# Technical Bulletin



## Subject: Bendix® EC-80™ Electronic Control Unit Data Storage

The purpose of this Bulletin is to inform users of Bendix® ESP®, Antilock Braking Systems (ABS), and Automatic Traction Control (ATC) EC-80™ Controllers of the event-based data storage capabilities of those products and the process to obtain this data.

**⚠ ATTENTION**

**Depending on the product type and version, Bendix Electronic Control Units (ECUs) may store data related to troubleshooting, diagnostics, service needs, vehicle system operating status, and vehicle operator inputs. No personally identifying data (i.e. name, gender, or age) is recorded. Bendix will not access stored ECU data or share it with others except: with the consent of the vehicle owner; in response to an official request by law enforcement or other governmental agency; as part of Bendix's defense of litigation; or, as otherwise required by law. Data that Bendix receives may also be used for research purposes or made available to others for research purposes, where a need is shown and the data is not linked to a specific vehicle or owner.**

**Bendix®-brand ECUs are not designed to store data for purposes of accident reconstruction and Bendix® ACom® PRO™ Diagnostic Software is not intended to retrieve data for purposes of accident reconstruction. Bendix makes no representations as to the accuracy of data retrieved and interpreted from ECUs for purposes of accident reconstruction. Bendix does not offer accident reconstruction services or interpretation of stored data. Bendix ECUs are not protected from fire, loss of power, impact, damage, or other conditions that may be sustained in a crash situation and may cause data to be unavailable or irretrievable.**

### A. Extraction Procedure

Bendix will process all requests for event-based data. The following steps are required:

- The requester (who must be the registered owner of the vehicle from which the ECU is removed, or their designate) must download a *Request and Release of Bendix® ECU Download form, BW8206, from b2bendix.com,* then follow the instructions on this form.
- The requester will provide the completed form and Bendix EC-80 ECU to Bendix.
- Bendix will extract the data from the ECU and return the ECU to the requester.
- Bendix will provide the standard data extracted report ("Bendix ECU Data Download" report) to the requester.

**NOTE:** Bendix will charge a fee to extract the data and provide a report.

### B. Bendix EC-80 ECU Event Triggers

Each Bendix EC-80 ECU has the capability to record various data elements based on certain event triggers. Event recording will typically be triggered by one (1) or more of the following situations:

- Bendix® Wingman® collision mitigation system brake activation;
- High lateral acceleration;
- High longitudinal acceleration; and/or
- Driver override of Bendix Wingman collision mitigation system activation.

## C. Bendix® EC-80™ Electronic Control Unit (ECU) Data Report Information

For each triggered event, the Bendix® EC-80™ ECU captures data – every 0.5 seconds, for up to 20 seconds, with approximately 10 seconds pre- and post-trigger. It can store up to four (4) different event logs, with the oldest log overwritten as a new event log is captured. Various data elements and video may be captured of the events, as described below.

### C1. Data Report Foundation Information

Examples of data log information that may be captured during an extraction – or entered manually by the technician doing the extraction – include:

- Extraction Date;
- Extraction Time;
- Extraction Tool Version;
- Extraction Location;
- Extraction Performed By;
- Event Data Recorder Version;
- Vehicle Make;
- Vehicle Model;
- Vehicle Identification Number (VIN);
- Antilock Braking System (ABS) ECU Type;
- ABS ECU Part Number;
- ABS ECU Serial Number;
- Notes; and
- Total Event Count.

**NOTE:** The date, time, and location of the actual event are ***NOT*** recorded in the EC-80 ECU.

### C2. Bendix EC-80 ECU Event-based Header Information

Each event log is typically accompanied by certain header information indicating certain aspects of the log:

- Event Completed;
- Event Number;
- Event Lock Number;
- Engine Hours (min);
- Power-up Time (min);
- Trigger Type;
- FDA Table Index;
- Video; and
- Configuration.

### C3. Bendix EC-80 ECU Event-based Data Elements

All data is gathered from the J1939 network – or directly from ABS/Electronic Stability Control (ESP)/Collision Mitigation Technology systems – as well as other vehicle systems, as appropriate. If a data element is not present at the time of recording, it will be indicated with “NA,” blank, or a specific code as noted below. The following data elements are typically recorded by the system:

- Time (seconds) – indicates when the data element was captured relative to the trigger occurrence;
- Trigger (1 or 0) – indicates when the trigger occurred indicated by a 1;
- *Forward Looking Radar (FLR) Status (0 or 1) – FLR status indicates normal operation when the value is 1;
- ABS Status (0 or 1) – ABS status indicates normal operation when the value is 1;
- Trailer ABS Status (0 or 1) – indicates the warning lamp is off or not detected when the value is 0; a value of 1 indicates the warning lamp is on;
- **ESP Status (0 or 1) – ESP status indicates normal operation when the value is 1;
- ABS Warning Lamp Request (0 or 1) – indicates when ABS went active as indicated with a 1;
- Automatic Traction Control (ATC) Warning Lamp Request (0 or 1) – indicates when ATC went active as indicated with a 1;
- ATC Mud/Snow Switch (0 or 1) – indicates when the switch is positioned to “on” as indicated by a 1;
- ABS Off-road Switch (0 or 1) – indicates when the switch is positioned to “on” as indicated by a 1;
- Vehicle Speed (mph) – indicates the vehicle speed;
- **Steering Angle (degrees) – provides driver steering angle input. Negative values are right turns; positive values are left turns;
- Accelerator Pedal Position (0% - 100%) – indicates how much throttle was requested. 100% equals full throttle;
- CCVS Brake Light Request (0,1,2,3) – indicates when there was a brake light request. 0 indicates no brake light request; 1 indicates a brake light request; 2 indicates “unknown;” and 3 is “reserved for future use.”;

* Data available only on vehicles equipped with a Bendix ESP EC-80 Controller ***and*** Bendix® Wingman® system.

** Data available on vehicles equipped with Bendix ESP EC-80 Controllers.

- **Driver Service Brake Application (0,1,2,3) – reports brake pressure demanded by the driver using the service brake pedal. (0 = < 1/2 bar; 1 = 1/2 bar to 2 bars; 2 = 2 bars to 6 bars; 3 = > 6 bars);
- Park Brake Dash Indicator Request (0 or 1) – reports tractor park brake switch status (0 = Not Set; 1 = Set);
- **Cruise Control (CC) Active Status (0,1,2,3) – reports if cruise control was active or not (0 = CC not active; 1 = CC Active; 2 = Error; 3 = Not Available);
- *VDC Brake Lamp Request (0 or 1) – reports when the brake lights were requested to be turned on by the Bendix® Active Safety Technology – ESP® (Electronic Stability Program) or Bendix® Wingman® collision mitigation system (0 = Off; 1 = On);
- *Forward Looking Radar (FLR) Audible Alert (0,1,2,3,4,5,6,7) – reports levels of audible warning given to the driver by the Wingman system (0 = No warning; 1 = Distance Alert 1; 2 = Distance Alert 2; 3 = Distance Alert 3; 4 = System Shutdown Alert; 5 = Impact Alert; 6 = Error; 7 = Not Available);
- *Bendix® FLR20™ System Intervention (0 or 1) – reports when there was a brake intervention by the Bendix Wingman system (0 = No Intervention; 1 = System intervention);
- Bendix® Antilock Braking System (ABS) Activity (0 or 1) – reports when there was ABS activation (0 = No activation; 1 = ABS activation);
- **Bendix ESP Intervention (0 or 1) – reports when there was an intervention by the ESP system (0 = No intervention; 1 = ESP intervention); and
- Bendix Hill Start Aid (HSA) Function Intervention (0 or 1) – reports when there was intervention requested by the HSA feature (0 = HSA not active; 1 = HSA active.)

### D. Video Capture

The Bendix® Wingman® Fusion™ collision mitigation system and AutoVue® Lane Departure Warning (LDW) System by Bendix CVS utilize a camera as part of the system. These systems may capture video information regarding specific events.

For the Bendix Wingman Fusion system, if an event causes data recording to be triggered in the Bendix® EC-80™ Electronic Control Unit (ECU), as noted in *Section C,* then the camera will record and save up to ten (10) seconds of video prior to the event trigger being activated and up to ten (10) seconds of video after the event trigger is activated, for a total of up to twenty (20) seconds of event video. As noted in *Section C*, the system captures trigger information every half (0.5) second.

The AutoVue LDW System – linked with Bendix™ SafetyDirect® – operates independently of the Bendix EC-80 system. As such, it may, or may not, capture events or data which are not captured by the Bendix EC-80 data recorder. This system, when triggered, will all also capture up to ten (10) seconds of video before and up to ten (10) seconds of video after the event trigger is activated, for a total of up to twenty (20) seconds of event video.

### E. Event Lock

Events deemed significant by the system, based on specific parameters in the system including acceleration change greater than 0.85 g or a vehicle speed change greater than nine (9) mph within a second, the specific event is “locked” in the system and will not be overwritten until after the next 50 events are recorded. Only two (2) events are able to be locked at a time. If a third “significant” event occurs that is deemed to be lockable, the oldest event will be overwritten.

### F. Data from Older Bendix®-brand Braking Systems

Older Bendix®-brand braking systems may also contain data which may or may not be captured in certain situations. This data may vary between system versions and may be triggered by different events. In order to assess if any data is available on the Bendix ECU retrieved, please follow the procedure noted in *Section A. Extraction Procedure.* Bendix makes no claims regarding whether decipherable data is available in any ECU, nor what specific data points are – or may be captured – by a particular ECU.

* Data available only on vehicles equipped with a Bendix ESP EC-80 Controller ***and*** Bendix® Wingman® system.

** Data available on vehicles equipped with Bendix ESP EC-80 Controllers.

### G. Data Retrievable by Bendix® ACom® PRO™ Diagnostic Software for the Antilock Braking System (ABS)/Automatic Traction Control (ATC)/Electronic Stability Program (ESP) Systems, and Bendix® Driver Assistance Technologies

General categories of information typically available via the standard Bendix ACom PRO diagnostic software event report include:

- General Electronic Control Unit (ECU) header Information;
- Active Diagnostic Trouble Codes (DTCs);
- Inactive DTCs;
- Event History – DTCs;
- Event History – Info Events; and
- Event Counters and ESP Counters.

A sample report can be generated by using “demo mode” in the Bendix ACom PRO diagnostic software.

**Additional Information**

Visit b2bendix.com for the following information and downloads:

- *Bendix® ABS/ATC EC-80™ Controller Service Data Sheet, SD-13-4983*
- *Bendix® ESP EC-80™ Controllers Service Data Sheet, SD-13-4986*
- *Bendix ACom PRO Diagnostic Software*