

## Glossary of CDR Terms

ABS - Anti-lock Brake System, part of that system includes the ABS Module

ABS activity - ABS activity means the anti-lock brake system (ABS) is actively controlling the vehicle's brakes (NHTSA 49 CFR Part 563 definition)

Acceleration A vector quantity specifying the rate of change of velocity  $g \text{ f/s}^2 \text{ m/s}^2$

Accelerator pedal, percent full - The driver requested acceleration as measured by the throttle position sensor on the accelerator pedal compared to the fully depressed position. This definition is in conflict with that proposed in "Part 563" for Engine throttle, percent full. a value of 100% full

Accelerometer - A device which converts mechanical motion into an electrical signal proportional to the acceleration value of the motion; it measures acceleration or gravitational force

ACM Airbag Control Module - the control module for airbags and related restraint systems - see RCM and SDM

ACN - Automatic Crash Notification System, may also be seen as Advanced Crash Notification System

Adjusted Algorithm Forward Velocity Change - see relevant SDM Data Limitation text for the module(s) effected and the conditions which may cause this condition to impact the reported delta-V mph

Airbag warning lamp - Air bag warning lamp status means whether the warning lamp required by FMVSS No. 208 is active or inactive/on or off (NHTSA 49 CFR Part 563 definition) On/off

Algorithm - A series of steps designed to accomplish a specific task

Algorithm enable - A programmed level for a specific ACM at which the ACM begins the deployment decision making Algorithm - see wakeup

Asynchronous communication - Communications that occur at irregular intervals

BCM - Body Control Module

BAS - Brake Assist System

Brake switch status - The status of the device that is installed in, or connected to, the brake pedal system to detect whether the pedal was pressed on/off, open/closed

Buffer Also "RAM buffer" - the memory area where crash related data is actively stored in RAM

Bus, communication bus - A shared channel that transmits data one bit after the other over a single wire or fiber. See also Serial Bus

CAN Controller Area Network - a type of communication bus. See also GMLAN

Capture - The process of buffering EDR data in a temporary, volatile storage medium where it is continuously updated at regular time intervals - see record (NHTSA 49 CFR Part 563 definition)

CDR Crash Data Retrieval System - the name of the ETAS/Bosch built system used to image crash data from certain light vehicles

CDR Version CDR version is a number that identifies which release of the CDR software was used to collect the data.

Class 2 serial bus - A type of serial communication on a "bus"

Command / commanded - If or when the algorithm criteria has been met to deploy a device

Communications bus - A pathway for computer to computer, computer to peripheral communications or between electronic/electrical components (see also bus, communications bus).

Control module - A module that makes decisions and controls other devices

Crash pulse - The period of time defined by the moment when two vehicles come in contact until that point where they separate at the centroid of damage and the exchange of momentum between the vehicles ends. As "crash duration" it is defined by time. Sec

Data Limitations - Text, dynamically built within the CDR software for a particular ACM detailing specific end-user cautions, certain definitions and known anomalies

Delta-V - The vector change of speed of a vehicle involved in an "event" described by a magnitude and direction (positive or negative relative to a specified axis).

Delta-V, lateral - Delta-V, lateral, as defined in "Part 563," calls for a cumulative change in velocity, as recorded by the EDR of the vehicle, along the lateral axis, starting from crash time zero and ending at 0.25 seconds, and recorded every 0.01 seconds (NHTSA 49 CFR Part 563 definition). Mph

Delta-v, longitudinal - Delta-V, longitudinal, as defined in "Part 563," calls for a cumulative change in velocity, as recorded by the EDR of the vehicle, along the longitudinal axis, starting from crash time zero and ending at 0.25 seconds, recorded every 0.01 seconds (NHTSA 49 CFR Part 563 definition). Mph

Deployment (Event) - Acceleration observed along one of the car's axes sufficient to cause the

control module's crash sensing algorithm to "enable" or "wake up" and which is sufficient to warrant a commanded deployment Mph

Deployment Level (Event) - Acceleration is observed along one of the car's axes which is sufficient to cause the GM SDM's crash sensing algorithm to "enable" and anticipate a collision severity which otherwise warrants a deployment for that vehicle but a deployment had been previously commanded

Deployment time - Deployment time, frontal air bag means (for both driver and right front passenger) the elapsed time from that module's established crash time zero to the deployment command or for multi-staged air bag systems, the deployment command for the first stage (NHTSA 49 CFR Part 563 definition).

Disposal - The deployment command of the second (or higher, if present) stage of a frontal air bag for the purpose of disposing the propellant from the air bag device (NHTSA 49 CFR Part 563 definition).

DLC- Diagnostic Link Connector may also be seen as Data Link Connector.

Download - To copy a file from a remote computer (ACM) to "your" computer - see imaging, upload and readout

DPID - Dynamic Position in Data - see PID

DTC - Diagnostic Trouble Code

EBD - Electronic Brake Distribution

EDR - Event Data Recorder - a function within a module (ACM, PCM...) which has the capability to save certain crash parameters after primary functions are completed. It may record a vehicle's dynamic, time-series data during and/or just prior to a crash event intended for retrieval after the crash event.

EEPROM - Electronically Erasable Programmable Read Only Memory - a type of non volatile computer memory used for data storage (memory is not lost when the power is disconnected)  
Electronic Frontal Sensor A satellite sensor (meaning a sensor remote from the ACM) mounted forward in the vehicle of the ACM in the occupant compartment. Associated names include: satellite sensor, up front sensor, crush zone sensor, remote front sensor, frontal crash sensor.  
Enabled When a threshold has been met satisfying one of the criteria necessary to begin a process or deploy a device

End of event time - End of event time as found in "Part 563," means the moment at which the cumulative delta-V within a 20 ms time period becomes 0.8 km/h (0.5 mph) or less (NHTSA 49 CFR Part 563 definition).

Engine RPM - Engine RPM means, for vehicles powered by internal combustion engines, the

number of revolutions per minute of the main crankshaft of the vehicle's engine, and for vehicles not powered by internal combustion engines, the number of revolutions per minute of the motor shaft at the point at which it enters the vehicle transmission gearbox (NHTSA 49 CFR Part 563 definition). a whole number

Engine throttle, percent full - As defined in "Part 563," this is the driver requested acceleration as measured by the throttle position sensor on the accelerator pedal compared to the fully depressed position (See also Accelerator pedal, percent full) (NHTSA 49 CFR Part 563 definition). % of 100% full

ESP - An acronym for Chrysler's Electronic Stability Program.

ETC - Electronic Throttle Control

ETR - Engineering Translation Report

Event - The occurrence of some level of acceleration which causes an ACM to evaluate available data and decide whether or not to deploy restraint device(s). A crash or other physical occurrence that causes a module's trigger threshold to be met or exceeded (NHTSA 49 CFR Part 563 definition).

Event Data Recorder EDR - a function within a module (ACM, PCM...) which has the capability to save certain crash parameters after primary functions are completed. It may record a vehicle's dynamic, time-series data during and/or just prior to a crash event intended for retrieval after the crash event.

FDR - Flight Data Recorder

Forward velocity change - ACM recorded negative X axis delta-V

Frontal air bag - The primary inflatable occupant restraint device that is designed to deploy in a frontal crash to protect the front seat occupants. It requires no action by vehicle occupants and is used to meet the applicable frontal crash protection requirements of FMVSS No. 208. (NHTSA 49 CFR Part 563 definition).

GMLAN - A General Motors implementation of the Controller Area Network type serial communication protocol

Ignition Cycle - Ignition power applied to and removed from the ACM.

Ignition cycle, crash (at event) - The number of power cycles applied to the recording device up to and including the time when the crash event occurred since the first installation of the EDR (NHTSA 49 CFR Part 563 definition). A whole number

Ignition cycle, investigation (At investigation or "download") - The number of power cycles applied to the recording device at the time when the data was downloaded since the first

installation or use of the EDR (NHTSA 49 CFR Part 563 definition). A whole number  
Imaging (EDR data) To use the CDR System to download a copy of the data stored in the EDR component to a PC. Using the CDR System, the technician takes an image – like a photo – of data stored in the EDR without changing the crash data as stored in that EDR.

Interface Module - A part of the CDR System. Comparable to a modem, a part that facilitates communication between a PC and an ACM using the CDR System software.

Lateral acceleration - Lateral acceleration means the component of the vector acceleration of a point in the vehicle on the Y axis as defined in SAE J211 (see Y Axis) (NHTSA 49 CFR Part 563 definition). The lateral acceleration is positive from left to right, from the perspective of the driver when seated in the vehicle facing the direction of forward vehicle travel.  $G \text{ f/s}^2 \text{ m/s}^2$   
Light vehicles passenger cars, SUVs and light duty trucks, under 8500GVW  
Longitudinal acceleration Longitudinal acceleration means the component of the vector acceleration of a point in the vehicle on the X axis as defined in SAE J211 (see X Axis) (NHTSA 49 CFR Part 563 definition). The longitudinal acceleration is positive in the direction of forward vehicle travel.  $G \text{ f/s}^2 \text{ m/s}^2$

Matured Diagnostic - Trouble Code has met criteria to be stored in module.

Maximum delta-V, lateral - The maximum value of the cumulative change in velocity, as recorded by the EDR in the vehicle along the Y axis, starting from crash time zero and ending at 0.3 seconds as specified in "NHTSA 49 CFR Part 563" (NHTSA 49 CFR Part 563 definition).  
Mph

Maximum delta-V, longitudinal - The maximum value of the cumulative change in velocity, as recorded by the EDR in the vehicle along the X axis, starting from crash time zero and ending at 0.3 seconds as specified in "Part 563" (NHTSA 49 CFR Part 563 definition). Mph

MIL Malfunction Indicator Lamp. - A lamp on the dash board of a vehicle which illuminates if the on-board computer control system detects a problem with the vehicle's engine, drivetrain or electronic control systems.

Millisecond - A millisecond is 0.001 seconds msec ms

Modem - Short for modulator/demodulator, a piece of hardware that lets a computer talk to another computer. Contextual reference: CDR interface module

Multi-event crash - As defined in "Part 563," it means the occurrence of 2 events, the first and last of which begin not more than 5 seconds apart (NHTSA 49 CFR Part 563 definition). A whole number

Near-deployment - An out-of-date and inappropriate term replaced by the more descriptive and more accurate term "non-deployment"

NHTSA - National Highway Traffic Safety Administration (US)

Non Deployment (Event) Acceleration observed along one of the car's axes sufficient to cause the module's crash sensing algorithm to "enable" or "wake up" but which does not warrant a commanded deployment

Non-volatile memory - Memory reserved for maintaining recorded EDR data in a semi-permanent fashion normally involving storage on a EEPROM. Data recorded in non-volatile memory is retained after a loss of power and can be retrieved with EDR data extraction tools and methods (NHTSA 49 CFR Part 563 definition).

Normal acceleration - The component of the vector acceleration of a point in the vehicle on the Z axis. The normal acceleration is positive in a downward direction and is zero when the accelerometer is at rest as described in SAE J211 (NHTSA 49 CFR Part 563 definition). The normal acceleration is positive in a downward direction and is zero when the accelerometer is at rest.  $G \quad f/s^2 \quad m/s^2$

NTSB - National Transportation Safety Board (US)

OBD II- Onboard Diagnostic system version 2

Occupant position classification - As defined in "Part 563," this is a data element/classification indicating that the seating posture of a front outboard occupant (both driver and right front passenger) is determined to be out-of-position (NHTSA 49 CFR Part 563 definition). Values may be variable

Occupant size classification - For right front passenger, as defined in "Part 563," it is the classification of an occupant as an adult and not a child, and for driver, the classification of the driver as not being of small stature. Values recorded vary by OEM and system (NHTSA 49 CFR Part 563 definition). Values are variable

ORC Occupant Restraint Control – the Chrysler designation for the ACM found in Chrysler vehicles

Part 563 49 Code of Federal Regulations Part 563 – Docket No. NHTSA-2006-25666, RIN 2127-AI72 "Event Data Recorders"

PC - Personal Computer

PCM - Powertrain Control module – the module (computer) that controls most engine and drivetrain functions in motor vehicles.

PDOF - Principal Direction of Force an angle, degrees

PID - Packet Identifier (also identified as Position In Data) B2- a position in stored data which translates a certain way based on its position

Powered-Up - The act of applying a 10V – 16VDC power source to the appropriate pins on a specific control module.

Pretensioner - A pretensioner is a device that is activated by a vehicle's crash sensing system and removes slack from a vehicle safety belt when sufficient thresholds are met and, in some cases, where the belt is buckled (NHTSA 49 CFR Part 563 definition).

Program Verification Number - Program verification number is a hexadecimal number used internally by the CDR program to detect corruption of the CDR program.

PVS - Pedal Voltage Sensor

RAM - Random Access Memory – a type of volatile computer memory

Raw Pedal - This is the accelerator pedal position value in volts as measured at the pedal sensor.

Raw Throttle - This is the throttle plate position value in volts as measured at the throttle plate sensor.

RCM Restraint Control Module – the Ford designation for the ACM found in Ford vehicles  
Readout The output of a computer file in readable form – see imaging, download and upload  
Record The process of saving captured EDR data into a non-volatile device for subsequent retrieval, to "write data" to the EEPROM – see capture (NHTSA 49 CFR Part 563 definition).

Relative Pedal - This is the percentage of accelerator pedal depressed (0 – 100%)

Relative Throttle - This is the percentage of throttle blade opening at the engine (0 – 100%)

ROM Read Only Memory - a type of non-volatile computer memory

RPM - Revolutions Per Minute

RPO - Regular Production Option,

SAE - Society of Automotive Engineers

Safety belt status - Also seen as seat belt buckle circuit status, this reflects the feedback from the safety system that is used to determine if an occupant's safety belt (for either/both driver and right front passenger) is buckled or not buckled (NHTSA 49 CFR Part 563 definition). buckled / unbuckled

Satellite sensor - A sensor remote from the primary unit, reporting information to a control module. While often an Incorrect, Potentially Troublesome Moniker, other names include: Electronic Frontal Sensor, crush zone sensor, remote front sensor and frontal crash sensor.

SDM Sensing Diagnostic Module - the General Motors designation for the ACM found in GM vehicles

Seat track position switch - Seat track position switch is used to indicate the relative position of a seat - driver or right front passenger - on the seat track where it may be used to indicate the seat/occupant is in a forward position near an airbag which may be deployed (NHTSA 49 CFR Part 563 definition). Seat track position switch, foremost, status means the status of the switch that is installed to detect whether the seat is moved to a forward position.

Seat/safety belt status - The signal/feedback from the safety system that is used to determine that an occupant's safety belt is fastened or not fastened (buckled/unbuckled)

Serial bus - A physical interface that transfers data between computer components inside a computer or between computers

Serial communications - Communications between electronic/electrical components on a single data path

Service brake status - The status of the service brake is reflected as "on" or "off" and means the status of the device that is installed in or connected to the brake pedal system to detect whether the pedal was pressed to a specific position by the driver (NHTSA 49 CFR Part 563 definition). Service brake, on and off means the status of the device that is installed in or connected to the brake pedal system to detect whether the pedal was pressed. The device can include the brake pedal switch or other driver-operated service brake control. on / off

Side air bag - A side air bag is any inflatable occupant restraint device that is mounted to the seat or side structure of the vehicle interior and that is designed to deploy in a side impact event (NHTSA 49 CFR Part 563 definition).

Side curtain/tube air bag - A side curtain/tube air bag is any inflatable occupant restraint device that is mounted to the side structure of the vehicle interior, and that is designed to deploy in a side impact crash or rollover event (NHTSA 49 CFR Part 563 definition).

SIR - Supplemental Inflatable Restraint, typically a GM term - see SRS

Speed, vehicle indicated - "Speed, Vehicle Indicated" the speed indicated by a manufacturer-designated subsystem designed to indicate the vehicle's ground travel speed during vehicle operation - see PCM and VSS (NHTSA 49 CFR Part 563 definition). Mph

Spoliation - Lawyers and courts use the term spoliation to refer to destruction of evidence relevant to legal proceeding.

SRS - Supplemental Restraint System, typically a Ford term - see SIR

Stability control - A stability control device is one not directly controlled by the operator (e.g.,

steering or brakes) and is intended to prevent loss of vehicle control by sensing, interpreting, and adjusting a vehicle's driving and handling characteristics, is controlling or assisting the driver in controlling the vehicle (NHTSA 49 CFR Part 563 definition).

Steering wheel angle - The steering wheel angle is an indication of the measured angular displacement of the steering wheel from a neutral straight-ahead position. Polarity conforms to SAE J211 where clockwise and a positive angle are synonymous (NHTSA 49 CFR Part 563 definition). degrees, positive or negative

Suppression switch status - The airbag suppression switch status is an indication of the status of the switch indicating whether an air bag suppression system is on or off typically as it applies to a right front passenger airbag system (NHTSA 49 CFR Part 563 definition). suppressed / not suppressed

Synchronous communications - Communications that occur at a regular interval typically controlled by a processor clock.

Throttle Body Position Sensor, percent full - The measured percent of 100% full open at the engine throttle body % of 100% full

Time between events - As found in certain GM CDR reports, the time between events is measured from the module level end of the first event to algorithm enable of the second event. It may reflect the time between a non-deployment and a deployment or deployment and deployment level event. Limits are found in the relevant sections of the Data Limitations text for each module. Sec

Time between events ("NHTSA 49 CFR Part 563") - As used in "Part 563," and referred to as time from event 1 to 2 it means the elapsed time from time zero of the first event to time zero of the second event (NHTSA 49 CFR Part 563 definition). Sec

Time to deploy, pretensioner - Time to deploy, pretensioner is the elapsed time from crash time zero as defined at the module level to the deployment command for the safety belt pretensioner (for both driver and right front passenger as appropriate) (NHTSA 49 CFR Part 563 definition). Sec

Time to deploy, side air bag/curtain - Time to deploy, side air bag/curtain is the elapsed time from crash time zero as defined at the module level to the deployment command for a side air bag or a side curtain/tube air bag (for both driver and right front passenger as appropriate) (NHTSA 49 CFR Part 563 definition). Sec

Time to first stage - Time to first stage is the elapsed time between time zero as defined at the module level to the time when the first stage of a frontal air bag is commanded to deploy (NHTSA 49 CFR Part 563 definition). Sec

Time to maximum delta-V, lateral - Time to maximum delta-V, lateral is time from crash time zero as defined at the module level to the point in time where the maximum value of the

cumulative change in velocity is found, as recorded by the EDR, along the lateral (Y) axis (NHTSA 49 CFR Part 563 definition). Sec

Time to maximum delta-V, longitudinal - Time to maximum delta-V, longitudinal is the time from crash time zero as defined at the module level to the point where the maximum value of the cumulative change in velocity is found, as recorded by the EDR, along the longitudinal (X) axis (NHTSA 49 CFR Part 563 definition). Sec

Time to nth stage - Time to nth stage is the elapsed time from the crash time zero as defined at the module level to the deployment command for the nth stage of a frontal air bag (for both driver and right front passenger as appropriate) (NHTSA 49 CFR Part 563 definition). Sec

Time zero - Time zero is the point where system "wake-up" within the air bag control module occurs. It is the time the ACM algorithm is activated. The threshold may be module and OEM dependent (NHTSA 49 CFR Part 563 definition). For continuously running algorithms, the first point in the interval where a longitudinal, cumulative delta-V of over 0.8 km/h (0.5 mph) is reached within a 20 ms time period; or for vehicles that record "delta-V, lateral," the first point in the interval where a lateral, cumulative delta-V of over 0.8 km/h (0.5 mph) is reached within a 5 ms time period. Sec

TPS - Throttle Position Sensor, normally identified as a sensor located under the hood on the throttle body on the engine

Trigger threshold - Trigger threshold is where a change in acceleration normally along the vehicle X axis equals or exceeds a pre determined value as set in an ACM's calibration (NHTSA 49 CFR Part 563 definition). Pre-determined value on typical systems is 8 km/h within a 150 ms interval. For vehicles that record "delta-V, lateral," trigger threshold means a change in vehicle velocity, in either the longitudinal or lateral direction that equals or exceeds 8 km/h within a 150 ms interval.  $g \quad f/s^2 \quad m/s^2$

Upload - To send a copy of a file from one computer to another using a modem (i.e. the CDR interface module) and communication software - see also imaging, download and readout

Vehicle roll angle - Vehicle roll angle is the number of degrees rotation around the vehicle's X axis (NHTSA 49 CFR Part 563 definition). Alternatively, vehicle roll angle means the angle between the vehicle y-axis and the ground plane. degrees, positive or negative

Vehicle roll angle ("Part 563") - Vehicle roll angle means the angle between the vehicle Y axis and the ground plane (NHTSA 49 CFR Part 563 definition). degrees, positive or negative

VIN - Vehicle Identification Number

Volatile memory - Volatile memory is the memory reserved for buffering of captured EDR data (see "capture"), typically as RAM (see "RAM"). The memory is not capable of retaining data in a semi-permanent fashion. Data captured in a volatile memory is continuously overwritten and

is not retained in the event of a power loss or retrievable with EDR data extraction tools (NHTSA 49 CFR Part 563 definition).

VSS - Vehicle Speed Sensor

Wakeup - Also algorithm wakeup or algorithm enable, a programmed level for a specific ACM at which the ACM begins the deployment decision making algorithm - see algorithm enable

X axis - As further defined in SAE J2111 - in the direction of the vehicle X-axis, which is parallel to the vehicle's longitudinal centerline. The X-direction is positive in the direction of forward vehicle travel.

Y axis - As further defined in SAE J2111 - in the direction of the vehicle Y-axis, which is perpendicular to its X-axis and in the same horizontal plane as that X axis. The Y-direction is positive from the driver's toward the passenger's side of the vehicle.

Z axis - As further defined in SAE J2111 - in the direction of the vehicle Z-axis, which is perpendicular to the X and Y axes. The Z-direction is positive in a downward direction relative to the normal position of the vehicle on the X-Y based plane.