

NHTSA_58 SUA Cases Report

ASA Preliminary Analysis



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FORENSIC ANALYSIS OF ELECTRONIC AND COMPUTER VEHICLE CONTROLS

NHTSA_58SUACases_ASA-PrelimAnalysis_1f.shw
 9Oct10

PROTOTYPE READOUT TOOL REPORT

Event Data

INVESTIGATION DATE	04/08/2010
INVESTIGATOR	TAG
ACCIDENT DATE	EVES ECU 087706799L
VEHICLE	Tundra
MODEL YEAR	2007
VIN NUMBER	5TBR754197S453547

Data Table

Data Name	Data
ECU Number	89170-0C311
R/O Deployment Time	no deployment less than 2sec
R/O RA MAX Value within 2sec. from trigger	-0.0
R/O CSA-Manual Cut OFF	Undetermined
R/O Writing Flag	Writing
Safing Left ON	CentralB CentralC
Safing Left OFF	bpImpact cpHighGImpact cpHighGNonImpact cpCCU1YNonImpact cpLowGNonImpact
Safing Right ON	
Safing Right OFF	CentralB CentralC bpImpact cpHighGImpact cpHighGNonImpact cpCCU1YNonImpact cpLowGNonImpact
Discrimination Left ON	
Discrimination Left OFF	bp cpHighG cpLowG CCU1Y
Discrimination Right ON	
Discrimination Right OFF	bp cpHighG cpLowG CCU1Y
Recorded Ama Side	LeftSide
Deployment judgment Side	NonSide
Deployment Enabled	OFF
NowPage	0 Page
Freeze Signal	UnFreeze
Deployment Time	129 ms
Deployment Stage Driver	Hi
Deployment Stage Passenger	Not Fired



U.S Department of Transportation
Office of Public Affairs
1200 New Jersey Ave., S.E.
Washington, DC 20590

REPORT

Ongoing NHTSA Research on Unintended Acceleration & Event Data Recorder (EDR) Readings

The National Highway Traffic Safety Administration (NHTSA) is currently conducting research exploring all possible causes of unintended acceleration, including electronic vehicle controls, mechanical failure, human error, and interference with accelerator systems. NHTSA has enlisted the expertise of researchers and engineers from the prestigious National Academy of Sciences and NASA for a pair of studies that seek to get to the bottom of unintended acceleration. In the meantime, NHTSA continues to review complaints from vehicle owners, analyze Early Warning Reporting (EWR) data submitted by manufacturers, and conduct field inspections for possible indications of additional defects.

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Of the 58 cases studied, thirty-five recorders showed that no brake was applied. Fourteen cases involved partial braking: nine cases where brakes were applied late in the crash sequence; three involving early braking; and two involving mid-event braking. One incident involved a case of pedal entrapment. Another showed that both the brake and the gas pedal were depressed. In one case the recorder only contained information related to a separate incident and in another, NHTSA is still working to resolve inconclusive data from an EDR. In five cases, the EDR was not triggered at all.

At this early point in its investigation, NHTSA officials have drawn no conclusions about additional causes of unintended acceleration in Toyotas beyond the two defects already known – pedal entrapment and sticking gas pedals.

A Forensic Engineering Approach to SUA Investigations

A proper forensic engineering evaluation alleged SUA event includes consideration of many related witnesses & artifacts:

1. Vehicle damage & Reconstruction interpretation
2. Driver & Passenger witnesses
3. Drivers & Passengers in other vehicles
4. Police & EMT reports
5. Vehicle VIN, Systems Specification(s), Applicable Recalls, TSBs
6. DTC, PID, DPID & Freeze Frame Data
7. EDR data

EDR data alone may not be reliable. EDR data applicability, accuracy and consistency has to be confirmed with respect to witness, physical, mechanical & electrical parameter facts of each alleged SUA incident. However, the NHTSA Report SUA preliminary observations appear to be based on EDR data only, thus they are based on only a sub portion of a proper forensic engineering evaluation.

Omissions in The NHTSA 58 Case Data

1. 15/58 Cases ==> Vehicles outside the Toyota SUA Recall Range.
2. 20/58 Cases ==> Accelerator Recall Applicability Indeterminate
3. For example, NHTSA did not present EDR data for a vehicle prior investigated by NHTSA SCI (Report DS07035, 07Camry, in the Toyota SUA Recall Range). That report was a thorough documentation (22 pages) of the Reconstruction, witness and physical, mechanical & electrical parameter facts of that subject SUA incident.
4. 32/58 Cases ==> No VIN given.
5. 26/58 Cases ==> only Part-VIN given - See Exhibit B

RECALL / CAMPAIGN INFORMATION



At Toyota, safety is the cornerstone of our business. The safety of our owners and the public is our utmost concern.

You can enter your VIN (Vehicle Identification Number) below to see if your vehicle is included in any Safety Recall or Service Campaign.

Check My VIN

The VIN you entered is not a valid Toyota VIN. Please check your VIN and try again. Note that Lexus and Scion VINs are not recognized and vehicles purchased outside the Continental US may not be included.

Is your Toyota vehicle involved in a Special Service Campaign or Recall?
Enter your 17-digit VIN here.

Vehicle ID Number (VIN):

[Where do I find my VIN number?](#)

Submit

Exhibit B Toyota VIN Check for Recalls

ASA Provisional Observations

based on face value of 58 EDR Reports only
= the only data available from NHTSA

26/58 Cases ==> Vehicle partial VIN supplied

32/58 Cases ==> Vehicle VIN not supplied

0/58 cases ==> Include supporting documentation, including Reconstruction, witness and physical, mechanical & electrical parameter facts of that subject SUA incident.

Cases include vehicles subject to:

09V-023 Recall, Tunnel Side Fmat	02/58	Indeterminate (no VIN &/or no Mfg Dt)
09V-388 Recall, Dvr Fmat	39/58	confirmed (by Model Year)
10V-017-18 Recall Accel Sticking	08/58	prob confirmed (by VIN & Model Year)
10V-017-18 Recall Accel Sticking	20/58	indeterminate (no VIN supplied)
Not subject to SUA Recalls	15/58	

02/58 Cases ==> Vehicles confirmed subj to 09V-388 & EDR indicates provisional FMAT Impg

05/58 Cases ==> Vehicles confirmed subj to 10V-018 & EDR indicates provisional OpError

17/58 Cases ==> Vehicles indeterminate subj to 10V-018 & EDR indicates provisional OpError

Provisional OpError includes;
accel apply, no brake
no brake prior to impact
late brake prior to impact
consistent EDR data record

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Exhibit C.1.1 Subject Vehicle Accident, 26Oct07

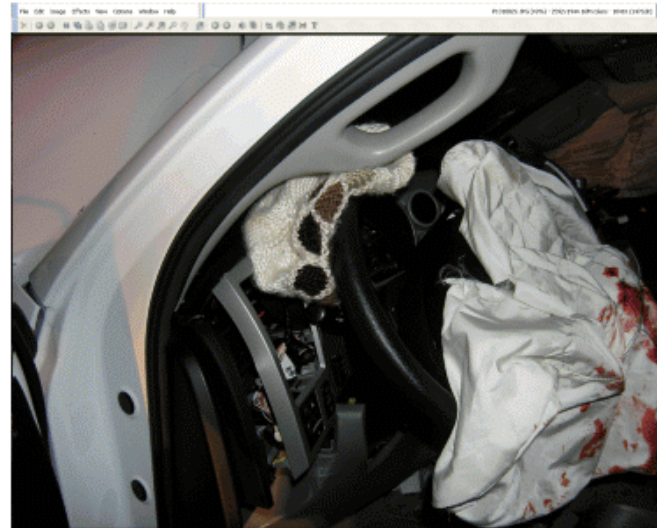
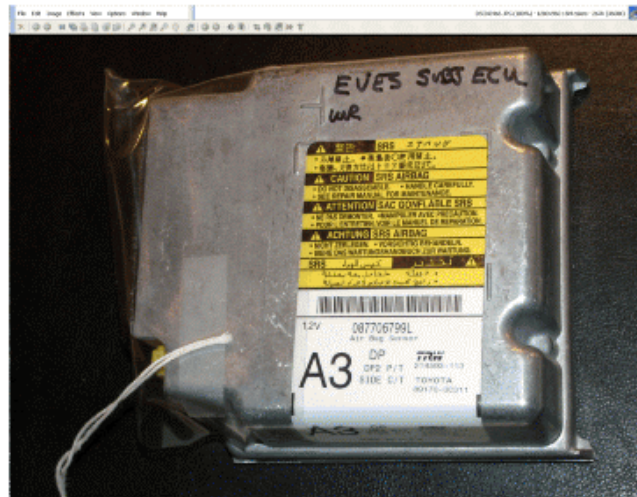


Exhibit C.1.2 Subject SRS ECU



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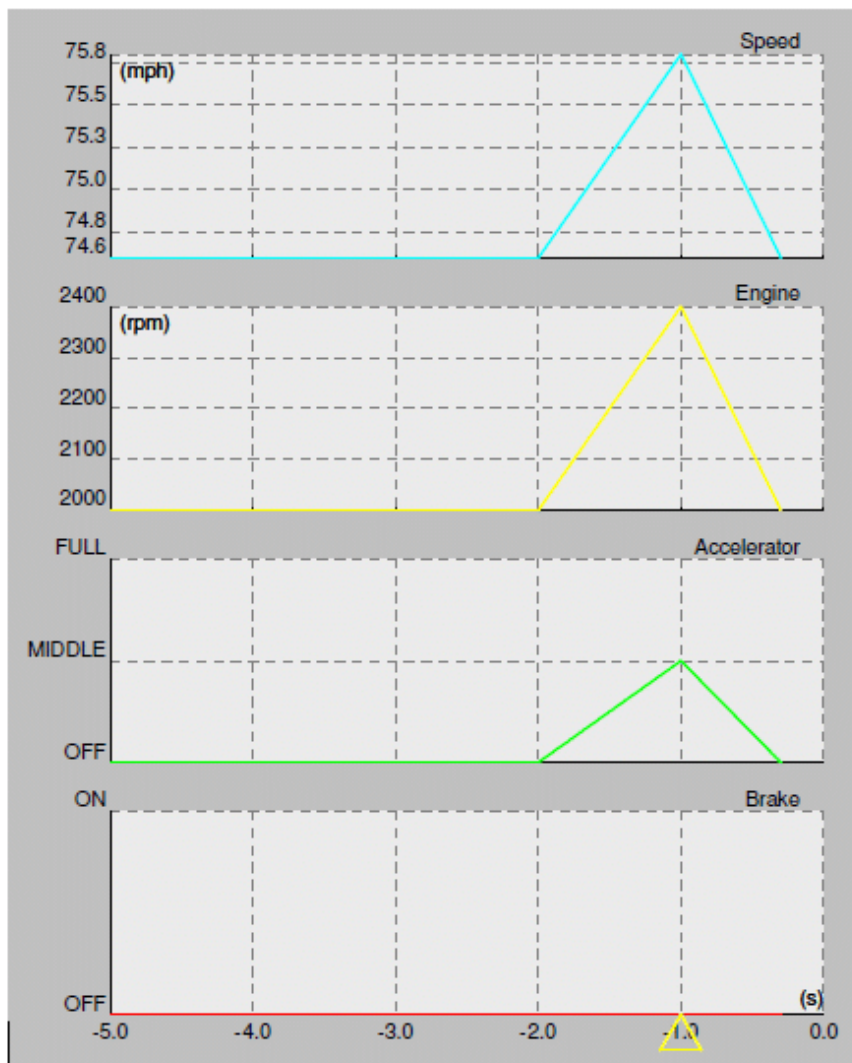


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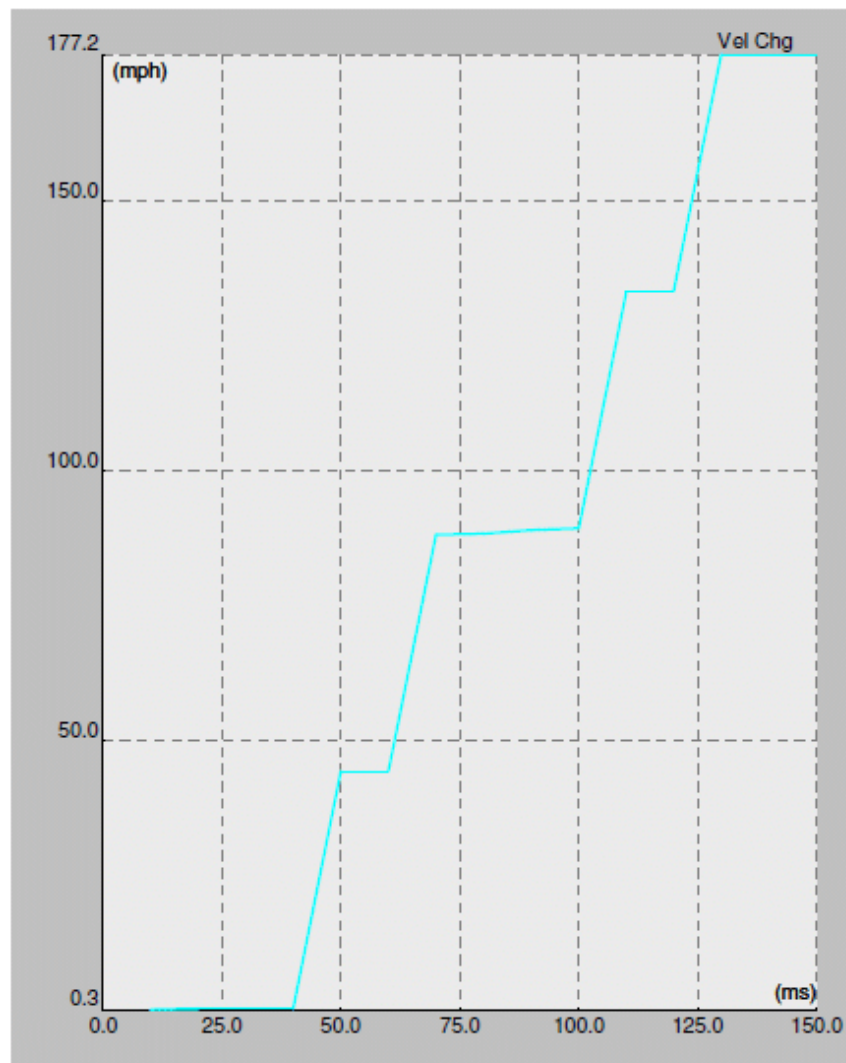
8Apr10 Toyo Download, Offices of Bowman & Brooke, Gardena California

Pre-Crash Data



Pre-Crash Data

Post-Crash Data



Post-Crash Data

Exhibit C.11.3 shows the subject SRS ECU Toyota ROT version2 translated Pre-event data.



Pre-Crash Data

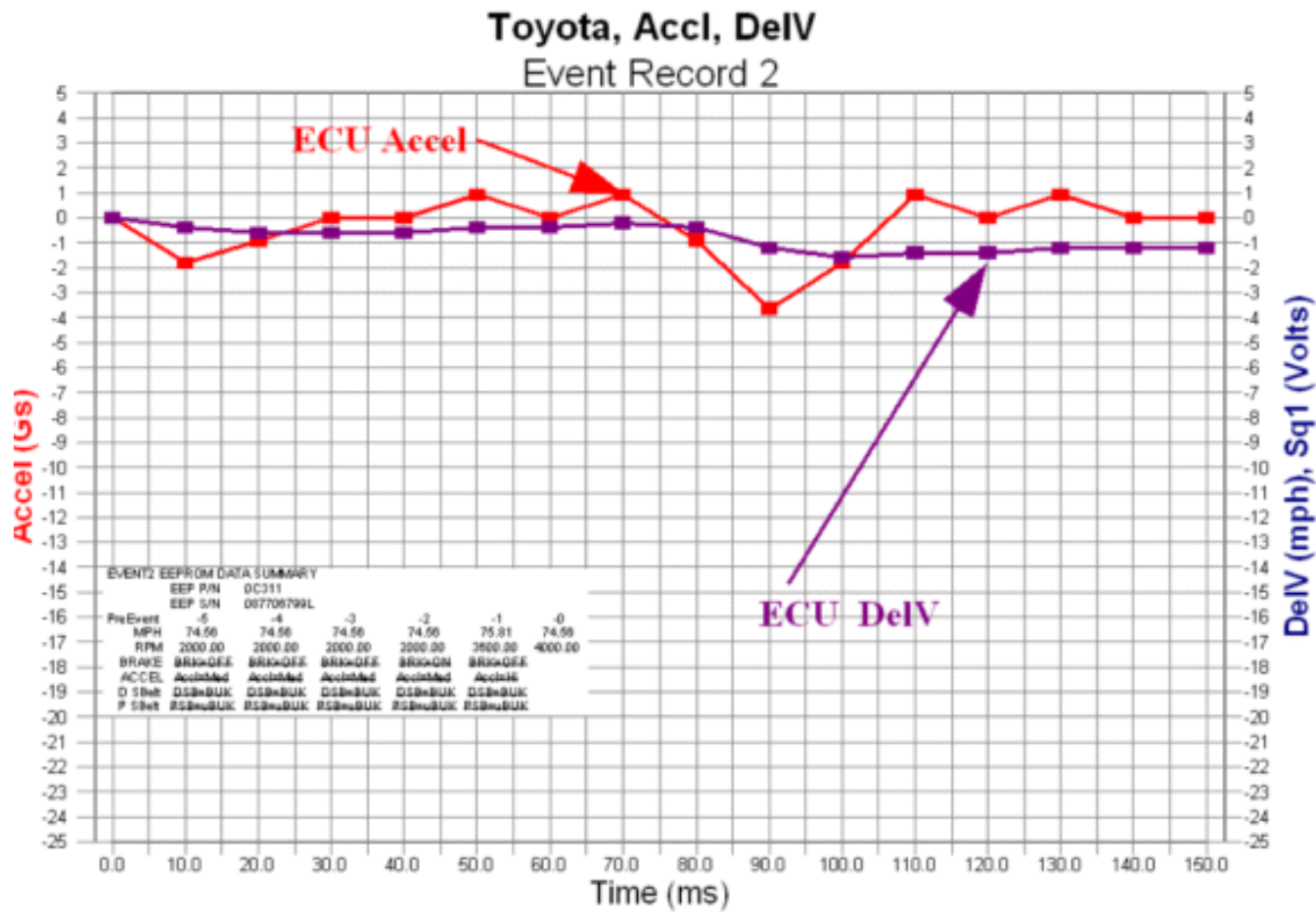
s	Speed	Engine	Accelerator	Brake
-5.0	74.6	2000	OFF	OFF
-4.0	74.6	2000	OFF	OFF
-3.0	74.6	2000	OFF	OFF
-2.0	74.6	2000	OFF	OFF
-1.0	75.8	2400	MIDDLE	OFF
-0.3	74.6	2000	OFF	OFF

Exhibit C.11.4 shows the subject SRS ECU Toyota ROT version2 translated Delta-V data (mph).

Post-Crash Data

ms	Vel Chg	ms	Vel Chg	ms	Vel Chg
10.0	0.3	70.0	88.2	130.0	177.2
20.0	0.5	80.0	88.4	140.0	177.2
30.0	0.5	90.0	89.1	150.0	177.2
40.0	0.5	100.0	89.4		
50.0	44.4	110.0	133.3		
60.0	44.4	120.0	133.3		

Exhibit C.11.5 shows the subject SRS ECU ASA translated acceleration and Delta-
data and the translated Pre-event data [data window on data chart].



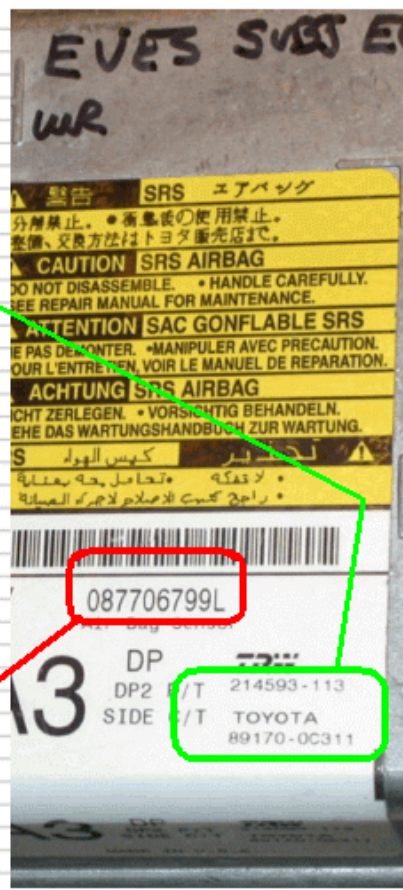
Toy089170_EEPROM Analysis
07-10 Tundra 0C311
07_Tundra_0C311_T1u_s799L_VN3547_EvesSV5V_1a.wb3
28Jul10

ASA, Inc.
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Voice: 703.860.1766, 703.860.0060, x0

EEP Addr	Hex Value	Translated Value	Concatenated Representation
0169	00	00000000	
016A	2A	00101010	
016B	ED	11101101	
016C	30	0 ACMToyo P/N	0
016D	43	0 ACMToyo P/N	C
016E	33	0 ACMToyo P/N	3
016F	31	0 ACMToyo P/N	1
0170	31	0 ACMToyo P/N	1
0171	02	00000010	
0172	02	00000010	
0173	06	00000110	
0174	06	00000110	
0175	03	00000011	
0176	03	00000011	
0177	FF	11111111	ÿ
0178	FF	11111111	ÿ
0179	FF	11111111	ÿ
017A	FF	11111111	ÿ
017B	FF	11111111	ÿ
017C	FF	11111111	ÿ
017D	FB	11110111	û
017E	EF	11101111	ÿ
017F	EE	11101110	ÿ
0180	EE	11101110	ÿ
0181	EE	11101110	ÿ
0182	EE	11101110	ÿ
0183	EE	11101110	ÿ
0184	FF	11111111	ÿ
0185	FF	11111111	ÿ
0186	33	00110011	3
0187	FF	11111111	ÿ
0188	EE	11101110	ÿ
0189	E1	11100001	ú
018A	FF	11111111	ÿ
018B	FF	11111111	ÿ
018C	FF	11111111	ÿ
018D	FF	11111111	ÿ
018E	FF	11111111	ÿ
018F	FF	11111111	ÿ
0190	30	0 ACMToyo Serial No	0
0191	38	0 ACMToyo Serial No	8
0192	37	0 ACMToyo Serial No	7
0193	37	0 ACMToyo Serial No	7
0194	30	0 ACMToyo Serial No	0
0195	36	0 ACMToyo Serial No	6
0196	37	0 ACMToyo Serial No	7
0197	39	0 ACMToyo Serial No	9
0198	39	0 ACMToyo Serial No	9
0199	4C	0 ACMToyo Serial No	L
019A	FF	11111111	ÿ

EEP P/N 0C311

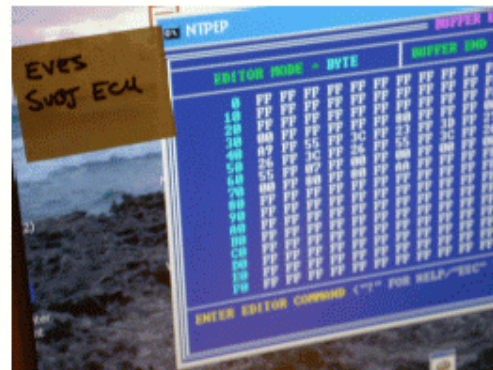
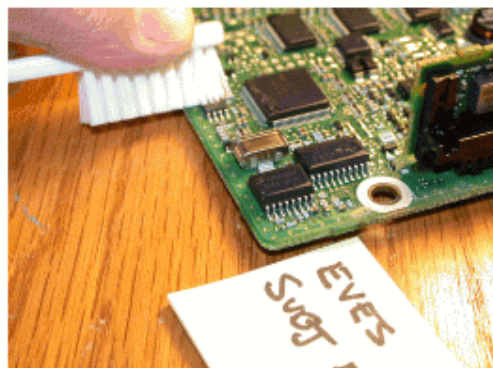
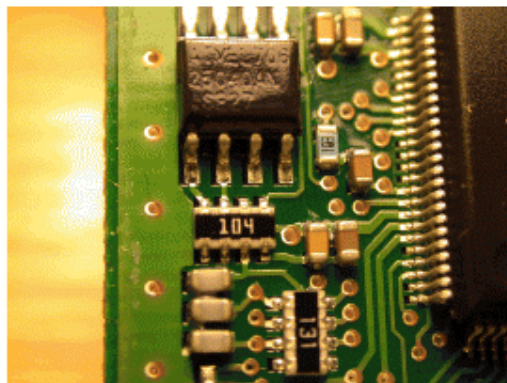
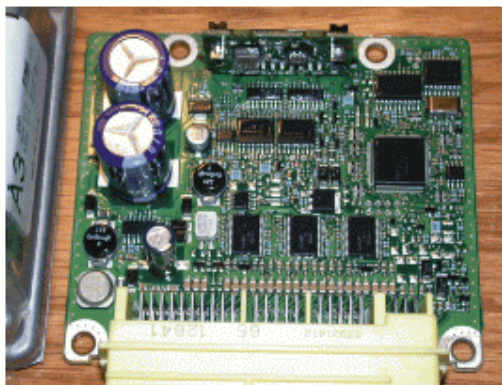
EEP S/N 087706799L



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Exhibit C.11.11 shows the methodology used to accomplish the EEPROM direct-read employed for this analysis.



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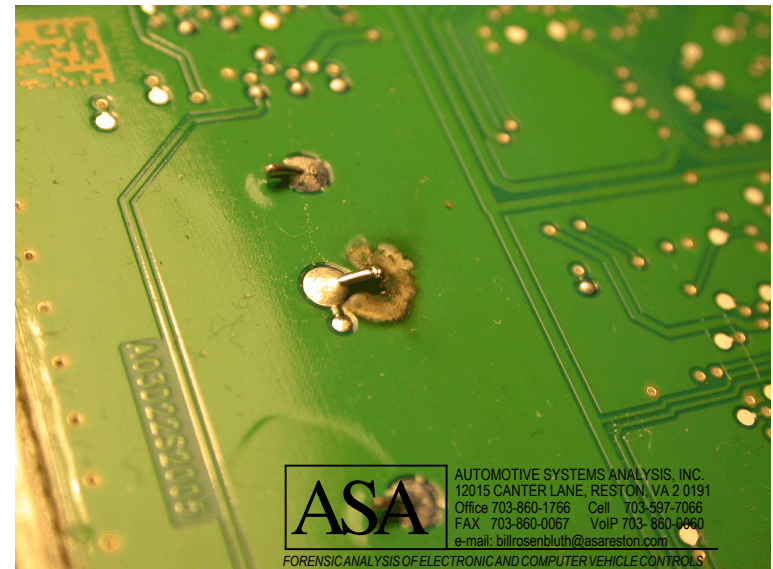
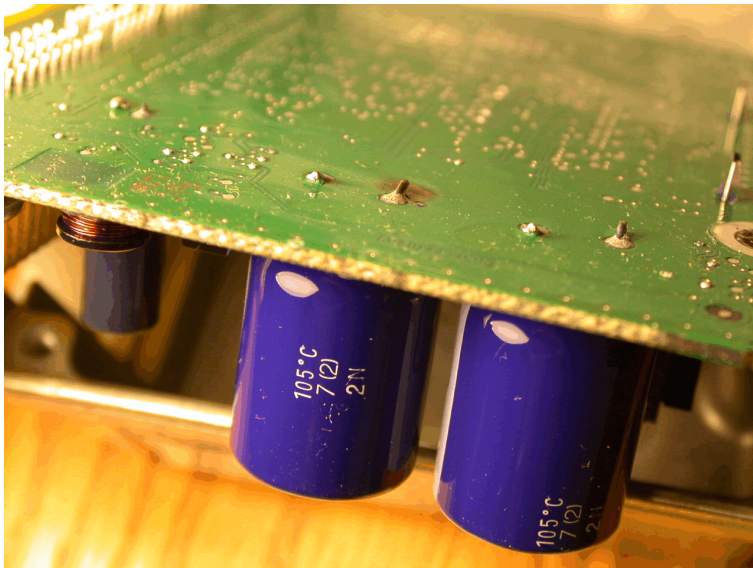


FORENSIC ANALYSIS OF ELECTRONIC AND COMPUTER VEHICLE CONTROLS

The crash event record, as properly translated, contains non-meaningful acceleration data. With non-meaningful acceleration data, no crash-event Delta-V can be derived. The non-meaningful data was probably a residue from a prior non-deployment event.

One reason for non-meaningful acceleration data (after a known crash and deploy event) can be an electronic anomaly preventing RAM data (volatile) from being written to EEPROM after the crash event.

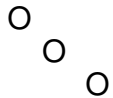
Such an electronic anomaly was physically observed in the subject SRS ECU. In the subject ECU, the backing plate was deformed such that a short circuit, with arcing, existed between an energy storage capacitor positive lead and the backing plate (an electrical ground). These arcing artifacts were photographed.



September 13, 2010
Toyota Plans 6 New Hybrids for 2012
By NICK BUNKLEY

DETROIT — Toyota plans to introduce two electric vehicles in the United States and six hybrid cars worldwide by the end of 2012, a company executive said Monday.

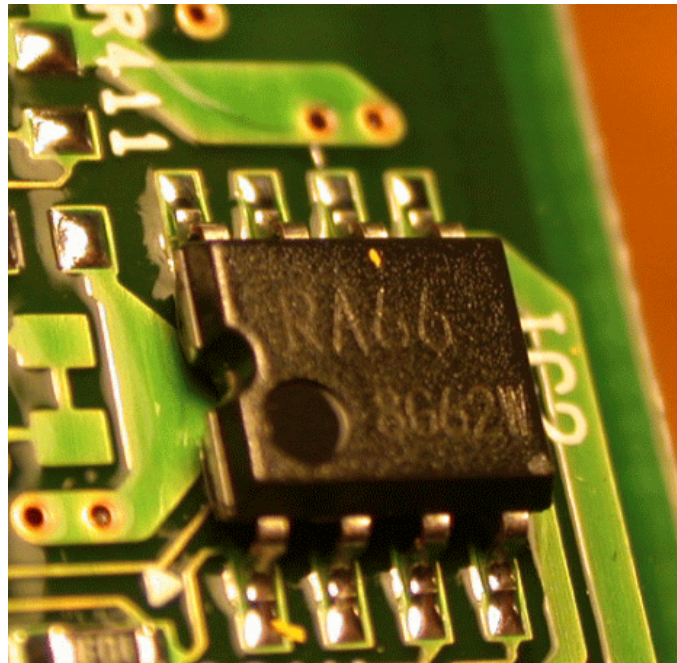
In addition, the executive, Takeshi Uchiyamada, said Toyota would start selling a plug-in version of its popular Prius hybrid car in the spring of 2012 and a hydrogen fuel-cell vehicle in limited quantities by 2015.



A Toyota spokesman, John Hanson, said the company was aiming to sell about 20,000 of the plug-in Priuses a year initially. He said early estimates indicated that it could cost about \$3,000 to \$5,000 more than the traditional Prius.

Mr. Uchiyamada also revealed that Toyota had discovered a software bug in the tools used to download data from its vehicles' onboard data recorders, but he said it did not have an effect on the investigations into the cause of sudden acceleration. The readers, which have been used by the company and by federal regulators looking into thousands of complaints, were fixed before testing vehicles reported to have experienced sudden acceleration, he said.

Some Toyota critics have dismissed the validity of the data from the onboard recorders, based in part on previous comments by Toyota questioning their reliability, but **Mr. Uchiyamada said that criticism is misguided. “The bug never affected the data that would indicate which pedal is being depressed,” he said. “The event data recorder was always accurate, only the reader was inaccurate with regard to speed.”**



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[не стандартная маркировка микросхем - AUTO TECHNOLOGY ☆](#) - [[Translate this page](#)]

В43АВ EEPROM 24C02 В46АJ EEPROM 24C02 В49АJ EEPROM 24C02 Регистрация: 06

Март 09; Пол: Мужчина; Город: RUSSIA FarEast Vlad-ok; Интересы: Кручу-верчу;

Автомобиль: Toyota ... ra66 - 93c66 (Realtek). 0. Наверх; Цитата · Ответить ...

www.auto-bk.ru/forum/topic/8115/ - Cached

[Нужна помощь, RAV4, где 93C66? \[Архив\] - Изучение уязвимостей ... ☆](#) - [[Translate this page](#)]

Toyota RAV4 2007 Блок SRS DENSO 89170-42201 150300-1470. Две 8-пиновые

микросхемы: RA66 7R43W и 9J15SE617, где EEPROM с краш-д

93C66. ...

www.invest-mentor.hu/forum/archive/index.php/t-7062.html - Cache

- **Medium-voltage and Standard-voltage Operation**
 - 2.7 (V_{CC} = 2.7V to 5.5V)
- **Automotive Temperature Range –40°C to 125°C**
- **User-selectable Internal Organization**
 - 2K: 256 x 8 or 128 x 16
 - 4K: 512 x 8 or 256 x 16
- **Three-wire Serial Interface**
- **Sequential Read Operation**
- **2 MHz Clock Rate**
- **Self-timed Write Cycle (10 ms max)**
- **High Reliability**
 - Endurance: 1 Million Write Cycles
 - Data Retention: 100 Years
- **Lead-free/Halogen-free Devices Available**
- **8-lead JEDEC SOIC and 8-lead TSSOP Packages**

Description

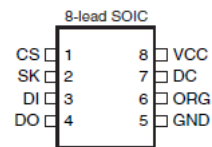
The AT93C56A/66A provides 2048/4096 bits of serial electrically-erasable programmable read-only memory (EEPROM). The EEPROM is organized as 128/256 words of 16 bits each when the ORG pin is connected to VCC and 256/512 words of 8 bits each when it is tied to ground. The device is optimized for use in many automotive applications where low-power and low-voltage operations are essential. The AT93C56A/66A is available in space-saving 8-lead JEDEC SOIC and 8-lead TSSOP packages.

The AT93C56A/66A is enabled through the Chip Select (CS) pin and accessed via a three-wire serial interface consisting of Data Input (DI), Data Output (DO), and Shift Clock (SK). Upon receiving a Read instruction at DI, the address is decoded and the data is clocked out serially on the data output pin DO. The write cycle is completely self-timed and no separate erase cycle is required before write. The write cycle is only enabled when the part is in the Erase/Write Enable state. When CS is brought high following the initiation of a write cycle, the DO pin outputs the Ready/Busy status of the part.

The AT93C56A/66A is available in 2.7V to 5.5V versions.

Table 1. Pin Configuration

Pin Name	Function
CS	Chip Select
SK	Serial Data Clock
DI	Serial Data Input



Three-wire Automotive Temperature Serial EEPROMs

2K (256 x 8 or 128 x 16)

4K (512 x 8 or 256 x 16)

AT93C56A AT93C66A

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Toyo89170_06200-33550 EEPROM Anlysis	ASA, Inc.
2008 Lexus ES350 Frontal Deploy	12015 Canter Lane, Reston, VA 20191
08ES350_33550_TPM32_T1j_x----_VN2445_FrtAB-PTH_Dply_1c.wb3	Voice: 703.860.1766, 703.860.0060, x0
7Oct10	

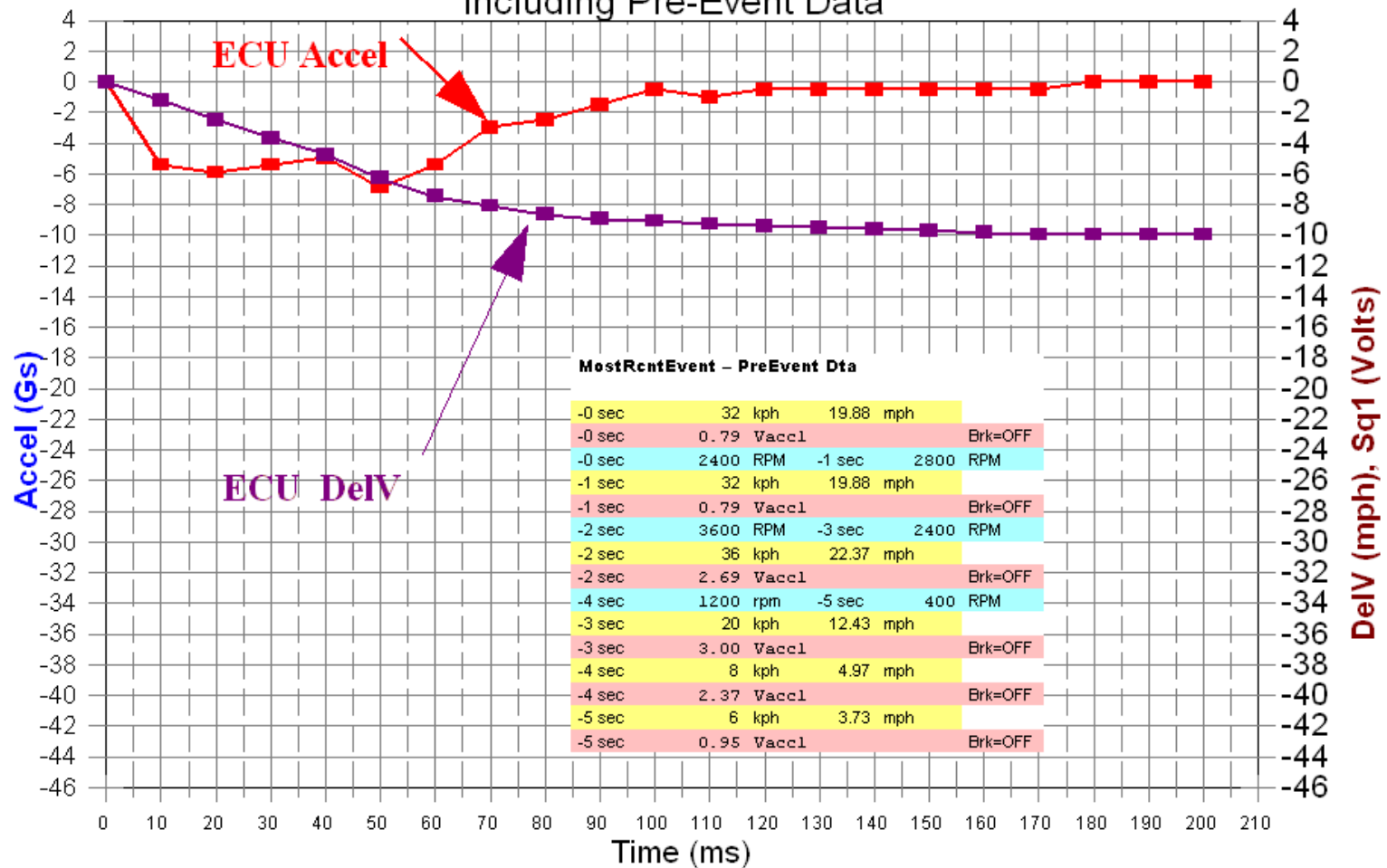
HEX DATA TABLE																
EEPROM																
ADDRESS	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0000	00	00	00	00	00	00	00	00	00	00	28	20	00	00	00	00
0010	08	08	88	00	00	00	00	00	00	00	00	00	00	00	00	00
0020	28	20	00	00	00	00	08	08	88	00	00	00	ff	ff	00	00
0030	00	00	01	01	48	87	00	00	a5	03	00	01	ff	ff	ff	ff
0040	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff	ff
0050	ff	ff	10	01	01	28	4f	66	28	4f	31	10	3f	11	0c	18
0060	0c	14	0c	14	00	00	00	00	00	00	00	00	00	00	00	00
0070	00	00	00	00	00	00	00	00	00	00	10	01	01	40	14	67
0080	40	14	96	48	47	31	28	4f	10	3f	0c	18	01	00	00	00
0090	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00A0	00	00	ff	ff	0b	0c	0b	0a	0e	0b	06	05	03	01	02	01
00B0	01	01	01	01	01	00	00	00	01	45	00	00	00	04	04	00
00C0	21	21	20	00	04	fe	ff	fd	fe	ff	00	ff	00	ff	fe	ff
00D0	ff	ff	00	00	02	01	fe	fc	00	10	00	00	00	03	11	cc
00E0	fe	fe	00	00	ff	ff	00	00	00	00	ff	ff	00	01	00	ff
00F0	00	00	00	00	00	00	ff	ff	ff	ff	ff	ff	ff	ff	00	00
0100	00	00	00	ff	ff	ff	ff	ff	ff	ff	ff	00	00	00	ff	ff
0110	ff	ff	ff	ff	fe	fe	fe	fe	fd	ff	01	07	06	fa	ec	f2
0120	fc	fe	fb	fb	f3	f7	ff	06	09	04	ff	fd	fe	01	03	02
0130	fd	00	30	00	00	02	00	5d	fe	fe	00	00	00	00	00	00
0140	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0150	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0160	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0170	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0180	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0190	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
01A0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
01B0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
01C0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
01D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
01E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
01F0	00	00	00	00	00	00	00	00	00	00	00	00	b8	28	b8	28

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FORENSIC ANALYSIS OF ELECTRONIC AND COMPUTER VEHICLE CONTROLS

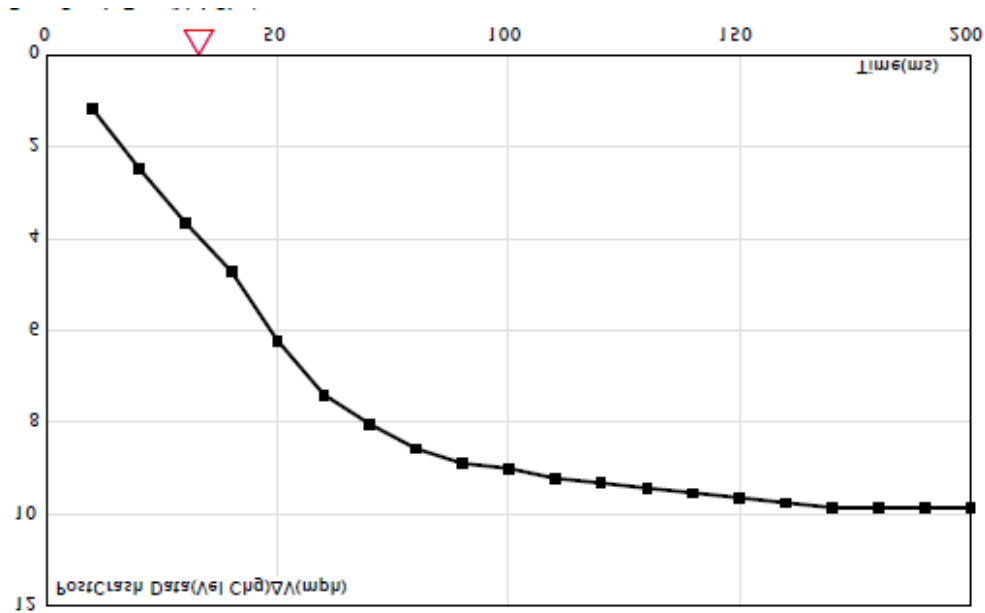
Toyota, Most Recent Event, Accel, DelV Including Pre-Event Data



Toyo89170_06200-33550 EEPROM Analysis
 2008 Lexus ES350 Frontal Deploy
 08ES350_33550_TPM32_T1j_x----_VII2445_FrtAB-PTH_Dply_1c.wb3
 7Oct10

ASA, Inc.
 12015 Canter Lane, Reston, VA 20191
 Voice: 703.860.1766, 703.860.0060, x0

Toyota ROT Report for Same Device as Shown in ASA Translation



PreCrash Data

Speed	:	3.7	5.0	12.4	22.4	19.9	19.9(mph)
Brake	:	OFF	OFF	OFF	OFF	OFF	OFF
Accelerator	:	0.94	2.46	3.09	2.77	0.78	0.78(V)
		OFF	FULL	FULL	FULL	OFF	OFF
Engine	:	400	1200	2400	3600	2800	2400(rpm)

Time from Last PreCrash Data : 100(ms) △

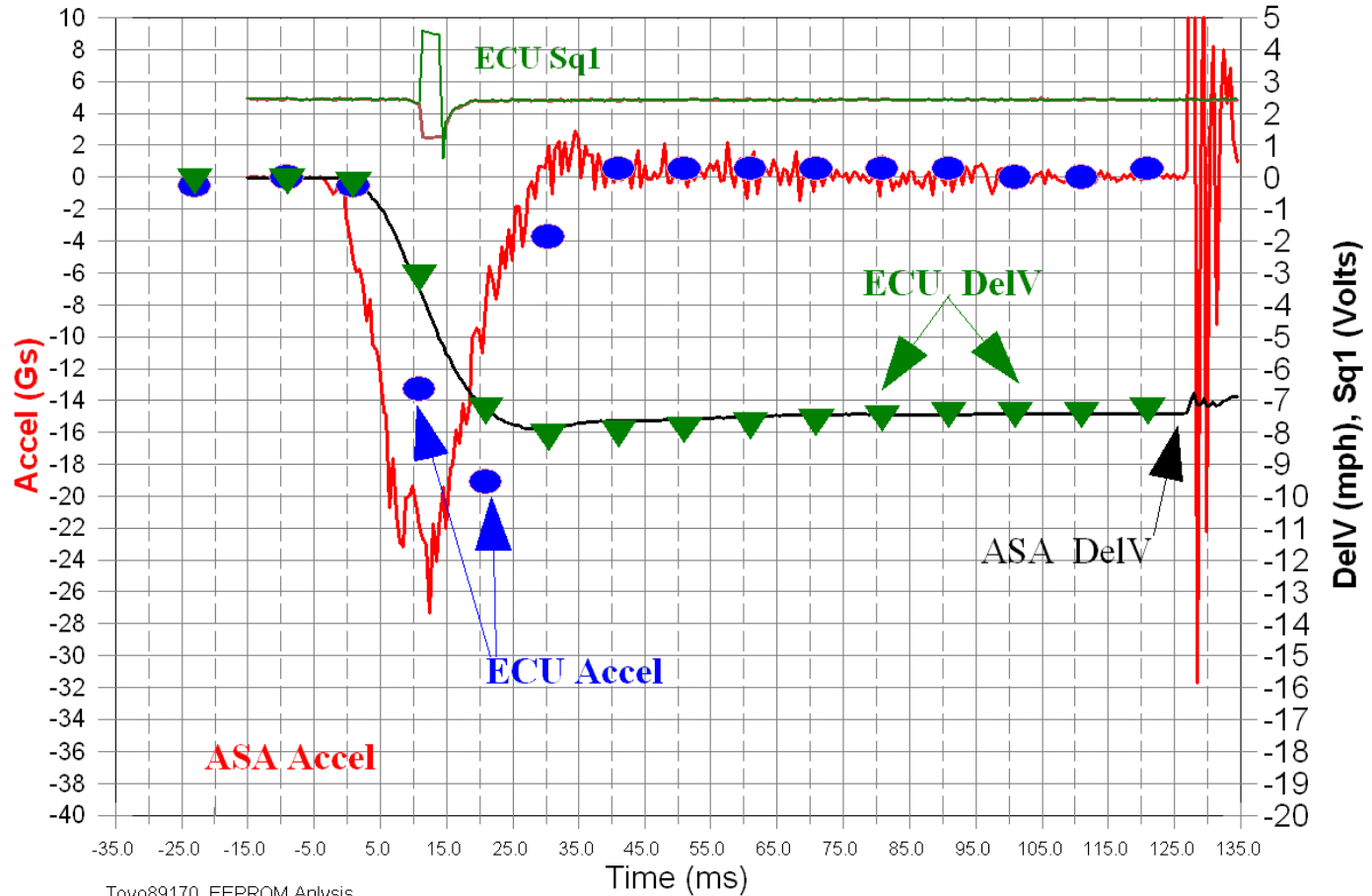
Video

Impinged-Acceleration SLOT Calibration Method

“SLOT” information is defined by the Society of Automotive Engineers (SAE) Recommended Practice J2178-2 (SAE J2178-2) to be Scaling, Limit, Offset and Transfer Function specifications that allow hexadecimal encoded engineering data to be interpreted into engineering units such as psi, seconds, volts, amps, Gs, etc.

Example of Impinged-Acceleration SLOT Calibration Results

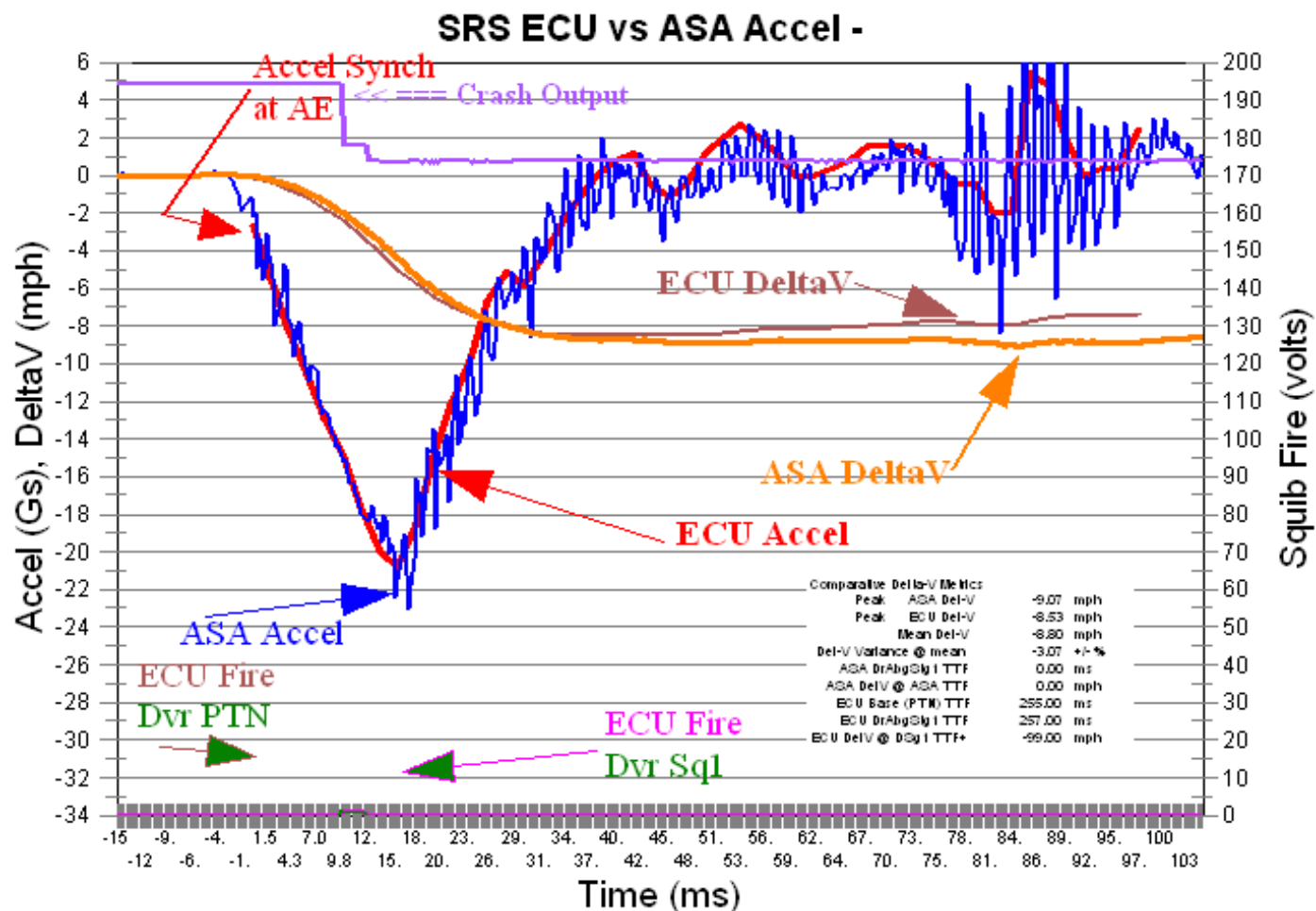
ToyotaECU vs ASA Data, 150 ms



Toyo89170_EEPROM Analysis
2003 Lexus ES300
Toyo_03ES300Tmpl_1p6_x1VJI_R15fr2_1a.wb3
9Mar09

ASA, Inc.
12015 Canter Lane, Reston, VA 20191
Voice: 703.860.1766, 703.860.0060, x2

Example of Impinged-Acceleration SLOT Calibration Results



Hyundai Data template
 2004 Accent
 SRS EEPROM
 04Accent_Tmpl_1k2_x635B_R155_noDrSqfire_28Apr09_1a.wb3
 28Apr09

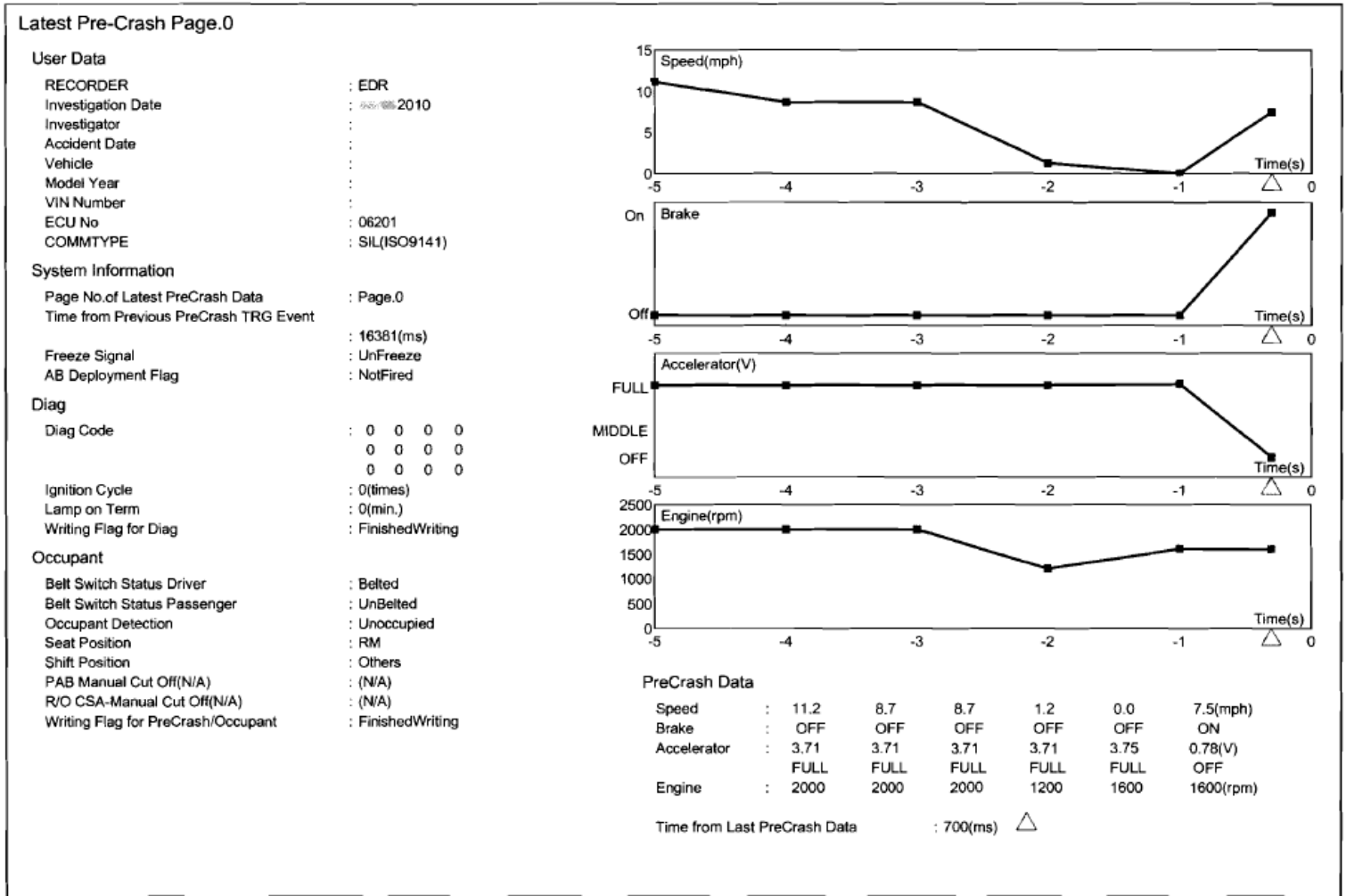
Automotive Systems Analysis, Inc.
 12015 Canter Lane, Reston, VA 20191
 Voice: 703-860-1766, Fax: 703-860-0060, x2

Questionable EDR Reports

**Non Consistent (contradictory)
EDR Record**

Inconclusive EDR Record

Case 4 Complete EDR Image



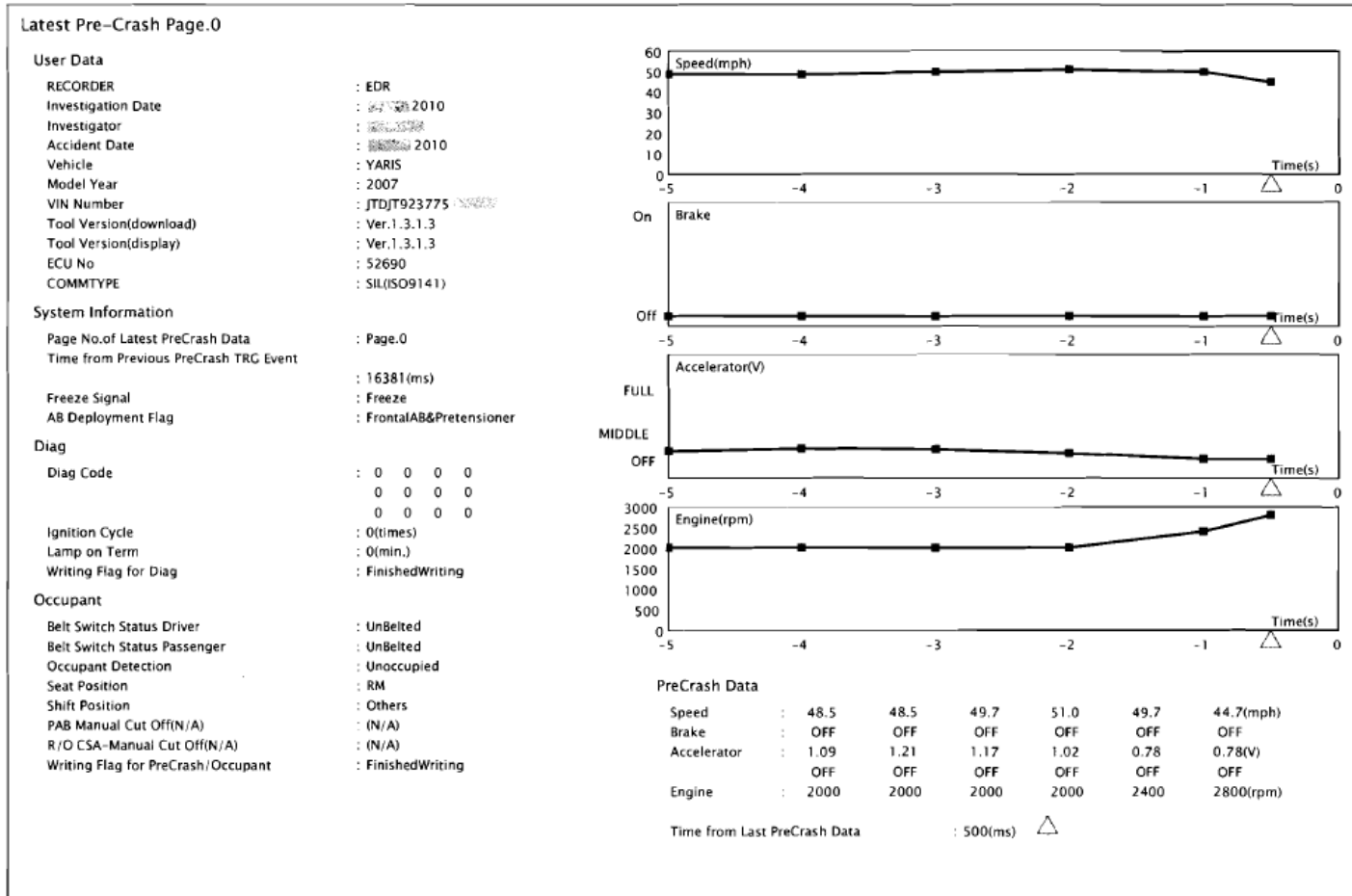
- Contradictions in record:
1. Speed decreasing w/accel WOT
 2. Speed increasing w/accel off
 3. Speed decreasing w/brake off
 4. Speed increasing w/brake on

ASA

AUTOMOTIVE SYSTEMS ANALYSIS, INC.
 12015 CANTER LANE, RESTON, VA 2 0191
 Office 703-860-1766 Cell 703-597-7066
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FORENSIC ANALYSIS OF ELECTRONIC AND COMPUTER VEHICLE CONTROLS

Case 38 Complete EDR Image

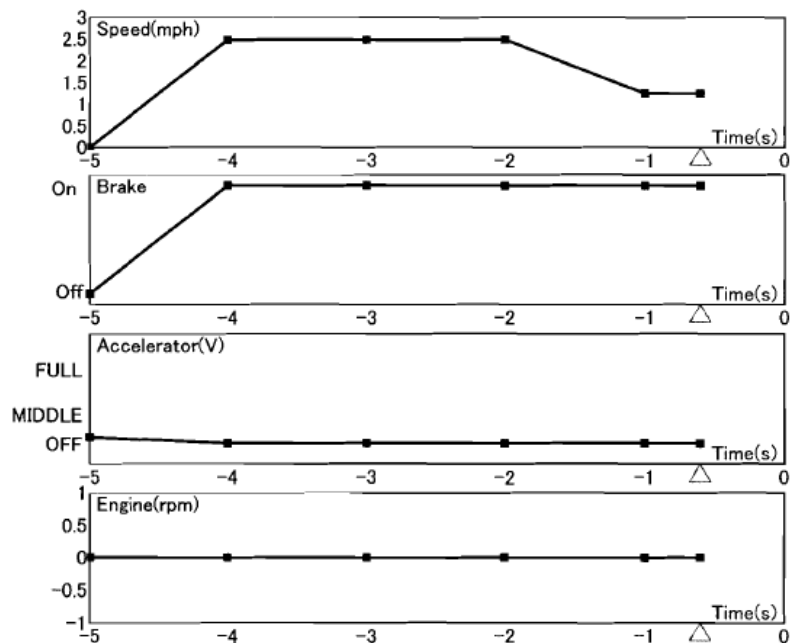


Contradictions in record:

1. RPM increasing (+800RPM) w/Accel released to Idle (0.78V)

Next Most Recent Incident

Case 19 Complete EDR Image

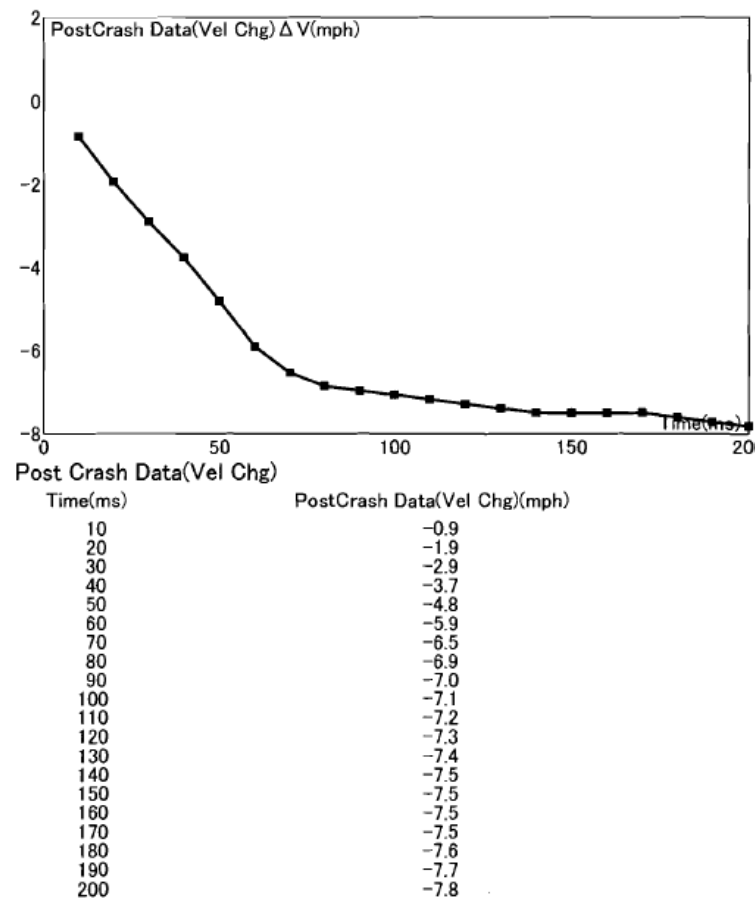


PreCrash Data

Speed	:	0.0	2.5	2.5	2.5	1.2	1.2(mph)
Brake	:	OFF	ON	ON	ON	ON	ON
Accelerator	:	1.02	0.78	0.78	0.78	0.78	0.78(V)
Engine	:	0	0	0	0	0	0(rpm)

Time from Last PreCrash Data : 400(ms) Δ

Case 19 Complete EDR Image



Contradictions in record:
 ENTRY SPD =1.2 DEL-V 7.8 FOR PG 0
 = Next Most Recent = Contradictory

Questionable EDR Reports

Non Consistent (contradictory)
EDR Record

Inconclusive EDR Record

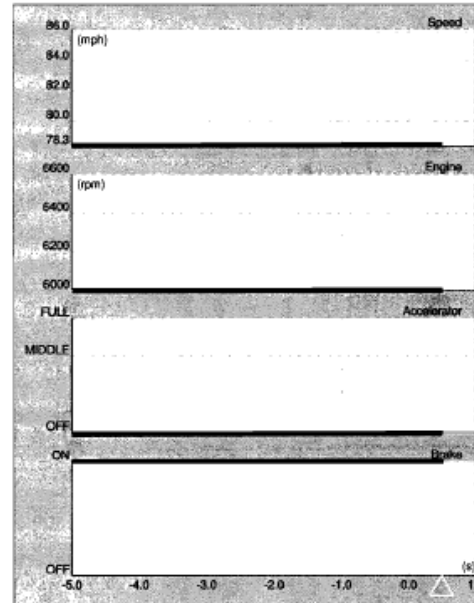
PROTOTYPE READOUT TOOL REPORT

Event Data	Case B1 Complete EDR Image	Graph Data
INVESTIGATION DATE	08/08/2010	Next most recent
INVESTIGATOR		BANK1
ACCIDENT DATE		
VEHICLE	Toyota Corolla	
MODEL YEAR	2010	
VIN NUMBER	1NXBU4EE4AZ039507	

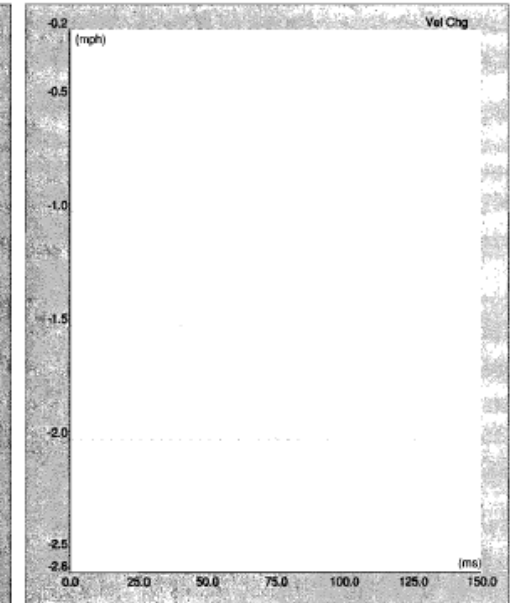
Individual Data

Data Name	Data
Time From Previous Event	5100 ms
Time From Last PreCrash Data	1500 ms
Pre-Crash Data Flag	ON ON ON ON ON ON
Shift Position	P
Seat Position Driver	Undetermined
Belt Switch Status Driver	Invalid
Belt Switch Status Passenger	Invalid
Occupant Detection Passenger	Invalid
PAB-Manual Cut OFF(N/A)	(N/A)
Ignition Cycles	2047 times
Lamp On Term	30705 minutes
Diag Code	FF FF FF FF FF FF FF FF FF FF FF FF
Event counter	0
Writing Flag	Not Recorded

Pre-Crash Data



Post-Crash Data



Pre-Crash Data

s	Speed	Engine	Accelerator	Brake
-5.0	78.3	6000	-0.04(FALSE)	ON
-4.0	78.3	6000	-0.04(FALSE)	ON
-3.0	78.3	6000	-0.04(FALSE)	ON
-2.0	78.3	6000	-0.04(FALSE)	ON
-1.0	78.3	6000	-0.04(FALSE)	ON
0.5	78.3	6000	-0.04(FALSE)	ON

Post-Crash Data

ms	Vel Chg	ms	Vel Chg	ms	Vel Chg
10.0	-0.2	70.0	-1.2	130.0	-2.2
20.0	-0.3	80.0	-1.4	140.0	-2.4
30.0	-0.5	90.0	-1.5	150.0	-2.6
40.0	-0.7	100.0	-1.7		
50.0	-0.9	110.0	-1.9		
60.0	-1.0	120.0	-2.1		

Observations and Questions w/resp/to Scientific Validation of Case Entries in the NHTSA Report

1. No case reflects a fixed lower partial value of accelerator position (NRI) such as would be expected for a sticking pedal event.
2. There are very few indications as to whether the case vehicles have had any or all of the Toyo recalls applied.
3. There are no indications as to whether the case vehicles have been inspected to confirm that any or all of the Toyo recalls, if applied, were applied correctly. [Note that Tang evidenced an improper recall apply].
4. None of the Case Reports contain the source EEPROM data which would allow for an independent check of ROT report translation veracity [Note that an improper translation was found in Eves].
5. There are no photos of the vehicles to visually correlate impact damage to ROT reported collision status.. Are there photos not included in the report?
6. There are no Reconstruction analyses of the vehicles to quantitatively correlate impact damage to ROT reported collision status. Are there such analyses not included in the report?
7. There is no mention in the NHTSA report of any work to confirm that the ROT record data accurately reflects the vehicle acceleration during impact. Has NHTSA/NAS conducted any such confirmation?

Observations and Questions w/resp/to Scientific Validation of Case Entries in the NHTSA Report (continued)

8. There is no mention in the NHTSA report of any work to confirm that the ROT record data accurately reflects the vehicle pre-event conditions. Has NHTSA/NAS conducted any such confirmation?
9. The accelerator position-analog voltage is shown in some, but not all reports. Some reports show only an accelerator assignment to OFF, MED, FULL versus the actual position-analog voltage. We know [and it is shown in the reports] that the nominal accelerator voltage range is 0.78 --3.78 Volts. The actual accelerator position-analog voltage is derivable from the actual SLOT values and shown in ASA charts [for ASA reverse-engineering-derived SLOT value]. Does NHTSA/NAS have the Toyota Accelerator OFF, MED, FULL definition versus position-analog voltage?
10. Does NHTSA/NAS have the Toyota EEPROM translation SLOT factors for acceleration, RPM, Speed, Accel-volts, etc.? Does NHTSA/NAS have these for each EDR P/N type?
11. Does NHTSA/NAS have a Toyota manual that explains each heading of data in the reports?
12. What is the algorithm wakeup value to start an event. When does an event end?
13. What is the non-deploy reset time so that a new event wakeup can be detected?
14. Why does Toyota show Longitudinal Delta-V with a sign opposite to the standard SAE J211, J670e, J1733 signing convention? (See Exhibit A)

Exhibit A Standard SAE
J211, J670e, J1733
signing convention

GEOMETRIC CONVENTIONS :

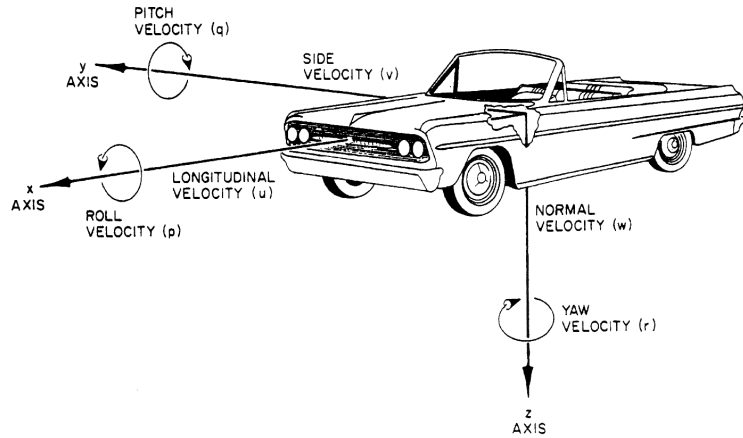
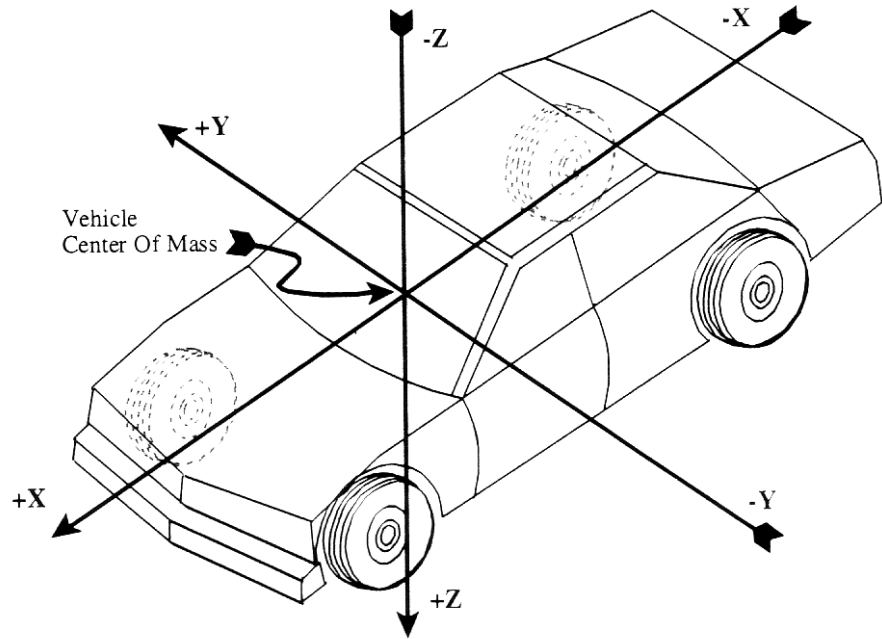


FIG. 2.1—Vehicle direction and control axis systems. (Reprinted with permission from SAE document J670e, © 1976, Society of Automotive Engineers, Inc.)



Base Vehicle with SAE J211/J670e Axes Superimposed

FIG. 2.2—Vehicle axis system with signed SAE J211/J670e directions and labels.