IMPORTANT NOTICE: Robert Bosch LLC and the manufacturers whose vehicles are accessible using the CDR System urge end users to use the latest production release of the Crash Data Retrieval system software when viewing, printing or exporting any retrieved data from within the CDR program. Using the latest version of the CDR software is the best way to ensure that retrieved data has been translated using the most current information provided by the manufacturers of the vehicles supported by this product.

CDR File Information

User Entered VIN	JTHBK1EG3C2477205
User	
Case Number	MC5116
EDR Data Imaging Date	08/24/2012
Crash Date	
Filename	(7640) 12 LEXUS ES350.CDRX
Saved on	Friday, August 24 2012 at 16:55:41
Collected with CDR version	Crash Data Retrieval Tool 6.0
Reported with CDR version	Crash Data Retrieval Tool 11.1.1
EDR Device Type	Airbag Control Module
Event(s) recovered	Side (1)

Comments

No comments entered.

Data Limitations

CDR Record Information:

- Due to limitations of the data recorded by the airbag ECU, such as the resolution, data range, sampling interval, time period of the recording, and the items recorded, the information provided by this data may not be sufficient to capture the entire crash.
- Pre-Crash data is recorded in discrete intervals. Due to different refresh rates within the vehicle's electronics, the data recorded may not be synchronous to each other.
- Airbag ECU data should be used in conjunction with other physical evidence obtained from the vehicle and the surrounding circumstances.
- If the airbags did not deploy or the pretensioners did not operate during an event that meets a specified recording threshold, it is called a Non-Deployment Event. Data from a Non-Deployment Event can be overwritten by a succeeding event that meets the specified recording threshold. If the airbag(s) deploy or the pretensioners are operated, it is called a Deployment Event. Deployment Event data cannot be overwritten or deleted by the airbag ECU following that event.
- If power supply to the airbag ECU is lost during an event, all or part of the data may not be recorded.
- "Diagnostic Trouble Codes" are information about faults when a recording trigger is established. Various diagnostic trouble codes could be set and recorded due to component or system damage during an accident.
- The airbag ECU records only diagnostic information related to the airbag system. It does not record diagnostic information related to other vehicle systems.
- The TaSCAN, Global TechStream, or Intelligent Tester II devices (or any other Toyota genuine diagnostic tool) can be used to obtain detailed information on the diagnostic trouble codes from the airbag system, as well as diagnostic information from other systems. However, in some cases, the diagnostic trouble codes of the airbag system recorded by the airbag ECU when the event occurred may not match the diagnostic trouble codes read out when the diagnostic tool is used.

General Information:

- The data recording specifications of Toyota's airbag ECUs are divided into the following seven categories. The specifications for 12EDR or later are designed to be compatible with NHTSA's 49CFR Part 563 rule.
  - 00EDR / 02EDR / 04EDR / 06EDR / 10EDR / 12EDR / 13EDR
- The airbag ECU records data for all or some of the following accident types: frontal crash, rear crash , side crash, and rollover events. Depending on the installed airbag ECU, data for side crash and/or rollover events may not be recorded.
- This airbag ECU records post-crash data, and depending on the airbag ECU, may record pre-crash data.
  - If a single event occurs independently, the data for that event is recorded on a one-to-one basis.
  - If multiple events occur successively (within a period of approximately 500ms), the establishment of the recording trigger for the first event is defined as the "pre-crash recording trigger". Pre-crash data for the first event and post-crash data for each successive event is then recorded.
- The airbag ECU has two recording pages (memory maps) to store pre-crash data. Additionally, to store post-crash data, the airbag ECU has two recording pages for each accident type: two pages for frontal and rear crash, two pages for a side crash, and two pages for rollover event.
- The data recorded by the airbag ECU includes correlating information between each previously occurring event (i.e., information that clarifies the collision event sequence. This correlation information consists of the following items.
  - Time from Previous Pre-Crash TRG
  - Linked Pre-Crash Page
  - Time from Pre-Crash TRG

- TRG Count
- Previous Crash Type

- The point in time at which the recording trigger is established is regarded as time zero for the recorded data.
- The recording trigger judgment threshold value differs depending on the collision type (i.e., frontal crash, rear crash, side crash, or rollover event).
- Time series data for side crash may have 24 or 25 sampling points.
- Some of the data recorded by the airbag ECU is transmitted to the airbag ECU from various vehicle control modules by the vehicle's Controller Area Network (CAN).
- In some cases, the airbag ECU part number printed on the ECU label may not match the airbag ECU part number that the CDR tool reports. The part number retrieved by the CDR tool should be considered as the official ECU part number.

Data Element Sign Convention:
The following table provides an explanation of the sign notation for data elements that may be included in this CDR report.

Data Element Name	Positive Sign Notation Indicates
Max. Longitudinal Delta-V	Forward
Longitudinal Delta-V	Forward
Max. Lateral Delta-V , B-Pillar Sensor	Outside to Inside
Max. Lateral Delta-V , C-Pillar Sensor	Outside to Inside
Max. Lateral Delta-V , Front Door Sensor	Outside to Inside
Max. Lateral Delta-V , Slide Door Sensor	Outside to Inside
Lateral Delta-V , B-Pillar Sensor	Outside to Inside
Lateral Delta-V , C-Pillar Sensor	Outside to Inside
Lateral Delta-V , Airbag ECU Sensor	Outside to Inside
Roll Angle Peak	Clockwise Rotation
Roll Angle	Clockwise Rotation
Lateral Acceleration , Airbag ECU Sensor *	Right to Left

* For sensing a rollover

Data Definitions:
1)

- The "ON" setting for the "Freeze Signal" indicates a state in which the non-volatile memory can not be overwritten or deleted by the airbag ECU. After "Freeze Signal" has been turned ON, subsequent events will not be recorded.
- "Recording Status" indicates a state in which all recorded event data has been written into the non-volatile memory, or a state in which this process was interrupted and not fully written into the non-volatile memory. If "Recording Status" is "Incomplete", recorded event data may not be valid.
- "Time to Deployment Command" indicates the time between recording trigger establishment and the determination of airbag deployment. This value may differ from the actual time it takes for the airbag to fully deploy.
- Even if an airbag/pretensioner did not deploy due to the "front passenger airbag disable switch and/or "RSCA Disable Switch" in the ON position or other disabling criteria are met, the "Time to deployment command" data element for that airbag/pretensioner may still be recorded.
- "Engine RPM" indicates the number of engine revolutions, not the number of motor revolutions. The recorded value has an upper limit of 5,200 rpm. Resolution is 400 rpm and the value is rounded down and recorded. For example, if the actual engine speed is 799 rpm, the recorded value will be 400 rpm.
- The upper limit for the recorded "Vehicle Speed" value is 122 km/h (75.8mph). Resolution is 2km/h (1.2mph) and the value is rounded down and recorded. The accuracy of the "Vehicle Speed" value can be affected by various factors. These include, but not limited, to the following.
  - Significant changes in the tire’s rolling radius
  - Wheel lock and wheel slip
- "Accelerator Rate" has two recording specifications. Both the recorded value increases as the driver depresses the accelerator.
  - Percentage of accelerator pedal depressed (recorded as 0-100(%)).
  - Output voltage of accelerator pedal module (recorded as 0-5(V)).
- The "Drive" setting for the "Shift Position" value indicates the shift position state is other than "R,"(Reverse), "N" (Neutral), or "P" (Park).
- Depending on the type of occupant sensor installed in the vehicle, one of the following four recording formats for "Occupancy Status, Passenger" will be utilized.
  - Occupied / Not Occupied
  - Adult / Child / Not Occupied
  - AM50 / AF05 / Child / Not Occupied
  - AM50 / AF05 / Child or Not Occupied
- Resolution of the "Air Bag Warning Lamp ON Time Since DTC was Set" is 15 minutes, and the value is rounded down and recorded.
- "Longitudinal Delta-V" indicates the change in forward speed after establishment of the recording trigger. This does not refer to vehicle speed, and it does not include the change in speed during the period from the start of the actual collision to establishment of the recording trigger.
- "Roll Angle peak" may not always match the peak value within the "Roll Angle" sampling points due to differences in data calculation method.
- For "Lateral Delta-V", the sensor location (B-pillar, front door, C-pillar, and slide door) shows the outline of a typical sensor position. Sensory location can be confirmed using the repair manual.
- "Time from Previous Pre-Crash TRG" indicates the time between the establishment of an event's pre-crash recording trigger to the

establishment of a more recent event's pre-crash recording trigger. The upper limit for the recorded value is 16,381 milliseconds. In the event of establishment of the first pre-crash recording trigger after the ignition is switched ON, the upper limit value(max value) is recorded.

- "TRG Count" indicates a calculated value of the number of times recording triggers have been established for all crash types. The sequence in which each event occurred can be verified from the "TRG Count". The smaller the "TRG Count" value, the older the data. The upper limit for the recorded value is 65,533 times. When more than one event reaches the upper limit, the actual "TRG Count" may be greater than what is displayed for that event.
- "Linked Pre-Crash Page" is used to link 'paged" pre-crash data with 'paged" post-crash data. When old pre-crash data is overwritten by new pre-crash data, the "Linked Pre-Crash Page" value may record a page number that is not actually linked.
- Resolution of the "Time from Pre-Crash to TRG" is 100 [ms], and the value is rounded down and recorded.

05006_ToyotaDENSO_r018

System Status at Time of Retrieval

ECU Part Number	89170-33571
ECU Generation	06EDR
Recording Status, All Pages	Complete
Freeze Signal	ON
Freeze Signal Factor	Side Airbag, Driver Deployment
Diagnostic Trouble Codes Exist	No
Time from Previous Pre Crash TRG (msec)	16381 or greater
Latest Pre-Crash Page	0
Contains Unlinked Pre-Crash Data	No

Event Record Summary at Retrieval

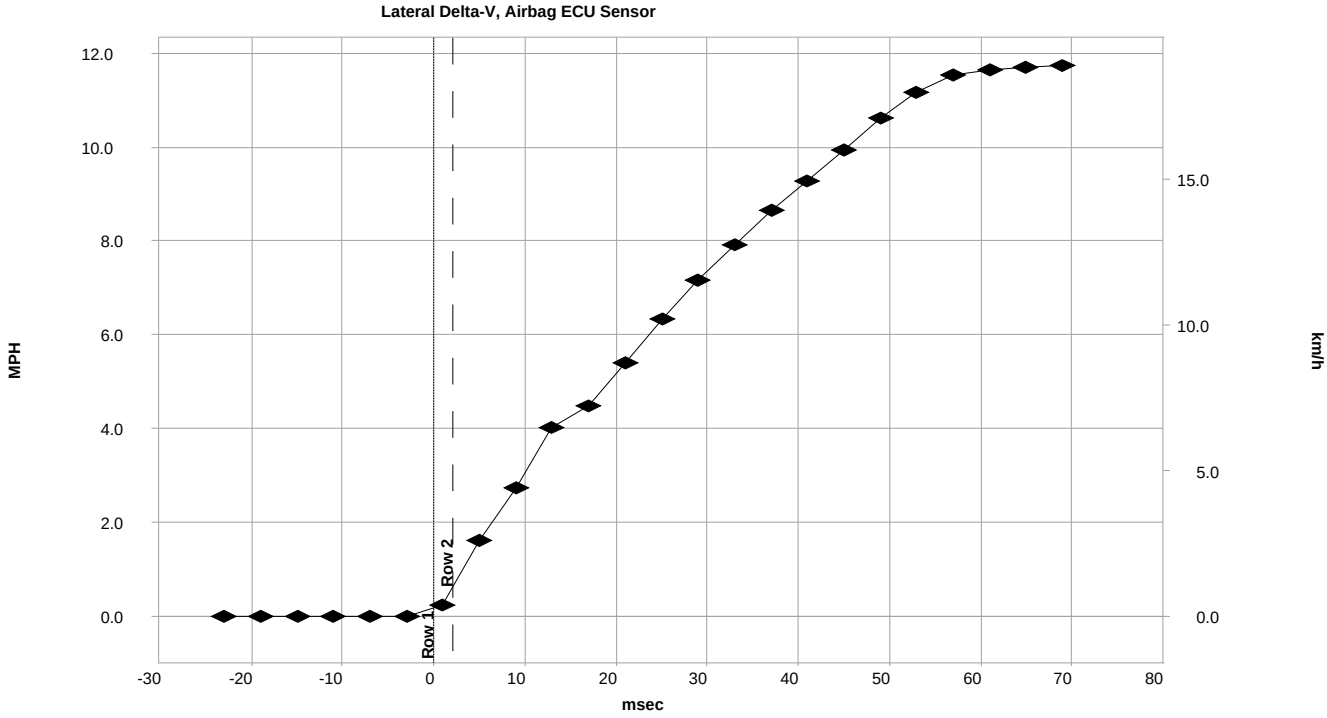
Events Recorded	TRG Count	Crash Type	Time (msec)	Pre-Crash & DTC Data Recording Status	Event & Crash Pulse Data Recording Status
Most Recent Event	1	Side Crash	0	Complete (Page 0)	Complete (Side Page 0)

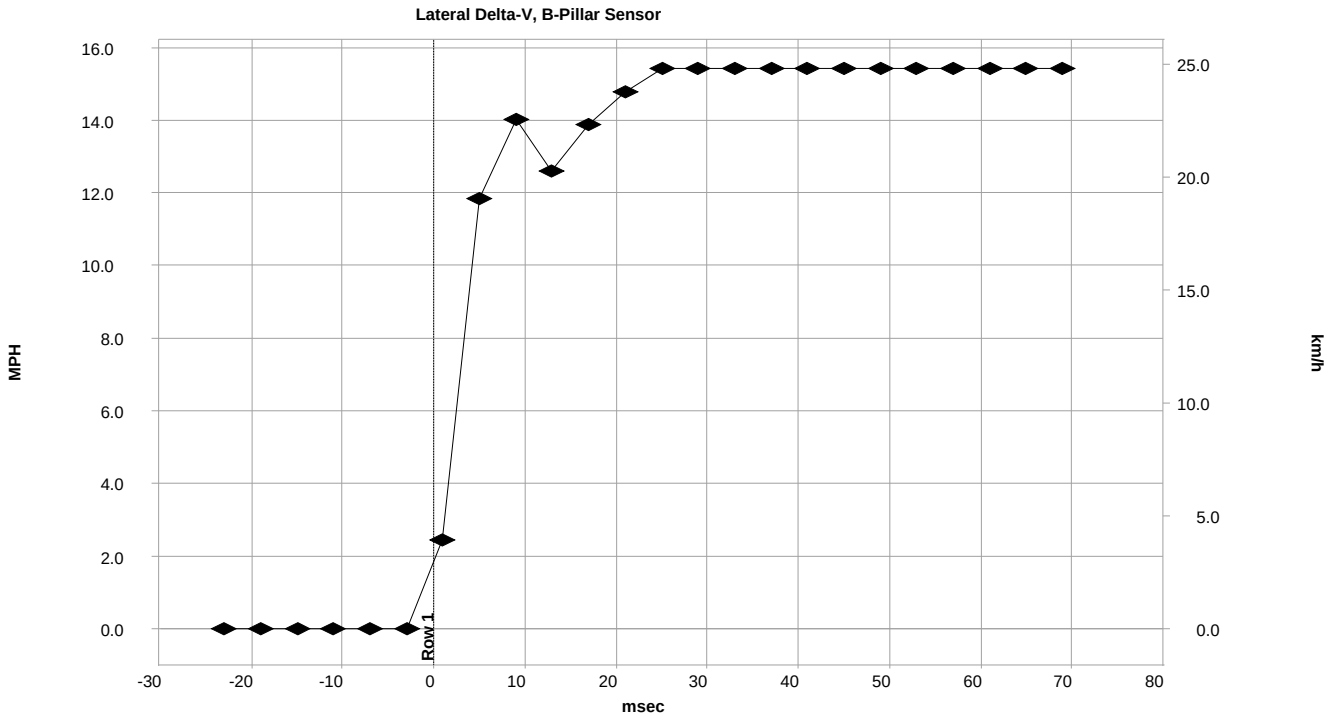
System Status at Event (Most Recent Event, TRG 1)

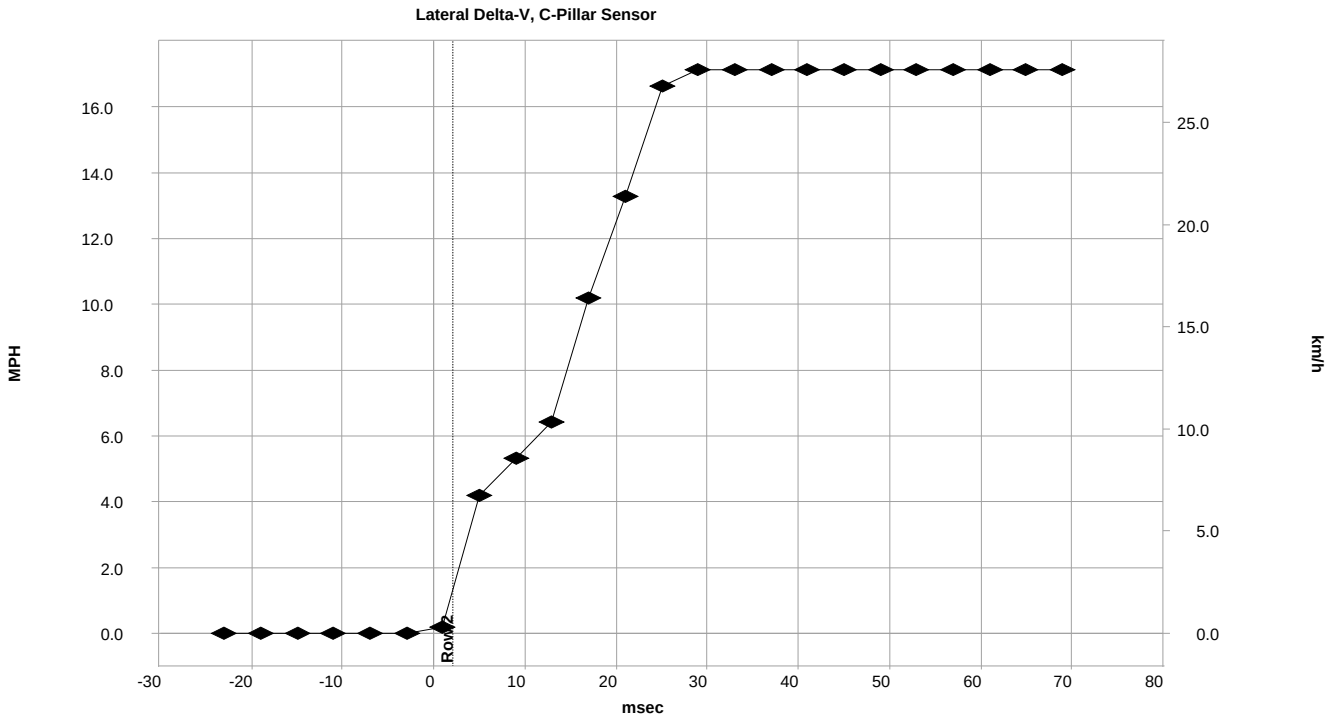
Recording Status, Side Crash Info.	Complete
Crash Type	Side Crash
TRG Count (times)	1
Recorded Side	Driver's Side
Previous Crash Type	No Event
Time from Pre-Crash TRG (msec)	0
Linked Pre-Crash Page	0
Time to Deployment Command, B-Pillar Sensor (msec)	0
Time to Deployment Command, C-Pillar Sensor (msec)	2

Lateral Crash Pulse (Most Recent Event, TRG 1 - table 1 of 2)

Recording Status, Time Series Data	Complete
Time from TRG to Next Sample (msec)	1
Max Lateral Delta-V, B-Pillar Sensor (MPH [km/h])	15.4 [24.8]
Max Lateral Delta-V, C-Pillar Sensor (MPH [km/h])	17.1 [27.6]






Lateral Delta-V, C-Pillar Sensor
MPH
km/h
msec
RowZ
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
25.0
20.0
15.0
10.0
5.0
0.0
-30
-20
-10
0
10
20
30
40
50
60
70
80

Lateral Crash Pulse (Most Recent Event, TRG 1 - table 2 of 2)

Time (msec)	Lateral Delta-V, Airbag ECU Sensor (MPH [km/h])	Lateral Delta-V, B-Pillar Sensor (MPH [km/h])	Lateral Delta-V, C-Pillar Sensor (MPH [km/h])
-23	0.0 [0.0]	0.0 [0.0]	0.0 [0.0]
-19	0.0 [0.0]	0.0 [0.0]	0.0 [0.0]
-15	0.0 [0.0]	0.0 [0.0]	0.0 [0.0]
-11	0.0 [0.0]	0.0 [0.0]	0.0 [0.0]
-7	0.0 [0.0]	0.0 [0.0]	0.0 [0.0]
-3	0.0 [0.0]	0.0 [0.0]	0.0 [0.0]
1	0.2 [0.4]	2.4 [3.9]	0.2 [0.3]
5	1.6 [2.6]	11.8 [19.0]	4.2 [6.8]
9	2.7 [4.4]	14.0 [22.6]	5.3 [8.6]
13	4.0 [6.5]	12.6 [20.3]	6.4 [10.3]
17	4.5 [7.2]	13.9 [22.4]	10.2 [16.4]
21	5.4 [8.7]	14.8 [23.8]	13.3 [21.4]
25	6.3 [10.2]	15.4 [24.8]	16.6 [26.8]
29	7.2 [11.5]	15.4 [24.8]	17.1 [27.6]
33	7.9 [12.7]	15.4 [24.8]	17.1 [27.6]
37	8.7 [13.9]	15.4 [24.8]	17.1 [27.6]
41	9.3 [14.9]	15.4 [24.8]	17.1 [27.6]
45	9.9 [16.0]	15.4 [24.8]	17.1 [27.6]
49	10.6 [17.1]	15.4 [24.8]	17.1 [27.6]
53	11.2 [18.0]	15.4 [24.8]	17.1 [27.6]
57	11.5 [18.6]	15.4 [24.8]	17.1 [27.6]
61	11.6 [18.7]	15.4 [24.8]	17.1 [27.6]
65	11.7 [18.8]	15.4 [24.8]	17.1 [27.6]
69	11.7 [18.9]	15.4 [24.8]	17.1 [27.6]

DTCs Present at Time of Event (Most Recent Event, TRG 1)

Recording Status, Diagnostic	Complete
Ignition Cycle Since DTC was Set (times)	0
Airbag Warning Lamp ON Time Since DTC was Set (min)	0
Diagnostic Trouble Codes	None

Pre-Crash Data, 1 Sample (Most Recent Event, TRG 1)

Recording Status, Pre-Crash/Occupant	Complete
Time from Pre-Crash to TRG (msec)	0
Buckle Switch, Left Seat	Buckled
Buckle Switch, Right Seat	Unbuckled
Occupancy Status, Passenger	Not Occupied
Seat Position, Driver	Rearward
Shift Position	N

Pre-Crash Data, -5 to 0 seconds (Most Recent Event, TRG 1)

Time (sec)	-4	-3	-2	-1	0	0 (TRG)
Vehicle Speed (MPH [km/h])	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]
Brake Switch	OFF	OFF	OFF	OFF	OFF	OFF
Accelerator Rate (V)	0.78	0.78	0.78	0.78	0.78	0.78
Engine RPM (RPM)	0	0	0	0	0	0

Hexadecimal Data

Data that the vehicle manufacturer has specified for data retrieval is shown in the hexadecimal data section of the CDR report. The hexadecimal data section of the CDR report may contain data that is not translated by the CDR program. The control module contains additional data that is not retrievable by the CDR system.

PIDs

PID	Data
00	BC 60 00 01
01	00
03	33 33 35 37 31 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30
04	FF FF FF FF
05	01
06	07
0A	01
0B	00
20	80 00 00 01
21	00 31
40	00 00 00 01
60	00 00 00 01
80	00 00 00 01
A0	00 00 00 01
C0	00 00 00 01
E0	C0 10 00 00
E1	18 18
E2	00 5B 19 11 00
EC	FF

EEPROM

Address	Data (-- = data not imaged from ECU) (** = no response from ECU)
0	-- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
10	-- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
20	-- -- -- -- -- -- -- -- -- -- -- -- -- -- 00 00
30	00 00 00 00 3F FD 00 00 A5 04 00 07 00 00 -- --
40	-- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
50	-- -- 10 01 00 00 14 00 00 14 00 00 14 00 00 14
60	00 14 00 14 00 00 00 55 00 00 00 00 00 00 00 00
70	00 00 00 00 00 00 00 00 00 55 00 00 00 00 00 00
80	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
90	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
A0	00 00 -- -- 00 00 00 00 00 00 00 00 00 00 00 00
B0	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
C0	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
D0	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
E0	00 00 00 00 -- -- 00 00 00 00 00 00 13 49 11 F5
F0	0A 07 05 00 00 00 00 00 00 00 00 00 00 00 00 00
100	00 00 00 00 02 2F 0D 0D 2C 24 27 06 00 00 00 00
110	00 00 00 00 00 00 00 00 00 00 00 00 F2 B0 BF B4
120	E6 CA C9 D0 D4 D5 DC D9 D8 E0 EB FA FC FE 00 00
130	00 00 10 55 00 01 E0 00 00 02 00 55 00 00 00 00
140	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
150	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
160	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
170	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
180	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
190	00 00

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