Electronic Logging Device (ELD)
Test Plan and Procedures

10/17/2016

Version 2.0

U.S. Department of Transportation
Federal Motor Carrier Safety Administration

Revision History

Version	Rev	Date	Changes Made	Writer	Reviewer
0.0	-	12/16/2015	Original Document	FMCSA	
1.0	-	3/11/2016	Webinar Updates	FMCSA	
2.0	-	10/17/16	Implementation Phase Web Services Tests Note	FMCSA	

Use of Compliance Test Procedures

An Electronic Logging Device (ELD) must meet the technical specifications set forth in the Appendix to Subpart B of Part 395 of title 49, Code of Federal Regulations. Although use of the ELD test procedures set forth in this document is not binding on ELD providers, these procedures are made available to ELD providers to assist them in carrying out their testing processes before certifying an ELD model as compliant with the technical specifications. The ELD certification process does require a certifying statement describing how the model was tested to comply with FMCSA regulations. The FMCSA would use these test procedures to evaluate compliance if the Agency decides to undertake an independent evaluation of an ELD that has been certified by the provider.

Implementation Phase Data Transfer and Web Services Test Steps

Due to the fact that data transfer cannot be trialed with an actual authorized safety official and that the Web Services portal at FMCSA is not yet operational, the following test steps* are not required to be completed:

ELD-FUNC-4.3.2.5-2
ELD-FUNC-4.9.1-2
ELD-FUNC-4.9.2-5
ELD-FUNC-4.10.1.1-2
ELD-FUNC-4.10.1.1-3
ELD-FUNC-4.10.1.1-4
ELD-FUNC-4.10.1.2-2
ELD-FUNC-4.10.1.2-3
ELD-FUNC-4.10.2-1

These steps are also highlighted in YELLOW if they are contained within this document.

*Data transfer via e-mail accounts, USB, and Bluetooth can still be tested in the manufacturer's test environment. If the required output file can be generated per the technical specifications, it will work in FMCSA Web Services

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Introduction

In an effort to improve commercial motor vehicle (CMV) safety and reduce the overall paperwork burden for both motor carriers and drivers, the Federal Motor Carrier Safety Administration (FMCSA) published a *Supplemental Notice of Proposed Rule Making* (SNPRM) on March 28, 2014 to require the use of Electronic Logging Devices (ELDs) within the motor carrier industry that is currently subject to Records of Duty Status (RODS) preparation requirements. The SNPRM requires new technical specifications for ELDs that address statutory requirements and mandates ELDs for drivers currently using RODS. Also, the SNPRM calls for clarifying supporting document requirements so that motor carriers and drivers can comply efficiently with Hours of Service (HOS) regulations and, so that motor carriers can make the best use of ELDs and related support systems as their primary means of recording HOS information and ensuring HOS compliance. The SNPRM proposes both procedural and technical provisions aimed at ensuring that ELDs are not used to harass vehicle operators.

To ensure consistency among manufacturers and devices, functional specifications were published with the SNPRM. FMCSA provided these specifications to confirm compliance of an ELD with independent testing and validation.

1.1 ELD Design

The ELD design is such that motor carriers and drivers can comply efficiently with HOS regulations and that motor carriers can make the best use of ELDs and related support systems as their primary means of recording HOS information and ensuring HOS compliance.

Engine information will be shared with the ELD through integral synchronization. The ELD will be tamper-resistant so unauthorized alteration of the captured data will not occur. ELDs, certified by the providers, will meet or exceed the performance requirements.

Transfer of standardized ELD data to authorized safety officials will be accomplished.

1.2 Test Philosophy

This Electronic Logging Device Test Plan provides the test environment and procedures for examining the specifications set forth by FMCSA. Those specifications were listed in a Requirements Traceability Matrix (RTM).

Procedures were prepared by deconstructing the RTM and to be tested for validation and verification. The procedures are listed in ELD Test Procedures Chapter 1, 2 and 3.

1.3 Scope of Document

This document provides the following information in support of ELD testing:

- Test overview and philosophy
- Configuration management process for testing
- Quality assurance process for testing
- Validation through inspection
- Pass/fail criteria
- Test cases
- Test results
- Test report

1.4 Requirements Management

All test procedures will track back to the requirements provided in the RTM and the RTM includes the decomposed requirements.

1.5 Test Results

As seen in **Table 1**, testing of procedures will be coded as passed or failed.

Table 1 Test Result Indicators

Result	Code	Reason
Passed	P	Test results for the step matched the expected result
Failed	F	Test results for the step did not produce the expected result

1.5.1 Record Retention

All records of ELD procedures testing including test conduct forms and results shall be kept for a period of two years.

1.6 Test Team

The Test Team information should be inserted here with the titles and areas of responsibilities.

1.7 Test Schedule

Insert test schedule here.

1.8 Test Procedures

Test procedures are generated to verify the requirements as documented in the RTM. Requirements have been decomposed so each procedure, step, or group of multiple steps verifies a single requirement.

1.9 Corrective Action Process

The corrective action process for any procedures that do not pass should be included here.

1.9.1 Regression Test

Regression testing will occur after any corrective action is taken. Once the corrective action has occurred, the capability will be retested to verify that the corrective action has eliminated the deficiency/defect.

1.10 Test Reports

The ELD Test Report will include the results of the testing and the following:

- Details for every test procedure or test step that was conducted, regardless of whether the step was a success or failure, include;
    - The date of the test
    - The identity of the person who performed or led the test
    - The outcome of the test (pass/ fail)
    - Any comments related to the test
- For each failed test procedure:
    - The identification of all tests that will need to be re-run as a result of the deficiency/defect.

Testing Procedures

1.11 Quality Assurance

Insert the Quality Assurance program here.

1.12 Automated Testing Process

No automated testing will be done as part of the ELD procedures testing.

1.13 ELD Test Procedures

Individual test procedures will be grouped according to requirement type in the following chapters:

- Chapter 1: Accounts, Inputs and Vehicle Interface
- Chapter 2: Processing, Monitoring and Recording
- Chapter 3: Outputs and Data Transfer

Technical Testing Approach

1.14 ELD Procedures Testing Overview

Testing of the ELD procedures will be a step-by-step completion of the test procedures which have been developed to verify the requirements in the RTM.

1.15 Objectives

Testing is to be used to verify conformance of the ELD with the FMCSA requirements.

1.16 Test Items

1.16.1 General

When necessary, Commercial Motor Vehicles (CMVs) will be used for bus interfaces.

1.16.2 Environmental Conditions

Normal conditions for equipment design:

Those ELD/components located indoors in a testing environment:

- Ambient temperature range: 40° F - 84° F (4° C - 28° C)
- Relative humidity: 10 - 95%

Those ELD/components located outside in CMVs for testing:

- Ambient temperature range: - 10° F - 115° F (- 23° C - 46° C)
- Relative humidity: 0 - 100%

Requirements Traceability Matrix

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.		x								
ELD-FUNC-4.1		x								
ELD-FUNC-4.1.1		x								
ELD-FUNC-4.1.1-1	An ELD must support a user account structure that separates drivers and motor carrier's support personnel (i.e. non-drivers).		x							
ELD-FUNC-4.1.2		x								
ELD-FUNC-4.1.2-1	Each user of the ELD must have a valid active account on the ELD with a unique identifier assigned by the motor carrier.		x							
ELD-FUNC-4.1.2-2	Each driver account must require the entry of the driver's license number and the State or jurisdiction that issued the driver's license into the ELD during the account creation process.		x							
ELD-FUNC-4.1.2-3	The driver account must securely store the driver's license number and the State or jurisdiction on the ELD		x							
ELD-FUNC-4.1.2-4	An ELD must not allow creation of more than one driver account associated with a driver's license for a given motor carrier.		x							
ELD-FUNC-4.1.2-5	A driver account must not have administrative rights to create new accounts on the ELD.		x							
ELD-FUNC-4.1.2-6	A support personnel account must not allow recording of ELD data for its account holder.		x							
ELD-FUNC-4.1.2-7	An ELD must reserve a unique driver account for recording events during non-authenticated operation of a CMV.		x							

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.1.3		x								
ELD-FUNC-4.1.3-1	An ELD must provide secure access to data recorded and stored on the system by requiring user authentication during system login.		x							
ELD-FUNC-4.1.3-2	Driver accounts must only have access to data associated with that driver, protecting the authenticity and confidentiality of the collected information.		x							
ELD-FUNC-4.1.4		x								
ELD-FUNC-4.1.4-1	An ELD must be capable of separately recording and retaining ELD data for each individual driver using the ELD.		x							
ELD-FUNC-4.1.4-2	An ELD must provide for and require concurrent authentication for team drivers.		x							
ELD-FUNC-4.1.4-3	If more than one ELD unit is used to record a driver's electronic records within a motor carrier's operation, the ELD in the vehicle the driver is operating most recently must be able to produce a complete ELD report for that driver		x							
ELD-FUNC-4.1.4-4	The complete ELD report for that driver must consist of the current 24-hour period and the previous 7 consecutive days.		x							
ELD-FUNC-4.1.5		x								
ELD-FUNC-4.1.5-1	An ELD must associate all non-authenticated operation of a CMV with a single ELD account labeled unidentified driver.		x							
ELD-FUNC-4.1.5-2	If a driver does not log onto the ELD, as soon as the vehicle is in motion, the ELD must provide a visual or visual and audible warning reminding the driver to stop and login to the ELD		x							

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.1.5-3	If a driver does not log onto the ELD, as soon as the vehicle is in motion, the ELD must record accumulated driving and on-duty, not-driving, time in accordance with the ELD defaults described in section 4.4.1 under the unidentified driver profile		x							
ELD-FUNC-4.1.5-4	If a driver does not log onto the ELD, as soon as the vehicle is in motion, the ELD must not allow entry of any information into the ELD other than a response to the login prompt		x							
ELD-FUNC-4.2		x								
ELD-FUNC-4.2-1	An ELD must be integrally synchronized with the engine of the CMV. (See 4.2 for more details)			x						
ELD-FUNC-4.3		x								
ELD-FUNC-4.3.1		x								
ELD-FUNC-4.3.1.1		x								
ELD-FUNC-4.3.1.1-1	An ELD must be powered and become fully functional within 1 minute of the vehicle's engine receiving power and must remain powered for as long as the vehicle's engine stays powered.			x	x					
ELD-FUNC-4.3.1.2		x								
ELD-FUNC-4.3.1.2-1	An ELD must automatically determine whether a CMV is in motion or stopped by comparing the vehicle speed information with respect to a set speed threshold. (See 4.3.1.2 for more details)			x	x					
ELD-FUNC-4.3.1.2-2	If an ELD is required to have a link to the vehicle's engine ECM, vehicle speed information must be acquired from the engine ECM. Otherwise, vehicle speed information must be acquired using an independent source. (See 4.3.1.2 for more details)			x	x					

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.3.1.3		x								
ELD-FUNC-4.3.1.3-1	An ELD must monitor vehicle miles as accumulated by a CMV over the course of an ignition power on cycle (accumulated vehicle miles) and over the course of CMV's operation (total vehicle miles). Vehicle miles information must use or must be converted to units of whole miles.			x	x			x		
ELD-FUNC-4.3.1.4										
ELD-FUNC-4.3.1.4-1	An ELD must monitor engine hours of the CMV over the course of an ignition power on cycle (elapsed engine hours) and over the course of the CMV's operation total engine hours. Engine hours must use or must be converted to hours in intervals of a tenth of an hour.			x	x			x		
ELD-FUNC-4.3.1.5		x								
ELD-FUNC-4.3.1.5-1	The ELD must obtain and record the date and time information automatically without allowing any external input or interference from a motor carrier, driver, or any other person.				x		x			
ELD-FUNC-4.3.1.5-2	The ELD time must be synchronized to Coordinated Universal Time (UTC) and the absolute deviation from UTC must not exceed 10 minutes at any point in time.				x					
ELD-FUNC-4.3.1.6		x								
ELD-FUNC-4.3.1.6-1	An ELD must have the capability to automatically determine the position of the CMV in standard latitude/longitude coordinates with the accuracy and availability requirements of this section.				x					

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.3.1.6-2	ELD must obtain and record this information without allowing any external input or interference from a motor carrier, driver, or any other person.				x		x			
ELD-FUNC-4.3.1.6-3	CMV position measurement must be accurate to ±0.5 mile of absolute position of the CMV when an ELD measures a valid latitude/longitude coordinate value.				x					
ELD-FUNC-4.3.1.6-4	Position information must be obtained in or converted into standard signed latitude and longitude values and must be expressed as decimal degrees to hundreds of a degree precision (i.e., a decimal point and two decimal places).				x					
ELD-FUNC-4.3.1.6-5	Measurement accuracy combined with the reporting precision requirement implies that position reporting accuracy will be in the order of ±1mile of absolute position of the CMV during the course of a CMV's commercial operation.				x					
ELD-FUNC-4.3.1.6-6	During periods of a driver's indication of personal use of the CMV, measurement reporting precision requirement is further reduced to be expressed as decimal degrees to tenths of a degree (i.e. a decimal point and single decimal place) as further specified in section 4.7.3.		x		x					
ELD-FUNC-4.3.1.6-7	An ELD must be able to acquire a valid position measurement at least once every 5 miles of driving; however, CMV location information is only recorded during ELD events as specified in section 4.5.1			x	x					
ELD-FUNC-4.3.1.7		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.3.1.7-1	The vehicle identification number (VIN) for the power unit of a CMV must be automatically obtained from the engine ECM and recorded if it is available on the vehicle data bus.			x	x					
ELD-FUNC-4.3.2		x								
ELD-FUNC-4.3.2-1	An ELD must prompt the driver to input information into the ELD only when the CMV is stationary and driver's duty status is not on-duty driving, except for the condition specified in section 4.4.1.2.			x	x					
ELD-FUNC-4.3.2-2	If the driver's duty status is driving, an ELD must only allow the driver who is operating the CMV to change the driver's duty status to another duty status.			x	x					
ELD-FUNC-4.3.2-3	A stopped vehicle must maintain zero (0) miles per hour speed to be considered stationary for purposes of information entry into an ELD.			x	x					
ELD-FUNC-4.3.2-4	An ELD must allow an authenticated co-driver who is not driving, but who has logged into the ELD prior to the vehicle being in motion to make entries over his or her own records when the vehicle is in motion.			x	x					
ELD-FUNC-4.3.2-5	The ELD must not allow co-drivers to switch driving roles when the vehicle is in motion.			x	x					
ELD-FUNC-4.3.2.1		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.3.2.1-1	An ELD must provide a means for a driver to manually enter information pertaining to driver's ELD records such as CMV power unit number, as specified in section 7.4 of this appendix; trailer number(s), as specified in section 7.42; and shipping document number, as specified in section 7.39.				x					
ELD-FUNC-4.3.2.1-2	If the motor carrier populates these fields automatically, the ELD must provide means for the driver to review such information and make corrections as necessary.				x					
ELD-FUNC-4.3.2.2		x								
ELD-FUNC-4.3.2.2.1		x								
ELD-FUNC-4.3.2.2.1-1	An ELD must provide a means for the authenticated driver to select a driver's duty status.				x					
ELD-FUNC-4.3.2.2.1-2	The ELD must use the ELD duty status categories listed in Table 1. (See Table 1 in 4.3.2.2.1 for details)				x					
ELD-FUNC-4.3.2.2.2		x								
ELD-FUNC-4.3.2.2.2-1	An ELD must provide means for a driver to indicate the beginning and end of a period when the driver may use the CMV for authorized personal use, or for performing yard moves.				x					
ELD-FUNC-4.3.2.2.2-2	The ELD must acquire this status (authorized personal use) in a standard format from the category list in Table 2. (See Table 2 in 4.3.2.2.2 for details)				x					
ELD-FUNC-4.3.2.2.2-3	An ELD must allow a driver to only select categories that a motor carrier enables by configuration for that driver, as described in section 4.3.3.1.1.				x					

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.3.2.2.2-4	An ELD must only allow one category to be selected at any given time and use the latest selection by the driver.				x					
ELD-FUNC-4.3.2.2.2-5	The ELD must prompt the driver to enter an annotation upon selection of a category from Table 2 and record driver's entry.				x					
ELD-FUNC-4.3.2.2.2-6	A driver's indication of special driving situation must reset to none if the ELD or CMV's engine goes through a power off cycle (ELD or CMV's engine turns off and then on)			x	x					
ELD-FUNC-4.3.2.2.2-7	The driver's indication will reset to none except if the driver has indicated authorized personal use of CMV, in which case, the ELD must require confirmation of continuation of the authorized personal use of CMV condition by the driver.			x	x					
ELD-FUNC-4.3.2.2.2-8	If the driver's indication is not confirmed by the driver and the vehicle is in motion, the ELD must default to none.			x	x					
ELD-FUNC-4.3.2.3		x								
ELD-FUNC-4.3.2.3-1	An ELD must include a function whereby a driver can certify the driver's records at the end of a 24-hour period. This function, when selected, must display a statement that reads "I hereby certify that my data entries and my record of duty status for this 24-hour period are true and correct." Driver must be prompted to select "Agree" or "Not ready." Driver's affirmative selection of "Agree" must be recorded as an event.		x		x					
ELD-FUNC-4.3.2.3-2	An ELD must only allow the authenticated driver to certify records associated with that driver.		x		x					

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.3.2.3-3	If any edits are necessary after the driver certifies the records for a given 24-hour period, the ELD must require and prompt the driver to re-certify the updated records.		x		x					
ELD-FUNC-4.3.2.3-4	If there are any past records on the ELD (excluding the current 24-hour period) that requires certification or re-certification by the driver, the ELD must indicate the required driver action on the ELD's display and prompt the driver to take the necessary action during the login and logout processes.		x		x					
ELD-FUNC-4.3.2.4		x								
ELD-FUNC-4.3.2.4-1	An ELD must provide a standardized single-step driver interface for compilation of driver's ELD records and initiation of the data transfer to authorized safety officials when requested during a roadside inspection.				x					x
ELD-FUNC-4.3.2.4-2	The ELD must input the data transfer request from the driver, require confirmation, present and request selection of the supported data transfer options by the ELD, and prompt for entry of the output file comment as specified in section 4.3.2.5.				x	x			x	x
ELD-FUNC-4.3.2.4-3	Upon confirmation of the output file request, the ELD must generate the compliant output file and perform the data transfer.				x	x			x	x
ELD-FUNC-4.3.2.4-4	The supported single-step data transfer initiation mechanism (such as a switch or an icon on a touch-screen display) must be clearly marked and visible to the driver when the vehicle is stopped.			x	x					x

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.3.2.5		x								
ELD-FUNC-4.3.2.5-1	An ELD must accommodate the entry of an output file comment up to 60 characters long.				x					
ELD-FUNC-4.3.2.5-2	If an authorized safety official provides a key phrase or code during an inspection to be included in the output file comment, it must be entered and embedded into the electronic ELD records in the exchanged dataset as specified in section 4.8.2.1.1.				x					
ELD-FUNC-4.3.2.5-3	The default value for the output file comment must be blank.				x					
ELD-FUNC-4.3.2.5-4	This output file comment must be used only for the creation of the related data files for the intended time, place, and ELD user.				x					
ELD-FUNC-4.3.2.6		x								
ELD-FUNC-4.3.2.6-1	An ELD must allow for a driver to add annotations in text format to recorded, entered, or edited ELD events.				x					
ELD-FUNC-4.3.2.6-2	The ELD must require annotations to be 4 characters or longer, including embedded spaces if driver annotation is required and driver is prompted by the ELD.				x					
ELD-FUNC-4.3.2.7		x								
ELD-FUNC-4.3.2.7-1	An ELD must allow manual entry of a CMV's location by the driver in text format in support of the driver edit requirements described in section 4.3.2.8.				x					
ELD-FUNC-4.3.2.7-2	Driver's manual location entry must be available as an option to a driver only when prompted by the ELD under allowed conditions as described in section 4.6.1.4.				x					

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.3.2.7-3	A manual location entry must show “M” in the latitude/longitude coordinates fields in ELD records.				x					
ELD-FUNC-4.3.2.8		x								
ELD-FUNC-4.3.2.8-1	An ELD must provide a mechanism for a driver to review, edit, and annotate the driver’s ELD records when a notation of errors or omissions is necessary or enter the driver’s missing ELD records subject to the requirements specified in this section.				x					
ELD-FUNC-4.3.2.8-2	An ELD must not permit alteration or erasure of the original information collected concerning the driver’s ELD records or alteration of the source data streams used to provide that information.				x					
ELD-FUNC-4.3.2.8.1		x								
ELD-FUNC-4.3.2.8.1-1	If a driver edits or annotates an ELD record or enters missing information the act must not overwrite the original record.				x					
ELD-FUNC-4.3.2.8.1-2	The ELD must use the process outlined in section 4.4.4.2 to configure required event attributes to track the edit history of records.				x					
ELD-FUNC-4.3.2.8.1-3	Driver edits must be accompanied by an annotation. The ELD must prompt the driver to annotate edits.				x					
ELD-FUNC-4.3.2.8.2		x								
ELD-FUNC-4.3.2.8.2-1	An ELD must not allow or require the editing or manual entry of records with the following event types, as described in section 7.1.24 (See 4.3.2.8.2 for details)				x					

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.3.2.8.2-2	An ELD must not allow automatically recorded driving time to be shortened.				x					
ELD-FUNC-4.3.2.8.2-3	An ELD must not allow the ELD username associated with an ELD record to be edited or reassigned, except under the following circumstances (See 4.3.2.8.2 for details)				x					
ELD-FUNC-4.3.3		x								
ELD-FUNC-4.3.3-1	An ELD must restrict availability of motor carrier entries outlined in this subsection only to authenticated “support personnel” account holders.	x								
ELD-FUNC-4.3.3.1		x								
ELD-FUNC-4.3.3.1-1	If an ELD or a technology that includes an ELD function offers configuration options to the motor carrier or the driver that are not otherwise addressed or prohibited in this appendix, the configuration options must not affect the ELD’s compliance with the requirements of this rule for each configuration setting of the ELD.	x								
ELD-FUNC-4.3.3.1.1		x								
ELD-FUNC-4.3.3.1.1-1	An ELD must allow a motor carrier to unilaterally configure the availability of each of the three categories listed on Table 2 that the motor carrier chooses to authorize for each of its drivers.				x					
ELD-FUNC-4.3.3.1.1-2	By default, none of these categories listed on Table 2 must be available to a new driver account without the motor carrier proactively configuring their availability.				x					

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.3.3.1.1-3	A motor carrier may change the configuration for the availability of each category for each of its drivers.				x					
ELD-FUNC-4.3.3.1.1-4	Changes to the configuration setting must be recorded on the ELD and communicated to the applicable authenticated driver during the ELD login process.				x					
ELD-FUNC-4.3.3.1.2		x								
ELD-FUNC-4.3.3.1.2-1	An ELD must provide the motor carrier an ability to configure a driver account exempt from use of an ELD.		x		x					
ELD-FUNC-4.3.3.1.2-2	The ELD must default the setting of this configuration option for each new driver account created on an ELD to no exemption.		x		x					
ELD-FUNC-4.3.3.1.2-3	An exemption for the new driver account must be proactively configured for an applicable driver account by the motor carrier.		x		x					
ELD-FUNC-4.3.3.1.2-4	The ELD must prompt the motor carrier to annotate the record and provide an explanation for the configuration of exemption.				x					
ELD-FUNC-4.3.3.1.2-5	If a motor carrier configures a driver account to be exempt, the ELD must present the configured indication that is in effect for that driver during the ELD login and logout processes.		x		x					

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.3.3.1.2-6	If a motor carrier configures a driver account as exempt the ELD must continue to record ELD driving time but suspend detection of missing data elements data diagnostic event for the driver described in section 4.6.1.5 and data transfer compliance monitoring function described in section 4.6.1.7 when such driver is authenticated on the ELD.		x		x					
ELD-FUNC-4.3.3.1.3		x								
ELD-FUNC-4.3.3.1.3-1	An ELD may allow the motor carrier (via a monitoring algorithm or support personnel) to screen edits to the driver's certified (as described in section 4.3.2.3)				x					
ELD-FUNC-4.3.3.1.3-2	An ELD may allow the motor carrier (via a monitoring algorithm or support personnel) to review corrective edits to the driver's certified (as described in section 4.3.2.3)				x					
ELD-FUNC-4.3.3.1.3-3	An ELD may allow the motor carrier (via a monitoring algorithm or support personnel) to request corrective edits to the driver's certified (as described in section 4.3.2.3)				x					
ELD-FUNC-4.3.3.1.3-4	An ELD may allow the motor carrier to submit records through the ELD system electronically.				x					
ELD-FUNC-4.3.3.1.3-5	If submitting records through the ELD system electronically is implemented by the ELD, the ELD must also support functions for the driver to see and review the requested edits.				x					
ELD-FUNC-4.3.3.1.3-6	Edits requested by anyone or any system other than the driver must require the driver's electronic confirmation or rejection.				x					
ELD-FUNC-4.4		x								
ELD-FUNC-4.4.1		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.4.1.1		x								
ELD-FUNC-4.4.1.1-1	An ELD must automatically record driving time when the vehicle is in motion by setting duty status to driving for the driver			x		x				
ELD-FUNC-4.4.1.1-2	If the driver sets the duty status to off-duty and indicates personal use of CMV, in which case duty status must remain off-duty until driver's indication of the driving condition ends or sets the duty status to on-duty not driving and indicates yard moves			x		x				
ELD-FUNC-4.4.1.1-3	If the duty status is set to on-duty not driving and indicates yard moves, the duty status must remain on-duty not driving until driver's indication of the driving condition ends.			x		x				
ELD-FUNC-4.4.1.2		x								
ELD-FUNC-4.4.1.2-1	When the duty status is set to driving, and the CMV has not been in-motion for 5 consecutive minutes, the ELD must prompt the driver to confirm continued driving status or enter the proper duty status.			x		x				
ELD-FUNC-4.4.1.2-2	If the driver does not respond to the ELD prompt within 1-minute after receiving the prompt, the ELD must automatically switch the duty status to on-duty not driving. The time thresholds for purposes of this section must not be configurable.					x				
ELD-FUNC-4.4.1.3		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.4.1.3-1	An ELD must not feature any other automatic records of duty setting mechanism than those described in sections 4.4.1.1 and 4.4.1.2.	x								
ELD-FUNC-4.4.1.3-2	Duty status changes that are not initiated by the driver, including duty status alteration recommendations by motor carrier support personnel or a software algorithm, are subject to motor carrier edit requirements in section 4.3.3.1.2.	x								
ELD-FUNC-4.4.2		x								
ELD-FUNC-4.4.2-1	For each change in duty status, the ELD must convert automatically captured vehicle position in latitude/longitude coordinates into geo-location information, indicating approximate distance and direction to an identifiable location corresponding to the name of a nearby city, town, or village, with a State abbreviation.			x		x				
ELD-FUNC-4.4.2-2	Geo-location information must be derived from a database that contains all cities, towns, and villages with a population of 5,000 or greater and listed in ANSI INCITS 446-2008 (incorporated by reference, see § 395.38), reference (3)(a) in section 6 of this appendix.	x								
ELD-FUNC-4.4.2-3	An ELD's viewable outputs (such as printouts or displays) must feature geo-location information as place names in text format.					x			x	
ELD-FUNC-4.4.3		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.4.3-1	An ELD must have the capability to convert and track date and time captured in UTC standard to the time standard in effect at driver's home terminal, taking the daylight savings time changes into account by using the parameter "Time Zone Offset from UTC" as specified in section 7.41.					x				
ELD-FUNC-4.4.3-2	An ELD must record the driver's record of duty status using the time standard in effect at the driver's home terminal for a 24-hour period beginning with the time specified by the motor carrier for that driver's home terminal.					x				
ELD-FUNC-4.4.3-3	The data element "Time Zone Offset from UTC" must be included in the "Driver's certification of Own Records" events as specified in section 4.5.1.4.					x				
ELD-FUNC-4.4.4		x								
ELD-FUNC-4.4.4-1	This section describes the security measures for configuring and tracking event attributes for ELD records, edits, and entries in a standardized manner.	x								
ELD-FUNC-4.4.4.1		x								
ELD-FUNC-4.4.4.1-1	Each ELD event must feature an event sequence ID number.	x								
ELD-FUNC-4.4.4.1-2	The event sequence ID number for each ELD must use continuous numbering across all users of that ELD.					x	x			
ELD-FUNC-4.4.4.1-3	The event sequence ID number for each ELD must use continuous numbering across all engines.					x				
ELD-FUNC-4.4.4.1-4	The event sequence ID number for each ELD must use continuous numbering across all ELD power on and off cycles.					x	x			

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.4.4.1-5	An ELD must use the next available event sequence ID number (incremented by one) each time a new event log is recorded.					x	x			
ELD-FUNC-4.4.4.1-6	Event sequence ID number must track at least the last 65,536 unique events recorded on the ELD.					x	x			
ELD-FUNC-4.4.4.1-7	The continuous event sequence ID numbering structure used by the ELD must be mapped into a continuous hexadecimal number between 0000 (Decimal 0) and FFFF (Decimal 65535).					x	x			
ELD-FUNC-4.4.4.2		x								
ELD-FUNC-4.4.4.2-1	An ELD must retain the original records even when allowed edits and entries are made over a driver's ELD records.					x	x			
ELD-FUNC-4.4.4.2-2	An ELD must keep track of all event record history, and the process used by the ELD must produce the event record status for the ELD records in the standard categories specified in sections 7.23, 7.22 and 7.25					x	x			
ELD-FUNC-4.4.4.2-3	An ELD must keep track of all event record history, and the process used by the ELD must produce the event record origin for the ELD records in the standard categories specified in sections 7.23, 7.22 and 7.25					x	x			
ELD-FUNC-4.4.4.2-4	An ELD must keep track of all event record history, and the process used by the ELD must produce the event type for the ELD records in the standard categories specified in sections 7.23, 7.22 and 7.25					x	x			
ELD-FUNC-4.4.4.2.1		x								
ELD-FUNC-4.4.4.2.1-1	At the instance an ELD creates a record automatically, the ELD must set the "Event Record Status" to "1" (active)					x				

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.4.4.2.1-2	At the instance an ELD creates a record automatically, the ELD must set the “Event Record Origin” to “1” (automatically recorded by ELD)					x				
ELD-FUNC-4.4.4.2.2										
ELD-FUNC-4.4.4.2.2-1	At the instance of a driver editing existing record(s), the ELD must identify the ELD record(s) being modified for which the “Event Record Status” is currently set to “1” (active)					x				
ELD-FUNC-4.4.4.2.2-2	At the instance of a driver editing existing record(s), the ELD must acquire driver input for the intended edit.					x				
ELD-FUNC-4.4.4.2.2-3	At the instance of a driver editing existing record(s), the ELD must construct the ELD record(s) that will replace the record(s) identified in (1) above.					x				
ELD-FUNC-4.4.4.2.2-4	At the instance of a driver editing existing record(s), the ELD must set the “Event Record Status” of the ELD record(s) identified in (1) above, which is being modified, to “2” (inactive-changed)					x				
ELD-FUNC-4.4.4.2.2-5	At the instance of a driver editing existing record(s), the ELD must set the “Event Record Status” of the ELD record(s) constructed in (2) above to “1” (active)					x				
ELD-FUNC-4.4.4.2.2-6	At the instance of a driver editing existing record(s), the ELD must set the “Event Record Origin” of the ELD record(s) constructed in (2) above to “2” (edited or entered by the driver)					x				
ELD-FUNC-4.4.4.2.3		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.4.4.2.3-1	When a driver enters missing record(s), the ELD must acquire driver input for the missing entries being implemented.					x				
ELD-FUNC-4.4.4.2.3-2	When a driver enters missing record(s), the ELD must construct the new ELD record(s) that will represent the driver entries.					x				
ELD-FUNC-4.4.4.2.3-3	When a driver enters missing record(s), the ELD must set the "event record status" of the ELD record(s) constructed in (1) above to "1" (active)					x				
ELD-FUNC-4.4.4.2.3-4	When a driver enters missing record(s), the ELD must set the "event record origin" of the ELD record(s) constructed in (1) above to "2" (edited or entered by the driver)					x				
ELD-FUNC-4.4.4.2.4		x								
ELD-FUNC-4.4.4.2.4-1	When a driver reviews ELD record(s) logged under the unidentified driver profile, the ELD must identify the ELD record(s) logged under the unidentified driver profile that will be reassigned to the driver					x				
ELD-FUNC-4.4.4.2.4-2	When a driver reviews and assumes ELD record(s) logged under the unidentified driver profile, the ELD must use elements of the unidentified driver log(s) from (1) above and acquire driver input to populate missing elements of the log originally recorded under the unidentified driver profile					x				
ELD-FUNC-4.4.4.2.4-3	When a driver reviews and assumes ELD record(s) logged under the unidentified driver profile, the ELD must construct the new event record(s) for the driver					x				

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.4.4.2.4-4	When a driver reviews and assumes ELD record(s) logged under the unidentified driver profile, the ELD must set the event record status of the ELD record(s) identified in (1) above, which is being modified, to “2” (inactive–changed)					x				
ELD-FUNC-4.4.4.2.4-5	When a driver reviews and assumes ELD record(s) logged under the unidentified driver profile, the ELD must set the event record status of the ELD record(s) constructed in (2) above to “1” (active)					x				
ELD-FUNC-4.4.4.2.4-6	When a driver reviews and assumes ELD record(s) logged under the unidentified driver profile, the ELD must set the event record origin of the ELD record(s) constructed in (2) above to “4” (assumed from unidentified driver profile)					x				
ELD-FUNC-4.4.4.2.5		x								
ELD-FUNC-4.4.4.2.5-1	If a motor carrier requests an edit on a driver’s records electronically, the ELD must identify the ELD record(s) being requested to be modified for which the “event record status” is currently set to “1” (active)					x				
ELD-FUNC-4.4.4.2.5-2	If a motor carrier requests an edit on a driver’s records electronically, the ELD must Acquire motor carrier input for the intended edit.					x				
ELD-FUNC-4.4.4.2.5-3	If a motor carrier requests an edit on a driver’s records electronically, the ELD must construct the ELD record(s) that will replace the record identified in (1) above –if approved by the driver					x				

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.4.4.2.5-4	If a motor carrier requests an edit on a driver's records electronically, the ELD must Set the event record status of the ELD record(s) in (2) above to "3" (inactive–change requested)					x				
ELD-FUNC-4.4.4.2.5-5	If a motor carrier requests an edit on a driver's records electronically, the ELD must Set the event record origin of the ELD record constructed in (2) above to "3" (edit requested by an authenticated user other than the driver)					x				
ELD-FUNC-4.4.4.2.6		x								
ELD-FUNC-4.4.4.2.6-1	If edits are requested by the motor carrier to the driver over a driver's records electronically, the ELD must implement functions for the driver to review the requested edits					x				
ELD-FUNC-4.4.4.2.6-2	If edits are requested by the motor carrier to the driver over a driver's records electronically, the ELD must implement functions for the driver to indicate on the ELD whether the driver confirms or rejects the requested edit(s).					x				
ELD-FUNC-4.4.4.2.6-3	If the driver approves the motor carrier's edit suggestion the ELD must set the event record status of the ELD record(s) to "2" (inactive–changed)					x				
ELD-FUNC-4.4.4.2.6-4	If the driver approves the motor carrier's edit suggestion the ELD must set the "event record status" of the ELD record(s) to "1" (active).					x				
ELD-FUNC-4.4.4.2.6-5	If the driver disapproves the motor carrier's edit(s) suggestion, the ELD must set the "event record status" of the ELD record(s) to "4" (inactive–change rejected).					x				
ELD-FUNC-4.4.5		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.4.5-1	An ELD must support standard security measures that require the calculation and recording of standard data check values for each ELD event recorded, for each line of the output file, and for the entire data file to be generated for transmission to an authorized safety official or the motor carrier.					x				
ELD-FUNC-4.4.5-2	An event data check value must be calculated at the time of the following instances and must accompany that event record thereafter: When an event record is automatically created by the ELD					x				
ELD-FUNC-4.4.5-3	An event data check value must be calculated at the time of the following instances: When an authorized edit is performed by the driver on the ELD					x				
ELD-FUNC-4.4.5-4	An event data check value must be calculated at the time of the following instances and must accompany that event record thereafter: When an electronic edit proposal is created by the motor carrier through the ELD system					x				
ELD-FUNC-4.4.5-5	Each line of the ELD output file must include a line data check value, which must be calculated as specified in section 4.4.5.2.	x								
ELD-FUNC-4.4.5-6	Each ELD report must also include a file data check value, which must be calculated as specified in section 4.4.5.3.	x								
ELD-FUNC-4.4.5.1		x								
ELD-FUNC-4.4.5.1-1	The event data check value must be calculated as follows.	x								
ELD-FUNC-4.4.5.1.1		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.4.5.1.1-1	A checksum calculation includes the summation of numeric values or mappings of a specified group of alphanumeric data elements.	x								
ELD-FUNC-4.4.5.1.1-2	The ELD must calculate an event checksum value associated with each ELD event at the instance of the event record being created.					x				
ELD-FUNC-4.4.5.1.1-3	The event record elements that must be included in the checksum calculation are the following: (See 4.4.5.1.1 for details)					x				
ELD-FUNC-4.4.5.1.1-4	The ELD must sum the numeric values of all individual characters making up the listed data elements using the character to decimal value coding specified in Table 3	x								
ELD-FUNC-4.4.5.1.1-5	The ELD must sum the numeric values of all individual characters making up the listed data elements using the 8-bit lower byte of the hexadecimal representation of the summed total as the event checksum value for that event.	x								
ELD-FUNC-4.4.5.1.2		x								
ELD-FUNC-4.4.5.1.2-1	The event data check value must be the hexadecimal representation of the output 8-bit byte, after the below bitwise operations are performed on the binary representation of the event checksum value (See 4.4.5.1.2 for details)	x								
ELD-FUNC-4.4.5.2		x								
ELD-FUNC-4.4.5.2-1	A line data check value must be calculated at the time of the generation of the ELD output file					x				

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.4.5.2-2	A line data check value must be calculated when transferring data to authorized safety officials					x				
ELD-FUNC-4.4.5.2-3	A line data check value must be calculated when cataloguing drivers' ELD records at a motor carrier's facility.					x				
ELD-FUNC-4.4.5.2.1		x								
ELD-FUNC-4.4.5.2.1-1	The ELD must calculate a line checksum value associated with each line of ELD output file at the instance when an ELD output file is generated.					x			x	
ELD-FUNC-4.4.5.2.1-2	The data elements that must be included in the line checksum calculation vary as per the output data file.	x								
ELD-FUNC-4.4.5.2.1-3	The ELD must convert each character featured in a line of output using the character to decimal value coding specified on Table 3	x								
ELD-FUNC-4.4.5.2.1-4	The ELD must sum the converted numeric values of each character listed on a given ELD output line item (excluding the line data check value being calculated)	x								
ELD-FUNC-4.4.5.2.1-5	The ELD must use the 8-bit lower byte value of the hexadecimal representation of the summed total as the line checksum value for that line of output.	x								
ELD-FUNC-4.4.5.2.2		x								
ELD-FUNC-4.4.5.2.2-1	The line data check value must be calculated by performing the following operations on the binary representation of the line checksum value (See 4.4.5.2.2 for details)	x								
ELD-FUNC-4.4.5.2.3		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.4.5.2.3-1	The calculated line data check value must be appended as the last line item of each of the individual line items of the ELD output file					x			x	
ELD-FUNC-4.4.5.3		x								
ELD-FUNC-4.4.5.3-1	A file data check value must also be calculated at the time of the creation of an ELD output file.					x			x	
ELD-FUNC-4.4.5.3.1		x								
ELD-FUNC-4.4.5.3.1-1	The ELD must calculate a single 16-bit file checksum value associated with an ELD output file at the instance when an ELD output file is generated.	x								
ELD-FUNC-4.4.5.3.1-2	The file data check value calculation must include all individual line data check values contained in that file.	x								
ELD-FUNC-4.4.5.3.1-3	The ELD must sum all individual line data check values contained in a data file output created	x								
ELD-FUNC-4.4.5.3.1-4	The ELD must use the lower two 8-bit byte values of the hexadecimal representation of the summed total as the “file checksum” value.	x								
ELD-FUNC-4.4.5.3.2		x								
ELD-FUNC-4.4.5.3.2-1	The file data check value must be calculated by performing the following operations on the binary representation of the file checksum value (See 4.4.5.3.2 for details)	x								
ELD-FUNC-4.4.5.3.3		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.4.5.3.3-1	The calculated 16-bit file data check value must be converted to hexadecimal 8-bit bytes and must be appended as the last line item of the ELD output file	x								
ELD-FUNC-4.4.5.3.3-2	The calculated 16-bit file data check value must be appended as the last line item of the ELD output file	x								
ELD-FUNC-4.5		x								
ELD-FUNC-4.5.1		x								
ELD-FUNC-4.5.1.1		x								
ELD-FUNC-4.5.1.1-1	When a driver's duty status changes, the ELD must associate the record with the driver						x			
ELD-FUNC-4.5.1.1-2	When a driver's duty status changes, the ELD must associate the record with the record originator (if created during an edit or entry)						x			
ELD-FUNC-4.5.1.1-3	When a driver's duty status changes, the ELD must associate the record with the vehicle						x			
ELD-FUNC-4.5.1.1-4	When a driver's duty status changes, the ELD must associate the record with the motor carrier						x			
ELD-FUNC-4.5.1.1-5	When a driver's duty status changes, the ELD must associate the record with the shipping document number						x			
ELD-FUNC-4.5.1.1-6	When a driver's duty status changes, the ELD must include the following data elements (See 4.5.1.1 for details)						x			
ELD-FUNC-4.5.1.2		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.5.1.2-1	When a CMV is in motion, as described in section 4.3.1.2, and there has not been a duty status change event or another intermediate log event recorded in the previous 1-hour period, the ELD must record a new intermediate log event.			x			x			
ELD-FUNC-4.5.1.2-2	The ELD must associate the record to the driver.						x			
ELD-FUNC-4.5.1.2-3	The ELD must associate the record with the vehicle						x			
ELD-FUNC-4.5.1.2-4	The ELD must associate the record with the motor carrier						x			
ELD-FUNC-4.5.1.2-5	The ELD must associate the record with the shipping document number						x			
ELD-FUNC-4.5.1.2-6	The ELD must include the following data elements outlined in 4.5.1.1.						x			
ELD-FUNC-4.5.1.3		x								
ELD-FUNC-4.5.1.3-1	At each instance when the status of a driver's indication of personal use of CMV or yard moves changes, the ELD must record a new event.						x			
ELD-FUNC-4.5.1.3-2	The ELD must associate the record to the driver.						x			
ELD-FUNC-4.5.1.3-3	The ELD must associate the record with the vehicle						x			
ELD-FUNC-4.5.1.3-4	The ELD must associate the record with the motor carrier						x			
ELD-FUNC-4.5.1.3-5	The ELD must associate the record with the shipping document number						x			
ELD-FUNC-4.5.1.3-6	The ELD must include the following data elements outlined in 4.5.1.1						x			
ELD-FUNC-4.5.1.4		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.5.1.4-1	At each instance when a driver certifies or re-certifies that driver's records for a given 24-hour period are true and correct, the ELD must record the event.						x			
ELD-FUNC-4.5.1.4-2	The ELD must associate the record to the driver.						x			
ELD-FUNC-4.5.1.4-3	The ELD must associate the record with the vehicle						x			
ELD-FUNC-4.5.1.4-4	The ELD must associate the record with the motor carrier						x			
ELD-FUNC-4.5.1.4-5	The ELD must associate the record with the shipping document number						x			
ELD-FUNC-4.5.1.4-6	The ELD must include the following data elements (see 4.5.1.4 for details)						x			
ELD-FUNC-4.5.1.5		x								
ELD-FUNC-4.5.1.5-1	At each instance when an authorized user logs in and out of the ELD, the ELD must record the event.						x			
ELD-FUNC-4.5.1.5-2	The ELD must associate the record to the driver.						x			
ELD-FUNC-4.5.1.4-3	The ELD must associate the record with the vehicle						x			
ELD-FUNC-4.5.1.5-4	The ELD must associate the record with the motor carrier						x			
ELD-FUNC-4.5.1.5-5	The ELD must associate the record with the shipping document number						x			
ELD-FUNC-4.5.1.5-6	The ELD must include the following data elements (see 4.5.1.5 for details)						x			
ELD-FUNC-4.5.1.6		x								
ELD-FUNC-4.5.1.6-1	When a CMV's engine is powered up or shut down, an ELD must record the event within 1 minute of occurrence.			x			x			

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.5.1.6-2	When a CMV's engine is powered up or shut down, an ELD must retain the earliest shut down event if CMV has not moved since the last ignition power on cycle.			x			x			
ELD-FUNC-4.5.1.6-3	When a CMV's engine is powered up or shut down, an ELD must retain the latest power-up event if CMV has not moved since the last ignition power on cycle.									
ELD-FUNC-4.5.1.6-4	The ELD must associate the record to the driver or the unidentified driver profile			x			x			
ELD-FUNC-4.5.1.6-5	The ELD must associate the record with the vehicle			x			x			
ELD-FUNC-4.5.1.6-6	The ELD must associate the record with the motor carrier			x			x			
ELD-FUNC-4.5.1.6-7	The ELD must associate the record with the shipping document number			x			x			
ELD-FUNC-4.5.1.6-8	The ELD must include the following data elements (see 4.5.1.6 for details)			x			x			
ELD-FUNC-4.5.1.7		x								
ELD-FUNC-4.5.1.7-1	At each instance when an ELD malfunction is detected by the ELD, the ELD must record the event.						x			
ELD-FUNC-4.5.1.7-2	At each instance when an ELD malfunction is cleared by the ELD, the ELD must record the event.									
ELD-FUNC-4.5.1.7-3	At each instance when an ELD data diagnostic event is detected by the ELD, the ELD must record the event.									
ELD-FUNC-4.5.1.7-4	At each instance when an ELD data diagnostic event is cleared by the ELD, the ELD must record the event.									
ELD-FUNC-4.5.1.7-5	The ELD must associate the record to the driver.						x			
ELD-FUNC-4.5.1.7-6	The ELD must associate the record with the vehicle						x			

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.5.1.7-7	The ELD must associate the record with the motor carrier						x			
ELD-FUNC-4.5.1.7-8	The ELD must associate the record with the shipping document number						x			
ELD-FUNC-4.5.1.7-9	The ELD must include the following data elements (see 4.5.1.7 for details)						x			
ELD-FUNC-4.6		x								
ELD-FUNC-4.6-1	An ELD must have the capability to monitor its compliance with the technical requirements of this section for detectable malfunctions listed in Table 4 of Appendix B and must keep records of its malfunction. (See Appendix B, section 4.6 for details).							x		
ELD-FUNC-4.6-2	An ELD must have the capability to monitor its compliance with the technical requirements of this section for data inconsistencies listed in Table 4 of Appendix B and must keep records of its data diagnostic event detection. (See Appendix B, section 4.6 for details).							x		
ELD-FUNC-4.6.1		x								
ELD-FUNC-4.6.1.1		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.6.1.1-1	An ELD must monitor data it receives from the engine ECM or alternative sources as allowed in sections 4.3.1.1- 4.3.1.4, its onboard sensors, and data record history to identify instances when it may not have complied with the power requirements specified in section 4.3.1.1, in which case, the ELD must record a power data diagnostics event for the corresponding driver(s), or under the unidentified diver profile if no drivers were authenticated at the time of detection.			x			x	x		x
ELD-FUNC-4.6.1.1-2	An ELD must set a power compliance malfunction if the power data diagnostics event described above indicate an aggregated in-motion driving time understatement of 30 minutes or more on the ELD over a 24-hour period across all driver profiles, including the unidentified driver profile.			x				x		
ELD-FUNC-4.6.1.2										
ELD-FUNC-4.6.1.2-1	An ELD must monitor the data it receives from the engine ECM or alternative sources as allowed in sections 4.3.1.1-4.3.1.4			x				x		x
ELD-FUNC-4.6.1.2-2	An ELD must monitor the data it receives from its onboard sensors to identify instances of its non-compliance with the ELD engine synchronization requirement specified in section 4.2.					x		x		
ELD-FUNC-4.6.1.2-3	An ELD must monitor the data it receives from its onboard data record history to identify instances of its non-compliance with the ELD engine synchronization requirement specified in section 4.2.					x		x		

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.6.1.2-4	An ELD must monitor the data it receives from its onboard sensors to identify durations of its non-compliance with the ELD engine synchronization requirement specified in section 4.2.					x		x		
ELD-FUNC-4.6.1.2-5	An ELD must monitor the data it receives from its data record history to identify durations of its non-compliance with the ELD engine synchronization requirement specified in section 4.2.					x		x		
ELD-FUNC-4.6.1.2-6	An ELD required to establish a link to the engine ECM as described in section 4.2 must monitor its connectivity to the engine ECM			x				x		x
ELD-FUNC-4.6.1.2-7	An ELD required to establish a link to the engine ECM as described in section 4.2 must record an engine-synchronization data diagnostics event when it no longer can acquire updated values for the ELD parameters required for records within 5 seconds of the need.			x				x		
ELD-FUNC-4.6.1.2-8	An ELD must set an engine synchronization compliance malfunction if connectivity to any of the required data sources specified in section 4.3.1 is lost for more than 30 minutes during a 24-hour period aggregated across all driver profiles, including the unidentified driver profile.			x				x		
ELD-FUNC-4.6.1.3		x								
ELD-FUNC-4.6.1.3-1	The ELD must periodically cross-check its compliance with the requirement specified in section 4.3.1.5 with respect to an accurate external UTC source						x	x		

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.6.1.3-2	The ELD must record a timing compliance malfunction when it can no longer meet the underlying compliance requirement.						x	x		
ELD-FUNC-4.6.1.4		x								
ELD-FUNC-4.6.1.4-1	An ELD must continually monitor the availability of valid position measurements meeting the listed accuracy requirements in section 4.3.1.6	x								
ELD-FUNC-4.6.1.4-2	An ELD must track the distance and elapsed time from the last valid measurement point.	x								
ELD-FUNC-4.6.1.4-3	ELD records requiring location information must use the last valid position measurement and include the latitude/longitude coordinates and distance traveled, in miles, since the last valid position measurement.						x	x		
ELD-FUNC-4.6.1.4-4	An ELD must monitor elapsed time during periods when the ELD fails to acquire a valid position measurement within the past 5 miles of CMV's movement.						x	x		
ELD-FUNC-4.6.1.4-5	When such elapsed time exceeds a cumulative 60 minutes over a 24 hour period, the ELD must set and record a positioning compliance malfunction.						x	x		
ELD-FUNC-4.6.1.4-6	If a new ELD event must be recorded at an instance when ELD had failed to acquire a valid position measurement within the most recent elapsed 5 miles of driving, but the ELD has not yet set a positioning compliance malfunction, the ELD must record the character "X" in both the latitude and longitude fields					x	x	x		

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.6.1.4-7	If the location is entered manually by the driver, it must log the character “M” instead. Under the circumstances listed in this paragraph, if the ELD event is due to a change in duty status for the driver, the ELD must prompt the driver to enter location manually in accordance with section 4.3.2.7.					x	x	x		
ELD-FUNC-4.6.1.4-8	If the location information is not entered by the driver and the vehicle is in motion, the ELD must record a missing required data elements data diagnostic event for the driver.					x	x	x		
ELD-FUNC-4.6.1.4-9	If a new ELD event must be recorded at an instance when the ELD has set a positioning compliance malfunction, the ELD must record the character “E” in both the latitude and longitude fields regardless of whether the driver is prompted and manually enters location information.					x	x	x		
ELD-FUNC-4.6.1.5		x								
ELD-FUNC-4.6.1.5-1	An ELD must monitor its storage capacity and integrity						x	x		
ELD-FUNC-4.6.1.5-2	An ELD must detect a data recording compliance malfunction if it can no longer record or retain required events or retrieve recorded logs that are not otherwise catalogued remotely by the motor carrier.						x	x		
ELD-FUNC-4.6.1.5-3	An ELD must monitor the completeness of the ELD event record information in relation to the required data elements for each event type						x	x		
ELD-FUNC-4.6.1.5-4	An ELD must record a missing data elements data diagnostics event for the driver if any required field is missing at the time of recording.						x	x		

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.6.1.6		x								
ELD-FUNC-4.6.1.6-1	When there are ELD records involving driving time logged on an ELD under the unidentified driver profile, the ELD must prompt the driver(s) logging into that ELD with a warning indicating the existence of new unassigned driving time.							x		
ELD-FUNC-4.6.1.6-2	The ELD must provide a mechanism for the driver to review and either acknowledge the assignment of one or more of the unidentified driver records attributable to the driver under the authenticated driver's profile as described in section 4.3.2.8.2(1) or indicate that these records are not attributable to the driver.					x		x		
ELD-FUNC-4.6.1.6-3	If more than 30 minutes of driving in a 24-hour period show an unidentified driver on the ELD, the ELD must detect an unidentified driving records data diagnostic event						x	x		
ELD-FUNC-4.6.1.6-4	If more than 30 minutes of driving in a 24-hour period show an unidentified driver on the ELD, the ELD must record an unidentified driving records data diagnostic event						x			
ELD-FUNC-4.6.1.6-5	If more than 30 minutes of driving in a 24-hour period show an unidentified driver on the ELD, the data diagnostic indicator must be turned on for all drivers logged in to that ELD for the current 24-hour period							x		
ELD-FUNC-4.6.1.6-6	If more than 30 minutes of driving in a 24-hour period show an unidentified driver on the ELD, the data diagnostic indicator must be turned on for all drivers logged in to that ELD for the following 7 days							x		

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.6.1.6-7	An unidentified driving records data diagnostic event can be cleared by the ELD when driving time logged under the unidentified driver profile for the current 24-hour period and the previous 7 consecutive days drops to 15 minutes or less.					x		x		
ELD-FUNC-4.6.1.7		x								
ELD-FUNC-4.6.1.7-1	An ELD must implement in-service monitoring functions to verify that the data transfer mechanism(s) described in Appendix B, section 4.9.1 are continuing to function properly.							x		x
ELD-FUNC-4.6.1.7-2	An ELD must verify the in-service monitoring functionality at least once every 7 days.							x		
ELD-FUNC-4.6.1.7-3	The in-service monitoring functions may be automatic or may involve manual steps for a driver.							x		
ELD-FUNC-4.6.1.7-4	An ELD must record a data transfer data diagnostic event						x	x		x
ELD-FUNC-4.6.1.7-5	After an ELD records a data transfer data diagnostic event, the ELD must increase the frequency of the monitoring function to check at least once every 24-hour period.						x	x		x
ELD-FUNC-4.6.1.7-6	If the ELD stays in the unconfirmed data transfer mode following the next three consecutive monitoring checks, the ELD must detect a data transfer compliance malfunction.						x	x		x
ELD-FUNC-4.6.1.8		x								
ELD-FUNC-4.6.1.8-1	The ELD provider may implement additional, technology-specific malfunction and data diagnostic detection schemes and	x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.6.1.8-2	The ELD provider may use the ELD's malfunction status indicator and data diagnostic status indicator (described in sections 4.6.2.1 and 4.6.3.1) to communicate ELD's malfunction or non-compliant state to the operator(s) of the ELD.	x								
ELD-FUNC-4.6.2		x								
ELD-FUNC-4.6.2-1	ELD malfunctions affect integrity of the device and its compliance; therefore, active malfunctions must be indicated to all drivers who may use that ELD.							x		
ELD-FUNC-4.6.2-2	An ELD must provide a recognizable visual indicator, and may provide an audible signal, to the operator as to its malfunction status.							x		
ELD-FUNC-4.6.2.1		x								
ELD-FUNC-4.6.2.1-1	An ELD must display a single visual malfunction indicator for all drivers using the ELD on the ELD's display or on a stand-alone indicator.							x		
ELD-FUNC-4.6.2.1-2	The visual signal for the malfunction indicator must be visible to the driver when the driver is seated in the normal driving position.							x		
ELD-FUNC-4.6.2.1-3	The ELD malfunction indicator must be clearly illuminated when there is an active malfunction on the ELD.							x		
ELD-FUNC-4.6.2.1-4	The malfunction status must be continuously communicated to the driver when the ELD is powered.							x		
ELD-FUNC-4.6.3		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.6.3-1	ELD data diagnostic status affects only the authenticated user; therefore, an ELD must only indicate the active data diagnostics status applicable to the driver logged into the ELD.							x		
ELD-FUNC-4.6.3-2	An ELD must provide a recognizable visual indicator, and may provide an audible signal, to the driver as to its data diagnostics status.							x		
ELD-FUNC-4.6.3.1		x								
ELD-FUNC-4.6.3.1-1	An ELD must display a single visual data diagnostics indicator, apart from the visual malfunction indicator described in section 4.6.2.1, to visually communicate existence of active data diagnostics events for the applicable driver.							x		
ELD-FUNC-4.6.3.1-2	The visual signal must be visible to the driver when the driver is seated in the normal driving position.							x		
ELD-FUNC-4.7										
ELD-FUNC-4.7.1		x								
ELD-FUNC-4.7.1-1	If a driver selects the sleeper-berth state for the driver's record of duty status, and no co-driver has logged into the ELD as on-duty driving, and if the ELD outputs audible signals, the ELD must allow the driver to mute the ELD's volume or turn off the ELD's audible output or automatically mute the ELD's volume or turn off the ELD's audible output.				x				x	
ELD-FUNC-4.7.2		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.7.2-1	An ELD must provide a mechanism for a driver to obtain a copy of the driver's own ELD records on demand, in either an electronic or printout format compliant with inspection standards outlined in section 4.8.2.1.				x				x	
ELD-FUNC-4.7.2-2	The process must not require a driver to go through the motor carrier to obtain copies of the driver's own ELD records if driver's records reside on or are accessible directly by the ELD unit used by the driver.					x			x	
ELD-FUNC-4.7.2-3	If an ELD meets the requirements of this section by making data files available to the driver, it must also provide a utility function for the driver to display the data on a computer, at a minimum, as specified in § 395.8(g).				x				x	
ELD-FUNC-4.7.3		x								
ELD-FUNC-4.7.3-1	While an ELD must record the events listed in section 4.5.1 under all circumstances, a subset of the recorded elements must either be omitted in the records or recorded at a lower precision level, as described in further detail below, when a driver indicates that the driver is temporarily using the CMV for an authorized personal purpose.	x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.7.3-2	When a driver indicates that the driver is temporarily using the CMV for an authorized personal purpose, a subset of the recorded elements must either be omitted in the records or recorded at a lower precision level, as described in further detail below. The driver indicates this intent by setting driver's duty status to off-duty as described in Appendix B, section 4.3.2.2.1 and indicating authorized personal use of CMV as described in Appendix B, section 4.3.2.2.2.				x		x		x	
ELD-FUNC-4.7.3-3	During a period when a driver indicates authorized personal use of CMV, the ELD must record all new ELD events with latitude/longitude coordinates information rounded to a single decimal place resolution			x			x		x	
ELD-FUNC-4.7.3-4	During a period when a driver indicates authorized personal use of CMV, the ELD must omit recording vehicle miles and engine hours fields in new ELD logs by leaving them blank, except for events corresponding to a CMV's engine power-up and shut-down activity as described in section 4.5.1.6.			x			x		x	
ELD-FUNC-4.7.3-5	A driver's indication that the CMV is being operated for authorized personal purposes may span more than one CMV ignition on cycle if the driver proactively confirms continuation of the personal use condition prior to placing the vehicle in motion when the ELD prompts the driver at the beginning of the new ignition power on cycle.			x	x				x	
ELD-FUNC-4.8										
ELD-FUNC-4.8.1		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.8.1.1-1	Print paper must be able to accommodate the graph grid specifications as listed in section 4.8.1.3 of Appendix B.								x	
ELD-FUNC-4.8.1.2-1	If an ELD does not produce a printout, the ELD must be designed so that its display may be reasonably viewed by an authorized safety official without entering the commercial motor vehicle.								x	
ELD-FUNC-4.8.1.3-1	The printout and display must show reports for the inspected driver's profile and the unidentified driver profile separately.								x	
ELD-FUNC-4.8.1.3-2	The printout and display must show the following information for the current 24-hour period and each of the previous 7 consecutive days (See 4.8.1.3 for more details).								x	
ELD-FUNC-4.8.1.3-3	The printout and display must show each change of duty status on a graph-grid and must be at least 6 inches by 1.5 inches in size.								x	
ELD-FUNC-4.8.1.3-4	The graph-grid must overlay periods of driver's indications of authorized personal use of CMV and yard moves using a different style line (such as dashed or dotted line) or shading.								x	
ELD-FUNC-4.8.2		x								
ELD-FUNC-4.8.2-1	An ELD must have the capability to generate a consistent electronic file output compliant with the format described herein to facilitate the transfer of ELD data sets on the authorized safety officials' computing environments.	x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.8.2-2	An ELD must have the capability to generate a consistent electronic file output compliant with the format described herein to facilitate the processing of ELD data sets on the authorized safety officials' computing environments.	x								
ELD-FUNC-4.8.2-3	An ELD must have the capability to generate a consistent electronic file output compliant with the format described herein to facilitate the standardized display of ELD data sets on the authorized safety officials' computing environments.	x								
ELD-FUNC-4.8.2.1		x								
ELD-FUNC-4.8.2.1-1	The ELD must produce a standard ELD data output file for transfer purposes, which must be generated according to the standard specified in this section.								x	
ELD-FUNC-4.8.2.1-2	Data output must be provided in a single comma-delimited file outlined in this section using American National Standard Code for Information Exchange (ASCII) character sets meeting the standards of ANSI INCITS 4-1986 (R2012) (incorporated by reference, see § 395.38), reference (3)(b) in section 6 of this appendix. It must include: (1) a header segment, which specifies current or non-varying elements of an ELD file; and (2) variable length comma-delimited segments for the drivers, vehicles, ELD events, ELD malfunction and data diagnostics records, ELD login and logout activity, and unidentified driver records.								x	
ELD-FUNC-4.8.2.1.1		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.8.2.1.1-1	This segment must include the following data elements and format (See 4.8.2.1.1 for details)	x								
ELD-FUNC-4.8.2.1.2		x								
ELD-FUNC-4.8.2.1.2-1	The User List must list all drivers and co-drivers with driving time records on the most recent CMV operated by the inspected driver and motor carrier's support personnel who requested edits within the time period for which this file is generated.								x	
ELD-FUNC-4.8.2.1.2-2	The user list must be in chronological order with most recent user of the ELD on top, including the driver being inspected, the co-driver, and the unidentified driver profile.								x	
ELD-FUNC-4.8.2.1.2-3	The user list has a variable number of rows depending on the number of profiles with activity over the time period for which this file is generated. (See 4.8.2.1.2 for details)								x	
ELD-FUNC-4.8.2.1.3		x								
ELD-FUNC-4.8.2.1.3-1	The CMV List must list each CMV that the current driver operated and that has been recorded on the driver's ELD records within the time period for which this file is generated.								x	
ELD-FUNC-4.8.2.1.3-2	The list must be rank ordered in accordance with the time of CMV operation with the most recent CMV being on top.								x	
ELD-FUNC-4.8.2.1.3-3	This segment has a variable number of rows depending on the number of CMVs operated by the driver over the time period for which this file is generated. (See 4.8.2.1.3 for details)								x	
ELD-FUNC-4.8.2.1.4		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.8.2.1.4-1	This segment must list ELD event records tagged with event type 1 (a change in duty status as described in section 4.5.1.1).								x	
ELD-FUNC-4.8.2.1.4-2	The ELD Event List must list ELD event records tagged with event type 2 (an intermediate log as described in section 4.5.1.2)								x	
ELD-FUNC-4.8.2.1.4-3	This segment must list ELD event records tagged with event type 3 (a change in driver's indication of conditions impacting driving time recording as described in section 4.5.1.3)								x	
ELD-FUNC-4.8.2.1.4-4	The ELD Event List must list all event record status types and of all event record origins for the driver, rank ordered with the most current log on top in accordance with the date and time fields of the record.								x	
ELD-FUNC-4.8.2.1.4-5	The ELD Event List has a variable number of rows depending on the number of ELD events recorded for the driver over the time period for which this file is generated. (See 4.8.2.1.4 for details)								x	
ELD-FUNC-4.8.2.1.5		x								
ELD-FUNC-4.8.2.1.5-1	This segment must list only the elements of the ELD event list created in 4.8.2.1.4 above that have an annotation, comment, or a manual entry of location description by the driver.								x	
ELD-FUNC-4.8.2.1.5-2	This segment has a variable number of rows depending on the number of ELD events under section 4.8.2.1.4 that feature a comment, annotation, or manual location entry by the driver. (See 4.8.2.1.5 for details)								x	
ELD-FUNC-4.8.2.1.6		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.8.2.1.6-1	The ELD Event List for Driver's Certification of Own Records must list ELD event records with event type 4 (driver's certification of own records as described in section 4.5.1.4) for the inspected driver for time period for which this file is generated, It must be rank ordered with the most current record on top.								x	
ELD-FUNC-4.8.2.1.6-2	This segment has a variable number of rows depending on the number of certification and re-certification actions the authenticated driver may have executed on the ELD over the time period for which this file is generated. (See 4.8.2.1.6 for details)								x	
ELD-FUNC-4.8.2.1.7		x								
ELD-FUNC-4.8.2.1.7-1	The Malfunction and Diagnostic Event Records must list all ELD malfunctions that have occurred on this ELD during the time period for which this file is generated.								x	
ELD-FUNC-4.8.2.1.7-2	The Malfunction and Diagnostic Event Records must list diagnostic event records related to the driver being inspected, rank ordered with the most current record on top.								x	
ELD-FUNC-4.8.2.1.7-3	This segment has a variable number of rows depending on the number of ELD malfunctions and ELD diagnostic event records recorded and relevant to the inspected driver over the time period for which this file is generated. (See 4.8.2.1.7 for details)								x	
ELD-FUNC-4.8.2.1.8		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.8.2.1.8-1	The ELD Login/Logout Report must list the login and logout activity on the ELD (ELD events with event type 5 (A driver's login/logout activity)) for the inspected driver for the time period for which this file is generated.								x	
ELD-FUNC-4.8.2.1.8-2	The login/logout activity logs must be rank ordered with the most recent activity on top. (See 4.8.2.1.8 for details)								x	
ELD-FUNC-4.8.2.1.9		x								
ELD-FUNC-4.8.2.1.9-1	CMV's Engine Power Up and Shut Down Activity must list the logs created when CMV's engine is powered up and shut down (ELD events with event type 6 (CMV's engine power up/shut down)) for the time period for which this file is generated.								x	
ELD-FUNC-4.8.2.1.9-2	The power up/shutdown logs must be rank ordered with the latest activity on top. (See 4.8.2.1.9 for details)								x	
ELD-FUNC-4.8.2.1.10		x								
ELD-FUNC-4.8.2.1.10-1	The ELD Event Log List for the Unidentified Driver Profile must list the ELD event records for the Unidentified Driver profile, rank ordered with most current log on top in accordance with the date and time fields of the logs.								x	
ELD-FUNC-4.8.2.1.10-2	This segment has a variable number of rows depending on the number of Unidentified Driver ELD records recorded over the time period for which this file is generated. (See 4.8.2.1.10 for details)								x	
ELD-FUNC-4.8.2.1.11		x								
ELD-FUNC-4.8.2.1.11-1	This segment lists the file data check value as specified in section 4.4.5.3 of this appendix. (See 4.8.2.1.11 for details)	x								
ELD-FUNC-4.8.2.2		x								

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.8.2.2-1	If the ELD output is saved in a file for transfer or maintenance purposes, it must follow the twenty-five character-long filename standard below: (See 4.8.2.2 for details)								x	
ELD-FUNC-4.9		x								
ELD-FUNC-4.9-1	An ELD must be able to present the captured ELD records of a driver in the standard electronic format as described below	x								
ELD-FUNC-4.9-2	An ELD must be able to transfer the data file to an authorized safety official, on demand, for inspection purposes.	x								
ELD-FUNC-4.9.1		x								
ELD-FUNC-4.9.1-1	On demand during a roadside safety inspection, an ELD must produce a driver's record of duty status for the current 24-hour period and the previous 7 consecutive days in electronic format, in the standard data format described in section 4.8.2.1.								x	x
ELD-FUNC-4.9.1-2	When a driver uses the single-step driver interface, as described in section 4.3.2.4, to indicate for the ELD to compile and transfer driver's ELD records to authorized safety officials, the ELD must transfer the generated ELD data output to the computing environment used by authorized safety officials via the standards referenced in this section.								x	x
ELD-FUNC-4.9.1-3	An ELD must support one of the two options for roadside data transfer in paragraph (b) of this section, and must certify proper operation of each element under that option. (See Appendix B, section 4.9.1 for details)								x	x

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.9.1-4	An authorized safety official will specify which transfer mechanism the official will use within the certified transfer mechanisms of an ELD. (See 4.9.1 for details)	x								
ELD-FUNC-4.9.2		x								
ELD-FUNC-4.9.2-1	An ELD must be capable of maintaining and retaining copies of electronic ELD records for a period of at least 6 months from the date of receipt.						x		x	x
ELD-FUNC-4.9.2-2	An ELD must produce, on demand, a data file or a series of data files of ELD records for a subset of its drivers.						x		x	x
ELD-FUNC-4.9.2-3	An ELD must produce, on demand, a data file or a series of data files of ELD records for a subset of its vehicles.						x		x	x
ELD-FUNC-4.9.2-4	An ELD must produce, on demand, a data file or a series of data files of ELD records for subset of the 6-month record retention period, to be specified by an authorized safety official, in an electronic format standard described in section 4.8.2.1 or, if the motor carrier has multiple offices or terminals, within the time permitted under § 390.29.						x		x	x
ELD-FUNC-4.9.2-5	At a minimum, an ELD must be able to transfer the ELD records electronically by one of the following transfer mechanisms: Web Services as specified in section 4.10.1.1 of this appendix (but not necessarily wirelessly), E-mail as specified 4.10.1.2 (but not necessarily wirelessly) or USB 2.0 as specified in section 4.10.1.3 of this appendix and Bluetooth, as specified in section 4.10.1.4								x	x

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.10		x								
ELD-FUNC-4.10-1	ELDs must transmit ELD records electronically in accordance with the file format specified in section 4.8.2.1	x								
ELD-FUNC-4.10-2	ELDs must be capable of a one-way transfer of these records through wired and/or wireless methods to authorized safety officials upon request as specified in section 4.9.	x								
ELD-FUNC-4.10.1		x								
ELD-FUNC-4.10.1-1	For each type of wireless transfer mechanisms, an ELD, when used, must follow the underlying specifications in this section.	x								
ELD-FUNC-4.10.1.1		x								
ELD-FUNC-4.10.1.1-1	Transfer of ELD data to FMCSA via Web Services must follow the following standards: (See 4.10.1.1 for details)	x								
ELD-FUNC-4.10.1.1-2	Transfer of ELD data to FMCSA via Web Services must follow the following standards: Web Services Description Language (WSDL) (See Appendix B, section 4.10.1.1 for details) 1.1 (incorporated by reference, see §395.38), reference (1)(a) in section 6 of the appendix								x	x
ELD-FUNC-4.10.1.1-3	Transfer of ELD data to FMCSA via Web Services must follow the following standards: Simple Object Access Protocol (SOAP) (See 4.10.1.1 for details) 1.2 (incorporated by reference, see §395.38),reference (1)(b) in section 6 of the appendix								x	x

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.10.1.1-4	Transfer of ELD data to FMCSA via Web Services must follow the following standards: Extensible Markup Language (XML) (See 4.10.1.1 for details) 1.0 5th Edition (incorporated by reference, see §395.38),reference (1)(c) in section 6 of the appendix								x	x
ELD-FUNC-4.10.1.1-5	ELD data transmission from the ELD to the ELD support system must be accomplished in a way that protects the privacy of the driver(s).								x	x
ELD-FUNC-4.10.1.1-6	At roadside if both the vehicle operator and law enforcement have an available data connection, the vehicle operator will initiate the transfer of ELD data to an authorized safety official. (See 4.10.1.1 for details)								x	x
ELD-FUNC-4.10.1.2		x								
ELD-FUNC-4.10.1.2-1	ELD must attach a file to an e-mail message to be sent using RFC 5321 Simple Mail Transfer Protocol (SMTP) (incorporated by reference, see § 395.38), reference (7) (b) in section 6 of Appendix C, to a specific e-mail address, which will be shared with the ELD providers during the technology registration process.								x	x

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.10.1.2-2	The file must have the format described in section 4.8.2.1 of this appendix and must be encrypted using the Secure/Multipurpose Internet Mail Extensions as described in RFC 5751 (incorporated by reference, see § 395.38), and the RSA algorithm as described in RFC 4056 (incorporated by reference, see § 395.38), with the FMCSA public key compliant with NIST SP 800-32 (incorporated by reference, see § 395.38) to be provided to the ELD provider at the time of registration. The content must be encrypted using AES in FIPS Publication 197 (incorporated by reference, see § 395.38), and RFC 3565 (incorporated by reference, see § 395.38).								x	x
ELD-FUNC-4.10.1.2-3	The e-mail must be formatted using the RFC 5322 Internet Message Format (incorporated by reference, see § 395.38), reference (7)(c) in section 6 Appendix C, as follows: (See Appendix B, section 4.10.1.3 for details). A message confirming receipt of the ELD file will be sent to the address specified in the e-mail. The filename must follow the convention specified in Appendix B, section 4.8.2.2.								x	x
ELD-FUNC-4.10.1.3		x								
ELD-FUNC-4.10.1.3-1	ELDs certified for USB data transfer mechanism must be capable of transferring ELD records using the Universal Serial Bus Specification (Revision 2.0)(incorporated by reference, see § 395.38), reference (2)(a) in section 6 of Appendix C.								x	x

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.10.1.3-2	Each ELD technology must implement a single USB-compliant interface with the necessary adaptors for a Type A connector. The USB interface must implement the Mass Storage class (08h) for driverless operation, to comply with IEEE standard 1667-2009, (incorporated by reference, see § 395.38), reference (4)(a) in section 6 of Appendix C.								x	x
ELD-FUNC-4.10.1.3-3	ELD must be capable of providing power to a standard USB-compatible drive.								x	x
ELD-FUNC-4.10.1.3-4	An ELD must re-authenticate the driver prior to saving the driver's ELD file to an external device.								x	x
ELD-FUNC-4.10.1.3-5	On initiation by an authenticated driver, an ELD must be capable of saving ELD file(s) to USB-compatible drives (AES, in FIPS Publication 197, incorporated by reference, see § 395.38) that are provided by authorized safety officials during an inspection.								x	x
ELD-FUNC-4.10.1.3-6	Prior to initiating this action, ELDs must be capable of reading a text file from an authorized safety officials' drive and verifying it against a file provided to ELD providers who have registered their technologies as described in section 5.1.								x	x

Req ID	Derived Requirement Text	Title	Accounts	Vehicle Interface	ELD Inputs	Processing	Recording	Monitoring	ELD Outputs	Data Transfer
ELD-FUNC-4.10.1.4-1	Bluetooth SIG Specification of the Bluetooth System covering core package version 2.1 + EDR or higher (incorporated by reference, see § 395.38), reference (8) (a) in section 6 of Appendix C, must be followed. ELDs using this standard must be capable of displaying a Personal Identification Number generated by the Bluetooth application profile for bonding with other devices.								x	x
ELD-FUNC-4.10.1.4-2	Upon request of an authorized official, the ELD must become discoverable by the authorized safety officials' Bluetooth-enabled computing platform, and generate a random code, which the driver must share with the official.								x	x
ELD-FUNC-4.10.1.4-3	The ELD must connect to the roadside authorized safety officials' technology via wireless personal area network and transmit the required data via Web Services as described in Appendix B, section 4.10.1.1.								x	x
ELD-FUNC-4.10.2		x								
ELD-FUNC-4.10.2-1	Regardless of the roadside transmission option supported by an ELD, ELD records are maintained and retained must be able to transmit enforcement-specified historical data for their drivers using one of the methods specified under section Appendix B, section 4.9.2.						x			x

Startup Procedure

For the testing of all procedures, unless otherwise noted, it is assumed that:

- Multiple driver accounts have been created that are associated with different states and driver's license numbers
- The manufacturer's directions to power on an ELD application/device will be used
- The driver has logged on to the ELD

Appendix A- Acronym List

AOBRD - Automatic On-Board Recording Device

BASICs – Behavior Analysis Safety Improvement Categories

CDL – Commercial Driver's License

CMV – Commercial Motor Vehicle

CSA – Compliance, Safety, Accountability

DOT – Department of Transportation

DVIR – Driver Vehicle Inspection Reports

ECM – Electronic Control Module

ELD – Electronic Logging Device

EOBR – Electronic On-Board Recorder

FMCSA – Federal Motor Carriers Safety Administration

FMCRs – Federal Motor Carrier Safety Regulations

FMS – Fleet Management Systems

HOS – Hours of Service

ICD – Interface Control Document

MCMIS – Motor Carrier Management Information System

NHTSA – National Highway Traffic Safety Administration

NTSB – National Transportation Safety Administration

ODND – On-Duty Not Driving

PII – Personally Identifiable Information

RODS – Records of Duty Status

SAFER – Safety and Fitness Electronic Records

SNPRM – Supplemental Notice of Proposed Rulemaking

TLS – Transport Layer Security

USB – Universal Serial Bus

UTC – Coordinated Universal Time

V&V – Validation and Verification

VIN – Vehicle Identification Number

WSDL – Web Services Definition Language

XML – Extensible Markup Language

XOR – Exclusive Or {bitwise binary operation}

Appendix B – ELD Functional Requirements (Section 4)

APPENDIX TO SUBPART B OF PART 395—FUNCTIONAL SPECIFICATIONS FOR ALL ELECTRONIC LOGGING DEVICES (ELDS)

4. FUNCTIONAL REQUIREMENTS

4.1 ELD User Accounts

4.1.1 Account Types

An ELD must support a user account structure that separates drivers and motor carrier's support personnel (i.e. non-drivers).

4.1.2 Account Creation

(a) Each user of the ELD must have a valid active account on the ELD with a unique identifier assigned by the motor carrier.

(b) Each driver account must require the entry of the driver's license number and the State or jurisdiction that issued the driver's license into the ELD during the account creation process. The driver account must securely store this information on the ELD.

(c) An ELD must not allow creation of more than one driver account associated with a driver's license for a given motor carrier.

(d) A driver account must not have administrative rights to create new accounts on the ELD.

(e) A support personnel account must not allow recording of ELD data for its account holder.

(f) An ELD must reserve a unique driver account for recording events during non-authenticated operation of a CMV. This appendix will refer to this account as the "unidentified driver account."

4.1.3 Account Security

(a) An ELD must provide secure access to data recorded and stored on the system by requiring user authentication during system login.

(b) Driver accounts must only have access to data associated with that driver, protecting the authenticity and confidentiality of the collected information.

4.1.4 Account Management

(a) An ELD must be capable of separately recording and retaining ELD data for each individual driver using the ELD.

(b) An ELD must provide for and require concurrent authentication for team drivers.

(c) If more than one ELD unit is used to record a driver's electronic records within a motor carrier's operation, the ELD in the vehicle the driver is operating most recently must be able to produce a complete ELD report for that driver, on demand, for the current 24-hour period and the previous 7 consecutive days.

4.1.5 Non-Authenticated Operation

(a) An ELD must associate all non-authenticated operation of a CMV with a single ELD account labeled unidentified driver.

(b) If a driver does not log onto the ELD, as soon as the vehicle is in motion, the ELD must:

(1) Provide a visual or visual and audible warning reminding the driver to stop and log in to the ELD;

(2) Record accumulated driving and on-duty, not-driving, time in accordance with the ELD defaults described in section 4.4.1 of this appendix under the unidentified driver profile; and

(3) Not allow entry of any information into the ELD other than a response to the login prompt.

4.2 ELD-Vehicle Interface

(a) An ELD must be integrally synchronized with the engine of the CMV. Engine synchronization for purposes of ELD compliance means the monitoring of the vehicle's engine operation to automatically capture the engine's power status, vehicle's motion status, miles driven value, and engine hours value when the CMV's engine is powered.

(b) An ELD used while operating a CMV that is a model year 2000 or later model year, as indicated by the vehicle identification number (VIN), that has an engine electronic control module (ECM) must establish a link to the engine ECM when the CMV's engine is powered and receive automatically the engine's power status, vehicle's motion status, miles driven value, and engine hours value through the serial or Control Area Network communication protocols supported by the vehicle's engine ECM. If the vehicle does not have an ECM, an ELD may use alternative sources to obtain or estimate these vehicle parameters with the listed accuracy requirements under section 4.3.1 of this appendix.

4.3 ELD Inputs

4.3.1 ELD Sensing

4.3.1.1 Engine Power Status

An ELD must be powered and become fully functional within 1 minute of the vehicle's engine receiving power and must remain powered for as long as the vehicle's engine stays powered.

4.3.1.2 Vehicle Motion Status

(a) An ELD must automatically determine whether a CMV is in motion or stopped by comparing the vehicle speed information with respect to a set speed threshold as follows:

(1) Once the vehicle speed exceeds the set speed threshold, it must be considered in motion.

(2) Once in motion, the vehicle must be considered in motion until its speed falls to 0 miles per hour and stays at 0 miles per hour for 3 consecutive seconds. Then, the vehicle will be considered stopped.

(3) An ELD's set speed threshold for determination of the in-motion state for the purpose of this section must not be configurable to greater than 5 miles per hour.

(b) If an ELD is required to have a link to the vehicle's engine ECM, vehicle speed information must be acquired from the engine ECM. Otherwise, vehicle speed information must be acquired using an independent source apart from the positioning services described under section 4.3.1.6 of this appendix and must be accurate within ±3 miles per hour of the CMV's true ground speed for purposes of determining the in-motion state for the CMV.

4.3.1.3 Vehicle Miles

(a) An ELD must monitor vehicle miles as accumulated by a CMV over the course of an ignition power on cycle (accumulated vehicle miles) and over the course of CMV's operation (total vehicle miles). Vehicle miles information must use or must be converted to units of whole miles.

(b) If the ELD is required to have a link to the vehicle's engine ECM as specified in section 4.2 of this appendix:

(1) The ELD must monitor the engine ECM's odometer message broadcast and use it to log total vehicle miles information; and

(2) The ELD must use the odometer message to determine accumulated vehicle miles since engine's last power on instance.

(c) If the ELD is not required to have a link to the vehicle's engine ECM as specified in section 4.2 of this appendix, the accumulated vehicle miles indication must be obtained or estimated from a source that is accurate to within ±10% of miles accumulated by the CMV over a 24-hour period as indicated on the vehicle's odometer display.

4.3.1.4 Engine Hours

(a) An ELD must monitor engine hours of the CMV over the course of an ignition power on cycle (elapsed engine hours) and over the course of the total engine hours of the CMV's operation. Engine hours must use or must be converted to hours in intervals of a tenth of an hour.

(b) If an ELD is required to have a link to the vehicle's engine ECM, the ELD must monitor the engine ECM's total engine hours message broadcast and use it to log total engine hours information. Otherwise, engine hours must be obtained or estimated from a source that monitors the ignition power of the CMV and must be accurate within ±0.1 hour of the engine's total operation within a given ignition power on cycle.

4.3.1.5 Date and Time

(a) The ELD must obtain and record the date and time information automatically without allowing any external input or interference from a motor carrier, driver, or any other person.

(b) The ELD time must be synchronized to Coordinated Universal Time (UTC) and the absolute deviation from UTC must not exceed 10 minutes at any point in time.

4.3.1.6 CMV Position

(a) An ELD must determine automatically the position of the CMV in standard latitude/longitude coordinates with the accuracy and availability requirements of this section.

(b) The ELD must obtain and record this information without allowing any external input or interference from a motor carrier, driver, or any other person.

(c) CMV position measurement must be accurate to ±0.5 mile of absolute position of the CMV when an ELD measures a valid latitude/longitude coordinate value.

(d) Position information must be obtained in or converted to standard signed latitude and longitude values and must be expressed as decimal degrees to hundreds of a degree precision (i.e., a decimal point and two decimal places).

(e) Measurement accuracy combined with the reporting precision requirement implies that position reporting accuracy will be on the order of ±1mile of absolute position of the CMV during the course of a CMV's commercial operation.

(f) During periods of a driver's indication of personal use of the CMV, the measurement reporting precision requirement is reduced to tenths of a degree (i.e., a decimal point and single decimal place) as further specified in section 4.7.3 of this appendix.

(g) An ELD must be able to acquire a valid position measurement at least once every 5 miles of driving; however, the ELD records CMV location information only during ELD events as specified in section 4.5.1 of this appendix.

4.3.1.7 CMV VIN

The vehicle identification number (VIN) for the power unit of a CMV must be automatically obtained from the engine ECM and recorded if it is available on the vehicle data bus.

4.3.2 Driver's Manual Entries

(a) An ELD must prompt the driver to input information into the ELD only when the CMV is stationary and driver's duty status is not on-duty driving, except for the condition specified in section 4.4.1.2 of this appendix.

(b) If the driver's duty status is driving, an ELD must only allow the driver who is operating the CMV to change the driver's duty status to another duty status.

(c) A stopped vehicle must maintain zero (0) miles per hour speed to be considered stationary for purposes of information entry into an ELD.

(d) An ELD must allow an authenticated co-driver who is not driving, but who has logged into the ELD prior to the vehicle being in motion, to make entries over his or her own records when the vehicle is in motion. The ELD must not allow co-drivers to switch driving roles when the vehicle is in motion.

4.3.2.1 Driver's Entry of Required Event Data Fields

(a) An ELD must provide a means for a driver to enter information pertaining to the driver's ELD records manually, e.g., CMV power unit number, as specified in section 7.4 of this appendix; trailer number(s), as specified in section 7.42; and shipping document number, as specified in section 7.39.

(b) If the motor carrier populates these fields automatically, the ELD must provide means for the driver to review such information and make corrections as necessary.

4.3.2.2 Driver's Status Inputs

4.3.2.2.1 Driver's Indication of Duty Status

(a) An ELD must provide a means for the authenticated driver to select a driver's duty status.

(b) The ELD must use the ELD duty status categories listed in Table 1 of this appendix.

Table 1

Duty Status Categories

Duty Status	Abbreviation	Data Coding
Off Duty	OFF	1
Sleeper Berth	SB	2
Driving	D	3
On-duty Not Driving	ON	4

4.3.2.2.2 Driver's Indication of Situations Impacting Driving Time Recording

(a) An ELD must provide the means for a driver to indicate the beginning and end of a period when the driver may use the CMV for authorized personal use or for performing yard moves. The ELD must acquire this status in a standard format from the category list in Table 2 of this appendix. This list must be supported independent of the duty status categories described in section 4.3.2.2.1 of this appendix.

Table 2

Categories for Driver's Indication of Situations Impacting Driving Time Recording

Category	Abbreviation	Data Coding
Authorized Personal Use of CMV	PC	1

Yard Moves	YM	2
Default: None	--	0

(b) An ELD must allow a driver to select only categories that a motor carrier enables by configuration for that driver, as described in section 4.3.3.1.1 of this appendix.

(c) An ELD must only allow one category to be selected at any given time and use the latest selection by the driver.

(d) The ELD must prompt the driver to enter an annotation upon selection of a category from Table 2 of this appendix and record the driver's entry.

(e) A driver's indication of special driving situation must reset to none if the ELD or CMV's engine goes through a power off cycle (ELD or CMV's engine turns off and then on) except if the driver has indicated authorized personal use of CMV. If the driver has indicated authorized personal use of the CMV, the ELD must require confirmation of continuation of the authorized personal use of CMV condition by the driver. If not confirmed by the driver and the vehicle is in motion, the ELD must default to none.

4.3.2.3 Driver's Certification of Records

(a) An ELD must include a function whereby a driver can certify the driver's records at the end of a 24-hour period.

(1) This function, when selected, must display a statement that reads "I hereby certify that my data entries and my record of duty status for this 24-hour period are true and correct."

(2) An ELD must prompt the driver to select "Agree" or "Not ready." An ELD must record the driver's affirmative selection of "Agree" as an event.

(b) An ELD must only allow the authenticated driver to certify records associated with that driver.

(c) If any edits are necessary after the driver certifies the records for a given 24-hour period, the ELD must require and prompt the driver to re-certify the updated records.

(d) If there are any past records on the ELD (excluding the current 24-hour period) that require certification or re-certification by the driver, the ELD must indicate the required driver action on the ELD's display and prompt the driver to take the necessary action during the login and logout processes.

4.3.2.4 Driver's Data Transfer Initiation Input

(a) An ELD must provide a standardized single-step driver interface for compilation of driver's ELD records and initiation of the data transfer to authorized safety officials when requested during a roadside inspection.

(b) The ELD must input the data transfer request from the driver, require confirmation, present and request selection of the supported data transfer options by the ELD, and prompt for entry of the output file comment as specified in section 4.3.2.5 of this appendix. Upon confirmation, the ELD must generate the compliant output file and perform the data transfer.

(c) The supported single-step data transfer initiation mechanism (such as a switch or an icon on a touch-screen display) must be clearly marked and visible to the driver when the vehicle is stopped.

4.3.2.5 Driver's Entry of an Output File Comment

An ELD must accommodate the entry of an output file comment up to 60 characters long. If an authorized safety official provides a key phrase or code during an inspection to be included in the output file comment, it must be entered and embedded in the electronic ELD records in the exchanged dataset as specified in section 4.8.2.1.1 of this appendix. The default value for the output file comment must be blank. This output file comment must be used only for the creation of the related data files for the intended time, place, and ELD user.

4.3.2.6 Driver's Annotation of Records

(a) An ELD must allow a driver to add annotations in text format to recorded, entered, or edited ELD events.

(b) The ELD must require annotations to be 4 characters or longer, including embedded spaces if driver annotation is required and driver is prompted by the ELD.

4.3.2.7 Driver's Entry of Location Information

(a) An ELD must allow manual entry of a CMV's location by the driver in text format in support of the driver edit requirements described in section 4.3.2.8 of this appendix.

(b) The driver's manual location entry must be available as an option to a driver only when prompted by the ELD under allowed conditions as described in section 4.6.1.4 of this appendix.

(c) A manual location entry must show "M" in the latitude/longitude coordinates fields in ELD records.

4.3.2.8 Driver's Record Entry/Edit

(a) An ELD must provide a mechanism for a driver to review, edit, and annotate the driver's ELD records when a notation of errors or omissions is necessary or enter the driver's missing ELD records subject to the requirements specified in this section.

(b) An ELD must not permit alteration or erasure of the original information collected concerning the driver's ELD records or alteration of the source data streams used to provide that information.

4.3.2.8.1 Mechanism for Driver Edits and Annotations

(a) If a driver edits or annotates an ELD record or enters missing information, the act must not overwrite the original record.

(b) The ELD must use the process outlined in section 4.4.4.2 of this appendix to configure required event attributes to track the edit history of records.

(c) Driver edits must be accompanied by an annotation. The ELD must prompt the driver to annotate edits.

4.3.2.8.2 Driver Edit Limitations

(a) An ELD must not allow or require the editing or manual entry of records with the following event types, as described in section 7.25 of this appendix:

Event Type	Description
2	An intermediate log,
5	A driver's login/logout activity,
6	CMV's engine power up / shut down, or
7	ELD malfunctions and data diagnostic events

(b) An ELD must not allow automatically recorded driving time to be shortened or the ELD username associated with an ELD record to be edited or reassigned, except under the following circumstances:

(1) Assignment of Unidentified Driver records. ELD events recorded under the "Unidentified Driver" profile may be edited and assigned to the driver associated with the record; and

(2) Correction of errors with team drivers**.** In the case of team drivers, the driver account associated with the driving time records may be edited and reassigned between the team drivers if there was a mistake resulting in a mismatch between the actual driver and the driver recorded by the ELD and if both team drivers were respectively indicated in each other's records as a co-driver. The ELD must require each co-driver to confirm the change for the corrective action to take effect.

4.3.3 Motor Carrier's Manual Entries

An ELD must restrict availability of motor carrier entries outlined in this section only to authenticated "support personnel" account holders.

4.3.3.1 ELD Configuration

If an ELD or a technology that includes an ELD function offers configuration options to the motor carrier or the driver that are not otherwise addressed or prohibited in this appendix, the configuration options must not affect the ELD's compliance with the requirements of this rule for each configuration setting of the ELD.

4.3.3.1.1 Configuration of Available Categories Impacting Driving Time Recording

(a) An ELD must allow a motor carrier to unilaterally configure the availability of each of the three categories listed on Table 2 of this appendix that the motor carrier chooses to authorize for each of its drivers. By default, none of these categories must be available to a new driver account without the motor carrier proactively configuring their availability.

(b) A motor carrier may change the configuration for the availability of each category for each of its drivers. Changes to the configuration setting must be recorded on the ELD and communicated to the applicable authenticated driver during the ELD login process.

4.3.3.1.2 Configuration of Using ELDs

(a) An ELD must provide the motor carrier the ability to configure a driver account exempt from use of an ELD.

(c) The ELD must default the setting of this configuration option for each new driver account created on an ELD to "no exemption."

(d) An exemption must be proactively configured for an applicable driver account by the motor carrier. The ELD must prompt the motor carrier to annotate the record and provide an explanation for the configuration of exemption.

(e) If a motor carrier configures a driver account as exempt

(1) The ELD must present the configured indication that is in effect for that driver during the ELD login and logout processes.

(2) The ELD must continue to record ELD driving time but suspend detection of missing data elements data diagnostic event for the driver described in section 4.6.1.5 of this appendix and data transfer compliance monitoring function described in section 4.6.1.7 when such driver is authenticated on the ELD.

4.3.3.1.3 Motor Carrier's Post-Review Electronic Edit Requests

(a) An ELD may allow the motor carrier (via a monitoring algorithm or support personnel) to screen, review, and request corrective edits to the driver's certified (as described in section 4.3.2.3 of this appendix) and submitted records through the ELD

system electronically. If this function is implemented by the ELD, the ELD must also support functions for the driver to see and review the requested edits.

(b) Edits requested by anyone or any system other than the driver must require the driver's electronic confirmation or rejection.

4.4 ELD Processing and Calculations

4.4.1 Conditions for Automatic Setting of Duty Status

4.4.1.1 Automatic Setting of Duty Status to Driving

An ELD must automatically record driving time when the vehicle is in motion by setting duty status to driving for the driver unless, before the vehicle is in motion, the driver:

(a) Sets the duty status to off-duty and indicates personal use of CMV, in which case duty status must remain off-duty until driver's indication of the driving condition ends; or

(b) Sets the duty status to on-duty not driving and indicates yard moves, in which case duty status must remain on-duty not driving until driver's indication of the driving condition ends.

4.4.1.2 Automatic Setting of Duty Status to On-Duty Not Driving

When the duty status is set to driving, and the CMV has not been in-motion for 5 consecutive minutes, the ELD must prompt the driver to confirm continued driving status or enter the proper duty status. If the driver does not respond to the ELD prompt within 1-minute after receiving the prompt, the ELD must automatically switch the duty status to on-duty not driving. The time thresholds for purposes of this section must not be configurable.

4.4.1.3 Other Automatic Duty-Status Setting Actions Prohibited

An ELD must not feature any other automatic records of duty setting mechanism than those described in sections 4.4.1.1 and 4.4.1.2 of this appendix. Duty status changes that are not initiated by the driver, including duty status alteration recommendations by motor carrier support personnel or a software algorithm, are subject to motor carrier edit requirements in section 4.3.3.1.3.

4.4.2 Geo-Location Conversions

(a) For each change in duty status, the ELD must convert automatically captured vehicle position in latitude/longitude coordinates into geo-location information, indicating approximate distance and direction to an identifiable location corresponding to the name of a nearby city, town, or village, with a State abbreviation.

(b) Geo-location information must be derived from a database that contains all cities, towns, and villages with a population of 5,000 or greater and listed in ANSI INCITS 446-2008 (R2013) (incorporated by reference, see § 395.38).

(c) An ELD's viewable outputs (such as printouts or display) must feature geo-location information as place names in text format.

4.4.3 Date and Time Conversions

(a) An ELD must have the capability to convert and track date and time captured in UTC standard to the time standard in effect at driver's home terminal, taking the daylight savings time changes into account by using the parameter "Time Zone Offset from UTC" as specified in section 7.41 of this appendix.

(b) An ELD must record the driver's record of duty status using the time standard in effect at the driver's home terminal for a 24-hour period beginning with the time specified by the motor carrier for that driver's home terminal.

(c) The data element “Time Zone Offset from UTC” must be included in the “Driver’s Certification of Own Records” events as specified in section 4.5.1.4 of this appendix.

4.4.4 Setting of Event Parameters in Records, Edits, and Entries

This section describes the security measures for configuring and tracking event attributes for ELD records, edits, and entries in a standardized manner.

4.4.4.1 Event Sequence Identifier (ID) number

(a) Each ELD event must feature an event sequence ID number.

(1) The event sequence ID number for each ELD event must use continuous numbering across all users of that ELD and across engine and ELD power on and off cycles.

(2) An ELD must use the next available event sequence ID number (incremented by one) each time a new event log is recorded.

(3) The event sequence ID number must track at least the last 65,536 unique events recorded on the ELD.

(b) The continuous event sequence ID numbering structure used by the ELD must be mapped into a continuous hexadecimal number between 0000 (Decimal 0) and FFFF (Decimal 65535).

4.4.4.2 Event Record Status, Event Record Origin, Event Type Setting

(a) An ELD must retain the original records even when allowed edits and entries are made over a driver’s ELD records.

(b) An ELD must keep track of all event record history, and the process used by the ELD must produce the event record status, event record origin, and event type for the ELD records in the standard categories specified in sections 7.23, 7.22, and 7.25 of this

appendix, respectively for each record as a standard security measure. For example, an ELD may use the process outlined in sections 4.4.4.2.1–4.4.4.2.6 to meet the requirements of this section.

4.4.4.2.1 Records Automatically Logged by ELD

At the instance an ELD creates a record automatically, the ELD must:

(a) Set the "Event Record Status" to "1" (active); and

(b) Set the "Event Record Origin" to "1" (automatically recorded by ELD).

4.4.4.2.2 Driver Edits

At the instance of a driver editing existing record(s), the ELD must:

(a) Identify the ELD record(s) being modified for which the "Event Record Status" is currently set to "1" (active);

(b) Acquire driver input for the intended edit and construct the ELD record(s) that will replace the record(s) identified in paragraph 4.4.4.2.2(a) of this appendix;

(c) Set the "Event Record Status" of the ELD record(s) identified in paragraph 4.4.4.2.2(a) of this appendix, which is being modified, to "2" (inactive-changed);

(d) Set the "Event Record Status" of the ELD record(s) constructed in paragraph 4.4.4.2.2(b) of this appendix to "1" (active); and

(e) Set the "Event Record Origin" of the ELD record(s) constructed in paragraph 4.4.4.2.2(b) of this appendix to "2" (edited or entered by the driver).

4.4.4.2.3 Driver Entries

When a driver enters missing record(s), the ELD must:

(a) Acquire driver input for the missing entries being implemented and construct the new ELD record(s) that will represent the driver entries;

(b) Set the “event record status” of the ELD record(s) constructed in paragraph 4.4.4.2.3(a) of this appendix to “1” (active); and

(c) Set the “event record origin” of the ELD record(s) constructed in paragraph 4.4.4.2.3(a) of this appendix to “2” (edited or entered by the driver).

4.4.4.2.4 Driver’s Assumption of Unidentified Driver Logs

When a driver reviews and assumes ELD record(s) logged under the unidentified driver profile, the ELD must:

(a) Identify the ELD record(s) logged under the unidentified driver profile that will be reassigned to the driver;

(b) Use elements of the unidentified driver log(s) from paragraph 4.4.4.2.4(a) of this appendix and acquire driver input to populate missing elements of the log originally recorded under the unidentified driver profile, and construct the new event record(s) for the driver;

(c) Set the event record status of the ELD record(s) identified in paragraph 4.4.4.2.4(a) of this appendix, which is being modified, to “2” (inactive–changed);

(d) Set the event record status of the ELD record(s) constructed in paragraph 4.4.4.2.4(b) of this appendix to “1” (active); and

(e) Set the event record origin of the ELD record(s) constructed in paragraph 4.4.4.2.4(b) of this appendix to “4” (assumed from unidentified driver profile).

4.4.4.2.5 Motor Carrier Edit Suggestions

If a motor carrier requests an edit on a driver’s records electronically, the ELD must:

(a) Identify the ELD record(s) the motor carrier requests to be modified for which the "event record status" is currently set to "1" (active);

(c) Acquire motor carrier input for the intended edit and construct the ELD record(s) that will replace the record identified in paragraph 4.4.4.2.5(a) of this appendix—if approved by the driver;

(d) Set the event record status of the ELD record(s) in paragraph 4.4.4.2.5(b) of this appendix to "3" (inactive–change requested); and

(e) Set the event record origin of the ELD record constructed in paragraph 4.4.4.2.5(b) of this appendix to "3" (edit requested by an authenticated user other than the driver).

4.4.4.2.6 Driver's Actions Over Motor Carrier Edit Suggestions

(a) If edits are requested by the motor carrier, the ELD must allow the driver to review the requested edits and indicate on the ELD whether the driver confirms or rejects the requested edit(s).

(b) If the driver approves the motor carrier's edit suggestion the ELD must:

(1) Set the event record status of the ELD record(s) identified under paragraph 4.4.4.2.5 (a) of this appendix being modified, to "2" (inactive–changed); and

(2) Set the "event record status" of the ELD record(s) constructed in paragraph 4.4.4.2.5 (b) of this appendix to "1" (active).

(c) If the driver disapproves the motor carrier's edit(s) suggestion, the ELD must set the "event record status" of the ELD record(s) identified in paragraph 4.4.4.2.5 (b) of this appendix to "4" (inactive–change rejected).

4.4.5 Data Integrity Check Functions

(a) An ELD must support standard security measures that require the calculation and recording of standard data check values for each ELD event recorded, for each line of the output file, and for the entire data file to be generated for transmission to an authorized safety official or the motor carrier.

(b) For purposes of implementing data check calculations, the alphanumeric-to-numeric mapping provided in Table 3 of this appendix must be used.

(c) Each ELD event record type specified in sections 4.5.1.1 and 4.5.1.3 of this appendix must include an event data check value, which must be calculated as specified in section 4.4.5.1. An event data check value must be calculated at the time of the following instances and must accompany that event record thereafter:

(1) When an event record is automatically created by the ELD;

(2) When an authorized edit is performed by the driver on the ELD;

(3) When an electronic edit proposal is created by the motor carrier through the ELD system.

(d) Each line of the ELD output file must include a line data check value, which must be calculated as specified in section 4.4.5.2 of this appendix.

(e) Each ELD report must also include a file data check value, which must be calculated as specified in section 4.4.5.3 of this appendix.

4.4.5.1 Event Data Check

The event data check value must be calculated as follows.

4.4.5.1.1 Event Checksum Calculation

(a) A checksum calculation includes the summation of numeric values or mappings of a specified group of alphanumeric data elements. The ELD must calculate

an event checksum value associated with each ELD event at the instance of the event record being created.

(b) The event record elements that must be included in the checksum calculation are the following:

(1) <Event Type>,

(2) <Event Code>,

(3) <Event Date>,

(4) <Event Time>,

(5) <Vehicle Miles>,

(6) <Engine Hours>,

(7) <Event Latitude>,

(8) <Event Longitude>,

(9) <CMV number>, and

(10) < ELD username>.

(c) The ELD must sum the numeric values of all individual characters making up the listed data elements using the character to decimal value coding specified in Table 3 of this appendix, and use the 8-bit lower byte of the hexadecimal representation of the summed total as the event checksum value for that event.

4.4.5.1.2 Event Data Check Calculation

The event data check value must be the hexadecimal representation of the output 8-bit byte, after the below bitwise operations are performed on the binary representation of the event checksum value, as set forth below:

(a) Three consecutive circular shift left (rotate no carry -left) operations; and

(b)A bitwise exclusive OR (XOR) operation with the hexadecimal value C3 (decimal 195; binary 11000011).

4.4.5.2 Line Data Check

A line data check value must be calculated at the time of the generation of the ELD output file, to transfer data to authorized safety officials or to catalogue drivers' ELD records at a motor carrier's facility. A line data check value must be calculated as follows.

4.4.5.2.1 Line Checksum Calculation.

(a) The ELD must calculate a line checksum value associated with each line of ELD output file at the instance when an ELD output file is generated.

(b) The data elements that must be included in the line checksum calculation vary as per the output data file specified in section 4.8.2.1 of this appendix.

(c) The ELD must convert each character featured in a line of output using the character to decimal value coding specified on Table 3 of this appendix and sum the converted numeric values of each character listed on a given ELD output line item (excluding the line data check value being calculated), and use the 8-bit lower byte value of the hexadecimal representation of the summed total as the line checksum value for that line of output.

4.4.5.2.2 Line Data Check Calculation.

The line data check value must be calculated by performing the following operations on the binary representation of the line checksum value as follows:

(a) Three consecutive circular shift left (rotate no carry -left) operations on the line checksum value; and

(b) A bitwise XOR operation with the hexadecimal value 96 (decimal 150; binary

10010110).

4.4.5.2.3 Line Data Check Value Inclusion in Output File

The calculated line data check value must be appended as the last line item of each of the individual line items of the ELD output file as specified in the output file format in section 4.8.2.1 of this appendix.

4.4.5.3 File Data Check

A file data check value must also be calculated at the time of the creation of an ELD output file. A file data check value must be calculated as follows.

4.4.5.3.1 File Checksum Calculation.

(a) The ELD must calculate a single 16-bit file checksum value associated with an ELD output file at the instance when an ELD output file is generated.

(b) The file data check value calculation must include all individual line data check values contained in that file.

(c) The ELD must sum all individual line data check values contained in a data file output created, and use the lower two 8-bit byte values of the hexadecimal representation of the summed total as the “file checksum” value.

4.4.5.3.2 File Data Check Value Calculation.

(a) The file data check value must be calculated by performing the following operations on the binary representation of the file checksum value:

(1) Three consecutive circular shift left (aka rotate no carry -left) operations on each 8-bit bytes of the value; and

(2) A bitwise XOR operation with the hexadecimal value 969C (decimal 38556; binary 1001011010011100).

(b) The file data check value must be the 16-bit output obtained from the above process.

4.4.5.3.3 File Data Check Value Inclusion in Output File.

The calculated 16-bit file data check value must be converted to hexadecimal 8-bit bytes and must be appended as the last line item of the ELD output file as specified in the output file format in section 4.8.2.1.11 of this appendix.

Table 3

Character to Decimal Value Mapping for Checksum Calculations

"Character" ➔ Decimal mapping {ASCII ("Character") (*decimal*)– 48 (*decimal*)}

"1"➔1 "A"➔17 "J"➔26 "S"➔35 "a"➔49 "j"➔58 "s"➔67
"2"➔2 "B"➔18 "K"➔27 "T"➔36 "b"➔50 "k"➔59 "t"➔68
"3"➔3 "C"➔19 "L"➔28 "U"➔37 "c"➔51 "l"➔60 "u"➔69
"4"➔4 "D"➔20 "M"➔29 "V"➔38 "d"➔52 "m"➔61 "v"➔70
"5"➔5 "E"➔21 "N"➔30 "W"➔39 "e"➔53 "n"➔62 "w"➔71
"6"➔6 "F"➔22 "O"➔31 "X"➔40 "f"➔54 "o"➔63 "x"➔72
"7"➔7 "G"➔23 "P"➔32 "Y"➔41 "g"➔55 "p"➔64 "y"➔73
"8"➔8 "H"➔24 "Q"➔33 "Z"➔42 "h"➔56 "q"➔65 "z"➔74
"9"➔9 "I"➔25 "R"➔34 "i"➔57 "r"➔66
All other characters including blank spaces➔ 0

4.5 ELD Recording

4.5.1 Events and Data to Record

An ELD must record data at the following discrete events:

4.5.1.1 Event: Change in Driver's Duty Status

When a driver's duty status changes, the ELD must associate the record with the driver, the record originator—if created during an edit or entry—the vehicle, the motor carrier, and the shipping document number and must include the following data elements:

(a) <Event Sequence ID Number> as described in section 7.24 of this appendix;

(b) <Event Record Status> as described in section 7.23;

(c) <Event Record Origin> as described in section 7.22;

(d) <Event Type> as described in section 7.25;

(e) <Event Code> as described in section 7.20;

(f) <{Event} Date> as described in section 7.8;

(g) <{Event} Time> as described in section 7.40;

(h) <{Accumulated} Vehicle Miles> as described in section 7.43;

(i) <{Elapsed} Engine Hours> as described in section 7.19;

(j) <{Event} Latitude> as described in section 7.31;

(k) <{Event} Longitude> as described in section 7.33;

(l) <Distance Since Last Valid Coordinates> as described in section 7.9;

(m) <Malfunction Indicator Status {for ELD}> as described in section 7.35;

(n) <Data Diagnostic Event Indicator Status {for Driver}> as described in section 7.7;

(o) <{Event} Comment /Annotation> as described in section 7.6;

(p) <Driver's Location Description> as described in section 7.12; and

(q) <Event Data Check Value> as described in section 7.21.

4.5.1.2 Event: Intermediate Logs

(a) When a CMV is in motion, as described in section 4.3.1.2 of this appendix, and there has not been a duty status change event or another intermediate log event recorded in the previous 1-hour period, the ELD must record a new intermediate log event.

(b) The ELD must associate the record to the driver, the vehicle, the motor carrier, and the shipping document number, and must include the same data elements outlined in section 4.5.1.1 of this appendix except for item (p) in section 4.5.1.1.

4.5.1.3 Event: Change in Driver's Indication of Allowed Conditions that Impact Driving Time Recording

(a) At each instance when the status of a driver's indication of personal use of CMV or yard moves changes, the ELD must record a new event.

(b) The ELD must associate the record with the driver, the vehicle, the motor carrier, and the shipping document number, and must include the same data elements outlined in section 4.5.1.1 of this appendix.

4.5.1.4 Event: Driver's Certification of Own Records

(a) At each instance when a driver certifies or re-certifies that the driver's records for a given 24-hour period are true and correct, the ELD must record the event.

(b) The ELD must associate the record with the driver, the vehicle, the motor carrier, and the shipping document number and must include the following data elements:

(1) <Event Sequence ID Number> as described in section 7.24 of this appendix;

(2) <Event Type> as described in section 7.25;

(3) <Event Code> as described in section 7.20;

(4) <Time Zone Offset from UTC> as described in section 7.41.

(5) <{Event} Date>and <Date {of the certified record}> as described in section 7.8; and

(6) <{Event} Time> as described in section 7.40.

4.5.1.5 Event: Driver's Login/Logout Activity

(a) At each instance when an authorized user logs in and out of the ELD, the ELD must record the event.

(b) The ELD must associate the record with the driver, the vehicle, the motor carrier, and the shipping document number, and must include the following data elements:

(1) <Event Sequence ID Number> as described in section 7.24 of this appendix;

(2) <Event Type> as described in section 7.25;

(3) <Event Code> as described in section 7.20;

(4) <{Event} Date> as described in section 7.8;

(5) <{Event} Time> as described in section 7.40;

(6) <{Total} Vehicle Miles> as described in section 7.43; and

(7) <{Total} Engine Hours> as described in section 7.19.

4.5.1.6 Event: CMV's Engine Power Up and Shut Down Activity

(a) When a CMV's engine is powered up or shut down, an ELD must record the event within 1 minute of occurrence and retain the earliest shut down and latest power-up event if the CMV has not moved since the last ignition power on cycle.

(b) The ELD must associate the record with the driver or the unidentified driver profile, the vehicle, the motor carrier, and the shipping document number, and must include the following data elements:

(1) <Event Sequence ID Number> as described in section 7.24 of this appendix;

(2) <Event Type> as described in section 7.25;

(3) <Event Code> as described in section 7.20;

(4) <{Event} Date> as described in section 7.8;

(5) <{Event} Time> as described in section 7.40;

(6) <{Total} Vehicle Miles> as described in section 7.43;

(7) <{Total} Engine Hours> as described in section 7.19;

(8) <{Event} Latitude> as described in section 7.31;

(9) <{Event} Longitude> as described in section 7.33; and

(10) <Distance Since Last Valid Coordinates> as described in section 7.9.

4.5.1.7 Event: ELD Malfunction and Data Diagnostics Occurrence

(a) At each instance when an ELD malfunction or data diagnostic event is detected or cleared by the ELD, the ELD must record the event.

(b) The ELD must associate the record with the driver, the vehicle, the motor carrier, and the shipping document number, and must include the following data elements:

(1) <Event Sequence ID Number> as described in section 7.24 of this appendix;

(2) <Event Type> as described in section 7.25;

(3) <Event Code> as described in section 7.20;

(4) <Malfunction/Diagnostic Code> as described in section 7.34;

(5) {Event} Date> as described in section 7.8;

(6) <{Event} Time> as described in section 7.40;

(7) <{Total} Vehicle Miles> as described in section 7.43; and

(8) <{Total} Engine Hours> as described in section 7.19.

4.6 ELD's Self-Monitoring of Required Functions

An ELD must have the capability to monitor its compliance with the technical requirements of this section for the detectable malfunctions and data inconsistencies listed in Table 4 of this appendix and must keep records of its malfunction and data diagnostic event detection.

Table 4

Standard Coding for Required Compliance Malfunction and Data Diagnostic Event Detection

Malfunction/Diagnostic Code	Malfunction Description
P	"Power compliance" malfunction
E	"Engine synchronization compliance" malfunction
T	"Timing compliance" malfunction
L	"Positioning compliance" malfunction
R	"Data recording compliance" malfunction
S	"Data transfer compliance" malfunction
O	"Other" ELD detected malfunction

Malfunction/Diagnostic Code	Data Diagnostic Event
1	"Power data diagnostic" event
2	"Engine synchronization data diagnostic" event
3	"Missing required data elements data diagnostic" event
4	"Data transfer data diagnostic" event
5	"Unidentified driving records data diagnostic" event
6	"Other" ELD identified diagnostic event

4.6.1 Compliance Self-Monitoring, Malfunctions and Data Diagnostic Events

4.6.1.1 Power Compliance Monitoring

(a) An ELD must monitor data it receives from the engine ECM or alternative sources as allowed in sections 4.3.1.1–4.3.1.4 of this appendix, its onboard sensors, and data record history to identify instances when it may not have complied with the power requirements specified in section 4.3.1.1, in which case, the ELD must record a power

data diagnostics event for the corresponding driver(s), or under the unidentified driver profile if no drivers were authenticated at the time of detection.

(b) An ELD must set a power compliance malfunction if the power data diagnostics event described in paragraph 4.6.1.1(a) of this appendix indicates an aggregated in-motion driving time understatement of 30 minutes or more on the ELD over a 24-hour period across all driver profiles, including the unidentified driver profile.

4.6.1.2 Engine Synchronization Compliance Monitoring

(a) An ELD must monitor the data it receives from the engine ECM or alternative sources as allowed in sections 4.3.1.1–4.3.1.4 of this appendix, its onboard sensors, and data record history to identify instances and durations of its non-compliance with the ELD engine synchronization requirement specified in section 4.2.

(b) An ELD required to establish a link to the engine ECM as described in section 4.2 must monitor its connectivity to the engine ECM and its ability to retrieve the vehicle parameters described under section 4.3.1 of this appendix and must record an engine-synchronization data diagnostics event when it no longer can acquire updated values for the ELD parameters required for records within 5 seconds of the need.

(c) An ELD must set an engine synchronization compliance malfunction if connectivity to any of the required data sources specified in section 4.3.1 of this appendix is lost for more than 30 minutes during a 24-hour period aggregated across all driver profiles, including the unidentified driver profile.

4.6.1.3 Timing Compliance Monitoring

The ELD must periodically cross-check its compliance with the requirement specified in section 4.3.1.5 of this appendix with respect to an accurate external UTC

source and must record a timing compliance malfunction when it can no longer meet the underlying compliance requirement.

4.6.1.4 Positioning Compliance Monitoring

(a) An ELD must continually monitor the availability of valid position measurements meeting the listed accuracy requirements in section 4.3.1.6 of this appendix and must track the distance and elapsed time from the last valid measurement point.

(b) ELD records requiring location information must use the last valid position measurement and include the latitude/longitude coordinates and distance traveled, in miles, since the last valid position measurement.

(c) An ELD must monitor elapsed time during periods when the ELD fails to acquire a valid position measurement within 5 miles of the CMV's movement. When such elapsed time exceeds a cumulative 60 minutes over a 24 hour period, the ELD must set and record a positioning compliance malfunction.

(d) If a new ELD event must be recorded at an instance when the ELD had failed to acquire a valid position measurement within the most recent elapsed 5 miles of driving, but the ELD has not yet set a positioning compliance malfunction, the ELD must record the character "X" in both the latitude and longitude fields, unless location is entered manually by the driver, in which case it must log the character "M" instead. Under the circumstances listed in this paragraph, if the ELD event is due to a change in duty status for the driver, the ELD must prompt the driver to enter location manually in accordance with section 4.3.2.7 of this appendix. If the driver does not enter the location

information and the vehicle is in motion, the ELD must record a missing required data element data diagnostic event for the driver.

(e) If a new ELD event must be recorded at an instance when the ELD has set a positioning compliance malfunction, the ELD must record the character "E" in both the latitude and longitude fields regardless of whether the driver is prompted and manually enters location information.

4.6.1.5 Data Recording Compliance Monitoring

(a) An ELD must monitor its storage capacity and integrity and must detect a data recording compliance malfunction if it can no longer record or retain required events or retrieve recorded logs that are not otherwise catalogued remotely by the motor carrier.

(b) An ELD must monitor the completeness of the ELD event record information in relation to the required data elements for each event type and must record a missing data elements data diagnostics event for the driver if any required field is missing at the time of recording.

4.6.1.6 Monitoring Records Logged under the Unidentified Driver Profile

(a) When there are ELD records involving driving time logged on an ELD under the unidentified driver profile, the ELD must prompt the driver(s) logging in with a warning indicating the existence of new unassigned driving time.

(b) The ELD must provide a mechanism for the driver to review and either acknowledge the assignment of one or more of the unidentified driver records attributable to the driver under the authenticated driver's profile as described in paragraph 4.3.2.8.2 (b)(1) of this appendix or indicate that these records are not attributable to the driver.

(c) If more than 30 minutes of driving in a 24-hour period show unidentified driver on the ELD, the ELD must detect and record an unidentified driving records data diagnostic event and the data diagnostic indicator must be turned on for all drivers logged in to that ELD for the current 24-hour period and the following 7 days.

(d) An unidentified driving records data diagnostic event can be cleared by the ELD when driving time logged under the unidentified driver profile for the current 24-hour period and the previous 7 consecutive days drops to 15 minutes or less.

4.6.1.7 Data Transfer Compliance Monitoring

(a) An ELD must implement in-service monitoring functions to verify that the data transfer mechanism(s) described in section 4.9.1 of this appendix are continuing to function properly. An ELD must verify this functionality at least once every 7 days. These monitoring functions may be automatic or may involve manual steps for a driver.

(b) If the monitoring mechanism fails to confirm proper in-service operation of the data transfer mechanism(s), an ELD must record a data transfer data diagnostic event and enter an unconfirmed data transfer mode.

(c) After an ELD records a data transfer data diagnostic event, the ELD must increase the frequency of the monitoring function to check at least once every 24-hour period. If the ELD stays in the unconfirmed data transfer mode following the next three consecutive monitoring checks, the ELD must detect a data transfer compliance malfunction.

4.6.1.8 Other Technology-Specific Operational Health Monitoring

In addition to the required monitoring schemes described in sections 4.6.1.1–4.6.1.7 of this appendix, the ELD provider may implement additional, technology-

specific malfunction and data diagnostic detection schemes and may use the ELD's malfunction status indicator and data diagnostic status indicator (described in sections 4.6.2.1 and 4.6.3.1) to communicate the ELD's malfunction or non-compliant state to the operator(s) of the ELD.

4.6.2 ELD Malfunction Status Indicator

ELD malfunctions affect the integrity of the device and its compliance; therefore, active malfunctions must be indicated to all drivers who may use that ELD. An ELD must provide a recognizable visual indicator, and may provide an audible signal, to the operator as to its malfunction status.

4.6.2.1 Visual Malfunction Indicator

(a) An ELD must display a single visual malfunction indicator for all drivers using the ELD on the ELD's display or on a stand-alone indicator. The visual signal must be visible to the driver when the driver is seated in the normal driving position.

(b) The ELD malfunction indicator must be clearly illuminated when there is an active malfunction on the ELD.

(c) The malfunction status must be continuously communicated to the driver when the ELD is powered.

4.6.3 ELD Data Diagnostic Status Indicator

ELD data diagnostic status affects only the authenticated user; therefore, an ELD must only indicate the active data diagnostics status applicable to the driver logged into the ELD. An ELD must provide a recognizable visual indicator, and may provide an audible signal, to the driver as to its data diagnostics status.

4.6.3.1 Visual Data Diagnostics Indicator

(a) An ELD must display a single visual data diagnostics indicator, apart from the visual malfunction indicator described in section 4.6.2.1 of this appendix, to communicate visually the existence of active data diagnostics events for the applicable driver.

(b) The visual signal must be visible to the driver when the driver is seated in the normal driving position.

4.7 Special Purpose ELD Functions

4.7.1 Driver's ELD Volume Control

(a) If a driver selects the sleeper-berth state for the driver's record of duty status and no co-driver has logged into the ELD as on-duty driving, and if the ELD outputs audible signals, the ELD must either:

(1) Allow the driver to mute the ELD's volume or turn off the ELD's audible output, or

(2) Automatically mute the ELD's volume or turn off the ELD's audible output.

(b) For purposes of this section, if an ELD operates in combination with another device or other hardware or software technology that is not separate from the ELD, the volume controls required herein apply to the combined device or technology.

4.7.2 Driver's Access to Own ELD Records

ELD must provide a mechanism for a driver to obtain a copy of the driver's own ELD records on demand, in either an electronic or printout format compliant with inspection standards outlined in section 4.8.2.1 of this appendix.

(a) The process must not require a driver to go through the motor carrier to obtain copies of the driver's own ELD records if driver's records reside on or are accessible directly by the ELD unit used by the driver.

(b) If an ELD meets the requirements of this section by making data files available to the driver, it must also provide a utility function for the driver to display the data on a computer, at a minimum, as specified in § 395.8(g).

4.7.3 Privacy Preserving Provision for Use During Personal Uses of a CMV

(a) An ELD must record the events listed in section 4.5.1 of this appendix under all circumstances. However, when a driver indicates that the driver is temporarily using the CMV for an authorized personal purpose, a subset of the recorded elements must either be omitted in the records or recorded at a lower precision level, as described in further detail below. The driver indicates this intent by setting the driver's duty status to off-duty, as described in section 4.3.2.2.1, and indicating authorized personal use of CMV as described in section 4.3.2.2.2.

(b) During a period when a driver indicates authorized personal use of CMV, the ELD must:

(1) Record all new ELD events with latitude/longitude coordinates information rounded to a single decimal place resolution; and

(2) Omit recording vehicle miles and engine hours fields in new ELD logs by leaving them blank, except for events corresponding to a CMV's engine power-up and shut-down activity as described in section 4.5.1.6 of this appendix.

(c) A driver's indication that the CMV is being operated for authorized personal purposes may span more than one CMV ignition on cycle if the driver proactively

confirms continuation of the personal use condition prior to placing the vehicle in motion when the ELD prompts the driver at the beginning of the new ignition power on cycle.

4.8. ELD Outputs

4.8.1 Printout or Display

The ELD must be able to generate a compliant report as specified in this section, either as a printout or on a display.

4.8.1.1 Print Paper Requirements

Print paper must be able to accommodate the graph grid specifications as listed in section 4.8.1.3 of this appendix.

4.8.1.2 Display Requirements

(a) This section does not apply if an ELD produces a printout for use at a roadside inspection.

(b) An ELD must be designed so that its display may be reasonably viewed by an authorized safety official without entering the commercial motor vehicle. For example, the display may be untethered from its mount or connected in a manner that would allow it to be passed outside of the vehicle for a reasonable distance.

4.8.1.3 Information To Be Shown on the Printout and Display at Roadside

(a) The printout and display must show reports for the inspected driver's profile and the unidentified driver profile separately. If there are no unidentified driver records existing on the ELD for the current 24-hour period and for any of the previous 7

consecutive days, an ELD does not need to print or display unidentified driver records for the authorized safety official. Otherwise, both reports must be printed or displayed and provided to the authorized safety official.

(b)The printout and display must show the following information for the current 24-hour period and each of the previous 7 consecutive days: (Items in < . > are data elements.)

Date: <Date {of Record}>

24-hour Starting Time, Time Zone Offset from UTC: <24-Hour Period Starting Time>, <Time Zone Offset from UTC>

Carrier: <Carrier's USDOT number>,<Carrier Name>

Driver Name: <{Driver} Last Name>, <{Driver} First Name>

Driver ID < ELD username{for the driver} >

Driver License State <{Driver} Driver License Issuing State>

Driver License Number: <{Driver} Driver License Number>

Co-Driver: <{Co-Driver's} Last Name>, <{Co-Driver's} First Name>

Co-Driver ID: < ELD username{for the co-driver}>

Current Odometer: <{Current}{Total} Vehicle Miles>

Current Engine Hours: <{Current}{Total} Engine Hours>

ELD ID: <ELD Registration ID>

ELD Provider: <Provider**>**

Truck Tractor ID: <CMV Power Unit Number>

Truck Tractor VIN: <CMV VIN>

Shipping ID: <Shipping Document Number>

Current Location: <{Current} Geo-location>

Unidentified Driving Records: <{Current} Data Diagnostic Event Indicator Status {for "Unidentified driving records data diagnostic" event}>

Exempt Driver Status: <Exempt Driver Configuration {for the Driver}>

ELD Malfunction Indicators: <Malfunction Indicator Status {and Malfunction Description} {for ELD}>

Driver's Data Diagnostic Status: <Data Diagnostic Event Status {and Diagnostic Description}{for Driver}>

Date: <Date {of Printout or Display}>

Change of Duty Status, Intervening Interval Records and Change in Driver's Indication of Special Driving Conditions:

<Event Record Status>,<Event Record Origin>,<Event Type>,<{Event} Date>, <{Event} Time>,<{Accumulated} Vehicle Miles>,<{Elapsed} Engine Hours>,<Geo-Location>#,<{Event} Comment/Annotation>

:

:

<Event Sequence ID Number>,<Event Record Status>,<Event Record Origin>,<Event Type>,<Event Code>,<{Event} Date>,<{Event} Time>,<{Accumulated} Vehicle Miles>,<{Elapsed} Engine Hours>,<Geo-Location>#,<{Event} Comment/Annotation>

"<Geo-location> must be substituted with "<Driver's Location Description>" field for manual entries and with "<{blank}>" field for intervening logs.

Example of Print/Display Daily Header

Record Date	USDOT #	Driver License Number	Driver License State	ELD ID	Trailer ID
20-Nov-14	123456789	D000368210361	IL	987654	Unit #
Time Zone	Driver Name	Co-Driver Name	ELD Manufacturer	Shipping ID	Data Diagnostic Indicators
CST	Smith, Richard	Jones, David	Acme ELDs	BL1234567890	Yes
24-Period Starting Tim	Driver ID	Co-Driver ID	Truck Tractor ID	Unidentified Driver Records	ELD Malfunction Indicators
Midnight	1234567	8910111	Unit #	No	Yes
Carrier		Start- End Odometer	Truck Tractor VIN	Exempt Driver Status	Start-End engine hours
Acme Trucking		39564-40044	1M2P267Y5AM022445	No	758.2-766.7
Current Location		File Comment		Print/Display Date	
Truckee, CA				20-Nov-14	

24 Hours [Print/Display Graph Grid]

Total hours <Total Hours {in working day so far}>

Off duty <Total Hours {logged in Off-duty status}>

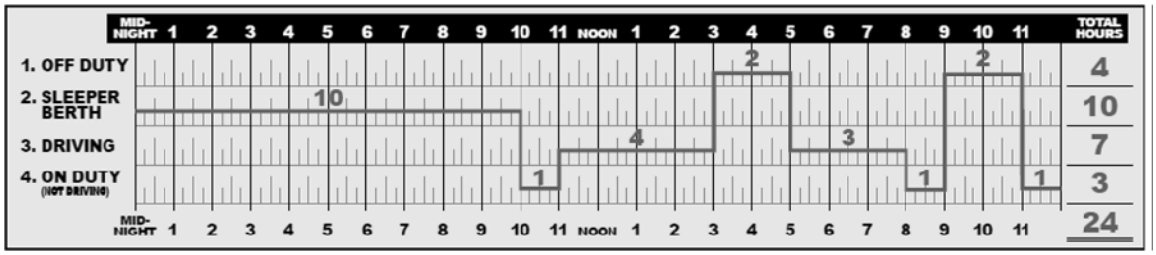
Sleeper Berth <Total Hours {logged in Sleeper berth status}>

Driving <Total Hours {logged in Driving status}>

On duty not driving <Total Hours {logged in on-duty not driving status}>

Miles Today < Vehicle Miles {Driven Today}>

Example of Print/Display 24 Hours Duty Status Grid



[For Each Row of Driver's Record Certification Events]

Time: <{Event} Time>

Location: <Geo-Location>#

Odometer: <{Total} Vehicle Miles>

Engine Hours: <{Total} Engine Hours>

Event:<Date {of the certified record}>

Origin: Driver

Comment: <{Event} Comment/Annotation>

[For Each Row of Malfunctions and Data Diagnostic Events]

Time: <{Event} Time>

Location: <Geo-Location>#

Odometer: < {Total}Vehicle Miles>

Engine Hours: <{Total}Engine Hours>

Event:<Event Type>

Origin: <Event Record Origin>

Comment: <{Event} Comment/Annotation>

[For Each Row of ELD Login/Logout Events]

Time: <{Event} Time>

Location: <Geo-Location>#

Odometer: < {Total}Vehicle Miles>

Engine Hours: <{Total}Engine Hours>

Event:<Event Type>

Origin: <ELD username>

Comment: <{Event} Comment/Annotation>

[For Each Row of CMV Engine Power up / Shut Down Events]

Time: <{Event} Time> (24 hours)

Location: <Geo-Location>#

Odometer: < {Total}Vehicle Miles>

Engine Hours: <{Total}Engine Hours>

Event:<Event Type>

Origin: Auto

Comment/Annotation>

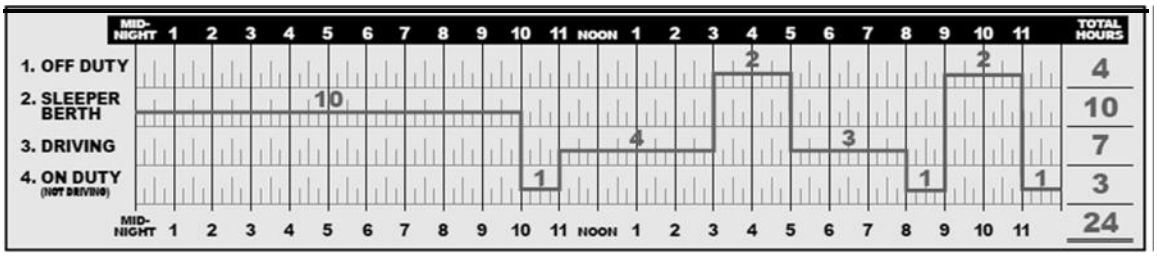
[1]Printout report must only list up to 10 most recent ELD malfunctions and up to 10 most recent data diagnostics events within the time period for which the report is generated.

Example of Print/Display detail log data

Time	Location	Odometer	Eng Hours	Event Type/Status	Origin
19-Nov-14					
22:00	49 mi NNE Fallon, NV	39564	758.2	Off duty	Driver
20-Nov-14					
10:00	49 mi NNE Fallon, NV	39564	758.2	Login	Driver
10:00	49 mi NNE Fallon, NV	39564	758.2	ODND	Driver
11:52	49 mi NNE Fallon, NV	39564	758.2	PowerUp	Auto
11:52	49 mi NNE Fallon, NV	39564	758.2	Power Compliance	Auto
11:52	49 mi NNE Fallon, NV	39564	758.2	Engine Sync	Auto
12:00	49 mi NNE Fallon, NV	39564	758.3	Driving	Driver
13:00	2 mi E Fernley, NV	39624	759.3	Int Location	Auto
14:00	7 mi NNE Truckee, CA	39684	760.3	Int Location	Auto
15:00	6 mi SSE Meadow Vista, CA	39744	761.3	Int Location	Auto
16:00	3.5 mi SW Davis, CA	39804	762.3	Off duty	Driver
16:45	3.5 mi SW Davis, CA	39804	762.3	On duty	Driver
17:00	3.5 mi SW Davis, CA	39804	762.4	Driving	Auto

Example of Full Day ELD Record:

Record Date	*USDOT #*	*Driver License Number*	*Driver License State*	*ELD ID*	*Trailer ID*
20-Nov-14	123456789	D000368210361	IL	987654	Unit #
Time Zone	*Driver Name*	*Co-Driver Name*	*ELD Manufacturer*	*Shipping ID*	*Data Diagnostic Indicators*
CST	Smith, Richard		Acme ELDs	BL1234567890	No
24 Period Starting Time	*Driver ID*	*Co-Driver ID*	*Truck Tractor ID*	*Unidentified Driver Records*	*ELD Malfunction Indicators*
Midnight	1234567		Unit #	No	No
Carrier	*Start End Odometer*	*Miles Today*	*Truck Tractor VIN*	*Exempt Driver Status*	*Start End Engine Hours*
Acme Trucking	39564 - 39984	420	1M2P267Y5AM022445	No	758.2-765.7
Current Location	*File Comment*			*Print/Display Date*	
6 mi. NE North Auburn, CA				20-Nov-14	



Time	Location	Odometer	Eng Hours	Event Type/Status	Origin
20-Nov-14					
0:00	49 mi NNE Fallon, NV	39564	758.2	SB	Driver
10:00	49 mi NNE Fallon, NV	39564	758.2	Login	Driver
10:00	49 mi NNE Fallon, NV	39564	758.2	ODND	Driver
10:52	49 mi NNE Fallon, NV	39564	758.2	Power Up	Auto
11:00	49 mi NNE Fallon, NV	39564	758.2	Driving	Auto
12:00	2 mi E Fernley, NV	39624	759.3	Int Location	Auto
13:00	7 mi NNE Truckee, CA	39684	760.3	Int Location	Auto
14:00	6 mi SSE Meadow Vista, CA	39744	761.3	Int Location	Auto
15:00	3.5 mi SW Davis, CA	39804	762.3	Off Duty	Driver
17:00	3.5 mi SW Davis, CA	39804	762.3	Driving	Auto
18:00	1 mi E Emeryville, CA	39864	763.4	Int Location	Auto
19:00	4 mi SSW Univ. of California,	39924	764.4	Int Location	Auto
20:00	6 mi NE North Auburn, CA	39984	765.5	ODND	Driver
21:00	6 mi NE North Auburn, CA	39984	765.7	Off Duty	Driver
23:00	6 mi NE North Auburn, CA	39984	765.7	ODND	Driver
23:58	6 mi NE North Auburn, CA	39984	765.7	Cert	Driver
23:58	6 mi NE North Auburn, CA	39984	765.7	Logout	Driver

(c) The printout and display must show a graph-grid consistent with § 395.8(g) showing each change of duty status.

(1)On the printout, the graph-grid for each day's RODS must be at least 6 inches by 1.5 inches in size.

(2)The graph-grid must overlay periods of driver's indications of authorized personal use of CMV and yard moves using a different style line (such as dashed or dotted line) or shading. The appropriate abbreviation must also be indicated on the graph-grid.

4.8.2 ELD Data File

An ELD must have the capability to generate a consistent electronic file output compliant with the format described herein to facilitate the transfer, processing, and standardized display of ELD data sets on the authorized safety officials' computing environments.

4.8.2.1 ELD Output File Standard

(a) Regardless of the particular database architecture used for recording the ELD events in electronic format, the ELD must produce a standard ELD data output file for transfer purposes, which must be generated according to the standard specified in this section.

(b) Data output must be provided in a single comma-delimited file outlined in this section using American National Standard Code for Information Exchange (ASCII) character sets meeting the standards of ANSI INCITS 4-1986 (R2012) (incorporated by reference, see § 395.38). It must include:

(1) A header segment, which specifies current or non-varying elements of an ELD file; and

(2) Variable length comma-delimited segments for the drivers, vehicles, ELD events, ELD malfunction and data diagnostics records, ELD login and logout activity, and unidentified driver records.

(3) Any field value that may contain a comma (“,”) or a carriage return (<CR>) must be replaced with a semicolon (‘;’) before generating the compliant CSV output file

4.8.2.1.1 Header Segment

This segment must include the following data elements and format:

ELD File Header Segment: <CR>

<{Driver's} Last Name>,<{Driver's} First Name>,< ELD username{for the driver} >,< {Driver's} Driver's License Issuing State>,<{Driver's} Driver's License Number>,<Line Data Check Value> <CR>

<{Co-Driver's} Last Name>,<{Co-Driver's} First Name>,<ELD username {for the co-driver} >,<Line Data Check Value> <CR>

<CMV Power Unit Number>,<CMV VIN>,<Trailer Number(s)>,<Line Data Check Value> <CR>

<Carrier's USDOT Number>,<Carrier Name>,<Multiday-basis Used>,<24-Hour Period Starting Time>,<Time Zone Offset from UTC>,<Line Data Check Value> <CR>

<Shipping Document Number>,<Exempt Driver Configuration>,<Line Data Check Value> <CR>

<{Current} Date>,< {Current} Time>,< {Current} Latitude>,<{Current} Longitude>,< {Current} {Total} Vehicle Miles>,< {Current} {Total} Engine Hours>,<Line Data Check Value> <CR>

<ELD Registration ID>,<ELD Identifier>,<ELD Authentication Value>,<Output File Comment>,<Line Data Check Value> <CR>

4.8.2.1.2 User List

This segment must list all drivers and co-drivers with driving time records on the most recent CMV operated by the inspected driver and motor carrier's support personnel who requested edits within the time period for which this file is generated. The list must

be in chronological order with most recent user of the ELD on top, and include the driver being inspected, the co-driver, and the unidentified driver profile. This segment has a variable number of rows depending on the number of profiles with activity over the time period for which this file is generated. This section must start with the following title:

User List: <CR>

Each subsequent row must have the following data elements:

<{Assigned User} Order Number>,<{User's} ELD Account Type>,<{User's} Last Name>,<{User's} First Name>,<Line Data Check Value> <CR>

4.8.2.1.3 CMV List

This segment must list each CMV that the current driver operated and that has been recorded on the driver's ELD records within the time period for which this file is generated. The list must be rank ordered in accordance with the time of CMV operation with the most recent CMV being on top. This segment has a variable number of rows depending on the number of CMVs operated by the driver over the time period for which this file is generated. This section must start with the following title:

CMV List: <CR>

Each subsequent row must have the following data elements:

<{Assigned CMV} Order Number>,<CMV Power Unit Number>,<CMV VIN>,<Line Data Check Value> <CR>

4.8.2.1.4 ELD Event List for Driver's Record of Duty Status

This segment must list ELD event records tagged with event types 1 (a change in duty status as described in section 4.5.1.1 of this appendix), 2 (an intermediate log as described in section 4.5.1.2), and 3 (a change in driver's indication of conditions

impacting driving time recording as described in section 4.5.1.3). The segment must list all event record status types and all event record origins for the driver, rank ordered with the most current log on top in accordance with the date and time fields of the record. This segment has a variable number of rows depending on the number of ELD events recorded for the driver over the time period for which this file is generated. This section must start with the following title:

ELD Event List: <CR>

Each subsequent row must have the following data elements:

<Event Sequence ID Number>,<Event Record Status>,<Event Record Origin>,<Event Type>, <Event Code>,<{Event} Date>,<{Event} Time>,< {Accumulated} Vehicle Miles>,< {Elapsed} Engine Hours>,<{Event} Latitude>,<{Event} Longitude>,<Distance Since Last Valid Coordinates>, <{Corresponding CMV} Order Number>,<{ User} Order Number {for Record Originator}>,<Malfunction Indicator Status {for ELD}>,<Data Diagnostic Event Indicator Status {for Driver}>,<Event Data Check Value>,<Line Data Check Value> <CR>

4.8.2.1.5 Event Annotations, Comments, and Driver's Location Description

This segment must list only the elements of the ELD event list created in section 4.8.2.1.4 of this appendix that have an annotation, comment, or a manual entry of location description by the driver. This segment has a variable number of rows depending on the number of ELD events under section 4.8.2.1.4 that feature a comment, annotation, or manual location entry by the driver. This section must start with the following title:

ELD Event Annotations or Comments: <CR>

Each subsequent row must have the following data elements:

<Event Sequence ID Number>,< ELD username {of the Record Originator} >,<{Event} Comment Text or Annotation>,<{Event} Date>,<{Event} Time>, <Driver's Location Description>,<Line Data Check Value> <CR>

4.8.2.1.6 ELD Event List for Driver's Certification of Own Records

This segment must list ELD event records with event type 4 (driver's certification of own records as described in section 4.5.1.4 of this appendix) for the inspected driver for the time period for which this file is generated. It must be rank ordered with the most current record on top. This segment has a variable number of rows depending on the number of certification and re-certification actions the authenticated driver may have executed on the ELD over the time period for which this file is generated. This section must start with the following title:

Driver's Certification/Recertification Actions: <CR>

Each subsequent row must have the following data elements:

<Event Sequence ID Number>,<Event Code>,<{Event} Date>,<{Event} Time>,<Date {of the certified record}>,<{Corresponding CMV} Order Number>,<Line Data Check Value> <CR>

4.8.2.1.7 Malfunction and Diagnostic Event Records

This segment must list all malfunctions that have occurred on this ELD during the time period for which this file is generated. It must list diagnostic event records related to the driver being inspected, rank ordered with the most current record on top. This segment has a variable number of rows depending on the number of ELD malfunctions and ELD diagnostic event records recorded and relevant to the inspected driver over the time period for which this file is generated. This section must start with the following title:

Malfunctions and Data Diagnostic Events: <CR>

Each subsequent row must have the following data elements:

<Event Sequence ID Number>,<Event Code>,<Malfunction/Diagnostic Code>,<{Event} Date>,<{Event} Time>,<{Total} Vehicle Miles>,<{Total} Engine Hours>,<{Corresponding CMV} Order Number>,<Line Data Check Value> <CR>

4.8.2.1.8 ELD Login/Logout Report

This segment must list the login and logout activity on the ELD (ELD events with event type 5 (A driver's login/logout activity)) for the inspected driver for the time period for which this file is generated. It must be rank ordered with the most recent activity on top. This section must start with the following title:

ELD Login/Logout Report: <CR>

Each subsequent row must have the following data elements:

<Event Sequence ID Number>,<Event Code>,<ELD username>,<{Event} Date>,<{Event} Time>,<{Total} Vehicle Miles>,<{Total} Engine Hours>,<Line Data Check Value> <CR>

4.8.2.1.9 CMV's Engine Power-Up and Shut Down Activity

This segment must list the logs created when a CMV's engine is powered up and shut down (ELD events with event type 6 (CMV's engine power up/shut down)) for the time period for which this file is generated. It must be rank ordered with the latest activity on top. This section must start with the following title:

CMV Engine Power-Up and Shut Down Activity: <CR>

Each subsequent row must have the following data elements: <Event Sequence ID Number>,<Event Code>,<{Event} Date>,<{Event}

Time>,<{Total} Vehicle Miles>,<{Total} Engine Hours>,<{Event} Latitude>,<{Event} Longitude>,<CMV Power Unit Number>,<CMV VIN>,<Trailer Number(s)>,<Shipping Document Number>,<Line Data Check Value> <CR>

4.8.2.1.10 ELD Event Log List for the Unidentified Driver Profile

This segment must list the ELD event records for the Unidentified Driver profile, rank ordered with most current log on top in accordance with the date and time fields of the logs. This segment has a variable number of rows depending on the number of Unidentified Driver ELD records recorded over the time period for which this file is generated. This section must start with the following title:

Unidentified Driver Profile Records: <CR>

Each subsequent row must have the following data elements:

<Event Sequence ID Number>,<Event Record Status>,<Event Record Origin>,<Event Type>,<Event Code>,<{Event} Date>,<{Event} Time>,< {Accumulated} Vehicle Miles>,< {Elapsed} Engine Hours>,<{Event} Latitude>,<{Event} Longitude>,<Distance Since Last Valid Coordinates>, <{Corresponding CMV} Order Number>,<Malfunction Indicator Status {for ELD}>,<Event Data Check Value>,<Line Data Check Value> <CR>

4.8.2.1.11 File Data Check Value

This segment lists the file data check value as specified in section 4.4.5.3 of this appendix. This part includes a single line as follows:

End of File: <CR>

<File Data Check Value><CR>

4.8.2.2 ELD Output File Name Standard

If the ELD output is saved in a file for transfer or maintenance purposes, it must follow the 25 character-long filename standard below:

(a) The first five position characters of the filename must correspond to the first five letters of the last name of the driver for whom the file is compiled. If the last name of the driver is shorter than five characters, remaining positions must use the character "_" [underscore] as a substitute character. For example, if the last name of the driver is "Lee", the first five characters of the output file must feature "Lee_ _".

(b) The sixth and seventh position characters of the filename must correspond to the last two digits of the driver's license number for the driver for whom the file is compiled.

(c) The eighth and ninth position characters of the filename must correspond to the sum of all individual numeric digits in the driver's license number for the driver for whom the file is compiled. The result must be represented in two-digit format. If the sum value exceeds 99, use the last two digits of the result. For example, if the result equals "113", use "13". If the result is less than 10, use 0 as the first digit. For example, if the result equals "5", use "05".

(d) The tenth through fifteenth position characters of the filename must correspond to the date the file is created. The result must be represented in six digit format "MMDDYY" where "MM" represents the month, ""DD" represents the day, and "YY" represents the last two digits of the year. For example, February 5, 2013, must be represented as "020513".

(e) The sixteenth position character of the filename must be a hyphen "-".

(f) The seventeenth through twenty-fifth position characters of the filename must, by default, be “000000000” but each of these nine digits can be freely configured by the motor carrier or the ELD provider to be a number between 0 and 9 or a character between A and Z to be able to produce distinct files—if or when necessary—that may otherwise be identical in filename as per the convention proposed in this section. ELD providers or motor carriers do not need to disclose details of conventions they may use for configuring the seventeenth through twenty-fifth digits of the filename.

4.9 Data Transfer Capability Requirements

An ELD must be able to present the captured ELD records of a driver in the standard electronic format as described below, and transfer the data file to an authorized safety official, on demand, for inspection purposes.

4.9.1 Data Transfer During Roadside Safety Inspections

(a) On demand during a roadside safety inspection, an ELD must produce ELD records for the current 24-hour period and the previous 7 consecutive days in electronic format, in the standard data format described in section 4.8.2.1 of this appendix.

(b) When a driver uses the single-step driver interface, as described in section 4.3.2.4 of this appendix, to indicate that the ELD compile and transfer the driver’s ELD records to authorized safety officials, the ELD must transfer the generated ELD data output to the computing environment used by authorized safety officials via the standards referenced in this section. To meet roadside electronic data transfer requirements, an ELD must do at least one of the following:

(1) Option 1—Telematics transfer methods. Transfer the electronic data using both:

(i) Wireless Web services, and

(ii) Email, or

(2) Option 2—Local transfer methods. Transfer the electronic data using both:

(i) USB2 (incorporated by reference, see § 395.38), and

(ii) Bluetooth (incorporated by reference, see § 395.38).

(c) The ELD must provide an ELD record for the current 24-hour period and the previous 7 consecutive days as described in section 4.8.1.3 either on a display or on a printout.

(d) An ELD must support one of the two options for roadside data transfer in paragraph (b) of this section, and must certify proper operation of each element under that option. An authorized safety official will specify which transfer mechanism the official will use within the certified transfer mechanisms of an ELD.

4.9.2 Motor Carrier Data Reporting

(a) An ELD must be capable of retaining copies of electronic ELD records for a period of at least 6 months from the date of receipt.

(b) An ELD must produce, on demand, a data file or a series of data files of ELD records for a subset of its drivers, a subset of its vehicles, and for a subset of the 6-month record retention period, to be specified by an authorized safety official, in an electronic format standard described in section 4.8.2.1 of this appendix or, if the motor carrier has multiple offices or terminals, within the time permitted under § 390.29.

(1) At a minimum, an ELD must be able to transfer the ELD records electronically by one of the following transfer mechanisms:

(2) Web Services as specified in section 4.10.1.1 of this appendix (but not necessarily wirelessly), and E-mail as specified 4.10.1.2 (but not necessarily wirelessly); or

(3)USB 2.0 as specified in section 4.10.1.3 of this appendix and Bluetooth, as specified in section 4.10.1.4 (both incorporated by reference, see § 395.38).

4.10 Communications Standards for the Transmittal of Data Files from ELDs

ELDs must transmit ELD records electronically in accordance with the file format specified in section 4.8.2.1 of this appendix and must be capable of a one-way transfer of these records to authorized safety officials upon request as specified in section 4.9.

4.10.1 Data Transfer Mechanisms

For each type of data transfer mechanism, an ELD must follow the specifications in this section.

4.10.1.1 Wireless Data Transfer via Web Services

(a) Transfer of ELD data to FMCSA via Web Services must follow the following standards:

(1)Web Services Description Language (WSDL) 1.1

(2)Simple Object Access Protocol (SOAP) 1.2 (incorporated by reference, see § 395.38)

(3)Extensible Markup Language (XML) 1.0 5th Edition

(b) If an ELD provider plans to use Web Services, upon ELD provider registration as described in section 5.1 of this appendix,

(1) FMCSA will provide formatting files necessary to convert the ELD file into an XML format and upload the data to the FMCSA servers. These files include FMCSA's Rules of Behavior, XML Schema, WSDL file, Interface Control Document (ICD), and the ELD Web Services Development Handbook, and

(2)ELD Providers must obtain a Public/Private Key pair compliant with the NIST SP 800-32, Introduction to Public Key Technology and the Federal PKI Infrastructure, (incorporated by reference, see § 395.38), and submit the public key with their registration.

(3)ELD Providers will be required to complete a test procedure to ensure their data is properly formatted before they can begin submitting driver's ELD data to the FMCSA server.

(c) ELD data transmission must be accomplished in a way that protects the privacy of the driver(s).

(d)At roadside, if both the vehicle operator and law enforcement have an available data connection, the vehicle operator will initiate the transfer of ELD data to an authorized safety official. In some cases, an ELD may be capable of converting the ELD file to an XML format using an FMCSA-provided schema and upload it using information provided in the WSDL file using SOAP via RFC 7230, RFC 7231, and RFC 5246, Transport Layer Security (TLS) Protocol Version 1.2 (incorporated by reference, see § 395.38).

4.10.1.2 Wireless Data Transfer Through E-Mail

(a) The ELD must attach a file to an email message to be sent using RFC 5321 Simple Mail Transfer Protocol (SMTP) (incorporated by reference, see § 395.38), to a specific email address, which will be shared with the ELD providers during the technology registration process.

(b)The file must have the format described in section 4.8.2.1 of this appendix and must be encrypted using the Secure/Multipurpose Internet Mail Extensions as described in RFC 5751 (incorporated by reference, see § 395.38), and the RSA algorithm as

described in RFC 4056 (incorporated by reference, see § 395.38), with the FMCSA public key compliant with NIST SP 800-32 (incorporated by reference, see § 395.38) to be provided to the ELD provider at the time of registration. The content must be encrypted using AES in FIPS Publication 197 (incorporated by reference, see § 395.38), and RFC 3565 (incorporated by reference, see § 395.38).

(c) The email must be formatted using the RFC 5322 Internet Message Format (incorporated by reference, see § 395.38), as follows:

Element	**Format**
To :	<Address Provided by FMCSA during online registration>
From :	<Desired return address for confirmation>
Subject :	ELD records from <ELD Registration ID><':'> <ELD Identifier>
Body :	<Output File Comment>
Attachment :	MIME encoded AES-256 encrypted file with <filename>.<Date string>.<unique identifier>.aes

(d) A message confirming receipt of the ELD file will be sent to the address specified in the email. The filename must follow the convention specified in section 4.8.2.2 of this appendix.

4.10.1.3 Data Transfer via USB 2.0

(a) ELDs certified for the USB data transfer mechanism must be capable of transferring ELD records using the Universal Serial Bus Specification (Revision 2.0) (incorporated by reference, see § 395.38).

(b) Each ELD technology must implement a single USB-compliant interface with the necessary adaptors for a Type A connector. The USB interface must implement the

Mass Storage class (08h) for driverless operation, to comply with IEEE standard 1667-2009, (incorporated by reference, see § 395.38).

(c) The ELD must be capable of providing power to a standard USB-compatible drive.

(d) An ELD must re-authenticate the driver prior to saving the driver's ELD file to an external device.

(e) On initiation by an authenticated driver, an ELD must be capable of saving ELD file(s) to USB-compatible drives (AES, in FIPS Publication 197, incorporated by reference, see § 395.38) that are provided by authorized safety officials during an inspection. Prior to initiating this action, ELDs must be capable of reading a text file from an authorized safety officials' drive and verifying it against a file provided to ELD providers who have registered their technologies as described in section 5.1 of this appendix.

4.10.1.4 Data Transfer via Bluetooth®

(a) Bluetooth SIG Specification of the Bluetooth System covering core package version 2.1 + EDR (incorporated by reference, see § 395.38) must be followed. ELDs using this standard must be capable of displaying a Personal Identification Number generated by the Bluetooth application profile for bonding with other devices (incorporated by reference, see § 395.38).

(b) Upon request of an authorized official, the ELD must become discoverable by the authorized safety officials' Bluetooth-enabled computing platform, and generate a random code, which the driver must share with the official (incorporated by reference, see § 395.38).

(c) The ELD must connect to the roadside authorized safety officials' technology via wireless personal area network and transmit the required data via Web Services as described in section 4.10.1.1 of this appendix.

4.10.2 Motor Carrier Data Transmission

Regardless of the roadside transmission option supported by an ELD, ELD records are to be retained and must be able to transmit enforcement-specified historical data for their drivers using one of the methods specified under section 4.9.2 of this appendix.

(a) Web services option must follow the specifications described under section 4.10.1.1 of this appendix.

(b) The email option must follow the specifications described under section 4.10.1.2 of this appendix.

(c) The USB option must follow the specifications of Universal Serial Bus Specification, revision 2.0 (incorporated by reference, see § 395.38) and described in section 4.10.1.3 of this appendix.

(d) Bluetooth must follow the specifications incorporated by reference (see § 395.38) and described in section 4.10.1.4 of this appendix.

5. ELD REGISTRATION AND CERTIFICATION

As described in § 395.22(a) of this part, motor carriers must only use ELDs that are listed on the FMCSA Web site. An ELD provider must register with FMCSA and certify each ELD model and version for that ELD to be listed on this Web site.

Appendix C- ELD Functional Requirements (Sections 5-7)

APPENDIX TO SUBPART B OF PART 395—FUNCTIONAL SPECIFICATIONS FOR ALL ELECTRONIC LOGGING DEVICES (ELDS)

5.1. ELD Provider's Registration

5.1.1. Registering Online

(a) An ELD provider developing an ELD technology must register online at a secure FMCSA Web site where the ELD provider can securely certify that its ELD is compliant with this appendix.

(b) Provider's registration must include the following information:

(1) Company name of the technology provider/manufacturer.

(2) Name of an individual authorized by the provider to verify that the ELD is compliant with this appendix and to certify it under section 5.2 of this appendix.

(3) Address of the registrant.

(4) E-mail address of the registrant.

(5) Telephone number of the registrant.

5.1.2 Keeping Information Current

The ELD provider must keep the information in section 5.1.1(b) of this appendix current through FMCSA's Web site.

5.1.3 Authentication Information Distribution

FMCSA will provide a unique ELD registration ID, authentication key(s), authentication file(s), and formatting and configuration details required in this appendix to registered providers during the registration process.

5.2 Certification of Conformity with FMCSA Standards

A registered ELD provider must certify that each ELD model and version has been sufficiently tested to meet the functional requirements included in this appendix under the conditions in which the ELD would be used.

5.2.1 Online Certification

(a) An ELD provider registered online as described in section 5.1.1 of this appendix must disclose the information in paragraph (b) of this section about each ELD model and version and certify that the particular ELD is compliant with the requirements of this appendix.

(b) The online process will only allow a provider to complete certification if the provider successfully discloses all of the following required information:

(1) Name of the product.

(2) Model number of the product.

(3) Software version of the product.

(4) An ELD identifier, uniquely identifying the certified model and version of the ELD, assigned by the ELD provider in accordance with section 7.15 of this appendix.

(5) Picture and/or screen shot of the product.

(6) User's manual describing how to operate the ELD.

(7) Description of the supported and certified data transfer mechanisms and step-by-step instructions for a driver to produce and transfer the ELD records to an authorized safety official.

(8) Summary description of ELD malfunctions.

(9) Procedure to validate an ELD authentication value as described in section 7.14 of this appendix.

(10) Certifying statement describing how the product was tested to comply with FMCSA regulations.

5.2.2 Procedure to Validate an ELD's Authenticity

Paragraph 5.2.1(b)(9) of this appendix requires that the ELD provider identify its authentication process and disclose necessary details for FMCSA systems to independently verify the ELD authentication values included in the dataset of inspected ELD outputs. The authentication value must include a hash component that only uses data elements included in the ELD dataset and data file. ELD authentication value must meet the requirements specified in section 7.14 of this appendix.

5.3 Publicly Available Information

Except for the information listed under paragraphs 5.1.1(b)(2), (4), and (5) and 5.2.1(b)(9) of this appendix, FMCSA will make the information in sections 5.1.1 and 5.2.1 for each certified ELD publicly available on a Web site to allow motor carriers to determine which products have been properly registered and certified as ELDs compliant with this appendix.

5.4 Removal of Listed Certification

5.4.1 Removal Process

FMCSA may remove an ELD model or version from the list of ELDs on the FMCSA Website in accordance with this section.

5.4.2 Notice

FMCSA shall initiate the removal of an ELD model or version from the list of ELDs on the FMCSA Web site by providing the ELD provider written notice stating:

(a) The reasons FMCSA proposes to remove the model or version from the FMCSA list; and

(b) Any corrective action that the ELD provider must take for the ELD model or version to remain on the list.

5.4.3 Response

An ELD provider that receives notice under section 5.4.2 of this appendix may submit a response to the Director, Office of Carrier Driver, and Vehicle Safety Standards no later than 30 days after issuance of the notice of proposed removal, explaining:

(a) The reasons why the ELD provider believes the facts relied on by the Agency, in proposing removal, are wrong; or

(b) The action the ELD provider will take to correct the deficiencies that FMCSA identified.

5.4.4 Agency Action

(a) If the ELD provider fails to respond within 30 days of the date of the notice issued under section 5.4.2 of this appendix, the ELD model or version shall be removed from the FMCSA list.

(b) If the ELD provider submits a timely response, the Director, Office of Carrier, Driver, and Vehicle Safety Standards, shall review the response and withdraw the notice of proposed removal, modify the notice of proposed removal, or affirm the notice of proposed removal, and notify the ELD provider in writing of the determination.

(c) Within 60 days of the determination, the ELD provider shall take any action required to comply. If the Director determines that the ELD provider failed to timely take

the required action within the 60 day period, the ELD model or version shall be removed from the FMCSA list.

(d) The Director, Office of Carrier, Driver, and Vehicle Safety Standards may request from the ELD provider any information that the Director considers necessary to make a determination under this section.

5.4.5 Administrative Review

(a) Within 30 days of removal of an ELD model or version from the FMCSA list of certified ELDs under section 5.4.4 of this appendix, the ELD provider may request administrative review.

(b) A request for administrative review must be submitted in writing to the FMCSA Associate Administrator for Policy. The request must explain the error committed in removing the ELD model or version from the FMCSA list, identify all factual, legal, and procedural issues in dispute, and include any supporting information or documents.

(c) The Associate Administrator may ask the ELD provider to submit additional information or attend a conference to discuss the removal. If the ELD provider does not submit the requested information or attend the scheduled conference, the Associate Administrator may dismiss the request for administrative review.

(d) The Associate Administrator will complete the administrative review and notify the ELD provider of the decision in writing. The decision constitutes a final Agency action.

6. REFERENCES

(a) American National Standards Institute (ANSI). 11 West 42nd Street, New York, New York 10036, http://webstore.ansi.org, (212) 642-4900.

(1) ANSI INCITS 4-1986 (R2012), American National Standard for Information Systems – Coded Character Sets – 7-Bit American National Standard Code for Information Interchange (7-Bit ASCII), approved June 14, 2007, IBR in section 4.8.2.1, Appendix A to subpart B.

(2) ANSI INCITS 446-2008 (R2013), American National Standard for Information Technology – Identifying Attributes for Named Physical and Cultural Geographic Features (Except Roads and Highways) of the United States, Territories, Outlying Areas, and Freely Associated Areas, and the Waters of the Same to the Limit of the Twelve-Mile Statutory Zone, approved October 28, 2008, IBR in section 4.4.2, Appendix A to subpart B.

(b) Bluetooth SIG, Inc. 5209 Lake Washington Blvd NE., Suite 350, Kirkland, WA 98033, https://www.bluetooth.org/Technical/Specifications/adopted.htm, (425) 6913535.

(1) Bluetooth SIG, Inc., Specification of the Bluetooth System: Wireless Connections Made Easy, Covered Core Package version 2.1 + EDR, volumes 0 through 4, approved July 26, 2007, IBR in sections 4.9.1, 4.9.2, 4.10.1.4, 4.10.2, Appendix A to subpart B.

(2) [Reserved]

(c) Institute of Electrical and Electronic Engineers (IEEE) Standards Association. 445 Hoes Lane, Piscataway, NJ 08854-4141, http://standards.ieee.org/index.html, (732) 981-0060.

(1) IEEE Std 1667-2009, IEEE Standard for Authentication in Host Attachments of Transient Storage Devices, approved 11 November 2009, IBR in section 4.10.1.3, Appendix A to subpart B.

(2) [Reserved]

(d) Internet Engineering Task Force (IETF). C/o Association Management Solutions, LLC (AMS) 48377 Freemont Blvd., Suite 117, Freemont, CA 94538, (510) 492-4080.

(1) IETF RFC 3565, Use of the Advanced Encryption Standard (AES) Encryption Algorithm in Cryptographic Message Syntax (CMS), approved July 2003, IBR in section 4.10.1.2, Appendix A to subpart B.

(2) IETF RFC 4056, Use of the RSASSA-PSS Signature Algorithm in Cryptographic Message Syntax (CMS), approved June 2005, IBR in section 4.10.1.2, Appendix A to subpart B.

(3) IETF RFC 5246, The Transport Layer Security (TLS) Protocol Version 1.2, approved August 2008, IBR in section 4.10.1.1, Appendix A to subpart B.

(4) IETF RFC 5321, Simple Mail Transfer Protocol, approved October 2008, IBR in section 4.10.1.2, Appendix A to subpart B.

(5) IETF RFC 5322, Internet Message Format, approved October 2008, IBR in section 4.10.1.2, Appendix A to subpart B.

(6) IETF RFC 5751, Secure/Multipurpose Internet Mail Extensions (S/MIME) Version 3.2, Message Specification, approved January 2010, IBR in section 4.10.1.2, Appendix A to subpart B.

(7) IETF RFC 7230, Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing, approved June 2014, IBR in section 4.10.1.1, Appendix A to subpart B.

(8) IETF RFC 7231, Hypertext Transfer Protocol (HTTP/1.1): Semantics and Content, approved June 2014, IBR in section 4.10.1.1, Appendix A to subpart B.

(e) National Institute of Standards and Technology (NIST). 100 Bureau Drive, Stop 1070, Gaithersburg, MD 20899-1070, http://www.nist.gov, (301) 975-6478. (1) Federal Information Processing Standards Publication (FIPS PUB) 197, Advanced Encryption Standard (AES), approved November 26, 2001, IBR in sections 4.10.1.2 and 4.10.1.3, Appendix A to subpart B.

(2) SP 800-32, Introduction to Public Key Technology and the Federal PKI Infrastructure, approved February 26, 2001, IBR in section 4.10.1.2, Appendix A to subpart B.

(f) Universal Serial Bus Implementers Forum (USBIF). 3855 SW. 153rd Drive, Beaverton, Oregon 97006, http://www.usb.org, (503) 619-0426.

(1)USB Implementers Forum, Inc., Universal Serial Bus Specification, Revision 2.0, approved April 27, 2000, as revised through April 3, 2015, IBR in sections 4.9.1, 4.9.2, 4.10.1.3, and 4.10.2, Appendix A to subpart B.

(2)[Reserved]

(g) World Wide Web Consortium (W3C). 32 Vassar Street, Building 32-G514, Cambridge, MA 02139, http://www.w3.org, (617) 253-2613.

(1)W3C Recommendation 27, SOAP Version 1.2 Part 1: Messaging Framework (Second Edition), including errata, approved April 2007, IBR in section 4.10.1.1, Appendix A to subpart B.

(2)[Reserved]

7. DATA ELEMENTS DICTIONARY

7.1 24-Hour Period Starting Time

Description : This data element refers to the 24-hour period starting time specified by the motor carrier for driver's home terminal.

Purpose : Identifies the bookends of the work day for the driver; makes ELD records consistent with § 395.8 requirements, which require this information to be included on the form.

Source : Motor carrier.

Used in : ELD account profile; ELD outputs.

Data Type : Programmed or populated on the ELD during account creation and maintained by the motor carrier to reflect true and accurate information for drivers.

Data Range : 000000 to 235959; first two digits 00 to 23; middle two digits and last two digits 00 to 59.

Data Length : 6 characters.

Data Format : <HHMMSS> Military time format, where "HH" refers to hours, "MM" refers to minutes, and "SS" refers to seconds; designation for start time expressed in time standard in effect at the driver's home terminal.

Disposition : Mandatory.

Examples : [060000], [073000], [180000].

7.2 Carrier Name

Description : This data element refers to the motor carrier's legal name for conducting commercial business.

Purpose : Provides a recognizable identifier about the motor carrier on viewable ELD outputs; provides ability to cross check against USDOT number.

Source : FMCSA's Safety and Fitness Electronic Records (SAFER) System.

Used in : ELD account profile.

Data Type : Programmed on the ELD or entered once during the ELD account creation process.

Data Range : Any alphanumeric combination.

Data Length : Minimum: 4; Maximum: 120 characters.

Data Format : <Carrier Name> as in <CCCC> to <CCCC ..... CCCC>.

Disposition : Mandatory.

Example : [CONSOLIDATED TRUCKLOAD INC.].

7.3 Carrier's USDOT Number

Description : This data element refers to the motor carrier's USDOT number.

Purpose : Uniquely identifies the motor carrier employing the driver using the ELD.

Source : FMCSA's Safety and Fitness Electronic Records (SAFER) System.

Used in : ELD account profiles; ELD event records; ELD output file.

Data Type : Programmed on the ELD or entered once during the ELD account creation process.

Data Range : An integer number of length 1-8 assigned to the motor carrier by FMCSA (9 position numbers reserved).

Data Length : Minimum: 1; Maximum: 9 characters.

Data Format : <Carrier's USDOT Number> as in <C> to <CCCCCCCCC>.

Disposition : Mandatory.

Examples : [1], [1000003].

7.4 CMV Power Unit Number

Description : This data element refers to the identifier the motor carrier uses for their CMVs in their normal course of business.

Purpose : Identifies the vehicle a driver operates while a driver's ELD records are recorded; Makes ELD records consistent with § 395.8 requirements, which require the truck or tractor number to be included on the form.

Source : Unique CMV identifiers a motor carrier uses in its normal course of business and includes on dispatch documents, or the license number and the licensing State of the power unit.

Used in : ELD event records; ELD output file.

Data Type : Programmed on the ELD or populated by motor carrier's extended ELD system or entered by the driver.

Data Range : Any alphanumeric combination.

Data Length : Minimum: 1; Maximum: 10 characters.

Data Format : <CMV Power Unit Number> as in <C> to <CCCCCCCCCC>.

Disposition : Mandatory for all CMVs operated while using an ELD.

Examples : [123], [00123], [BLUEKW123], [TX12345].

7.5 CMV VIN

Description : This data element refers to the manufacturer-assigned vehicle identification number (VIN) for the CMV powered unit.

Purpose : Uniquely identifies the operated CMV not only within a motor carrier at a given time but across all CMVs sold within a 30-year rolling period.

Source : A robust unique CMV identifier standardized in North America.

Used in : ELD event records; ELD output file.

Data Type : Retrieved from the engine ECM via the vehicle databus.

Data Range : Either blank or 17 characters long as specified by NHTSA in 49 CFR part 565, or 18 characters long with first character assigned as "-" (dash) followed by the 17 character long VIN. Check digit, i.e., VIN character position 9, as specified in 49 CFR part 565 must imply a valid VIN.

Data Length : Blank or 17-18 characters.

Data Format : <CMV VIN> or <"-"><CMV VIN> or <{*blank*}> as in <CCCCCCCCCCCCCCCCC>, or <-CCCCCCCCCCCCCCCCC> or <>.

Disposition : Mandatory for all ELDs linked to the engine ECM and when VIN is available from the engine ECM over the vehicle databus; otherwise optional. If optionally populated and source is not the engine ECM, precede VIN with the character "-" in records.

Examples : [1FUJGHDV0CLBP8834], [-1FUJGHDV0CLBP8896], [].

7.6 Comment/Annotation

Description : This is a textual note related to a record, update, or edit capturing the comment or annotation a driver or authorized support personnel may input to the ELD.

Purpose : Provides ability for a driver to offer explanations to records, selections, edits, or entries.

Source : Driver or authorized support personnel.

Used in : ELD events; ELD outputs.

Data Type : Entered by the authenticated user via ELD's interface.

Data Range : Free form text of any alphanumeric combination.

Data Length : 0-60 characters if optionally entered; 4-60 characters if annotation is required and driver is prompted by the ELD.

Data Format : <Comment/Annotation> as in <{blank}> or <C> to <CCC ..... CCC >.

Disposition : Optional in general; Mandatory if prompted by ELD.

Examples : [], [Personal Conveyance. Driving to Restaurant in bobtail mode], [Forgot to switch to SB. Correcting here].

7.7 Data Diagnostic Event Indicator Status

Description : This is a Boolean indicator identifying whether the used ELD unit has an active data diagnostic event set for the authenticated driver at the time of event recording.

Purpose : Documents the snapshot of ELD's data diagnostic status for the authenticated driver at the time of an event recording.

Source : ELD internal monitoring functions.

Used in : ELD events; ELD outputs.

Data Type : Internally monitored and managed.

Data Range : 0 (no active data diagnostic events for the driver) or 1 (at least one active data diagnostic event set for the driver).

Data Length : 1 character.

Data Format : <Data Diagnostic Event Indicator Status> as in <C >.

Disposition : Mandatory.

Examples : [0] or [1].

7.8 Date

Description : In combination with the variable “Time”, this parameter stamps records with a reference in time; even though date and time must be captured in UTC, event records must use date and time converted to the time zone in effect at the driver’s home terminal as specified in section 4.4.3.

Purpose : Provides ability to record the instance of recorded events.

Source : ELD’s converted time measurement.

Used in : ELD events; ELD outputs.

Data Type : UTC date must be automatically captured by ELD; date in effect at the driver’s home terminal must be calculated as specified in section 4.4.3.

Data Range : Any valid date combination expressed in <MMDDYY> format where “MM” refers to months, “DD” refers to days of the month and “YY” refers to the last two digits of the calendar year.

Data Length : 6 characters.

Data Format : <MMDDYY> where <MM> must be between 01 and 12, <DD> must be between 01 and 31, and <YY> must be between 00 and 99.

Disposition : Mandatory.

Examples : [122815], [010114], [061228].

7.9 Distance Since Last Valid Coordinates

Description : Distance in whole miles traveled since the last valid latitude, longitude pair the ELD measured with the required accuracy.

Purpose : Provides ability to keep track of location for recorded events in cases of temporary position measurement outage.

Source : ELD internal calculations.

Used in : ELD events; ELD outputs.

Data Type : Kept track of by the ELD based on position measurement validity.

Data Range : An integer value between 0 and 6; If the distance traveled since the last valid coordinate measurement exceeds 6 miles, the ELD must enter the value as 6.

Data Length : 1 character.

Data Format : <Distance Since Last Valid Coordinates> as in <C>.

Disposition : Mandatory.

Examples : [0], [1], [5], [6].

7.10 Driver's License Issuing State

Description : This data element refers to the issuing State, Province or jurisdiction of the listed Driver's License for the ELD account holder.

Purpose : In combination with "Driver's License Number", it links the ELD driver account holder uniquely to an individual with driving credentials; ensures that only one driver account can be created per individual.

Source : Driver's license.

Used in : ELD account profile(s); ELD output file.

Data Type : Entered (during the creation of a new ELD account).

Data Range : To character abbreviation listed on Table 5 of this appendix.

Data Length : 2 characters.

Data Format : <Driver's License Issuing State> as in <CC>.

Disposition : Mandatory for all driver accounts created on the ELD; optional for "non-driver" accounts.

Example : [WA].

Table 5

State and Province Abbreviation Codes

U.S.A STATE CODE	STATE	STATE CODE	STATE
AL	ALABAMA	MT	MONTANA
AK	ALASKA	NC	NORTH CAROLINA
AR	ARKANSAS	ND	NORTH DAKOTA
AZ	ARIZONA	NE	NEBRASKA
CA	CALIFORNIA	NH	NEW HAMPSHIRE
CO	COLORADO	NJ	NEW JERSEY
CT	CONNECTICUT	NM	NEW MEXICO
DC	DIST of COL	NV	NEVADA
DE	DELAWARE	NY	NEW YORK
FL	FLORIDA	OH	OHIO
GA	GEORGIA	OK	OKLAHOMA
HI	HAWAII	OR	OREGON
IA	IOWA	PA	PENNSYLVANIA
ID	IDAHO	RI	RHODE ISLAND
IL	ILLINOIS	SC	SOUTH CAROLINA
IN	INDIANA	SD	SOUTH DAKOTA
KS	KANSAS	TN	TENNESSEE
KY	KENTUCKY	TX	TEXAS
LA	LOUISIANA	UT	UTAH
MA	MASSACHUSETTS	VA	VIRGINIA
MD	MARYLAND	VT	VERMONT
ME	MAINE	WA	WASHINGTON
MI	MICHIGAN	WI	WISCONSIN
MN	MINNESOTA	WV	WEST VIRGINIA
MO	MISSOURI	WY	WYOMING
MS	MISSISSIPPI		

AMERICAN POSSESSIONS OR PROTECTORATES

STATE CODE	STATE
AS	AMERICAN SAMOA
GU	GUAM
MP	NORTHERN MARIANAS
PR	PUERTO RICO
VI	VIRGIN ISLANDS

CANADA

PROVINCE CODE	PROVINCE
AB	ALBERTA
BC	BRITISH COLUMBIA
MB	MANITOBA
NB	NEW BRUNSWICK
NF	NEWFOUNDLAND
NS	NOVA SCOTIA
NT	NORTHWEST TERRITORIES
ON	ONTARIO
PE	PRINCE EDWARD ISLAND
QC	QUEBEC
SK	SASKATCHEWAN
YT	YUKON TERRITORY

MEXICO

STATE CODE	STATE	STATE CODE	STATE
AG	AGUASCALIENTES	MX	MEXICO
BN	BAJA CALIFORNIA NORTE	NA	NAYARIT
BS	BAJA CALIFORNIA SUR	NL	NUEVO LEON
CH	COAHUILA	OA	OAXACA
CI	CHIHUAHUA	PU	PUEBLA
CL	COLIMA	QE	QUERETARO
CP	CAMPECHE	QI	QUINTANA ROO
CS	CHIAPAS	SI	SINALOA
DF	DISTRICTO FEDERAL	SL	SAN LUIS POTOSI
DG	DURANGO	SO	SONORA
GE	GUERRERO	TA	TAMAULIPAS
GJ	GUANAJUATO	TB	TABASCO
HD	HIDALGO	TL	TLAXCALA
JA	JALISCO	VC	VERACRUZ
MC	MICHOACAN	YU	YUCATAN
MR	MORELOS	ZA	ZACATECAS

OTHER

PROVINCE CODE	**PROVINCE, STATE or COUNTRY**
OT	ALL OTHERS NOT COVERED ABOVE

7.11 Driver's License Number

Description : This data element refers to the unique Driver's License information required for each driver account on the ELD.

Purpose : In combination with driver's license issuing State, it links the ELD driver account holder to an individual with driving credentials; ensures that only one driver account can be created per individual.

Source : Driver's license.

Used in : ELD account profile(s); ELD output file.

Data Type : Entered (during the creation of a new ELD account).

Data Range : Any alphanumeric combination.

Data Length : Minimum: 1; Maximum: 20 characters.

Data Format : <Driver's License Number > as in <C> to <CCCCCCCCCCCCCCCCCCCC>. For ELD record keeping purposes, ELD must only retain characters in a Driver's License Number entered during an account creation process that are a number between 0-9 or a character between AZ (non-case sensitive).

Disposition : Mandatory for all driver accounts created on the ELD; optional for "non-driver" accounts.

Examples : [SAMPLMJ065LD], [D000368210361], [198], [N02632676353666].

7.12 Driver's Location Description

Description : This is a textual note related to the location of the CMV input by the driver upon ELD's prompt.

Purpose : Provides ability for a driver to enter location information related to entry of missing records; provides ability to accommodate temporary positioning service interruptions or outage without setting positioning malfunctions.

Source : Driver, only when prompted by the ELD.

Used in : ELD events; ELD outputs.

Data Type : Entered by the authenticated driver when ELD solicits this information as specified in section 4.3.2.7.

Data Range : Free form text of any alphanumeric combination.

Data Length : 5-60 characters.

Data Format : <CCCCC> to <CCC..... CCC >.

Disposition : Mandatory when prompted by ELD.

Examples : [], [5 miles SW of Indianapolis, IN], [Reston, VA].

7.13 ELD Account Type

Description : An indicator designating whether an ELD account is a driver account or support personnel (non-driver) account.

Purpose : Enables authorized safety officials to verify account type specific requirements set forth in this document.

Source : ELD designated.

Used in : ELD outputs.

Data Type : Specified during the account creation process and recorded on ELD.

Data Range : Character “D”, indicating account type “Driver”, or “S”, indicating account type “motor carrier’s support personnel” (i.e. non-driver); “Unidentified Driver” account must be designated with type “D”.

Data Length : 1 character.

Data Format : <C>.

Disposition : Mandatory.

Examples : [D], [S].

7.14 ELD Authentication Value

Description : An alphanumeric value that is unique to an ELD and verifies the authenticity of the given ELD.

Purpose : Provides ability to cross-check the authenticity of an ELD used in the recording of a driver’s records during inspections.

Source : ELD provider-assigned value; includes a certificate component and a hashed component; necessary information related to authentication keys and hash procedures disclosed by the registered ELD provider during the online ELD certification process for independent verification by FMCSA systems.

Used in : ELD outputs.

Data Type : Calculated from the authentication key and calculation procedure privately distributed by the ELD provider to FMCSA during the ELD registration process.

Data Range : Alphanumeric combination.

Data Length : 16-32 characters.

Data Format : <CCCC ..... CCCC>.

Disposition : Mandatory.

Example : [D3A4506EC8FF566B506EC8FF566BDFBB].

7.15 ELD Identifier

Description : An alphanumeric identifier assigned by the ELD provider to the ELD technology that is certified by the registered provider at FMCSA's Web site.

Purpose : Provides ability to cross-check that the ELD used in the recording of a driver's records is certified through FMCSA's registration and certification process as required.

Source : Assigned and submitted by the ELD provider during the online certification of an ELD model and version.

Used in : ELD outputs.

Data Type : Coded on the ELD by the ELD provider and disclosed to FMCSA during the online certification process.

Data Range : A six character alphanumeric identifier using characters A-Z and number 0-9.

Data Length : 6 characters.

Data Format : <ELD Identifier> as in <CCCCCC>.

Disposition : Mandatory.

Examples : [1001ZE], [GAM112], [02P3P1].

7.16 ELD Provider

Description : An alphanumeric company name of the technology provider as registered at the FMCSA's Web site.

Purpose : Provides ability to cross-check that the ELD used in the recording of a driver's records is certified through FMCSA's registration and certification process as required.

Source : Assigned and submitted by the ELD provider during the online registration process.

Used in : ELD outputs.

Data Type : Coded on the ELD by the ELD provider and disclosed to FMCSA during the online registration process.

Data Range : Any alphanumeric combination.

Data Length : Minimum: 4; Maximum 120 characters.

Data Format : <ELD Provider> as in <CCCC> to <CCCC..... CCCC>.

Disposition : Mandatory.

Examples : [ELD PROVIDER INC].

7.17 ELD Registration ID

Description : An alphanumeric registration identifier assigned to the ELD provider that is registered with FMCSA during the ELD registration process.

Purpose : Provides ability to cross-check that the ELD provider has registered as required.

Source : Received from FMCSA during online provider registration.

Used in : ELD outputs.

Data Type : Coded on the ELD by the provider.

Data Range : A four character alphanumeric registration identifier using characters A-Z and numbers 0-9.

Data Length : 4 characters.

Data Format : <ELD Registration ID> as in <CCCC>.

Disposition : Mandatory.

Examples : [ZA10], [QA0C], [FAZ2].

7.18 ELD Username

Description : This data element refers to the unique user identifier assigned to the account holder on the ELD to authenticate the corresponding individual during an ELD login process; the individual may be a driver or a motor carrier's support personnel.

Purpose : Documents the user identifier assigned to the driver linked to the ELD account.

Source : Assigned by the motor carrier during the creation of a new ELD account.

Used in : ELD account profile; event records; ELD login process.

Data Type : Entered (during account creation and user authentication).

Data Range : Any alphanumeric combination.

Data Length : Minimum: 4; Maximum: 60 characters.

Data Format : <ELD Username> as in <CCCC> to <CCCC ..... CCCC>.

Disposition : Mandatory for all accounts created on the ELD.

Examples : [smithj], [100384], [sj2345], [john.smith].

7.19 Engine Hours

Description : This data element refers to the time the CMV's engine is powered in decimal hours with 0.1 hr (6-minute) resolution; this parameter is a placeholder for <{Total} Engine Hours>, which refers to the aggregated time of a vehicle's engine's operation since its inception, and used in recording "engine power on" and "engine shut down" events, and also for <{Elapsed} Engine Hours>, which refers to the elapsed time in the engine's operation in the given ignition power on cycle, and used in the recording of all other events.

Purpose : Provides ability to identify gaps in the operation of a CMV, when the vehicle's engine may be powered but the ELD may not; provides ability to cross check integrity of recorded data elements in events and prevent gaps in the recording of ELD.

Source : ELD measurement or sensing.

Used in : ELD events; ELD outputs.

Data Type : Acquired from the engine ECM or a comparable other source as allowed in section 4.3.1.4.

Data Range : For <{Total} Engine Hours>, range is between 0.0 and 99,999.9; for <{Elapsed} Engine Hours>, range is between 0.0 and 99.9.

Data Length : 3-7 characters.

Data Format : <Vehicle Miles> as in <C.C> to <CCCCC.C>.

Disposition : Mandatory.

Examples : [0.0], [9.9], [346.1], [2891.4].

7.20 Event Code

Description : A dependent attribute on “Event Type” parameter that further specifies the nature of the change indicated in “Event Type”; t`his parameter indicates the new status after the change.

Purpose : Provides ability to code the specific nature of the change electronically.

Source : ELD internal calculations.

Used in : ELD event records; ELD outputs.

Data Type : ELD recorded and maintained event attribute in accordance with the type of event and nature of the new status being recorded.

Data Range : Dependent on the “Event Type” as indicated on Table 6 of this appendix.

Data Length : 1 character.

Data Format : <Event Type> as in <C>.

Disposition : Mandatory.

Examples : [0], [1], [4], [9].

Table 6

"Event Type" Parameter Coding

Event Type	Event Code	Event Code Description
1	1	Driver's duty status changed to "Off-duty"
1	2	Driver's duty status changed to "Sleeper Berth"
1	3	Driver's duty status changed to "Driving"
1	4	Driver's duty status changed to "On-duty not driving"
2	1	Intermediate log with conventional location precision
2	2	Intermediate log with reduced location precision
3	1	Driver indicates "Authorized Personal Use of CMV"
3	2	Driver indicates "Yard Moves"
3	0	Driver indication for PC, YM and WT cleared
4	1	Driver's first certification of a daily record
4	n	Driver's n'th certification of a daily record (when recertification necessary). "n" is an integer between 1 and 9. If more than 9 certifications needed, use 9 for each new re-certification record.
5	1	Authenticated driver's ELD login activity
5	2	Authenticated driver's ELD logout activity
6	1	Engine power-up with conventional location precision
6	2	Engine power-up with reduced location precision
6	3	Engine shut down with conventional location precision
6	4	Engine shut-down with reduced location precision
7	1	An ELD malfunction logged
7	2	An ELD malfunction cleared
7	3	A data diagnostic event logged
7	4	A data diagnostic event cleared

7.21 Event Data Check Value

Description : A hexadecimal "check" value calculated in accordance with the procedure outlined in section 4.4.5.1 of this appendix and attached to each event record at the time of recording.

Purpose : Provides ability to identify cases where an ELD event record may 'have been inappropriately modified after its original recording.

Source : ELD internal.

Used in : ELD events; ELD output file.

Data Type : Calculated by the ELD in accordance with section 4.4.5.1 of this appendix.

Data Range : A number between hexadecimal 00 (decimal 0) and hexadecimal FF (decimal 255).

Data Length : 2 characters.

Data Format : <Event Data Check Value> as in <CC>.

Disposition : Mandatory.

Examples : [05], [CA], [F3].

7.22 Event Record Origin

Description : An attribute for the event record indicating whether it is automatically recorded, or edited, entered or accepted by the driver, requested by another authenticated user, or assumed from unidentified driver profile.

Purpose : Provides ability to track origin of the records.

Source : ELD internal calculations.

Used in : ELD event records; ELD outputs.

Data Type : ELD recorded and maintained event attribute in accordance with the procedures outlined in sections 4.4.4.2.2, 4.4.4.2.3, 4.4.4.2.4, 4.4.4.2.5, and 4.4.4.2.6 of this appendix.

Data Range : 1, 2, 3 or 4 as described on Table 7 of this appendix.

Data Length : 1 character.

Data Format : <Event Record Origin> as in <C>.

Disposition : Mandatory.

Examples : [1], [2], [3], [4].

Table 7

"Event Record Origin" Parameter Coding

Event Record Origin	Event Record Origin Code
Automatically recorded by ELD	1
Edited or entered by the Driver	2
Edit requested by an Authenticated User other than the Driver	3
Assumed from Unidentified Driver profile	4

7.23 Event Record Status

Description : An attribute for the event record indicating whether an event is active or inactive and further, if inactive, whether it is due to a change or lack of confirmation by the driver or due to a driver's rejection of change request.

Purpose : Provides ability to keep track of edits and entries performed over ELD records while retaining original records.

Source : ELD internal calculations.

Used in : ELD event records; ELD outputs.

Data Type : ELD recorded and maintained event attribute in accordance with the procedures outlined in sections 4.4.4.2.2, 4.4.4.2.3, 4.4.4.2.4, 4.4.4.2.5, and 4.4.4.2.6 of this appendix.

Data Range : 1, 2, 3 or 4 as described on Table 8 of this appendix.

Data Length : 1 character.

Data Format : <Event Record Status> as in <C>.

Disposition : Mandatory.

Examples : [1], [2], [3], [4]

Table 8

"Event Record Status" Parameter Coding

Event Record Status	Event Record Status Code
Active	1
Inactive – Changed	2
Inactive – Change Requested	3
Inactive – Change Rejected	4

7.24 Event Sequence ID Number

Description : This data element refers to the serial identifier assigned to each required ELD event as described in section 4.5.1 of this appendix.

Purpose : Provides ability to keep a continuous record, on a given ELD, across all users of that ELD.

Source : ELD internal calculations.

Used in : ELD event records; ELD outputs.

Data Type : ELD maintained; incremented by 1 for each new record on the ELD; continuous for each new event the ELD records regardless of owner of the records.

Data Range : 0 to FFFF; initial factory value must be 0; after FFFF hexadecimal (decimal 65535), the next Event Sequence ID number must be 0.

Data Length : 1-4 characters.

Data Format : <Event Sequence ID Number > as in <C> to <CCCC>.

Disposition : Mandatory.

Examples : [1], [1F2C], [2D3], [BB], [FFFE].

7.25 Event Type

Description : An attribute specifying the type of the event record.

Purpose : Provides ability to code the type of the recorded event in electronic format.

Source : ELD internal calculations.

Used in : ELD event records; ELD outputs.

Data Type : ELD recorded and maintained event attribute in accordance with the type of event being recorded.

Data Range : 1-7 as described on Table 9 of this appendix.

Data Length : 1 character.

Data Format : <Event Type> as in <C>.

Disposition : Mandatory.

Examples : [1], [5], [4], [7].

Table 9

"Event Type" Parameter Coding

Event Type	Event Type Code
A change in driver's duty-status	1
An intermediate log	2

A change in driver's indication of authorized personal use of CMV or yard moves	3
A driver's certification/re-certification of records	4
A driver's login/logout activity	5
CMV's engine power up / shut down activity	6
A malfunction or data diagnostic detection occurrence	7

7.26 Exempt Driver Configuration

Description : A parameter indicating whether the motor carrier configured a driver's profile to claim exemption from ELD use.

Purpose : Provides ability to code the motor carrier-indicated exemption for the driver electronically.

Source : Motor carrier's configuration for a given driver.

Used in : ELD outputs.

Data Type : Motor carrier configured and maintained parameter in accordance with the qualification requirements listed in § 395.1.

Data Range : E (exempt) or 0 (number zero).

Data Length : 1 character.

Data Format : <Exempt Driver Configuration> as in <C>.

Disposition : Mandatory.

Examples : [E], [0].

7.27 File Data Check Value

Description : A hexadecimal "check" value calculated in accordance with the procedure outlined in section 4.4.5.3 of this appendix and attached to each ELD output file.

Purpose : Provides ability to identify cases where an ELD file may have been inappropriately modified after its original creation.

Source : ELD internal.

Used in : ELD output files.

Data Type : Calculated by the ELD in accordance with section 4.4.5.3 of this appendix.

Data Range : A number between hexadecimal 0000 (decimal 0) and hexadecimal FFFF (decimal 65535).

Data Length : 4 characters.

Data Format : <File Data Check Value> as in <CCCC>.

Disposition : Mandatory.

Examples : [F0B5], [00CA], [523E].

7.28 First Name

Description : This data element refers to the given name of the individual holding an ELD account.

Purpose : Links an individual to the associated ELD account.

Source : Driver's license for driver accounts; driver's license or government-issued ID for support personnel accounts.

Used in : ELD account profile(s); ELD outputs (display and file).

Data Type : Entered (during the creation of a new ELD account).

Data Range : Any alphanumeric combination.

Data Length : Minimum: 2; Maximum: 30 characters.

Data Format : <First Name> as in <CC> to <CC.....CC> where "C" denotes a character.

Disposition : Mandatory for all accounts created on the ELD.

Example : [John].

7.29 Geo-Location

Description : A descriptive indicator of the CMV position in terms of a distance and direction to a recognizable location derived from a GNIS database at a minimum containing all cities, towns and villages with a population of 5,000 or greater.

Purpose : Provide recognizable location information on a display or printout to users of the ELD.

Source : ELD internal calculations as specified in section 4.4.2 of this appendix.

Used in : ELD display or printout.

Data Type : Identified from the underlying latitude/longitude coordinates by the ELD.

Data Range : Contains four segments in one text field; a recognizable location driven from GNIS database containing—at a minimum—all cities, towns and villages with a population of 5,000 in text format containing a location name and the State abbreviation, distance from this location and direction from this location.

Data Length : Minimum: 5; Maximum: 60 characters.

Data Format : <Distance from {identified} Geo-location> <'mi '> <Direction from {identified} Geo-location> <' '> <State Abbreviation {of identified} Geo Location> <' '> <Place name of {identified} Geo-location> where: <Distance from {identified} Geo-location> must either be <{blank}> or <C> or <CC> where the up-to two character number specifies absolute distance between identified geo-location and event location; <Direction from {identified} Geo-location> must either be <{blank}> or <C> or <CC> or <CCC> , must represent direction of event location with respect to the identified geo-location, and must take a value listed on Table 10 of this appendix; <State Abbreviation {of identified} Geo Location> must take values listed on Table 5; <Place name of

{identified} Geo-location> must be the text description of the identified reference location; Overall length of the “Geo-location” parameter must not be longer than 60 characters long.

Disposition : Mandatory.

Examples : [2mi ESE IL Darien], [1mi SE TX Dallas], [11mi NNW IN West Lafayette].

Table 10

Conventional Compass Rose Direction Coding To Be Used in the Geo-Location Parameter.

Direction	Direction Code
At indicated geo-location	{blank}
North of indicated geo-location	N
North – North East of indicated geo-location	NNE
North East of indicated geo-location	NE

East – North East of indicated geo-location	ENE
East of indicated geo-location	E
East – South East of indicated geo-location	ESE
South East of indicated geo-location	SE
South – South East of indicated geo-location	SSE
South of indicated geo-location	S
South – South West of indicated geo-location	SSW
South West of indicated geo-location	SW
West – South West of indicated geo-location	WSW
West of indicated geo-location	W
West – North West of indicated geo-location	WNW
North West of indicated geo-location	NW
North– North West of indicated geo-location	NNW

7.30 Last Name

Description : This data element refers to the last name of the individual holding an ELD account.

Purpose : Links an individual to the associated ELD account.

Source : Driver's license for driver accounts; driver's license or government-issued ID for support personnel accounts.

Used in : ELD account profile(s); ELD outputs (display and file).

Data Type : Entered (during the creation of a new ELD account).

Data Range : Any alphanumeric combination.

Data Length : Minimum: 2; Maximum: 30 characters

Data Format : <Last Name> as in <CC> to <CC CC>.

Disposition : Mandatory for all accounts created on the ELD.

Example : [Smith].

7.31 Latitude

Description : An angular distance in degrees north and south of the equator.

Purpose : In combination with the variable “Longitude”, this parameter stamps records requiring a position attribute with a reference point on the face of the earth.

Source : ELD’s position measurement.

Used in : ELD events; ELD outputs.

Data Type : Latitude and Longitude must be automatically captured by the ELD.

Data Range : -90.00 to 90.00 in decimal degrees (two decimal point resolution) in records using conventional positioning precision; -90.0 to 90.0 in decimal degrees (single decimal point resolution) in records using reduced positioning precision when allowed; latitudes north of the equator must be specified by the absence of a minus sign (-) preceding the digits designating degrees; latitudes south of the Equator must be designated by a minus sign (-) preceding the digits designating degrees.

Data Length : 3 to 6 characters.

Data Format : First character: [<‘-’> or <{blank}>]; then [<C> or <CC>]; then <‘.’>; then [<C> or <CC>].

Disposition : Mandatory.

Examples : [-15.68], [38.89], [5.07], [-6.11], [-15.7], [38.9], [5.1], [-6.1].

7.32 Line Data Check Value

Description : A hexadecimal “check” value calculated in accordance with procedure outlined in section 4.4.5.2 and attached to each line of output featuring data at the time of output file being generated.

Purpose : Provides ability to identify cases where an ELD output file may have been inappropriately modified after its original generation.

Source : ELD internal.

Used in : ELD output file.

Data Type : Calculated by the ELD in accordance with 4.4.5.2.

Data Range : A number between hexadecimal 00 (decimal 0) and hexadecimal FF (decimal 255) .

Data Length : 2 characters.

Data Format : <Line Data Check Value> as in <CC>.

Disposition : Mandatory.

Examples : [01], [A4], [CC].

7.33 Longitude

Description : An angular distance in degrees measured on a circle of reference with respect to the zero (or prime) meridian; The prime meridian runs through Greenwich, England.

Purpose : In combination with the variable “Latitude”, this parameter stamps records requiring a position attribute with a reference point on the face of the earth.

Source : ELD’s position measurement.

Used in : ELD events; ELD outputs.

Data Type : Latitude and Longitude must be automatically captured by the ELD.

Data Range : -179.99 to 180.00 in decimal degrees (two decimal point resolution) in records using conventional positioning precision; -179.9 to 180.0 in decimal degrees (single decimal point resolution) in records using reduced positioning precision when allowed; longitudes east of the prime meridian must be specified by the absence of a minus sign (-) preceding the digits designating degrees of longitude; longitudes west of the prime meridian must be designated by minus sign (-) preceding the digits designating degrees.

Data Length : 3 to 7 characters.

Data Format : First character: [<'-'> or <{blank}>]; then [<C>, <CC> or <CCC>]; then <'.'>; then [<C> or <CC>].

Disposition : Mandatory.

Examples : [-157.81], [-77.03], [9.05], [-0.15], [-157.8], [-77.0], [9.1], [-0.2].

7.34 Malfunction/Diagnostic Code

Description : A code that further specifies the underlying malfunction or data diagnostic event.

Purpose : Enables coding the type of malfunction and data diagnostic event to cover the standardized set in Table 4 of this appendix.

Source : ELD internal monitoring.

Used in : ELD events; ELD outputs.

Data Type : Recorded by ELD when malfunctions and data diagnostic events are set or reset.

Data Range : As specified in Table 4 of this appendix.

Data Length : 1 character.

Data Format : <C>.

Disposition _ : Mandatory.

Examples : [1], [5], [P], [L].

7.35 Malfunction Indicator Status

Description : This is a Boolean indicator identifying whether the used ELD unit has an active malfunction set at the time of event recording.

Purpose : Documents the snapshot of ELD's malfunction status at the time of an event recording.

Source : ELD internal monitoring functions.

Used in : ELD events; ELD outputs.

Data Type : Internally monitored and managed.

Data Range : 0 (no active malfunction) or 1 (at least one active malfunction).

Data Length : 1 character.

Data Format : <Malfunction Indicator Status> as in <C>.

Disposition : Mandatory.

Examples : [0] or [1].

7.36 Multiday Basis Used

Description : This data element refers to the multiday basis (7 or 8 days) used by the motor carrier to compute cumulative duty hours.

Purpose : Provides ability to apply the HOS rules accordingly.

Source : Motor carrier.

Used in : ELD account profile; ELD outputs.

Data Type : Entered by the motor carrier during account creation process.

Data Range : 7 or 8.

Data Length : 1 character.

Data Format : <Multiday basis used> as in <C>.

Disposition : Mandatory.

Examples : [7], [8].

7.37 Order Number

Description : A continuous integer number assigned in the forming of a list, starting at 1 and incremented by 1 for each unique item on the list.

Purpose : Allows for more compact report file output generation avoiding repetitious use of CMV identifiers and usernames affected in records.

Source : ELD internal.

Used in : ELD outputs, listing of users and CMVs referenced in ELD logs.

Data Type : Managed by ELD.

Data Range : Integer between 1 and 99.

Data Length : 1-2 characters.

Data Format : <Order Number> as in <C> or <CC>.

Disposition : Mandatory.

Examples : [1], [5], [11], [28].

7.38 Output File Comment

Description : A textual field that may be populated with information pertaining to the created ELD output file; An authorized safety official may provide a key phrase or code to be included in the output file comment, which may be used to link the requested data to

an inspection, inquiry, or other enforcement action; if provided to the driver by an authorized safety official, it must be entered into the ELD and included in the exchanged dataset as specified.

Purpose : The output file comment field provides an ability to link submitted data to an inspection, inquiry, or other enforcement action, if deemed necessary; further, it may also link a dataset to a vehicle, driver, carrier, and/or ELD that may participate in voluntary future programs that may involve exchange of ELD data.

Source : Enforcement personnel or driver or motor carrier.

Used in : ELD outputs.

Data Type : If provided, output file comment is entered or appended to the ELD dataset prior to submission of ELD data to enforcement.

Data Range : Blank or any alphanumeric combination specified and provided by an authorized safety official.

Data Length : 0-60 characters.

Data Format : <{blank}>, or <C> thru <CCCC ..... CCCC>.

Disposition : Mandatory.

Examples : [], [3BHG701015], [113G1EFW02], [7353930].

7.39 Shipping Document Number

Description : Shipping document number the motor carrier uses in their system and dispatch documents.

Purpose : Links ELD data to the shipping records; makes ELD dataset consistent with § 395.8 requirements.

Source : Motor carrier.

Used in : ELD outputs.

Data Type : Entered in the ELD by the authenticated driver or motor carrier and verified by the driver.

Data Range : Any alphanumeric combination.

Data Length : 0-40 characters.

Data Format : <{blank}>, or <C> thru <CCCC.....CCCC>.

Disposition : Mandatory if a shipping number is used on motor carrier's system.

Examples : [], [B 75354], [FX334411707].

7.40 Time

Description : In combination with the variable "Date", this parameter stamps records with a reference in time; even though date and time must be captured in UTC, event records must use date and time converted to the time zone in effect at the driver's home terminal as specified in section 4.4.3 of this appendix.

Purpose : Provides ability to record the instance of recorded events.

Source : ELD's converted time measurement.

Used in : ELD events; ELD outputs.

Data Type : UTC time must be automatically captured by ELD; time in effect at the driver's home terminal must be calculated as specified in section 4.4.3 of this appendix.

Data Range : Any valid date combination expressed in <HHMMSS> format where "HH" refers to hours of the day, "MM" refers to minutes, and "SS" refers to seconds.

Data Length : 6 characters.

Data Format : <HHMMSS> where <HH> must be between 00 and 23, <MM> and <SS> must be between 00 and 59.

Disposition : Mandatory.

Examples : [070111], [001259], [151522], [230945].

7.41 Time Zone Offset from UTC

Description : This data element refers to the offset in time between UTC time and the time standard in effect at the driver's home terminal.

Purpose : Establishes the ability to link records stamped with local time to a universal reference.

Source : Calculated from measured variable <{UTC} Time> and <{Time Standard in Effect at driver's home terminal} Time>; Maintained together with "24-hour Period Starting Time" parameter by the motor carrier or tracked automatically by ELD.

Used in : ELD account profile; ELD event: Driver's certification of own records.

Data Type : Programmed or populated on the ELD during account creation and maintained by the motor carrier or ELD to reflect true and accurate information for drivers. This parameter must adjust for Daylight Saving Time changes in effect at the driver's home terminal.

Data Range : 04 to 11; omit sign.

Data Length : 2 characters.

Data Format : <Time Zone Offset from UTC> as in <HH> where "HH" refer to hours in difference.

Disposition : Mandatory.

Examples : [04], [05], [10].

7.42 Trailer Number(s)

Description : This data element refers to the identifier(s) the motor carrier uses for the trailers in their normal course of business.

Purpose : Identifies the trailer(s) a driver operates while a driver's ELD records are recorded; makes ELD records consistent with § 395.8 which requires the trailer number(s) to be included on the form.

Source : Unique trailer identifiers a motor carrier uses in their normal course of business and includes on dispatch documents, or the license number and licensing State of each towed unit; trailer number(s) must be updated each time hauled trailers change.

Data Type : Automatically captured by the ELD or populated by motor carrier's extended ELD system or entered by the driver; must be updated each time the hauled trailer(s) change.

Data Range : Any alphanumeric combination.

Data Length : Minimum: blank; Maximum: 32 characters (3 trailer numbers each maximum 10 characters long, separated by spaces).

Data Format : Trailer numbers; separated by space in case of multiple trailers hauled at one time; field to be left blank" for non-combination vehicles (such as a straight truck or bobtail tractor).

> <Trailer Unit Number {#1}><' '><Trailer Unit Number {#2}> <' '><Trailer Unit Number {#3}> as in <{blank}> to <CCCCCCCCCC CCCCCCCCCC CCCCCCCCCC>.

Disposition : Mandatory when operating combination vehicles.

Examples : [987], [00987 PP2345], [BX987 POP712 10567], [TX12345 LA22A21], [].

7.43 Vehicle Miles

Description : This data element refers to the distance traveled using the CMV in whole miles; this parameter is a placeholder for <{Total} Vehicle Miles>, which refers to the odometer reading and is used in recording “engine power on” and “engine shut down” events, and also for <{Accumulated} Vehicle Miles>, which refers to the accumulated miles in the given ignition power on cycle and is used in the recording of all other events.

Purpose : Provides ability to track distance traveled while operating the CMV in each duty status. Total miles traveled within a 24-hour period is a required field in § 395.8.

Source : ELD measurement or sensing.

Used in : ELD events; ELD outputs.

Data Type : Acquired from the engine ECM or a comparable other source as allowed in section 4.3.1.3.

Data Range : For <{Total} Vehicle Miles>, range is between 0 and 9,999,999; for <{Accumulated} Vehicle Miles>, range is between 0 and 9,999.

Data Length : 1-7 characters.

Data Format : <Vehicle Miles> as in <C> to <CCCCCCC>.

Disposition : Mandatory.

Examples : [99], [1004566], [0], [422].

Chapter 1

ELD Test Procedures

Accounts, Inputs, and Vehicle Interface

10/17/2016

Version 2.0

U.S. Department of Transportation
Federal Motor Carrier Safety Administration

Revision History

Version	Rev	Date	Changes Made	Writer	Reviewer
0.0	-	12/16/15	Original Document	FMCSA	
1.0	-	3/11/16	Webinar Updates	FMCSA	
2.0	-	10/17/16	Implementation Phase Web Services Tests Note	FMCSA	

This is a copy of The ELD Compliance Test Procedures [as a Word document]. The current official version [as a .pdf file] is published on the FMCSA website and updated as required. Please be aware that any modification is the company's responsibility if it differs from the FMCSA official version.

Use of Compliance Test Procedures

An Electronic Logging Device (ELD) must meet the technical specifications set forth in the Appendix to Subpart B of Part 395 of title 49, Code of Federal Regulations. Although use of the ELD test procedures set forth in this document is not binding on ELD providers, these procedures are made available to ELD providers to assist them in carrying out their testing processes before certifying an ELD model as compliant with the technical specifications. The ELD certification process does require a certifying statement describing how the model was tested to comply with FMCSA regulations. The FMCSA would use these test procedures to evaluate compliance if the Agency decides to undertake an independent evaluation of an ELD that has been certified by the provider.

Implementation Phase Data Transfer and Web Services Test Steps

Due to the fact that data transfer cannot be trialed with an actual authorized safety official and that the Web Services portal at FMCSA is not yet operational, the following test steps* are not required to be completed:

ELD-FUNC-4.3.2.5-2

ELD-FUNC-4.9.1-2

ELD-FUNC-4.9.2-5

ELD-FUNC-4.10.1.1-2

ELD-FUNC-4.10.1.1-3

ELD-FUNC-4.10.1.1-4

ELD-FUNC-4.10.1.2-2

ELD-FUNC-4.10.1.2-3

ELD-FUNC-4.10.2-1

These steps are also highlighted in YELLOW if they are contained within this document.

*Data transfer via e-mail accounts, USB, and Bluetooth can still be tested in the manufacturer's test environment. If the required output file can be generated per the technical specifications, it will work in FMCSA Web Services

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1. ELD Test Procedures

1.1ELD Test Procedures – Accounts

An ELD must support a user account structure that separates drivers and motor carrier's support personnel (i.e. Non-drivers). Each user of the ELD must have a valid active account on the ELD and an ELD must provide secure access to data recorded and stored on the system. In addition, an ELD must be capable of separately recording and retaining ELD data for each individual driver using the ELD and must associate all non-authenticated operation of a CMV with a single ELD account. The following test procedures address account creation, account security, account management and non-authenticated operation.

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Requirement No.	Test Step No.	Requirement Description of Test Steps	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.1.1-1	1.	**Requirement: An ELD must support a user account structure that separates drivers and motor carrier's support personnel (i.e. Non-drivers).** Description of Test Step: Test 1: a) Login to the application using a valid driver user account b) Verify the correct user account structure was generated c) Logout Test 2: d) Login to the application using a valid non-driver or support personnel user account e) Verify the correct user account structure was generated f) Logout Test 3: g) Login to the application using a non-valid account h) Verify the user was unable to login	Expected Test Step Outcome: Test 1: The user was able to successfully login to the application using a driver user account. The application showed a driver user account framework. User was able to logoff. Test 2: The user was able to successfully login to the application using a non-driver user account. The application showed a non-driver user account framework. User was able to logoff. Test 3: The user was unable to login with an invalid account. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Steps	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.1.2-1	2.	**Requirement: Each user of the ELD must have a valid active account on the ELD with a unique identifier assigned by the motor carrier.** Description of Test Step: Precondition: • Accounts have been created for drivers and motor carrier support personnel with different privileges Test 1: a) Login to the application using a valid driver user account b) Verify a valid active account with a unique identifier was assigned a) Logout Test 2: b) Login to the application using a valid non-driver or support personnel user account c) Verify a valid active account with a unique identifier was assigned (different identifier than Test 1) d) Logout	Expected Test Step Outcome: Test 1: The user was able to successfully login to the application using a valid driver user account. A unique identifier was generated. User was able to logoff. Test 2: The user was able to successfully login to the application using a valid non-driver user account. A unique identifier was generated. User was able to logoff. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Steps	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.1.2-2	3.	**Requirement: Each driver account must require the entry of the driver's license number and the State or jurisdiction that issued the driver's license into the ELD during the account creation process.** Description of Test Step: Precondition: • Accounts have been created for drivers with the associated driver's license numbers and the state or jurisdiction Test 1: a) Verify the correct state and driver's license number was generated and matched the login account b) Logout Test 2: c) Login to the application using a driver user account (different account than Test 1) d) Verify the correct state and driver's license number was generated and matched the login account e) Logout	Expected Test Step Outcome: Test 1: The user was able to successfully login to the application using a driver user account. A correct state and license number was generated. User was able to logoff. Test 2: The user was able to successfully login to the application using a driver user account. A correct state and license number was generated. User was able to logoff. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Steps	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.1.2-3	4.	**Requirement: The driver account must securely store the driver's license number and the State or jurisdiction on the ELD** Description of Test Step: Precondition: • Accounts have been created for drivers with the associated driver's license numbers and the state or jurisdiction Test 1: a) Verify the correct state and driver's license number was generated and matched the login account b) Verify account information was securely stored on ELD and retained for as long as the user is logged in c) Logout d) Verify the driver user account information is no longer stored after logout Test 2: e) Login to the application using a driver user account (different account than Test 1) f) Verify account information was securely stored on ELD and retained for as long as the user is logged in g) Logout h) Verify the driver user account information is no longer stored after logout	Expected Test Step Outcome: Test 1: The user was able to successfully login to the application using a valid driver user account. The mapped state and license number was stored and retained for the login duration. User was able to logoff. Upon logoff, the user account information is no longer retained. Test 2: The user was able to successfully login to the application using a valid driver user account. A correct state and license number was generated. The account information was stored and retained for the login duration. User was able to logoff. Upon logoff, the user account information is no longer retained. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Steps	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.1.2-4	5.	**Requirement: An ELD must not allow creation of more than one driver account associated with a driver's license for a given motor carrier.** Description of Test Step: Test 1: a) Login to the ELD using a motor carrier user account b) Create a driver user account with a unique driver's license c) Verify the driver's license number was generated Test 2: d) Have the motor carrier attempt to create another driver user account with the same driver's license as in Test 1 e) Verify the account was not able to be created due to multiple driver's licenses f) Logout	Expected Test Step Outcome: Test 1: The user was able to successfully login to the application using a motor carrier user account. A unique license number was generated for new driver user account. Test 2 (if applicable): The user tried to create a new driver user account with the same license number as in Test 1 and failed. User was able to logoff. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.1.2-5	6.	**Requirement: A driver account must not have administrative rights to create new accounts on the ELD.** Description of Test Step: Test 1: a) Login to the application using a valid driver user account b) Attempt to create a new account on the ELD c) Verify account can't be created d) Logout	Expected Test Step Outcome: Test 1: The user was able to successfully login to the application using a driver user account. User was unable to create another account on the ELD. User was able to logoff. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Steps	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.1.2-6	7.	**Requirement: A support personnel account must not allow recording of ELD data for its account holder.** Description of Test Step: Test 1: a) Login to the application using a valid non-driver user account (support personnel account) b) Attempt to try and record ELD data c) Verify attempt was unsuccessful and no ELD data was recorded d) Logout	Expected Test Step Outcome: Test 1: The user was able to successfully login to the application using a non-driver user account. User was unable to record ELD data. User was able to logoff. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.1.2-7	8.	**Requirement: An ELD must reserve a unique driver account for recording events during non-authenticated operation of a CMV.** Description of Test Step: Test 1: a) Power on the vehicle without logging into the ELD and ignore the ELD prompts b) Drive the vehicle for a predetermined set of time c) Bring the vehicle to a stop and power off the vehicle d) Login to the ELD using a valid user account e) Verify ELD events were recorded during non-authenticated operation under the unidentified driver account f) Logout	Expected Test Step Outcome: Test 1: The user did not login to the ELD and powered on the vehicle. The user drove the vehicle for a predetermined amount of time and powered off the vehicle. The user was able to successfully login to the ELD and verify the ELD recorded non-authenticated events. User was able to logoff. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Steps	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.1.3-1	9.	**Requirement: An ELD must provide secure access to data recorded and stored on the system by requiring user authentication during system login.** Description of Test Step: Precondition: • ELD data has been recorded and is present on the ELD Test 1: a) Login to the application using a driver user account b) Verify ELD events that were recorded during normal operation can be accessed c) Logout	Expected Test Step Outcome: Test 1: The user was able to successfully login to the application using an authorized user account. User was able to access recorded ELD data. User was able to logoff. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.1.3-2	10.	**Requirement: Driver accounts must only have access to data associated with that driver, protecting the authenticity and confidentiality of the collected information.** Description of Test Step: Precondition: • ELD data has been recorded on a multiple driver user accounts Test 1: a) Login to the application using a valid driver user account with associated data b) Attempt to access the driver account data c) Verify the only ELD events/data that can be accessed are specific to the driver account that's logged in d) From the current logged on driver account, attempt to access data for a different driver account e) Verify another user's account information can't be accessed f) Logout	Expected Test Step Outcome: Test 1: The user was able to successfully login to the application using a valid driver user account. User was able to access own recorded ELD data. User was unable to access any other account information. User was able to logoff. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Steps	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.1.4-1	11.	**Requirement: An ELD must be capable of separately recording and retaining ELD data for each individual driver using the ELD.** Description of Test Step: Precondition: • ELD data has been recorded on a multiple driver user accounts Test 1: a) Login to the application using a valid driver user account b) Verify the only ELD events/data that can be accessed are specific to the driver account that's logged in. c) Create a new ELD event (note the time) d) Logout Test 2: e) Login to the application using another valid driver user account (different account than Test 1) f) Verify the recorded ELD events/data that can be accessed are specific to the driver account that's logged in g) Logout Test 3: h) Login to the application using the same driver user account as Test 1 i) Verify the ELD events/data that can be accessed are specific to the driver account that's logged in and the new event was recorded j) Logout	Expected Test Step Outcome: Test 1: The user was able to successfully login to the application using a valid driver user account. User was able to access own recorded ELD data. User was able to create new ELD event. User was able to logoff. Test 2: The user was able to successfully login to the application using a different valid driver user account. User was able to access own recorded ELD data. User was able to logoff. Test 3: The user was able to successfully login to the application using the same valid driver user account as Test 1. User was able to access own recorded ELD data including the new event. User was able to logoff. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Steps	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.1.4-2	12.	**Requirement: An ELD must provide for and require concurrent authentication for team drivers.** Description of Test Step: a) At least two drivers of a team should login to the application b) Verify the ELD events/data that can be accessed are specific to all the drivers who have logged in as the team c) Logout by each driver	Expected Test Step Outcome: Actual Test Step Outcome: All drivers on the team are listed and events/data specific to each of the drivers can be accessed. Each driver has logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Steps	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.1.4-3	13.	**Requirement: If more than one ELD unit is used to record a driver's electronic records within a motor carrier's operation, the ELD in the vehicle the driver is operating most recently must be able to produce a complete ELD report for that driver** Description of Test Step: Precondition: • More than 1 ELD application/device is available (2 are needed for this test – ELD1 and ELD2) Test 1: a) Login to ELD 1 using a valid driver user account b) Verify the only ELD events/data that can be accessed are specific to the driver account that's logged in. c) Create a new ELD event (note the time) d) Logout Test 2: e) Login to ELD 2 using the same driver user account as Test 1 f) Verify the recorded ELD events/data that can be accessed are specific to the driver account that's logged in g) Verify the ELD event created in Test 1 is stored and accessible on ELD 2 h) Verify the ELD report for the driver user account contains the initial events/data and the new event added in Test 1 i) Logout	Expected Test Step Outcome: Test 1: The user was able to successfully login to the application using a valid driver user account. User was able to access own recorded ELD data. User was able to create new ELD event. User was able to logoff. Test 2: The user was able to successfully login to another ELD application using the same driver user account. User was able to access own recorded ELD data including the new ELD event created in Test 1. User is able to produce a complete report on ELD2 which provides the previously existing data and the new event added on ELD1 User was able to logoff. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Steps	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.1.4-4	14.	**Requirement: The complete ELD report for that driver must consist of the current 24-hour period and the previous 7 consecutive days.** Description of Test Step: Precondition: • This is a week-long test (can be run in concurrence with other tests) Test 1 (Day 1): a) Login to the application using a valid driver user account (note the time) b) Create a new ELD event c) Logout Test 2 (Day 2-7): d) Login to the application using the same valid driver user account (note the time) e) Create a new ELD event f) Logout Test 3 (Day 8) g) Login to the application using the same driver user account (note the time) h) Create a new ELD event i) Verify the past 7 days of ELD events were stored and recorded j) Verify the ELD report includes the past 7 days of ELD events, as well as, the events of the current day (day 8) k) Logout	Expected Test Step Outcome: Test 1: The user was able to successfully login to the application using a driver user account. User was able to access own recorded ELD data. User was able to create new ELD event. User was able to logoff. Test 2: The user was able to successfully login to the application using a driver user account. User was able to access own recorded ELD data. User was able to create new ELD event. User was able to logoff. Test 3: The user was able to successfully login to the application using a driver user account. User was able to access own recorded ELD data. User was able to create new ELD event. User was able to access the past 7 days of ELD events as well as the current day's events. User was able to logoff. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Steps	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.1.5-1	15.	**Requirement: An ELD must associate all non-authenticated operation of a CMV with a single ELD account labeled unidentified driver.** Description of Test Step: Test 1: a) Power on the vehicle without logging into the ELD and ignore the ELD prompts b) Drive the vehicle for a predetermined set of time c) Bring the vehicle to a stop and power off the vehicle d) Login to the ELD using a valid user account e) Verify ELD events were recorded during non-authenticated operation under the unidentified driver account f) Logout	Expected Test Step Outcome: Test 1: The user did not login to the ELD and powered on the vehicle. The user drove the vehicle for a predetermined amount of time and powered off the vehicle. The user was able to successfully login to the ELD and verify the ELD recorded non-authenticated events with the unidentified driver account. User was able to logoff. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Steps	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.1.5-2	16.	**Requirement: If a driver does not log onto the ELD, as soon as the vehicle is in motion, the ELD must provide a visual or visual and audible warning reminding the driver to stop and login to the ELD** Description of Test Step: Test 1: a) Have the driver put the CMV in motion (without logging on first) b) Verify a visual or visual and audible warning indicator activates on the ELD c) Verify a visual or visual and audible warning activates to remind the driver to stop and login d) Bring the CMV to a stop e) Verify a visual or visual and audible warning stops f) Attempt to login to the ELD using a valid driver user account g) Verify login is successful and zero warning indicators are present h) Logout	Expected Test Step Outcome: Test 1: Motion was successfully applied to the ELD and a visual or visual and audible warning indicator activates when motion is applied without driver user logon. A visual or visual and audible warning message will activate. Motion was successfully stopped and the warning ceased. The user was able to successfully login to the application using a driver user account. Warning indicators were no longer present. User was able to logoff. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Steps	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.1.5-3	17.	**Requirement: If a driver does not log onto the ELD, as soon as the vehicle is in motion, the ELD must record accumulated driving and on-duty, not-driving, time in accordance with the ELD defaults described in Appendix B, section 4.4.1 under the unidentified driver profile** Description of Test Step: Test 1: a) Have the driver put the CMV in motion (without logging on first) b) Verify an audio or visual warning indicator activates on the ELD c) Verify an audible warning activates to remind the driver to stop and login d) Verify ELD is recording and note the time for when the motion is applied e) Bring the CMV to a stop f) Verify audible warning stops g) Attempt to login to the ELD using a valid driver user account h) Verify login is successful and zero warning indicators are present i) Verify on-duty, not-driving time was recorded for the period the ELD was in motion j) Verify the recorded data was logged under the unidentified user account k) Logout	Expected Test Step Outcome: Test 1: Motion was successfully applied to the ELD and a warning indicator activated when motion is activated without login. An audible warning message was activated. After a recorded amount of time, motion was successfully stopped and the warning ceased. The user was able to successfully login to the application. Warning indicators were no longer present. On-duty, not-driving time was recorded under an unidentified user account. User was able to logoff. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Steps	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.1.5-4	18.	**Requirement: If a driver does not log onto the ELD, as soon as the vehicle is in motion, the ELD must not allow entry of any information into the ELD other than a response to the login prompt** Description of Test Step: Test 1: a) Have the driver put the CMV in motion (without logging on first) b) Verify an audio or visual warning indicator activates on the ELD c) Verify an audible warning activates to remind the driver to stop and login d) Verify only the login prompt is accessible while the ELD is in motion and the user can't access any data e) Bring the CMV to a stop	Expected Test Step Outcome: Test 1: Motion was successfully applied to the ELD and a warning indicator was activated when motion is activated without login. The user was only allowed to access the login prompt and not any other data. Vehicle was brought to a stop. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
Test Step Note	N/A			
Test Step Note	N/A			
Test Step Note	N/A			

1.2ELD Test Procedures – Inputs

ELD inputs consist of ELD sensing, driver's manual entries and motor carrier's manual entries. The test procedures demonstrate the specifications required for each aspect that the ELD intakes, analyzes and keeps track of within the system.

Test Procedure Number	**ELD-1.2**					
Functional Area/Test Procedure Name	**ELD – Inputs**					
Date Test Initiated						
Description of Test Configuration						
Test Engineer (s)						
Overview/Description	☐	**Engineering Test Cycle**	☐	**Stand-alone Test**	☐	**System Test**
	☐	**Second Test Cycle**	☐	**Acceptance Test**	☐	**Regression Testing**

Date Test Completed:	**Signatures:**	**Test Engineer: _____** **Test Lead: _____** **Quality Assurance: _____** **Customer: _____** **Customer: _____**
Time Test Began: **Time Test Ended:**		

Requirement No.	**Test Step No.**	**Requirement** **Description of Test Step**	**Expected Test Step Outcome** **Actual Test Step Outcome**	**Pass (P), Fail(F)**

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.1.1-1	1.	**Requirement: An ELD must be powered and become fully functional within 1 minute of the vehicle's engine receiving power and must remain powered for as long as the vehicle's engine stays powered.** Description of Test Step: Test 1: a) Power on the ignition of the vehicle's engine (start timer) b) Verify the ELD is powered on within 1 minute of ignition. Note the time at which the ELD is powered on. c) Verify the ELD becomes fully functional d) Keep the engine running for a pre-determined set of time e) Verify the ELD remains powered on for the entire duration of time f) Power off the vehicle's engine g) Verify the ELD is powered off	Expected Test Step Outcome: Test 1: Engine was successfully powered on. ELD was successfully powered on and fully functional within 1 minute of engine power and remained on for the entire power duration. Engine was successfully powered off. ELD was successfully powered off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.1.2-1	2.	**An ELD must automatically determine whether a CMV is in motion or stopped by comparing the vehicle speed information with respect to a set speed threshold. (See Appendix B, section 4.3.1.2 for more details)** Description of Test Step: Test 1: a) Power on the ignition of the vehicle's engine b) Login to the ELD using a driver user account c) Keep the engine in idle for five minutes d) Verify with the ELD that is in a stopped state (0 miles per hour) e) Shift the vehicle into drive and maintain a moderate amount of speed for a pre-determined set of time f) Verify with the ELD that it acknowledges it is in motion and in the correct state g) Bring the vehicle back to a stop (vehicle speed falls to 0 miles per hour and stays at 0 miles per hour for 3 consecutive seconds) h) Verify the ELD correctly switches back to an idle state i) Power off the vehicle's engine j) Logout	Expected Test Step Outcome: Test 1: Engine was successfully powered on. The ELD was in the proper motion state when the vehicle was in motion based on the speed threshold. The vehicle was brought to a stop and the User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.1.2-2	3.	**Requirement: If an ELD is required to have a link to the vehicle's engine ECM, vehicle speed information must be acquired from the engine ECM. Otherwise, vehicle speed information must be acquired using an independent source. (See Appendix B, section 4.3.1.2 for more details).** Description of Test Step: Test 1: a) Verify ELD connection to engine ECM physically b) Power on the ignition of the vehicle's engine c) Login to the ELD using a driver user account d) Verify ELD speed information in current stopped state e) Shift to drive and keep the mph/speed of the vehicle variable f) Verify ELD speed information is variable to the vehicle speed g) Bring the vehicle back to a stop h) Verify the ELD correctly switches back to an idle state i) Power off the vehicle's engine j) Verify the ELD is powered off	Expected Test Step Outcome: Test 1: Engine was successfully powered on. ELD was successfully powered on and the user logged in. ELD's speed information was relative to the speed of the vehicle and was acquired from the engine ECM. The vehicle was brought to a stop and the ELD was successfully powered off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.1.3-1	4.	**Requirement: An ELD must monitor vehicle miles as accumulated by a CMV over the course of an ignition power on cycle (accumulated vehicle miles) and over the course of CMV's operation (total vehicle miles). Vehicle miles information must use or must be converted to units of whole miles.** Description of Test Step: Test 1: a) Power on the ignition of the vehicle's engine b) Login to the ELD using a valid driver user account c) Verify on the ELD the vehicle miles information and that it's displayed in the correct units (whole miles) d) Record the number of miles e) Drive the vehicle for five miles f) Verify miles are being accumulated during the drive g) Bring the vehicle back to a stop h) Verify the total amount of miles are correctly display on the ELD i) Power off the vehicle's engine j) Verify the ELD is powered off k) Logout	Expected Test Step Outcome: Test 1: Engine was successfully powered on. ELD was successfully powered on and the user logged in. Vehicle miles information was in the correct format. The vehicle miles were correctly accumulated over the course of travel. The vehicle was brought to a stop, the miles correctly totaled, and the ELD was successfully powered off. User logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.1.4-1	5.	**Requirement: An ELD must monitor engine hours of the CMV over the course of an ignition power on cycle (elapsed engine hours) and over the course of the CMV's operation total engine hours. Engine hours must use or must be converted to hours in intervals of a tenth of an hour.** Description of Test Step: Test 1: a) Power on the ignition of the vehicle's engine b) Login to the ELD using a driver user account c) Verify on the ELD the vehicle engine hours information and that it's displayed in the correct units (10^{th} of a hour) d) Record the number of engine hours e) Drive the vehicle for one hour fifteen minutes f) Verify engine usage time is being accumulated during the drive g) Bring the vehicle back to a stop h) Verify the total number of engine miles to a tenth of an hour are correctly display on the ELD i) Power off the vehicle's engine j) Verify the ELD is powered off	Expected Test Step Outcome: Test 1: Engine was successfully powered on. ELD was successfully powered on and the user logged in. Vehicle engine hour's information is provided in the correct format. The engine hours were correctly monitored over the duration of travel. The vehicle was brought to a stop and the engine hours were correctly totaled and provided in intervals of a tenth of an hour. The ELD was successfully powered off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.1.5-1	6.	**Requirement: The ELD must obtain and record the date and time information automatically without allowing any external input or interference from a motor carrier, driver, or any other person.** Description of Test Step: Precondition: • ELD date and time has been configured Test 1: a) Verify the date and time on the ELD is correct and automatically updates without any external assistance b) Logout	Expected Test Step Outcome: Test 1: User successfully logged in. ELD date and time were configured correctly. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.1.5-2	7.	**Requirement: The ELD time must be synchronized to Coordinated Universal Time (UTC) and the absolute deviation from UTC must not exceed 10 minutes at any point in time.** Description of Test Step: Precondition: • ELD date and time has been configured Test 1: a) Verify the date and time on the ELD is synchronized with the UTC time b) Verify the absolute deviation from UTC time is less than 10 minutes c) Logout	Expected Test Step Outcome: Test 1: User successfully logged in. ELD date and time were correctly synchronized with UTC time and were within the absolute deviation. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.1.6-1	8.	**Requirement: An ELD must have the capability to automatically determine the position of the CMV in standard latitude/longitude coordinates with the accuracy and availability requirements of this section.** Description of Test Step: Precondition: • ELD GPS has been configured Test 1: a) Have the user navigate to the ELD's GPS information b) Verify the position on the ELD is correct and in standard latitude/longitude coordinates c) Verify the ELD coordinates match the actual latitude/longitude coordinates d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in. ELD GPS position was correct in latitude/longitude coordinates. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.1.6-2	9.	**Requirement: ELD must obtain and record this information without allowing any external input or interference from a motor carrier, driver, or any other person.** Description of Test Step: Precondition: • ELD GPS has been configured Test 1: a) Have the user navigate to the ELD's GPS information b) Verify the position on the ELD is correct and in standard latitude/longitude coordinates c) Verify the ELD coordinates match the actual latitude/longitude coordinates d) Verify the GPS doesn't require any external assistance with geographical information e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in. ELD GPS position was correct in latitude/longitude coordinates. ELD GPS did not require any external assistance. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.1.6-3	10.	**Requirement: CMV position measurement must be accurate to ±0.5 mile of absolute position of the CMV when an ELD measures a valid latitude/longitude coordinate value.** Description of Test Step: Precondition: • ELD GPS has been configured Test 1: a) Have the user navigate to the ELD's GPS information b) Verify the position on the ELD is correct and in standard latitude/longitude coordinates c) Verify latitude/longitude coordinates is within an 0.5 mile absolute deviation to the CMV latitude/longitude coordinates d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in. ELD GPS position was correct in latitude/longitude coordinates. ELD GPS was within 0.5 miles absolute deviation. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.1.6-4	11.	**Requirement: Position information must be obtained in or converted into standard signed latitude and longitude values and must be expressed as decimal degrees to hundreds of a degree precision (i.e., a decimal point and two decimal places).** Description of Test Step: Precondition: • ELD GPS has been configured Test 1: a) Verify the position on the ELD is correct and in standard latitude/longitude coordinates b) Verify the latitude/longitude coordinates are in decimal degrees to hundreds of a degree precision (i.e., a decimal point and two decimal places) c) Logout	Expected Test Step Outcome: Test 1: User successfully logged in. ELD GPS position was correct in latitude/longitude coordinates and in decimal degrees to hundreds of a degree precision (i.e., a decimal point and two decimal places). User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.1.6-5	12.	**Requirement: Measurement accuracy combined with the reporting precision requirement implies that position reporting accuracy will be in the order of ±1mile of absolute position of the CMV during the course of a CMV's commercial operation.** Description of Test Step: Precondition: • ELD GPS has been configured Test 1: a) Have the user navigate to the ELD's GPS information b) Verify the position on the ELD is correct and in standard latitude/longitude coordinates c) Verify latitude/longitude is within an 0.5 mile absolute deviation d) Drive the vehicle for a minimum of 5 miles and monitor the GPS during travel e) Verify the GPS absolute deviation doesn't exceed 1 mile f) Bring the CMV to a complete stop g) Logout	Expected Test Step Outcome: Test 1: User successfully logged in. ELD GPS position was correct in latitude/longitude coordinates. ELD GPS was within 0.5 miles absolute deviation. During travel the absolute deviation did not exceed 1 mile. User successfully logged off after the vehicle came to a complete stop. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.1.6-6	13.	**Requirement: During periods of a driver's indication of personal use of the CMV, measurement reporting precision requirement is further reduced to be expressed as decimal degrees to tenths of a degree (i.e. a decimal point and single decimal place) as further specified in Appendix B, section 4.7.3.** Description of Test Step: Precondition: • ELD GPS has been configured Test 1: a) Login to the application using a driver b) Set the duty status to authorized personal use of CMV c) Verify the position on the ELD is correct and in standard latitude/longitude coordinates d) Verify latitude/longitude coordinates are expressed as decimal degrees to tenths of a degree (i.e. a decimal point and single decimal place) e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in with authorized personal use of CMV. ELD GPS position was correct in latitude/longitude coordinates. Latitude/longitude coordinates were expressed as decimal degrees to tenths of a degree (i.e. a decimal point and single decimal place). User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.1.6-7	14.	**Requirement: An ELD must be able to acquire a valid position measurement at least once every 5 miles of driving; however, CMV location information is only recorded during ELD events as specified in Appendix B, section 4.5.1** Description of Test Step: Precondition: • ELD GPS has been configured Test 1: a) Verify the position on the ELD is correct and in standard latitude/longitude coordinates b) Verify latitude/longitude is within an 0.5 mile absolute deviation c) Drive the vehicle for fifteen miles and monitor the GPS during travel d) Verify the GPS acquires a position at least every 5 miles (CMV location information is only recorded during ELD events) e) Bring the CMV to a complete stop f) Verify CMV location information is recorded g) Logout	Expected Test Step Outcome: Test 1: User successfully logged in. ELD GPS position was correct in latitude/longitude coordinates. During travel, GPS had valid position measurement every 5 miles. User successfully logged off after vehicle came to a complete stop. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.1.7-1	15.	**Requirement: The vehicle identification number (VIN) for the power unit of a CMV must be automatically obtained from the engine ECM and recorded if it is available on the vehicle data bus.** Description of Test Step: Precondition: • ELD has been configured for use with the vehicle data bus Test 1: a) Have the user navigate to the vehicle information captured on the ELD b) Verify ELD automatically reads the VIN for the power unit of the CMV c) Verify ELD records the VIN d) Verify the VIN numbers match e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in. ELD was successfully connected and configured for the vehicle's data bus. ELD automatically identified and recorded the VIN of the CMV. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2-1	16.	**Requirement: An ELD must prompt the driver to input information into the ELD only when the CMV is stationary and driver's duty status is not on-duty driving, except for the condition specified in Appendix B, section 4.4.1.2.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Verify the ELD prompts the user to input information c) Attempt to input information into the ELD with the vehicle stationary and status is not on-duty driving d) Verify information could be inputted e) Drive the vehicle for five miles f) Attempt to input information into the ELD with the vehicle in motion and status is on-duty driving g) Verify information couldn't be inputted h) Bring the vehicle to a stop i) Power off the vehicle's engine j) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in. User was prompted to input information when duty status was not on duty driving and the vehicle was stationary. The user was able to input information into the ELD when the vehicle was stationary. User was unable to input any information into the ELD when the vehicle was in motion and status was on-duty driving. User successfully logged off after bringing the vehicle to a stop. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2-2	17.	**Requirement: If the driver's duty status is driving, an ELD must only allow the driver who is operating the CMV to change the driver's duty status to another duty status.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Set the driver's duty status is on-duty driving and put the vehicle in motion c) Bring the vehicle to a stop d) Verify the driver can change his duty status to off-duty driving e) With another user attempt to change the current duty cycle of the driver back to on-duty driving f) Verify attempt failed g) Use the driver that's on status to change his duty cycle back to on-duty driving h) Verify the driver can set the duty status back to on duty driving i) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in and has status of on-duty. User changed their duty status from on-duty driving to off-duty driving. Another user failed to change the current user's duty status. Initial user changed their duty cycle back to its original status. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.2-3	18.	**Requirement: A stopped vehicle must maintain zero (0) miles per hour speed to be considered stationary for purposes of information entry into an ELD.** Description of Test Step: Previously tested in ELD-FUNC-4.3.2-1	Expected Test Step Outcome: Previously tested in ELD-FUNC-4.3.2-1 Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2-4	19.	**Requirement: An ELD must allow an authenticated co-driver who is not driving, but who has logged into the ELD prior to the vehicle being in motion to make entries over his or her own records when the vehicle is in motion.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Login to the ELD using an authorized co-driver user account c) Drive the vehicle for five miles d) Have the co-driver attempt to access their records when the vehicle is in motion e) Verify records could be accessed and entries can be made to the records f) Bring the vehicle to a stop g) Power off the vehicle's engine h) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. Another user successfully logged in as a co-driver who was not driving. Co-driver user successfully accessed and makes entries to their records while the vehicle was in motion. Both users successfully logged off after the vehicle was brought to a stop. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2-5	20.	**Requirement: The ELD must not allow co-drivers to switch driving roles when the vehicle is in motion.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Login to the ELD using an authorized co-driver user account c) Drive the vehicle for five miles d) Have the co-driver attempt to change his status to driver while the vehicle is still in motion e) Verify attempt wasn't successful f) Bring the vehicle to a stop g) Power off the vehicle's engine h) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. Another user successfully logged in as a co-driver who was not driving. While vehicle was in motion, the co-driver user tried to change their driving status to driver and failed. Users successfully logged off after the vehicle was brought to a stop. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.2.1-1	21.	**Requirement: An ELD must provide a means for a driver to manually enter information pertaining to driver's ELD records such as CMV power unit number, as specified in section 7.4 of this appendix; trailer number(s), as specified in section 7.42; and shipping document number, as specified in section 7.39.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Navigate to ELD records c) Verify driver can manually enter power unit number, trailer number(s), and shipping document number in the ELD records (if automatically generated see 4.3.2.1-2) d) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User successfully entered information in ELD records pertaining to power unit number, trailer number(s), and shipping document number, if not already automatically generated. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.1-2	22.	**Requirement: If the motor carrier populates these fields automatically, the ELD must provide means for the driver to review such information and make corrections as necessary.** Description of Test Step: Precondition: • **If not applicable see 4.3.2.1-1** Test 1: a) Verify power unit number, trailer number(s), and shipping document number in the ELD records are automatically generated b) Verify user can modify/make corrections to the ELD record c) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User successfully modified information in ELD records pertaining to power unit number, trailer number(s), and shipping document number that are automatically generated. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.2.2.1-1	23.	**Requirement: An ELD must provide a means for the authenticated driver to select a driver's duty status.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Verify the user can select an applicable driver duty status (see Test Step #24 for valid duty status categories) c) Verify the driver's status is changed to the selected duty status d) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User successfully selected a driver duty status. The user's driver status is changed to the selected option. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.2.1-2	24.	**Requirement: The ELD must use the ELD duty status categories listed in Table 1. (See Table 1 in Appendix B, section 4.3.2.2.1 for details)** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Verify the user can select an applicable driver duty status from the following provided categories a. Off Duty b. Sleeper Berth c. Driving d. On-duty Not Driving c) Verify driver duty status was selected d) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User was able to successfully select each driver duty status from the duty status categories list. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.2.2.2-1	25.	**Requirement: An ELD must provide means for a driver to indicate the beginning and end of a period when the driver may use the CMV for authorized personal use, or for performing yard moves.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Verify the user is provided the following options and can select an applicable category for personal driving time and recording a. Authorized Personal Use of CMV b. Yard Moves c. Default: None c) Verify all applicable categories can be selected d) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User was able to successfully select each of the personal use category options from the list. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.2.2-2	26.	**Requirement: The ELD must acquire this status (authorized personal use) in a standard format from the category list in Table 2. (See Table 2 in Appendix B, section 4.3.2.2.2 for details)** Description of Test Step: Previously tested in 4.3.2.2.2-1	Expected Test Step Outcome: Previously tested in 4.3.2.2.2-1 Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.2.2.2-3	27.	**Requirement: An ELD must allow a driver to only select categories that a motor carrier enables by configuration for that driver, as described in Appendix B, section 4.3.3.1.1.** Description of Test Step: Previously tested in 4.3.2.2.2-1	Expected Test Step Outcome: Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.2.2.2-4	28.	**Requirement: An ELD must only allow one category to be selected at any given time and use the latest selection by the driver.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Verify the user can select only one applicable category for personal driving time and recording a. Authorized Personal Use of CMV b. Yard Moves c. Default: None c) Verify the user can select all applicable categories for personal driving and the latest selection is displayed d) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User was able select only one personal use category from the list. User can select a different one category from the list. The user's last selected option is displayed. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.2.2-5	29.	**Requirement: The ELD must prompt the driver to enter an annotation upon selection of a category from Table 2 in Appendix B and record driver's entry.** Test 1: a) Login to the ELD using a driver user account b) Verify the user can select only one applicable category for personal driving time and recording a. Authorized Personal Use of CMV b. Yard Moves c. Default: None c) Verify ELD prompts the user to enter an annotation and the user can enter an annotation d) Verify annotation is recorded e) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User was able to select only one personal use category from the list. ELD prompted the user to enter an annotation, the user enters an annotation and the entry was recorded. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.2.2.2-6	30.	**Requirement: A driver's indication of special driving situation must reset to none if the ELD or CMV's engine goes through a power off cycle (ELD or CMV's engine turns off and then on)** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Verify the user can select Yard Moves from the following applicable category for personal driving time and recording (user's personal driving status is now Yard Moves) a. Authorized Personal Use of CMV b. Yard Moves c. Default: None c) Power off the ELD d) Power on the ELD and login as the same user e) Verify the personal driving status has defaulted to Default: None f) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User selects Yard Moves from the personal use category list. ELD is powered off and successfully restarted. The personal driving time category defaulted to none after restart. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.2.2-7	31.	**Requirement: The driver's indication will reset to none except if the driver has indicated authorized personal use of CMV, in which case, the ELD must require confirmation of continuation of the authorized personal use of CMV condition by the driver.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Verify the user can select Authorized Personal Use of CMV from the following applicable category for personal driving time and recording a. Authorized Personal Use of CMV b. Yard Moves c. Default: None c) Power off the ELD d) Power on the ELD and login as the same user e) Verify the ELD prompts the user for continuous use of Authorized Personal Use of CMV f) User provides confirmation of continuous use g) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User successfully selects Authorized Personal Use of CMV category from the list. ELD is powered off and successfully restarted. The user was prompted for continuous use of authorized personal use after restart and provides confirmation of continuous use. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.2.2-8	32.	**Requirement: If the driver's indication is not confirmed by the driver and the vehicle is in motion, the ELD must default to none.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Verify the user can select Authorized Personal Use of CMV applicable category for personal driving time and recording from the following options a. Authorized Personal Use of CMV b. Yard Moves c. Default: None c) Power off the ELD d) Power on the ELD and login as the same user e) Verify the ELD prompts the user for continuous use of Authorized Personal Use of CMV f) Have the user not confirm the prompt for continuous use g) Put the vehicle in motion h) Verify the ELD defaults to Default: None. i) Bring the vehicle to a stop j) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User successfully selects only one personal use category from the list. ELD is powered off and successfully restarted. The user was prompted for continuous use of authorized personal use. The user doesn't confirm the prompt and status defaults to none. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.3-1	33.	**Requirement: An ELD must include a function whereby a driver can certify the driver's records at the end of a 24-hour period. This function, when selected, must display a statement that reads "I hereby certify that my data entries and my record of duty status for this 24-hour period are true and correct." Driver must be prompted to select "Agree" or "Not ready." Driver's affirmative selection of "Agree" must be recorded as an event.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Have the user select the function to certify his 24-hour duty status c) Verify a statement is displayed that reads "I hereby certify that my data entries and my record of duty status for this 24-hour period are true and correct." d) Verify the user is prompted to select "Agree" or "Not Ready" e) Have the user select "Agree" f) Verify the event was recorded g) Logoff Test 2: h) Login to the ELD using a driver user account i) Have the user select the function to certify his 24-hour duty status j) Verify a statement is displayed that reads "I hereby certify that my data entries and my record of duty status for this 24-hour period are true and correct." k) Verify the user is prompted to select "Agree" or "Not Ready" l) Have the user select "Not Ready" m) Verify the event was not recorded n) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User verified the correct statement and selections at the 24-hour duty status screen. The user selected the appropriate response and the event was recorded. User successfully logged off. Test 2: User successfully logged in as a driver account. User verified the correct statement and selections at the 24-hour duty status screen. The user selected the appropriate response and the event was not recorded. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.3-2	34.	**Requirement: An ELD must only allow the authenticated driver to certify records associated with that driver.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Have the user attempt to certify the driver's 24-hour duty status c) Verify the attempt was successful Test 2: d) Have the current user attempt to certify another driver's 24-hour duty status e) Verify the attempt was unsuccessful f) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver user account. User navigates to a driver's end of 24-hour status screen and was successful in certifying the driver's status. Test 2: User navigates to another driver's end of 24-hour status screen and was unsuccessful in certifying the driver's status. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.3-3	35.	**Requirement: If any edits are necessary after the driver certifies the records for a given 24-hour period, the ELD must require and prompt the driver to re-certify the updated records.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Have the user navigate to the 24-hour duty status screen and certify his 24-hour duty status by selecting “Agree” c) Verify the event was recorded d) Have the user edit the recorded event e) Verify the event was edited f) Verify the ELD prompts the user to re-certify the updated record g) Verify the updated event was recertified and recorded h) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User made the correct selections at the 24-hour duty status screen and the event was recorded. User edited the recorded event and the ELD prompted the user to re-certify the event and the new event was recorded. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.3-4	36.	**Requirement: If there are any past records on the ELD (excluding the current 24-hour period) that requires certification or re-certification by the driver, the ELD must indicate the required driver action on the ELD's display and prompt the driver to take the necessary action during the login and logout processes.** Description of Test Step: Precondition: • A past recorded event (pre-24 hour) hasn't been certified by the driver Test 1: a) Login to the ELD using a driver user account b) Verify the ELD prompts the user to certify a previous 24-hour record c) Navigate to the 24-hour end of duty status screen d) Verify there is a past record that hasn't been certified e) Attempt to logoff f) Verify the ELD prompts the user to certify a previous 24-hour record g) Have the user certify his 24-hour duty status by selecting "Agree" h) Verify the event was recorded i) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. ELD prompted the user to certify a previous record. User navigated to end of 24-hour status screen and verified a record wasn't certified. The user attempted to logoff. ELD prompted the user to certify the past event. User certified the past event and successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.4-1	37.	**Requirement: An ELD must provide a standardized single-step driver interface for compilation of driver's ELD records and initiation of the data transfer to authorized safety officials when requested during a roadside inspection.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Simulate a roadside inspection: a. Access the driver's ELD records b. Initiate a driver transfer request c) Verify the process for compiling the records and initiating the data transfer was a single-step process d) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. A single step interface was used for the compilation of the driver's records and initiation of the data transfer request. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.2.4-2	38.	**Requirement: The ELD must input the data transfer request from the driver, require confirmation, present and request selection of the supported data transfer options by the ELD, and prompt for entry of the output file comment as specified in Appendix B, section 4.3.2.5.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Initiate a driver transfer request c) Verify the ELD requires confirmation of the input request d) Verify the ELD requests and presents data transfer options to the user e) Have the user select the appropriate data transfer option f) Verify the ELD prompts for entry of the output file g) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account and initiated a driver transfer request. The ELD successfully confirmed the input request, presented data transfer selections, and prompted for entry of the output file. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.4-3	39.	**Requirement: Upon confirmation of the output file request, the ELD must generate the compliant output file and perform the data transfer.** Test 1: a) Login to the ELD using a driver user account b) Initiate a driver transfer request c) Verify the ELD requires confirmation of the input request d) Verify the ELD requests and presents data transfer options to the user e) Have the user select the appropriate data transfer option f) Verify the ELD prompts for entry of the output file g) After confirmation of the output file, verify the ELD generates the correct output file and performs the data transfer h) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account and initiated a driver transfer request. The ELD successfully confirmed the input request, presented data transfer selections, and prompted for entry of the output file. The correct output file was generated and the data transfer initiated. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.2.4-4	40.	**Requirement: The supported single-step data transfer initiation mechanism (such as a switch or an icon on a touch-screen display) must be clearly marked and visible to the driver when the vehicle is stopped.** Test 1: a) Login to the ELD using a driver user account b) Simulate a roadside inspection with the vehicle stopped: a. Access the driver's ELD records b. Initiate a driver transfer request with the single-step transfer mechanism c) Verify the single-step transfer mechanism was clearly marked (switch or icon on display) d) Verify the single-step process mechanism initiated the transfer e) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. A single step interface was used for the compilation of the driver's records and initiation of the data transfer request. The single step mechanism was clearly marked and visible on the display screen. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.5-1	41.	**Requirement: An ELD must accommodate the entry of an output file comment up to 60 characters long.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Initiate a driver transfer request c) Verify the ELD: a. Requires confirmation of the input request b. Requests and presents data transfer options c. Prompts for entry of the output file d) Have the user attempt to enter more than 60 character in the output file comment e) Verify output file comment section can only hold up to 60 characters f) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account and initiated a driver transfer request. The ELD successfully confirmed the input request, presented data transfer selections, and prompted for entry of the output file. The output file comment section held up to 60 characters. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.5-2	42.	**Requirement: If an authorized safety official provides a key phrase or code during an inspection to be included in the output file comment, it must be entered and embedded into the electronic ELD records in the exchanged dataset as specified in Appendix B, section 4.8.2.1.1.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Initiate a driver transfer request c) Verify the ELD: a. Requires confirmation of the input request b. Requests and presents data transfer options c. Prompts for entry of the output file d) Input a key phrase or code into the output file comment section e) Verify the key phrase or code was correctly entered into the exchanged dataset of the electronic ELD records (Format of the output file header comment will be covered in ELD-FUNC-4.8.2.1.1) f) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account and initiated a driver transfer request. The ELD successfully confirmed the input request, presented data transfer selections, and prompted for entry of the output file. The key phrase or code was correctly entered into the electronic ELD records. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.5-3	43.	**Requirement: The default value for the output file comment must be blank.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Initiate a driver transfer request c) Verify the ELD: a. Requires confirmation of the input request b. Requests and presents data transfer options c. Prompts for entry of the output file d) Verify output file comment is blank by default e) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account and initiated a driver transfer request. The ELD successfully confirmed the input request, presented data transfer selections, and prompted for entry of the output file. The output file comment section default was blank. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.2.5-4	44.	**Requirement: This output file comment must be used only for the creation of the related data files for the intended time, place, and ELD user.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Initiate a driver transfer request c) Verify the ELD: a. Requires confirmation of the input request b. Requests and presents data transfer options c. Prompts for entry of the output file d) Input date, time, and user into the output file comments section e) Verify the output file comment showed the inputs f) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account and initiated a driver transfer request. The ELD successfully confirmed the input request, presented data transfer selections, and prompted for entry of the output file. User inputted the date, time, and ELD user into the output comments section. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.6-1	45.	**Requirement: An ELD must allow for a driver to add annotations in text format to recorded, entered, or edited ELD events.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Verify there is an ELD event created in the driver's records c) Have the driver add annotations to the recorded ELD event d) Verify the annotations are added to the recorded ELD event e) Verify all driver annotations are in text format f) Have the driver edit an ELD event (if one is not already preset) g) Have the driver add annotations to the edited ELD event h) Verify the annotations are added to the edited ELD event i) Verify all driver annotations are in text format j) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User added annotations to a recorded event. User added annotations to an edited event. All annotations were in text format. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.2.6-2	46.	**Requirement: The ELD must require annotations to be 4 characters or longer, including embedded spaces if driver annotation is required and driver is prompted by the ELD.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Have the driver create or edit an ELD event and add annotations c) Attempt to include only 0-3 characters in the annotation field d) Verify ELD prompts the user to include 4 or more characters in the annotation field e) Have the user enter 4 or more characters in the annotation field f) Verify ELD accepts the annotation g) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User added annotations to a created or edited event. User attempted only 0-3 characters in the annotation field and the ELD prompted the user for 4 or more. The user entered 4 or more characters into the annotation. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.7-1	47.	**Requirement: An ELD must allow manual entry of a CMV's location by the driver in text format in support of the driver edit requirements described in Appendix B, section 4.3.2.8.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Navigate to the ELD CMV's location entry c) Have the user manually enter a location d) Verify entry is successfully entered and in text format e) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User navigated to the CMV's location field and successfully entered the CMV's location. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.2.7-2	48.	**Requirement: Driver's manual location entry must be available as an option to a driver only when prompted by the ELD under allowed conditions as described in Appendix B, section 4.6.1.4.** Description of Test Step: Test 1: Previously tested in ELD-FUNC-4.3.2.7-1	Expected Test Step Outcome: Previously tested in ELD-FUNC-4.3.2.7-1 Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.2.7-3	49.	**Requirement: A manual location entry must show "M" in the latitude/longitude coordinates fields in ELD records.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Navigate to the ELD CMV's location entry c) Have the user manually enter a location d) Verify location is successfully entered and in text format e) Verify the location entry shows a "M" in the latitude/longitude coordinate fields of the manually entered location f) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User navigated to the CMV's location field and successfully entered the CMV's location. Latitude/Longitude fields showed an "M". User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.8-1	50.	**Requirement: An ELD must provide a mechanism for a driver to review, edit, and annotate the driver's ELD records when a notation of errors or omissions is necessary or enter the driver's missing ELD records subject to the requirements specified in this section.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Navigate to the ELD driver's records c) Have the user attempt to review, edit, and annotate records d) Verify a mechanism is in place for the driver to review, edit, and annotate records e) Verify the records were able to be reviewed, edited, and annotated f) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User navigated to the driver's records and a mechanism was in place for the user to successfully review, edit, and annotate a driver's ELD record. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.2.8-2	51.	**Requirement: An ELD must not permit alteration or erasure of the original information collected concerning the driver's ELD records or alteration of the source data streams used to provide that information.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Navigate to the ELD driver's records c) Identify and select an original record d) Have the user attempt to edit an original record e) Verify the attempt to alter the original record was not permitted f) Have the user attempt to delete an original record g) Verify the attempt to delete the original record was not permitted h) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User navigated to the driver's records and was unsuccessful in attempting to alter or erase an original record. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.8.1-1	52.	**Requirement: If a driver edits or annotates an ELD record or enters missing information the act must not overwrite the original record.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Navigate to the ELD driver's records c) Have the user attempt to annotate an original record with missing information; d) Verify the annotation is accepted e) Verify the annotation did not erase any of the original data f) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User navigated to the driver's records and annotated a record. The annotation did not result in the deletion any original information. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.2.8.1-2	53.	**Requirement: The ELD must use the process outlined in Appendix B, section 4.4.4.2 to configure required event attributes to track the edit history of records.** Description of Test Step: Will be tested in ELD-FUNC-4.4.4.2	Expected Test Step Outcome: Will be tested in ELD-FUNC-4.4.4.2 Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.8.1-3	54.	**Requirement: Driver edits must be accompanied by an annotation. The ELD must prompt the driver to annotate edits.** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Navigate to the ELD driver's records c) Have the user attempt to edit a record d) Verify the ELD prompted the user for an annotation for the reason of the edit e) Have the user enter an annotation f) Verify the edit was successful following an annotation g) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User navigated to the driver's records and edited a record. The ELD prompted the user for an annotation for the edit. User entered an annotation. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.2.8.2-1	55.	**Requirement: An ELD must not allow or require the editing or manual entry of records with the following event types, as described in Appendix C, section 7.1.24 (See Appendix B, section 4.3.2.8.2 for details)** Description of Test Step: Test 1: a) Login to the ELD using a driver user account b) Navigate to the ELD driver's records c) Have the user attempt to edit the records with the following event type: a. #2 – An intermediate log b. #5 – A driver's login/logout activity c. #6 – CMV's engine power up/shutdown d. #7 – ELD malfunctions and data diagnostics events d) Verify the ELD did not allow the user the edit any of these records e) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User navigated to the driver's records and attempted to edit event types #2, #5, #6, and #7. The ELD did not allow editing of those event types. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.8.2-2	56.	**Requirement: An ELD must not allow automatically recorded driving time to be shortened.** Description of Test Step: Precondition: • Previous driving time has been recorded Test 1: a) Login to the ELD using a driver user account b) Navigate to the ELD driver's records c) Have the user attempt to edit a driving time record (previously recorded) and make the driving time shorter d) Verify the ELD did not allow the user the shorten the driving time record e) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver account. User navigated to the driver's records and attempted to edit a driving time record. The ELD did not allow the user to shorten the driving time of the record. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.2.8.2-3	57.	**Requirement: An ELD must not allow the ELD username associated with an ELD record to be edited or reassigned, except under the following circumstances (See Appendix B, section 4.3.2.8.2 for details)** Description of Test Step: Precondition: • Records have been both assigned and not assigned to drivers • Records have been assigned to team drivers Test 1: a) Login to the ELD using a support personnel user account b) Navigate to the ELD driver's records c) Have the user attempt to edit a username associated with its associated ELD record d) Verify the ELD did not allow the username to be edited e) Logoff Test 2: f) Login to the ELD using a support personnel user account g) Navigate to the ELD driver's records h) Have the user locate a record associated with an unidentified driver i) Attempt to assign the record with its associated driver j) Verify the ELD record was assigned k) Logoff Test 3: l) Login to the ELD using a driver user account and a co-driver user account m) Navigate to the ELD driver's records n) Have the user locate a record associated with the team drivers (verify there are a minimum of 2 drivers associated with the record) o) Attempt to edit the record and change the driving time between drivers p) Verify the ELD record was edited correctly and the ELD prompted the driver and the co-driver to both accept the corrective action to the records q) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a support personnel account. User navigated to the driver's records and attempted to edit a username associated with a record. The ELD did not allow the user to edit the record. User successfully logged off. Test 2: User successfully logged in as a support personnel account. User navigated to the driver's records and assigned an unidentified driver record to a driver username. User successfully logged off. Test 3: Users successfully logged in as a driver and co-driver user accounts. User navigated to the driver's records and edited the driving time to the co-driver. The ELD prompted both users to verify the corrective action to the record. Users successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.3.1.1-1	58.	**Requirement: An ELD must allow a motor carrier to unilaterally configure the availability of each of the three categories listed on Table 2 in Appendix B that the motor carrier chooses to authorize for each of its drivers.** Description of Test Step: Precondition: • Authenticated support personnel account holders are used for motor carrier entries in this test step Test 1: a) Login to the ELD using a support personnel user account (motor carrier) b) Have the user configure the different driver duty status categories for a driver (authorized personal use of CMV, yard moves, default: none) c) Verify the duty status categories can be configured by the motor carrier d) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a support personnel account. User configured the driver duty statuses for applicable drivers. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.3.1.1-2	59.	**Requirement: By default, none of these categories listed on Table 2 in Appendix B must be available to a new driver account without the motor carrier proactively configuring their availability.** Description of Test Step: Precondition: • Authenticated support personnel account holders are used for motor carrier entries in this test step Test 1: a) Login to the ELD using a support personnel user account (motor carrier) b) Have the user create a new driver user account c) Verify that no driver duty status categories (authorized personal use of the CMV, yard moves, default: none) are configured for the new account d) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a support personnel account. A new driver user account was created and none of the driver duty statuses were configured for the new account. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.3.1.1-3	60.	**Requirement: A motor carrier may change the configuration for the availability of each category for each of its drivers.** Description of Test Step: Precondition: • Authenticated support personnel account holders are used for motor carrier entries in this test step Test 1: a) Login to the ELD using a support personnel user account (motor carrier) b) Have the user change the configuration settings for the driver duty status categories (authorized personal use of the CMV, yard moves, default: none) c) Verify the configuration settings were successfully changed d) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a support personnel account. The configuration settings were changed on a driver duty status. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.3.1.1-4	61.	**Requirement: Changes to the configuration setting must be recorded on the ELD and communicated to the applicable authenticated driver during the ELD login process.** Description of Test Step: Precondition: • Authenticated support personnel account holders are used for motor carrier entries in this test step Test 1: a) Login to the ELD using a support personnel user account (motor carrier) b) Have the user change the configuration settings for the driver duty status categories (authorized personal use of the CMV, yard moves, default: none) c) Verify the configuration settings were successfully changed and the changes were recorded on the ELD d) Logoff Test 2: e) Login to the ELD using the applicable driver user account (updated account from Test 1) f) Verify the ELD notifies the user of the account settings update g) Verify the configuration settings of the driver duty status has been updated accordingly h) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a support personnel account. The configuration settings were changed on a driver duty status and were successfully recorded. User successfully logged off. Test 2: User successfully logged in as the updated driver user account. The ELD notified the driver of the updated settings on the duty status. User verified the configuration settings and successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.3.1.2-1	62.	**Requirement: An ELD must provide the motor carrier an ability to configure a driver account exempt from use of an ELD.** Description of Test Step: Precondition: • Authenticated support personnel account holders are used for motor carrier entries in this test step Test 1: a) Login to the ELD using a support personnel user account (motor carrier) b) Have the user create a new driver account exempt from use of the ELD c) Verify new account was created and ELD data is unable to be recorded d) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a support personnel account. A new driver account was created and exempt from the ELD. The account was verified to store no ELD data. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.3.1.2-2	63.	**Requirement: The ELD must default the setting of this configuration option for each new driver account created on an ELD to no exemption.** Description of Test Step: Precondition: • Authenticated support personnel account holders are used for motor carrier entries in this test step Test 1: a) Login to the ELD using a support personnel user account (motor carrier) b) Have the user create a new driver account c) Verify the default setting was set to no exemption d) Verify ELD data can be recorded e) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a support personnel account. A new driver account was created and the default setting was set to non-exemption. ELD data could be recorded. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.3.1.2-3	64.	**Requirement: An exemption for the new driver account must be proactively configured for an applicable driver account by the motor carrier.** Description of Test Step: Precondition: • Authenticated support personnel account holders are used for motor carrier entries in this test step • Exempt account settings pre-configured Test 1: a) Login to the ELD using an exempt account that was pre-configured b) Verify the default setting was set to exemption c) Verify the configuration settings correctly align with the motor carrier's configuration and no ELD data is being captured d) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as an exempt account. The correct configuration settings were in place. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.3.1.2-4	65.	**Requirement: The ELD must prompt the motor carrier to annotate the record and provide an explanation for the configuration of exemption.** Description of Test Step: Precondition: • Authenticated support personnel account holders are used for motor carrier entries in this test step Test 1: a) Login to the ELD using a support personnel user account (motor carrier) b) Have the user create a new driver account c) Verify the default setting was set to no exemption d) Have the user set the configuration of the new account to exempt from use of the ELD e) Verify the ELD prompts the user to annotate the action and require an explanation for the exemption f) Have the user enter the annotation g) Verify annotation is accepted h) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a support personnel account. A new driver account was created and the default setting was set to non-exemption. The user set the new account to exempt and the ELD prompted the user to annotate and provide reasoning. User entered the annotated and provided reasoning for annotation. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.3.1.2-5	66.	**Requirement: If a motor carrier configures a driver account to be exempt, the ELD must present the configured indication that is in effect for that driver during the ELD login and logout processes.** Description of Test Step: Precondition: • Authenticated support personnel account holders are used for motor carrier entries in this test step Test 1: a) Login to the ELD using the applicable driver user account (exempt) b) Verify the ELD indicated that the exempt account configuration is in place c) Verify the ELD indicated that the exempt account configuration is in place during the logout process d) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as an exempt driver user account. The exempt indication was present during the login and logout process. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.3.1.2-6	67.	**Requirement: If a motor carrier configures a driver account as exempt the ELD must continue to record ELD driving time but suspend detection of missing data elements data diagnostic event for the driver described in Appendix B, section 4.6.1.5 and data transfer compliance monitoring function described in Appendix B, section 4.6.1.7 when such driver is authenticated on the ELD.** Description of Test Step: Precondition: • Authenticated support personnel account holders are used for motor carrier entries in this test step • Vehicle interface needed for driving time Test 1: a) Login to the ELD using the applicable driver user account (exempt) b) Put the vehicle in motion c) Have the user record driving time under the exempt driver account d) Verify the ELD does not record data diagnostic events and data transfer monitoring functions e) Bring the vehicle to a stop f) Verify driving time was recorded g) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as an exempt driver user account. The ELD did not record the applicable data elements under the exempt account when the vehicle was in motion. Driving time was recorded. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.3.1.3-1	68.	**Requirement: An ELD may allow the motor carrier (via a monitoring algorithm or support personnel) to screen corrective edits to the driver's certified (as described in Appendix B, section 4.3.2.3)** Description of Test Step: Precondition: • Authenticated support personnel account holders are used for motor carrier entries in this test step Test 1: a) Login to the ELD using a support personnel user account (motor carrier) b) Navigate to a driver's certified driving record c) Attempt to screen corrective edits d) Verify screening attempt is successful e) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a support personnel user account. The user navigated to a driver's certified driving records and successfully screened corrective actions on the records. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.3.1.3-2	69.	**Requirement: An ELD may allow the motor carrier (via a monitoring algorithm or support personnel) to review corrective edits to the driver's certified (as described in Appendix B, section 4.3.2.3)** Description of Test Step: Precondition: • Authenticated support personnel account holders are used for motor carrier entries in this test step Test 1: a) Login to the ELD using a support personnel user account (motor carrier) b) Navigate to a driver's certified driving record c) Attempt to review corrective edits d) Verify review attempt is successful e) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a support personnel user account. The user navigated to a driver's certified driving records and successfully reviewed corrective actions on the records. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.3.1.3-3	70.	**Requirement: An ELD may allow the motor carrier (via a monitoring algorithm or support personnel) to request corrective edits to the driver's certified (as described in Appendix B, section 4.3.2.3)** Description of Test Step: Precondition: • Authenticated support personnel account holders are used for motor carrier entries in this test step Test 1: a) Login to the ELD using a support personnel user account (motor carrier) b) Navigate to a driver's certified driving record c) Attempt to request corrective edits d) Verify request is successful e) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a support personnel user account. The user navigated to a driver's certified driving records and successfully requested corrective actions on the records. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.3.3.1.3-4	71.	**Requirement: An ELD may allow the motor carrier to submit records through the ELD system electronically.** Description of Test Step: Precondition: • Authenticated support personnel account holders are used for motor carrier entries in this test step Test 1: a) Login to the ELD using a support personnel user account (motor carrier) b) Navigate to a driver's certified driving record c) Attempt to submit the certified driving record electronically d) Verify records were electronically submitted e) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a support personnel user account. The user navigated to a driver's certified driving records and successfully submitted the records electronically. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.3.1.3-5	72.	**Requirement: If submitting records through the ELD system electronically is implemented by the ELD, the ELD must also support functions for the driver to see and review the requested edits.** Description of Test Step: Precondition: • Authenticated support personnel account holders are used for motor carrier entries in this test step Test 1: a) Login to the ELD using a support personnel user account (motor carrier) b) Navigate to a driver's certified driving record c) Request corrective edits to the record d) Submit the certified driving record electronically through the ELD e) Verify record was sent electronically f) Logoff Test 2: g) Login to the ELD a driver user account (modified account from Test 1) h) Navigate to the driver's certified driving records i) Verify the user can see and review the edits to the records j) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a support personnel user account. The user navigated to a driver's certified driving records and successfully screened, reviewed, and requested corrective actions on the records. The user navigated to a driver's certified driving records and successfully submitted the records electronically. User successfully logged off. Test 2: User successfully logged in as a driver user account. The user navigated to the driver's certified driving records and could see and review the edits to the records from the motor carrier. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.3.3.1.3-6	73.	**Requirement: Edits requested by anyone or any system other than the driver must require the driver's electronic confirmation or rejection.** Description of Test Step: Precondition: • Authenticated support personnel account holders are used for motor carrier entries in this test step Test 1 a) Login to the ELD using a driver user account (modified account from Test 1 in 4.3.3.1.3-5) b) Navigate to the driver's certified driving records c) Verify the user can see and review the edits to the records d) Have the user confirm or reject the edits e) Verify the confirmation or rejection of the edits f) Logoff	Expected Test Step Outcome: Test 1: User successfully logged in as a driver user account. The user navigated to the driver's certified driving records and could see and review the edits to the records from the motor carrier. User confirmed or rejected the edits. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
Test Step Note	N/A			
Test Step Note	N/A			
Test Step Note	N/A			

1.3 ELD Test Procedures – Vehicle Interface

An ELD must be integrally synchronized with the engine of the CMV. Engine synchronization for purposes of ELD compliance means the monitoring of the vehicle's engine operation to automatically capture engine's power status, vehicle's motion status, miles driven value, and engine hour's value. The following test procedures demonstrate and ensure that the ELD vehicle interface works as required.

Test Procedure Number	**ELD-1.3**					
Functional Area/Test Procedure Name	**ELD – Vehicle Interface**					
Date Test Initiated						
Description of Test Configuration						
Test Engineer (s)						
Overview/Description	☐	**Engineering Test Cycle**	☐	**Stand-alone Test**	☐	**System Test**
	☐	**Second Test Cycle**	☐	**Acceptance Test**	☐	**Regression Testing**

Date Test Completed:	**Signatures:**	**Test Engineer: _____** **Test Lead: _____** **Quality Assurance: _____** **Customer: _____** **Customer: _____**
Time Test Began: **Time Test Ended:**		

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.2-1	1.	**Requirement: An ELD must be integrally synchronized with the engine of the CMV. (See Appendix B, section 4.2 for more details)** Description of Test Step: Precondition: • Verify that the engine has an electronic control module (ECM) with the CMV vendor • The ELD must establish a link to the engine ECM and receive information through a serial or Control Area Network (CAN) communication Test 1: a) Establish a link between the ELD and the CMV's ECM b) Verify a link was established by having the ELD synchronize with the vehicle's engine and automatically capture: a. Engine power status b. Vehicle's motion status c. Miles driven value d. Engine hours value c) Verify these data points are captured on the ELD Test 2: d) Power on the vehicle and put the vehicle in drive e) Drive the vehicle for a predetermined amount of time f) Bring the vehicle to a stop g) Verify the ELD captured the new values the new data points h) Logout	Expected Test Step Outcome: Test 1: A link was successfully established between the ELD and the engine's ECM. The ELD synchronized and automatically captured the engine power status, vehicle motion status, miles driven value, and engine hour's value. Test 2: User put the vehicle in motion and drove for a predetermined amount of time and verified the ELD captured the new data values. User logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
Test Step Note	N/A			

Test Step Note	N/A	
Test Step Note	N/A	

Chapter Two:
ELD Test Procedures
Processing, Monitoring and Recording

10/17/2016

Version 2.0

U.S. Department of Transportation
Federal Motor Carrier Safety Administration

Revision History

Version	Rev	Date	Changes Made	Writer	Reviewer
0.0	-	12/16/15	Original Document	FMCSA	
1.0	-	3/11/16	Webinar Updates	FMCSA	
2.0	-	10/17/16	Implementation Phase Web Services Tests Note	FMCSA	

This is a copy of The ELD Compliance Test Procedures [as a Word document]. The current official version [as a .pdf file] is published on the FMCSA website and updated as required. Please be aware that any modification is the company's responsibility if it differs from the FMCSA official version.

Use of Compliance Test Procedures

An Electronic Logging Device (ELD) must meet the technical specifications set forth in the Appendix to Subpart B of Part 395 of title 49, Code of Federal Regulations. Although use of the ELD test procedures set forth in this document is not binding on ELD providers, these procedures are made available to ELD providers to assist them in carrying out their testing processes before certifying an ELD model as compliant with the technical specifications. The ELD certification process does require a certifying statement describing how the model was tested to comply with FMCSA regulations. The FMCSA would use these test procedures to evaluate compliance if the Agency decides to undertake an independent evaluation of an ELD that has been certified by the provider.

Implementation Phase Data Transfer and Web Services Test Steps

Due to the fact that data transfer cannot be trialed with an actual authorized safety official and that the Web Services portal at FMCSA is not yet operational, the following test steps* are not required to be completed:

ELD-FUNC-4.3.2.5-2

ELD-FUNC-4.9.1-2

ELD-FUNC-4.9.2-5

ELD-FUNC-4.10.1.1-2

ELD-FUNC-4.10.1.1-3

ELD-FUNC-4.10.1.1-4

ELD-FUNC-4.10.1.2-2

ELD-FUNC-4.10.1.2-3

ELD-FUNC-4.10.2-1

These steps are also highlighted in YELLOW if they are contained within this document.

*Data transfer via e-mail accounts, USB, and Bluetooth can still be tested in the manufacturer's test environment. If the required output file can be generated per the technical specifications, it will work in FMCSA Web Services

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2.1 ELD Test Procedures- Processing

The ELD requirements for internal processing and tracking of information flow include conditions for automatic setting of duty status, geo-location conversions, date and time conversions, setting of event parameters in records, edits and entries, and data integrity check functions. An ELD must demonstrate the capability of automatically setting the duty status to either "Driving" or "On-Duty Not Driving" depending on the ELD/vehicle condition and must not feature any other automatic records of duty setting mechanisms. For each change in duty status, the ELD must convert automatically captured vehicle position in latitude/longitude coordinates into geo-location information. An ELD must have the capability to convert and track date and time captured in UTC standard to the time standard in effect at driver's home terminal. Specified security measures for configuring and tracking event attributes for ELD records, edits, and entries shall be captured and displayed in a standardized manner. An ELD must support standard security measures which require the calculation and recording of standard data check values for each ELD event recorded, for each line of the output file, and for the entire data file to be generated for transmission to an authorized safety official or the motor carrier. The following test procedures validate the device internal processing and information tracking.

Test Procedure Number	**ELD-2.1**					
Functional Area/Test Procedure Name	**ELD – Processing**					
Date Test Initiated						
Description of Test Configuration						
Test Engineer (s)						
Overview/Description	☐	**Engineering Test Cycle**	☐	**Stand-alone Test**	☐	**System Test**
	☐	**Second Test Cycle**	☐	**Acceptance Test**	☐	**Regression Testing**

Date Test Completed:	**Signatures:**	**Test Engineer: _____** **Test Lead: _____** **Quality Assurance: _____** **Customer: _____** **Customer: _____**
Time Test Began: **Time Test Ended:**		

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.1.1-1	1.	**Requirement: An ELD must automatically record driving time when the vehicle is in motion by setting duty status to driving for the driver.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Verify on the ELD that the driving time is not being recorded c) Set the duty status to on duty d) Power up the CMV's engine e) Put the vehicle in motion for a predetermined set of time f) Verify the ELD sets the duty status to driving and the driving time clock is recording g) Bring the vehicle to a stop h) Allow for 5 mins of stop time i) Verify the driving time clock has stopped recorded j) Power off the CMV's engine k) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and set the duty status to on duty. After the vehicle was in motion, the driving time was recorded for the duration of the trip. The vehicle was brought to a stop and the user successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.1.1-2	2.	**Requirement: If the driver sets the duty status to off-duty and indicates personal use of CMV, duty status must remain off-duty until the driver's indication of the driving condition ends.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Set the duty status to off duty, authorized personal use of the CMV c) Power up the CMV's engine d) Put the vehicle in motion e) Verify the ELD maintains the current duty status f) Bring the vehicle to a stop g) Power off the CMV's engine h) Verify the duty status has remained the same i) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and set the duty status to off duty, authorized personal use of the CMV. After the vehicle was in motion, the duty status remained the same. The vehicle was brought to a stop and the user successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.1.1-3	3.	**Requirement: If the duty status is set to on-duty not driving and indicates yard moves, the duty status must remain on-duty not driving until driver's indication of the driving condition ends.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Set the duty status to on duty, yard moves c) Verify the ELD is in an on-duty not driving state d) Power up the CMV's engine e) Put the vehicle in motion f) Verify the ELD changes the duty status to on-duty driving, yard moves g) Bring the vehicle to a stop h) Power off the CMV's engine i) Verify the duty status has remained the same j) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and set the duty status to on duty, yard moves. After the vehicle was in motion, the duty status changed to on duty, driving, yard moves. The vehicle was brought to a stop and the user successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.1.2-1	4.	**Requirement: When the duty status is set to driving, and the CMV has not been in-motion for 5 consecutive minutes, the ELD must prompt the driver to confirm continued driving status or enter the proper duty status.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Set the duty status to on duty c) Power up the CMV's engine d) Put the vehicle in motion e) Verify the ELD changes the duty status to on-duty driving f) Bring the vehicle to a stop g) Wait for 5 consecutive minutes h) Verify the ELD prompts the driver to continue duty status or enter a new duty status i) Have the driver continue driving duty status j) Power off the CMV's engine k) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and set the duty status to on duty. After the vehicle was in motion, the duty status changed to on duty, driving. The vehicle was brought to a stop, not moved for 5 consecutive minutes. The ELD prompted the user to continue current duty status or enter a new one. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.1.2-2	5.	**Requirement: If the driver does not respond to the ELD prompt within 1-minute after receiving the prompt, the ELD must automatically switch the duty status to on-duty not driving. The time thresholds for purposes of this section must not be configurable.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Set the duty status to on duty c) Power up the CMV's engine d) Put the vehicle in motion e) Verify the ELD changes the duty status to on-duty driving f) Bring the vehicle to a stop g) Wait for 5 consecutive minutes h) The ELD prompts the driver to continue duty status or enter a new duty status – i) User does not respond to the ELD prompt j) Wait an additional minute with no response to prompt k) Verify the ELD changes the duty status from on-duty driving to on-duty not driving l) Verify the time was a minute or less for the user to receive the prompt m) Power off the CMV's engine n) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and set the duty status to on duty. The vehicle was put in motion and the duty status changed to on duty, driving. The vehicle was brought to a stop and unmoved for 5 consecutive minutes. The ELD prompted the user to continue current duty status or enter a new one. After another minute wait time, the ELD automatically switched the duty status to on duty not driving. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.2-1	6.	**Requirement: For each change in duty status, the ELD must convert automatically captured vehicle position in latitude/longitude coordinates into geo-location information, indicating approximate distance and direction to an identifiable location corresponding to the name of a nearby city, town, or village, with a State abbreviation.** Precondition: • Set up test environment to capture geo-location information Description of Test Test 1: a) Login to the application with a valid user account b) Set the duty status to off duty c) Change the duty status to on duty not driving d) Verify on the ELD that the geo-location information was captured for each duty status change e) Verify the captured data indicated approximated distance and direction to an identifiable location f) Verify data results are valid for the test location g) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and set the duty status to off duty. User changed the duty status to on duty not driving and verified on the ELD that the geo-location information was captured. This information included distance and direction to a known location with the city and state identified. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.2-3	7.	**Requirement: An ELD's viewable outputs (such as printouts or displays) must feature geo-location information as place names in text format.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Access a printout or display of duty status changes (from 4.4.2-1 test) c) Verify on the printout or display that the geo-location information was displayed in text format d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and accessed a printout or display of the user's duty status changes. The geo-location information was displayed on the printout or display in text format. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.3-1	8.	**Requirement: An ELD must have the capability to convert and track date and time captured in UTC standard to the time standard in effect at driver's home terminal, taking the daylight savings time changes into account by using the parameter "Time Zone Offset from UTC" as specified in section 7.41.** Preconditions: • The ELD must be able to manage and convert time in UTC standard to the driver's home terminal time Description of Test Step: Test 1: a) Login to the application with a valid user account b) Record the ELD location and local time c) Verify/Capture the ELD time with the driver's home terminal time d) Verify the time is the appropriate offset from UTC e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and verified the ELD time matches the driver's home terminal with the correct offset from UTC. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.3-2	9.	**Requirement: An ELD must record the driver's record of duty status using the time standard in effect at the driver's home terminal for a 24-hour period beginning with the time specified by the motor carrier for that driver's home terminal.** Description of Test Step Precondition: • The ELD must be able to manage, convert, and display time as both UTC and Time Standard in effect at the driver's home terminal time Test 1: a) Login to the application with a valid user account b) Record the local time for the start of the 24 hour period c) Set the duty status to off duty d) Change the duty status to on duty not driving e) Verify the ELD time in the driver's record of duty status corresponds with the driver's home terminal time f) Verify the time is the appropriate offset from UTC g) Verify the record accounts for the 24 hour period h) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and set, then changed, the duty status. User verified in the driver's record of duty status that the ELD time matches the driver's home terminal with the correct offset from UTC. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.3-3	10.	**Requirement: The data element "Time Zone Offset from UTC" must be included in the "Driver's Certification of Own Records" events as specified in section 4.5.1.4.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to the certification of driver's own records c) Open the certified records d) Verify that the data element "Time Zone Offset from UTC" is included in the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the driver's certification of records and opened a driver's certified record. The data element "Time Zone Offset from UTC" was included on the record. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.1-2	11.	**Requirement: The event sequence ID number for each ELD must use continuous numbering across all users of that ELD.** Precondition: • Multiple driver user accounts are needed for this requirement with event records Description of Test Step: Test 1: a) Login to the application with valid user account b) Navigate to the event records for that user c) Verify the event records uses sequential ID numbers for the events d) Logout Test 2: e) Login to the application with a different user account f) Navigate to the event records for that user g) Verify the event records uses sequential ID numbers for the events h) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the event records and verified the sequence ID numbers were in continuous sequential order for all the events. User successfully logged out and a different user logged in. Test 2: The user verified the sequence ID numbers were in continuous sequential order for all the events. The second user successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.1-3	12.	**Requirement: The event sequence ID number for each ELD must use continuous numbering across all engines.** Precondition: • Multiple vehicles are needed for this requirement Description of Test Step: Test 1: a) Login to the application with valid user account b) Navigate to the event records for that user c) Verify the event records uses sequential ID numbers for the events d) Logout e) Remove the ELD from the present vehicle and put it in a different CMV Test 2: f) Login to the application with valid user account g) Navigate to the event records for that user h) Verify the event records uses sequential ID numbers for the events with the second CMV i) Logout j) Remove the ELD from the present vehicle and put it in a different CMV	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the event records and verified the sequence ID numbers were in continuous sequential order for all the events. User successfully logged out and the ELD was moved to a different CMV. Test 2: The user logged in and verified the sequence ID numbers were in continuous sequential order for all the events. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.1-4	13.	**Requirement: The event sequence ID number for each ELD must use continuous numbering across all ELD power on and off cycles.** Description of Test Step: Test 1: a) Login to the application with valid user account b) Navigate to the event records for that user c) Verify the event records uses sequential ID numbers for the events d) Logout and power off the ELD Test 2: e) Power on the ELD and login to the application with a different user account f) Navigate to the event records for that user g) Verify the event records uses sequential ID numbers for the events h) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the event records and verified the sequence ID numbers were in continuous sequential order for all the events. User successfully logged out and power cycled the ELD. Test 2: Another user logged in and verified the sequence ID numbers were in continuous sequential order for all the events. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.1-5	14.	**Requirement: An ELD must use the next available event sequence ID number (incremented by one) each time a new event log is recorded.** Description of Test Step: Test 1: a) Login to the application with valid user account b) Navigate to the event log records c) Verify the event log uses sequential ID numbers for the events d) Create a new event e) Navigate to the event log records for that user f) Verify the event logs uses sequential ID numbers for the events g) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the event log records and verified the sequence ID numbers were in continuous sequential order for all the events. User created a new event and verified the sequence ID number incremented by 1 in the event log records. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.4.4.1-6	15.	**Requirement: Event sequence ID number must track at least the last 65,536 unique events recorded on the ELD.** Description of Test Step: Test 1: a) The event sequence number must be defined to be a 16 bit word in the code b) This can be verified through code inspection	Expected Test Step Outcome: Test 1: A sixteen bit data type will hold 65,536 unique numbers. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.1-7	16.	**Requirement: The continuous event sequence ID numbering structure used by the ELD must be mapped into a continuous hexadecimal number between 0000 (Decimal 0) and FFFF (Decimal 65535).** Description of Test Step: Test 1: a) Review the code to ensure that the ELD event number is mapped to a continuous hexadecimal number b) Review the event log to see if the event number is in hexadecimal	Expected Test Step Outcome: Test 1: The code shows that output will be in hexadecimal. The event log displays the event number in hexadecimal. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2-1	17.	**Requirement: An ELD must retain the original records even when allowed edits and entries are made over a driver's ELD records.** Precondition: • Retrieve the original record from the ELD database Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to the ELD database and retrieve a driver's original records and entries c) Update the driver's entries with test data and construct a new ELD record that will represent the new driver entries d) Set the "event record status" of the ELD record constructed in (b) above to "1" (active) e) Set the "event record origin" of the ELD record constructed in (b) above to "2" (edited or entered by the driver) f) Note the new record ID g) Save the new record h) Retrieve both the updated and the original records from the database and ensure that both records and all changes have been saved	Expected Test Step Outcome: Test 1: Two records will be retrieved from the database, the original record and the updated record. Check that the "event record status" of the new ELD record is set to "1" (active). Check that the "event record origin" of the new ELD record is to "2" (edited or entered by the driver). Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2-2	18.	**Requirement: An ELD must keep track of all event record history, and the process used by the ELD must produce the event record status for the ELD records in the standard categories specified in sections 7.23, 7.22 and 7.25.** Precondition: • Ensure active and inactive events are supported Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the event records c) Verify that the user can identify whether the event is active or inactive by identifying the Event Record Status Code: a) Active – (1) b) Inactive – Changed (2) c) Inactive – Change Requested (3) d) Inactive – Change Rejected (4) d) Logout	Expected Test Step Outcome: Test 1: User successfully logged and navigated to the ELD event records. The event records were identified by the user on whether they were active or inactive by their Event Record Status Code. User successfully logged off. Actual Test Step Outcome:	

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2-3	19.	**Requirement: An ELD must keep track of all event record history, and the process used by the ELD must produce the event record origin for the ELD records in the standard categories specified in sections 7.23, 7.22 and 7.25.** Precondition: • Ensure active and inactive events are supported Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the event records c) Verify that the user can track the origin of the records by identifying the Event Record Origin Code: a) Automatically recorded by ELD – (1) b) Edited or Entered by the Driver – (2) c) Edit Requested by an Authenticated User other than the Driver – (3) d) Assumed from the Unidentified Driver profile – (4) d) Logout	Expected Test Step Outcome: Test 1: User successfully logged and navigated to the ELD event records. The event records were traced back to their origin by their Event Record Origin Code. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2-4	20.	**Requirement: An ELD must keep track of all event record history, and the process used by the ELD must produce the event type for the ELD records in the standard categories specified in sections 7.23, 7.22 and 7.25** Precondition: • Ensure active and inactive events are supported Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the event records c) Verify that the user can specify the type of event record by identifying the Event Type Code: a) A change in driver's duty-status – (1) b) An intermediate log – (2) c) A change in driver's indication of authorized personal use of CMV or yard moves – (3) d) A driver's certification/re-certification of records – (4) e) A driver's login/logout activity – (5) f) CMV's engine power up/shut down activity – (6) g) A malfunction or data diagnostic detection occurrence – (7) d) Logout	Expected Test Step Outcome: Test 1: User successfully logged and navigated to the ELD event records. The event record types were traced by their Event Type Code. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.1-1	21.	**Requirement: At the instance an ELD creates a record automatically, the ELD must set the "Event Record Status" to "1" (active)** Description of Test Step: Test 1: a) Login to the ELD with a driver user account b) Navigate to the event records c) Verify an event was recorded automatically from the Login process and the Event Record Status was set to Active - (1) for the event d) Logout	Expected Test Step Outcome: Test 1: User successfully logged and navigated to the ELD event records. The event for logging in to the ELD was set to Active – 1 in the Event Record Status. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.4.4.2.1-2	22.	**Requirement: At the instance an ELD creates a record automatically, the ELD must set the "Event Record Origin" to "1" (automatically recorded by ELD)** Description of Test Step: Test 1: a) Login to the ELD with a driver user account b) Navigate to the event records c) Verify an event was recorded automatically from the Login process and the Event Record Origin was set to (1) for the event d) Logout	Expected Test Step Outcome: Test 1: User successfully logged and navigated to the ELD event records. The event for logging in to the ELD was set to (1) in the Event Record Origin. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.2-1	23.	**Requirement: At the instance of a driver editing existing record(s), the ELD must identify the ELD record(s) being modified for which the "Event Record Status" is currently set to "1" (active)** Description of Test Step: Test 1: a) Login to the ELD with a driver user account b) Have the user change duty status (off duty not driving to sleeper berth) c) Navigate to the event records d) Have the user edit the duty status change record e) Verify the event being modified has the Event Record Status set to Active - (1) for the event f) Logout	Expected Test Step Outcome: User successfully logged and navigated to the ELD event records. The user edited an existing record and set the Event Record Status to Active (1) for the modified record. User can successfully edit record. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.4.4.2.2-2	24.	**Requirement: At the instance of a driver editing existing record(s), the ELD must acquire driver input for the intended edit.** Description of Test Step: Test 1: a) Login to the ELD with a driver user account b) Navigate to the event records c) Have the user edit an existing duty status record from a previous test d) Verify the ELD required driver input for the edit e) Logout	Expected Test Step Outcome: Test 1: User successfully logged and navigated to the ELD event records. The ELD required driver input after the user attempted to edit the existing record. User can successfully edit record. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.2-3	25.	**Requirement: At the instance of a driver editing existing record(s), the ELD must construct the ELD record(s) that will replace the record(s) identified in (1) above.** Description of Test Step: Test 1: a) Login to the ELD with a driver user account b) Navigate to the event records c) Have the user edit an existing duty status record from a previous test d) Verify the ELD constructed a new record from the edit that will replace the existing record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged and navigated to the ELD event records. The ELD constructed a new record with the edit and replaced the existing record. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.4.4.2.2-4	26.	**Requirement: At the instance of a driver editing existing record(s), the ELD must set the "Event Record Status" of the ELD record(s) identified in (1) above, which is being modified, to "2" (inactive-changed).** Description of Test Step: Test 1: a) Login to the ELD with a driver user account b) Navigate to the event records c) Have the user edit an existing duty status record from a previous test d) Verify the ELD sets the Event Record Status to (2) for the record being modified e) Logout	Expected Test Step Outcome: Test 1: User successfully logged and navigated to the ELD event records. The ELD set the Event Record Status to (2) for the record that was modified. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.2-5	27.	**Requirement: At the instance of a driver editing existing record(s), the ELD must set the "Event Record Status" of the ELD record(s) constructed in (2) above to "1" (active).** Description of Test Step: Test 1: a) Login to the ELD with a driver user account b) Navigate to the event records c) Have the user edit an existing duty status record from a previous test d) Verify the ELD constructed a new record from the edit that will replace the existing record e) Verify the ELD sets the Event Record Status to (1) for the constructed new record f) Logout	Expected Test Step Outcome: Test 1: User successfully logged and navigated to the ELD event records. The ELD constructed a new record with the edit and replaced the existing record. The ELD set the Event Record Status to (1) for the new constructed record. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.2-6	28.	**Requirement: At the instance of a driver editing existing record(s), the ELD must set the "Event Record Origin" of the ELD record(s) constructed in (2) above to "2" (edited or entered by the driver).** Description of Test Step: Test 1: a) Login to the ELD with a driver user account b) Navigate to the event records c) Have the user edit an existing duty status record from a previous test d) Verify the ELD constructed a new record from the edit that will replace the existing record e) Verify the ELD sets the Event Record Origin to (2) for the constructed new record f) Logout	Expected Test Step Outcome: Test 1: User successfully logged and navigated to the ELD event records. The ELD constructed a new record with the edit and replaced the existing record. The ELD set the Event Record Origin to (2) for the new constructed record. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.3-1	29.	**Requirement: When a driver enters missing record(s), the ELD must acquire driver input for the missing entries being implemented.** Precondition: • An event record entry needs to be missing for this test Description of Test Step: Test 1: a) Login to the ELD with a driver user account b) Navigate to the event records c) Have the user enter a missing record entry to the event records d) Verify the ELD requires driver input for the reason the missing entry was implemented e) Logout	Expected Test Step Outcome: Test 1: User successfully logged and navigated to the ELD event records. The user entered a missing record entry and the ELD required a reason the entry was implemented. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.3-2	30.	**Requirement: When a driver enters missing record(s), the ELD must construct the new ELD record(s) that will represent the driver entries.** Precondition: • An event record entry needs to be missing for this test Description of Test Step: Test 1: a) Login to the ELD with a driver user account b) Navigate to the event records c) Have the user enter a missing record entry to the event records d) Verify the ELD constructed a new record with the new entry e) Logout	Expected Test Step Outcome: Test 1: User successfully logged and navigated to the ELD event records. The user entered a missing record entry and the ELD constructed a new record with the new entry. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.3-3	31.	**Requirement: When a driver enters missing record(s), the ELD must set the "event record status" of the ELD record(s) constructed in (1) above to "1" (active).** Precondition: • An event record entry needs to be missing for this test Description of Test Step: Test 1: a) Login to the ELD with a driver user account b) Navigate to the event records c) Have the user enter a missing record entry to the event records d) Verify the ELD constructed a new record and set the Event Record Status to (1) for that record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged and navigated to the ELD event records. The user entered a missing record entry and the ELD constructed a new requirement with the new entry and set the Event Record Status to (1). User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.3-4	32.	**Requirement: When a driver enters missing record(s), the ELD must set the "event record origin" of the ELD record(s) constructed in (1) above to "2" (edited or entered by the driver).** Precondition: • An event record entry needs to be missing for this test Description of Test Step: Test 1: a) Login to the ELD with a driver user account b) Navigate to the event records c) Have the user enter a missing record entry to the event records d) Verify the ELD constructed a new record and set the Event Record Origin to (2) for that record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged and navigated to the ELD event records. The user entered a missing record entry and the ELD constructed a new requirement with the new entry and set the Event Record Origin to (2). User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.4-1	33.	**Requirement: When a driver reviews ELD record(s) logged under the unidentified driver profile, the ELD must identify the ELD record(s) logged under the unidentified driver profile that will be reassigned to the driver.** Precondition: • Unidentified driver profile records need to be on the ELD for this test Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account b) Navigate to the event records c) Identify the records from the unidentified driver profile have the events assigned to the current driver d) Verify the ELD identifies the records under the unidentified user account and assigns them to the driver e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in as a driver and navigated to the ELD event records and verifies the ELD identified the unidentified driver records. User assigned the unidentified records to the current driver and successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.4-2	34.	**Requirement: When a driver reviews and assumes ELD record(s) logged under the unidentified driver profile, the ELD must use elements of the unidentified driver log(s) from (1) above and acquire driver input to populate missing elements of the log originally recorded under the unidentified driver profile.** Precondition: • An unidentified driver event is recorded on the ELD Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account b) Navigate to the event records and identify an unidentified driver record/log c) Have the user assume the unidentified record and claim ownership d) Have the user populate the missing elements from the original record e) Verify elements were populated f) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records and verified an unidentified record was present. The user claimed ownership of the record and populated the missing elements from the original record. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.4-3	35.	**Requirement: When a driver reviews and assumes ELD record(s) logged under the unidentified driver profile, the ELD must construct the new event record(s) for the driver.** Precondition: • An unidentified driver event is recorded on the ELD Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account b) Navigate to the event records and identify an unidentified driver record/log c) Have the user assume the unidentified record and claim ownership d) Verify the ELD constructed a new event for the driver e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records and verified an unidentified record was present. The user claimed ownership of the record and the constructed a new event for the driver. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.4-4	36.	**Requirement: When a driver reviews and assumes ELD record(s) logged under the unidentified driver profile, the ELD must set the event record status of the ELD record(s) identified in (1) above, which is being modified, to "2" (inactive–changed).** Precondition: • An unidentified driver event is recorded on the ELD Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account b) Navigate to the event records and identify an unidentified driver record/log c) Have the user assume the unidentified record and claim ownership d) Verify the ELD set the Event Record Status of the original record to (2) e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records and verified an unidentified record was present. The user claimed ownership of the record and ELD set the Event Record Status of the original record to (2). User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.4-5	37.	**Requirement: When a driver reviews and assumes ELD record(s) logged under the unidentified driver profile, the ELD must set the event record status of the ELD record(s) constructed in (2) above to "1" (active).** Precondition: • An unidentified driver event is recorded on the ELD Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account b) Navigate to the event records and identifies an unidentified driver record/log c) Have the user assume the unidentified record and claim ownership d) Verify the ELD set the Event Record Status of the new constructed record to (1) e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records and verified an unidentified record was present. The user claimed ownership of the record and ELD set the Event Record Status of the new record to (1). User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.4-6	38.	**Requirement: When a driver reviews and assumes ELD record(s) logged under the unidentified driver profile, the ELD must set the event record origin of the ELD record(s) constructed in (2) above to "4" (assumed from unidentified driver profile).** Precondition: • An unidentified driver event is recorded on the ELD Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account b) Navigate to the event records and identifies an unidentified driver record/log c) Have the user assume the unidentified record and claim ownership d) Verify the ELD set the Event Record Origin of the new constructed record to (4) e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records and verified an unidentified record was present. The user claimed ownership of the record and ELD set the Event Record Origin of the new record to (4). User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.5-1	39.	**Requirement: If a motor carrier requests an edit on a driver's records electronically, the ELD must identify the ELD record(s) being requested to be modified for which the "event record status" is currently set to "1" (active).** Precondition: • The motor carrier has requested an edit on a driver's record electronically Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account (account with the motor carrier edit) b) Navigate to the event records c) Verify the ELD identifies the event the motor carrier has requested an edit for d) Verify the ELD the Event Record Status of the record is set to (1) e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records and the ELD identified the request edit from the motor carrier. The Event Record Status of the event is set to (1). User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.5-2	40.	**Requirement: If a motor carrier requests an edit on a driver's records electronically, the ELD must acquire motor carrier input for the intended edit.** Precondition: • The motor carrier has requested an edit on a driver's record electronically Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account (account with the motor carrier edit) b) Navigate to the event records c) Verify the ELD identifies the event the motor carrier has requested an edit for d) Verify the event has acquired the intent for the edit from the motor carrier event e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records and the ELD identified the request edit from the motor carrier. The requested edit included the reason for the change from the motor carrier. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.5-3	41.	**Requirement: If a motor carrier requests an edit on a driver's records electronically, the ELD must construct the ELD record(s) that will replace the record identified in (1) above –if approved by the driver.** Precondition: • The motor carrier has requested an edit on a driver's record electronically Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account (account with the motor carrier edit) b) Navigate to the event records c) Verify the ELD identifies the event the motor carrier has requested an edit for d) Have the driver verify and approve the edit (or make the necessary edits) e) Verify the ELD constructs a new event with the approved edits f) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records and the ELD identified the request edit from the motor carrier. The user approved the edits and the ELD constructed a new record. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.5-4	42.	**Requirement: If a motor carrier requests an edit on a driver's records electronically, the ELD must set the event record status of the ELD record(s) in (2) above to "3" (inactive–change requested).** Precondition: • The motor carrier has requested an edit on a driver's record electronically Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account (account with the motor carrier edit) b) Navigate to the event records c) Verify the ELD identifies the event the motor carrier has requested an edit for d) Verify the ELD set the Event Record Status to (3) for the event with the requested edit e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records and the ELD identified the request edit from the motor carrier. The ELD had the Event Record Status set the (3) for the requested event. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.5-5	43.	**Requirement: If a motor carrier requests an edit on a driver's records electronically, the ELD must set the event record origin of the ELD record constructed in (2) above to "3" (edit requested by an authenticated user other than the driver).** Precondition: • The motor carrier has requested an edit on a driver's record electronically Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account (account with the motor carrier edit) b) Navigate to the event records c) Verify the ELD identifies the event the motor carrier has requested an edit for d) Have the driver approves the edit (or makes the necessary edits) e) Verify the ELD constructs a new ELD with the approved edits f) Verify the ELD set the Event Record Origin to (3) for the new constructed record g) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records and the ELD identified the request edit from the motor carrier. The user approved the edits and the ELD constructed a new event record. The ELD had the Event Record Origin set the (3) for the new constructed event. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.6-1	44.	**Requirement: If edits are requested by the motor carrier to the driver over a driver's records electronically, the ELD must implement functions for the driver to review the requested edits.** Precondition: • The motor carrier has requested an edit on a driver's record electronically Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account (account with the motor carrier edit) b) Navigate to the event records c) Verify the ELD identifies the event the motor carrier has requested an edit with d) Verify functions are in place for the driver to review the requested edit e) Have the driver review the requested edits f) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records and the ELD identified the request edit from the motor carrier. Functions were in place for the driver to review the requested edits. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.6-2	45.	**Requirement: If edits are requested by the motor carrier to the driver over a driver's records electronically, the ELD must implement functions for the driver to indicate on the ELD whether the driver confirms or rejects the requested edit(s).** Precondition: • The motor carrier has requested an edit on a driver's record electronically Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account (account with the motor carrier edit) b) Navigate to the event records c) Verify the ELD identifies the event the motor carrier has requested an edit for d) Verify functions are in place for the driver to confirm or reject the requested edits e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records and the ELD identified the request edit from the motor carrier. Functions were in place for the driver to confirm or reject the requested edits. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.6-3	46.	**Requirement: If the driver approves the motor carrier's edit suggestion the ELD must set the event record status of the ELD record(s) to "2" (inactive–changed).** Precondition: • The motor carrier has requested an edit on a driver's record electronically Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account (account with the motor carrier edit) b) Navigate to the event records c) Verify the ELD identifies the event the motor carrier has requested an edit for d) Have the user approved the requested edit e) Verify the ELD sets the Event Record Status of the original record to (2) f) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records and the ELD identified the request edit from the motor carrier. The user approved the edits and the ELD set the Event Record Status of the original record to (2). User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.6-4	47.	**Requirement: If the driver approves the motor carrier's edit suggestion the ELD must set the "event record status" of the ELD record(s) to "1" (active).** Precondition: • The motor carrier has requested an edit on a driver's record electronically Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account (account with the motor carrier edit) b) Navigate to the event records c) Verify the ELD identifies the event the motor carrier has requested an edit for d) Have the user approved the requested edit e) Verify the ELD constructs a new record for the approved edit f) Verify the ELD sets the Event Record Status of the new constructed record to (1) g) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records and the ELD identified the request edit from the motor carrier. The user approved the edits and the ELD constructed a new record and set the Event Record Status of the constructed record to (1). User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.4.2.6-5	48.	**Requirement: If the driver disapproves the motor carrier's edit(s) suggestion, the ELD must set the "event record status" of the ELD record(s) to "4" (inactive–change rejected).** Precondition: • The motor carrier has requested an edit on a driver's record electronically Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account (account with the motor carrier edit) b) Navigate to the event records c) Verify the ELD identifies the event the motor carrier has requested an edit for d) Have the user reject the requested edit e) Verify the ELD sets the Event Record Status of the requested edit to (4) f) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records and the ELD identified the request edit from the motor carrier. The user rejected the edits and the ELD set the Event Record Status of the disapproved record to (4). User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.5-1	49.	**Requirement: An ELD must support standard security measures that require the calculation and recording of standard data check values for each ELD event recorded, for each line of the output file, and for the entire data file to be generated for transmission to an authorized safety official or the motor carrier.** Description of Test Step: Test 1: a) The ELD will maintain, calculate and retain standard security measures for each event recorded on the database b) The specific security measures are TBD	Expected Test Step Outcome: Test 1: The user will confirm that standard security measures are in place and functioning. Confirmation of these security measures will be stored on the ELD database. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.4.5-2	50.	**Requirement: An event data check value must be calculated at the time of the following instances and must accompany that event record thereafter: When an event record is automatically created by the ELD** Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account b) Navigate to the event records c) Verify that an event record was created for logging in to the ELD d) Verify an event data check value was calculated for that event e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records and identified an event record. An event data check value was calculated for that event. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.5-3	51.	**Requirement: An event data check value must be calculated at the time of the following instances: When an authorized edit is performed by the driver on the ELD** Precondition: • An edit has been requested on a driver's record electronically Description of Test Step: Test 1: a) Login to the ELD with a valid driver user account b) Navigate to the event records c) Have the driver authorize the requested edit d) Verify an event data check value was calculated for that event e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records and identified a requested edit. After the edit was authorized, an event data check value was calculated for that event. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.5-4	52.	**Requirement: An event data check value must be calculated at the time of the following instances and must accompany that event record thereafter: When an electronic edit proposal is created by the motor carrier through the ELD system.** Description of Test Step: Test 1: a) Login to the ELD with a motor carrier user account b) Navigate to the event records c) Have the motor carrier request an edit on a driver's user account d) Verify an event data check value was calculated for that event e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in as a motor carrier and navigated to the ELD event records and requested an edit on a driver's record. An event data check value was calculated for that event. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.4.5.1.1-2	53.	**Requirement: The ELD must calculate an event checksum value associated with each ELD event at the instance of the event record being created.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the event records c) Have the user create a new event d) Verify an event checksum value was calculated for that event e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records. A new event was created and an event checksum value was calculated for that event. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.5.1.1-3	54.	**Requirement: The event record elements that must be included in the checksum calculation are the following.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the event records c) Verify an event checksum calculation include the following elements: a) <Event Type> b) <Event Code> c) <Event Date> d) <Event Time> e) <Vehicle Miles> f) <Engine Hours> g) <Event Latitude> h) <Event Longitude> i) <CMV number> j) < ELD username> d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD event records. The elements of the event checksum calculation were verified. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.5.2-1	55.	**Requirement: A line data check value must be calculated at the time of the generation of the ELD output file.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Have the user generate an output file of an event record c) Verify a line data check value was calculated when the output file was generated d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and generated an output file for an event record. A line data check value was calculated. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.4.5.2-2	56.	**Requirement: A line data check value must be calculated when transferring data to authorized safety officials.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Simulate transferring data to a safety official c) Verify a line data check value was calculated when the data was transferred d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and simulated transferring data to a safety official. A line data check value was calculated for the transfer. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.5.2-3	57.	**Requirement: A line data check value must be calculated when cataloguing drivers' ELD records at a motor carrier's facility.** Description of Test Step: Test 1: a) Login to the ELD with a motor carrier user account b) Catalogue a driver's records c) Verify a line data check value was calculated when the records were catalogued d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in with a motor carrier account. A line data check value was calculated when a driver's records were catalogued. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.4.5.2.1-1	58.	**Requirement: The ELD must calculate a line checksum value associated with each line of ELD output file at the instance when an ELD output file is generated.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Submit the process to generate the ELD output file c) Review the output to assure that a line checksum value is calculated for each line when the ELD output file is generated (repeat steps b) and c) as necessary) d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and confirmed that line checksum values are calculated for each line when the ELD output file is generated. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.4.5.2.3-1	59.	**Requirement: The calculated line data check value must be appended as the last line item of each of the individual line items of the ELD output file.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Submit the process to generate the ELD output file c) Review to ensure that the calculated line data check value is appended to be the last line item for each individual line items of the ELD output file d) Logout	Expected Test Step Outcome: Test 1: The user successfully logged in and confirmed that the calculated line data check value is appended to be the last line item for each individual line item of the ELD output file. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.4.5.3-1	60.	**Requirement: A file data check value must also be calculated at the time of the creation of an ELD output file.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Submit the process to generate the ELD output file c) Review to assure that a file data check value is calculated every time an ELD output file is generated d) Logout	Expected Test Step Outcome: Test 1: The user successfully logged in and confirmed that the file data check value is calculated when the ELD output file is generated. The user confirmed the calculation of the values provided from the ELD output. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
Test Step Note	N/A			
Test Step Note	N/A			
Test Step Note	N/A			

2.2 ELD Test Procedures- Monitoring

An ELD must have the capability to monitor itself for detectable malfunctions and data inconsistencies. This includes, compliance self-monitoring, malfunctions and data diagnostic events and an ELD malfunction and data diagnostics status indictors. After identifying a malfunction, the ELD should be capable of logging the problem and alerting the user to the issue. The following test procedures validate the device self-monitoring requirements and standardize the minimal set of malfunctions and data diagnostic events an ELD must be able to detect.

<table>
<tr><td>Test Procedure Number</td><td colspan="6">ELD- 2.2</td></tr>
<tr><td>Functional Area/Test Procedure Name</td><td colspan="6">ELD – Monitoring</td></tr>
<tr><td>Date Test Initiated</td><td colspan="6"></td></tr>
<tr><td>Description of Test Configuration</td><td colspan="6"></td></tr>
<tr><td>Test Engineer (s)</td><td colspan="6"></td></tr>
<tr><td rowspan="2">Overview/Description</td><td>☐</td><td>Engineering Test Cycle</td><td>☐</td><td>Stand-alone Test</td><td>☐</td><td>System Test</td></tr>
<tr><td>☐</td><td>Second Test Cycle</td><td>☐</td><td>Acceptance Test</td><td>☐</td><td>Regression Testing</td></tr>
<tr><td>Date Test Completed:</td><td rowspan="2">Signatures:</td><td colspan="5" rowspan="2">Test Engineer: _____
Test Lead: _____
Quality Assurance: _____
Customer: _____
Customer: _____</td></tr>
<tr><td>Time Test Began:
Time Test Ended:</td></tr>
</table>

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6-1	1.	**Requirement: An ELD must have the capability to monitor its compliance with the technical requirements of this section for detectable malfunctions listed in Table 4 of Appendix B and must keep records of its malfunction. (See Appendix B, section 4.6 for details).** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Have the user confirm on the ELD the capability to monitor a detectable malfunction c) Verify the ELD has the ability to keep records of malfunctions d) Logout	Expected Test Step Outcome: Test 1: User confirms the ELD has the capability to monitor and detect malfunctions and record malfunction events. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6-2	2.	**Requirement: An ELD must have the capability to monitor its compliance with the technical requirements of this section for data inconsistencies listed in Table 4 of Appendix B and must keep records of its data diagnostic event detection. (See Appendix B, section 4.6 for details).** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Have the user confirm on the ELD the capability to monitor data inconsistencies c) Verify the ELD has the ability to keep records of malfunctions and data diagnostic events d) Logout	Expected Test Step Outcome: Test 1: User confirms the ELD has the capability to monitor and detect data inconsistencies and record data diagnostic events. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.1-1	3.	**Requirement: An ELD must monitor data it receives from the engine ECM or alternative sources as allowed in Appendix B, sections 4.3.1.1- 4.3.1.4, its onboard sensors, and data record history to identify instances when it may not have complied with the power requirements specified in Appendix B, section 4.3.1.1, in which case, the ELD must record a power data diagnostics event for the corresponding driver(s), or under the unidentified driver profile if no drivers were authenticated at the time of detection.** Precondition: • Data event records are recorded from engine ECM or other alternative sources • A power data diagnostic malfunction is recorded Description of Test Step: Test 1: a) Login to the application with a valid user account b) Have the user navigate to the data event records c) Verify that the ELD monitors and records data it receives from the engine ECM or alternative sources (Engine power status, vehicle motion status, vehicle miles engine hours), its onboard sensors and data record history d) Verify that for instances in which the ELD does not comply with the power requirements, a power data diagnostics event is recorded for the corresponding driver(s) at the time of detection e) Ensure that if no driver is authenticated at the time of the detection, the record is logged under the unidentified driver profile f) Logout	Expected Test Step Outcome: Test 1: The user will confirm that data diagnostic event records are captured within the ELD database. The user will identify that these data diagnostic records are identified by the driver or correspond to the unidentified driver profile. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.1-2	4.	**Requirement: An ELD must set a power compliance malfunction if the power data diagnostics event described above indicate an aggregated in-motion driving time understatement of 30 minutes or more on the ELD over a 24-hour period across all driver profiles, including the unidentified driver profile.** Precondition: • There has been an aggregated in-motion driving time understatement of 30 minutes or more on the ELD over a 24-hour period across all driver profiles • A power data diagnostic malfunction is recorded Description of Test Step: Test 1: a) Login to the application with a valid user account b) Have the user navigate to the ELD data records c) Verify that the ELD has set a power compliance malfunction based on the power data diagnostic described in the precondition d) Ensure that this diagnostic is based across all driver profiles, including the unidentified driver profile e) Logout	Expected Test Step Outcome: Test 1: Access all driver profiles created in the past 24 hours including the unidentified driver profile. The user should be able to confirm that the power data diagnostic records indicate a power compliance malfunction is present and is identified for each driver and the unidentified driver profile. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.2-1	5.	**Requirement: An ELD must monitor the data it receives from the engine ECM or alternative sources as allowed in Appendix B, sections 4.3.1.1-4.3.1.4.** Description of Test Step: Previously tested in test step 4.6.1.1-1	Expected Test Step Outcome: Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.6.1.2-2	6.	**Requirement: An ELD must monitor the data it receives from its *onboard sensors* to identify *instances* of its non-compliance with the ELD engine synchronization requirement specified in Appendix B, section 4.2.** Precondition: • Instances of non-compliance with the ELD engine synchronization requirement exist Description of Test Step: Test 1: a) Login to the application with a valid user account b) Confirm that the ELD has the capability to monitor the data it receives from its onboard sensors c) Verify that instances of non-compliance with the engine ELD synchronization requirement can be assessed based on the onboard sensor readings d) Logout	Expected Test Step Outcome: Test 1: The user should be able to gather and review the data diagnostic file generated from the ELD database. The user should see that the records show that the ELD is synchronized or confirms that the data diagnostic records being received from the onboard sensors are recording instances of non-compliance with the ELD synchronization requirement. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.2-3	7.	**Requirement: An ELD must monitor the data it receives from its *onboard data record history* to identify *instances* of its non-compliance with the ELD engine synchronization requirement specified in Appendix B, section 4.2.** Precondition: • Instances of non-compliance with the ELD engine synchronization requirement exist Description of Test Step: Test 1: a) Login to the application with a valid user account b) Confirm that the ELD has the capability to monitor the data it receives from its onboard data record history c) Verify that instances of non-compliance with the engine ELD synchronization requirement can be assessed based on the onboard data record history data d) Logout	Expected Test Step Outcome: Test 1: The user should be able to gather and review the data diagnostic file generated from the ELD database. The user confirms that the data diagnostic records being received from the onboard data record history are recording instances of non-compliance with the ELD synchronization requirement. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.2-4	8.	**Requirement: An ELD must monitor the data it receives from its *onboard sensors* to identify *durations* of its non-compliance with the ELD engine synchronization requirement specified in Appendix B, section 4.2.** Precondition: • Instances of non-compliance with the ELD engine synchronization requirement exist Description of Test Step: Test 1: a) Login to the application with a valid user account b) Confirm that the ELD has the capability to monitor the data it receives from its onboard sensors c) Verify that the duration of the instances of non-compliance with the engine ELD synchronization requirement can be assessed based on the onboard sensor readings d) Logout	Expected Test Step Outcome: Test 1: The user should be able to gather and review the data diagnostic file generated from the ELD database. The user confirms that the data diagnostic records being received from the onboard sensors are recording the duration of instances of non-compliance with the ELD synchronization requirement. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.2-5	9.	**Requirement: An ELD must monitor the data it receives from its *data record history* to identify *durations* of its non-compliance with the ELD engine synchronization requirement specified in Appendix B, section 4.2.** Precondition: • Instances of non-compliance with the ELD engine synchronization requirement exist Description of Test Step: Test 1: a) Login to the application with a valid user account b) Confirm that the ELD has the capability to monitor the data it receives from its onboard data record history c) Verify that the duration of instances of non-compliance with the engine ELD synchronization requirement can be assessed based on the onboard data record history data d) Logout	Expected Test Step Outcome: Test 1: The user should be able to gather and review the data diagnostic file generated from the ELD database. The user confirms that the data diagnostic records being received from the onboard data record history are recording the durations of instances of non-compliance with the ELD synchronization requirement. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.2-6	10.	**Requirement: An ELD required to establish a link to the engine ECM, as described in Appendix B, section 4.2, must monitor its connectivity to the engine ECM.** Precondition: • The ELD has established a link to the engine ECM Description of Test Step: Test 1: a) Login to the application with a valid user account b) Verify that the ELD has the ability to monitor the vehicle's engine operation by automatically capturing the engine's power status, vehicle's motion status, miles driven value, and engine hour's value c) Confirm that the ELD is able to receive the engine operation information automatically through the serial or Control Area Network communication (CAN) protocols supported by the vehicle's engine ECM. Otherwise, the ELD may use alternative sources to obtain or estimate these vehicle parameters (with the listed accuracy requirements under section 4.3.1) d) Logout	Expected Test Step Outcome: Test 1: The user should be able to gather and review the data diagnostic file generated from the ELD database and confirm that the ELD is able to monitor the connectivity to the engine ECM. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.2-7	11.	**Requirement: An ELD required to establish a link to the engine ECM as described in Appendix B, section 4.2 must record an engine-synchronization data diagnostics event when it no longer can acquire updated values for the ELD parameters required for records within 5 seconds of the need.** Precondition: • The ELD has established a link to the engine ECM • ELD is unable to capture updated values for ELD parameters within engine synchronization data Description of Test Step: Test 1: a) Login to the application with a valid user account b) Retrieve the engine synchronization data diagnostic records from the ELD c) Confirm that an engine-synchronization data diagnostics event is recorded when updated values for ELD parameters are no longer captured within 5 seconds d) Logout	Expected Test Step Outcome: Test 1: The user should be able to gather and review the engine synchronization data diagnostics generated from the ELD. The user confirms that these events are recorded within five seconds when there is a failure to capture updated ELD parameters. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.2-8	12.	**Requirement: An ELD must set an engine synchronization compliance malfunction if connectivity to any of the required data sources specified in Appendix B, section 4.3.1 is lost for more than 30 minutes during a 24-hour period aggregated across all driver profiles, including the unidentified driver profile.** Precondition: • There must be a connectivity failure to engine power status, vehicle motion status, vehicle miles, engine hours, date and time, CMV position, and/or CMV VIN Description of Test Step: Test 1: a) Login to the application with a valid user account b) Have the user disconnect a required data source for at least 30 minutes during a 24 hour period c) Retrieve the engine synchronization compliance malfunction records from the ELD d) Confirm that the ELD has set an engine synchronization compliance malfunction for a total of 30 minutes e) Logout	Expected Test Step Outcome: Test 1: The user should be able to gather and review compliance malfunctions within the ELD and confirm that the ELD sets an engine synchronization compliance malfunction of a total of 30 minutes aggregated over 24 hours for any instance of connectivity failure to any of the required data sources. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.3-1	13.	**Requirement: The ELD must periodically cross-check its compliance with the requirement specified in Appendix B, section 4.3.1.5 with respect to an accurate external UTC source.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Verify that the ELD is able to obtain and record date and time information automatically without allowing any external input or interference from a motor carrier, driver or person c) Ensure that the date and time being displayed by the ELD is synchronized to Coordinated Universal Time (UTC) with an absolute deviation of 10 minutes or less at all times d) Logout	Expected Test Step Outcome: Test 1: User should be able to verify that the ELD cross-checks its compliance with date and time recording standards with respect to an accurate external UTC source. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.3-2	14.	**Requirement: The ELD must record a timing compliance malfunction when it can no longer meet the underlying compliance requirement.** Precondition: • Timing compliance malfunction created Description of Test Step: Test 1: a) Login to the application with a valid user account b) Retrieve the data diagnostic records from the ELD database c) Verify within ELD data malfunctions that for any instance in which the ELD date and time has exceeded UTC synchronization by 10 minutes, there is a timing compliance malfunction recorded d) Logout	Expected Test Step Outcome: Test 1: The user should be able to confirm through review of the data diagnostic/malfunction records that a timing compliance malfunction event has been recorded. This event is recorded when the ELD date and time synchronization exceeds more than a 10 minute difference from a Coordinate Universal Time (UTC). User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.4-3	15.	**Requirement: ELD records requiring location information must use the last valid position measurement and include the latitude/longitude coordinates and distance traveled, in miles, since the last valid position measurement.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Retrieve the data diagnostic records from the ELD database c) Review the data diagnostics records to confirm that a record was generated listing the last valid position of the ELD d) Confirm that an ELD record requiring location information is using the last valid position measurement e) Ensure that the location information is displayed as standard signed latitude and longitude values and as decimal degrees to hundreds of a degree precision f) Review diagnostic record to determine if the distance traveled is output as miles g) Logout	Expected Test Step Outcome: Test 1: User should be able to verify that an ELD record requiring location information has used the last valid position measurement and is displayed as latitude/longitude coordinates and the distance in miles. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.4-4	16.	**Requirement: An ELD must monitor elapsed time during periods when the ELD fails to acquire a valid position measurement within the past 5 miles of CMV's movement.** Precondition: • ELD failure to acquire a valid position measurement within 5 miles of CMV's movement should exist Description of Test Step: Test 1: a) Login to the application with a valid user account b) Retrieve the data diagnostic records from the ELD database c) Review the data diagnostics records to confirm that a record was generated listing the last valid position of the ELD d) Confirm that the ELD monitored and recorded elapsed time during periods that the ELD failed to acquire a valid position measurement within the past 5 miles of the CMV's movement e) Logout	Expected Test Step Outcome: Test 1: The user should be able to confirm that an event record successfully uses the most recent location position information on the ELD which includes elapsed time for periods when the ELD fails to acquire a valid position measurement within the past 5 miles of the CMV's movement. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.4-5	17.	**Requirement: When such elapsed time exceeds a cumulative 60 minutes over a 24 hour period, the ELD must set and record a positioning compliance malfunction.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Retrieve the data diagnostic records from the ELD database c) Review the data diagnostics records to confirm that a record was generated listing the last valid position of the ELD d) Ensure that for any instance where the elapsed time exceeds a cumulative 60 minutes over a 24-hour period, the ELD has set and recorded a positioning compliance malfunction e) Logout	Expected Test Step Outcome: Test 1: The user should be able to confirm that an event record successfully uses the most recent location position information on the ELD which includes elapsed time for periods when the ELD fails to acquire a valid position measurement. User should also be able to confirm that a positioning compliance malfunction was set and recorded for any instance where the elapsed time exceeds a cumulative 60 minutes over a 24-hour period. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.4-6	18.	**Requirement: If a new ELD event must be recorded at an instance when ELD had failed to acquire a valid position measurement within the most recent elapsed 5 miles of driving, but the ELD has not yet set a positioning compliance malfunction, the ELD must record the character "X" in both the latitude and longitude fields.** Precondition: • ELD failure to acquire a valid position measurement within 5 miles of CMV's movement should exist Description of Test Step: Test 1: a) Login to the application with a valid user account b) Retrieve the data diagnostic records from the ELD database c) Review the data diagnostics records to confirm that a record was generated listing the last valid position of the ELD d) Verify that an instance has occurred where the ELD failed to acquire a valid position measurement within the most recent elapsed 5 miles of driving e) Verify an event was created for the failure f) Confirm that until a positioning compliance malfunction is recorded for this event, there is an "X" in the latitude and longitude fields g) Logout	Expected Test Step Outcome: Test 1: The user should be able to confirm that if a positioning compliance malfunction has not yet been set to record an instance when ELD failed to acquire a valid position measurement within the most recent elapsed 5 miles of driving, an "X" should be displayed in the latitude and longitude fields displayed. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.4-7	19.	**Requirement: If the location is entered manually by the driver, it must log the character "M" instead. Under the circumstances listed in this paragraph, if the ELD event is due to a change in duty status for the driver, the ELD must prompt the driver to enter location manually in accordance with Appendix B, section 4.3.2.7.** Precondition: • ELD failure to acquire a valid position measurement within 5 miles of CMV's movement should exist Description of Test Step: Test 1: a) Login to the application with a valid user account b) Retrieve the data diagnostic records from the ELD database c) Verify if an instance has occurred where the ELD failed to acquire a valid position measurement within the most recent elapsed 5 miles of driving d) Confirm that an ELD event is due to a change in duty status for the driver e) Ensure the ELD prompts the driver to enter location manually and there is an "M" displayed in the latitude and longitude fields of the recorded ELD event f) Logout	Expected Test Step Outcome: Test 1: The user should be able to gather and review the data diagnostic file generated from the ELD database to confirm that an event record was entered where an 'M' is shown in the location field to signify that the location was entered manually. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.4-8	20.	**Requirement: If the location information is not entered by the driver and the vehicle is in motion, the ELD must record a missing required data elements data diagnostic event for the driver.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Ensure the ELD prompts the driver to enter location manually c) Save the record without the location input d) Retrieve the data diagnostic records from the ELD e) Confirm that the ELD has recorded a missing required data elements data diagnostic event for the driver f) Logout	Expected Test Step Outcome: Test 1: The user should be able to confirm that if no location is entered into the ELD, a 'missing required data elements' data diagnostic event was recorded. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.4-9	21.	**Requirement: If a new ELD event must be recorded at an instance when the ELD has set a positioning compliance malfunction, the ELD must record the character "E" in both the latitude and longitude fields regardless of whether the driver is prompted and manually enters location information.** Precondition: • The ELD has a positioning compliance malfunction Description of Test Step: Test 1: a) Login to the application with a valid user account b) Retrieve the data diagnostic records from the ELD database c) Review the records to confirm that a positioning compliance malfunction has been set and a new ELD event must now be recorded d) Confirm that regardless of whether the driver is prompted and manually enters location information, the ELD records an "E" in both latitude and longitude fields e) Logout	Expected Test Step Outcome: Test 1: The user should be able to confirm that a 'positioning compliance malfunction' was created and an "E" was recorded for the latitude and longitude within the new ELD event regardless of whether the driver manually enters location information. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.5-1	22.	**Requirement: An ELD must monitor its storage capacity and integrity.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Retrieve the data diagnostic records from the ELD database c) Locate and review the data records that correspond to the storage capacity and integrity of the ELD to ensure such information is being monitored d) Logout	Expected Test Step Outcome: Test 1: The user should be able to confirm the existence of the storage capacity and integrity components of the ELD database. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.5-2	23.	**Requirement: An ELD must detect a data recording compliance malfunction if it can no longer record or retain required events or retrieve recorded logs that are not otherwise catalogued remotely by the motor carrier.** Precondition: • A data recording compliance malfunction is present Description of Test Step: Test 1: a) Login to the application with a valid user account b) Retrieve the data diagnostic records from the ELD database c) Verify that no new record or event is displayed to reflect latest malfunction occurrence d) Confirm that the ELD cannot retrieve recorded logs that are not otherwise catalogues remotely by the motor carrier e) Confirm that the ELD detects a data recording compliance malfunction f) Logout	Expected Test Step Outcome: Test 1: User should be able to confirm that the ELD has detected a data recording compliance malfunction if it could no longer record or retain required events or retrieve recorded logs that are not otherwise catalogued remotely by the motor carrier. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.5-3	24.	**Requirement: An ELD must monitor the completeness of the ELD event record information in relation to the required data elements for each event type.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Retrieve the data diagnostic records from the ELD database c) Review the output and determine if there are any required data elements that are required but not displayed d) Logout	Expected Test Step Outcome: Test 1: The user should be able to confirm if there are any required data elements that are required but not entered. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.5-4	25.	**Requirement: An ELD must record a missing data elements data diagnostics event for the driver if any required field is missing at the time of recording.** Precondition: • Required field are missing from a driving record Description of Test Step: Test 1: a) Login to the application with a valid user account b) Retrieve the data diagnostic records from the ELD database c) Review the output and determine if there are any required data elements that are required but not displayed d) Confirm that the ELD has recorded a 'missing required data elements' data diagnostics event for any instance of missing required data elements e) Logout	Expected Test Step Outcome: Test 1: The user should be able to confirm if a missing data elements data diagnostics event has been created for the driver for an instance where there are required data elements that are not displaying. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.6-1	26.	**Requirement: When there are ELD records involving driving time logged on an ELD under the unidentified driver profile, the ELD must prompt the driver(s) logging into that ELD with a warning indicating the existence of new unassigned driving time.** Precondition: • The ELD must contain records of driving time logged under the unidentified driver profile Description of Test Step: Test 1: a) Login to the ELD as a driver b) Confirm that the ELD prompts the user with a warning to indicate the existence of new unassigned driving time c) Logout	Expected Test Step Outcome: Test 1: The user should be able to verify he/she is prompted with a warning indicating the existence of new unassigned driving time under the unidentified driver profile. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.6-2	27.	**Requirement: The ELD must provide a mechanism for the driver to review and either acknowledge the assignment of one or more of the unidentified driver records attributable to the driver under the authenticated driver's profile as described in Appendix B, section 4.3.2.8.2(1) or indicate that these records are not attributable to the driver.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Retrieve the data diagnostic records from the ELD database c) Review the driver records attributed to an unidentified driver profile d) Ensure user has the option to either acknowledge the assignment(s) of the unidentified driver records attributable to the authenticated driver's profile or indicate that the records are not attributable e) Retrieve the ELD driving records to confirm that changes have saved successfully f) Logout	Expected Test Step Outcome: Test 1: The user should be able to identify and review driver records that are attributed to an unidentified driver and update those selected records that can now be assigned to a specific driver. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.6-3	28.	**Requirement: If more than 30 minutes of driving in a 24-hour period show an unidentified driver on the ELD, the ELD must detect an unidentified driving records data diagnostic event.** Description of Test Step: Test 1: a) Simulate driving as an unidentified driver for more than 30 minutes b) Confirm that the ELD detected/recorded an unidentified driving records data diagnostic event c) Logout	Expected Test Step Outcome: Test 1: The user should be able to confirm that a data diagnostic record is created to indicate more than 30 minutes of driving in a 24 hour period by an unidentified driver. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.6.1.6-4	29.	**Requirement: If more than 30 minutes of driving in a 24-hour period show an unidentified driver on the ELD, the ELD must record an unidentified driving records data diagnostic event.** Description of Test Step: Test 1: a) Simulate driving for more than 30 minutes as an unidentified driver b) Verify that an unidentified driving records data diagnostic event had been recorded c) Logout	Expected Test Step Outcome: Test 1: At exactly 30 minutes of driving time by the unidentified driver, an unidentified driving record data diagnostic event will be recorded. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.6-5	30.	**Requirement: If more than 30 minutes of driving in a 24-hour period show an unidentified driver on the ELD, the data diagnostic indicator must be turned on for all drivers logged in to that ELD for the current 24-hour period.** Description of Test Step: Test 1: a) Simulate driving for more than 30 minutes as an unidentified driver b) Verify that the data diagnostic indicator is turned on for all drivers logged in to the ELD for the current 24-hour period Test 2: c) Log in with a driver user account d) Verify the data diagnostic indicator is present e) Logout	Expected Test Step Outcome: Test 1 and 2: The user should be able to confirm that the data diagnostic indicator is turned on for all drivers logged into the ELD during the 24 hour period of more than 30 minutes of unidentified driving time being simulated. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.6-6	31.	**Requirement: If more than 30 minutes of driving in a 24-hour period show an unidentified driver on the ELD, the data diagnostic indicator must be turned on for all drivers logged in to that ELD for the following 7 days.** Description of Test Step: Test 1: a) Simulate driving for more than 30 minutes as an unidentified driver b) Verify that the data diagnostic indicator is turned on for the next 7 days for all drivers logged in to the ELD Test 2: c) Log in with a driver user account d) Verify the data diagnostic indicator is present e) Logout	Expected Test Step Outcome: Test 1 and 2: After more than 30 minutes of unidentified driving time (either real or simulated) the user should be able to confirm that the data diagnostic indicator is turned on for all drivers logged into the ELD during the next 7 days. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.6-7	32.	**Requirement: An unidentified driving records data diagnostic event can be cleared by the ELD when driving time logged under the unidentified driver profile for the current 24-hour period and the previous 7 consecutive days drops to 15 minutes or less.** Description of Test Step: Precondition: • An unidentified driving records data diagnostic event must exist within the ELD • Set the unidentified driver time during the previous 24 hours is under 15 minutes • Set unidentified driving time during the previous 7 consecutive days Test 1: a) Login to the application with a valid user account b) Retrieve the data diagnostic records from the ELD database c) Check unidentified driver during the previous 24 hours and make sure it is under 15 minutes d) Check unidentified driving time during the previous 7 consecutive days and verify that it is less than 15 minutes e) Verify that the data diagnostic records logged under the unidentified driver profile for the current 24hour period were cleared when the driving time logged dropped to 15 minutes or less f) Verify that the data diagnostic records logged under the unidentified driver profile for the previous 7 consecutive days were cleared when the driving time logged dropped to 15 minutes or less g) Logout	Expected Test Step Outcome: Test 1: The user will navigate to and review the data diagnostic indicator on the ELD database and confirm that unidentified driving records data diagnostic events are cleared by the ELD when driving time logged under the unidentified driver profile dropped to 15 minutes or less for the current 24 hour period and the previous 7 consecutive days. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.7-1	33.	**Requirement: An ELD must implement in-service monitoring functions to verify that the data transfer mechanism(s) described in Appendix B, section 4.9.1 are continuing to function properly.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to the driver's event records c) Verify that the ELD in-service monitoring capabilities are functioning properly and are recording real-time data events d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in with a valid user account and navigated to the driver's event records. The ELD in-service monitoring functions were working properly and displaying data events. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.7-2	34.	**Requirement: An ELD must verify the in-service monitoring functionality at least once every 7 days.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to the driver's event records c) Verify that the ELD in-service monitoring capabilities are functioning properly and are recording real-time data events by examining driver logins d) Select a 7 day time period e) Verify the in-service monitoring process event is recorded least once in that period f) Select another sequential 7 day time period g) Verify the in-service monitoring process event is recorded at least once in that period h) Select a third sequential seven day time period i) Verify the in-service monitoring process event is recorded least once in that period j) Logout	Expected Test Step Outcome: Test 1: The ELD in-service monitoring functions were working properly and displaying data events. The ELD record showed a service monitoring function occurred once every seven days for three consecutive 7 day time periods. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.7-3	35.	**Requirement: The in-service monitoring functions may be automatic or may involve manual steps for a driver.** Description of Test Step: Test1: a) Login to the application with a valid user account b) Navigate to the driver's event records c) Verify that the ELD in-service monitoring capabilities are functioning properly and are recording real-time data events d) Verify the in-service monitoring process is automatic or involves manual steps for the driver e) If manual, note what steps are needed f) Logout	Expected Test Step Outcome: Test 1: The ELD in-service monitoring functions were working properly and displaying data events. The in-service monitoring functions were automatic and if manual steps were needed, they were recorded. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.7-4	36.	**Requirement: An ELD must record a data transfer data diagnostic event.** Precondition: • Data diagnostic events are present on the ELD Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to the data diagnostic event records c) Initiate a data transfer of a data diagnostic event d) Verify the ELD recorded the data transfer e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the data diagnostic event records. User initiated a data transfer of a data diagnostic event. The ELD recorded the data transfer event. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.7-5	37.	**Requirement: After an ELD records a data transfer data diagnostic event, the ELD must increase the frequency of the monitoring function to check at least once every 24-hour period.** Precondition: • Data diagnostic events are present on the ELD Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to the data diagnostic event records c) Initiate a data transfer of a data diagnostic event and record the time d) Verify the ELD recorded the data transfer e) Verify the ELD increases the monitoring function check from at least once every 7 days to at least once every 24-hour period f) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the data diagnostic event records. User initiated a data transfer of a data diagnostic event and the ELD recorded the data transfer event. The ELD increased the monitoring function check to at least once every 24-hour period from every 7 days. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.1.7-6	38.	**Requirement: If the ELD stays in the unconfirmed data transfer mode following the next three consecutive monitoring checks, the ELD must detect a data transfer compliance malfunction.** Precondition: • In-service monitoring mechanism in a failed operation state Description of Test Step: Test 1: a) Login to the application with a valid user account b) Verify the in-service monitoring mechanism is non-operational c) Verify the ELD is in an unconfirmed data transfer mode state d) After 3 consecutive monitoring checks, verify the ELD detects a data transfer compliance malfunction e) Logout	Expected Test Step Outcome: Test 1: User successfully verified the in-service monitoring mechanism was non-operational and the ELD was in an unconfirmed data transfer mode state. The ELD detected a data transfer compliance malfunction after 3 consecutive monitoring checks. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.2-1	39.	**Requirement: ELD malfunctions affect integrity of the device and its compliance; therefore, active malfunctions must be indicated to all drivers who may use that ELD.** Precondition: • A malfunction on the ELD is present and visible Description of Test Step: Test 1: a) Login to the application with a valid user account b) Determine on the ELD display if an error messages appear to indicate a problem with the unit's functionality or non-compliant state c) If an error message/indicator appears, note the malfunction indicator d) Logoff Test 2: e) Login with another valid user account f) Verify that the malfunction indicator is still active for the other user g) Logout	Expected Test Step Outcome: Test 1: User successfully logged in to the ELD device and determined if a malfunction indicator was present. If present, the user logged off the device. Test 2: Another user account logged in to the ELD. The malfunction indicator was still present for this other user. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.2-2	40.	**Requirement: An ELD must provide a recognizable visual indicator, and may provide an audible signal, to the operator as to its malfunction status.** Precondition: • A malfunction on the ELD has been created Description of Test Step: Test 1: a) Login to the application with a valid user account b) Determine on the ELD display if an error messages appear to indicate a problem with the unit's functionality or non-compliant state c) Verify that the malfunction indicator is visible and audible to the user d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in to the ELD device and determined if a malfunction indicator was present. The malfunction indicator was visible and audible to the user. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.2.1-1	41.	**Requirement: An ELD must display a single visual malfunction indicator for all drivers using the ELD on the ELD's display or on a stand-alone indicator.** Precondition: • A malfunction on the ELD is generated Description of Test Step: Test 1: a) Login to the application with a valid user account b) Determine on the ELD stand-alone indicator if an error messages appear to indicate a problem with the unit's functionality or non-compliant state c) If an error message on the stand-alone indicator appears, note the malfunction indicator and logoff Test 2: d) Login with another valid user account e) Verify that the malfunction message on the stand-alone indicator is still active for the other user f) Logout	Expected Test Step Outcome: Test 1: The user determined a malfunction was present on the stand-alone indicator. If present, the user logged off the device. Test 2: Another user account logged in. The malfunction on the stand-alone indicator was still present for this other user. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.2.1-2	42.	**Requirement: The visual signal for the malfunction indicator must be visible to the driver when the driver is seated in the normal driving position.** Precondition: • A malfunction on the ELD is generated Description of Test Step: Test 1: a) Login to the application with a valid user account b) Determine on the ELD indicator if an error messages appears to indicate a problem with the unit's functionality or non-compliant state c) If an error message on the appears, note the malfunction indicator and logoff Test 2: d) Have another driver sit in the driving position e) Login with another valid user account f) Verify that the malfunction message on the screen is still visible g) Logout	Expected Test Step Outcome: Test 1 and 2: Both users, sitting in the normal driving position can see the malfunction message on the indicator. Users logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.2.1-3	43.	**Requirement: The ELD malfunction indicator must be clearly illuminated when there is an active malfunction on the ELD.** Precondition • A malfunction on the ELD is generated Description of Test Step: Test 1: a) Login to the application with a valid user account b) Determine if the error messages is visible and indicates a problem with the unit's functionality or non-compliant state c) If an error message appears, note the malfunction indicator and logoff Test 2: d) Have another driver sit in the driving position e) Login with another valid user account f) Verify that the malfunction message on the screen is still visible g) Logout	Expected Test Step Outcome: Test 1 and 2: Determine that the ELD malfunction indicator is clearly illuminated so both users, sitting in the normal driving position can see the malfunction message on the indicator. Users logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.2.1-4	44.	**Requirement: The malfunction status must be continuously communicated to the driver when the ELD is powered.** Precondition: • A malfunction on the ELD is present and visible Description of Test Step: Test 1: a) Login to the application with a valid user account b) Verify a malfunction is present on the ELD c) Keep the ELD powered on for a pre-determined set of time d) Verify that the malfunction indicator is continuously present and visible the entire time the ELD is powered on e) Logout	Expected Test Step Outcome: Test 1: User determined if a malfunction indicator was present. The malfunction indicator was visible for the entire duration the ELD device was powered on. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.3-1	45.	**Requirement: ELD data diagnostic status affects only the authenticated user; therefore, an ELD must only indicate the active data diagnostics status applicable to the driver logged into the ELD.** Precondition: • Multiple accounts with different data diagnostic statuses are loaded on the ELD device Description of Test Step: Test 1: a) Login to the application with a driver user account. b) Identify the data diagnostic status for the driver user account c) Logout Test 2: a) Login to the application with a motor carrier (support personnel) user account. b) Determine the data diagnostic status for the driver user account c) Verify the data diagnostic status is different than the driver user account in Test 1 d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in to the ELD device and identified the data diagnostic status for a driver user account. User successfully logged out. Test 2: User successfully logged in to the ELD device and identified the data diagnostic status for a motor carrier user account. The data diagnostic status was different than for the user in Test 1. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.3-2	46.	**Requirement: An ELD must provide a recognizable visual indicator, and may provide an audible signal, to the driver as to its data diagnostics status.** Precondition: • Data diagnostic events are present on the ELD Description of Test Step: Test 1: a) Login to the application with a valid user account. b) Identify the data diagnostic status event for the user c) Verify that the ELD provides an data diagnostic indicator and that it's visible (and possibly audible) to the user d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in to the ELD device and identified the data diagnostic status for a driver user account. The status indicator was visible (also potentially audible) to the user. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.3.1-1	47.	**Requirement: An ELD must display a single visual data diagnostics indicator, apart from the visual malfunction indicator described in Appendix B, section 4.6.2.1, to visually communicate existence of active data diagnostics events for the applicable driver.** Precondition: • Data diagnostic events are present on the ELD • Malfunction events are present on the ELD Description of Test Step: Test 1: a) Login to the application with a valid user account b) Data diagnostic status indicator appears c) A separate malfunction indicator appears d) Identify the data diagnostic status event for the user e) Verify that the ELD provides an data diagnostic indicator and that it's visible (and possibly audible) to the user f) Verify the data diagnostic status indicator is different than the malfunction indicator g) Logout	Expected Test Step Outcome: Test 1: User successfully logged in to the ELD device and identified the data diagnostic status for a driver user account. The data diagnostic indicator was different than the malfunction indicator. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.6.3.1-2	48.	**Requirement: The visual signal must be visible to the driver when the driver is seated in the normal driving position.** Precondition: • Data diagnostic events are present on the ELD • Malfunction events are present on the ELD Description of Test Step: Test 1: a) Login to the application with a valid user account b) Data diagnostic status indicator appears c) A separate malfunction indicator appears d) Identify the data diagnostic status event for the user e) Verify that the ELD provides an data diagnostic indicator and that it's visible to the user f) Verify the data diagnostic status indicator is different than the malfunction indicator g) Logout	Expected Test Step Outcome: Test 1: Determine that the visual signal is clearly illuminated so both users, sitting in the normal driving position can see the visual signal on the indicator. User logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
Test Step Note	N/A			
Test Step Note	N/A			
Test Step Note	N/A			

2.3 ELD Test Procedures- Recording

An ELD must record data at the following events: change in driver's duty status, intermediate logs, change in driver's indication of allowed conditions that impact driving time recording, driver's certification of own records, driver's login/logout activity, CMV's engine power up and shut down activity, and ELD malfunction and data diagnostics occurrence. Each event is to be recorded with required specified data elements that are to be demonstrated and tested below. An ELD must also retain data to support the specified performance requirements. The following test procedures validate the device data recording capabilities.

Test Procedure Number	**ELD- 2.3**					
Functional Area/Test Procedure Name	**ELD – Recording**					
Date Test Initiated						
Test Support Items	**Test Tools or App(s) Description**		**Test Data Description**			
Description of Test Configuration						
Test Engineer (s)						
Overview/Description	☐	**Engineering Test Cycle**	☐	**Stand-alone Test**	☐	**System Test**
	☐	**Second Test Cycle**	☐	**Acceptance Test**	☐	**Regression Testing**

Date Test Completed:	**Signatures:**	**Test Engineer: _____** **Test Lead: _____** **Quality Assurance: _____** **Customer: _____** **Customer: _____**
Time Test Began: **Time Test Ended:**		

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.1-1	1.	**Requirement: When a driver's duty status changes, the ELD must associate the record with the driver.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Verify the ELD is in a state to record new events c) Set the driving duty status to off duty d) Change the driving duty status to on duty driving e) Verify the ELD recorded the event when the duty status changed f) Verify the driver account is associated with the duty status record g) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and set the duty status off duty. The user changed the duty status to on duty driving and the ELD recorded the change in duty status event. The driver account was associated with the record. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.5.1.1-2	2.	**Requirement: When a driver's duty status changes, the ELD must associate the record with the record originator (if created during an edit or entry).** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a duty status change event recorded on the ELD (from 4.5.1.1-1 test) d) Verify the record is associated with the record originator e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the records. The record was associated with the record originator. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.1-3	3.	**Requirement: When a driver's duty status changes, the ELD must associate the record with the vehicle.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a duty status change event recorded on the ELD (from 4.5.1.1-1 test) d) Verify the vehicle is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the records. The vehicle was associated with the record of the duty status change. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.5.1.1-4	4.	**Requirement: When a driver's duty status changes, the ELD must associate the record with the motor carrier.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a duty status change event recorded on the ELD (from 4.5.1.1-1 test) d) Verify the motor carrier is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the records. The motor carrier was associated with the record of the duty status change. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.1-5	5.	**Requirement: When a driver's duty status changes, the ELD must associate the record with the shipping document number.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a duty status change event recorded on the ELD (from 4.5.1.1-1 test) d) Verify the shipping document number is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the records. The shipping document number was associated with the record of the duty status change. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.1-6	6.	**Requirement: When a driver's duty status changes, the ELD must include the following data elements (See Appendix B, section 4.5.1.1 for details).** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a duty status change event recorded on the ELD (from 4.5.1.1-1 test) d) Verify the data elements are associated with the record: • <Event Sequence ID Number> • <Event Record Status> • <Event Record Origin> • <Event Type> • <Event Code> • <{Event} Date> • <{Event} Time> • <{Accumulated} Vehicle Miles> • <{Elapsed} Engine Hours> • <{Event} Latitude> • <{Event} Longitude> • <Distance Since Last Valid Coordinates> • <Malfunction Indicator Status {for ELD}> • <Data Diagnostic Event Indicator Status {for Driver}> • <{Event} Comment /Annotation> • <Driver's Location Description> • <Event Data Check Value> e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the records. The applicable data elements were associated with the record of the duty status change. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.2-1	7.	**Requirement: When a CMV is in motion, as described in Appendix B, section 4.3.1.2, and there has not been a duty status change event or another intermediate log event recorded in the previous 1-hour period, the ELD must record a new intermediate log event.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Verify the ELD is in a state to record new events c) Set the driving duty status to on duty driving d) Power on the CMV's engine and put the vehicle in motion e) After a 1 hour period of vehicle motion, if there hasn't been a log event recorded, the ELD must record a new intermediate log event. f) Verify a new intermediate log event was recorded on the ELD g) Bring the vehicle to a stop and power down the engine h) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and set the duty status to on duty driving. The vehicle was put in motion for a 1 hour time period and a new intermediate log event was created during that time period. The vehicle was brought to a stop and powered down. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.2-2	8.	**Requirement: The ELD must associate the record to the driver.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is an intermediate log event recorded on the ELD (from 4.5.1.2-1 test) d) Verify the driver is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the records. The driver was associated with the intermediate log event record. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.5.1.2-3	9.	**Requirement: The ELD must associate the record with the vehicle.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is an intermediate log event recorded on the ELD (from 4.5.1.2-1 test) d) Verify the vehicle is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the records. The vehicle was associated with the intermediate log event record. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.2-4	10.	**Requirement: The ELD must associate the record with the motor carrier.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is an intermediate log event recorded on the ELD (from 4.5.1.2-1 test) d) Verify the motor carrier is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the records. The motor carrier was associated with the intermediate log event record. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.5.1.2-5	11.	**Requirement: The ELD must associate the record with the shipping document number.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is an intermediate log event recorded on the ELD (from 4.5.1.2-1 test) d) Verify the shipping document number is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the records. The shipping document number was associated with the intermediate log event record. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.2-6	12.	**Requirement: The ELD must include the following data elements outlined in Appendix B, section 4.5.1.1.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is an intermediate log event recorded on the ELD (from 4.5.1.2-1 test) d) Verify the data elements are associated with the record: • <Event Sequence ID Number> • <Event Record Status> • <Event Record Origin> • <Event Type> • <Event Code> • <{Event} Date> • <{Event} Time> • <{Accumulated} Vehicle Miles> • <{Elapsed} Engine Hours> • <{Event} Latitude> • <{Event} Longitude> • <Distance Since Last Valid Coordinates> • <Malfunction Indicator Status {for ELD}> • <Data Diagnostic Event Indicator Status {for Driver}> • <{Event} Comment /Annotation> • <Event Data Check Value> e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the records. The applicable data elements were associated with the intermediate log event record. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.3-1	13.	**Requirement: At each instance when the status of a driver's indication of personal use of CMV or yard moves changes, the ELD must record a new event.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Verify the ELD is in a state to record new events c) Indicate authorized personal use of the ELD or yard moves for the driving duty status d) Change the driving duty status to another duty status state e) Verify the ELD recorded a new event when the duty status changed f) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and set the duty status to personal use of the CMV or yard moves. When the duty status changed the ELD recorded the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.5.1.3-2	14.	**Requirement: The ELD must associate the record to the driver.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a duty status change event recorded on the ELD (from 4.5.1.3-1 test) d) Verify the driver account is associated with the duty status record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD records. A duty status event had a driver account associated with the record. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.3-3	15.	**Requirement: The ELD must associate the record with the vehicle.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a duty status change event recorded on the ELD (from 4.5.1.3-1 test) d) Verify the vehicle is associated with the duty status record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD records. A duty status event had the vehicle associated with the record. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.5.1.3-4	16.	**Requirement: The ELD must associate the record with the motor carrier.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a duty status change event recorded on the ELD (from 4.5.1.3-1 test) d) Verify the motor carrier is associated with the duty status record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD records. A duty status event had the motor carrier associated with the record. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.3-5	17.	**Requirement: The ELD must associate the record with the shipping document number** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a duty status change event recorded on the ELD (from 4.5.1.3-1 test) d) Verify the shipping document number is associated with the duty status record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD records. A duty status event had the motor carrier associated with the record. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.3-6	18.	**Requirement: The ELD must include the following data elements outlined in Appendix B, section 4.5.1.1.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a duty status change event recorded on the ELD (from 4.5.1.3-1 test) d) Verify the following data elements are associated with the duty status record: • <Event Sequence ID Number> • <Event Record Status> • <Event Record Origin> • <Event Type> • <Event Code> • <{Event} Date> • <{Event} Time> • <{Accumulated} Vehicle Miles> • <{Elapsed} Engine Hours> • <{Event} Latitude> • <{Event} Longitude> • <Distance Since Last Valid Coordinates> • <Malfunction Indicator Status {for ELD}> • <Data Diagnostic Event Indicator Status {for Driver}> • <{Event} Comment /Annotation> • <Driver's Location Description> • <Event Data Check Value> e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD records. A duty status event had the applicable data elements associated with the record. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.4-1	19.	**Requirement: At each instance when a driver certifies or re-certifies that driver's records for a given 24-hour period are true and correct, the ELD must record the event.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Verify the ELD is in a state to record new events c) Have the user certify a driver's record for a 24-hour period d) Verify the ELD recorded the event when the record was certified e) Logout Test 2: a) Login to the ELD with a valid user account b) Verify the ELD is in a state to record new events c) Have the user re-certify a driver's record for a 24-hour period d) Verify the ELD recorded the event when the record was certified e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and certified a driver's record for a 24-hour period. The ELD recorded the event. The user successfully logged off. Test 1: User successfully logged in and re-certified a driver's record for a 24-hour period. The ELD recorded the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.4-2	20.	**Requirement: The ELD must associate the record to the driver.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a certified 24-hour driving record event recorded on the ELD (from 4.5.1.4-1 test) d) Verify the driver account is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and identified a driver 24-hour certified recorded event with the driver account associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.5.1.4-3	21.	**Requirement: The ELD must associate the record with the vehicle.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a certified 24-hour driving record event recorded on the ELD (from 4.5.1.4-1 test) d) Verify the vehicle is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and identified a driver 24-hour certified recorded event with the vehicle associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.4-4	22.	**Requirement: The ELD must associate the record with the motor carrier.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a certified 24-hour driving record event recorded on the ELD (from 4.5.1.4-1 test) d) Verify the motor carrier is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and identified a driver 24-hour certified recorded event with the motor carrier associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.5.1.4-5	23.	**Requirement: The ELD must associate the record with the shipping document number.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a certified 24-hour driving record event recorded on the ELD (from 4.5.1.4-1 test) d) Verify the shipping document number is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and identified a driver 24-hour certified recorded event with the shipping document number associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.4-6	24.	**Requirement: The ELD must include the following data elements (see Appendix B, section 4.5.1.4 for details).** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a certified 24-hour driving record event recorded on the ELD (from 4.5.1.4-1 test) d) Verify the following data elements are associated with the record: • <Event Sequence ID Number> • <Event Type> • <Event Code> • <Time Zone Offset from UTC> • <{Event} Date>and <Date {of the certified record}> • <{Event} Time> e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and identified a driver 24-hour certified recorded event with the applicable data elements associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.5-1	25.	**Requirement: At each instance when an authorized user logs in and out of the ELD, the ELD must record the event.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Verify the ELD is in a state to record new events c) Logoff the account d) Log back in to the ELD with a valid user account e) Verify the ELD recorded the event when the user logged in/out of the ELD f) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and logged out of the ELD. The ELD recorded the login/logout event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.5.1.5-2	26.	**Requirement: The ELD must associate the record to the driver.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a login/logout event recorded on the ELD (from 4.5.1.5-1 test) d) Verify the driver account is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in identified a login/logout event with the driver account associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.5-3	27.	**Requirement: The ELD must associate the record with the vehicle.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a login/logout event recorded on the ELD (from 4.5.1.5-1 test) d) Verify the vehicle is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in identified a login/logout event with the vehicle associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.5.1.5-4	28.	**Requirement: The ELD must associate the record with the motor carrier.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a login/logout event recorded on the ELD (from 4.5.1.5-1 test) d) Verify the motor carrier is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in identified a login/logout event with the motor carrier associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.5-5	29.	**Requirement: The ELD must associate the record with the shipping document number.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a login/logout event recorded on the ELD (from 4.5.1.5-1 test) d) Verify the shipping document number is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in identified a login/logout event with the shipping document number associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.5-6	30.	**Requirement: The ELD must include the following data elements (see Appendix B, section 4.5.1.5 for details).** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a login/logout event recorded on the ELD (from 4.5.1.5-1 test) d) Verify the following data elements are associated with the record • <Event Sequence ID Number> • <Event Type> • <Event Code> • <{Event} Date> • <{Event} Time> • <{Total} Vehicle Miles> • <{Total} Engine Hours> e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in identified a login/logout event with the applicable data elements associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.6-1	31.	**Requirement: When a CMV's engine is powered up or shut down, an ELD must record the event within 1 minute of occurrence.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Verify the ELD is in a state to record new events and is interfaced with the CMV's engine c) Record the time d) Power on the CMV's engine and keep running for ~5 minutes e) Verify the ELD recorded the event when the CMV's engine powered on within 1 minute of occurrence f) Power off the CMV's engine g) Verify the ELD recorded the event when the CMV's engine powered off within 1 minute of occurrence h) Logout	Expected Test Step Outcome: Test 1: User successfully logged in to the ELD. The ELD recorded an event with the CMV's engine powering on within 1 minute. The ELD recorded an event with the CMV's engine powering off within 1 minute. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.6-2	32.	**Requirement: When a CMV's engine is powered up or shut down, an ELD must retain the earliest shut down event if CMV has not moved since the last ignition power on cycle.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Verify there is an engine power up and shut down event recorded on the ELD (from 4.5.1.6-1 test) c) Verify the earliest shut down event is retained if the CMV has not moved d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and identified the engine power up and shut down recorded event. The earliest shut down event was retained. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.5.1.6-3	33.	**Requirement: When a CMV's engine is powered up or shut down, an ELD must retain the latest power-up event if CMV has not moved since the last ignition power on cycle.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Verify there is an engine power up and shut down event recorded on the ELD (from 4.5.1.6-1 test) c) Verify the latest power up event is retained if the CMV has not moved d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and identified the engine power up and shut down recorded event. The earliest power up event was retained. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.6-4	34.	**Requirement: The ELD must associate the record to the driver or the unidentified driver profile.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is an engine power up and shut down event recorded on the ELD (from 4.5.1.6-1 test) d) Verify the driver account is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and identified an engine power up and shut down event with the driver account associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.5.1.6-5	35.	**Requirement: The ELD must associate the record with the vehicle.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is an engine power up and shut down event recorded on the ELD (from 4.5.1.6-1 test) d) Verify the vehicle is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and identified an engine power up and shut down event with the vehicle associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.6-6	36.	**Requirement: The ELD must associate the record with the motor carrier.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is an engine power up and shut down event recorded on the ELD (from 4.5.1.6-1 test) d) Verify the motor carrier is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and identified an engine power up and shut down event with the motor carrier associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.5.1.6-7	37.	**Requirement: The ELD must associate the record with the shipping document number.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is an engine power up and shut down event recorded on the ELD (from 4.5.1.6-1 test) d) Verify the shipping document number is associated with the record e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and identified an engine power up and shut down event with the shipping document number associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.6-8	38.	**Requirement: The ELD must include the following data elements (see Appendix B, section 4.5.1.6 for details).** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is an engine power up and shut down event recorded on the ELD (from 4.5.1.6-1 test) d) Verify the following data elements are associated with the record • <Event Sequence ID Number> • <Event Type> • <Event Code> • <{Event} Date> • <{Event} Time> • <{Total} Vehicle Miles> • <{Total} Engine Hours> • <{Event} Latitude> • <{Event} Longitude> • <Distance Since Last Valid Coordinates> e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and identified an engine power up and shut down event with the applicable data elements associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.7-1	39.	**Requirement: At each instance when an ELD malfunction is detected by the ELD, the ELD must record the event.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Verify the ELD is in a state to record new events c) Prompt the user to initiate a temporary malfunction to the ELD d) Navigate to the ELD records e) Verify there is an malfunction event recorded on the ELD f) Logout	Expected Test Step Outcome: Test 1: User successfully logged in prompted a temporary malfunction to the ELD. The ELD recorded the malfunction event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.5.1.7-2	40.	**Requirement: At each instance when an ELD malfunction is cleared by the ELD, the ELD must record the event.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is an malfunction event recorded on the ELD (from 4.5.1.7-1 test) d) Clear the malfunction event e) Verify the ELD recorded the clear of the malfunction event f) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and cleared the recorded malfunction event. The cleared event was recorded. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.7-3	41.	**Requirement: At each instance when an ELD data diagnostic event is detected by the ELD, the ELD must record the event.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Verify the ELD is in a state to record new events c) Prompt the user to create a data diagnostic event d) Navigate to the ELD records e) Verify there is an data diagnostic event recorded on the ELD f) Logout	Expected Test Step Outcome: Test 1: User successfully logged in created a data diagnostic event on the ELD. The ELD recorded the data diagnostic event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.5.1.7-4	42.	**Requirement: At each instance when an ELD data diagnostic event is cleared by the ELD, the ELD must record the event.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is an data diagnostic event recorded on the ELD (from 4.5.1.7-3 test) d) Clear the data diagnostic event e) Verify the ELD recorded the clear of the data diagnostic event f) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and cleared the recorded data diagnostic event. The cleared event was recorded. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.7-5	43.	**Requirement: The ELD must associate the record to the driver.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a malfunction and data diagnostic event recorded on the ELD (from 4.5.1.7-1 and 4.5.1.7-3 tests) d) Verify the driver account is associated with the records e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and identified a malfunction and data diagnostic event with the driver account associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.5.1.7-6	44.	**Requirement: The ELD must associate the record with the vehicle.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a malfunction and data diagnostic event recorded on the ELD (from 4.5.1.7-1 and 4.5.1.7-3 tests) d) Verify the vehicle is associated with the records e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and identified a malfunction and data diagnostic event with the vehicle associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.7-7	45.	**Requirement: The ELD must associate the record with the motor carrier.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a malfunction and data diagnostic event recorded on the ELD (from 4.5.1.7-1 and 4.5.1.7-3 tests) d) Verify the motor carrier is associated with the records e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and identified a malfunction and data diagnostic event with the motor carrier associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.5.1.7-8	46.	**Requirement: The ELD must associate the record with the shipping document number.** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a malfunction and data diagnostic event recorded on the ELD (from 4.5.1.7-1 and 4.5.1.7-3 tests) d) Verify the shipping document number is associated with the records e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and identified a malfunction and data diagnostic event with the shipping document number associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.5.1.7-9	47.	**Requirement: The ELD must include the following data elements (see Appendix B, section 4.5.1.7 for details).** Description of Test Step: Test 1: a) Login to the ELD with a valid user account b) Navigate to the ELD records c) Verify there is a malfunction and data diagnostic event recorded on the ELD (from 4.5.1.7-1 and 4.5.1.7-3 tests) d) Verify the data elements are associated with the records • <Event Sequence ID Number> • <Event Type> • <Event Code> • <Malfunction/Diagnostic Code> • <{Event} Date> • <{Event} Time> • <{Total} Vehicle Miles> • <{Total} Engine Hours> e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and identified a malfunction and data diagnostic event with the applicable data elements associated with the event. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
Test Step Note	N/A			
Test Step Note	N/A			
Test Step Note	N/A			

Chapter Three:
ELD Test Procedures
Outputs and Data Transfer

10/17/2016

Version 2.0

U.S. Department of Transportation
Federal Motor Carrier Safety Administration

Revision History

Version	Rev	Date	Changes Made	Writer	Reviewer
0.0	-	12/16/15	Original Document	FMCSA	
1.0	-	3/11/16	Webinar Updates	FMCSA	
2.0	-	10/17/16	Implementation Phase Web Services Tests Note	FMCSA	

This is a copy of The ELD Compliance Test Procedures [as a Word document]. The current official version [as a .pdf file] is published on the FMCSA website and updated as required. Please be aware that any modification is the company's responsibility if it differs from the FMCSA official version.

Use of Compliance Test Procedures

An Electronic Logging Device (ELD) must meet the technical specifications set forth in the Appendix to Subpart B of Part 395 of title 49, Code of Federal Regulations. Although use of the ELD test procedures set forth in this document is not binding on ELD providers, these procedures are made available to ELD providers to assist them in carrying out their testing processes before certifying an ELD model as compliant with the technical specifications. The ELD certification process does require a certifying statement describing how the model was tested to comply with FMCSA regulations. The FMCSA would use these test procedures to evaluate compliance if the Agency decides to undertake an independent evaluation of an ELD that has been certified by the provider.

Implementation Phase Data Transfer and Web Services Test Steps

Due to the fact that data transfer cannot be trialed with an actual authorized safety official and that the Web Services portal at FMCSA is not yet operational, the following test steps* are not required to be completed:

ELD-FUNC-4.3.2.5-2

ELD-FUNC-4.9.1-2

ELD-FUNC-4.9.2-5

ELD-FUNC-4.10.1.1-2

ELD-FUNC-4.10.1.1-3

ELD-FUNC-4.10.1.1-4

ELD-FUNC-4.10.1.2-2

ELD-FUNC-4.10.1.2-3

ELD-FUNC-4.10.2-1

These steps are also highlighted in YELLOW if they are contained within this document.

*Data transfer via e-mail accounts, USB, and Bluetooth can still be tested in the manufacturer's test environment. If the required output file can be generated per the technical specifications, it will work in FMCSA Web Services

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3.1 ELD Test Procedures - Outputs

ELD outputs include the information displayed to a user via the ELD user interface and the standard data output file produced by the ELD. An ELD shall support the capability to present a specific set of information to a user. The standard data output file shall be tested to verify format and the ability to transfer to an authorized safety official upon request. The following procedures validate the output of ELD data.

<table>
<tr><td colspan="2">Test Procedure Number</td><td colspan="2">ELD-3.1</td><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td colspan="2">Functional Area/Test Procedure Name</td><td colspan="6">ELD-Outputs</td></tr>
<tr><td colspan="2">Date Test Initiated</td><td colspan="6"></td></tr>
<tr><td colspan="2">Description of Test Configuration</td><td colspan="6"></td></tr>
<tr><td colspan="2">Test Engineer (s)</td><td colspan="6"></td></tr>
<tr><td colspan="2" rowspan="2">Overview/Description</td><td>☐</td><td>Engineering Test Cycle</td><td>☐</td><td>Stand-alone Test</td><td>☐</td><td>System Test</td></tr>
<tr><td>☐</td><td>Second Test Cycle</td><td>☐</td><td>Acceptance Test</td><td>☐</td><td>Regression Testing</td></tr>
<tr><td colspan="2">Date Test Completed:</td><td rowspan="2">Signatures:</td><td colspan="5" rowspan="2">Test Engineer: _____
Test Lead: _____
Quality Assurance: _____
Customer: _____
Customer: _____</td></tr>
<tr><td colspan="2">Time Test Began:
Time Test Ended:</td></tr>
</table>

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.1.1-1	1.	**Requirement: Print paper must be able to accommodate the graph grid specifications as listed in section 4.8.1.3 of Appendix B.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to the ELD records c) Generate a print incorporating a graph grid d) Verify the graph grid was able to fit on printed paper e) Logout	Expected Test Step Outcome: Test 1: The user generated a printout of a fully shown graph grid. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.8.1.2-1	2.	**Requirement: If an ELD does not produce a printout, the ELD must be designed so that its display may be reasonably viewed by an authorized safety official without entering the commercial motor vehicle.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Verify that the ELD can be displayed without entering the vehicle (untethered from its mount or connected in a manner that would allow it to be passed outside of the vehicle for a reasonable distance) c) Logout	Expected Test Step Outcome: Test 1: The user was able to verify the ELD display can be viewed without entering the vehicle. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.1.3-1	3.	**Requirement: The printout and display must show reports for the inspected driver's profile and the unidentified driver profile separately.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to the ELD records c) Print or display the driver's profile d) Print or display the unidentified driver profile e) Verify both reports are printed or displayed f) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the ELD has the capability to print or display the driver's profile and the unidentified driver profile separately. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.1.3-2	4.	**Requirement: The printout and display must show the following information for the current 24-hour period and each of the previous 7 consecutive days (See 4.8.1.3 for more details).** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Verify the printout and displays shows the following information for the current 24-hr period and previous 7 days: a) Date b) 24-hour Starting Time, Time Zone Offset from UTC c) Carrier d) Driver Name e) Driver ID f) Driver License State g) Driver License Number h) Co-Driver i) Co-Driver ID j) Current Odometer k) Current Engine Hours l) ELD ID m) ELD Provider n) Truck Tractor ID o) Truck Tractor VIN p) Shipping ID q) Current Location r) Unidentified Driving Records s) Exempt Driver Status t) ELD Malfunction Indicators u) Driver's Data Diagnostic Status v) Date w) Change of Duty Status, Intervening Interval Records and Change in Driver's Indication of Special Driving Conditions c) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the ELD has the capability to display the relevant information for the current 24-hr period and the previous 7 consecutive days. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.1.3-3	1.	**Requirement: The printout must show each change of duty status on a graph-grid and must be at least 6 inches by 1.5 inches in size.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to the ELD records c) Generate a printout of the change of duty statuses on a graph-grid d) Verify the graph-grid was at least 6 inches by 1.5 inches in size e) Logout	Expected Test Step Outcome: Test 1: User was able to confirm the change of duty statuses on a graph grid and verify the size requirements. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.8.1.3-4	2.	**Requirement: The graph-grid must overlay periods of driver's indications of authorized personal use of CMV and yard moves using a different style line (such as dashed or dotted line) or shading.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to the ELD records c) Generate a printout or show on the display the change of duty statuses on a graph-grid d) Verify the graph-grid shows the periods of authorized personal use of CMV and yard moves using a different line or shading format e) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the ELD has the capability to display the authorized personal use of CMV and yards moves in a different format on the graph-grid. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1-1	7.	**Requirement: The ELD must produce a standard ELD data output file for transfer purposes, which must be generated according to the standard specified in this section.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Click the Transfer RODS button c) Confirm that the ELD has the capability to produce a standard ELD data output file for transfer purposes (which should be generated according to the specified standard) d) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the ELD has the capability to produce a standard ELD data output file for transfer purposes (which should be generated according to the specified standard). User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1-2	8.	**Requirement: Data output must be provided in a single comma-delimited file outlined in this section using American National Standard Code for Information Exchange (ASCII) character sets meeting the standards of ANSI INCITS 4-1986 (R2012) (incorporated by reference, see § 395.38), reference (3)(b) in section 6 of Appendix C. It must include: (1) a header segment, which specifies current or non-varying elements of an ELD file; and (2) variable length comma-delimited segments for the drivers, vehicles, ELD events, ELD malfunction and data diagnostics records, ELD login and logout activity, and unidentified driver records.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to generate a data output file c) Verify the following: a) Data output is provided in a single comma-delimited file using American National Standard Code for Information Exchange (ASCII) character sets meeting the standards of ANSI INCITS 4-1986 b) The data file must include: (1) a header segment, which specifies current or non-varying elements of an ELD file; and (2) variable length comma-delimited segments for the drivers, vehicles, ELD events, ELD malfunction and data diagnostics records, ELD login and logout activity, and unidentified driver records c) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the ELD data output file is a single comma-delimited file with a header segment and variable length comma delimited segments for the drivers, vehicles, ELD events, ELD malfunction and data diagnostics records, ELD login and logout activity and unidentified driver records. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.2-1	9.	**Requirement: The User List must list all drivers and co-drivers with driving time records on the most recent CMV operated by the inspected driver and motor carrier's support personnel who requested edits within the time period for which this file is generated.** Precondition: • User must acquire the most recent CMV that has been operated by the inspected driver or motor carrier's support personnel who requested edits within the time period for which the file is generated Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD User List c) Confirm that the user list contains all drivers and co-drivers with driving time records for that CMV d) Confirm that the user list contains the motor carrier's support personnel who requested edits within the file's time period e) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the User List within the data output file listed all drivers and co-drivers with driving time records on the most recent CMV operated by the inspected driver or motor carrier's support personnel who requested edits within the time period for which this file is generated. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.2-2	10.	**Requirement: The user list must be in chronological order with most recent user of the ELD on top, including the driver being inspected, the co-driver, and the unidentified driver profile.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD User List c) Confirm that the user list within the data output file is in chronological order with most recent user of the ELD on top, including the driver being inspected, the co-driver, and the unidentified driver profile d) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that User List is displayed in chronological order with the most recent user of ELD on top, including the driver being inspected, the co-driver, and the unidentified driver profile. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.2-3	11.	**Requirement: The User List has a variable number of rows depending on the number of profiles with activity over the time period for which this file is generated. (See Appendix B, section 4.8.2.1.2 for details)** Precondition: • Various number of profiles with activity should exist over time period for which the file is generated Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD User List c) Confirm that the user list has a variable number of rows depending on the number of profiles with activity over the time period for which this file is generated d) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the User List has a variable number of rows depending on the number of profiles with activity over the time period for which this file was generated. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.3-1	12.	**Requirement: The CMV List must list each CMV that the current driver operated and that has been recorded on the driver's ELD records within the time period for which this file is generated.** Precondition: • The current driver must have operated at least one CMV within the time period for which the file is generated • At least one CMV should be recorded on the driver's ELD records within the time period for which the file is generated Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD CMV List c) Confirm that the CMV list within the data output file list each CMV that the current driver operated and that has been recorded on the driver's ELD records within the time period for which this file is generated d) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the CMV list within the data output file listed each CMV that the current driver operated and that they have been recorded on the driver's ELD records within the time period for which this file is generated. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.3-2	13.	**Requirement: The list must be rank ordered in accordance with the time of CMV operation with the most recent CMV being on top.** Precondition: • The current driver must have operated at least one CMV within the time period for which the file is generated • At least one CMV should be recorded on the driver's ELD records within the time period for which the file is generated Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD CMV List c) Confirm that the CMV list within the data output file lists each CMV ordered in accordance with the time of CMV operation with the most recent CMV being on top d) Logout	Expected Test Step Outcome: Test 1: User was able to confirm that the CMV list within the data output file listed each CMV ordered in accordance with the time of CMV operation, with the most recent CMV listed first. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.3-3	14.	**Requirement: This segment has a variable number of rows depending on the number of CMVs operated by the driver over the time period for which this file is generated (See Appendix B, section 4.8.2.1.3 for details).** Precondition: • The driver must have operated at least one CMV within the time period for which the file is generated Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD CMV List c) Confirm that the CMV list within the data output file has a variable number of rows depending on the number of CMVs operated by the driver over the time period for which this file is generated d) Logout	Expected Test Step Outcome: Test 1: User was able to confirm that the CMV list within the data output file had a variable number of rows depending on the number of CMVs operated by the driver over the time period for which this file was generated. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.4-1	15.	**Requirement: The ELD Event List for Driver's RODS must list ELD event records tagged with event type 1 (a change in duty status as described in Appendix B, section 4.5.1.1).** Precondition: • A change in duty status must exist within the records Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD Event List c) Confirm that the ELD Event List for Driver's RODS lists a change in duty status as event type 1 d) Logout	Expected Test Step Outcome: Test 1: User was able to confirm that the ELD Event List for Driver's RODS lists a change in duty status as event type 1. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.8.2.1.4-2	16.	**Requirement: This segment must list ELD event records tagged with event type 2 (an intermediate log as described in Appendix B, section 4.5.1.2)** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD Event List c) Confirm that the ELD Event List for Driver's RODS lists an intermediate log as event type 2 d) Logout	Expected Test Step Outcome: Test 1: User was able to confirm that the ELD Event List for Driver's RODS lists an intermediate log as event type 2. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.4-3	17.	**Requirement: This segment must list ELD event records tagged with event type 3 (a change in driver's indication of conditions impacting driving time recording as described in Appendix B, section 4.5.1.3)** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD Event List c) Confirm that the ELD Event List for Driver's RODS lists a change in the driver's indication of conditions impacting driving time recording as event type 3 d) Logout	Expected Test Step Outcome: Test 1: User was able to confirm that the ELD Event List for Driver's RODS lists a change in driver's indication of conditions impacting driving time recording as event type 3. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.4-4	18.	**Requirement: The ELD Event List for Driver's RODS must list all event record status types and of all event record origins for the driver, rank ordered with the most current log on top in accordance with the date and time fields of the record.** Precondition: • Event records must exist within the ELD Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD Event List c) Confirm that the ELD Event List for Driver's RODS lists all event record status types and all event record origins for the driver d) Confirm that events are rank ordered with the most current log on top in accordance with the date and time fields of the record e) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the ELD Event List for Driver's RODS lists all event record status types and all event record origin for the driver in order of most current to least current in accordance with the date and time fields of the record. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.4-5	19.	**Requirement: ELD Event List for Driver's RODS has a variable number of rows depending on the number of ELD events recorded for the driver over the time period for which this file is generated. (See Appendix B, section 4.8.2.1.4 for details)** Precondition: • Event records must exist within the ELD Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD Event List c) Confirm that the ELD Event List for Driver's RODS has a variable number of rows depending on the number of ELD events recorded for the driver over the time period for which this file is generated d) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the ELD Event List for Driver's RODS has a variable number of rows depending on the number of ELD events recorded for the driver over the time period for which the file is generated. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.5-1	20.	**Requirement: This segment must list only the elements of the ELD event list created in Appendix B, section 4.8.2.1.4 above that have an annotation, comment, or a manual entry of location description by the driver.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD Event List c) Confirm that the ELD Event List for Driver's RODS only lists the elements of the ELD event list that have an annotation, comment or manual entry of location description by the driver d) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the ELD Event List for Driver's RODS lists only the elements of the ELD event list that have an annotation, comment or manual entry of location description by the driver. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.5-2	21.	**Requirement: This segment has a variable number of rows depending on the number of ELD events under Appendix B, section 4.8.2.1.4 that feature a comment, annotation, or manual location entry by the driver. (See Appendix B, section 4.8.2.1.5 for details)** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD Event List c) Confirm that the ELD Event Annotation or Comments has a variable number of rows depending on the number of ELD events recorded for the driver over the time period for which this file is generated d) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the ELD Event Annotation or Comments has a variable number of rows depending on the number of ELD events recorded for the driver over the time period for which the file is generated. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.6-1	22.	**Requirement: The ELD Event List for Driver's Certification of Own Records must list ELD event records with event type 4 (driver's certification of own records as described in Appendix B, section 4.5.1.4) for the inspected driver for time period for which this file is generated, It must be rank ordered with the most current record on top.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD Event List c) Confirm that the ELD Event List of Driver's Certifications of Own Records lists driver's certification of own records as event type 4 d) Confirm that events are rank ordered with the most current record on top e) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the ELD Event List for Driver's Certification of Own Records lists driver's certification of own records as event type 4. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.6-2	23.	**Requirement: This segment has a variable number of rows depending on the number of certification and re-certification actions the authenticated driver may have executed on the ELD over the time period for which this file is generated. (See Appendix B, section 4.8.2.1.6 for details)** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD Event List c) Confirm that the ELD Event List of Driver's Certifications of Own Records' number of rows depends on the number of certification and re-certification actions the authenticated driver may have executed on the ELD over the time period of the file d) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the ELD Event List for Driver's Certification of Own Records' number of rows depends on the number of certification and re-certification actions the authenticated driver may have executed on the ELD over the time period of the file. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.7-1	24.	**Requirement: The Malfunction and Diagnostic Event Records must list all ELD malfunctions that have occurred on this ELD during the time period for which this file is generated.** Precondition: • ELD malfunctions much have occurred on this ELD during the time period for which the file is generated Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD Malfunction and Diagnostic Events Records c) Confirm that the Malfunction and Diagnostic Event Records lists all ELD malfunctions that have occurred on the ELD during the time frame the file is generated d) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the Malfunction and Diagnostic Event Records lists all ELD malfunctions that have occurred on the ELD during the time frame the file is generated. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.7-2	25.	**Requirement: The Malfunction and Diagnostic Event Records must list diagnostic event records related to the driver being inspected, rank ordered with the most current record on top.** Precondition: • Diagnostic event records related to the driver must exist within the ELD Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD Malfunction and Diagnostic Events Records c) Confirm that the Malfunction and Diagnostic Event Records diagnostic event records to the driver being inspected ordered with the most current record on top d) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the Malfunction and Diagnostic Event Records lists diagnostic event records to the driver being inspected ordered with the most current record on top. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.7-3	26.	**Requirement: This segment has a variable number of rows depending on the number of ELD malfunctions and ELD diagnostic event records recorded and relevant to the inspected driver over the time period for which this file is generated. (See Appendix B, section 4.8.2.1.7 for details)** Precondition: • There should be at least one ELD malfunction and diagnostic event recorded within the ELD Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD Malfunction and Diagnostic Events Records c) Confirm that the number of rows displayed in the Malfunction and Diagnostic Event Records depends on ELD malfunctions and ELD diagnostic event records recorded and relevant to the inspected driver during the time frame for which the file is generated d) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the number of rows displayed in the Malfunction and Diagnostic Event Records depends on ELD malfunctions and ELD diagnostic event records recorded and relevant to the inspected driver during the time frame for which the file is generated. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.8-1	27.	**Requirement: The ELD Login/Logout Report must list the login and logout activity on the ELD (ELD events with event type 5 (A driver's login/logout activity)) for the inspected driver for the time period for which this file is generated.** Precondition: • Login and logout activity must exist within the ELD Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD Login/Logout Report c) Confirm that the ELD Login/Logout Report lists a driver's login/logout activity as event type 5 d) Confirm that events are rank ordered with the most recent activity on top e) Logout	Expected Test Step Outcome: Test 1: User was able to confirm that the ELD Login/Logout Report lists a driver's login/logout activity for the inspected driver as ELD event type 5. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.8.2.1.8-2	28.	**Requirement: The login/logout activity logs must be rank ordered with the most recent activity on top. (See Appendix B, section 4.8.2.1.8 for details)** Description of Test Step: Previously tested in 4.8.2.1.8-1.	Expected Test Step Outcome: Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.9-1	29.	**Requirement: CMV's Engine Power Up and Shut Down Activity must list the logs created when CMV's engine is powered up and shut down (ELD events with event type 6 (CMV's engine power up/shut down)) for the time period for which this file is generated.** Precondition: • CMV engine power up/shut down activity logs must exist within the ELD Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the CMV's Engine Power Up and Shutdown records c) Confirm that the CMV's Engine Power-Up and Shut down Activity lists CMV engine power up and shut down logs as ELD event type 6 d) Confirm that the logs are rank ordered with the latest activity on top e) Logout	Expected Test Step Outcome: Test 1: User was able to confirm that the CMV's Engine Power Up and Shut Down Activity logs CMV's engine power up/shut down activity as ELD event type 6 and the logs are ranked in in order of latest on top. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.8.2.1.9-2	30.	**Requirement: The power up/shutdown logs must be rank ordered with the latest activity on top. (See Appendix B, section 4.8.2.1.9 for details)** Description of Test Step: Previously tested in 4.8.2.1.9-1.	Expected Test Step Outcome: Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.10-1	31.	**Requirement: The ELD Event Log List for the Unidentified Driver Profile must list the ELD event records for the Unidentified Driver profile, rank ordered with most current log on top in accordance with the date and time fields of the logs.** Precondition: • Unidentified driver records must exist within the ELD Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD Event Log List c) Confirm that the ELD Event Log List for the Unidentified Driver Profile must list the ELD event records for the Unidentified Driver profile d) Confirm that the logs are rank ordered with the most current log on top in accordance with the date and time fields of the logs e) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the ELD Event Log List for the Unidentified Driver Profile must list the ELD event records for the Unidentified Driver profile and the logs are rank ordered with the most current log on top. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.1.10-2	32.	**Requirement: This segment has a variable number of rows depending on the number of Unidentified Driver ELD records recorded over the time period for which this file is generated. (See Appendix B, section 4.8.2.1.10 for details)** Precondition: • Unidentified driver records must exist within the ELD Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file of the ELD Event Log List c) Confirm that the ELD Event Log List for the Unidentified Driver Profile has a variable number of rows depending on the number of unidentified driver ELD records that have been recorded over the time period the file is generated d) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that the ELD Event Log List for the Unidentified Driver Profile has a variable number of rows depending on the number of unidentified driver ELD records that have been recorded over the time period the file is generated. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.8.2.2-1	33.	**Requirement: If the ELD output is saved in a file for transfer or maintenance purposes, it must follow the twenty-five character-long filename standard below: (See Appendix B, section 4.8.2.2 for details)** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Generate an output file for transfer or maintenance purposes c) Confirm that if an ELD output is saved in a file for transfer or maintenance purposes, it follows the twenty-five character naming convention standard below: d) The first five position characters of the filename must correspond to the first five letters of the last name of the driver for whom the file is compiled. If the last name of the driver is shorter than 5 characters, remaining positions must use the character "_" [underscore] as a substitute character. For example, if the last name of the driver is "Lee", the first five characters of the output file must feature "Lee_ _" e) The sixth and seventh position characters of the filename must correspond to the last two digits of the driver's license number for the driver for whom the file is compiled f) The eighth and ninth position characters of the filename must correspond to the sum of all individual numeric digits in the driver's license number for the driver for whom the file is compiled. The result must be represented in two-digit format. If the sum value exceeds 99, use the last two digits of the result. For example, if the result equals "113", use "13". If the result is less than 10, use 0 as the first digit. For example, if the result equals "5", use "05" g) The tenth through fifteenth position characters of the filename must correspond to the date the file is created. The result must be represented in six digit format "MMDDYY" where "MM" represent the month, ""DD" represent the day and "YY" represent the last two digits of the year. For example, February 5, 2013 must be represented as "020513" h) The sixteenth position character of the filename must be a hyphen "-" i) The seventeenth through twenty-fifth position characters of the filename must, by default, be "000000000" but each of these nine digits can be freely configured by the motor carrier or the ELD provider to be a number between 0 and 9 or a character between A and Z to be able to produce distinct files—if or when necessary—that may otherwise be identical in filename as per the convention proposed in this section. ELD providers or motor carriers do not need to disclose details of conventions they may use for configuring the seventeenth through twenty-fifth digits of the filename j) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that if an ELD output is saved in a file for transfer or maintenance purposes, it followed the twenty-five character filename standard. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.7.1-1	34.	**Requirement: If a driver selects the sleeper-berth state for the driver's record of duty status, and no co-driver has logged into the ELD as on-duty driving, and if the ELD outputs audible signals, the ELD must allow the driver to mute the ELD's volume or turn off the ELD's audible output or automatically mute the ELD's volume or turn off the ELD's audible output.** Precondition: • No co-driver may be logged into the ELD as on-duty driving • The ELD must output audible signals Description of Test Step: Test 1: a) Login to the application with a valid user account b) Click Dashboard c) Select the Sleeper Berth option d) Confirm that user can use the physical volume buttons present on the ELD to mute the ELD's volume or turn off the ELD's audible output or automatically mute e) Logout	Expected Test Step Outcome: Test 1: The user was able to confirm that he/she can mute the ELD's volume or turn off the ELD's audible output after selecting the sleeper berth state for the driver's RODS. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.7.2-1	35.	**Requirement: An ELD must provide a mechanism for a driver to obtain a copy of the driver's own ELD records on demand, in either an electronic or printout format compliant with inspection standards outlined in Appendix B, section 4.8.2.1.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to the driver's hours of service records c) Verify the records show the total hours of service for the current driver d) Verify a mechanism is in place for the driver to obtain a copy of the records through printout or electronic means e) Make a copy of the driver's hours of service records f) Logout	Expected Test Step Outcome: Test 1: User successfully navigated to the driver's hours of service records. The correct total hours of service were listed in the records. An electronic or printable mechanism was in place to make a copy of the records. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.7.2-2	36.	**Requirement: The process must not require a driver to go through the motor carrier to obtain copies of the driver's own ELD records if driver's records reside on or are accessible directly by the ELD unit used by the driver.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to the driver's hours of service records c) Verify the records show the total hours of service for the current driver d) Verify a mechanism is in place for the driver to obtain a copy of the records through printout or electronic means e) Make a copy of the driver's hours of service records f) Verify that the process didn't have to go through the motor carrier and can be done directly with the driver and an ELD g) Logout	Expected Test Step Outcome: Test 1: User successfully navigated to the driver's hours of service records. The correct total hours of service were listed in the records. An electronic or printable mechanism was in place to make a copy of the records. The motor carrier was not needed for this exchange, only the driver and the ELD. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.7.2-3	37.	**Requirement: If an ELD meets the requirements of this section by making data files available to the driver, it must also provide a utility function for the driver to display the data on a computer, at a minimum, as specified in § 395.8(g).** Precondition: • Before starting the test, verify the 4.7.2-1 and 4.7.2-2 requirements were completed first Description of Test Step: Test 1: a) Login to the application with a valid user account b) Access the hours of service copy from 4.7.2-1 (if inaccessible, generate a new copy) c) Have the driver display the current hours of service data on a computer d) Logout	Expected Test Step Outcome: Test 1: User successfully navigated to the driver's hours of service records. The driver was able to use the copy of hours of service from a previous test and display that data on a computer. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.7.3-2	38.	**Requirement: When a driver indicates that the driver is temporarily using the CMV for an authorized personal purpose, a subset of the recorded elements must either be omitted in the records or recorded at a lower precision level, as described in further detail below. The driver indicates this intent by setting driver's duty status to off-duty as described in Appendix B, section 4.3.2.2.1 and indicating authorized personal use of CMV as described in Appendix B, section 4.3.2.2.2.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Have the driver place the duty status to off duty and authorized personal use of CMV on the ELD c) Navigate to the ELD records d) Verify the ELD recorded all the duty status change events e) Verify the authorized personal use of the CMV event was recorded at a lower precision level f) Logout	Expected Test Step Outcome: Test 1: User successfully placed the duty status to off duty authorized personal use of the CMV. The user navigated to the driver's records and verified the duty status event was recorded and at a lower precision level. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.7.3-3	39.	**Requirement: During a period when a driver indicates authorized personal use of CMV, the ELD must record all new ELD events with latitude/longitude coordinates information rounded to a single decimal place resolution** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Have the driver place the duty status to off duty and authorized personal use of CMV on the ELD c) During the time the duty status is active, create new ELD events that would be recorded (driving, engine power up/shut down, login/logout, malfunction) d) Navigate to the ELD records e) Verify the ELD recorded all the new events while in the authorized personal use of CMV duty status f) Verify the recorded events had latitude/longitude coordinates information rounded to a single decimal place g) Logout	Expected Test Step Outcome: Test 1: User successfully placed the duty status to off duty authorized personal use of the CMV. The user created new ELD events during the duty status use and the new events were recorded latitude/longitude information down to a single decimal place. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.7.3-4	40.	**Requirement: During a period when a driver indicates authorized personal use of CMV, the ELD must omit recording vehicle miles and engine hours fields in new ELD logs by leaving them blank, except for events corresponding to a CMV's engine power-up and shut-down activity as described in Appendix B, section 4.5.1.6.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Have the driver place the duty status to off duty and authorized personal use of CMV on the ELD c) During the time the duty status is active, create new ELD events that would be recorded (driving, engine power up/shut down, login/logout, malfunction) d) Navigate to the ELD records e) Verify the ELD recorded all the new events while in the authorized personal use of CMV duty status f) Verify the recorded events omitted the vehicle miles and engine hours (except for engine power up and shutdown) g) Logout	Expected Test Step Outcome: Test 1: User successfully placed the duty status to off duty authorized personal use of the CMV. The user created new ELD events during the duty status use and the new events omitted the vehicle miles and engine hours (except for engine power up and shutdown). User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.7.3-5	41.	**Requirement: A driver's indication that the CMV is being operated for authorized personal purposes may span more than one CMV ignition on cycle if the driver proactively confirms continuation of the personal use condition prior to placing the vehicle in motion when the ELD prompts the driver at the beginning of the new ignition power on cycle.** Precondition: • Vehicle interface is needed for this requirement Description of Test Step: Test 1: a) Login to the application with a valid user account b) Have the driver place the duty status to off duty and authorized personal use of CMV on the ELD c) Power on the CMV's engine d) At the ELD prompt, select to continue the duty status use of authorized personal use of the CMV e) Power off the CMV's engine f) Power on the CMV's engine g) Verify the duty status remains in the authorized personal use of the CMV h) Power off the CMV's engine i) Logout	Expected Test Step Outcome: Test 1: User successfully placed the duty status to off duty and authorized personal use of the CMV. The user powered on the CMV's engine and selected to continue the duty status use. Following an engine power cycle, the duty status remained in the authorized personal use of the CMV. The vehicle wasn't in motion for the duration of this test. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
Test Step Note	N/A			
Test Step Note	N/A			
Test Step Note	N/A			

3.2 ELD Test Procedures- Data Transfer

An ELD must be able to capture ELD records of a driver and present such data in a standard electronic format file or series of such that will be tested below. This data file is expected to be transferable, by one of three required transfer mechanisms, to an authorized safety official, on demand, for inspection purposes such as roadside safety inspections. The following procedures validate the ability of the ELD to provide required data transfer.

Test Procedure Number	**ELD-3.2**					
Functional Area/Test Procedure Name	**ELD-Data Transfer**					
Date Test Initiated						
Description of Test Configuration						
Test Engineer (s)						
Overview/Description	☐	**First Test Cycle**	☐	**Stand-alone Test**	☐	**System Test**
	☐	**Second Test Cycle**	☐	**Acceptance Test**	☐	**Regression Testing**

Date Test Completed:	**Signatures:**	**Test Engineer: _____** **Test Lead: _____** **Quality Assurance: _____** **Customer: _____** **Customer: _____**
Time Test Began: **Time Test Ended:**		

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.9.1-1	1.	**Requirement: On demand during a roadside safety inspection, an ELD must produce a driver's record of duty status for the current 24-hour period and the previous 7 consecutive days in electronic format, in the standard data format described in Appendix B, section 4.8.2.1.** Precondition: • ELD has to have 7 consecutive days of duty status records Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to the driver's duty status records c) Verify the records show the current 24-hour period and the previous 7 consecutive days d) Verify records are in the correct standard electronic format e) Logout	Expected Test Step Outcome: Test 1: User successfully navigated to the driver's duty status records. The records showed the current 24 hour period and the previous 7 consecutive days. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.9.1-2	2.	**Requirement: When a driver uses the single-step driver interface, as described in Appendix B, section 4.3.2.4, to indicate for the ELD to compile and transfer driver's ELD records to authorized safety officials, the ELD must transfer the generated ELD data output to the computing environment used by authorized safety officials via the standards referenced in this section.** Precondition: • The supported single-step data transfer initiation mechanism (such as a switch or an icon on a touch-screen display) must be clearly marked and visible to the driver when the vehicle is stopped. Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to the driver's duty status records c) Have the user use the single step driver interface to compile and transfer the records d) Verify the single step driver interface compiled and transferred the data records e) Logout	Expected Test Step Outcome: Test 1: The user successfully navigated to the driver's records. The single step driver interface successfully compiled and transferred the records. The user successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.9.1-3	3.	**Requirement: An ELD must support one of the two options for roadside data transfer in paragraph (b) of this section, and must certify proper operation of each element under that option. (See Appendix B, section 4.9.1 for details)** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to the driver's duty status records c) Option 1— verify the Telematics transfer methods. Transfer the electronic data using both: d) Wireless Web services e) Email f) Attempt to transfer data using the web services and email mechanisms g) Option 2— verify the local transfer methods. Transfer the electronic data using both: h) USB 2.0 i) Bluetooth j) Attempt to transfer data using the USB 2.0 and Bluetooth mechanisms k) Logout	Expected Test Step Outcome: Test 1: User successfully navigated to the driver's records. Verify that 1 of the 2 data transfer mechanism options were successful (Option 1 were Web services and Email, Option 2 were USB 2.0 and Bluetooth). User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.9.2-1	4.	**Requirement: An ELD must be capable of maintaining and retaining copies of electronic ELD records for a period of at least 6 months from the date of receipt.** Precondition: • ELD records should exist for a period of at least 6 months from the day of receipt Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to the driver's duty status records c) Verify there are copies of driver's records out to 6 months from the original record date d) Logout	Expected Test Step Outcome: Test 1: User successfully navigated to the driver's records. The records went out at least 6 months from the original date. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.9.2-2	5.	**Requirement: An ELD must produce, on demand, a data file or a series of data files of ELD records for a subset of its drivers.** Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account b) Navigate to the ELD's records c) Verify the ELD can produce, on demand, a data file or a series of data files of ELD records for a subset of its drivers d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD records and verified the ELD displayed the files of multiple drivers that have logged into that specific ELD. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.9.2-3	6.	**Requirement: An ELD must produce, on demand, a data file or a series of data files of ELD records for a subset of its vehicles.** Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account b) Navigate to the ELD's records c) Verify the ELD can produce, on demand, a data file or a series of data files of ELD records for a subset of its vehicles d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD records and verified the ELD displayed the files of multiple vehicles that the ELD has connected to. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.9.2-4	7.	**Requirement: An ELD must produce, on demand, a data file or a series of data files of ELD records for subset of the 6-month record retention period, to be specified by an authorized safety official, in an electronic format standard described in Appendix B, section 4.8.2.1 or, if the motor carrier has multiple offices or terminals, within the time permitted under § 390.29.** Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account b) Navigate to the driver records c) Verify the ELD can produce, on demand, a data file or a series of data files of ELD records for a subset of the 6 month record retention period as specified by an authorized safety official, in an electronic format standard. d) Verify if the motor carrier has multiple offices or terminals, the ELD can produce, on demand, a data file or a series of data files of ELD records for a subset of the 6 month record retention period as specified by an authorized safety official, within the time permitted under **§** 390.29 e) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the ELD records and verified the ELD displayed the files of multiple drivers out to 6 months from the original date. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.9.2-5	8.	**Requirement: At a minimum, an ELD must be able to transfer the ELD records electronically by one of the following transfer mechanisms: Web Services as specified in section 4.10.1.1 of this appendix (but not necessarily wirelessly), E-mail as specified 4.10.1.2 (but not necessarily wirelessly) or USB 2.0 as specified in section 4.10.1.3 of this appendix and Bluetooth, as specified in section 4.10.1.4** Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account b) Navigate to the driver records c) Attempt to transfer files by Web services (not necessarily wirelessly) d) Attempt to transfer files by Email (not necessarily wirelessly) e) If not using the first 2 options, then attempt the next 2 transfer options f) Attempt to transfer files by USB 2.0 g) Attempt to transfer files by Bluetooth h) Verify that at least one pair of the transfer mechanisms were operational i) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and navigated to the record files. User successfully transferred files by ways of web services and email or by ways of USB 2.0 and Bluetooth. User successfully logged off. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.10.1.1-2	9.	**Requirement: Transfer of ELD data to FMCSA via Web Services must follow the following standards: Web Services Description Language (WSDL) (See Appendix B, section 4.10.1.1 for details) 1.1 (incorporated by reference, see §395.38), reference (1)(a) in section 6 Appendix C.** Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account b) Attempt to transfer ELD via Web Services with the Web Services Description Language (WSDL) standard c) Verify transfer via WSDL was successful d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and transferred ELD files via WSDL standard. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.10.1.1-3	10.	**Requirement: Transfer of ELD data to FMCSA via Web Services must follow the following standards: Simple Object Access Protocol (SOAP) (See Appendix B, section 4.10.1.1 for details) 1.2 (incorporated by reference, see §395.38),reference (1)(b) in section 6 of Appendix C** Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account b) Attempt to transfer ELD via Web Services with the Simple Object Access Protocol (SOAP) standard c) Verify transfer via SOAP was successful d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and transferred ELD files via SOAP standard. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.10.1.1-4	11.	**Requirement: Transfer of ELD data to FMCSA via Web Services must follow the following standards: Extensible Markup Language (XML) (See Appendix B, section 4.10.1.1 for details) 1.0 5th Edition (incorporated by reference, see §395.38), reference (1)(c) in section 6 of Appendix C.** Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account b) Attempt to transfer ELD via Web Services with the Extensible Markup Language (XML) standard c) Verify transfer via XML was successful d) Logout	Expected Test Step Outcome: Test 1: User successfully logged in and transferred ELD files via XML standard. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.10.1.1-5	12.	**Requirement: ELD data transmission from the ELD to the ELD support system must be accomplished in a way that protects the privacy of the driver(s).** Description of Test Step: Need to determine what levels of privacy need to be protected.	Expected Test Step Outcome: Demonstrated that the ELD does protect the privacy of the driver(s). Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.10.1.1-6	13.	**Requirement: At roadside if both the vehicle operator and law enforcement have an available data connection, the vehicle operator will initiate the transfer of ELD data to an authorized safety official. (See Appendix B, section 4.10.1.1 for details)** Precondition: • At roadside, both the vehicle operator and the law enforcement should have an available data connection Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account b) Confirm that user is able to initiate the transfer of ELD data to an authorized safety official c) Logout	Expected Test Step Outcome: Test 1: User was able to initiate the transfer of ELD data to authorized safety official at roadside if he/she and the law enforcement both have an available data connection. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.10.1.2-1	14.	**Requirement: ELD must attach a file to an e-mail message to be sent using RFC 5321 Simple Mail Transfer Protocol (SMTP) (incorporated by reference, see § 395.38), reference (7) (b) in section 6 of Appendix C, to a specific e-mail address, which will be shared with the ELD providers during the technology registration process.** Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account b) Confirm that the ELD can attach a file to an email to be sent using SMTP c) Verify that user is able to send email to a specific email address which will be shared with the ELD providers during the technology registration process d) Logout	Expected Test Step Outcome: Test 1: User was able to confirm that the ELD can attach a file to an email to be sent using SMTP and the user should be able to send email to a specific email address which will be shared with the ELD providers during the technology registration process. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.10.1.2-2	15.	**Requirement: The file must have the format described in section 4.8.2.1 of this appendix and must be encrypted using the Secure/Multipurpose Internet Mail Extensions as described in RFC 5751 (incorporated by reference, see § 395.38), and the RSA algorithm as described in RFC 4056 (incorporated by reference, see § 395.38), with the FMCSA public key compliant with NIST SP 800-32 (incorporated by reference, see § 395.38) to be provided to the ELD provider at the time of registration. The content must be encrypted using AES in FIPS Publication 197 (incorporated by reference, see § 395.38), and RFC 3565 (incorporated by reference, see § 395.38).** Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account **b)** Verify that file is encrypted using Secure/Multipurpose Internet Mail Extensions and the RSA algorithm **c)** Verify the file is encrypted with the FMCSA public key compliant with NIST SP 800-32 d) Verify the content is encrypted using AES in FIPS Publication 197 and RFC 3565 e) Logout	Expected Test Step Outcome: Test 1: User was able to confirm that the file has the expected format as described in section 4.8.2.1 and was encrypted with Secure/Multipurpose Internet Mail Extensions and the RSA algorithm. The content was encrypted using AES-256 in FIPS publication 197 and RFC 3565. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.10.1.2-3	16.	**Requirement: The e-mail must be formatted using the RFC 5322 Internet Message Format (incorporated by reference, see § 395.38), reference (7)(c) in section 6 Appendix C, as follows: (See Appendix B, section 4.10.1.3 for details). A message confirming receipt of the ELD file will be sent to the address specified in the e-mail. The filename must follow the convention specified in Appendix B, section 4.8.2.2.** Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account b) Confirm that the e-mail is formatted using the RFC 5322 Internet Message Format c) Verify that a message confirming receipt of the ELD file was sent to the address specified in the e-mail d) Ensure that the filename follows the twenty five character length naming convention specified in 4.8.2.2-1 e) Logout	Expected Test Step Outcome: Test 1: User was able to confirm that the email being sent is formatted using the RFC 5322 Internet Message Format and there is a confirmation message sent to the receiver of the email. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.10.1.3-1	17.	**Requirement: ELDs certified for USB data transfer mechanism must be capable of transferring ELD records using the Universal Serial Bus Specification (Revision 2.0)(incorporated by reference, see § 395.38), reference (2)(a) in section 6 of Appendix C.** Precondition: • Driver must have had opportunity to enter a comment within the file Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account b) Navigate to the driver's menu and select Transfer RODS button c) Confirm that user/ELD is capable of transferring the data file to a USB memory stick using a third party transfer manager and/or USB adapter d) Logout	Expected Test Step Outcome: Test 1: User was able to confirm that the ELD is able to transfer ELD records successfully through USB port. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.10.1.3-2	18.	**Requirement: Each ELD technology must implement a single USB-compliant interface with the necessary adaptors for a Type A connector. The USB interface must implement the Mass Storage class (08h) for driverless operation, to comply with IEEE standard 1667-2009, (incorporated by reference, see § 395.38), reference (4)(a) in section 6 of Appendix C.** Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account b) Navigate to the driver's menu and select Transfer RODS button c) Confirm that the ELD equipped with necessary adaptors for a Type A connector d) Verify that the USB interface implements the Mass Storage class (08h) for driverless operation e) Logout	Expected Test Step Outcome: Test 1: User was able to confirm that the ELD is equipped with the necessary adaptors for a Type A connector and the USB interface implements the Mass Storage class for driverless operation. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.10.1.3-3	19.	**Requirement: ELD must be capable of providing power to a standard USB-compatible drive.** Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account b) Confirm that the ELD is capable of providing power to a standard USB-compatible drive c) Logout	Expected Test Step Outcome: Test 1: User was able to confirm that the ELD is capable of providing power to a standard USB compatible drive. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.10.1.3-4	20.	**Requirement: An ELD must re-authenticate the driver prior to saving the driver's ELD file to an external device.** Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account b) Navigate to the Driver's menu and select Transfer RODS button c) Attempt to save an ELD file to an external device. d) Confirm that the ELD prompts to re-authenticate the driver prior to allowing user to save the ELD file e) Logout	Expected Test Step Outcome: Test 1: User was able to confirm that the ELD re-authenticates the driver prior to saving the driver's ELD file to an external device. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.10.1.3-5	21.	**Requirement: On initiation by an authenticated driver, an ELD must be capable of saving ELD file(s) to USB-compatible drives (AES, in FIPS Publication 197, incorporated by reference, see § 395.38) that are provided by authorized safety officials during an inspection.** Precondition: • USB compatible drives should be provided by authorized safety officials • An ELD provider developing an ELD technology must register online at a secure FMCSA website Description of Test Step: Test 1: a) Login to the application with a valid user account b) Navigate to driver's menu and select Transfer RODS button c) Verify that the ELD is capable of reading a text file from an authorized safety officials' drive d) Confirm that the ELD is able to verify the text file against a file provided to registered ELD providers e) Ensure that the ELD is capable of saving ELD file(s) to USB compatible drives that are provided by authorized safety officials during an inspection f) Logout	Expected Test Step Outcome: Test 1: User was able to confirm that the ELD is capable of reading a text file from an authorized safety officials' drive and verifying it against a file provided to ELD providers who have registered their technologies and subsequently confirm that the ELD is capable of saving an ELD file to USB compatible drives that are provided by authorized safety officials during an inspection. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.10.1.3-6	22.	**Requirement: Prior to initiating this action, ELDs must be capable of reading a text file from an authorized safety officials' drive and verifying it against a file provided to ELD providers who have registered their technologies as described in section 5.1.** Description of Test Step: Previously tested in 4.10.2.1-5	Expected Test Step Outcome: Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.10.1.4-1	23.	**Requirement: Bluetooth SIG Specification of the Bluetooth System covering core package version 2.1 + EDR or higher (incorporated by reference, see § 395.38), reference (8) (a) in section 6 of Appendix C, must be followed. ELDs using this standard must be capable of displaying a Personal Identification Number generated by the Bluetooth application profile for bonding with other devices.** Precondition: • ELD must use Bluetooth SIG specification standard of the Bluetooth system Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account b) Confirm that the ELD is capable of displaying a Personal Identification Number (generated by the Bluetooth application profile) for bonding with other devices c) Logout	Expected Test Step Outcome: Test 1: User was able to confirm that the ELD is capable of displaying a Personal Identification Number generated by the Bluetooth application profile for bonding with other devices. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.10.1.4-2	24.	**Requirement: Upon request of an authorized official, the ELD must become discoverable by the authorized safety officials' Bluetooth-enabled computing platform, and generate a random code, which the driver must share with the official.** Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account b) Confirm that the User is able to make the ELD discoverable by the authorized safety officials' Bluetooth enabled computing platform c) Verify that the ELD generates a random code that can be shared with the official d) Logout	Expected Test Step Outcome: Test 1: User was able to make the ELD discoverable by the authorized safety officials' Bluetooth enabled computing platform and generate a random code. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
ELD-FUNC-4.10.1.4-3	25.	**Requirement: The ELD must connect to the roadside authorized safety officials' technology via wireless personal area network and transmit the required data via Web Services as described in Appendix B, section 4.10.1.1.** Description of Test Step: Test 1: a) Login to the application using a motor carrier's user account b) Confirm that the ELD can connect to the roadside authorized safety officials' technology via wireless personal area network c) Verify that the ELD can transmit the required data via Web Services as described in section 4.10.1.1 of this appendix d) Logout	Expected Test Step Outcome: Test 1: The ELD must connect to the roadside authorized safety officials' technology via wireless personal area network. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____

Requirement No.	Test Step No.	Requirement Description of Test Step	Expected Test Step Outcome Actual Test Step Outcome	Pass (P), Fail(F)
ELD-FUNC-4.10.2-1	26.	**Requirement: Regardless of the roadside transmission option supported by an ELD, ELD records are maintained and retained must be able to transmit enforcement-specified historical data for their drivers using one of the methods specified under section Appendix B, section 4.9.2.** Description of Test Step: Test 1: a) Login to the application with a valid user account b) Click the Transfer RODS button c) Confirm that regardless of the roadside transmission option supported by the ELD, the support systems of the motor carrier that maintain and retain electronic ELD records, are able to transmit enforcement-specified historical data for their drivers using one of the following methods: a) Web Services b) USB 2.0 c) Email d) Bluetooth d) Logout	Expected Test Step Outcome: Test 1: User was able to confirm the support systems of the motor carrier were able to transmit web services, USB 2.0, email, or Bluetooth. User successfully logged out. Actual Test Step Outcome:	Time Start: _____ Time Stop: _____ Test Result: ____
Test Step Note	N/A			
Test Step Note	N/A			
Test Step Note	N/A			