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(2) For steering wheel diameters not listed in paragraph (b)(1) of this section the steering wheel lash shall not exceed 14 degrees angular rotation for manual steering systems, and 30 degrees angular rotation for power steering systems.

(c) *Steering column.* The steering column must be securely fastened.

(d) *Steering system.* Universal joints and ball-and-socket joints shall not be worn, faulty or repaired by welding. The steering gear box shall not have loose or missing mounting bolts or cracks in the gear box or mounting brackets. The pitman arm on the steering gear output shaft shall not be loose. Steering wheels shall turn freely through the limit of travel in both directions.

(e) *Power steering systems.* All components of the power system must be in operating condition. No parts shall be loose or broken. Belts shall not be frayed, cracked or slipping. The system shall not leak. The power steering system shall have sufficient fluid in the reservoir.

[53 FR 49402, Dec. 7, 1988, as amended at 70 FR 48055, Aug. 15, 2005]

PART 394 [RESERVED]

PART 395—HOURS OF SERVICE OF DRIVERS

Subpart A—General

Sec.

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

AUTHORITY: 49 U.S.C. 504, 21104(e), 31133, 31136, 31137, 31502; sec. 113, Pub. L. 103–311, 108 Stat. 1673, 1676; sec. 229, Pub. L. 106–159 (as added and transferred by sec. 4115 and amended by secs. 4130–4132, Pub. L. 109–59, 119 Stat. 1144, 1726, 1743, 1744), 113 Stat. 1748, 1773; sec. 4133, Pub. L. 109–59, 119 Stat. 1144, 1744; sec. 32934, Pub. L. 112–141, 126 Stat. 405, 830; sec. 5206(b), Pub. L. 114–94, 129 Stat. 1312, 1537; and 49 CFR 1.87.

SOURCE: 33 FR 19758, Dec. 25, 1968, unless otherwise noted.

EDITORIAL NOTE: Nomenclature changes to part 395 appear at 66 FR 49874, Oct. 1, 2001.

Subpart A—General

§ 395.1 Scope of rules in this part.

(a) *General.* (1) The rules in this part apply to all motor carriers and drivers, except as provided in paragraphs (b) through (x) of this section.

(2) The exceptions from Federal requirements contained in paragraphs (l) and (m) of this section do not preempt State laws and regulations governing the safe operation of commercial motor vehicles.

(b) *Driving conditions*—(1) *Adverse driving conditions.* Except as provided in paragraph (h)(3) of this section, a driver who encounters adverse driving conditions, as defined in §395.2, and cannot, because of those conditions, safely complete the run within the maximum driving time or duty time during which driving is permitted under §395.3(a) or §395.5(a) may drive and be permitted or required to drive a commercial motor vehicle for not more than two additional hours beyond the maximum allowable hours permitted under §395.3(a) or §395.5(a) to complete that run or to reach a place offering safety for the occupants of the commercial motor vehicle and security for the commercial motor vehicle and its cargo.

(2) *Emergency conditions.* In case of any emergency, a driver may complete his/her run without being in violation of the provisions of the regulations in this part, if such run reasonably could have been completed absent the emergency.

(c) *Driver-salesperson.* The provisions of §395.3(b) shall not apply to any driver-salesperson whose total driving time does not exceed 40 hours in any period of 7 consecutive days.

(d) *Oilfield operations.* (1) In the instance of drivers of commercial motor vehicles used exclusively in the transportation of oilfield equipment, including the stringing and picking up of pipe used in pipelines, and servicing of the field operations of the natural gas and oil industry, any period of 8 consecutive days may end with the beginning of any off-duty period of 24 or more successive hours.

(2) In the case of specially trained drivers of commercial motor vehicles that are specially constructed to service oil wells, on-duty time shall not include waiting time at a natural gas or oil well site. Such waiting time shall be recorded as ''off duty'' for purposes of §395.8, with remarks or annotations to indicate the specific off-duty periods that are waiting time, or on a separate ''waiting time'' line on the record of duty status to show that off-duty time is also waiting time. Waiting time shall not be included in calculating the 14-hour period in §395.3(a)(2). Specially trained drivers of such commercial motor vehicles are not eligible to use the provisions of paragraph (e)(1) of this section.

(e) *Short-haul operations*—(1) *150 air-mile radius driver.* A driver is exempt from the requirements of §§395.8 and 395.11 if:

(i) The driver operates within a 150 air-mile radius (172.6 statute miles) of the normal work reporting location;

(ii) The driver, except a driver-salesperson, returns to the work reporting location and is released from work within 14 consecutive hours;

(iii)(A) A property-carrying commercial motor vehicle driver has at least 10 consecutive hours off-duty separating each 14 hours on-duty;

(B) A passenger-carrying commercial motor vehicle driver has at least 8 consecutive hours off-duty separating each 14 hours on-duty; and

(iv) The motor carrier that employs the driver maintains and retains for a period of 6 months accurate and true time records showing:

(A) The time the driver reports for duty each day;

(B) The total number of hours the driver is on-duty each day;

(C) The time the driver is released from duty each day; and

(D) The total time for the preceding 7 days in accordance with §395.8(j)(2) for drivers used for the first time or intermittently.

(2) *Operators of property-carrying commercial motor vehicles not requiring a commercial driver's license.* Except as provided in this paragraph, a driver is exempt from the requirements of §§395.3(a)(2), 395.8, and 395.11 and ineligible to use the provisions of §395.1(e)(1), (g), and (o) if:

(i) The driver operates a property-carrying commercial motor vehicle for which a commercial driver's license is not required under part 383 of this subchapter;

(ii) The driver operates within a 150 air-mile radius of the location where the driver reports to and is released from work, *i.e.,* the normal work reporting location;

(iii) The driver returns to the normal work reporting location at the end of each duty tour;

(iv) The driver does not drive:

(A) After the 14th hour after coming on duty on 5 days of any period of 7 consecutive days; and

(B) After the 16th hour after coming on duty on 2 days of any period of 7 consecutive days;

(v) The motor carrier that employs the driver maintains and retains for a period of 6 months accurate and true time records showing:

(A) The time the driver reports for duty each day;

(B) The total number of hours the driver is on duty each day;

(C) The time the driver is released from duty each day;

(D) The total time for the preceding 7 days in accordance with §395.8(j)(2) for drivers used for the first time or intermittently.

(f) *Retail store deliveries.* The provisions of § 395.3 (a) and (b) shall not apply with respect to drivers of commercial motor vehicles engaged solely in making local deliveries from retail stores and/or retail catalog businesses to the ultimate consumer, when driving solely within a 100-air mile radius of the driver's work-reporting location, during the period from December 10 to December 25, both inclusive, of each year.

(g) *Sleeper berths*—(1) *Property-carrying commercial motor vehicle*—(i) *General.* A driver who operates a property-carrying commercial motor vehicle equipped with a sleeper berth, as defined in § 395.2, and uses the sleeper berth to obtain the off-duty time required by § 395.3(a)(1) must accumulate:

(A) At least 10 consecutive hours off-duty;

(B) At least 10 consecutive hours of sleeper berth time;

(C) A combination of consecutive sleeper berth and off-duty time amounting to at least 10 hours;

(D) A combination of sleeper berth time of at least 7 consecutive hours and up to 3 hours riding in the passenger seat of the vehicle while the vehicle is moving on the highway, either immediately before or after the sleeper berth time, amounting to at least 10 consecutive hours; or

(E) The equivalent of at least 10 consecutive hours off-duty calculated under paragraphs (g)(1)(ii) and (iii) of this section.

(ii) *Sleeper berth.* A driver may accumulate the equivalent of at least 10 consecutive hours off-duty by taking not more than two periods of either sleeper berth time or a combination of off-duty time and sleeper berth time if:

(A) Neither rest period is shorter than 2 consecutive hours;

(B) One rest period is at least 7 consecutive hours in the sleeper berth;

(C) The total of the two periods is at least 10 hours; and

(D) Driving time in the period immediately before and after each rest period, when added together:

(*1*) Does not exceed 11 hours under § 395.3(a)(3); and

(*2*) Does not violate the 14-hour duty-period limit under § 395.3(a)(2).

(iii) *Calculation*—(A) *In general.* The driving time limit and the 14-hour duty-period limit must be re-calculated from the end of the first of the two periods used to comply with paragraph (g)(1)(i)(E) of this section.

(B) *14-hour period.* The 14-hour driving window for purposes of § 395.3(a)(2) does not include qualifying rest periods under paragraph (g)(1)(ii) of this section.

(2) *Specially trained driver of a specially constructed oil well servicing commercial motor vehicle at a natural gas or oil well location.* A specially trained driver who operates a commercial motor vehicle specially constructed to service natural gas or oil wells that is equipped with a sleeper berth, as defined in §§ 395.2 and 393.76 of this subchapter, or who is off duty at a natural gas or oil well location, may accumulate the equivalent of 10 consecutive hours off duty time by taking a combination of at least 10 consecutive hours of off-duty time, sleeper-berth time, or time in other sleeping accommodations at a natural gas or oil well location; or by taking two periods of rest in a sleeper berth, or other sleeping accommodation at a natural gas or oil well location, providing:

(i) Neither rest period is shorter than 2 hours;

(ii) The driving time in the period immediately before and after each rest period, when added together, does not exceed the limit specified in § 395.3(a)(3);

(iii) The driver does not drive after the 14th hour after coming on duty following 10 hours off duty, where the 14th hour is calculated:

(A) By excluding any sleeper berth or other sleeping accommodation period of at least 2 hours which, when added to a subsequent sleeper berth or other sleeping accommodation period, totals at least 10 hours, and

(B) By including all on-duty time, all off-duty time not spent in the sleeper berth or other sleeping accommodations, all such periods of less than 2 hours, and any period not described in paragraph (g)(2)(iii)(A) of this section; and

(iv) The driver may not return to driving subject to the normal limits under § 395.3 without taking at least 10

consecutive hours off duty, at least 10 consecutive hours in the sleeper berth or other sleeping accommodations, or a combination of at least 10 consecutive hours off duty, sleeper berth time, or time in other sleeping accommodations.

(3) *Passenger-carrying commercial motor vehicles.* A driver who is driving a passenger-carrying commercial motor vehicle that is equipped with a sleeper berth, as defined in §§ 395.2 and 393.76 of this subchapter, may accumulate the equivalent of 8 consecutive hours of off-duty time by taking a combination of at least 8 consecutive hours off-duty and sleeper berth time; or by taking two periods of rest in the sleeper berth, providing:

(i) Neither rest period is shorter than two hours;

(ii) The driving time in the period immediately before and after each rest period, when added together, does not exceed 10 hours;

(iii) The on-duty time in the period immediately before and after each rest period, when added together, does not include any driving time after the 15th hour; and

(iv) The driver may not return to driving subject to the normal limits under § 395.5 without taking at least 8 consecutive hours off duty, at least 8 consecutive hours in the sleeper berth, or a combination of at least 8 consecutive hours off duty and sleeper berth time.

(h) *State of Alaska*—(1) *Property-carrying commercial motor vehicle*—(i) *In general.* The provisions of § 395.3(a) and (b) do not apply to any driver who is driving a commercial motor vehicle in the State of Alaska. A driver who is driving a property-carrying commercial motor vehicle in the State of Alaska must not drive or be required or permitted to drive:

(A) More than 15 hours following 10 consecutive hours off-duty;

(B) After being on-duty for 20 hours or more following 10 consecutive hours off-duty;

(C) After having been on-duty for 70 hours in any period of 7 consecutive days, if the motor carrier for which the driver drives does not operate every day in the week; or

(D) After having been on-duty for 80 hours in any period of 8 consecutive days, if the motor carrier for which the driver drives operates every day in the week.

(ii) *Off-duty periods.* Before driving, a driver who operates a property-carrying commercial motor vehicle equipped with a sleeper berth, as defined in § 395.2, and uses the sleeper berth to obtain the required off-duty time in the State of Alaska, must accumulate:

(A) At least 10 consecutive hours off-duty;

(B) At least 10 consecutive hours of sleeper berth time;

(C) A combination of consecutive sleeper berth and off-duty time amounting to at least 10 hours;

(D) A combination of consecutive sleeper berth time and up to 3 hours riding in the passenger seat of the vehicle while the vehicle is moving on a highway, either immediately before or after a period of at least 7, but less than 10, consecutive hours in the sleeper berth; or

(E) The equivalent of at least 10 consecutive hours off-duty calculated under paragraph (h)(1)(iii) of this section.

(iii) *Sleeper berth.* A driver who uses a sleeper berth to comply with the hours of service regulations may accumulate the equivalent of at least 10 consecutive hours off-duty by taking not more than two periods of either sleeper berth time or a combination of off-duty time and sleeper berth time if:

(A) Neither rest period is shorter than 2 consecutive hours;

(B) One rest period is at least 7 consecutive hours in the sleeper berth;

(C) The total of the two periods is at least 10 hours; and

(D) Driving time in the period immediately before and after each rest period, when added together:

(*1*) Does not exceed 15 hours; and

(*2*) Does not violate the 20-hour duty period under paragraph (h)(1)(i)(B) of this section.

(iv) *Calculation*—(A) *In general.* The driving time limit and the 20-hour duty-period limit must be re-calculated from the end of the first of the two periods used to comply with paragraph (h)(1)(ii)(E) of this section.

(B) *20-hour period.* The 20-hour duty period under paragraph (h)(1)(i)(B) does not include off-duty or sleeper berth time.

(2) *Passenger-carrying commercial motor vehicle.* The provisions of § 395.5 do not apply to any driver who is driving a passenger-carrying commercial motor vehicle in the State of Alaska. A driver who is driving a passenger-carrying commercial motor vehicle in the State of Alaska must not drive or be required or permitted to drive—

(i) More than 15 hours following 8 consecutive hours off-duty;

(ii) After being on-duty for 20 hours or more following 8 consecutive hours off-duty;

(iii) After having been on-duty for 70 hours in any period of 7 consecutive days, if the motor carrier for which the driver drives does not operate every day in the week; or

(iv) After having been on-duty for 80 hours in any period of 8 consecutive days, if the motor carrier for which the driver drives operates every day in the week.

(3) *Adverse driving conditions.* (i) A driver who is driving a commercial motor vehicle in the State of Alaska and who encounters adverse driving conditions (as defined in § 395.2) may drive and be permitted or required to drive a commercial motor vehicle for the period of time needed to complete the run.

(ii) After a property-carrying commercial motor vehicle driver completes the run, that driver must be off-duty for at least 10 consecutive hours before he/she drives again; and

(iii) After a passenger-carrying commercial motor vehicle driver completes the run, that driver must be off-duty for at least 8 consecutive hours before he/she drives again.

(i) *State of Hawaii.* The rules in § 395.8 do not apply to a driver who drives a commercial motor vehicle in the State of Hawaii, if the motor carrier who employs the driver maintains and retains for a period of 6 months accurate and true records showing—

(1) The total number of hours the driver is on duty each day; and

(2) The time at which the driver reports for, and is released from, duty each day.

(j) *Travel time*—(1) When a property-carrying commercial motor vehicle driver at the direction of the motor carrier is traveling, but not driving or assuming any other responsibility to the carrier, such time must be counted as on-duty time unless the driver is afforded at least 10 consecutive hours off duty when arriving at destination, in which case he/she must be considered off duty for the entire period.

(2) When a passenger-carrying commercial motor vehicle driver at the direction of the motor carrier is traveling, but not driving or assuming any other responsibility to the carrier, such time must be counted as on-duty time unless the driver is afforded at least 8 consecutive hours off duty when arriving at destination, in which case he/she must be considered off duty for the entire period.

(k) *Agricultural operations.* The provisions of this part shall not apply during planting and harvesting periods, as determined by each State, to drivers transporting

(1) Agricultural commodities from the source of the agricultural commodities to a location within a 150 air-mile radius from the source;

(2) Farm supplies for agricultural purposes from a wholesale or retail distribution point of the farm supplies to a farm or other location where the farm supplies are intended to be used within a 150 air-mile radius from the distribution point;

(3) Farm supplies for agricultural purposes from a wholesale distribution point of the farm supplies to a retail distribution point of the farm supplies within a 150 air-mile radius from the wholesale distribution point; or

(4) Livestock (as defined in section 602 of the Emergency Livestock Feed Assistance Act of 1988 (7 U.S.C. 1471) including insects)) within a 150 air-mile radius from the final destination of the livestock.

(l) *Ground water well drilling operations.* In the instance of a driver of a commercial motor vehicle who is used primarily in the transportation and operations of a ground water well drilling rig, any period of 7 or 8 consecutive days may end with the beginning of any off-duty period of 24 or more successive hours.

(m) *Construction materials and equipment.* In the instance of a driver of a commercial motor vehicle who is used primarily in the transportation of construction materials and equipment, any period of 7 or 8 consecutive days may end with the beginning of any off-duty period of 24 or more successive hours.

(n) *Utility service vehicles.* The provisions of this part shall not apply to a driver of a utility service vehicle as defined in § 395.2.

(o) *Property-carrying driver.* A property-carrying driver is exempt from the requirements of § 395.3(a)(2) if:

(1) The driver has returned to the driver's normal work reporting location and the carrier released the driver from duty at that location for the previous five duty tours the driver has worked;

(2) The driver has returned to the normal work reporting location and the carrier releases the driver from duty within 16 hours after coming on duty following 10 consecutive hours off duty; and

(3) The driver has not taken this exemption within the previous 6 consecutive days, except when the driver has begun a new 7- or 8-consecutive day period with the beginning of any off-duty period of 34 or more consecutive hours as allowed by § 395.3(c).

(p) *Commercial motor vehicle transportation to or from a motion picture production site.* A driver of a commercial motor vehicle providing transportation of property or passengers to or from a theatrical or television motion picture production site is exempt from the requirements of § 395.3(a) if the driver operates within a 100 air-mile radius of the location where the driver reports to and is released from work, i.e., the normal work-reporting location. With respect to the maximum daily hours of service, such a driver may not drive—

(1) More than 10 hours following 8 consecutive hours off duty;

(2) For any period after having been on duty 15 hours following 8 consecutive hours off duty.

(3) If a driver of a commercial motor vehicle providing transportation of property or passengers to or from a theatrical or television motion picture production site operates beyond a 100 air-mile radius of the normal work-reporting location, the driver is subject to § 395.3(a), and paragraphs (p)(1) and (2) of this section do not apply.

(q) *Attendance on commercial motor vehicles containing Division 1.1, 1.2, or 1.3 explosives.* Operators who are required by 49 CFR 397.5 to be in attendance on commercial motor vehicles containing Division 1.1, 1.2, or 1.3 explosives are on duty at all times while performing attendance functions or any other work for a motor carrier. Operators of commercial motor vehicles containing Division 1.1, 1.2, or 1.3 explosives subject to the requirements for a 30-minute rest break in § 395.3(a)(3)(ii) may use 30 minutes or more of attendance time to meet the requirement for a rest break, providing they perform no other work during the break. Such drivers must record the rest break as on-duty time in their record of duty status with remarks or annotations to indicate the specific on-duty periods that are used to meet the requirement for break.

(r) *Railroad signal employees.* The provisions of this part shall not apply to a signal employee, as defined in § 395.2, who operates a commercial motor vehicle, is engaged in installing, repairing, or maintaining signal systems, is employed by a railroad carrier or a contractor or subcontractor to a railroad carrier, while regulated by the Federal Railroad Administration.

(s) *Covered farm vehicles.* The rules in this part do not apply to drivers of ''covered farm vehicles,'' as defined in 49 CFR 390.5.

(t) *Ready-mixed concrete delivery vehicle.* A driver of a ready-mixed concrete delivery vehicle subject to the requirement for a 30-minute rest break in § 395.3(a)(3)(ii) may use 30-minutes or more of time spent while waiting with the commercial motor vehicle at a job site or terminal to meet the requirement for the 30-minute rest break, providing the driver performs no other work during the break.

(u) *Transport of commercial bees.* The provisions of § 395.3(a)(3)(ii), requiring a 30-minute rest break, do not apply to a driver engaged in the interstate transportation of bees by commercial motor vehicle as long as the bees are on the vehicle.

(v) *Transport of livestock.* The provisions of § 395.3(a)(3)(ii), requiring a 30-minute rest break, do not apply to a driver engaged in the interstate transportation of livestock by commercial motor vehicle while the livestock are on the vehicle.

(w) *Hi-rail vehicles.* For the driver of a hi-rail vehicle, the maximum on duty time under § 395.3 shall not include time in transportation to or from a duty assignment if such time in transportation—

(1) Does not exceed 2 hours per calendar day or a total of 30 hours per calendar month; and

(2) Is fully and accurately accounted for in records to be maintained by the motor carrier and such records are made available upon request of the Federal Motor Carrier Safety Administration or the Federal Railroad Administration.

(x) *Pipeline welding trucks.* The rules in this part do not apply to drivers of ''pipeline welding trucks,'' as defined in 49 CFR 390.38(b).

[57 FR 33647, July 30, 1992]

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting § 395.1, see the List of CFR Sections Affected, which appears in the Finding Aids section of the printed volume and at *www.govinfo.gov.*

§ 395.2 Definitions.

As used in this part, the following words and terms are construed to mean:

Adverse driving conditions means snow, ice, sleet, fog, or other adverse weather conditions or unusual road or traffic conditions that were not known, or could not reasonably be known, to a driver immediately prior to beginning the duty day or immediately before beginning driving after a qualifying rest break or sleeper berth period, or to a motor carrier immediately prior to dispatching the driver.

Agricultural commodity means:

(1) Any agricultural commodity, non-processed food, feed, fiber, or livestock as defined in this section.

(2) As used in this definition, the term ''any agricultural commodity'' means horticultural products at risk of perishing, or degrading in quality, during transport by commercial motor vehicle, including plants, sod, flowers, shrubs, ornamentals, seedlings, live trees, and Christmas trees.

Driver-salesperson means any employee who is employed solely as such by a private carrier of property by commercial motor vehicle, who is engaged both in selling goods, services, or the use of goods, and in delivering by commercial motor vehicle the goods sold or provided or upon which the services are performed, who does so entirely within a radius of 100 miles of the point at which he/she reports for duty, who devotes not more than 50 percent of his/her hours on duty to driving time. The term *selling goods* for purposes of this section shall include in all cases solicitation or obtaining of reorders or new accounts, and may also include other selling or merchandising activities designed to retain the customer or to increase the sale of goods or services, in addition to solicitation or obtaining of reorders or new accounts.

Driving time means all time spent at the driving controls of a commercial motor vehicle in operation.

Eight consecutive days means the period of 8 consecutive days beginning on any day at the time designated by the motor carrier for a 24-hour period.

Electronic logging device (ELD) means a device or technology that automatically records a driver's driving time and facilitates the accurate recording of the driver's hours of service, and that meets the requirements of subpart B of this part.

ELD record means a record of duty status, recorded on an ELD, that reflects the data elements that an ELD must capture.

Farm supplies for agricultural purposes means products directly related to the growing or harvesting of agricultural commodities during the planting and harvesting seasons within each State, as determined by the State, and livestock feed at any time of the year.

Ground water well drilling rig means any vehicle, machine, tractor, trailer, semi-trailer, or specialized mobile equipment propelled or drawn by mechanical power and used on highways to transport water well field operating equipment, including water well drilling and pump service rigs equipped to access ground water.

Hi-rail vehicle means an internal rail flaw detection vehicle equipped with flange hi-rails.

Livestock means livestock as defined in sec. 602 of the Emergency Livestock Feed Assistance Act of 1988 [7 U.S.C. 1471], as amended, insects, and all other living animals cultivated, grown, or raised for commercial purposes, including aquatic animals.

Multiple stops means all stops made in any one village, town, or city may be computed as one.

Non-processed food means food commodities in a raw or natural state and not subjected to significant post-harvest changes to enhance shelf life, such as canning, jarring, freezing, or drying. The term ''non-processed food'' includes fresh fruits and vegetables, and cereal and oilseed crops which have been minimally processed by cleaning, cooling, trimming, cutting, chopping, shucking, bagging, or packaging to facilitate transport by commercial motor vehicle.

On-duty time means all time from the time a driver begins to work or is required to be in readiness to work until the time the driver is relieved from work and all responsibility for performing work. *On-duty time* shall include:

(1) All time at a plant, terminal, facility, or other property of a motor carrier or shipper, or on any public property, waiting to be dispatched, unless the driver has been relieved from duty by the motor carrier;

(2) All time inspecting, servicing, or conditioning any commercial motor vehicle at any time;

(3) All driving time as defined in the term *driving time;*

(4) All time in or on a commercial motor vehicle, other than:

(i) Time spent resting in or on a parked vehicle, except as otherwise provided in § 397.5 of this subchapter;

(ii) Time spent resting in a *sleeper berth;* or

(iii) Up to 3 hours riding in the passenger seat of a property-carrying vehicle moving on the highway immediately before or after a period of at least 7 consecutive hours in the sleeper berth;

(5) All time loading or unloading a commercial motor vehicle, supervising, or assisting in the loading or unloading, attending a commercial motor vehicle being loaded or unloaded, remaining in readiness to operate the commercial motor vehicle, or in giving or receiving receipts for shipments loaded or unloaded;

(6) All time repairing, obtaining assistance, or remaining in attendance upon a disabled commercial motor vehicle;

(7) All time spent providing a breath sample or urine specimen, including travel time to and from the collection site, to comply with the random, reasonable suspicion, post-crash, or follow-up testing required by part 382 of this subchapter when directed by a motor carrier;

(8) Performing any other work in the capacity, employ, or service of, a motor carrier; and

(9) Performing any compensated work for a person who is not a motor carrier.

Ready-mixed concrete delivery vehicle means a vehicle designed to deliver ready-mixed concrete on a daily basis and equipped with a mechanism under which the vehicle's propulsion engine provides the power to operate a mixer drum to agitate and mix the product en route to the delivery site.

Seven consecutive days means the period of 7 consecutive days beginning on any day at the time designated by the motor carrier for a 24-hour period.

Signal employee, as defined in 49 U.S.C. 21101(4), means an individual who is engaged in installing, repairing, or maintaining signal systems.

Sleeper berth means a berth conforming to the requirements of § 393.76 of this chapter.

Supporting document means a document, in any medium, generated or received by a motor carrier in the normal course of business as described in § 395.11 that can be used, as produced or with additional identifying information, by the motor carrier and enforcement officials to verify the accuracy of a driver's record of duty status.

Transportation of construction material and equipment means the transportation of construction and pavement materials, construction equipment, and construction maintenance vehicles, by

a driver to or from an active construction site (a construction site between mobilization of equipment and materials to the site to the final completion of the construction project) within a 75 air mile radius of the normal work reporting location of the driver, except that a State, upon notice to the Administrator, may establish a different air mile radius limitation for purposes of this definition if such limitation is between 50 and 75 air miles and applies only to movements that take place entirely within the State. This paragraph does not apply to the transportation of material found by the Secretary to be hazardous under 49 U.S.C. 5103 in a quantity requiring placarding under regulations issued to carry out such section.

Twenty-four-hour period means any 24-consecutive-hour period beginning at the time designated by the motor carrier for the terminal from which the driver is normally dispatched.

Utility service vehicle means any commercial motor vehicle:

(1) Used in the furtherance of repairing, maintaining, or operating any structures or any other physical facilities necessary for the delivery of public utility services, including the furnishing of electric, gas, water, sanitary sewer, telephone, television cable or community antenna service, and broadband-internet and cellular telephone operations;

(2) While engaged in any activity necessarily related to the ultimate delivery of such public utility services to consumers, including travel or movement to, from, upon, or between activity sites (including occasional travel or movement outside the service area necessitated by any utility emergency as determined by the utility provider); and

(3) Except for any occasional emergency use, operated primarily within the service area of a utility's subscribers or consumers, without regard to whether the vehicle is owned, leased, or rented by the utility.

[57 FR 33648, July 30, 1992]

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting § 395.2, see the List of CFR Sections Affected, which appears in the Finding Aids section of the printed volume and at *www.govinfo.gov*.

§ 395.3 Maximum driving time for property-carrying vehicles.

(a) Except as otherwise provided in § 395.1, no motor carrier shall permit or require any driver used by it to drive a property-carrying commercial motor vehicle, nor shall any such driver drive a property-carrying commercial motor vehicle, regardless of the number of motor carriers using the driver's services, unless the driver complies with the following requirements:

(1) *Start of work shift.* A driver may not drive without first taking 10 consecutive hours off duty;

(2) *14-hour period.* A driver may not drive after a period of 14 consecutive hours after coming on-duty following 10 consecutive hours off-duty.

(3) *Driving time and interruptions of driving periods*—(i) *Driving time.* A driver may drive a total of 11 hours during the period specified in paragraph (a)(2) of this section.

(ii) *Interruption of driving time.* Except for drivers who qualify for either of the short-haul exceptions in § 395.1(e)(1) or (2), driving is not permitted if more than 8 hours of driving time have passed without at least a consecutive 30-minute interruption in driving status. A consecutive 30-minute interruption of driving status may be satisfied either by off-duty, sleeper berth or on-duty not driving time or by a combination of off-duty, sleeper berth and on-duty not driving time.

(b) No motor carrier shall permit or require a driver of a property-carrying commercial motor vehicle to drive, nor shall any driver drive a property-carrying commercial motor vehicle, regardless of the number of motor carriers using the driver's services, for any period after—

(1) Having been on duty 60 hours in any period of 7 consecutive days if the employing motor carrier does not operate commercial motor vehicles every day of the week; or

(2) Having been on duty 70 hours in any period of 8 consecutive days if the employing motor carrier operates commercial motor vehicles every day of the week.

(c)(1) Any period of 7 consecutive days may end with the beginning of an off-duty period of 34 or more consecutive hours.

(2) Any period of 8 consecutive days may end with the beginning of an off-duty period of 34 or more consecutive hours.

[76 FR 81188, Dec. 27, 2011, as amended at 78 FR 58485, Sept. 24, 2013; 78 FR 64181, Oct. 28, 2013; 84 FR 48081, Sept. 12, 2019; 85 FR 33452, June 1, 2020]

§ 395.5 Maximum driving time for passenger-carrying vehicles.

Subject to the exceptions and exemptions in § 395.1:

(a) No motor carrier shall permit or require any driver used by it to drive a passenger-carrying commercial motor vehicle, nor shall any such driver drive a passenger-carrying commercial motor vehicle:

(1) More than 10 hours following 8 consecutive hours off duty; or

(2) For any period after having been on duty 15 hours following 8 consecutive hours off duty.

(b) No motor carrier shall permit or require a driver of a passenger-carrying commercial motor vehicle to drive, nor shall any driver drive a passenger-carrying commercial motor vehicle, regardless of the number of motor carriers using the driver's services, for any period after—

(1) Having been on duty 60 hours in any 7 consecutive days if the employing motor carrier does not operate commercial motor vehicles every day of the week; or

(2) Having been on duty 70 hours in any period of 8 consecutive days if the employing motor carrier operates commercial motor vehicles every day of the week.

[70 FR 50073, Aug. 25, 2005]

§ 395.7 [Reserved]

§ 395.8 Driver's record of duty status.

(a)(1) Except for a private motor carrier of passengers (nonbusiness), as defined in § 390.5 of this subchapter, a motor carrier subject to the requirements of this part must require each driver used by the motor carrier to record the driver's duty status for each 24-hour period using the method prescribed in paragraphs (a)(1)(i) through (iii) of this section, as applicable.

(i) Subject to paragraph (a)(1)(ii) of this section, a motor carrier operating commercial motor vehicles must install and require each of its drivers to use an ELD to record the driver's duty status in accordance with subpart B of this part no later than December 18, 2017.

(ii)(A) A motor carrier may require a driver to record the driver's duty status manually in accordance with this section, rather than require the use of an ELD, if the driver is operating a commercial motor vehicle:

(*1*) In a manner requiring completion of a record of duty status on not more than 8 days within any 30-day period;

(*2*) In a driveaway-towaway operation in which the vehicle being driven is part of the shipment being delivered;

(*3*) In a driveaway-towaway operation in which the vehicle being transported is a motor home or a recreation vehicle trailer; or

(*4*) That was manufactured before model year 2000, as reflected in the vehicle identification number as shown on the vehicle's registration.

(B) The record of duty status must be recorded in duplicate for each 24-hour period for which recording is required. The duty status shall be recorded on a specified grid, as shown in paragraph (g) of this section. The grid and the requirements of paragraph (d) of this section may be combined with any company form.

(iii) Subject to paragraphs (a)(1)(i) and (ii) of this section, until December 18, 2017, a motor carrier operating commercial motor vehicles shall require each of its drivers to record the driver's record of duty status:

(A) Using an ELD that meets the requirements of subpart B of this part; or

(B) Manually, recorded on a specified grid as shown in paragraph (g) of this section. The grid and the requirements of paragraph (d) of this section may be combined with any company form. The record of duty status must be recorded in duplicate for each 24-hour period for which recording is required.

(2) A driver operating a commercial motor vehicle must:

(i) Record the driver's duty status using one of the methods under paragraph (a)(1) of this section; and

(ii) Submit the driver's record of duty status to the motor carrier within

13 days of the 24-hour period to which the record pertains.

(b) The duty status shall be recorded as follows:

(1) ''Off duty'' or ''OFF.''

(2) ''Sleeper berth'' or ''SB'' (only if a sleeper berth used).

(3) ''Driving'' or ''D.''

(4) ''On-duty not driving'' or ''ON.''

(c) For each change of duty status (e.g., the place of reporting for work, starting to drive, on-duty not driving and where released from work), the name of the city, town, or village, with State abbreviation, shall be recorded.

NOTE: If a change of duty status occurs at a location other than a city, town, or village, show one of the following: (1) The highway number and nearest milepost followed by the name of the nearest city, town, or village and State abbreviation, (2) the highway number and the name of the service plaza followed by the name of the nearest city, town, or village and State abbreviation, or (3) the highway numbers of the nearest two intersecting roadways followed by the name of the nearest city, town, or village and State abbreviation.

(d) The following information must be included on the form in addition to the grid:

(1) Date;

(2) Total miles driving today;

(3) Truck or tractor and trailer number;

(4) Name of carrier;

(5) Driver's signature/certification;

(6) 24-hour period starting time (e.g. midnight, 9:00 a.m., noon, 3:00 p.m.);

(7) Main office address;

(8) Remarks;

(9) Name of co-driver;

(10) Total hours (far right edge of grid);

(11) Shipping document number(s), or name of shipper and commodity;

(e)(1) No driver or motor carrier may make a false report in connection with a duty status.

(2) No driver or motor carrier may disable, deactivate, disengage, jam, or otherwise block or degrade a signal transmission or reception, or reengineer, reprogram, or otherwise tamper with an ELD so that the device does not accurately record and retain required data.

(3) No driver or motor carrier may permit or require another person to disable, deactivate, disengage, jam, or otherwise block or degrade a signal transmission or reception, or reengineer, reprogram, or otherwise tamper with an ELD so that the device does not accurately record and retain required data.

(f) The driver's activities shall be recorded in accordance with the following provisions:

(1) *Entries to be current.* Drivers shall keep their records of duty status current to the time shown for the last change of duty status.

(2) *Entries made by driver only.* All entries relating to a driver's duty status must be legible and made by the driver.

(3) *Date.* The month, day and year for the beginning of each 24-hour period shall be shown on the form containing the driver's duty status record.

(4) *Total miles driving today.* Total mileage driven during the 24-hour period shall be recorded on the form containing the driver's duty status record.

(5) *Commercial motor vehicle identification.* The driver shall show the number assigned by the motor carrier, or the license number and licensing State of each commercial motor vehicle operated during each 24-hour period on his/her record of duty status. The driver of an articulated (combination) commercial motor vehicle shall show the number assigned by the motor carrier, or the license number and licensing State of each motor vehicle used in each commercial motor vehicle combination operated during that 24-hour period on his/her record of duty status.

(6) *Name of motor carrier.* The name(s) of the motor carrier(s) for which work is performed shall be shown on the form containing the driver's record of duty status. When work is performed for more than one motor carrier during the same 24-hour period, the beginning and finishing time, showing a.m. or p.m., worked for each motor carrier shall be shown after each motor carrier's name. Drivers of leased commercial motor vehicles shall show the name of the motor carrier performing the transportation.

(7) *Signature/certification.* The driver shall certify to the correctness of all entries by signing the form containing the driver's duty status record with his/her legal name or name of record. The driver's signature certifies that all

entries required by this section made by the driver are true and correct.

(8) *Time base to be used.* (i) The driver's duty status record shall be prepared, maintained, and submitted 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.

(ii) The term ''7 or 8 consecutive days'' means the 7 or 8 consecutive 24-hour periods as designated by the carrier for the driver's home terminal.

(iii) The 24-hour period starting time must be identified on the driver's duty status record. One-hour increments must appear on the graph, be identified, and preprinted. The words ''Midnight'' and ''Noon'' must appear above or beside the appropriate one-hour increment.

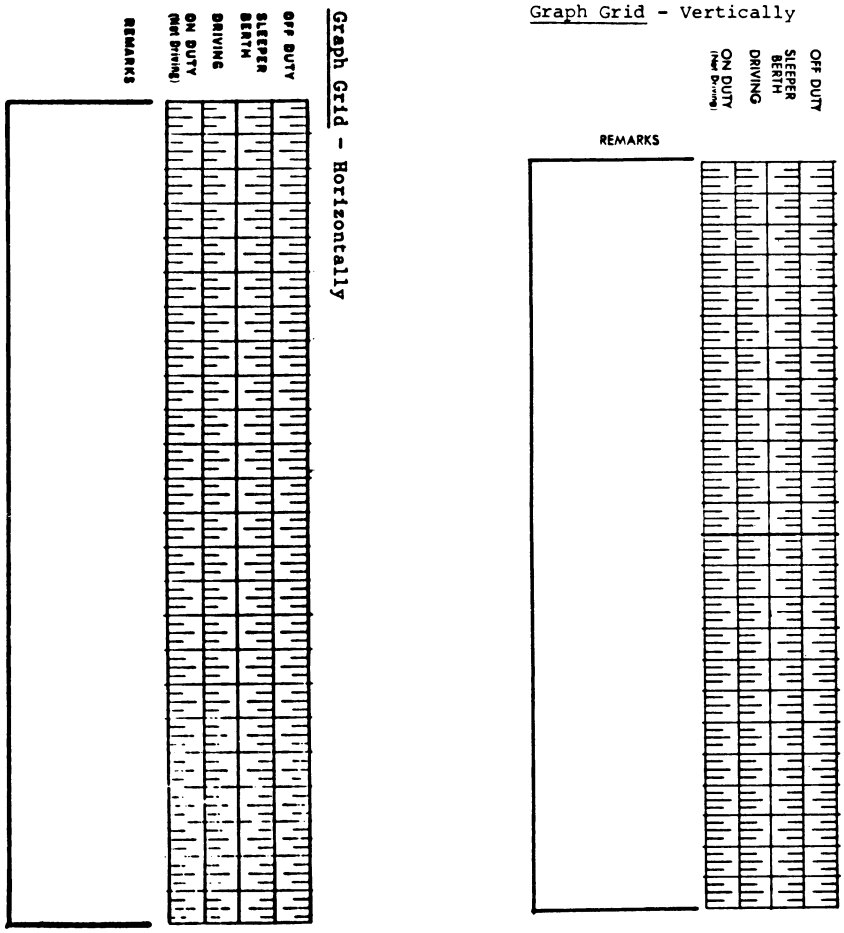
(9) *Main office address.* The motor carrier's main office address shall be shown on the form containing the driver's duty status record.

(10) *Recording days off duty.* Two or more consecutive 24-hour periods off duty may be recorded on one duty status record.

(11) *Total hours.* The total hours in each duty status: off duty other than in a sleeper berth; off duty in a sleeper berth; driving, and on duty not driving, shall be entered to the right of the grid, the total of such entries shall equal 24 hours.

(12) *Shipping document number(s) or name of shipper and commodity* shall be shown on the driver's record of duty status.

(g) *Graph grid.* The following graph grid must be incorporated into a motor carrier recordkeeping system which must also contain the information required in paragraph (d) of this section.



(h) *Graph grid preparation.* The graph grid may be used horizontally or vertically and shall be completed as follows:

(1) *Off duty.* Except for time spent resting in a sleeper berth, a continuous line shall be drawn between the appropriate time markers to record the period(s) of time when the driver is not on duty, is not required to be in readiness to work, or is not under any responsibility for performing work.

(2) *Sleeper berth.* A continuous line shall be drawn between the appropriate time markers to record the period(s) of time off duty resting in a sleeper berth, as defined in § 395.2. (If a non-sleeper berth operation, sleeper berth need not be shown on the grid.)

(3) *Driving.* A continuous line shall be drawn between the appropriate time markers to record the period(s) of driving time, as defined in § 395.2.

(4) *On duty not driving.* A continuous line shall be drawn between the appropriate time markers to record the period(s) of time on duty not driving specified in § 395.2.

(5) *Location—remarks.* The name of the city, town, or village, with State abbreviation where each change of duty status occurs shall be recorded.

NOTE: If a change of duty status occurs at a location other than a city, town, or village, show one of the following: (1) The highway number and nearest milepost followed by the name of the nearest city, town, or village and State abbreviation, (2) the highway number and the name of the service plaza followed by the name of the nearest city, town, or village and State abbreviation, or (3) the highway numbers of the nearest two intersecting roadways followed by the name of the nearest city, town, or village and State abbreviation.

(i) [Reserved]

(j) *Drivers used by more than one motor carrier.* (1) When the services of a driver are used by more than one motor carrier during any 24-hour period in effect at the driver's home terminal, the driver shall submit a copy of the record of duty status to each motor carrier. The record shall include:

(i) All duty time for the entire 24-hour period;

(ii) The name of each motor carrier served by the driver during that period; and

(iii) The beginning and finishing time, including a.m. or p.m., worked for each carrier.

(2) Motor carriers, when using a driver for the first time or intermittently, shall obtain from the driver a signed statement giving the total time on duty during the immediately preceding 7 days and the time at which the driver was last relieved from duty prior to beginning work for the motor carriers.

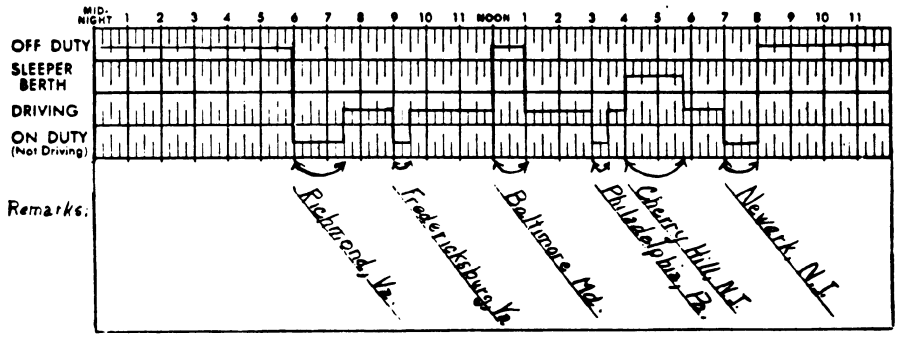
(k) *Retention of driver's record of duty status and supporting documents.* (1) A motor carrier shall retain records of duty status and supporting documents required under this part for each of its drivers for a period of not less than 6 months from the date of receipt.

(2) The driver shall retain a copy of each record of duty status for the previous 7 consecutive days which shall be in his/her possession and available for inspection while on duty.

NOTE: Driver's Record of Duty Status.

The graph grid, when incorporated as part of any form used by a motor carrier, must be of sufficient size to be legible.

The following executed specimen grid illustrates how a driver's duty status should be recorded for a trip from Richmond, Virginia, to Newark, New Jersey. The grid reflects the midnight to midnight 24 hour period.



Graph Grid (Midnight to Midnight Operation)

The driver in this instance reported for duty at the motor carrier's terminal. The driver reported for work at 6 a.m., helped load, checked with dispatch, made a pretrip inspection, and performed other duties until 7:30 a.m. when the driver began driving. At 9 a.m. the driver had a minor accident in Fredericksburg, Virginia, and spent one half hour handling details with the local police. The driver arrived at the company's Baltimore, Maryland, terminal at noon and went to lunch while minor repairs were made to the tractor. At 1 p.m. the driver resumed the trip and made a delivery in Philadelphia, Pennsylvania, between 3 p.m. and 3:30 p.m. at which time the driver started driving again. Upon arrival at Cherry Hill, New Jersey, at 4 p.m., the driver entered the sleeper berth for a rest break until 5:45 p.m. at which time the driver resumed driving again. At 7 p.m. the driver arrived at the company's terminal in Newark, New Jersey. Between 7 p.m. and

8 p.m. the driver prepared the required paperwork including completing the driver's record of duty status, driver vehicle inspection report, insurance report for the Fredericksburg, Virginia accident, checked for the next day's dispatch, etc. At 8 p.m., the driver went off duty.

[47 FR 53389, Nov. 26, 1982]

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting § 395.8, see the List of CFR Sections Affected, which appears in the Finding Aids section of the printed volume and at *www.govinfo.gov*.

§ 395.10 [Reserved]

§ 395.11 Supporting documents.

(a) *Effective date.* This section takes effect December 18, 2017.

(b) *Submission of supporting documents to motor carrier.* Except drivers for a private motor carrier of passengers (nonbusiness), a driver must submit to the driver's employer the driver's supporting documents within 13 days of either the 24-hour period to which the documents pertain or the day the document comes into the driver's possession, whichever is later.

(c) *Supporting document retention.* (1) Subject to paragraph (d) of this section, a motor carrier must retain each supporting document generated or received in the normal course of business in the following categories for each of its drivers for every 24-hour period to verify on-duty not driving time in accordance with § 395.8(k):

(i) Each bill of lading, itinerary, schedule, or equivalent document that indicates the origin and destination of each trip;

(ii) Each dispatch record, trip record, or equivalent document;

(iii) Each expense receipt related to any on-duty not driving time;

(iv) Each electronic mobile communication record, reflecting communications transmitted through a fleet management system; and

(v) Each payroll record, settlement sheet, or equivalent document that indicates payment to a driver.

(2)(i) A supporting document must include each of the following data elements:

(A) On the document or on another document that enables the carrier to link the document to the driver, the driver's name or personal identification number (PIN) or a unit (vehicle) number if the unit number can be associated with the driver operating the unit;

(B) The date, which must be the date at the location where the date is recorded;

(C) The location, which must include the name of the nearest city, town, or village to enable Federal, State, or local enforcement personnel to quickly determine a vehicle's location on a standard map or road atlas; and

(D) Subject to paragraph (c)(2)(ii) of this section, the time, which must be convertible to the local time at the location where it is recorded.

(ii) If a driver has fewer than eight supporting documents containing the four data elements under paragraph (c)(2)(i) of this section for a 24-hour period, a document containing the data elements under paragraphs (c)(2)(i)(A) through (C) of this section is considered a supporting document for purposes of paragraph (d) of this section.

(d) *Maximum number of supporting documents.* (1) Subject to paragraphs (d)(3) and (4) of this section, a motor carrier need not retain more than eight supporting documents for an individual driver's 24-hour period under paragraph (c) of this section.

(2) In applying the limit on the number of documents required under paragraph (d)(1) of this section, each electronic mobile communication record applicable to an individual driver's 24-hour period shall be counted as a single document.

(3) If a motor carrier has more than eight supporting documents for a driver's 24 hour period, the motor carrier must retain the supporting documents containing the earliest and the latest time indications among the eight supporting documents retained.

(4) In addition to other supporting documents required under this section, and notwithstanding the maximum number of documents under paragraph (d)(1) of this section, a motor carrier that requires a driver to complete a paper record of duty status under § 395.8(a)(1)(iii) must maintain toll receipts for any period when the driver kept paper records of duty status.

(e) *Link to driver's record of duty status.* A motor carrier must retain supporting documents in such a manner that they may be effectively matched to the corresponding driver's record of duty status.

(f) *Prohibition of destruction.* No motor carrier or driver may obscure, deface, destroy, mutilate, or alter existing information contained in a supporting document.

(g) *Supporting documents at roadside.* (1) Upon request during a roadside inspection, a driver must make available to an authorized Federal, State, or local official for the official's review any supporting document in the driver's possession.

(2) A driver need not produce a supporting document under paragraph (g)(1) of this section in a format other than the format in which the driver possesses it.

(h) *Self-compliance systems.* (1) FMCSA may authorize on a case-by-case basis motor carrier self-compliance systems.

(2) Requests for use of a supporting document self-compliance system may be submitted to FMCSA under the procedures described in 49 CFR part 381, subpart C (Procedures for Applying for Exemptions).

(3) FMCSA will consider requests concerning types of supporting documents retained by a motor carrier under §395.8(k)(1) and the method by which a driver retains a copy of the record of duty status for the previous 7 days and makes it available for inspection while on duty in accordance with §395.8.

[80 FR 78384, Dec. 16, 2015]

§395.12 [Reserved]

§395.13 Drivers ordered out of service.

(a) *Authority to order drivers out of service.* Every special agent of the Federal Motor Carrier Safety Administration (as defined in appendix B to part 390 of this chapter) is authorized to order a driver out of service and to notify the motor carrier of that order, upon finding at the time and place of examination that the driver has violated the out-of- service criteria as set forth in paragraph (b) of this section.

(b) *Out of service criteria.* (1) No driver shall drive after being on duty in excess of the maximum periods permitted by this part.

(2) No driver required to maintain a record of duty status under §395.8 shall fail to have a record of duty status current on the day of examination and for the prior seven consecutive days.

(3) *Exception.* A driver failing only to have possession of a record of duty status current on the day of examination and the prior day, but has completed records of duty status up to that time (previous 6 days), will be given the opportunity to make the duty status record current.

(c) *Responsibilities of motor carriers.* (1) No motor carrier shall:

(i) Require or permit a driver who has been ordered out of service to operate a commercial motor vehicle until that driver may lawfully do so under the rules in this part.

(ii) Require a driver who has been ordered out of service for failure to prepare a record of duty status to operate a commercial motor vehicle until that driver has been off duty for the appropriate number of consecutive hours required by this part and is in compliance with this section. The appropriate consecutive hours off duty may include sleeper berth time.

(2) A motor carrier shall complete the ''Motor Carrier Certification of Action Taken'' portion of the form ''Driver/Vehicle Examination Report'' and deliver the copy of the form either personally or by mail to the Division Administrator or State Director Federal Motor Carrier Safety Administration, at the address specified upon the form within 15 days following the date of examination. If the motor carrier mails the form, delivery is made on the date it is postmarked.

(d) *Responsibilities of the driver.* (1) No driver who has been ordered out of service shall operate a commercial motor vehicle until that driver may lawfully do so under the rules of this part.

(2) No driver who has been ordered out of service, for failing to prepare a record of duty status, shall operate a commercial motor vehicle until the driver has been off duty for the appropriate number of consecutive hours required by this part and is in compliance with this section.

(3) A driver to whom a form has been tendered ordering the driver out of service shall within 24 hours thereafter deliver or mail the copy to a person or place designated by the motor carrier to receive it.

(4) Section 395.13 does not alter the hazardous materials requirements prescribed in § 397.5 pertaining to attendance and surveillance of commercial motor vehicles.

[44 FR 34963, June 18, 1979, as amended at 47 FR 53392, Nov. 26, 1982; 51 FR 12622, Apr. 14, 1986; 53 FR 18058, May 19, 1988; 53 FR 38670, Sept. 30, 1988; 53 FR 47544, Nov. 23, 1988; 60 FR 38748, July 28, 1995; 66 FR 49874, Oct. 1, 2001; 68 FR 22516, Apr. 28, 2003; 70 FR 50073, Aug. 25, 2005; 75 FR 17245, Apr. 5, 2010; 77 FR 28451, May 14, 2012; 83 FR 22878, May 17, 2018; 86 FR 57076, Oct. 14, 2021; 88 FR 80192, Nov. 17, 2023; 89 FR 90624, Nov. 18, 2024]

§§ 395.15–395.19 [Reserved]

Subpart B—Electronic Logging Devices (ELDs)

SOURCE: 80 FR 78385, Dec. 16, 2015, unless otherwise noted.

§ 395.20 ELD applicability and scope.

(a) *Scope.* This subpart applies to ELDs used to record a driver's hours of service under § 395.8(a).

(b) *Applicability.* An ELD used after December 18, 2017 must meet the requirements of this subpart.

§ 395.22 Motor carrier responsibilities—In general.

(a) *Registered ELD required.* A motor carrier required to use an ELD must use only an ELD that is listed on the Federal Motor Carrier Safety Administration's registered ELDs list, accessible through the Agency's website, *www.fmcsa.dot.gov/devices.*

(b) *User rights management.* (1) This paragraph applies to a motor carrier whose drivers use ELDs and to the motor carrier's support personnel who have been authorized by the motor carrier to access ELD records and make or suggest authorized edits.

(2) A motor carrier must:

(i) Manage ELD accounts, including creating, deactivating, and updating accounts, and ensure that properly authenticated individuals have ELD accounts with appropriate rights;

(ii) Assign a unique ELD username to each user account with the required user identification data;

(iii) Ensure that a driver's license used in the creation of an ELD driver account is valid and corresponds to the driver using the ELD account; and

(iv) Ensure that information entered to create a new account is accurate.

(c) *Driver identification data.* (1) The ELD user account assigned by the motor carrier to a driver requires the following data elements:

(i) A driver's first and last name, as reflected on the driver's license;

(ii) A unique ELD username selected by the motor carrier;

(iii) The driver's valid driver's license number; and

(iv) The State or jurisdiction that issued the driver's license.

(2) The driver's license number or Social Security number must not be used as, or as part of, the username for the account created on an ELD.

(d) *Motor carrier support personnel identification data.* The ELD user account assigned by a motor carrier to support personnel requires the following data elements:

(1) The individual's first and last name, as reflected on a government issued identification; and

(2) A unique ELD username selected by the motor carrier.

(e) *Proper log-in required.* The motor carrier must require that its drivers and support personnel log into the ELD system using their proper identification data.

(f) *Calibration.* A motor carrier must ensure that an ELD is calibrated and maintained in accordance with the provider's specifications.

(g) *Portable ELDs.* If a driver uses a portable ELD, the motor carrier shall ensure that the ELD is mounted in a fixed position during the operation of the commercial motor vehicle and visible to the driver when the driver is seated in the normal driving position.

(h) *In-vehicle information.* A motor carrier must ensure that its drivers possess onboard a commercial motor vehicle an ELD information packet containing the following items:

(1) A user's manual for the driver describing how to operate the ELD;

(2) An instruction sheet for the driver describing the data transfer mechanisms supported by the ELD and step-by-step instructions for the driver to produce and transfer the driver's hours-of-service records to an authorized safety official;

(3) An instruction sheet for the driver describing ELD malfunction reporting requirements and recordkeeping procedures during ELD malfunctions; and

(4) A supply of blank driver's records of duty status graph-grids sufficient to record the driver's duty status and other related information for a minimum of 8 days.

(i) *Record backup and security.* (1) A motor carrier must retain for 6 months a back-up copy of the ELD records on a device separate from that on which the original data are stored.

(2) A motor carrier must retain a driver's ELD records so as to protect a driver's privacy in a manner consistent with sound business practices.

(j) *Record production.* When requested by an authorized safety official, a motor carrier must produce ELD records in an electronic format either at the time of the request or, if the motor carrier has multiple offices or terminals, within the time permitted under § 390.29 of this subchapter.

[80 FR 78385, Dec. 16, 2015, as amended at 88 FR 80192, Nov. 17, 2023]

§ 395.24 Driver responsibilities—In general.

(a) *In general.* A driver must provide the information the ELD requires as prompted by the ELD and required by the motor carrier.

(b) *Driver's duty status.* A driver must input the driver's duty status by selecting among the following categories available on the ELD:

(1) ''Off duty'' or ''OFF'' or ''1'';

(2) ''Sleeper berth'' or ''SB'' or ''2'', to be used only if sleeper berth is used;

(3) ''Driving'' or ''D'' or ''3''; or

(4) ''On-duty not driving'' or ''ON'' or ''4''.

(c) *Miscellaneous data.* (1) A driver must manually input the following information in the ELD:

(i) Annotations, when applicable;

(ii) Driver's location description, when prompted by the ELD; and

(iii) Output file comment, when directed by an authorized safety officer.

(2) A driver must manually input or verify the following information on the ELD:

(i) Commercial motor vehicle power unit number;

(ii) Trailer number(s), if applicable; and

(iii) Shipping document number, if applicable.

(d) *Driver use of ELD.* On request by an authorized safety official, a driver must produce and transfer from an ELD the driver's hours-of-service records in accordance with the instruction sheet provided by the motor carrier.

§ 395.26 ELD data automatically recorded.

(a) *In general.* An ELD provides the following functions and automatically records the data elements listed in this section in accordance with the requirements contained in appendix A to subpart B of this part.

(b) *Data automatically recorded.* The ELD automatically records the following data elements:

(1) Date;

(2) Time;

(3) CMV geographic location information;

(4) Engine hours;

(5) Vehicle miles;

(6) Driver or authenticated user identification data;

(7) Vehicle identification data; and

(8) Motor carrier identification data.

(c) *Change of duty status.* When a driver indicates a change of duty status under § 395.24(b), the ELD records the data elements in paragraphs (b)(1) through (8) of this section.

(d) *Intermediate recording.* (1) When a commercial motor vehicle is in motion and there has not been a duty status change or another intermediate recording in the previous 1 hour, the ELD automatically records an intermediate recording that includes the data elements in paragraphs (b)(1) through (8) of this section.

(2) If the intermediate recording is created during a period when the driver indicates authorized personal use of a

commercial motor vehicle, the data elements in paragraphs (b)(4) and (5) of this section (engine hours and vehicle miles) will be left blank and paragraph (b)(3) of this section (location) will be recorded with a single decimal point resolution (approximately within a 10-mile radius).

(e) *Change in special driving category.* If a driver indicates a change in status under § 395.28(a)(2), the ELD records the data elements in paragraphs (b)(1) through (8) of this section.

(f) *Certification of the driver's daily record.* The ELD provides a function for recording the driver's certification of the driver's records for every 24-hour period. When a driver certifies or recertifies the driver's records for a given 24-hour period under § 395.30(b)(2), the ELD records the date, time and driver identification data elements in paragraphs (b)(1), (2), and (6) of this section.

(g) *Log in/log out.* When an authorized user logs into or out of an ELD, the ELD records the data elements in paragraphs (b)(1) and (2) and (b)(4) through (8) of this section.

(h) *Engine power up/shut down.* When a commercial motor vehicle's engine is powered up or powered down, the ELD records the data elements in paragraphs (b)(1) through (8) of this section.

(i) *Authorized personal use.* If the record is created during a period when the driver has indicated authorized personal use of a commercial motor vehicle, the data element in paragraph (b)(3) of this section is logged with a single decimal point resolution (approximately within a 10-mile radius).

(j) *Malfunction and data diagnostic event.* When an ELD detects or clears a malfunction or data diagnostic event, the ELD records the data elements in paragraphs (b)(1) and (2) and (b)(4) through (8) of this section.

§ 395.28 Special driving categories; other driving statuses.

(a) *Special driving categories*—(1) *Motor carrier options.* A motor carrier may configure an ELD to authorize a driver to indicate that the driver is operating a commercial motor vehicle under any of the following special driving categories:

(i) Authorized personal use; and

(ii) Yard moves.

(2) *Driver's responsibilities.* A driver operating a commercial motor vehicle under one of the authorized categories listed in paragraph (a)(1) of this section:

(i) Must select on the ELD the applicable special driving category before the start of the status and deselect when the indicated status ends; and

(ii) When prompted by the ELD, annotate the driver's ELD record describing the driver's activity.

(b) *Drivers exempt from ELD use.* A motor carrier may configure an ELD to designate a driver as exempt from ELD use.

(c) *Other driving statuses.* A driver operating a commercial motor vehicle under any exception under § 390.3(f) of this subchapter or § 395.1 who is not covered under paragraph (a) or (b) of this section must annotate the driver's ELD record to explain the applicable exemption.

§ 395.30 ELD record submissions, edits, annotations, and data retention.

(a) *Accurate record keeping.* A driver and the motor carrier must ensure that the driver's ELD records are accurate.

(b) *Review of records and certification by driver.* (1) A driver must review the driver's ELD records, edit and correct inaccurate records, enter any missing information, and certify the accuracy of the information.

(2) Using the certification function of the ELD, the driver must certify the driver's records by affirmatively selecting ''Agree'' immediately following 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.'' The driver must certify the record immediately after the final required entry has been made or corrected for the 24-hour period.

(3) The driver must submit the driver's certified ELD records to the motor carrier in accordance with § 395.8(a)(2).

(4) If any edits are necessary after the driver submits the records to the motor carrier, the driver must recertify the record after the edits are made.

(c) *Edits, entries, and annotations.* (1) Subject to the edit limitations of an ELD, a driver may edit, enter missing

information, and annotate ELD recorded events. When edits, additions, or annotations are necessary, a driver must use the ELD and respond to the ELD's prompts.

(2) The driver or support personnel must annotate each change or addition to a record.

(3) In the case of team drivers, if there were a mistake resulting in the wrong driver being assigned driving-time hours by the ELD, and if the team drivers were both indicated in each other's records for that period as co-drivers, driving time may be edited and reassigned between the team drivers following the procedure supported by the ELD.

(d) *Motor carrier-proposed edits.* (1) On review of a driver's submitted records, the motor carrier may request edits to a driver's records of duty status to ensure accuracy. A driver must confirm or reject any proposed change, implement the appropriate edits on the driver's record of duty status, and recertify and resubmit the records in order for any motor carrier-proposed changes to take effect.

(2) A motor carrier may not request edits to the driver's electronic records before the records have been submitted by the driver.

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

(e) *Coercion prohibited.* A motor carrier may not coerce a driver to make a false certification of the driver's data entries or record of duty status.

(f) *Motor carrier data retention requirements.* A motor carrier must not alter or erase, or permit or require alteration or erasure of, the original information collected concerning the driver's hours of service, the source data streams used to provide that information, or information contained in any ELD that uses the original information and HOS source data.

§ 395.32 Non-authenticated driver logs.

(a) *Tracking non-authenticated operation.* The ELD must associate the non-authenticated operation of a commercial motor vehicle with a single account labeled ''Unidentified Driver'' as soon as the vehicle is in motion, if no driver has logged into the ELD.

(b) *Driver.* When a driver logs into an ELD, the driver must review any unassigned driving time when prompted by the ELD and must:

(1) Assume any records that belong to the driver under the driver's account; or

(2) Indicate that the records are not attributable to the driver.

(c) *Motor carrier.* (1) A motor carrier must ensure that records of unidentified driving are reviewed and must:

(i) Annotate the record, explaining why the time is unassigned; or

(ii) Assign the record to the appropriate driver to correctly reflect the driver's hours of service.

(2) A motor carrier must retain unidentified driving records for each ELD for a minimum of 6 months from the date of receipt.

(3) During a safety inspection, audit or investigation by an authorized safety official, a motor carrier must make available unidentified driving records from the ELD corresponding to the time period for which ELD records are required.

§ 395.34 ELD malfunctions and data diagnostic events.

(a) *Recordkeeping during ELD malfunctions.* In case of an ELD malfunction, a driver must do the following:

(1) Note the malfunction of the ELD and provide written notice of the malfunction to the motor carrier within 24 hours;

(2) Reconstruct the record of duty status for the current 24-hour period and the previous 7 consecutive days, and record the records of duty status on graph-grid paper logs that comply with § 395.8, unless the driver already possesses the records or the records are retrievable from the ELD; and

(3) Continue to manually prepare a record of duty status in accordance with § 395.8 until the ELD is serviced and brought back into compliance with this subpart.

(b) *Inspections during malfunctions.* When a driver is inspected for hours of service compliance during an ELD malfunction, the driver must provide the authorized safety official the driver's records of duty status manually kept

as specified under paragraphs (a)(2) and (3) of this section.

(c) *Driver requirements during ELD data diagnostic events.* If an ELD indicates that there is a data inconsistency that generates a data diagnostic event, the driver must follow the motor carrier's and ELD provider's recommendations in resolving the data inconsistency.

(d) *Motor carrier requirements for repair, replacement, or service.* (1) If a motor carrier receives or discovers information concerning the malfunction of an ELD, the motor carrier must take actions to correct the malfunction of the ELD within 8 days of discovery of the condition or a driver's notification to the motor carrier, whichever occurs first.

(2) A motor carrier seeking to extend the period of time permitted for repair, replacement, or service of one or more ELDs shall notify the FMCSA Division Administrator for the State of the motor carrier's principal place of business within 5 days after a driver notifies the motor carrier under paragraph (a)(1) of this section. Each request for an extension under this section must be signed by the motor carrier and must contain:

(i) The name, address, and telephone number of the motor carrier representative who files the request;

(ii) The make, model, and serial number of each ELD;

(iii) The date and location of each ELD malfunction as reported by the driver to the carrier; and

(iv) A concise statement describing actions taken by the motor carrier to make a good faith effort to repair, replace, or service the ELD units, including why the carrier needs additional time beyond the 8 days provided by this section.

(3) If FMCSA determines that the motor carrier is continuing to make a good faith effort to ensure repair, replacement, or service to address the malfunction of each ELD, FMCSA may allow an additional period.

(4) FMCSA will provide written notice to the motor carrier of its determination. The determination may include any conditions that FMCSA considers necessary to ensure hours-of-service compliance. The determination shall constitute a final agency action.

(5) A motor carrier providing a request for extension that meets the requirements of paragraph (d)(2) of this section is deemed in compliance with § 395.8(a)(1)(i) and (a)(2) until FMCSA makes an extension determination under this section, provided the motor carrier and driver continue to comply with the other requirements of this section.

§ 395.36 Driver access to records.

(a) *Records on ELD.* Drivers must be able to access their own ELD records. A motor carrier must not introduce a process that would require a driver to go through the motor carrier to obtain copies of the driver's own ELD records if such records exist on or are automatically retrievable through the ELD operated by the driver.

(b) *Records in motor carrier's possession.* On request, a motor carrier must provide a driver with access to and copies of the driver's own ELD records unavailable under paragraph (a) of this section during the period a motor carrier is required to retain the records under § 395.8(k).

§ 395.38 Incorporation by reference.

(a) *Incorporation by reference.* Certain materials are incorporated by reference in part 395, with the approval of the Director of the Office of the Federal Register under 5 U.S.C. 552(a), and 1 CFR part 51. To enforce any edition other than that specified in this section, the Federal Motor Carrier Safety Administration must publish notice of the change in the FEDERAL REGISTER, and the material must be available to the public. All approved material is available for inspection at the Federal Motor Carrier Safety Administration, Office of Analysis, Research and Technology, (800) 832–5660, and is available from the sources listed below. It is also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030 or go to *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(b) *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.

(c) *Bluetooth SIG, Inc.* 5209 Lake Washington Blvd. NE., Suite 350, Kirkland, WA 98033, *https://www.bluetooth.org/Technical/Specifications/adopted.htm*, (425) 691–3535.

(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]

(d) *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]

(e) *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.

(f) *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.

(g) *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]

(h) *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]

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

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1. SCOPE AND DESCRIPTION

(a) This appendix specifies the minimal requirements for an electronic logging device (ELD) necessary for an ELD provider to build and certify that its technology is compliant with this appendix.

1.1. ELD Function

The ELD discussed in this appendix is an electronic module capable of recording the electronic records of duty status for CMV drivers using the unit in a driving environment within a CMV and meets the compliance requirements in this appendix.

1.2. System Users

Users of ELDs are:
(a) CMV drivers employed by a motor carrier; and
(b) Support personnel who have been authorized by the motor carrier to:
(1) Create, remove, and manage user accounts;
(2) Configure allowed ELD parameters; and
(3) Access, review, and manage drivers' ELD records on behalf of the motor carrier.

1.3. System Architecture

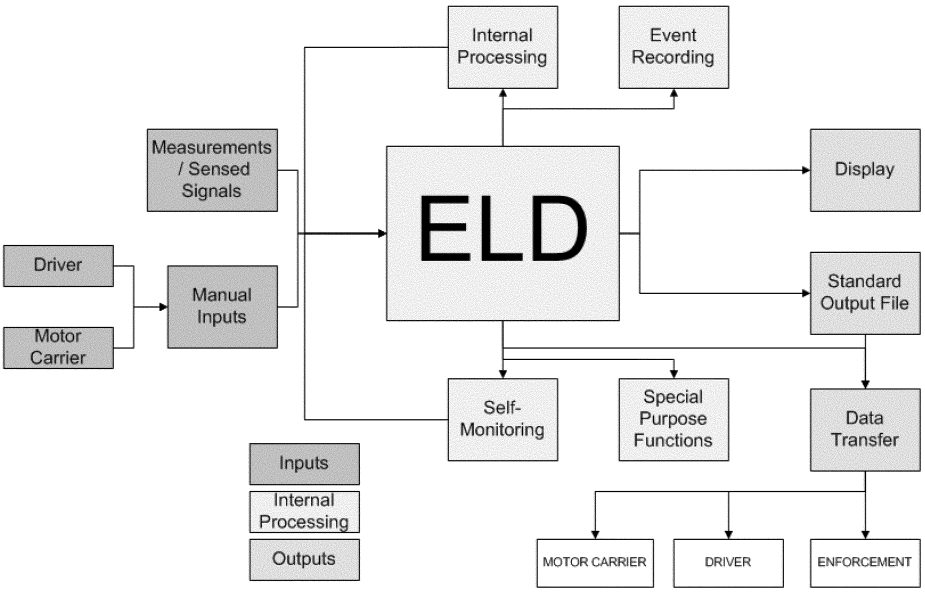
An ELD may be implemented as a standalone technology or within another electronic module. It may be installed in a CMV or may be implemented on a handheld unit that may be moved from vehicle to vehicle. The functional requirements are the same for all types of system architecture that may be used in implementing the ELD functionality.

1.4. System Design

(a) An ELD is integrally synchronized with the engine of the CMV such that driving time can be automatically recorded for the driver operating the CMV and using the ELD.
(b) An ELD allows for manual inputs from the driver and the motor carrier support personnel and automatically captures date and time, vehicle position, and vehicle operational parameters.
(c) An ELD records a driver's electronic RODS and other supporting events with the required data elements specified in this appendix and retains data to support the performance requirements specified in this appendix.
(d) An ELD generates a standard data file output and transfers it to an authorized safety official upon request.
(e) This appendix specifies minimally required data elements that must be part of an event record such that a standard ELD output file can be produced by all compliant ELDs.
(f) Figure 1 provides a visual layout of how this appendix is generally organized to further explain the required sub-functions of an ELD.

Figure 1

A Pictorial Overview of an ELD's Inputs, Outputs, and Other Sub-Functions



1.5. Sections of Appendix

(a) Section 2 lists the abbreviations used throughout this appendix.

(b) Section 3 provides definitions for terms and notations used in this document.

(c) Section 4 lists functional requirements for an ELD. More specifically, section 4.1 describes the security requirements for account management within an ELD system and introduces the term ''Unidentified Driver'' account. Section 4.2 explains internal engine synchronization requirements and its applicability when used in recording a driver's record of duty status in CMVs. Section 4.3 describes the inputs of an ELD which includes automatically measured signals by the ELD as covered in section 4.3.1, and manual entries by the authenticated driver as covered in section 4.3.2 and by the motor carrier as covered in section 4.3.3. The ELD requirements for internal processing and tracking of information flow are described in section 4.4, which includes conditions for and prohibitions against automatic setting of duty-status in section 4.4.1, required geo-location and date and time conversion functions in sections 4.4.2 and 4.4.3, respectively, use of event attributes for tracking of edit and entry history in section 4.4.4, and the use of data check functions in the recording of ELD logs in section 4.4.5 as standard security measures for all ELDs. Section 4.5 describes the events an ELD must record and the data elements each type of event must include. Section 4.6 introduces device self-monitoring requirements and standardizes the minimal set of malfunctions and data diagnostic events an ELD must be able to detect. Section 4.7 introduces technical functions that are intended to guard a driver against harassment and introduces a privacy preserving provision when a driver operates a CMV for personal purposes. Section 4.8 explains ELD outputs, which are the information displayed to a user and the standard data output file an ELD must produce. Sections 4.9 and 4.10, respectively, describe the data reporting requirements and the communications protocols.

(d) Section 5 describes the ELD certification and registration process.

(e) Section 6 lists the cited references throughout this appendix.

(f) Section 7 provides a data elements dictionary referencing each data element identified in this appendix.

2. ABBREVIATIONS

3pDP Third-Party Developers' Partnership
ASCII American Standard Code for Information Interchange
CAN Control Area Network
CMV Commercial Motor Vehicle
ECM Electronic Control Module
ELD Electronic Logging Device
FMCSA Federal Motor Carrier Safety Administration
HOS Hours of Service
HTTP Hypertext Transfer Protocol
HTTPS Hypertext Transfer Protocol Secure
ICD Interface Control Document
SAFER Safety and Fitness Electronic Records
RFC Request for Comments
RODS Records of Duty Status
TLS Transport Layer Security
UCT Coordinated Universal Time
USB Universal Serial Bus
WSDL Web Services Definition Language
XML Extensible Markup Language
XOR Exclusive Or {bitwise binary operation}

3. DEFINITIONS; NOTATIONS

3.1. Definitions

3.1.1. Databus

A vehicle databus refers to an internal communications network that interconnects components inside a vehicle and facilitates exchange of data between subsystems typically using serial or control area network protocols.

3.1.2. ELD Event

An ELD event refers to a discrete instance in time when the ELD records data with the data elements specified in this appendix. The discrete ELD events relate to the driver's duty status and ELD's operational integrity. They are either triggered by input from the driver (driver's duty status changes, driver's login/logout activity, etc.) or triggered by the ELD's internal monitoring functions (ELD malfunction detection, data diagnostics detection, intermediate logs, etc.). ELD events and required data elements for each type of ELD event are described in detail in section 4.5.1 of this appendix.

3.1.3. Exempt Driver

As specified in further detail in section 4.3.3.1.2 of this appendix, an ELD must allow a motor carrier to configure an ELD for a driver who may be exempt from the use of the ELD. An example of an exempt driver would be a driver operating under the short-haul exemption in §395.1(e) of this part (100 air-mile radius driver and non-CDL 150-air mile radius driver). Even though exempt drivers do not have to use an ELD, in operations when an ELD equipped CMV may be shared between exempt and non-exempt drivers, motor carriers can use this allowed configuration to avoid issues with unidentified driver data diagnostics errors.

3.1.4. Geo-Location

Geo-location is the conversion of a position measurement in latitude/longitude coordinates into a description of the distance and direction to a recognizable nearby location name. Geo-location information is used on an ELD's display or printout.

3.1.5. Ignition Power Cycle, Ignition Power On Cycle, Ignition Power Off Cycle

(a) An ignition power cycle refers to the engine's power status changing from ''on to off'' or ''off to on'', typically with the driver controlling engine power status by switching the ignition key positions.

(b) An ignition power on cycle refers to the engine power sequence changing from ''off to on and then off''. This refers to a continuous period when a CMV's engine is powered.

(c) An ignition power off cycle refers to the engine power sequence changing from ''on to off and then on''. This refers to a continuous period when a CMV's engine is not powered.

3.1.6. Unidentified Driver

''Unidentified Driver'' refers to the operation of a CMV featuring an ELD without an authenticated driver logging in the system. Functional specifications in this appendix require an ELD to automatically capture driving time under such conditions and attribute such records to the unique ''Unidentified Driver account,'' as specified in section 4.1.5 of this appendix, until the motor carrier and the driver review the records and they are assigned to the true and correct owner, as described in §395.32 of this part.

3.2. Notations

Throughout this appendix the following notations are used when data elements are referenced.

(a) < . > indicates a parameter an ELD must track. For example refers to the unique <ELD username> or identifier specified during the creation of an ELD account with the requirements set forth in section 7.18 of this appendix.

(b) { .} indicates which of multiple values of a parameter is being referenced. For example <ELD username {*for the co-driver*}> refers specifically to the ELD username for the co-driver.

(c) <CR> indicates a carriage return or new line or end of the current line. This notation is used in section 4.8.2 of this appendix, which describes the standard ELD output file.

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 engine ECM or the vehicle's databus. 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 or the vehicle's databus. 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 odometer message broadcast on the engine ECM or the vehicle's databus 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 total engine hours message broadcast on the engine ECM or the vehicle's databus 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 (UCT) and the absolute deviation from UCT 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 and recorded if it is available on the vehicle databus.

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.

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

(c) 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.

(d) 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);

(b) 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;

(c) 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

(d) 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 Power Unit 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 standalone 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

(a) 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 of this appendix.

(b) 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.

(c) 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 Identifier]

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>

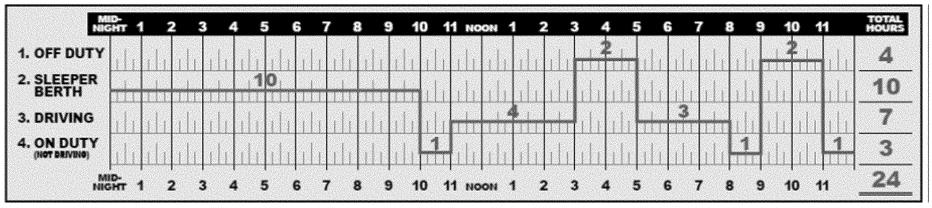
''<Geo-location> must be substituted with ''<Driver's Location Description>'' field for manual entries and with ''<{blank}>'' field for intervening logs.

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>

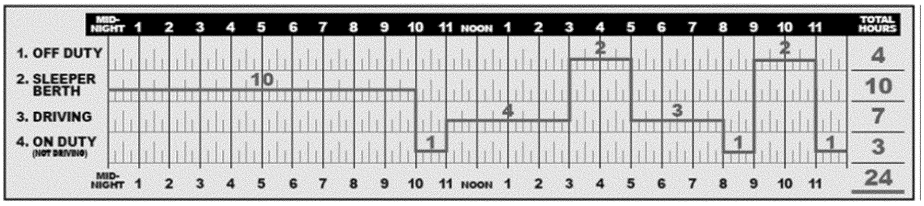
[1] Printout report must only list up to 10 most recent ELD malfunctions and up to 10 most recent data diagnostics events within the time period for which the report is generated.

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, CA	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.

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

(1) Web Services as specified in section 4.10.1.1 of this appendix (but not necessarily wirelessly), and Email as specified 4.10.1.2 (but not necessarily wirelessly); or

(2) 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 Email

(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 AESin 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 website. An ELD provider must register with FMCSA and certify each ELD model and version for that ELD to be listed on this website.

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 website 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) Email 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 website.

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 datafile. 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 website 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 website 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 FMCSA 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, FMCSA 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 FMCSA 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) FMCSA may request from the ELD provider any information that FMCSA 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 FMCSA, ATTN: ELD Removal—Request for Administrative Review. 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) FMCSA 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, FMCSA may dismiss the request for administrative review.

(d) FMCSA 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) 691–3535.

(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 <CCCCCCCCCCCCCCCCCC>, or <-CCCCCCCCCCCCCCCCCC> 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 A–Z (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. For example, an ELD Authentication Value could be generated by creating a string that concatenates a predetermined selection of values that will be included in the ELD Output File, signing that string (using the ELD private key and a predetermined hash algorithm), then using a binary-to-text encoding algorithm to encode the signature into alphanumeric characters.

Used in: ELD outputs.

Data Type: Calculated from the authentication ELD provider's private key not provided to FMCSA but corresponding to the ELD provider's public key certificate and calculation procedure privately distributed by the ELD provider to FMCSA during the ELD registration process.

Data Range: Alphanumeric combination.

Data Length: Greater than 16 characters.

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

Disposition: Mandatory.

Example:

[bGthamRrZmpha3NkamZsa2pzZGxma
2phc2xka2Y7ajtza25rbCBucms7Y2 ... RuZHN
udm5hc21kbnZBU0RGS0xKQVNMS0R
KTEs7QVNKRDtGTEtBSlNERktMSk
FEU0w7S1NESkZMSw==].

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 website.

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 website.

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 99999.9; for <{Elapsed} Engine hours>, range is between 0.0 and 99999.9.

Data Length: 3–7 characters.

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

Disposition: Mandatory for any event whose origin is the ELD or the unidentified driver profile. For events created by the driver or another authenticated user when engine hours are not available and cannot accurately be determined this field can be blank.

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''; this 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 or YM 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], p2D3], [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: X, M, E or −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: 1, or 3 to 6 characters.

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

Disposition: Mandatory.

Examples: [X], [M], [E], [−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: X, M, E or −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: 1, or 3 to 7 characters.

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

Disposition: Mandatory.

Examples: [X], [M], [E], [−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 for any event whose origin is the ELD or the unidentified driver profile. For events created by the driver or another authenticated user when vehicle miles are not available and cannot accurately be determined this field can be blank.

Examples: [99], [1004566], [0], [422].

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PART 396—INSPECTION, REPAIR, AND MAINTENANCE

Sec.

396.1 Scope.