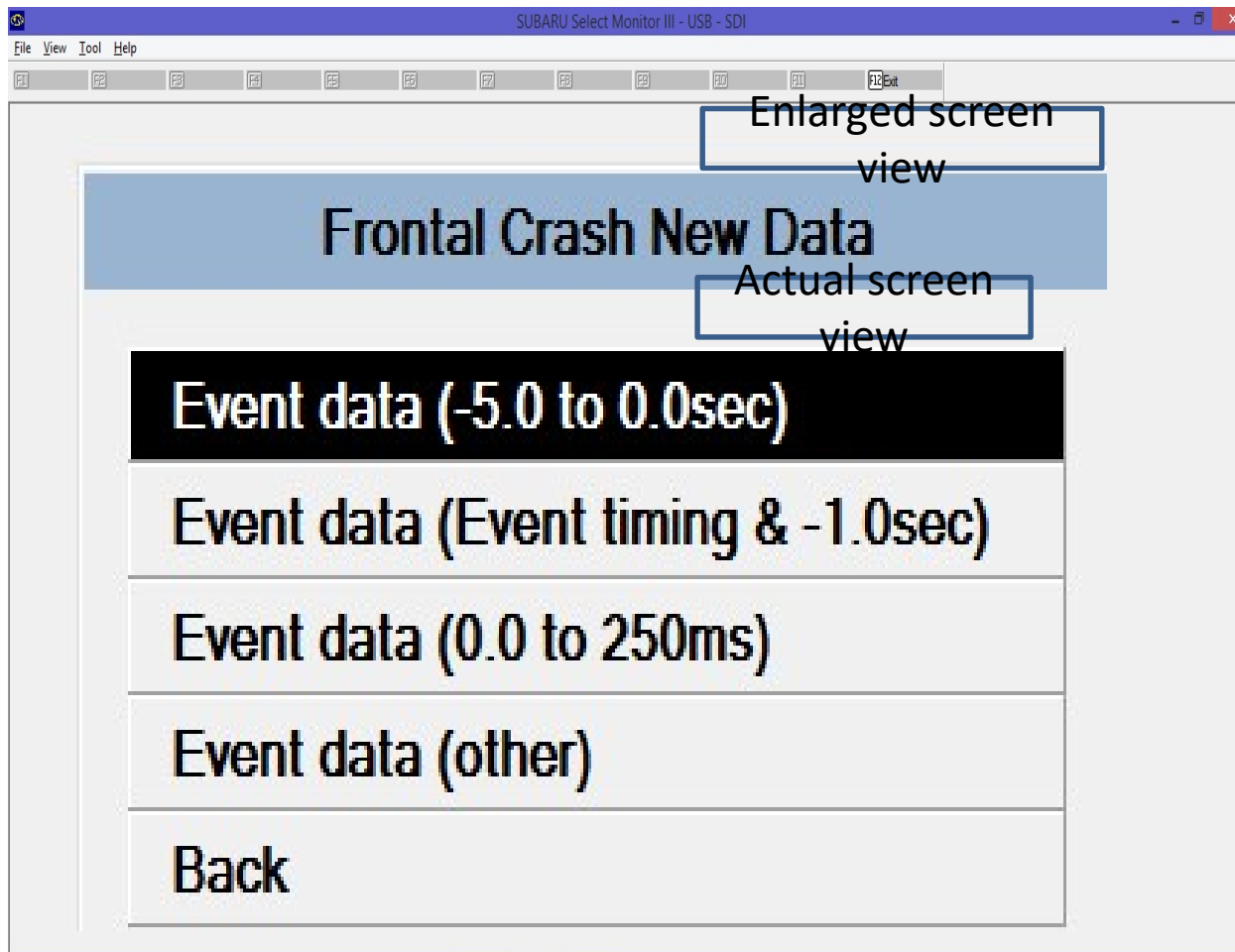
Legal
Notice –
click top
yes, then
bottom
yes goes
live,
select it

Four
Spaces in
Memory
(six if
rollover
equipped)

Event Record Data
Frontal Crash Old Data
Frontal Crash New Data
Side Crash Old Data
Side Crash New Data
Back

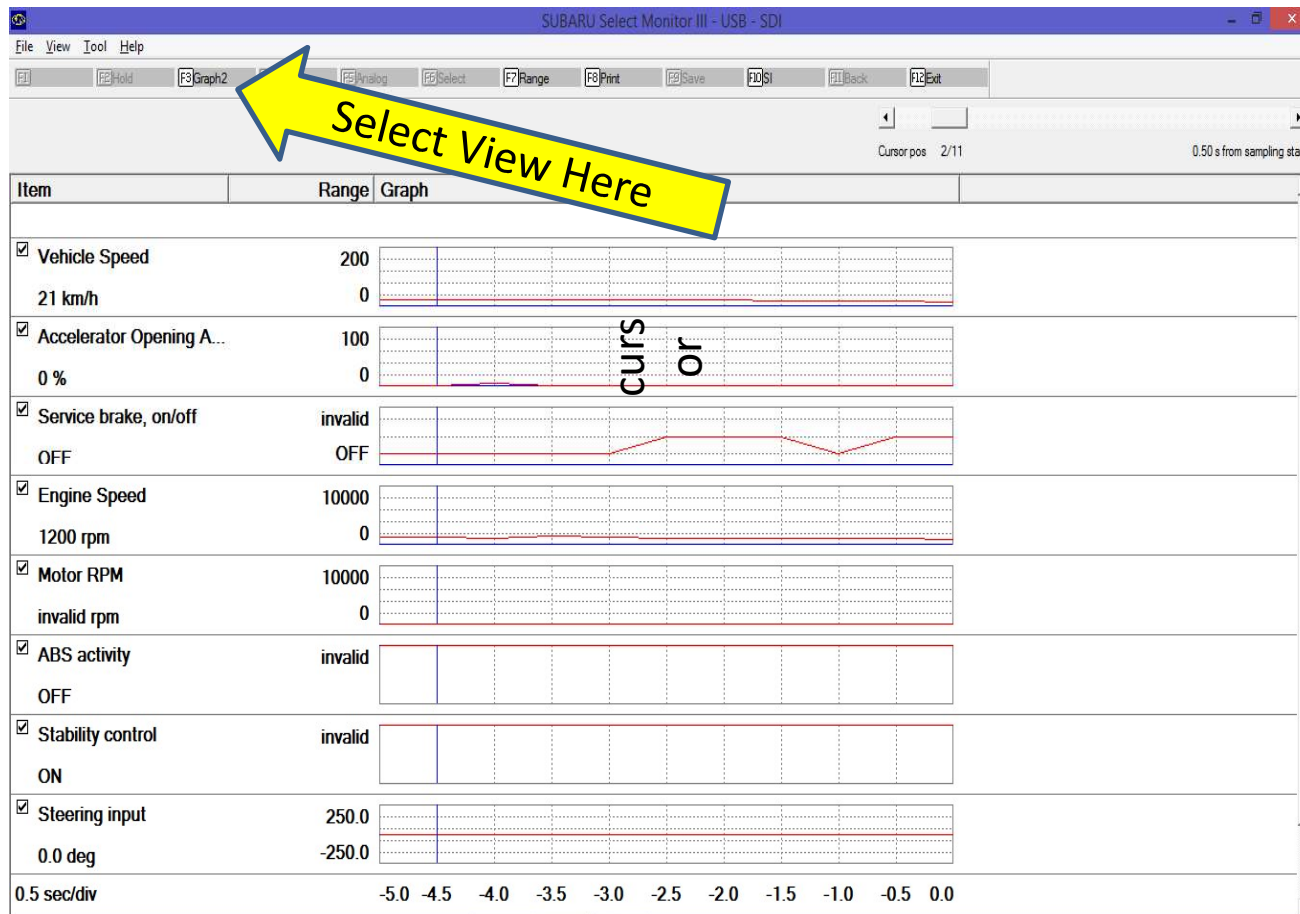


If no
events are
present



Four
Parts to
Each of
the 4
Event
Spaces

Graph2 View of Events

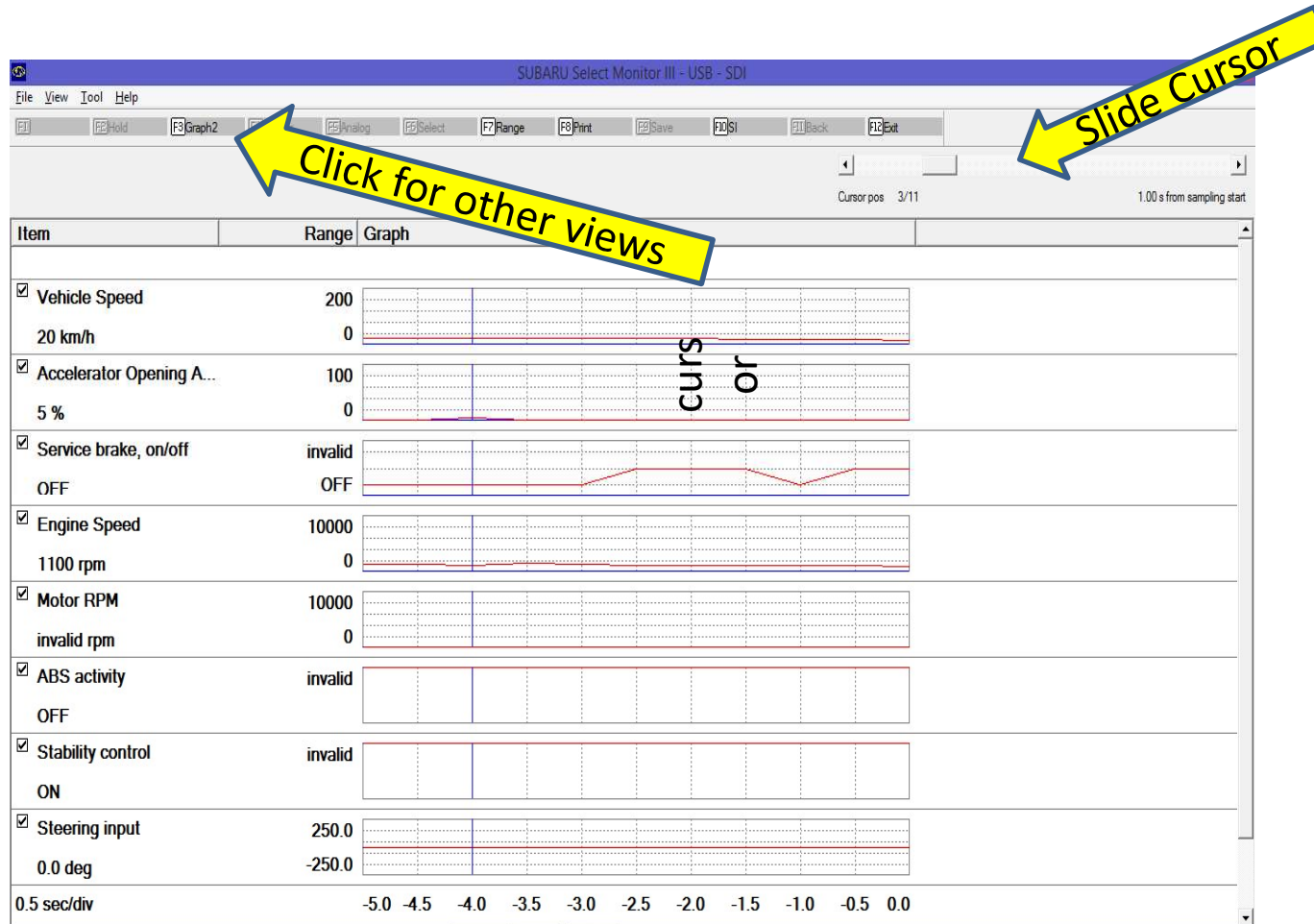


- Note graph is hard to read – big scale
- Note blue line is a cursor at -4.5
- The values for each parameter at -4.5 are displayed
- Move the cursor across graph to see all values

Viewing Precrash Data on Screen

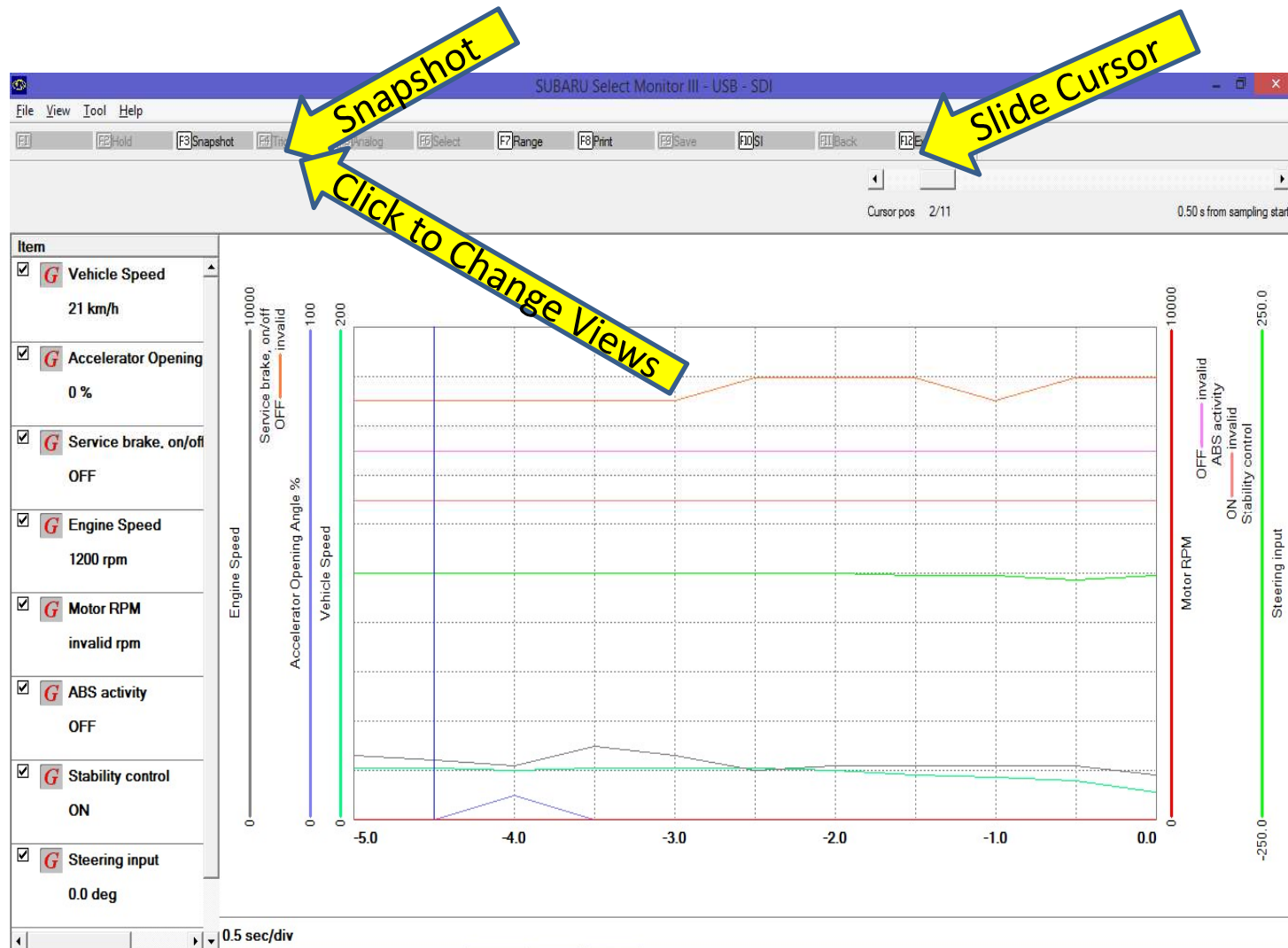
- For precrash data, there is a slide bar in the upper right. Slide bar to left shows data point 1 which is 5 seconds to impact. Data points are in half second intervals. Slide bar at far right shows data point 11 which is at impact.
- The software can show you a graph but will only display one number at a time digitally, you must move the slide bar 11 times to see all the numbers.

Graph2 View – Cursor at 4.0

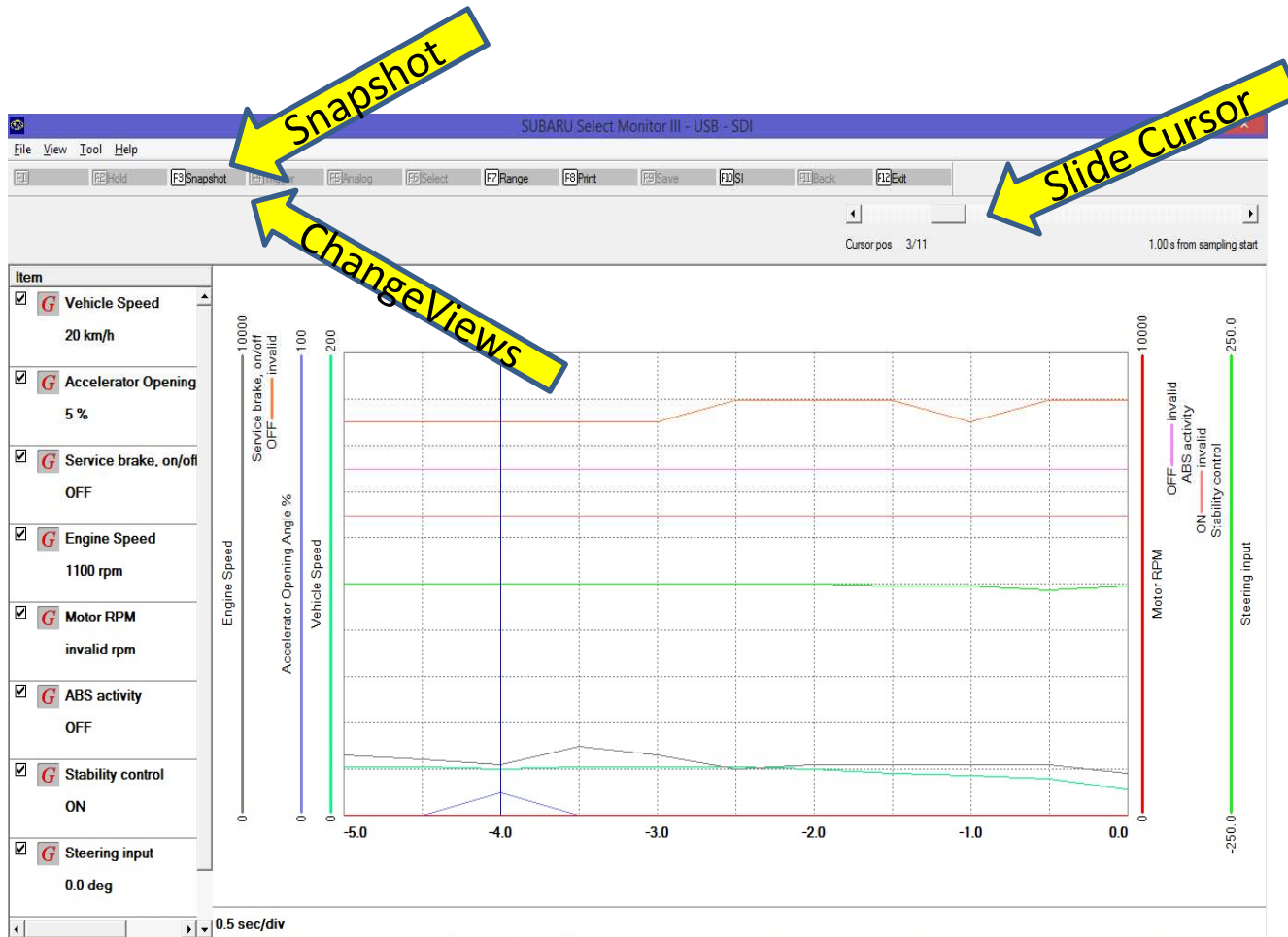


Note
values are
now
displayed
for -4.0
where
cursor is
located

Snapshot View – Cursor at -4.5

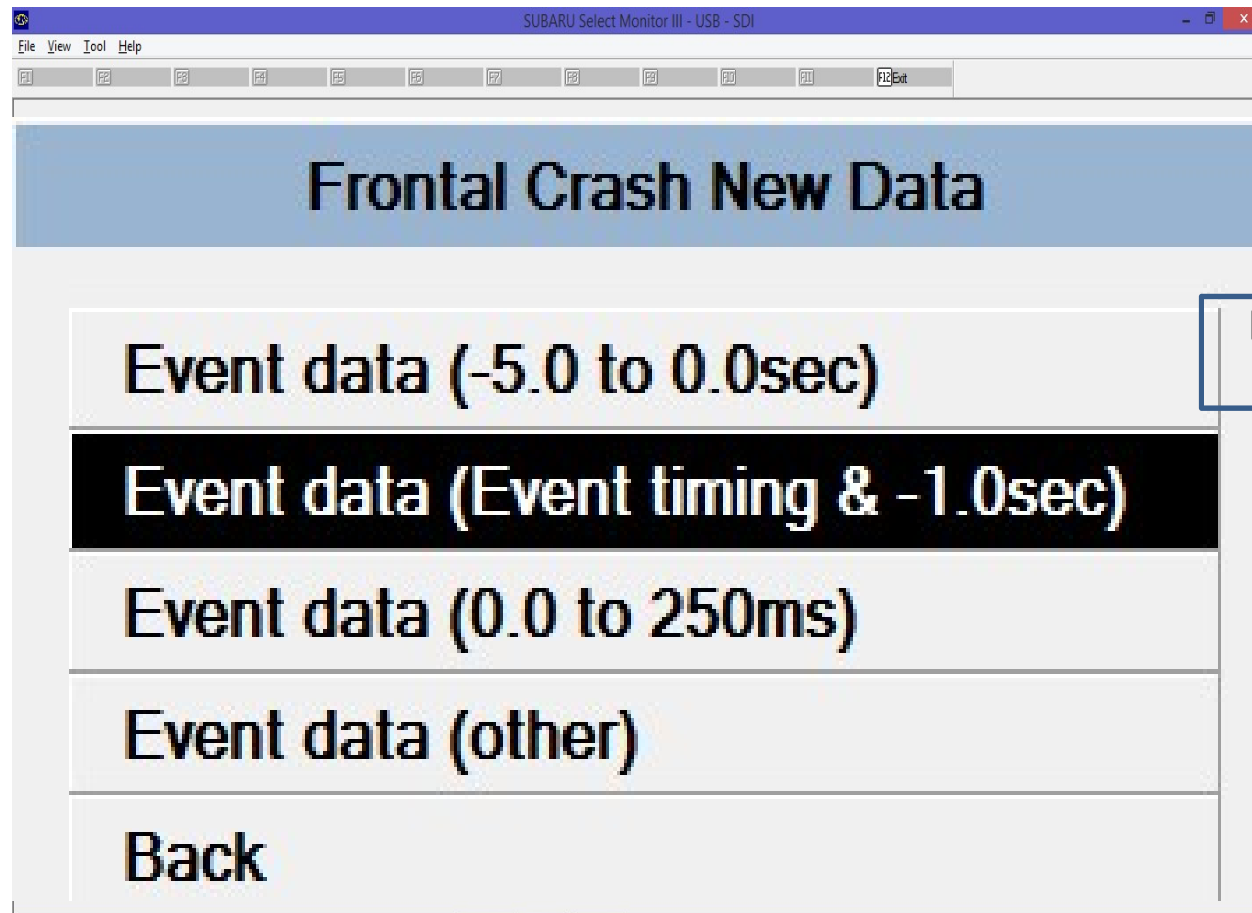


- Values at Left are for cursor at -4.5
- Scroll cursor to see all values



Snapshot View – Cursor at -4.0

- Values at Left are for cursor at -4.0
- Scroll to see other values



Actual screen
view

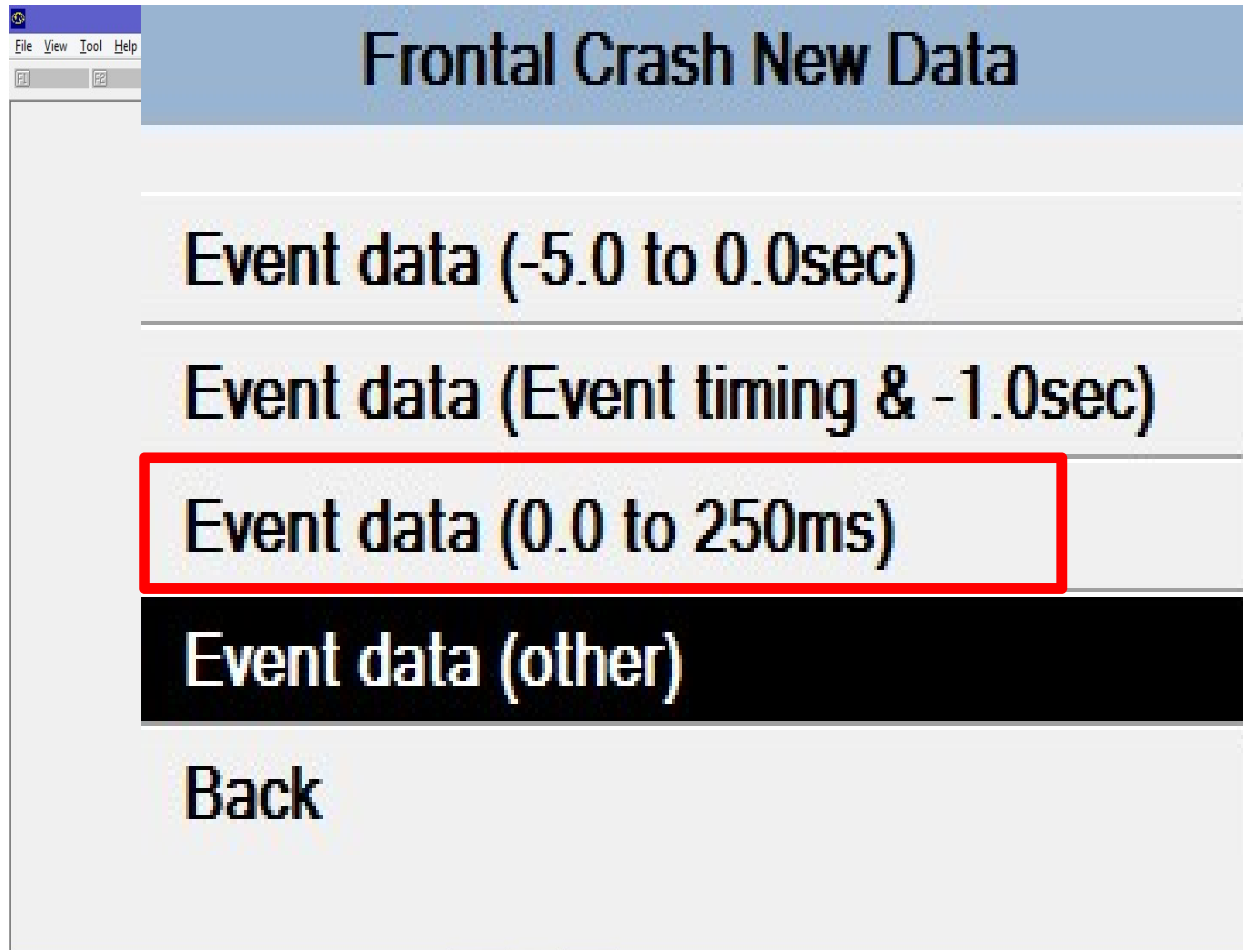
Enlarged screen
view

Event Data

Item	Value	Unit
<input checked="" type="checkbox"/> Event name	Frontal Crash ...	
<input type="checkbox"/> Maximum delta-V longitudinal	-9	km/h
<input type="checkbox"/> Time,maximum delta-V	120.0	ms
<input type="checkbox"/> Maximum delta-V, lateral	0	km/h
<input type="checkbox"/> Time maximum delta-V, lateral	67.5	ms
<input type="checkbox"/> Frontal air bag deployment, time...	invalid	ms
<input type="checkbox"/> Frontal air bag deployment, time...	invalid	ms
<input type="checkbox"/> Frontal air bag deployment, time...	invalid	ms
<input type="checkbox"/> Frontal air bag deployment, time...	invalid	ms
<input type="checkbox"/> Side air bag deployment, time to...	invalid	ms
<input type="checkbox"/> Side air bag deployment, time to...	invalid	ms
<input type="checkbox"/> Side curtain air bag deployment,...	invalid	ms
<input type="checkbox"/> Side curtain air bag deployment,...	invalid	ms
<input type="checkbox"/> Frontal air bag warning lamp	OFF	
<input type="checkbox"/> Safety belt status, driver	ON (fastened)	
<input type="checkbox"/> Safety belt status, right front pa...	OFF (not faste...	
<input type="checkbox"/> Occupant size classification, rig...	Yes	

Enlarged screen
view

Actual screen
view



Enlarged
screen
view

Viewing Delta V data on screen

- There is data from 0 to 250ms stored, 26 data points at 10ms intervals.
- The software will only display one value digitally at a time.
- There is a slide bar in the upper right that moves the cursor from point to point.
- It is easier to look at the CSV file

Event Data 0-250ms

Subaru Select Monitor III - USB - SDI

File View Tool Help

F1 F2 Hold F3 Graph1 F4 Trigger F5 Analog F6 Select F7 Range F8 Print F9 Save F10 Non SI F11 Back F12 Exit

Graph1

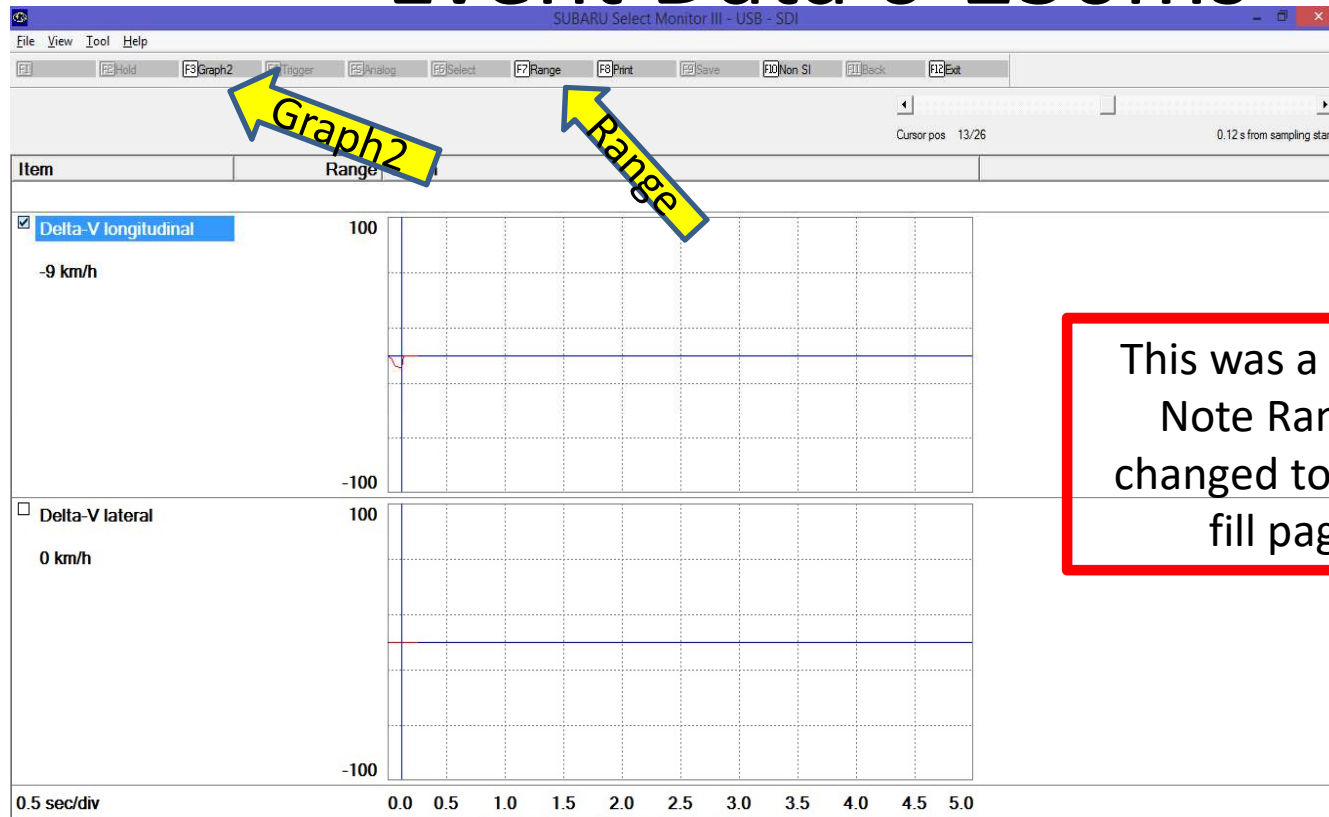
Scroll Cursor to see other values

Scroll Cursor

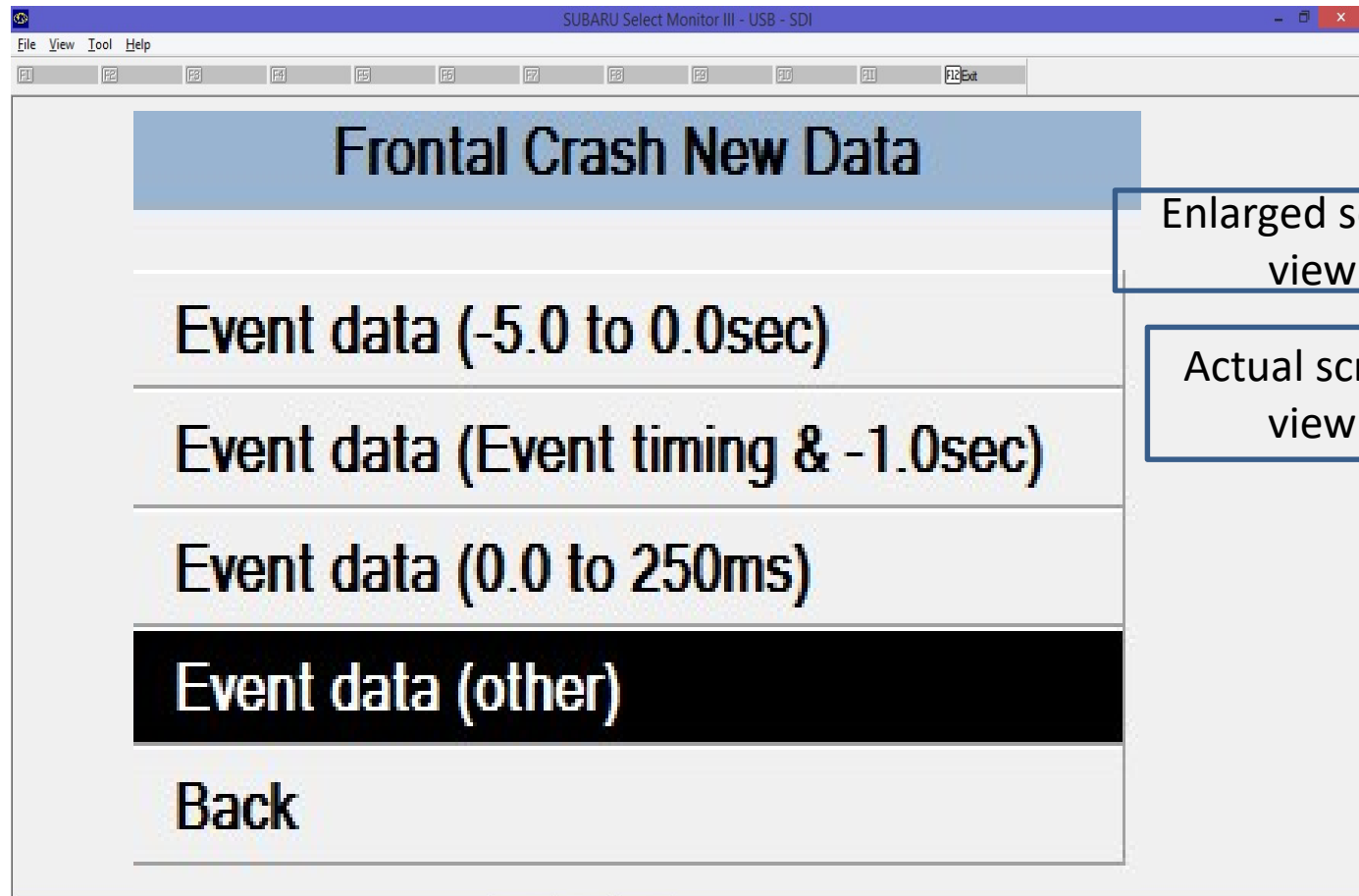
Cursor pos 3/26 0.02 s from sampling start

Item	Value	Unit	Maximum	Minimum	Average
<input checked="" type="checkbox"/> Event name	Frontal Crash ...		-	-	-
<input type="checkbox"/> Delta-V longitudinal	-2	km/h	-	-	-
<input type="checkbox"/> Delta-V lateral	0	km/h	-	-	-

Event Data 0-250ms

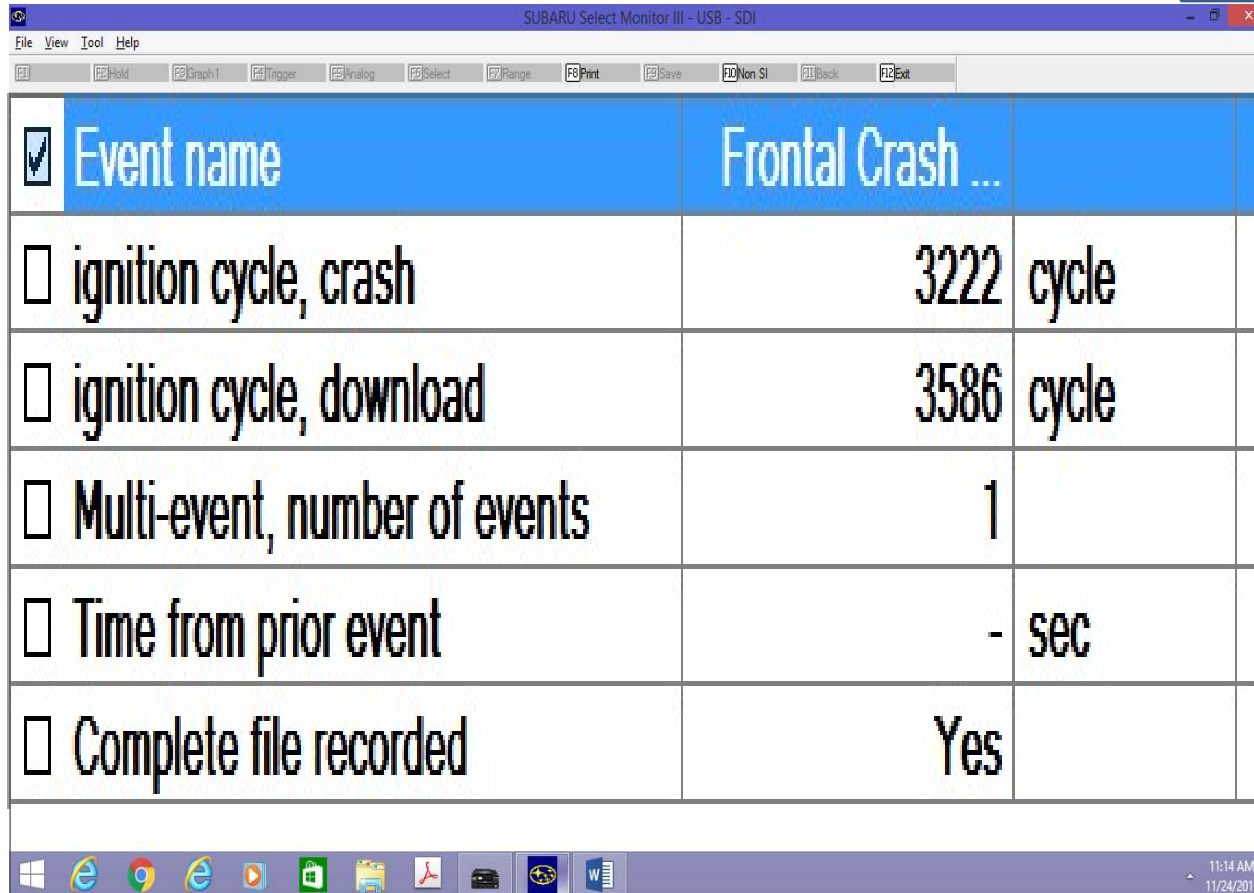


This was a small event.
Note Range can be
changed to make graph
fill page more



Event Data (other) – key cycles and time between events

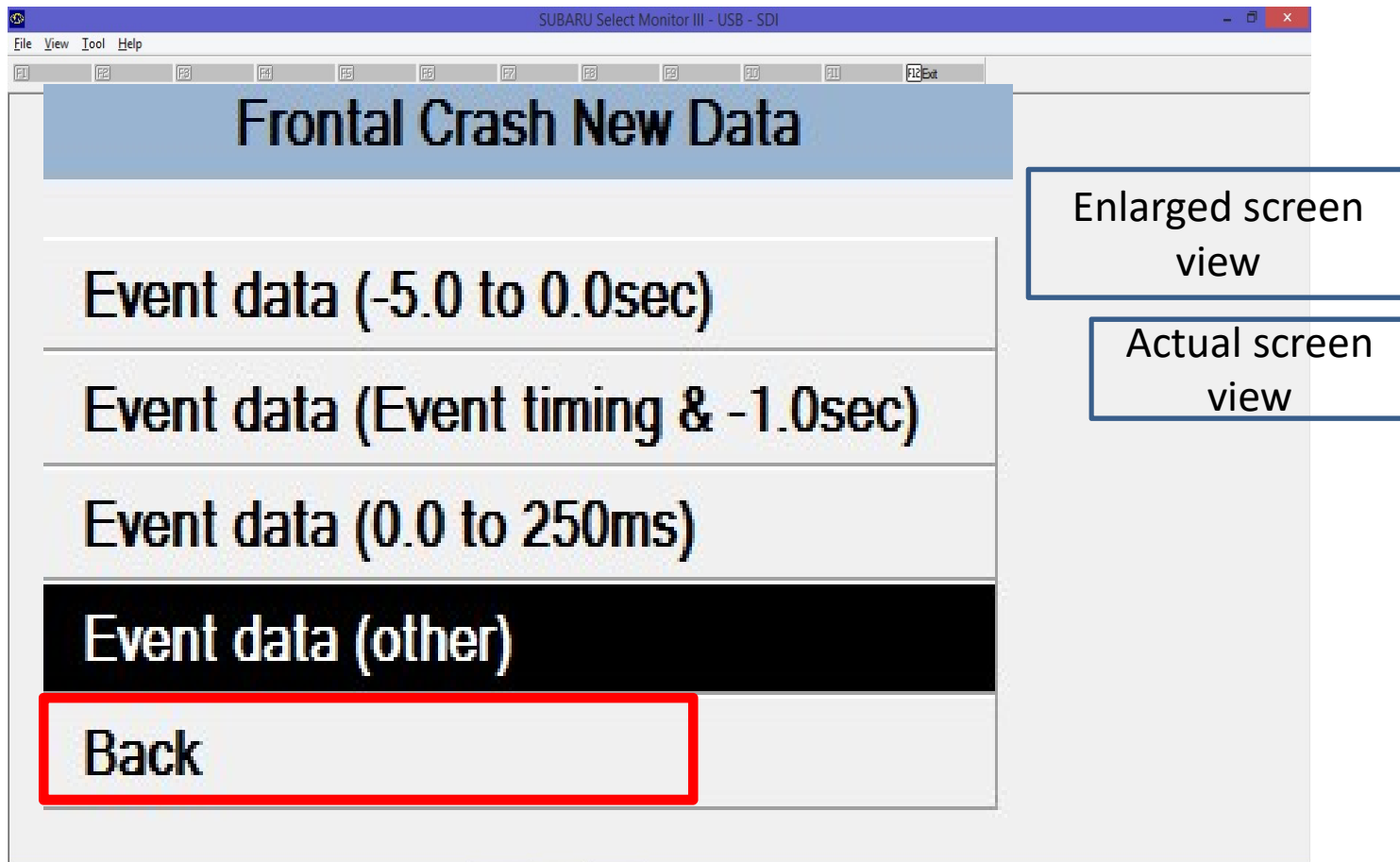
Enlarged screen
view



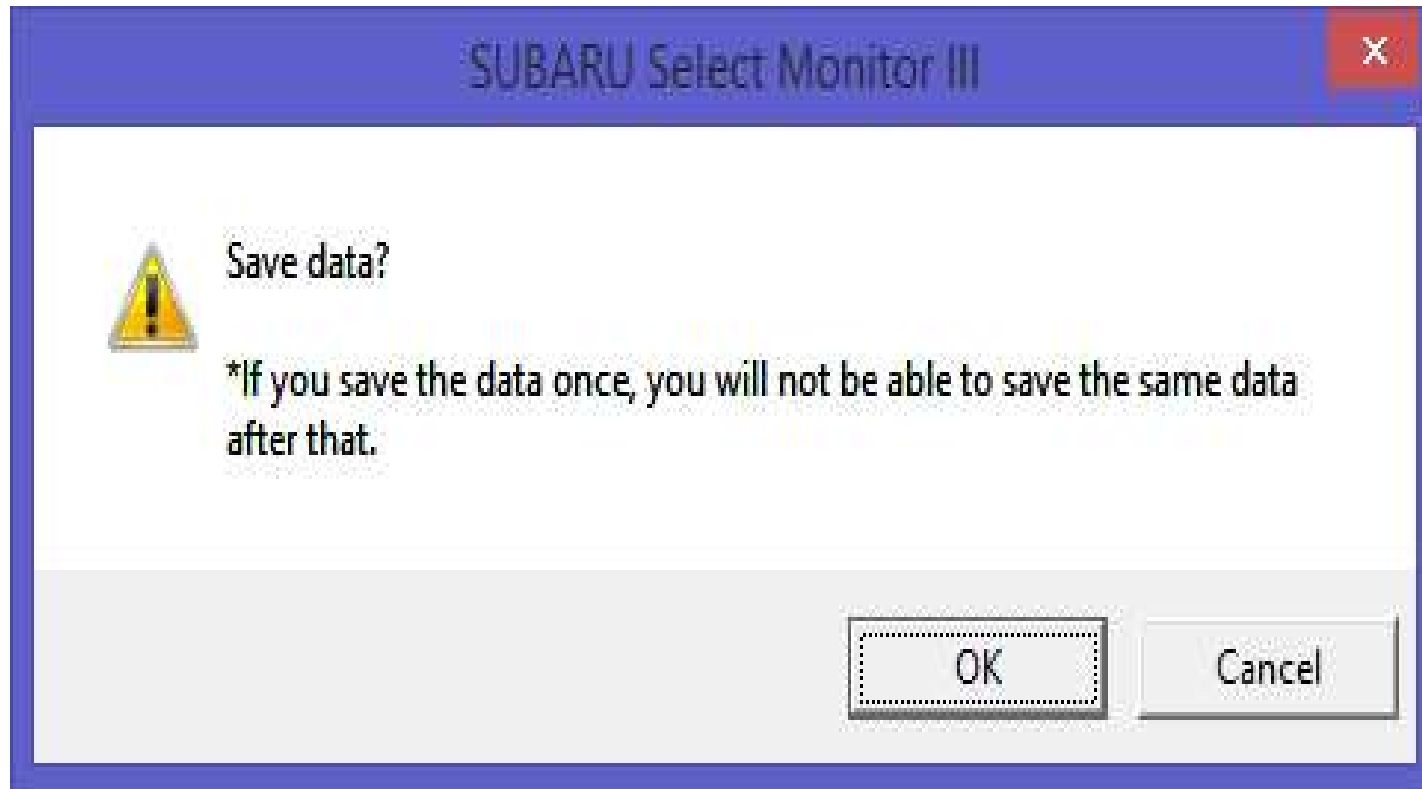
The screenshot shows the SUBARU Select Monitor III - USB - SDI software interface. The window title is "SUBARU Select Monitor III - USB - SDI". The menu bar includes "File", "View", "Tool", and "Help". The toolbar contains icons for "File", "Hold", "Graph1", "Trigger", "Analog", "Select", "Range", "Print", "Save", "Non SI", "Back", and "Exit". The main display area shows a table of event data. The table has four columns: a checkbox column, an "Event name" column, a "Frontal Crash ..." column, and an empty column. The data rows are as follows:

<input checked="" type="checkbox"/>	Event name	Frontal Crash ...	
<input type="checkbox"/>	ignition cycle, crash	3222	cycle
<input type="checkbox"/>	ignition cycle, download	3586	cycle
<input type="checkbox"/>	Multi-event, number of events	1	
<input type="checkbox"/>	Time from prior event	-	sec
<input type="checkbox"/>	Complete file recorded	Yes	

The Windows taskbar is visible at the bottom, showing icons for Windows, Internet Explorer, Google Chrome, Microsoft Edge, VLC media player, Microsoft Word, and a folder icon. The system clock in the bottom right corner shows "11:14 AM" and "11/24/2015".



If you try to save data from on screen, you will get this Scary Warning Message. OK it.





Freeze frame
data is
another menu
choice – this
one had no
data present

What should you do if you have a Subaru case?

- Law Enforcement, If the vehicle electrical system is functioning, you can make arrangements to take the vehicle to a Subaru dealer after getting Subaru approval that you have proper authority. Private, hire someone with the tool.
- If the vehicle electrical system is not functioning, you can take the ACM out of the vehicle and put it in an exemplar, or send it me or to Brad Muir of Crash Data Specialists who are building custom cables. There is no gateway in these pre-2016 vehicles
- For 2016 with nonfunctional electrical system, talk to your instructors about researching whether custom wiring harness will be sufficient (make sure no gateway has been put in)

Back Powering Subaru

- The Subaru interface has a DLC cable and normally gets its power through the DLC. If the vehicle electrical system is dead, you may have to back power the DLC fuse in addition to the airbag module fuse.
- There is also a jack in the side of the Hitachi Interface that takes the same size pin as your 12VDC Bosch CDR power supply. This will power the tester but not the ACM. The ACM must be powered separately.

SSM3 vs SSM4 Software

- SSM3 is thoroughly documented. SSM3 does not ask for a VIN or model or model year, just “airbag system”.
- The new SSM 4 software asks you for the model year, if you respond 2015 it tells you to use SSM 3 software on it. SSM3 software works with the new Denso interface. Some 2016 models respond to either SSM3 or 4, after VIN input on SSM4 it shows options.

Next Gen Public Tool

- Subaru has changed their dealer test equipment provider from Blue Streak to Nuspire for the 2016 model year. The **Hitachi** tool may read some carryover 2016's.
- The new tool is the **Denso DSTi**. It is backwards compatible and will service 2004-2017+ Subaru's and will be the tool needed to access future model years.
- It is sold by Nuspire . The hardware and first year software are bundled and cost \$7895. Second year software updates are \$5800/yr.

To buy the new Denso DST-I tool

Original source: with oscilloscope port

- Nuspire Networks – Tom Sepp, SDS mgr.
3155 Dallavo Court, Commerce, MI 48390
Nuspire (877) 782-7404 (Sepp 248-896-6187)
thomas.sepp@nuspire.com

New source: without oscilloscope port (\$900 less)

- **Ohio Diagnostics LLC**
- **Paul Schwager 330-668-1518**
- info@ohiodiagnostics.com

(smaller outfit, more personal service)

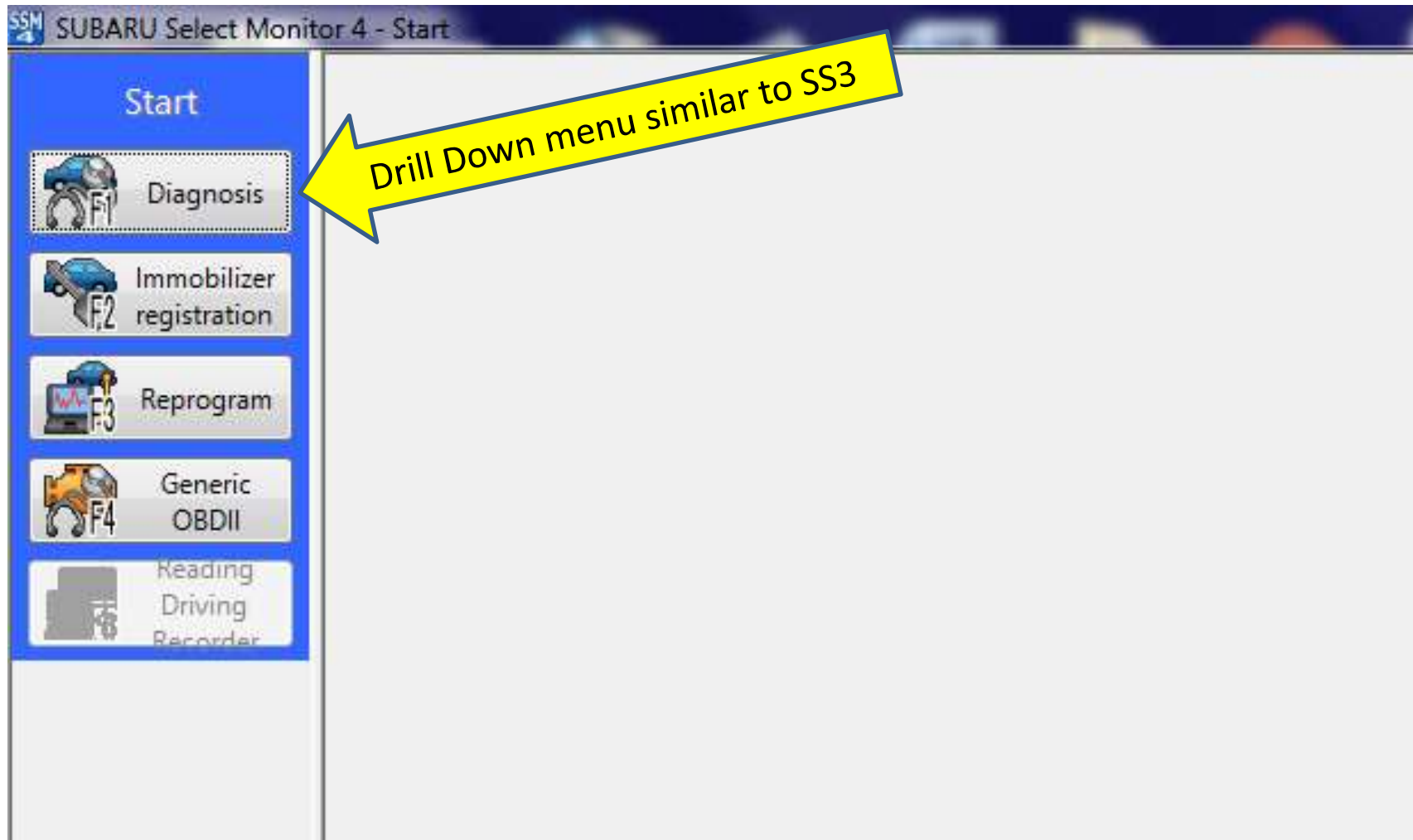
SSM 4 Cost

- The Denso interface with SSM4 software now \$5900 - \$3200 for the interface plus \$2700/yr software.
- There is no “EDR only” tool, the price is based on dealers fixing broken cars daily to pay for it.
- Only a few have it - myself, Brad Muir, DJS Associates in the Philly area, Robert Willer at collisiondata.com in Florida, robert@collisiondata.com, and by now surely a few others have invested in this tool.
- Subaru USA is working with Bosch CDR to switch to a Bosch CDR system. Bosch will not confirm but says another manufacturer is coming on “Late 2018”.

New Denso DSTi Tool Interface



Start with “Diagnosis”



Next: Vehicle Selection

SSM SUBARU Select Monitor 4 - Vehicle selection

Start Diagnosis

Select Vehicle

Vehicle specifications

VIN

Vehicle settings

Vehicle information

Vehicle: Legacy / Outback

Model: 16MY

Diagnostic software: SSM4

Play Project

Back

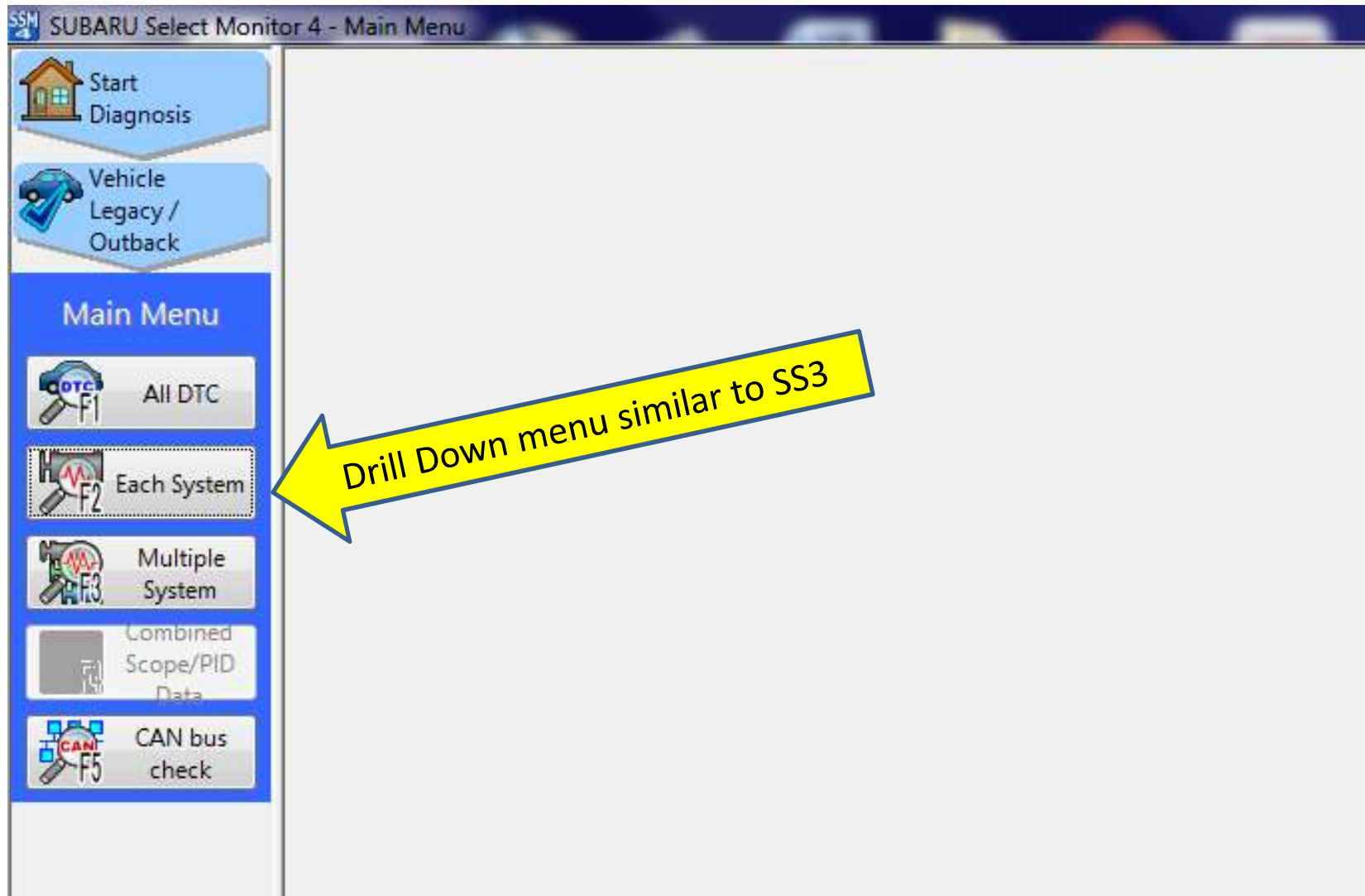
OK

INPUT VIN

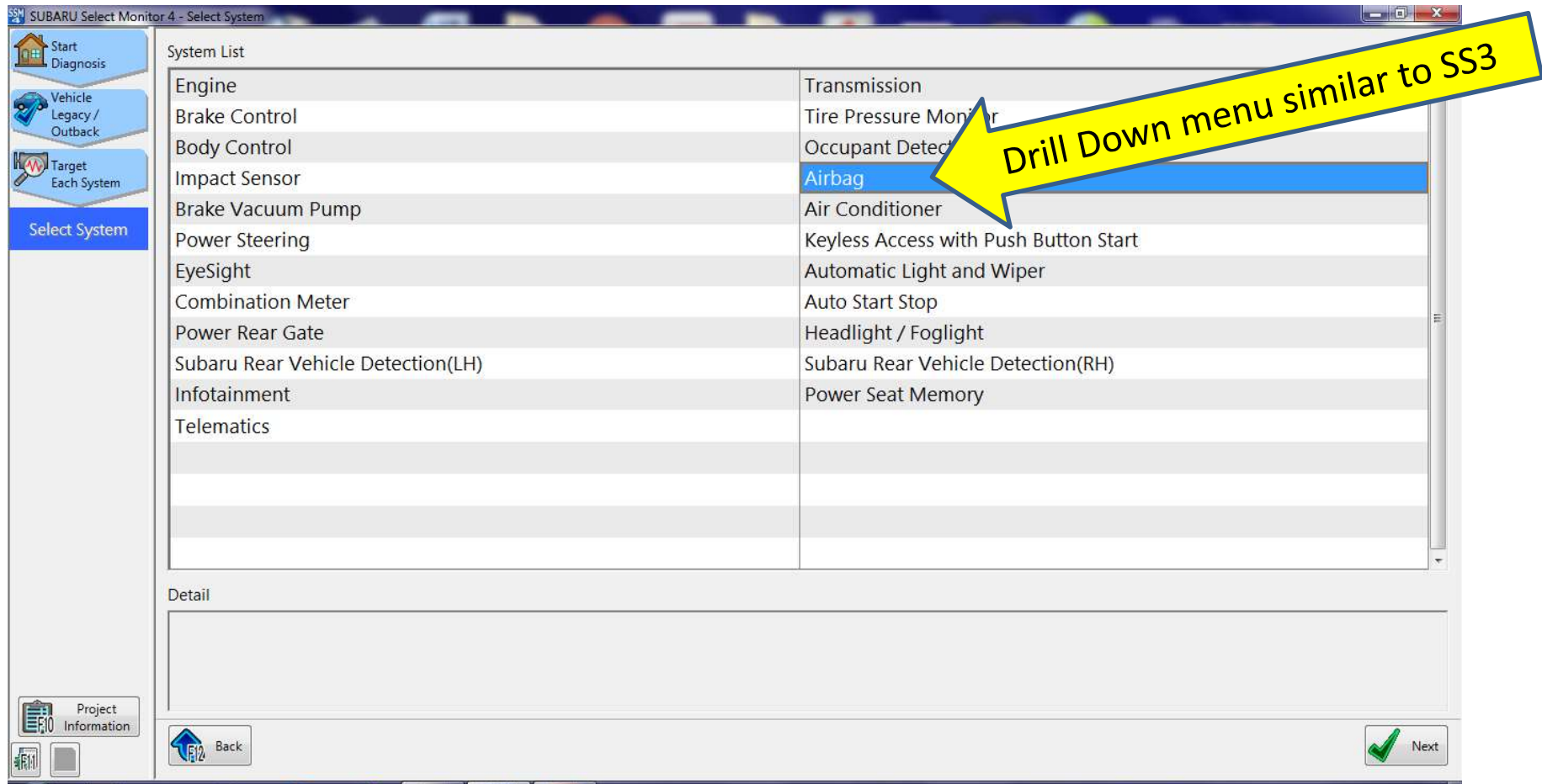
Get this (or input this)

See software needed

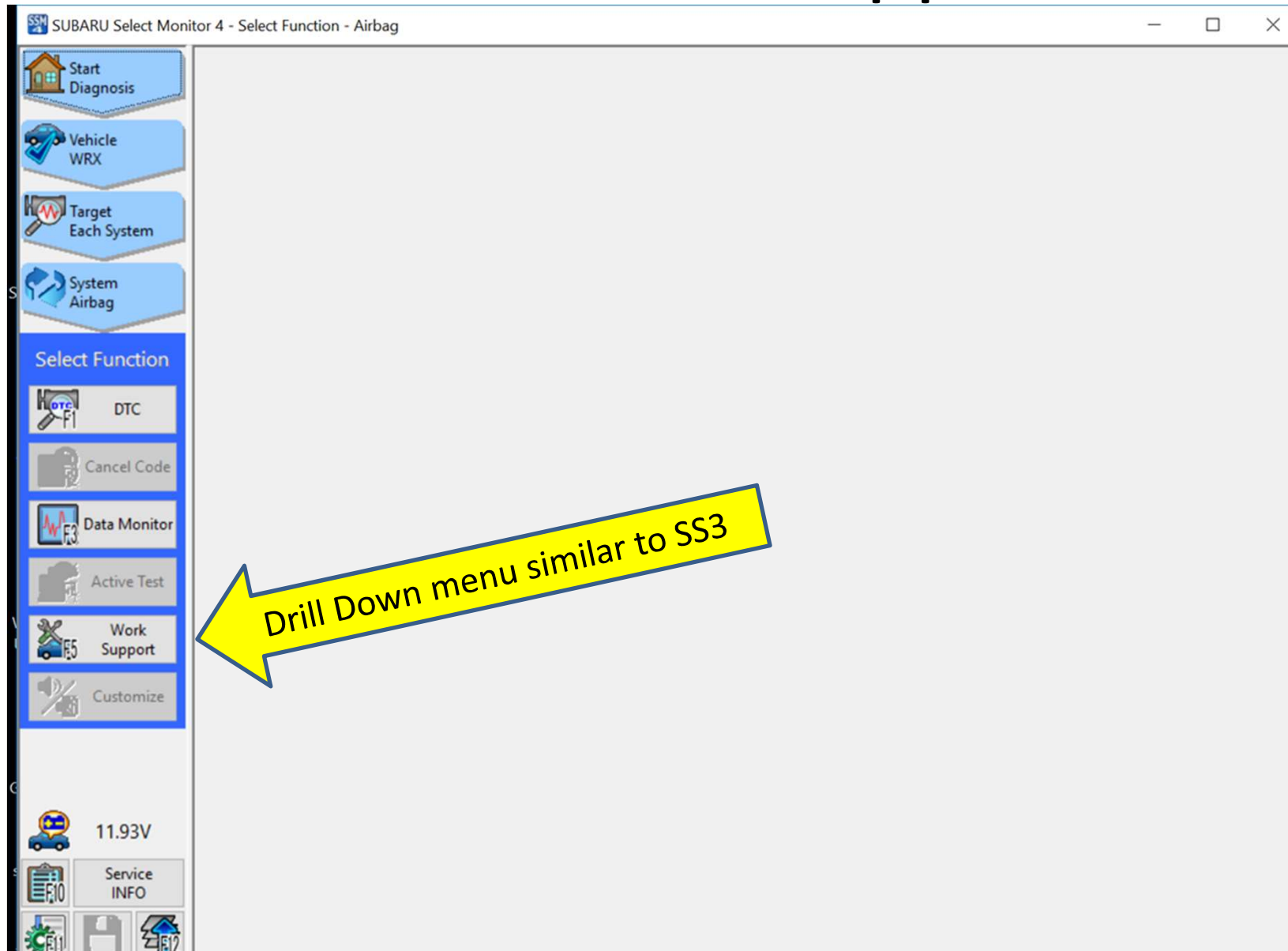
Next: Select “Each System”



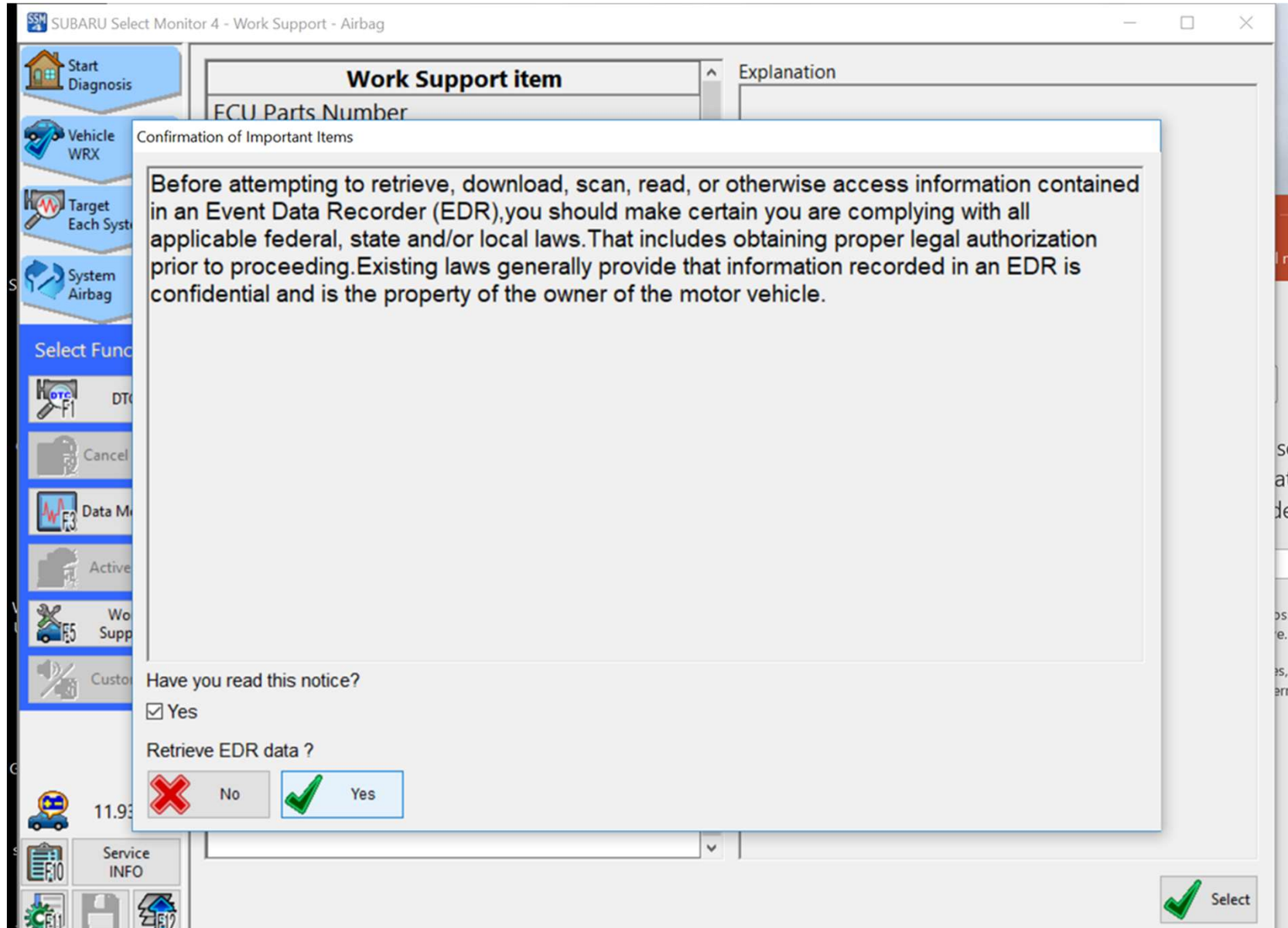
Next Select “Airbag”



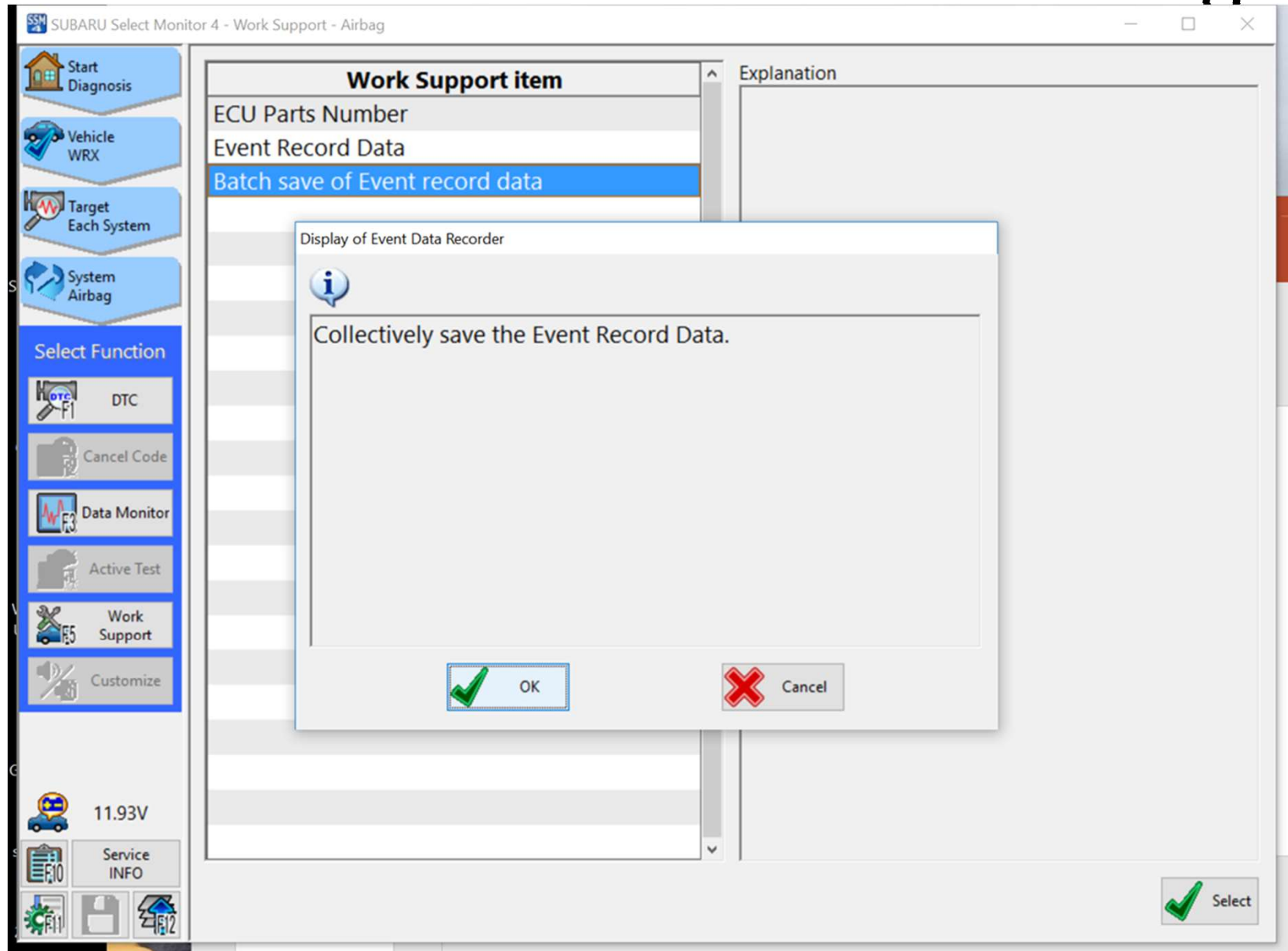
Select Work Support



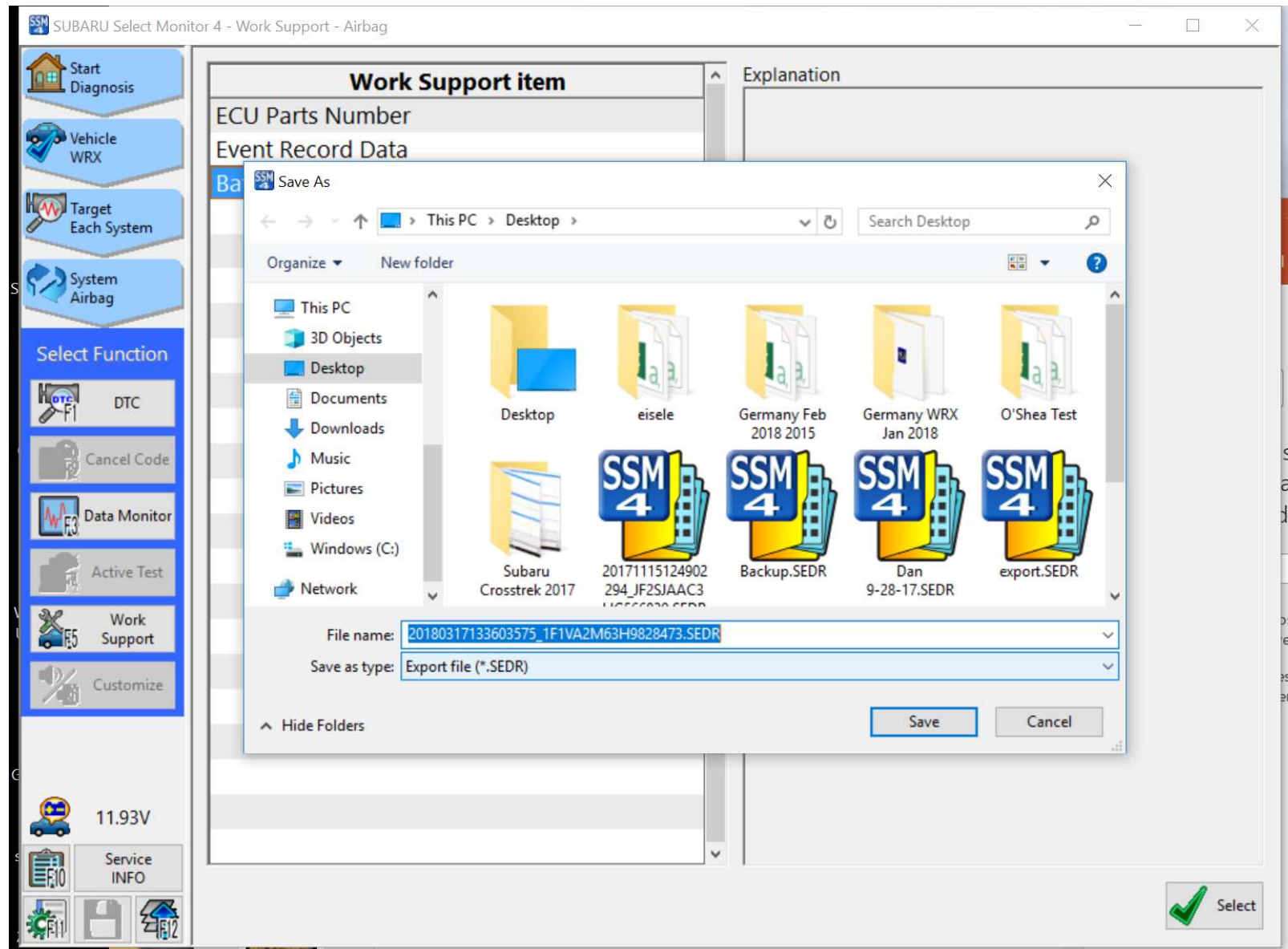
Acknowledge Privacy Caution



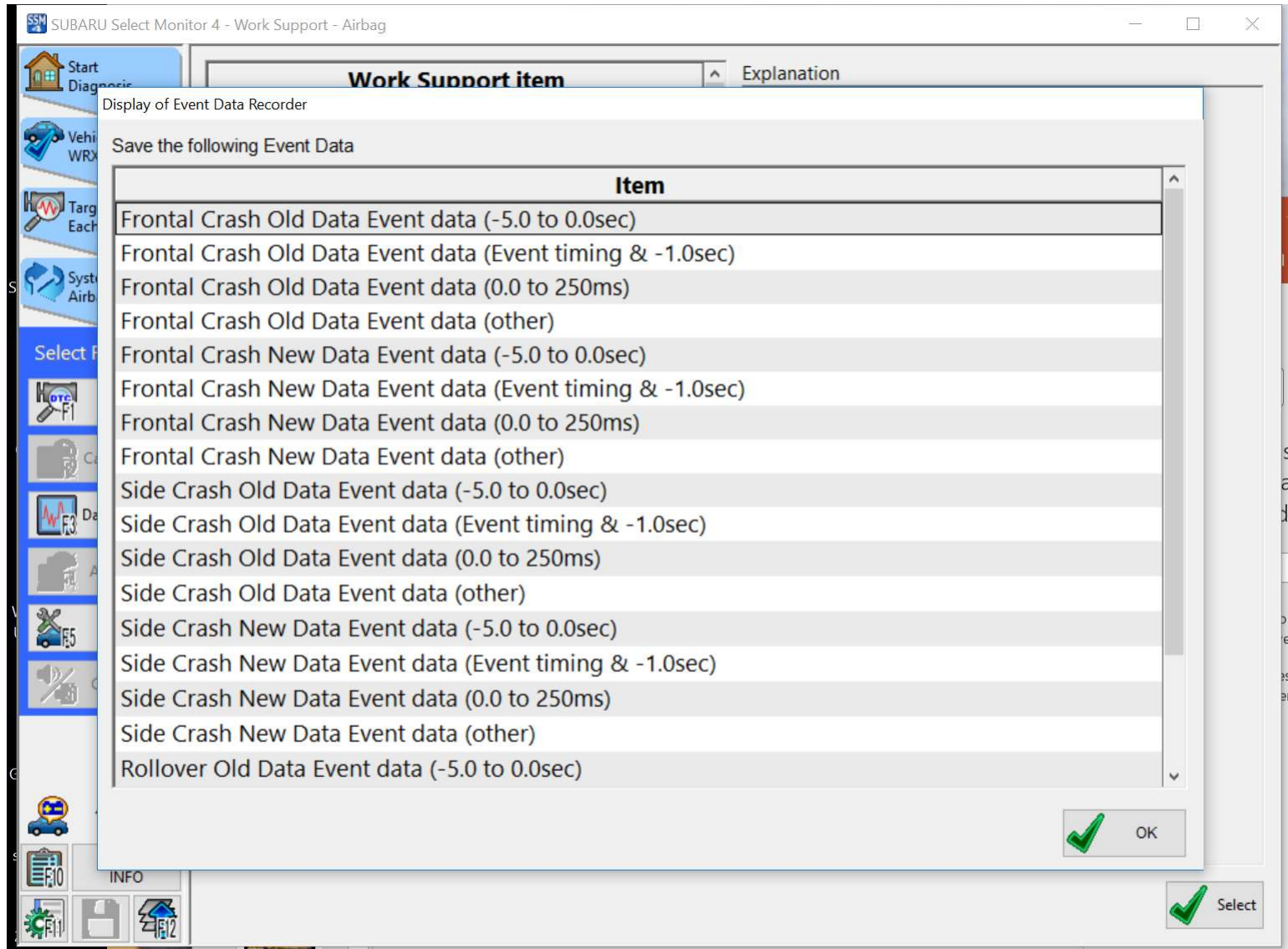
Select Batch Save and acknowledge



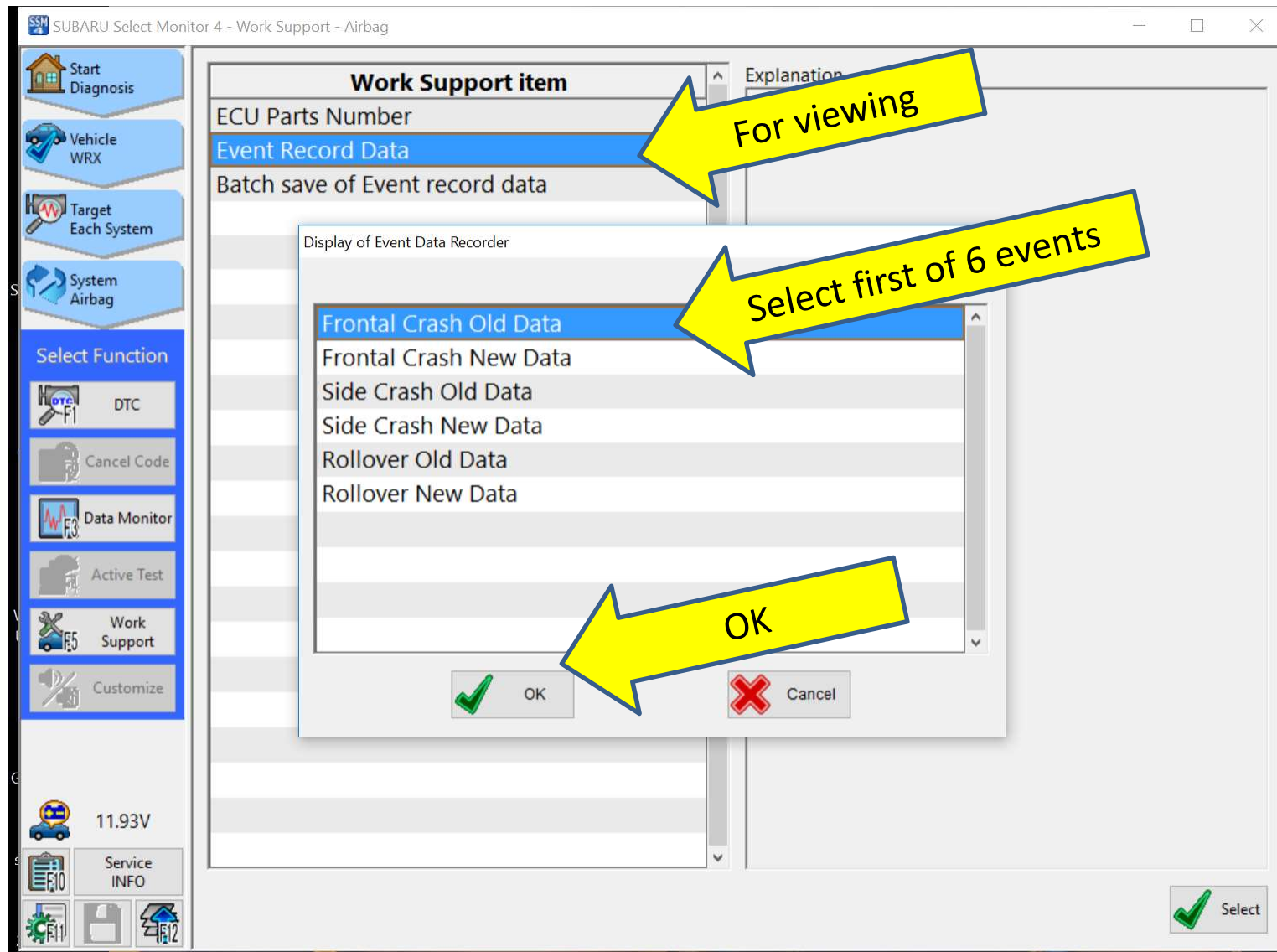
Choose save location and file name



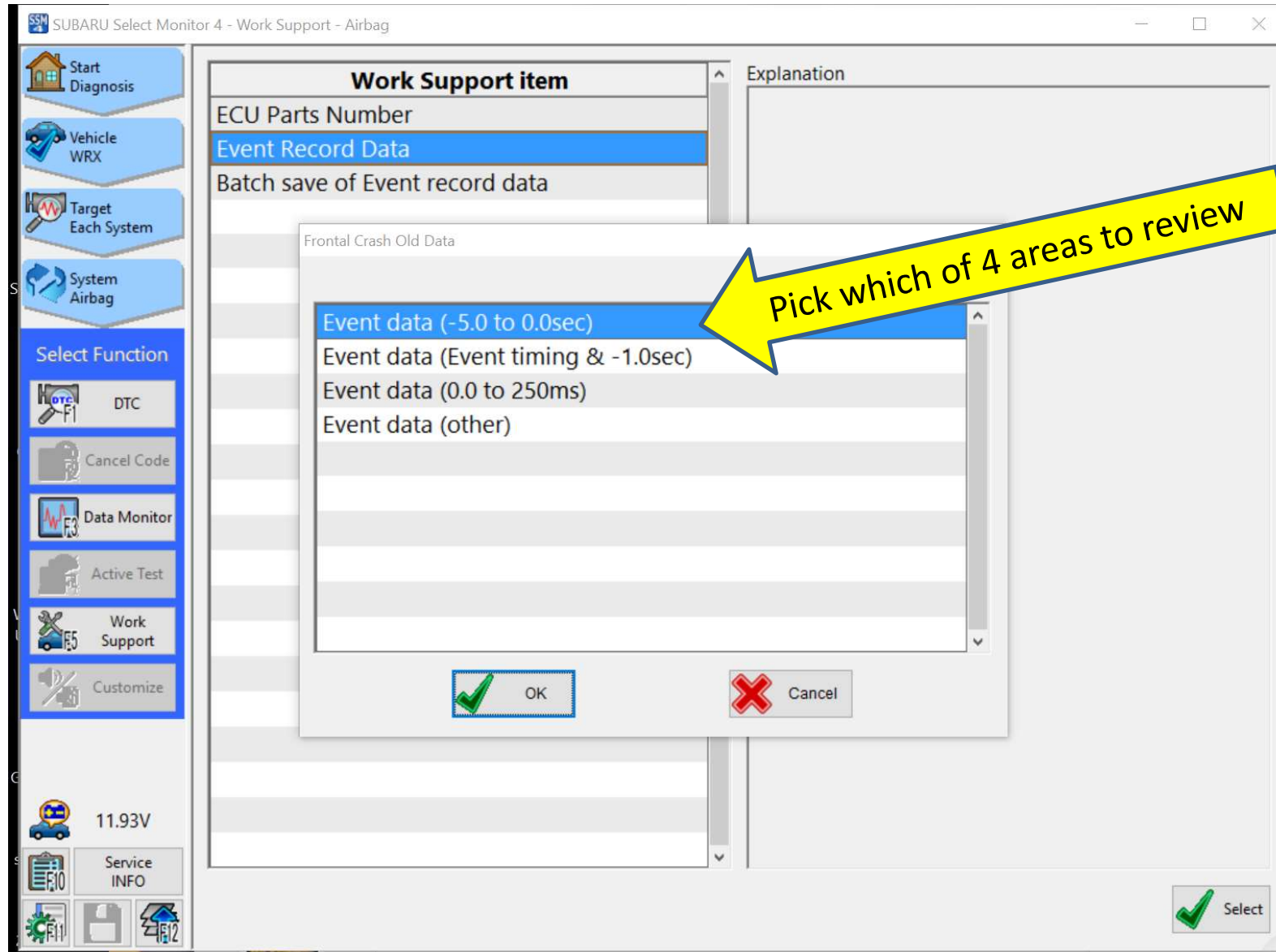
OK the list of events to be saved



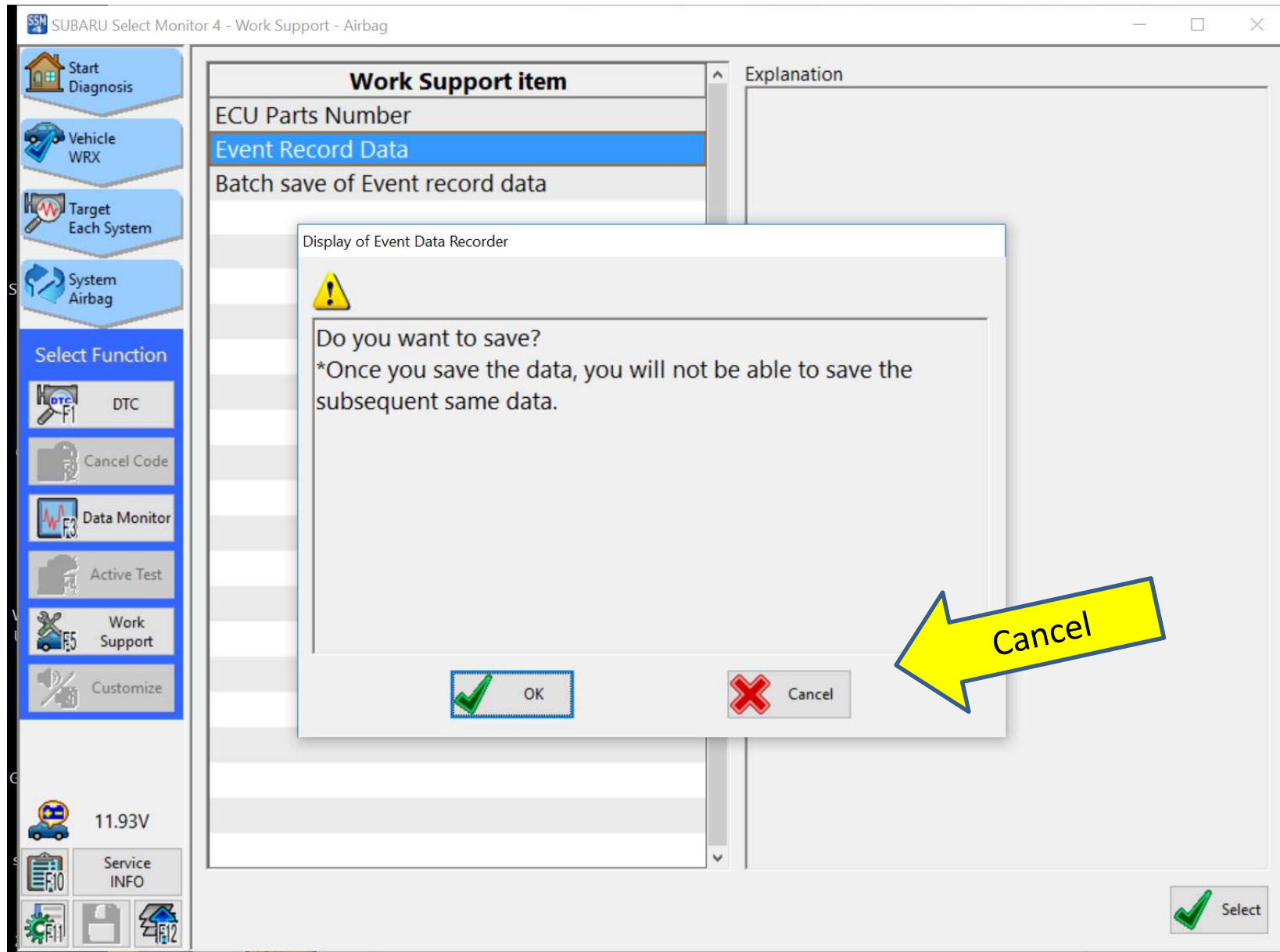
Now go back to review data



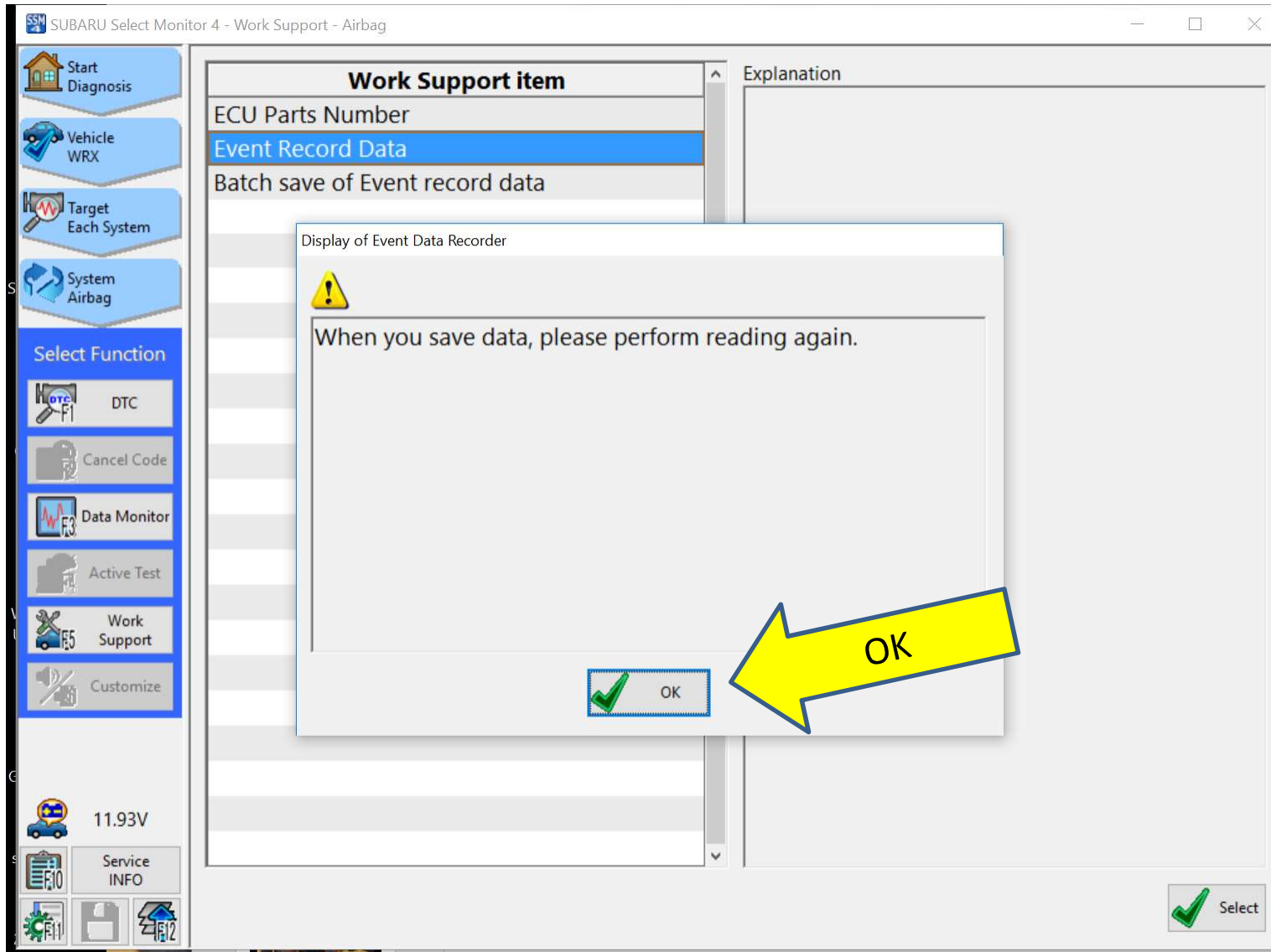
Select area of data to review



Scary choice makes no difference -



Acknowledge to move on



Data is displayed one time sample at a time –
use arrows to see other time samples

SSM SUBARU Select Monitor 4 - Event Data Recorder - Airbag

Start Diagnosis
Vehicle WRX
Target Each System
System Airbag

Select Function
DTC
Cancel Code
Data Monitor
Active Test
Work Support
Customize

Item	Value	Unit	Maximum	Minimum	Average
Vehicle Speed	200km/h o...	km/h	-	-	-
Accelerator Opening Angle %	100	%	-	-	-
Service brake, on/off	OFF		-	-	-
Engine RPM	5600	rpm	-	-	-
Motor RPM	invalid	rpm	-	-	-
ABS activity	OFF		-	-	-
Stability control	OFF		-	-	-
Steering input	0.0	deg	-	-	-
Steering input (%)	0.0	%	-	-	-

Cursor position 1/11

Time (cursor position) 00:00:00.000

Split Graph
Combo Graph
Monitor Setting
Trigger
Mark
Start

11.93V
Service INFO

Looking at -5.0

Use to Scroll

SSM4 Software Documentation

- What we do know is after saving as SSM4 files, that Subaru has DELIBERATELY DISABLED the convert to CSV file menu pick (grayed out).
- You can reopen and see the SSM4 files later, but to send data to someone else you must either summarize it yourself or screenshot it.
- If you have 6 events with 28 files, you may have to take hundreds of screen shots.

How to capture screen shot

SUBARU Select Monitor 4 - Event Data Recorder - Airbag

Start Diagnosis
Vehicle WRX
Target Each System
System Airbag

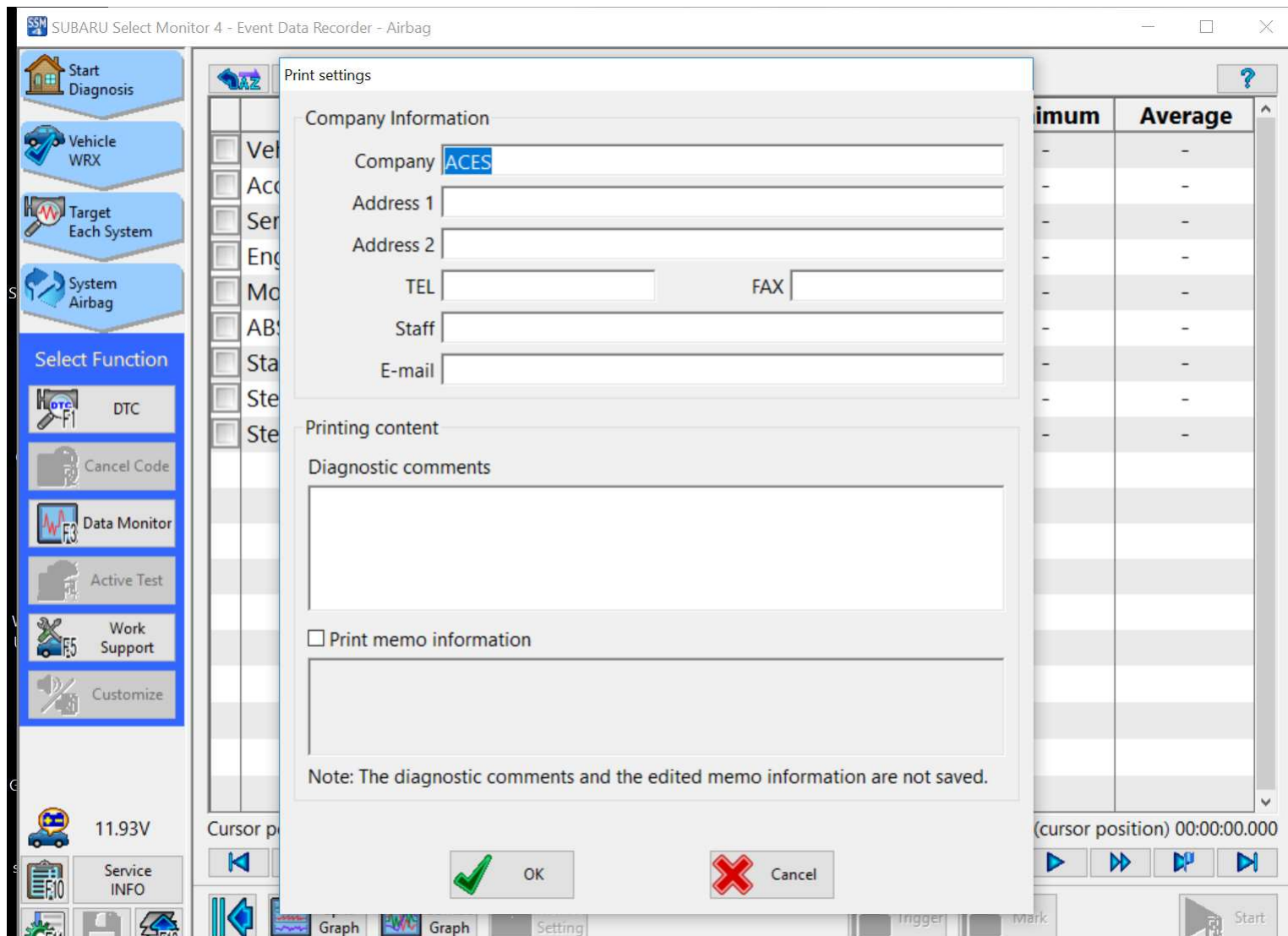
Select Function
DTC
Cancel Code
Data Monitor
Active Test
Work Support
Customize

	Item	Value	Unit	Maximum	Minimum	Average
<input type="checkbox"/>	Vehicle Speed	200km/h o...	km/h	-	-	-
<input type="checkbox"/>	Accelerator Opening Angle %	100	%	-	-	-
<input type="checkbox"/>	Service brake, on/off	OFF		-	-	-
<input type="checkbox"/>	Engine RPM	5600	rpm	-	-	-
<input type="checkbox"/>	Motor RPM	invalid	rpm	-	-	-
<input type="checkbox"/>	ABS activity	OFF		-	-	-
<input type="checkbox"/>	Stability control	OFF		-	-	-
<input type="checkbox"/>	Steering input	0.0	deg	-	-	-
<input type="checkbox"/>	Steering input (%)	0.0	%	-	-	-

File
Print
Function
Setup
on 1/4
Time (cursor position) 00:00:00.000
Split Graph
Combo Graph
Monitor Setting
Trigger
Mark
Start

1. Open Menu
2. Select Print

OK this useless screen



Preview of Save is shown

SSM Print preview

Print Next page Previous page Zoom in Zoom out Close

Print

SUBARU 1 / 1

Event Data Recorder

ACES

TEL: Employee, in charge: FAX:

E-mail:

Date and time: 3/17/2018 1:42:55 PM Vehicle: WRX
VIN: 1F1VA2M63H9B2B473 Model: 17MY > 55M4

[Diagnostic comments]

[Diagnostic result details]

Data name: _____

Memo: _____

<Airbag> Time (cursor position) 00:00:00.000

Item	Value	Unit	Maximum	Minimum	Average
Vehicle Speed	200km/h over	km/h			182
Accelerator Opening Angle %	100	%			27
Service brake, on/off	OFF		-	-	-
Engine RPM	5600	rpm			4936
Motor RPM	invalid	rpm			25500
ABS activity	OFF		-	-	-
Stability control	OFF		-	-	-
Steering input	0.0	deg			21.8
Steering input (%)	0.0	%			4.5

Print to PDF

SSM Print preview

Print Next page Previous page Zoom in Zoom out Close

Event Data Recorder

ACES

TEL: Employee, in charge: FAX:

E-mail:

Print

Printer

Name: Microsoft Print to PDF Properties

Status: Ready

Type: Microsoft Print To PDF

Where: PORTPROMPT:

Comment: ☐ Print to file

Print range

☒ All

☐ Specify age(s) 1 ge(s)

☐ Selection

Copies

Number of copies: 1

1 1 2 2 3

Print preview OK Cancel

OK

Steering input	0.0	deg		21.8
Steering input (%)	0.0	%		4.5

One down 200 to go

2017 wrx sti practice.pdf

file:///C:/Users/ruthc/Desktop/New%20folder/2017%20wrx%20sti%20practice.pdf

SUBARU 1 /

Event Data Recorder

ACES

TEL: FAX:

Employee, in charge:

E-mail:

Date and time: 3/17/2018 1:42:55 PM

VIN: 1F1VA2M63H9828473

Vehicle: WRX

Model: 17MY > SSM4

[Diagnostic comments]

[Diagnostic result details]

Data name:

Memo:

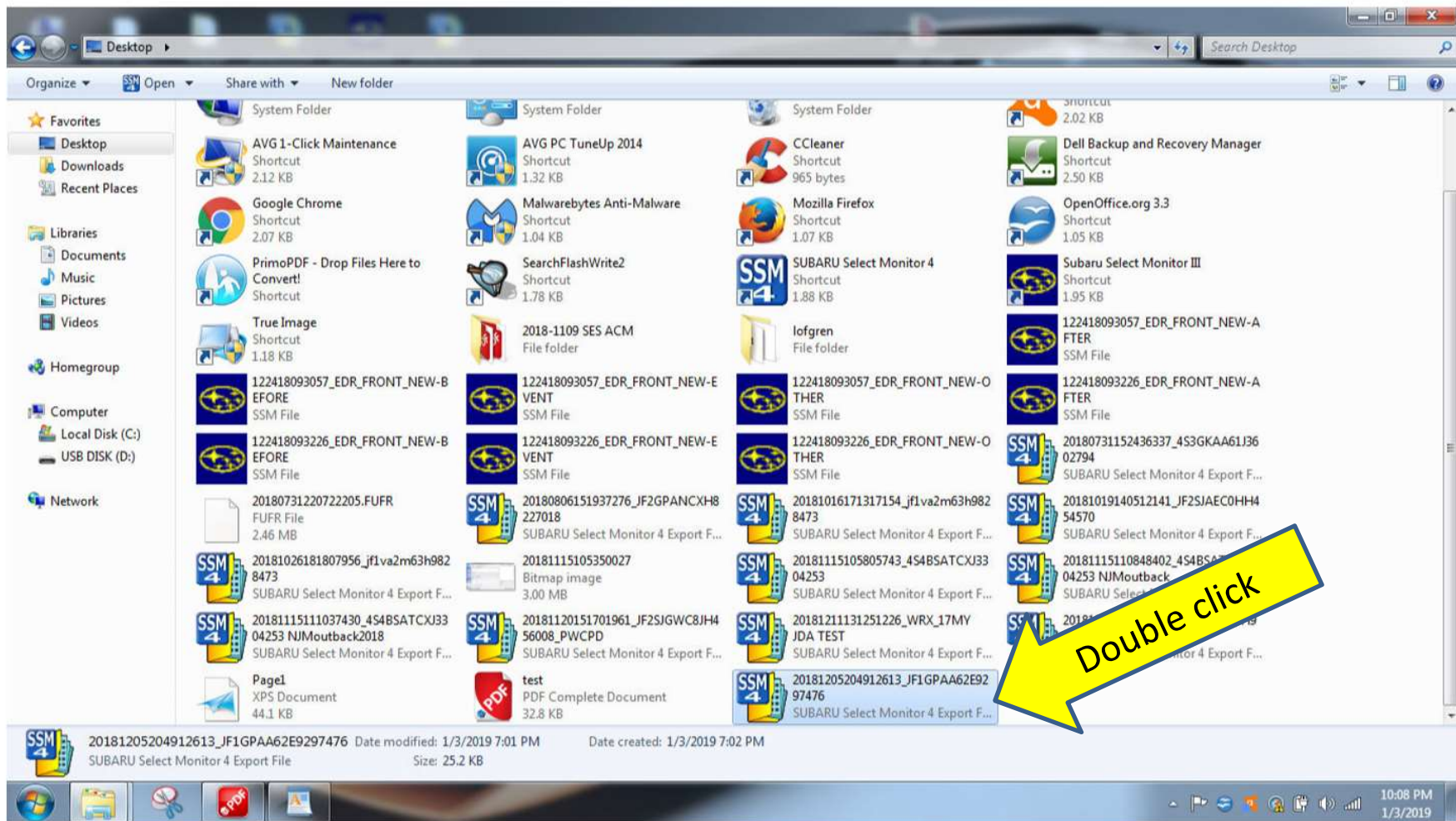
<Airbag>

Time (cursor position) 00:00:00.000

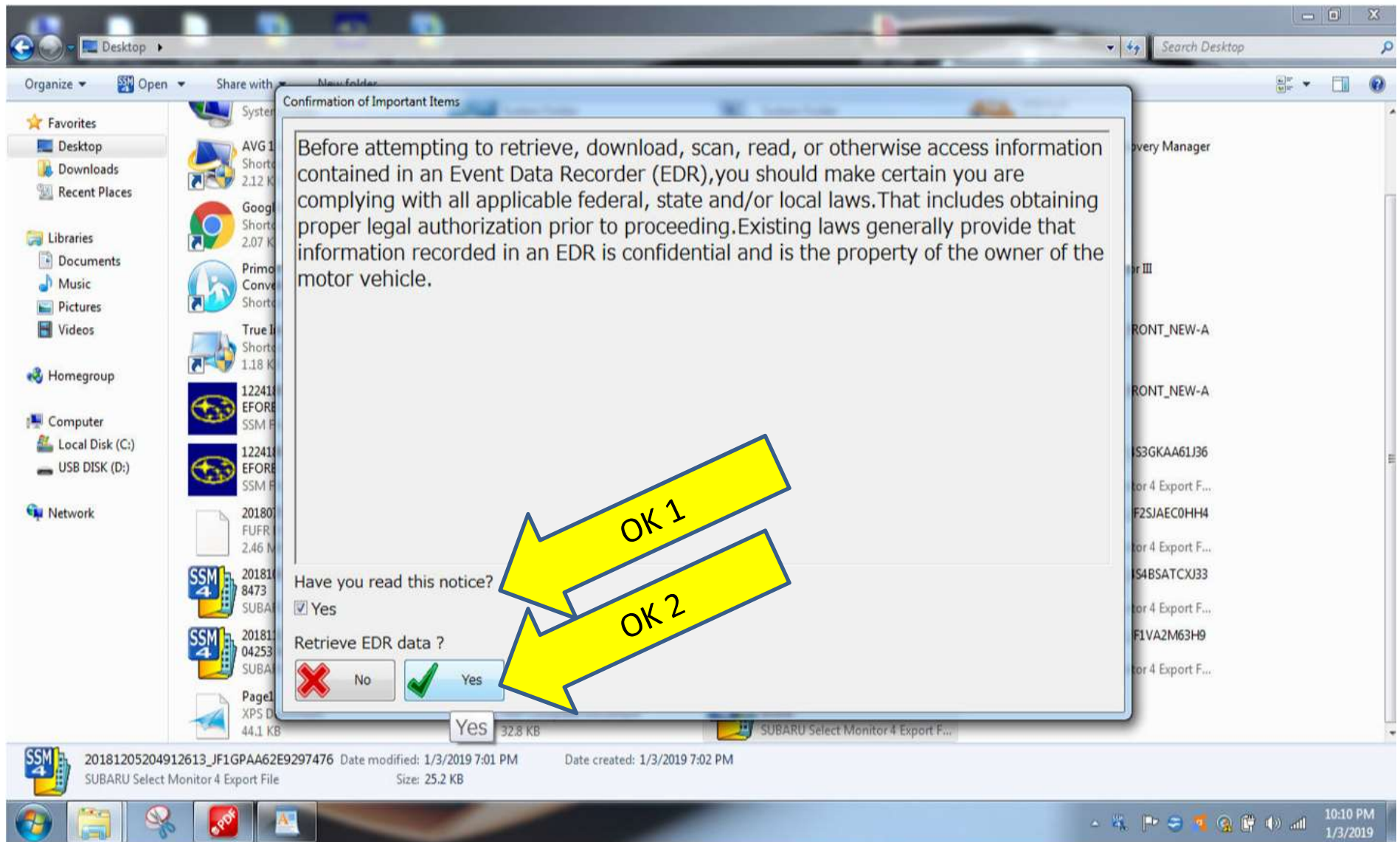
Item	Value	Unit	Maximum	Minimum	Average
Vehicle Speed	200km/h over	km/h			182
Accelerator Opening Angle %	100	%			27
Service brake, on/off	OFF		-	-	-
Engine RPM	5600	rpm			4936
Motor RPM	invalid	rpm			25500
ABS activity	OFF		-	-	-

Reopening .SEDR File

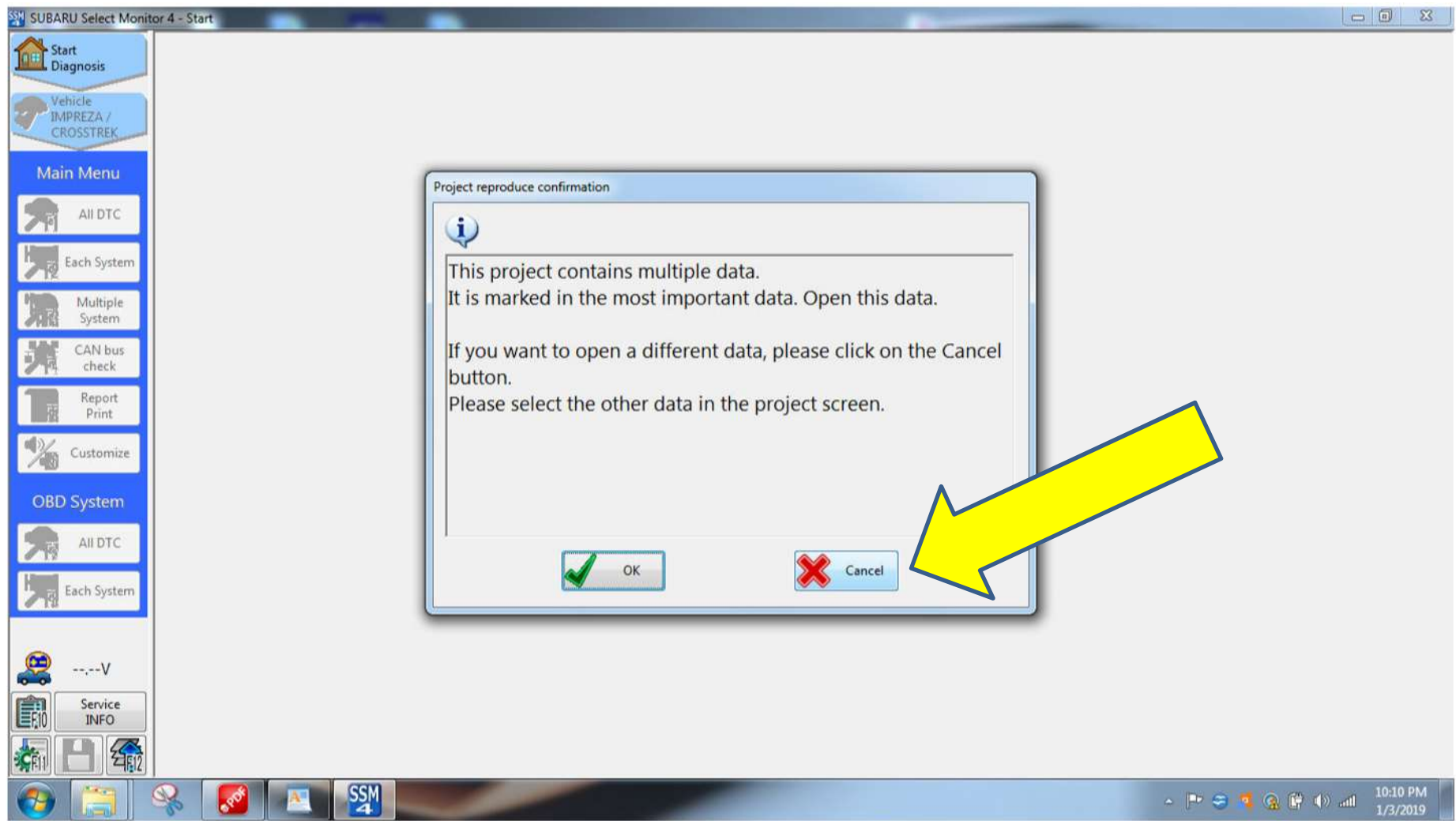
Reopen .SEDR File by double clicking on it - SSM program will open



OK Privacy Screen



Hit Cancel



Select file to be viewed in right box

Note you had to have opened it before to reopen it

The screenshot shows the SUBARU Select Monitor 4 software interface. The left sidebar contains navigation buttons: Start Diagnosis, Vehicle IMPREZA / CROSSTREK, Main Menu (All DTC, Each System, Multiple System, CAN bus check, Report Print, Customize), OBD System (All DTC, Each System), and Service INFO. The central area displays project information (Project name: 12/5/2018 8:47:22 PM_JF1GPAA62E9297476_Imp_0001, Start Time: 12/5/2018 8:47:22 PM, End Time: -), a comment field, and vehicle information (VIN: JF1GPAA62E9297476, Model: IMPREZA / CROSSTREK 14MY, Diagnostic software: SSM4). The right sidebar shows an 'Individual data list' with a tree view of event data. A yellow arrow points to the file 'Frontal Crash New Data Event data (0.0' in the list. Below the list, the 'Individual data' section shows details for the selected file: Data name: Frontal Crash New Data Event da, Entry date: 12/5/2018 8:49:07 PM, and a memo field. At the bottom right, there are buttons for CSV output, Delete, and Open. The taskbar at the bottom shows the Windows Start button, taskbar icons, and the system clock (10:11 PM, 1/3/2019).

Project

Project name 12/5/2018 8:47:22 PM_JF1GPAA62E9297476_Imp_0001

Start Time 12/5/2018 8:47:22 PM

End Time -

Comment of diagnosis (print out)

Vehicle information

Frame No -

Regist. No -

VIN JF1GPAA62E9297476

Vehicle IMPREZA / CROSSTREK

Model 14MY

Diagnostic software SSM4

Individual data list

Date (New -> Old)

Side Crash New Data Event data (Event

12/5/2018 8:49:09 PM

Airbag

Event Data Recorder

Side Crash New Data Event data (-5.0 to

12/5/2018 8:49:08 PM

Airbag

Event Data Recorder

Frontal Crash New Data Event data (0.0

Frontal Crash New Data Event data (0.0

12/5/2018 8:49:07 PM

Airbag

Event Data Recorder

Frontal Crash New Data Event data (0.0

12/5/2018 8:49:06 PM

Airbag

Event Data Recorder

Individual data

Data name Frontal Crash New Data Event da

Entry date 12/5/2018 8:49:07 PM

Memo

CSV output Delete Open

F10 key takes you to nav screen

SSM SUBARU Select Monitor 4 - Event Data Recorder - Airbag

Start Diagnosis

Vehicle IMPREZA / CROSSTREK

Target Each System

System Airbag

Select Function

DTC

Cancel Code

Data Monitor

Active Test

Work Support

Customize

Item	Value	Unit	Maximum	Minimum	Average
Maximum delta-V longitudinal	-49	km/h	-	-	-
Time, maximum delta-V	300.0	ms	-	-	-
Maximum delta-V, lateral	-9	km/h	-	-	-
Time maximum delta-V, lateral	300.0	ms	-	-	-
Frontal air bag deployment, time to deploy, 1st stage, driver	11	ms	-	-	-
Frontal air bag deployment, time to deploy, 1st stage, passenger side	11	ms	-	-	-
Frontal air bag deployment, time to deploy, 2nd stage, driver	11	ms	-	-	-
Frontal air bag deployment, time to deploy, 2nd stage, passenger side	21	ms	-	-	-
Side air bag deployment, time to deploy, driver	invalid	ms	-	-	-
Side air bag deployment, time to deploy, right front passenger	41	ms	-	-	-
Side curtain air bag deployment, time to deploy, driver side	19	ms	-	-	-
Side curtain air bag deployment, time to deploy, passenger side	19	ms	-	-	-
Frontal air bag warning lamp	OFF		-	-	-
Safety belt status, driver	ON (fasten...		-	-	-
Safety belt status, right front passenger	ON (fasten...		-	-	-
Time, the measurement first exceeded the design range of the longitudinal	invalid	ms	-	-	-
Time, the measurement first exceeded the design range of the lateral acceleration	invalid	ms	-	-	-
Occupant status, right front passenger	Occupant		-	-	-
Occupant status, reverse (AT/CVT)	invalid		-	-	-

position 1/1

Time (cursor position) 00:00:00.000

Split Graph

Combo Graph

Monitor Setting

Trigger

Mark

Start

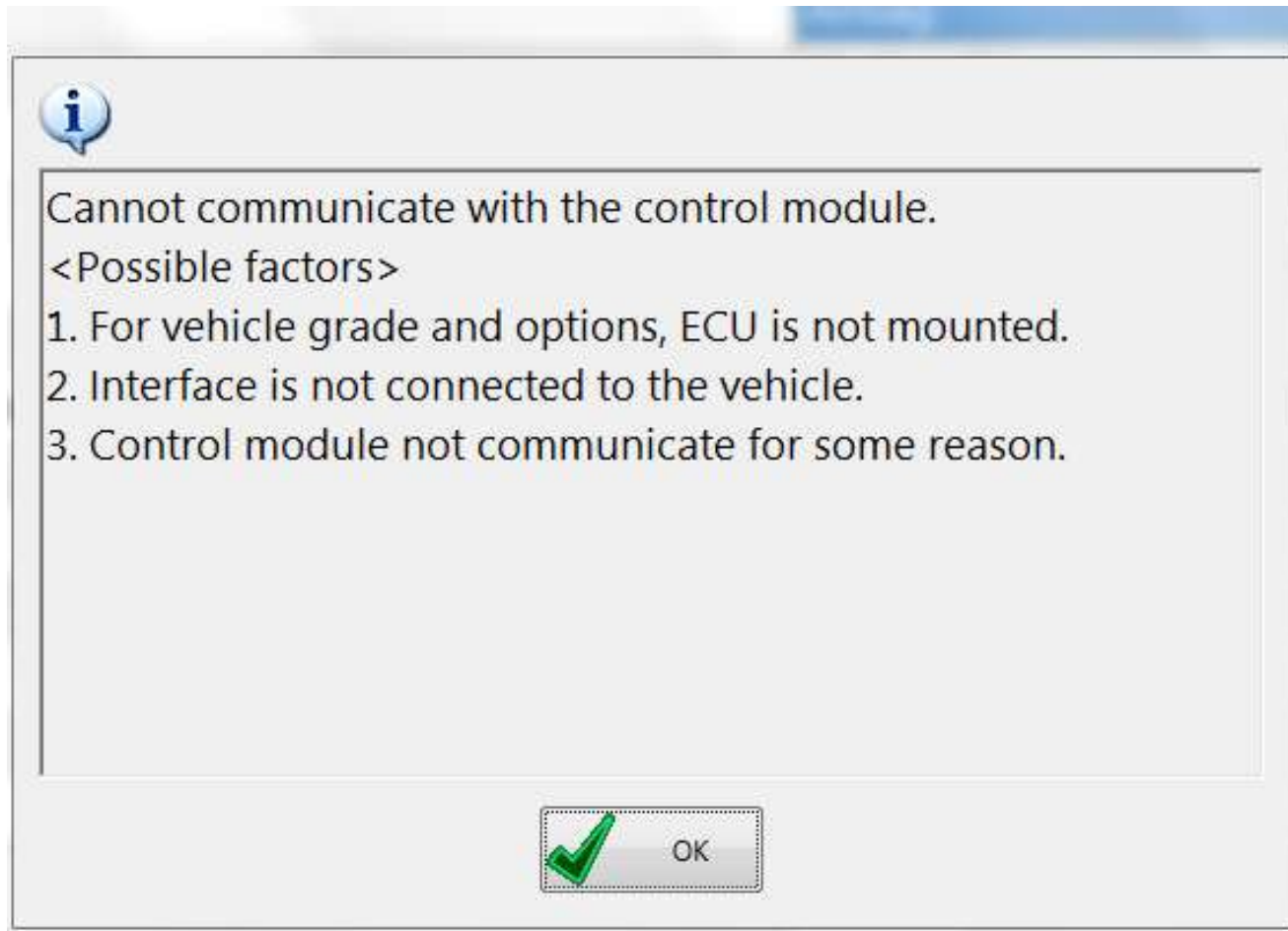
Up one level

Windows taskbar: 9:52 PM 1/3/2019

Other ways to capture SSM4

- Use the open office feature and open a text document file
- Use the Function-F11 key to do a screen capture
- Paste into open document
- Be sure to hit return between pastes. If you don't, it may just overwrite former paste

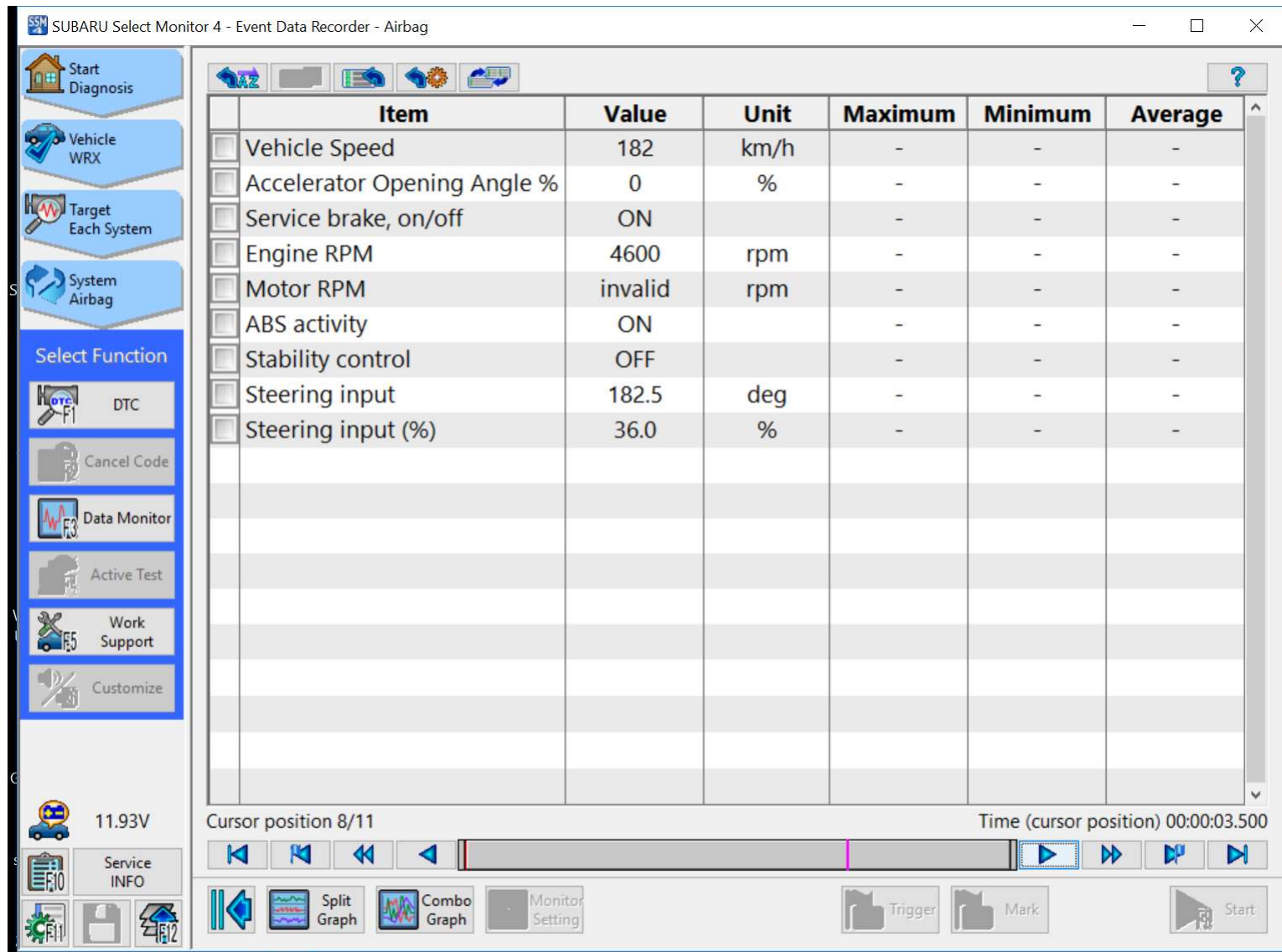
If no communication with ACM, you will get this error message



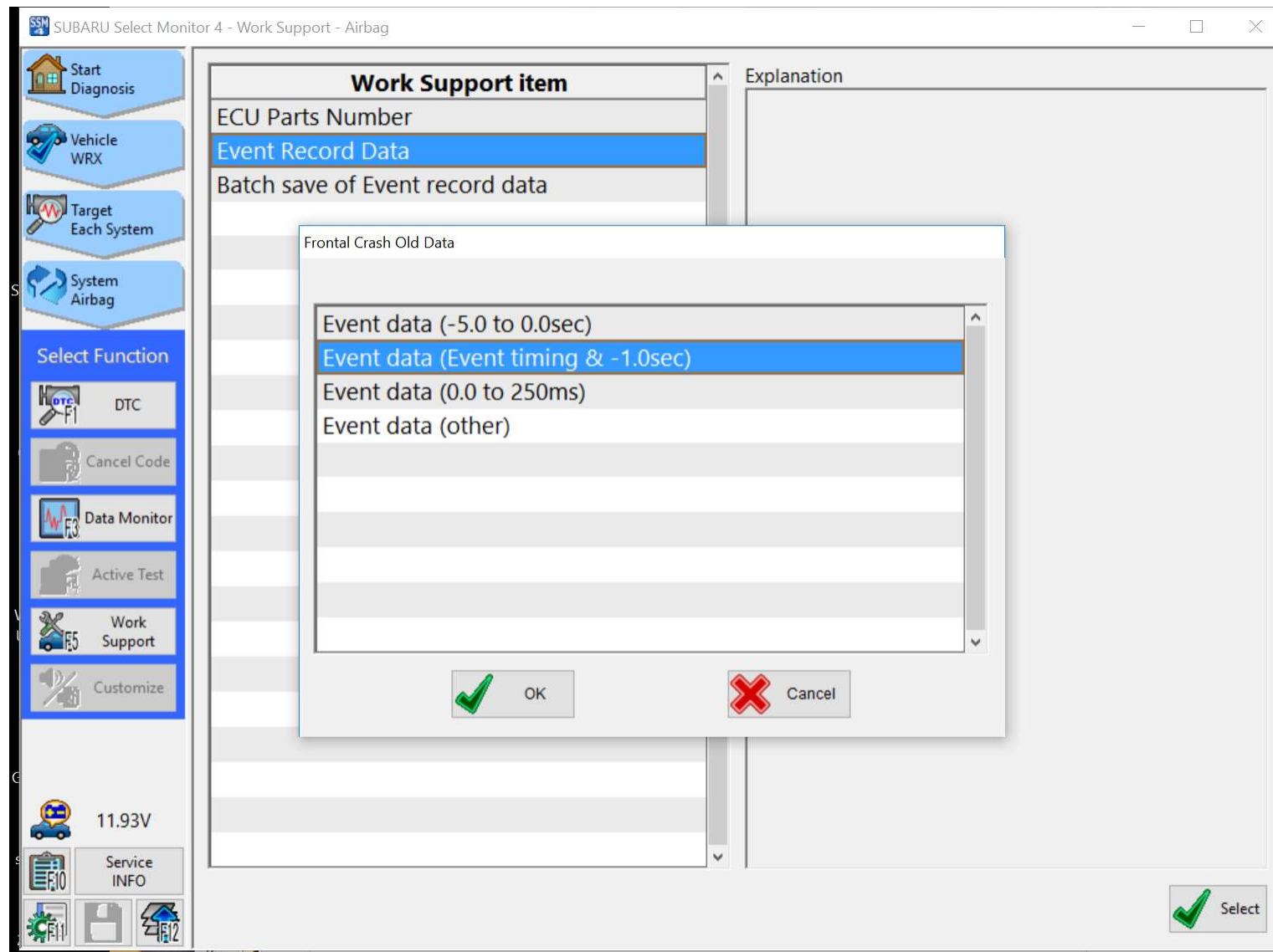
After a severe crash the DLC plug may not be powered. You may have to back power DLC fuse and ACM fuse to get data.



Scroll to next point in time. Repeat.



When finished with 11 precrash, go on to next section of data



Go thru same save procedure. Only one screen in this section to save.

SUBARU Select Monitor 4 - Event Data Recorder - Airbag

Start Diagnosis
Vehicle WRX
Target Each System
System Airbag

Select Function

DTC
Cancel Code
Data Monitor
Active Test
Work Support
Customize

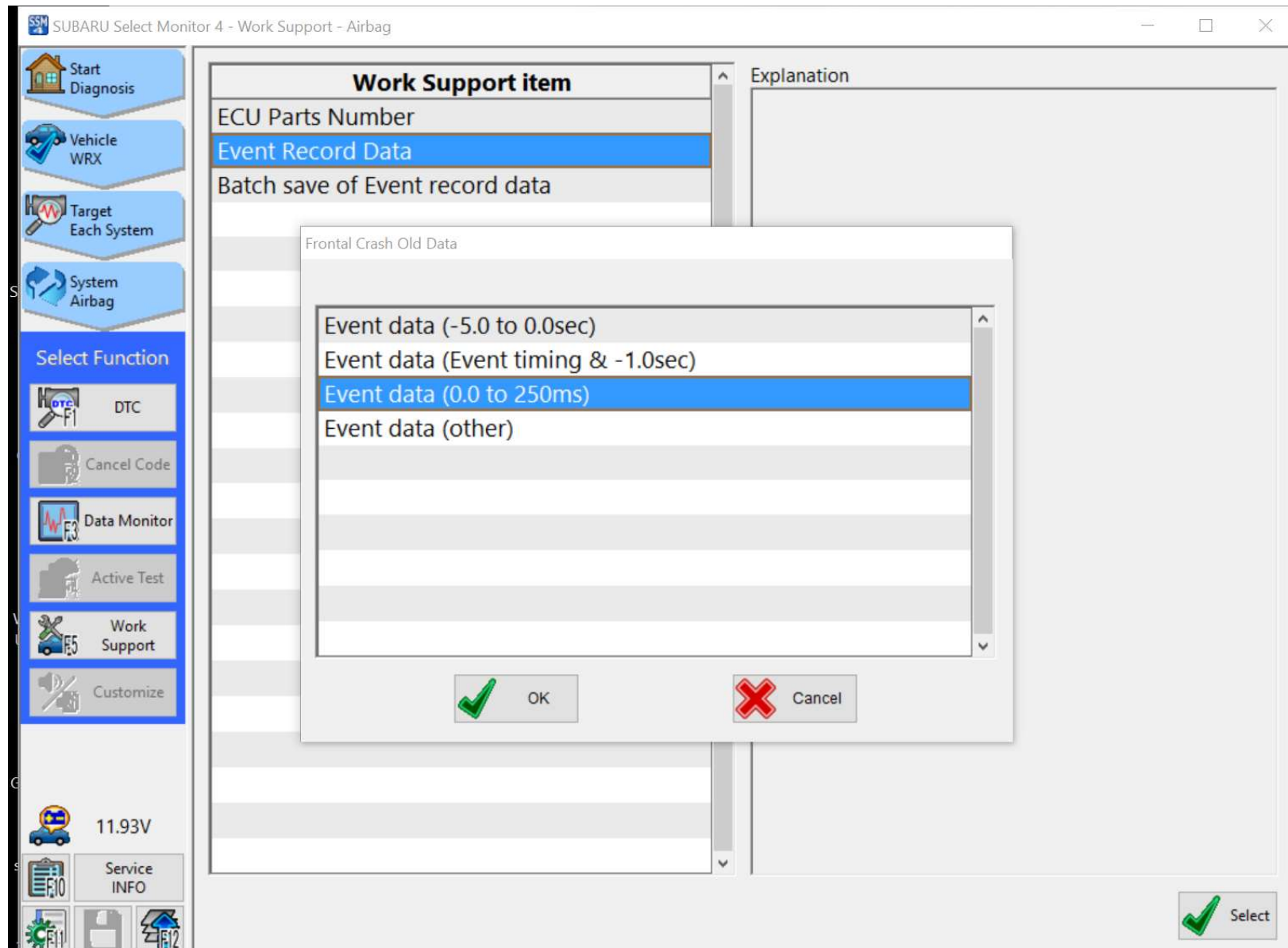
11.93V
Service INFO

Item	Value	Unit	Maximum	Minimum	Average
Maximum delta-V longitudi...	-13	km/h	-	-	-
Time,maximum delta-V	227.5	ms	-	-	-
Maximum delta-V, lateral	-34	km/h	-	-	-
Time maximum delta-V, late...	227.5	ms	-	-	-
Frontal air bag deployment, ...	invalid	ms	-	-	-
Frontal air bag deployment, ...	invalid	ms	-	-	-
Frontal air bag deployment, ...	invalid	ms	-	-	-
Frontal air bag deployment, ...	invalid	ms	-	-	-
Side air bag deployment, ti...	invalid	ms	-	-	-
Side air bag deployment, ti...	21	ms	-	-	-
Side curtain air bag deploy...	invalid	ms	-	-	-
Side curtain air bag deploy...	invalid	ms	-	-	-
Frontal air bag warning lamp	OFF		-	-	-
Safety belt status, driver	ON (fasten...		-	-	-
Safety belt status, right front...	OFF (not f...		-	-	-
Time, the measurement first ...	invalid	ms	-	-	-
Time, the measurement first ...	0	ms	-	-	-
Occupant status, right front ...	Empty		-	-	-
Shift status, reverse (AT/CVT)	invalid		-	-	-

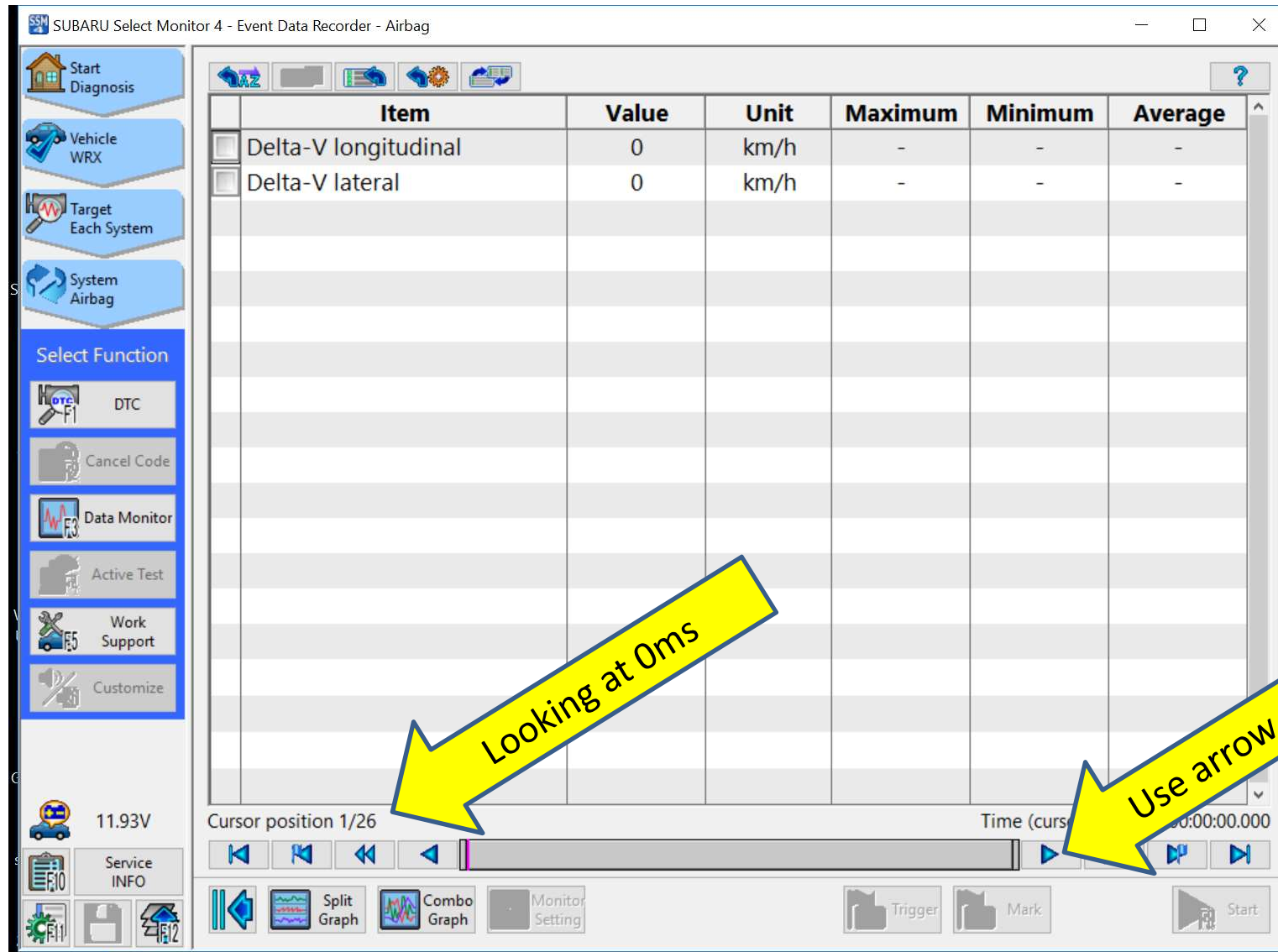
Cursor position 1/1 Time (cursor position) 00:00:00.000

Split Graph Combo Graph Monitor Setting Trigger Mark Start

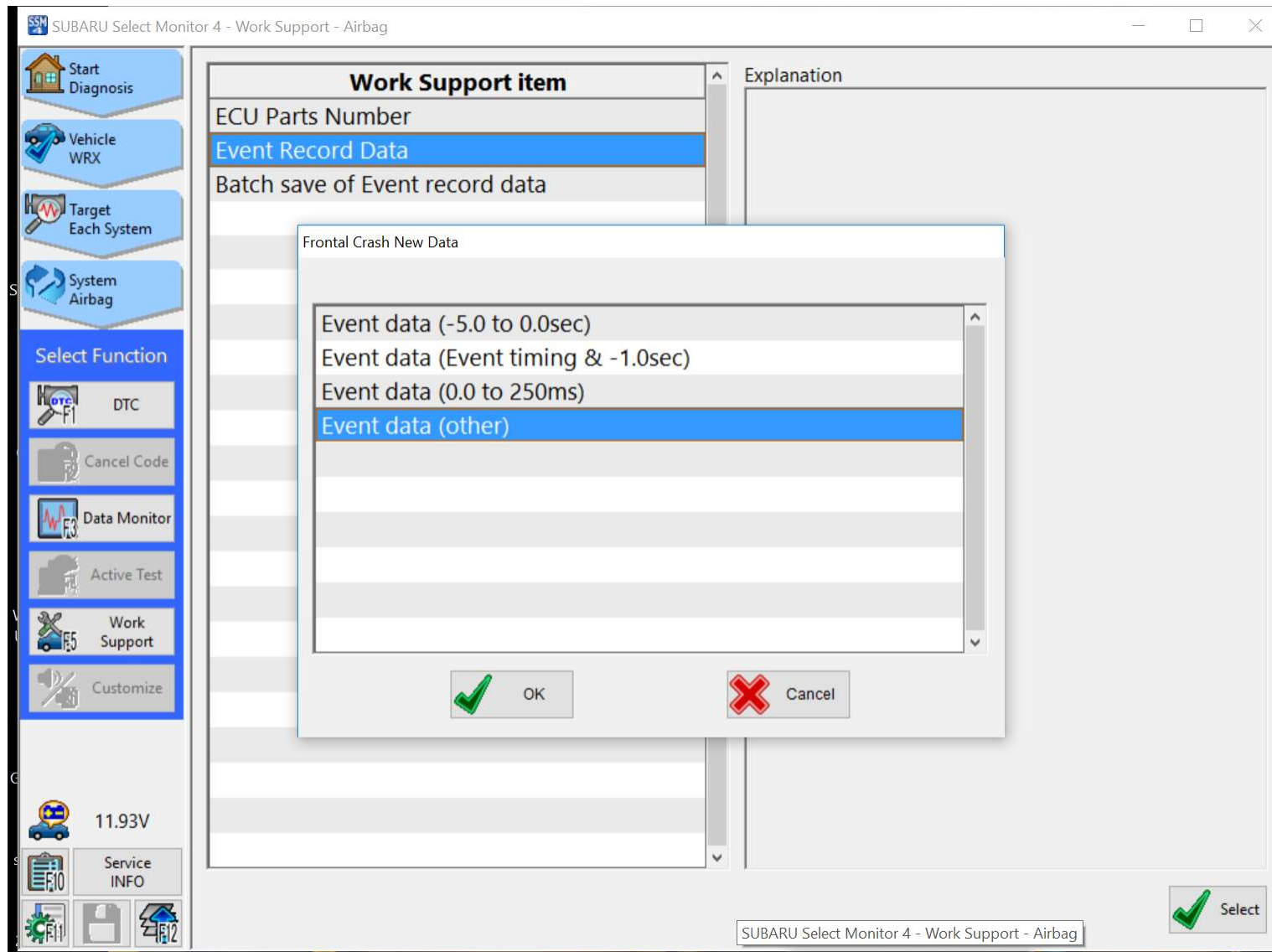
On to third section – Delta V



26 of these to get – yippee!



One section to go



Just one screen in this section

SSM SUBARU Select Monitor 4 - Event Data Recorder - Airbag

Start Diagnosis
Vehicle WRX
Target Each System
System Airbag

Select Function
DTC
Cancel Code
Data Monitor

	Item	Value	Unit	Maximum
<input type="checkbox"/>	ignition cycle, crash	1707	cycle	-
<input type="checkbox"/>	ignition cycle, download	1711	cycle	-
<input type="checkbox"/>	Multi-event, number of even...	2		-
<input type="checkbox"/>	Time from prior event	0.2	sec	-
<input type="checkbox"/>	Complete file recorded	Yes		-

One event done

- Now repeat for your Front New, Side Old, Side New, Rollover Old, and Rollover New (if present in your module). Pray for a small number of events.

ACM Locations

- Most ACM's are located under the center stack.
- The Legacy/Outback is under the center console between the seats

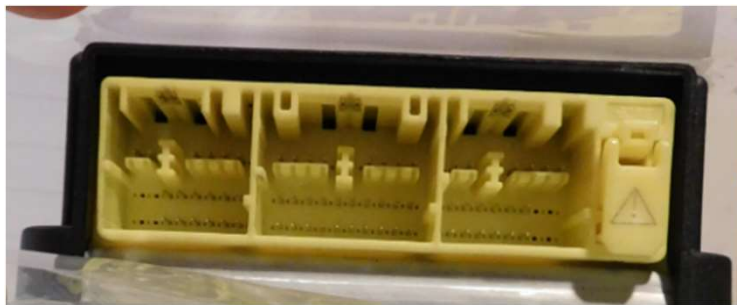
Three different DTM Connectors Needed to Do All! Connectors similar to Toyota CDR 613 & 615.



IMPRESZA, 2013 LEGACY, WRX

BRZ?? Really a Toyota

OUTBACK, CROSSTREK, WRX-STI



2015+ LEGACY/OUTBACK



DTM
Cables.
Build your
own or buy
from Bosch
SPX Kent
Moore.
\$1100 &
\$2800.



Yes, DTM
can be
done – so
far no
gateway
module
issues

Data Analysis

- Holds two events per crash type Frt/Side/Roll
- Longitudinal and Lateral Delta V in all modes
- Recording threshold 8km/h (5mph) over 150ms
- Deployments lock data for that crash mode but other crash modes are not locked
- Nondeployments can be overwritten, based on limited cases it appears to retain the most recent two events (like Toyota).
- Analyze this data in the same manner you would any other manufacturer's.
- Steering - positive is right

Data Analysis

- Max speed it can show is 200 kph
- Max steering is 252.5 degrees

Reopen SSM3 .ssm file

- Under **file** menu, select “converting sampling data to csv”.
- File name will mirror .ssm file, only extension is different
- CSV file for precrash will have 11 rows for times and 8 columns for data, all displayed together in summary fashion (unlike the other screens that only showed one data point at a time).

Column headings and time label need adjustment as shown below

Column Headings generated as found in CSV file

	Accelerator								
Vehicle	Opening	Service		Engine	Motor	ABS	Stability	Steering	Steering
Speed	Angle %	brake	on/off	Speed	RPM	activity	control	input	input (%) Mark
km/h	%		rpm	rpm			deg	%	

Corrected Column Headings based on other data views available in software

Vehicle	Accelerator	Service	Engine	Motor			Steering		
Speed	Opening	brake	Speed	RPM	ABS	Stability	input	Steering	
km/h	Angle %	on/off	rpm	rpm	Activity	Control	degrees	input %	Mark?
21	0	OFF	1300	invalid	OFF	ON	0	0	0

READY

Number of Data Columns will vary by model

- It's hard to make a template to fix it!

Subaru BRZ

- Subaru BRZ is a rebadged Toyota Scion FS-R
- The EDR is a Toyota EDR
- The Subaru software will still talk to the FS-R, but the data display screens are all different than the other Subaru EDR's.
- DiTallo reported at the 2018 EDR Summit that the Subaru software worked on the 2015 BRZ. In May 2018 a user tried to use it on a 2017 and got some good and some possibly bad values.

Subaru BRZ

- Bosch CDR software supports the Toyota FS-R
- A user successfully input a 2017 Subaru BRZ vin into CDR and used the CDR kit on the ACM. The VIN has structure like a Toyota.
- The CDR program yielded logical results. The Subaru tool retrieved good speed data, but the Delta V was different than CDR and appeared implausible. Steering data was not shown in the Subaru program but was visible in CDR.
- If you have a BRZ test the VIN in CDR, if it takes you should use the CDR software.

Sampling Time Label Adjustment

Suggested time label	Sampling time sec	Event name	Vehicle Speed km/h
-5	0	Frontal Crash New Data	21
-4.5	0.5	Frontal Crash New Data	21
-4	1	Frontal Crash New Data	20
-3.5	1.5	Frontal Crash New Data	21
-3	2	Frontal Crash New Data	21
-2.5	2.5	Frontal Crash New Data	21
-2	3	Frontal Crash New Data	20
-1.5	3.5	Frontal Crash New Data	18
-1	4	Frontal Crash New Data	17
-0.5	4.5	Frontal Crash New Data	16
0	5	Frontal Crash New Data	11

Technical Resources

- Subaru Technical Information System(STIS)
www.subarutechinfo.com/stis/#/login
- \$34.95 for 3 days access

There is an excellent presentation by Shawn Gyorke and Mike Ditallo from the 2018 CDR User's Conference with additional detail on the BRZ and case studies.

2014+ Subaru Eyesight System (optional)

- Has two cameras in the rear view mirror
- In one case, Subaru factory rep plugged into rear view mirror with special software, download ONE B&W picture from when crash avoidance algorithm activated.

Subaru Eyesight System - What it is and how it works.

Subaru EyeSight®. The highest-rated front crash prevention system by IIHS.

Add confidence to your drive with new Subaru technology that monitors your safety—whether your eyes are on the road or not.



Subaru EyeSight®

Subaru takes a look into the future with EyeSight®. Two cameras are mounted by the rearview mirror to monitor traffic and react to conditions even before you do. Basically, EyeSight® sees the problems and initiates action to help avoid the trouble. Eyesight® will also sound an alert and flash a visual warning if there's danger of a collision and will apply the brakes automatically if you don't. It can also optimize cruise control and warn drivers when they're straying outside their lane.

Available on select 2015
Subaru Outbacks, Legacys
Foresters, Imprezas and Crosstreks.

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