



RAVEN'S RULES MINI

Ravens Rules Mini is a summary of the new ELD section of the Federal Hours of Service and Raven's Rules this information has not been peer reviewed or reviewed by any regulatory body and is my opinion based on my research and experience. If I have missed anything or an error is noticed please let me know, I'm learning new things every day.

Jill McBeth C.Log

Raven

Transportation Safety Consulting

A ELD is a device that automatically records a driver's driving time and facilitates the recording of the driver's record of duty status (RODS). Motor carriers are required to ensure that each commercial vehicle is equipped with an ELD that meets the Technical Standard and is mounted in a fixed position and visible to the driver during operation.

FUNCTIONALITY

- ELDs automatically record driving time and generate a record of driver duty status (RODS).
- The devices must be certified by accredited bodies and meet the Technical Standards.
- ELDs are used by both drivers and authorized support personnel.
- ELDs can be implemented as standalone device or integrated within another system.
- ELD core functionality is monitoring hours of service.
- ELDs must synchronize with the CMV engine and must record essential data: engine power, vehicle motion, total distance driven, and engine hours when the CMV engine is powered.
- The interface between the ECM and the ELD can be achieved through either hardwired or wireless connections.
- An ELD generates a standard RODS

SCHEDULE XVIII

(Sections 1 to 4)

Motor Vehicle Transport Act

Commercial Vehicle Drivers Hours of Service Regulations

77(1) Failure to ensure commercial vehicle is equipped with ELD as required is \$1000.00.

78(1) Failure to ensure ELD operates in good working order and is calibrated and maintained is \$1000.00.

ACCOUNTS

Motor carriers must establish and maintain a system of accounts for ELDs that allow drivers to record their duty status in a personal account.

- Each user of the ELD must have an active account with a unique identifier assigned by the motor carrier and must require the driver's license and jurisdiction during the account creation.
- An ELD must not allow creation of more than one driver account associated with a driver's license.
- The ELD records events during non-authenticated driving of a CMV and creates a RODS for the "unidentified driver account."
- ELD must allow a motor carrier to configure an ELD for a driver who may be exempt from the use of an ELD.
- A ELD must accommodate and require concurrent authentication for team drivers.

SCHEDULE XVIII

(Sections 1 to 4)

Motor Vehicle Transport Act

Commercial Vehicle Drivers Hours of Service Regulations

77(4) Failure to ensure ELD is configured to allow authorized driver to indicate yard moves is \$600.00

77(6) (a) Use more than one ELD at same time is \$1000.00

(b) Request, require or allow driver to use more than one ELD at same time \$2000.00

78.1 Failure to create and maintain system of accounts for ELDs is \$1000.00

PDF HEADER PAGE AND GRID

The header peger and the grid are consistent with all ELD devices and all providers.

PRINTED PDF HEADER

Date of RODS (MM-DD-YY)	Day Starting Time (HH:MM:SS)	UTC Time Zone Offset (HH:MM)	Current Location (latitude, longitude)		Output File Comment	Current Date and Time (MM-DD-YY HH:MM:SS)
11-19-18	00:00:00	05:00	6 km NNE Cornwall ON (45.06, -74.68)		Officer W. J. Thompson, ID 17-0123	11-22-18 09:34:21
Driver Name (Last, First)	Driver ID (Username)	Exempt Driver Status (E: Exempt, 0: No)	Driver license (No and Jurisdiction)		Co-Driver Name (Last, First)	Co-Driver ID (Username)
Smith, Richard	sr123456	0	SMIR-123456-01 (QC)			
Power Unit Number (ID or Licence No & Jurisdiction)	VIN (Power Unit)	Total Vehicle Distance (Start – End of the Day)	Distance today (km)	Cur. Total Distance (km)	Cur. Total Engine Hours (hours)	Trailer Number (ID or Licence No & Jurisdiction)
1) 12345 2) FF98765-QC	1) 1M2P267YSAM022445 2) -1FUJGHV0CLBP8896	1) 346470 - 346608 2) 204885 - 204998	1) 138 2) 113	204998	6265.4	T12345 T542356 R956471-ON
Carrier Name	Home Terminal (Address)	Principal Place of Business (Address)				
Consolidated Truckload Inc.	1234 Industrial Street, Montreal, QC, H1C 1M1	1234 Industrial Street, Montreal, QC, H1C 1M1				
Operating Zone (1, 2, or 3)	Cycle (7 or 14)	Total Hours (in work shift)	Total Hours (in cycle)	Remaining Hours (in cycle)	Off-Duty Time Deferral (Status and time deferred) (0: none, 1: Day 1, 2: Day 2 – Time deferred: HH:MM)	
1	7	09:15	53:30	16:30	1 (02:00)	
Data Diagnostic Status (Status & Diagnostic Code)	Unidentified Driving Records (0: none, 1: active)	Malfunction Status (Status & Malfunction Code)	ELD Identifier	ELD Provider	ELD Certification ID	ELD Authentication Value
1 (Code 2)	1	0	1001ZE	ELD Provider Inc.	ZA10	D3A4506EC8FF566B506EC8FF566BDFBB

The header must include the following data:

Driver Last Name

Driver First Name

ELD username for the driver

Driver License Issuing Jurisdiction

Driver License Number

Co-Driver Last Name

Co-Driver First Name

ELD username for the co-driver

CMV Power Unit Number

CMV VIN

Trailer Number(s)

Carrier Name

Home Terminal Address – Determines time zone of RODS

Principal place of Business Address – Determines time zone of RODS

Cycle Used

Day Starting Time

Time Zone Offset from UTC

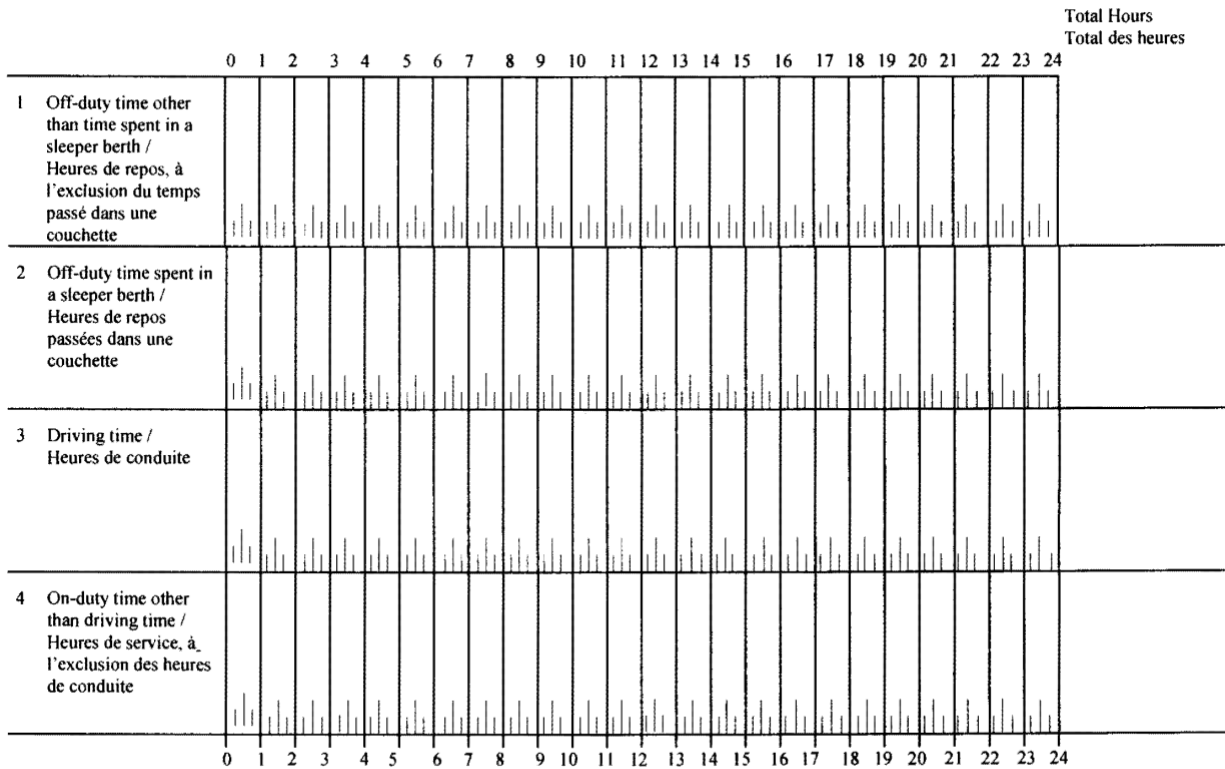
Exempt Driver Configuration

Current Date

Current Time

Current Latitude
 Current Longitude
 Current Total Vehicle Distance
 Current Total Engine Hours
 ELD Certification ID
 ELD Identifier
 ELD Authentication Value
 Output File Comment.

GRID



Information to be Shown on the Day Graph Grid

- Total hours.
- Off duty.
- Sleeper Berth.
- Driving; and
- On duty not driving.

SCHEDULE XVIII

(Sections 1 to 4)

Motor Vehicle Transport Act

Commercial Vehicle Drivers Hours of Service Regulations

82(1) (a) Failure to enter information in record of duty status at beginning of each day is \$500.00

(b) Failure to require driver to enter information in record of duty status at beginning of each day is \$1000.00

82(2) (a) Failure to record information as required in record of duty status \$500.00

REQUIRED DATA FOR ELD EVENTS

The required data elements for each event are:

- event sequence identification numbers: serial identifier assigned to each required ELD event, it keeps a continuous record, on a given ELD, across all users of that ELD
- event record status indicates if an event is active or inactive:
 - active 1
 - inactive changed 2
 - inactive change requested 3
 - inactive change rejected 4
- event origin:
 - automatically recorded by ELD 1
 - edited or entered by the Driver 2
 - edit requested by an authenticated user other than the Driver (admin) 3
 - assumed from Unidentified Driver profile 4
- event type:
 - A change in driver's duty status 1
 - An intermediate log 2
 - A change in driver's indication of personal use of CMV or yard moves 3
 - A driver's certification/re-certification of RODS 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
- Off-duty time deferral 20
- A change in driver's cycle 21
- A change in operating zone 22
- Additional hours not recorded 23

Table 6 from the Technical Standard

- event code
- date
- time
- accumulated vehicle distance
- engine hours
- latitude and longitude
- distance since last valid coordinates – 0 is correct
- malfunction indicator status, identifies when the ELD has an active malfunction at the time of the event.
- data diagnostic event indicator status, identifies if the ELD has an active data diagnostic event for the driver at the time of the event.
- comment/annotation
- driver location description
- event data check value

EVENT DETAILS

Events are triggered by changes in duty status and are collected from the ECM. The ELD records data of the driver's duty status and the operational integrity of the ELD system.

EVENT DETAILS:

Changes in driver's Duty Status, Intermediate Logs and Special Driving Conditions (Personal Use and Yard Moves)												
Date & time	Event	Geo-Location	Latitude, Longitude		Distance last val. coord.	CMV	Distance (Accum.)	Hours (Elapsed)	Distance (Total)	Record Status	Record Origin	Seq. ID
11-19-18												
00:20:12	ON	8 km SSW Montreal QC	36.99	-121.55	0	12345	0	0.0		1	1	1110
00:21:45	YM start	8 km SSW Montreal QC	36.99	-121.55	0	12345	0	0.0	346470	1	1	1111
00:52:52	YM end	8 km SSW Montreal QC	36.99	-121.55	0	12345	1	0.5	346471	1	1	1112
00:53:31	DR	8 km SSW Montreal QC	36.99	-121.55	0	12345	1	0.5		1	1	1113
01:53:31	INT	Geo-Location...	40.70	-85.46	0	12345	99	1.5		1	1	0FBB
02:53:31	INT	Geo-Location...	41.54	-85.06	0	12345	202	2.5		1	1	0FBC
03:15:28	SB	Rest Area, Mallorytown, HW 401	M	M	9	12345	233	2.9		1	1	0FBD
16:48:29	ON	Geo-Location...	45.21	-74.34	0	12345	0	0.0		1	1	0FE2
17:19:15	DR	Geo-Location...	45.21	-74.34	0	12345	0	0.2		1	1	0FE6

An ELD must record data for all distinct events specified in **4.5.1.1 – 4.5.1.11** of the Technical Standard.

ELD Sensing: The ELD is consistently monitoring.

- **Engine Power Status:** an ELD must be powered on and become fully functional within 1 minute of the CMV receiving power and must remain powered for as long as the CMV stays powered.
- **Vehicle Motion Status:** An ELD must automatically determine a CMV is in motion when the vehicle speed reaches a threshold of 8 km/h. When the speed drops to 0 km/h and stays a 0 for 3 seconds the vehicle will be stopped.
- **Vehicle Distance:** An ELD must monitor accumulated vehicle distance and total vehicle distance.
- **Engine Hours:** An ELD must monitor elapsed engine hours and total engine hours.
- **Date and Time:** The ELD must record the date and time automatically without any external input or interference.
- **CMV Position:** ELD must automatically determine the position of the CMV in standard latitude/longitude coordinates accurate to ± 0.8 kilometer without any external input or interference.
- **CMV VIN**

SCHEDULE XVIII

(Sections 1 to 4)

Motor Vehicle Transport Act

Commercial Vehicle Drivers Hours of Service Regulations

77(2) (a) Failure to record information associated with record of duty status as required \$500.00

(b) Failure to require driver to record information associated with record of duty status as required is \$1000.00

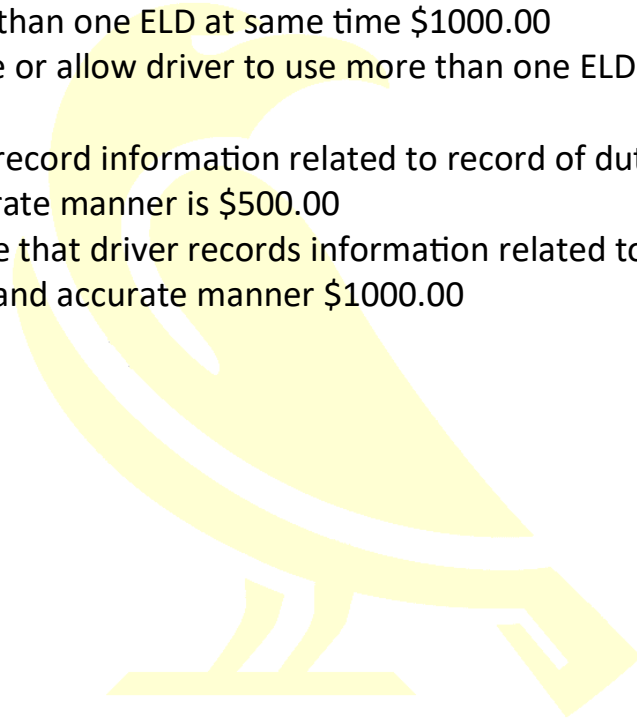
77(5) Failure to manually input or verify required information in ELD is \$500.00

77(6) (a) Use more than one ELD at same time \$1000.00

(b) Request, require or allow driver to use more than one ELD at same time is \$2000.00

77(8) (a) Failure to record information related to record of duty status in complete and accurate manner is \$500.00

(b) Failure to ensure that driver records information related to record of duty status in complete and accurate manner \$1000.00



RAVEN RULES – UNIDENTIFIED DRIVING

Data Diagnostic Status (Status & Diagnostic Code)	Unidentified Driving Records (0: none, 1: active)	Malfunction Status (Status & Malfunction Code)
1 (Code 2)	1	0

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. If no driver is authenticated the ELD will record the time under the “Unidentified Driver” account until the motor carrier and the driver review the records and they are assigned to the true and correct owner.

SCHEDULE XVIII

(Sections 1 to 4)

Motor Vehicle Transport Act

Commercial Vehicle Drivers Hours of Service Regulations

77(2) (a) Failure to record information associated with record of duty status as required is \$500.00

(b) Failure to require driver to record information associated with record of duty status as required is \$1000.00

87(1) Failure to monitor driver’s compliance with the Regulations is \$2000.00

87(2) Failure to take remedial action and record required information is \$2000.00

RAVEN RULES – MALFUNCTIONS

If a malfunction is not addressed within eight consecutive days, the motor carrier must cease using the device until it is repaired or replaced. Motor carriers are responsible for ensuring that the ELD installed in the CMV is in good working order and maintained according to manufacturer or seller specifications. This includes calibration and addressing any malfunctions promptly.

Data Diagnostic Status (Status & Diagnostic Code)	Unidentified Driving Records (0: none, 1: active)	Malfunction Status (Status & Malfunction Code)
1 (Code 2)	1	0

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

P Power compliance malfunction:

- An ELD must monitor the data it receives from the ECM, its onboard sensors, and data record history to identify instances of non-compliance with the power requirements.
- A power compliance malfunction indicates an aggregated driving time understatement of 30 minutes or more on the ELD over a 24-hour period across all driver profiles.

E Engine synchronization compliance malfunction

- An ELD must monitor the data it receives from the engine ECM, its onboard sensors, and data record history to identify instances of non-compliance with the ELD engine synchronization requirement.
- An ELD must monitor its connectivity to the ECM and the retrieval of required data and will record an engine-synchronization data diagnostics event when updated values are not available within 60 seconds.

- An ELD must set an engine synchronization compliance malfunction if connectivity to any of the required data sources is lost for more than 30 minutes during a 24-hour period aggregated across all driver profiles.

T Timing compliance malfunction

The ELD must cross-check its compliance with an accurate external UTC source within a 10-minute tolerance.

L Positioning compliance malfunction

- An ELD must monitor the availability of valid position measurements and must track the distance and elapsed time from the last valid measurement point.
- An ELD must monitor elapsed time during periods when the ELD fails to acquire a valid position measurement within 8 kilometers 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.
- When a ELD event is recorded when the ELD did not acquire a valid position within the most recent elapsed 8 kilometers of driving, the ELD will record "X" in the latitude and longitude fields or "M" if the location is entered manually.
- When a ELD event recorded when the ELD has a positioning compliance malfunction, the ELD will record "E" in the latitude and longitude fields regardless of if the driver manually enters location information.

R Data recording compliance malfunction

- An ELD must monitor storage capacity and integrity and will detect a data recording compliance malfunction when the ELD can no longer record or retain required events or retrieve records that are not otherwise catalogued remotely by the motor carrier.
- If the ELD is unable to retrieve records that are not stored remotely, it suggests that there may be a malfunction or issue with accessing and retrieving the necessary data for compliance purposes.

- An ELD monitors the completeness of the ELD event record information and will record a missing data elements data diagnostics event for any required field that is missing data at the time of recording.

S Data transfer compliance malfunction

- An ELD must implement monitoring functions to verify that the data transfer mechanism(s) are continuing to function properly.
- An ELD will verify this functionality at least once every 7 days and if the monitoring fails to confirm proper in-service operation of the data transfer mechanism(s), the ELD will record a data transfer data diagnostic event.
- After an ELD records a data transfer data diagnostic event, the ELD will increase the frequency of the monitoring to once every 24-hour period.
- If the ELD has unconfirmed data in three consecutive monitoring checks, the ELD will record a data transfer compliance malfunction.

O Other ELD detected malfunction:

In addition to the required monitoring the ELD provider may implement additional, technology-specific malfunction and data diagnostic detection

DRIVERS RESPONSIBILITY MALFUNCTION

When a driver of a CMV is notified the ELD is showing an error or data diagnostic code listed in **Table 4** of Schedule 2 of the Technical Standard, the driver must promptly inform the motor carrier once the driver is parked.

The driver needs to include the following details in the RODS for the day they noticed the problem:

- (a) The specific error or data diagnostic code from **Table 4** of Schedule 2.
- (b) The date and time when they noticed the error or code.
- (c) The time when they informed the motor carrier about the error or code.

From the day the driver notices the error or code until the ELD is fixed or replaced, the driver must continue to record the code mentioned in point (3)(a) in each RODS.

MOTOR CARRIER RESPONSIBILITY MALFUNCTION:

When the motor carrier is notified by the driver or becomes aware of the malfunction or data diagnostic code, they have 14 days to repair or replace the ELD. If the driver returns to the home terminal from a planned trip after the 14-day period, the repair or replacement should be done at that time.

The motor carrier needs to keep a register of ELD malfunctions or data diagnostic codes for the commercial vehicles they operate. This register should include the following information:

- The name of the driver who noticed the malfunction or code.
- The names of all drivers who used the commercial vehicle after the malfunction was discovered until the ELD was fixed.
- The make, model, and serial number of the ELD.
- The license plate or Vehicle Identification Number of the commercial vehicle.
- The date and location when the malfunction or code was noticed, as well as the date when the carrier was notified or became aware of it.
- The date when the ELD was replaced or repaired, and a brief description of the actions taken to fix it.

The motor carrier must keep this information for each ELD with a malfunction for 6 months from the date of replacement or repair.

SCHEDULE XVIII

(Sections 1 to 4)

Motor Vehicle Transport Act

Commercial Vehicle Drivers Hours of Service Regulations

78(1) Failure to ensure ELD operates in good working order and is calibrated and maintained is \$1000.00

78(2) Failure to notify motor carrier ELD is displaying malfunction or data diagnostic code is \$500.00

78(3) Failure to record required information is \$500.00

78(4) Failure to record malfunction or data diagnostic code as required is \$500.00

78(5) Failure to repair or replace ELD within required time is \$1000.00

78(6) Failure to maintain register containing the required information is \$600.00

If an inspector could determine a driver unplugged the ELD or disconnected the device from Bluetooth to impede the ELD communicating with the ECM that would be tampering.

86(3) (a) Tamper with ELD is \$1000.00

(b) Request, require or allow person to tamper with ELD is \$2000.00

Tampering

86 (1) No motor carrier shall request, require, or allow a driver to keep, and no driver shall keep more than one record of duty status in respect of any day.

(2) No motor carrier shall request, require, or allow any person to enter, and no person shall enter, inaccurate information in a record of duty status or falsify, mutilate, obscure, alter, delete, destroy, or deface the records or supporting documents.

(3) No motor carrier shall request, require, or allow any person to, and no person shall, disable, deactivate, disengage, jam, or otherwise block or degrade a signal transmission or reception, or re-engineer, reprogram or otherwise tamper with an ELD so that the device does not accurately record and retain the data that is required to be recorded and retained

RAVEN RULES – DATA DIAGNOSTIC

A data diagnostic error refers to an event or situation where the ELD detects non-compliance or issues with the data it receives or records. These errors are recorded by the ELD and indicate potential problems or discrepancies in the data. Examples of data diagnostic errors can include missing or inaccurate information, gaps in driving logs, or inconsistencies between the ELD data and the actual operations of the commercial vehicle. An unattended data diagnostic event (for the driver) will turn into a malfunction (for the ELD device that now effects any driver that logs in to the device).

Data Diagnostic Status (Status & Diagnostic Code)	Unidentified Driving Records (0: none, 1: active)	Malfunction Status (Status & Malfunction Code)
1 (Code 2)	1	0

Table 4

Standard Coding for Required Compliance Data Diagnostic Event Detection

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 events

6 Other ELD identified diagnostic events

Data Diagnostic Event

Power data diagnostic event

- An ELD monitors the data it receives from the ECM, its onboard sensors, and data record history to identify instances when it may not have complied with the power requirements.
- The ELD will record a power data diagnostics event for the driver(s) at the time of detection.
- An ELD will set a power compliance malfunction if the power data diagnostics event indicates an aggregated driving time understatement of 30 minutes or more on the ELD over a 24-hour period across all driver profiles.
- If the power data diagnostics event shows that the ELD has underestimated the total driving time by 30 minutes or more over a 24-hour period, the ELD sets a power compliance malfunction.

Engine synchronization data diagnostic event

- An ELD monitors the data it receives from the ECM, its onboard sensors, and data record history to identify instances and durations of its non-compliance with the ELD engine synchronization requirement.
- The ELD must record an engine-synchronization data diagnostics event.
- An ELD required to establish a link to the ECM must monitor its connectivity to the engine ECM and its ability to retrieve the vehicle parameter data and must record an engine-synchronization data diagnostics event when it no longer acquires updated data for the ELD required within 60 seconds.
- An ELD will set an engine synchronization compliance malfunction if connectivity to any of the required data sources is lost for more than 30 minutes during a 24-hour period aggregated across all driver profiles.
- The ECM connectivity status is continuously communicated to the driver when the ELD is powered.

Missing required data elements data diagnostic event

An ELD must record data for all distinct events 1 – 11 and each event has required data. When data is missing or corrupt it causes a data diagnostic error.

Data transfer data diagnostic event

- An ELD must implement monitoring functions to verify that the data transfer mechanism(s) are continuing to function properly.
- An ELD must verify this functionality at least once every 7 days.
- If the monitoring mechanism fails to confirm proper operation of the data transfer mechanism(s), an ELD will record a data transfer data diagnostic event and enter an unconfirmed data transfer mode.
- When an ELD records a data transfer data diagnostic event, the ELD increases the frequency of the monitoring to check at least once every 24-hour period.
- When the ELD stays in the unconfirmed data transfer mode after the next three consecutive monitoring checks, they will record a data transfer compliance malfunction.

Unidentified driving records data diagnostic events

- When there are ELD records from driving time recorded under the unidentified driver profile, the ELD prompts the driver(s) authenticating in of the existence of new unassigned driving time.
- The driver must review and either acknowledge the assignment of the unidentified driver records or indicate that the records are not
- Attributable to the driver.
- If more than 30 minutes of driving in a 24-hour period occur on the unidentified driver the ELD will record an unidentified driving records data diagnostic event and the data diagnostic indicator must be turned on for all drivers authenticated into that ELD for the current day and the following 14
- Days.
- An unidentified driving records data diagnostic event is cleared by the ELD when unidentified driving time for the current day and the 14 previous days drops to 15 minutes or less.

Other ELD identified diagnostic event.

In addition to the required monitoring, the ELD provider may implement additional, technology-specific malfunction and data diagnostic detection.

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(Sections 1 to 4)

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78(3) Failure to record required information is \$500.00

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If an inspector could determine a driver unplugged the ELD or disconnected the device from Bluetooth to impede the ELD communicating with the ECM that would be tampering.

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(2) No motor carrier shall request, require, or allow any person to enter, and no person shall enter, inaccurate information in a record of duty status or falsify, mutilate, obscure, alter, delete, destroy, or deface the records or supporting documents.

(3) No motor carrier shall request, require, or allow any person to, and no person shall, disable, deactivate, disengage, jam, or otherwise block or degrade a signal transmission or reception, or re-engineer, reprogram or otherwise tamper with an ELD so that the device does not accurately record and retain the data that is required to be recorded and retained.

RAVENS RULES: EVENT DETAILS – READING THE PDF RODS AND INTERPRETING EVENT DETAILS FOR COMPLIANCE

To ensure compliance with the current Hours of Service regulations, motor carriers are required to keep extensive records of their driver's duty status changes. These records must include all the necessary information associated with each event, with some events requiring more supporting data than others. Failure to provide complete data for any of the eleven events may result in a data diagnostic violation.

Changes in driver's Duty Status, Intermediate Logs and Special Driving Conditions (Personal Use and Yard Moves)												
Date & time	Event	Geo-Location	Latitude, Longitude		Distance last val. coord.	CMV	Distance (Accum.)	Hours (Elapsed)	Distance (Total)	Record Status	Record Origin	Seq. ID
11-19-18												
00:20:12	ON	8 km SSW Montreal QC	36.99	-121.55	0	12345	0	0.0		1	1	1110
00:21:45	YM start	8 km SSW Montreal QC	36.99	-121.55	0	12345	0	0.0	346470	1	1	1111
00:52:52	YM end	8 km SSW Montreal QC	36.99	-121.55	0	12345	1	0.5	346471	1	1	1112
00:53:31	DR	8 km SSW Montreal QC	36.99	-121.55	0	12345	1	0.5		1	1	1113
01:53:31	INT	Geo-Location...	40.70	-85.46	0	12345	99	1.5		1	1	0FBB
02:53:31	INT	Geo-Location...	41.54	-85.06	0	12345	202	2.5		1	1	0FBC
03:15:28	SB	Rest Area, Mallorytown, HW 401	M	M	9	12345	233	2.9		1	1	0FBD
16:48:29	ON	Geo-Location...	45.21	-74.34	0	12345	0	0.0		1	1	0FE2
17:19:15	DR	Geo-Location...	45.21	-74.34	0	12345	0	0.2		1	1	0FE6

Change in Driver Duty Status:

- For every change of duty, the ELD will associate the record with the driver, the vehicle, and the motor carrier.
- All events have required data elements that will record an error if missing or corrupt.

Intermediate Logs

- If the driver's duty status is set to driving, and there has not been a duty status change recorded in the previous 1-hour period, the ELD must record a new intermediate log event.
- Intermediate logs record data two ways: conventional location precision and reduced location precision.

Personal Use and Yard Move - Change in Driver Indication of Allowed Conditions that Impact Driving Time Recording:

- When a driver indicates personal use of CMV or yard moves changes, the ELD must record a new event associated to the driver, the vehicle and the motor carrier.
- The event must include all required data elements.

The required data elements for change in driver duty status, intermediate logs and personal use and yard move are:

- Event Sequence ID Number: use CTRL F to find events
- Event Record Status: anything with a 2, 3, or 4 needs additional review
- Event Record Origin: anything with a 2, 3, or 4 needs additional review
- Event Type and Event Code: Print or have Table 6 and Table 9 for reference when reviewing RODS.
- Event Date and Event Time: always in drivers home terminal
- Accumulated Vehicle Distance: If there is no data this needs additional review.
- Elapsed Engine Hours: If there is no data this needs additional review.
- Event Latitude and Event Longitude: If there is no data, or a M or a X this needs additional review.
- Distance Since Last Valid Coordinates: if there is a 0 that is correct, if there is data or a 9, this needs additional review.
- Malfunction Indicator Status: If there is any data this needs additional review.
- Data Diagnostic Event Indicator Status for Driver: If there is any data this needs additional review.
- Event Comment /Annotation: Only certain events require a comment, if there is a comment its good practise to review it. For example, if you notice a driver is logging off duty but writing a comment: unloading or waiting at scale, this would be an incorrect duty status as per the comment.
- Driver Location Description: the ELD is supposed the be recording data automatically and if a location description is required by the driver, it's because the ELD isn't getting the location from the ECM, and this needs additional review.
- Event Data Check Value: this is a system check that I ignore.

Login/Logout, Certification of RODS, Data Diagnostics and Malfunctions						
Date & time	Event	Additional info	CMV	Distance (Total)	Hours (Total)	Seq. ID
11-19-18						
00:18:54	Login		12345	346470	6386.1	10FF
12:05:51	Data Diagnostic (detected)	Code 2 (Engine synchronization)	12345	346804	6391.4	1096
12:08:22	Data Diagnostic (cleared)	Code 2 (Engine synchronization)	12345	346804	6391.5	1097
18:28:55	Certification of RODS	Time Zone: EST (UTC -05:00)	12345	--	--	1102
18:29:33	Logout		12345	346943	6395.8	112F
11-20-18						
07:41:22	Re-Certification of RODS (1)	Time Zone: EST (UTC -05:00)	12345	--	--	1222

Change in Driver's Cycle, Change in Operating Zone, Off-Duty Time Deferral									
Date & time	Event	Geo-Location	Latitude, Longitude		Distance last val. coord.	CMV	Record Status	Record Origin	Seq. ID
11-19-18									
00:19:15	Cycle 1 (7 days)					12345	1	3	1089
02:05:41	Operating Zone 1 (South of latitude 60°N in Canada)	Geolocation...	45.08	-73.42	0	12345	1	1	10FF
18:27:43	Off-Duty Time Deferral Day 1 (02:00)					12345	1	1	1201

LOGIN/LOGOUT, CERTIFICATION, DATA DIAGNOSTICS AND MALFUNCTIONS:

Driver Login/Logout Activity

- At each instance when a driver or authorized user authenticates in and out of the ELD, the ELD must record the event.
- The ELD must associate the record with the driver, the vehicle, and the motor carrier, and must include the following data elements:
 - Event Sequence ID Number
 - Event Type: have **Table 6** and **Table 9** for reference
 - Event Code have **Table 6** and **Table 9** for reference
 - Event Date
 - Event Time
 - Total Vehicle Distance: If there is no data this needs additional review and
 - Total Engine Hours: If there is no data this needs additional review.

Certification of Record of Duty Status 78.2 A driver shall, immediately after recording the last entry for a day, certify the accuracy of their record of duty status.

Driver Certification of Own RODS

- At each instance when a driver certifies or re-certifies a RODS for a given day are true and correct the ELD will record the event.
- The ELD must associate the record with the driver, the vehicle and the motor carrier, and must include the following data elements:
 - Event Sequence ID Number
 - Event Type have **Table 6** and **Table 9** for reference.
 - Event Code have **Table 6** and **Table 9** for reference.
 - Time Zone Offset from UTC
 - Event Date of the certified RODS and
 - Event Time

ELD Malfunction and Data Diagnostics Occurrence

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

The ELD must associate the record with the driver, the vehicle, and the motor carrier, and must include the following data elements:

- Event Sequence ID Number
- Event Type have **Table 6** and **Table 9** for reference.
- Event Code have **Table 6** and **Table 9** for reference.
- Malfunction/Diagnostic Code: If there is data this needs additional review.
- Event Date
- Event Time
- Total Vehicle Distance: If there is no data this needs additional review and
- Total Engine Hours: If there is no data this needs additional review.

Change in cycle, change in operating zone, off duty time deferral.

Change in Driver's Cycle

- At each instance the driver changes a cycle the ELD records over the time period for which this file is generated.
- The ELD must associate the record with the driver, the vehicle and the motor carrier, and must include the following data elements:
 - Event Sequence ID Number: use CTRL F to find events

- Event Record Status: anything with a 2, 3, or 4 needs additional review
- Event Record Origin: anything with a 2, 3, or 4 needs additional review
- Event Type and Event Code: Print or have Table 6 and Table 9 for reference when reviewing RODS.
- Event Date and Event Time: always in drivers home terminal
- Corresponding CMV Order Number
- Order Number for Record Originator
- New Cycle Used
- Event Data Check Value: this is a system check that I ignore.

Change in Operating Zone

- At each instance there is a Change in Operating Zone for the driver for the time period for which this file is generated.
- It must be rank ordered with the most recent record on top in accordance with the date and time fields of the record.
 - Event Sequence ID Number: use CTRL F to find events
 - Event Record Status: anything with a 2, 3, or 4 needs additional review
 - Event Record Origin: anything with a 2, 3, or 4 needs additional review
 - Event Type and Event Code: Print or have Table 6 and Table 9 for reference when reviewing RODS.
 - Event Date and Event Time: always in drivers home terminal
 - Event Latitude and Event Longitude: If there is no data, or a M or a X this needs additional review.
 - Distance Since Last Valid Coordinates: if there is a 0 that is correct, if there is data or a 9, this needs additional review.
 - Corresponding CMV Order Number
 - Order Number for Record Originator
 - New operating zone
 - Event Data Check Value: this is a system check that I ignore.

Off duty time deferral.

- At each instance when the Off-duty time deferral status changes, the ELD must record a new event.
- The ELD must associate the record with the driver, the record originator, the vehicle and the motor carrier, and must include the following data elements:
 - Event Sequence ID Number: use CTRL F to find events
 - Event Record Status: anything with a 2, 3, or 4 needs additional review
 - Event Record Origin: anything with a 2, 3, or 4 needs additional review
 - Event Type and Event Code: Print or have Table 6 and Table 9 for reference when reviewing RODS.
 - Event Date and Event Time: always in drivers home terminal
 - Event Comment /Annotation: Only certain events require a comment, if there is a comment its good practise to review it. For example, if you notice a driver is logging off duty but writing a comment: unloading or waiting at scale, this would be an incorrect duty status as per the comment.
 - Off-duty Time Deferral Status
 - Off-duty Time Deferred

SCHEDULE XVIII

(Sections 1 to 4)

Motor Vehicle Transport Act

Commercial Vehicle Drivers Hours of Service Regulations

78.2 Failure to certify accuracy of record of duty status immediately after recording last entry for a day is \$500.00

78.3(1) Failure to verify accuracy of certified records of duty status or require necessary changes is \$1000.00

78.3(2) Failure to make necessary changes to certify accuracy of, and forward, amended records of duty status is \$500.00

Comments, Remarks and Annotations						
Date (MM-DD-YY)	Time (HH:MM:SS)	Seq. No.	Comment or Annotation	Edit Date (MM-DD-YY)	Edit Time (HH:MM:SS)	Edit Username (originator)
11-19-18	07:41:22	1222	Driver error	11-20-18	07:41:22	sr123456

Additional Hours not recorded								
Date	Work shift Start (HH:MM)	Work shift End (HH:MM)	Total Hours (On-Duty)	Total Hours (Off-Duty)	CMV	Record Status	Record Origin	Seq. ID
11-18-18	00:00	23:59	00:00	24:00	12345	1	2	104E
11-17-18	00:00	23:59	00:00	24:00	12345	1	2	104F
11-16-18	07:00	17:00	09:00	15:00	12345	1	2	1106
11-15-18	07:00	17:00	09:00	15:00	12345	1	2	1107
...					12345	1	2	1108
11-05-18	07:00	17:00	09:00	15:00	12345	1	2	1109

Engine Power Up and Shut Down									
Date & time	Event	Geo-Location	Latitude, Longitude		Distance last val. coord.	CMV	Distance (Total)	Hours (Total)	Seq. ID
11-19-18									
00:18:45	Power Up	8 km SSW Montreal QC	36.99	-121.55	0	12345	346470	6386.1	0FBE
03:16:12	Shut Down	Geo-Location...	41.85	-85.00	0	12345	346525	6388.7	0FC3
06:04:22	Power Up	Geo-Location...	41.85	-85.00	0	12345	346525	6388.9	0FC4
07:40:12	Shut Down	Geo-Location...	41.85	-85.00	0	12345	346608	6389.0	0FC5
07:42:55	Power Up	Geo-Location...	41.85	-85.00	0	12345	346608	6389.1	0FC8
07:43:39	Shut Down	Geo-Location...	41.85	-85.00	0	12345	346608	6389.1	0FCC

COMMENTS, REMARKS AND ANNOTATIONS

This lists all ELD event records that have an annotation, comment, or a manual entry of location description by the driver. Always review the comments, they may include reason for edits, and this is where drivers explain extraordinary circumstances like personal conveyance.

ADDITIONAL HOURS NOT RECORDED

At each instance when an authorized user is entering additional hours that were not recorded during the current day or the required 14 previous days the ELD will record a new event.

The ELD must associate the record with the driver, the record originator, the vehicle, and the motor carrier, and must include the following data elements for each day during the current day and the 14 previous days:

- Event Sequence ID Number: use CTRL F to find events
- Event Record Status: anything with a 2, 3, or 4 needs additional review

- Event Record Origin: anything with a 2, 3, or 4 needs additional review
- Event Type and Event Code: Print or have Table 6 and Table 9 for reference when reviewing RODS.
- Event Date and Event Time: always in drivers home terminal
- Date of the day
- Beginning of work shift Time and End of work shift Time
- Total Hours logged in off-duty
- Total Hours logged in on-duty
- Event Comment /Annotation: Only certain events require a comment, if there is a comment its good practise to review it.

CMV'S ENGINE POWER UP AND SHUT DOWN ACTIVITY

When a CMV's engine is powered up or shut down, an ELD must record the event within 1 minute of occurrence.

The ELD must associate the record with the driver or the unidentified driver profile, the vehicle, and the motor carrier, and must include the following data elements:

- Event Sequence ID Number: use CTRL F to find events
- Event Record Status: anything with a 2, 3, or 4 needs additional review
- Event Record Origin: anything with a 2, 3, or 4 needs additional review
- Event Type and Event Code: Print or have Table 6 and Table 9 for reference when reviewing RODS.
- Event Date and Event Time: always in drivers home terminal
- Total Vehicle Distance: If there is no data this needs additional review.
- Total Engine Hours: If there is no data this needs additional review
- Event Latitude and Event Longitude: If there is no data, or a M or a X this needs additional review.
- Distance Since Last Valid Coordinates: if there is a 0 that is correct, if there is data or a 9, this needs additional review.

SCHEDULE XVIII

(Sections 1 to 4)

Motor Vehicle Transport Act

Commercial Vehicle Drivers Hours of Service Regulations

77(2) (a) Failure to record information associated with record of duty status as required is \$500.00

(b) Failure to require driver to record information associated with record of duty status as required is \$1000.00

77(5) Failure to manually input or verify required information in ELD is \$500.00

77(6) (a) Use more than one ELD at same time is \$1000.00

(b) Request, require or allow driver to use more than one ELD at same time is \$2000.00

77(8) (a) Failure to record information related to record of duty status in complete and accurate manner is \$500.00

(b) Failure to ensure that driver records information related to record of duty status in complete and accurate manner is \$1000.00

MONITORING BY MOTOR CARRIERS

Effective monitoring cannot be done monthly, after the fact, using printed PDF RODS sent to an off-site third party and scanned. Carriers must monitor the ELD dashboard and the available hours on a consistent basis to ensure compliance with the Regulations. Carriers must verify the accuracy of RODS daily and request edits if needed.

Verification of Records of Duty Status

78.3 (1) A motor carrier shall verify the accuracy of the certified records of duty status that are forwarded by the driver according to the supporting documents provided and shall require from the driver those changes necessary to ensure the accuracy of the records.

(2) The driver shall either accept or reject the changes required by the motor carrier, make the necessary changes and recertify the accuracy of their record of duty status and forward the amended records of duty status to the motor carrier.

Monitoring

87 (1) A motor carrier shall monitor the compliance of each driver with these Regulations.

(2) A motor carrier that determines that there has been non-compliance with these Regulations shall take immediate remedial action and record the dates on which the non-compliance occurred, and the action taken.

78.3 (1) This is 2 parts:

1. Verify the accuracy of the certified RODS that are forwarded: RODS are required to be certified after the last entry of the day. The carrier has the RODS immediately at the end of each day. It is the responsibility of the carrier and the driver to verify accuracy every day.
2. Require from the driver changes to ensure accuracy. These edits are required to be done daily or the inaccurate data is permanent and cannot be amended.

78.3 (2) The driver is required to review the changes requested and work with the carrier going back and forth until both agree the RODS are accurate and compliant.

87 (1) is straightforward. The ELD is consistently monitoring the drivers time and checking the integrity of the ELD device and reporting this information back to the carrier using the carrier dashboard. The ELD device alerts the driver with an audible and visual warning 30 minutes before a duty status limit is reached and/or if there are device integrity, data integrity or connectivity issues.

87 (2) is 3 parts.

1. Determine non-compliance – determination occurs immediately when a duty status limit is reached, and the carrier and driver are notified via the ELD or the dashboard.
2. Immediate – as soon as the carrier and the driver are notified there is a violation. The ELD data provides a time stamp for the record.
3. Remedial action taken – This depends on the non-compliance. A driver going over a duty status limit should be immediately stopped and placed out of service. A malfunction, the driver should stop and switch to paper logs and follow the malfunction protocol, a data diagnostic event should be noted and cleared if possible or the event may resolve itself after certain criteria is met. The ELD records these actions with time stamps, and it is important to make clear notes to

satisfy the criteria of recording the dates on which the non-compliance occurred, and the action taken.

Below is the current guidance for a monitoring policy. The ELD considerations was added for each point where applicable.

The process used to monitor drivers for compliance must produce measurable results. The goal of the company is to work towards achieving a Fatigue Violation Rate of 0% (i.e., no fatigue-related violations by any drivers).

The following approach should be used when reviewing driver records for hours-of-service violations:

- Assign a person to be responsible for monitoring, taking remedial action when violations are found, etc. *ELD: monitor dashboard daily, verify certified RODS as received. (RODS are required to be certified at the last entry of the day)*
- This person should also be responsible for ensuring they and other applicable employees have the necessary skills and knowledge to accurately analyze hours of service records.
- Verify that all authorized drivers have a record for every calendar day (including days off and holidays). *ELD: will not have missing records.*
- Check all authorized drivers for form and manner violations for every day. This includes checking for name, address, date, daily hour totals, and odometer readings on the record. *ELD: no longer necessary once the ELD is set up with company information. The ELD does not make form and manner errors such as spelling or abbreviations. The odometer and daily totals are calculated automatically.*
- Check all authorized drivers for fatigue-related violations: *ELD: driver is alerted 30 minutes before a daily limit is reached. Driver is alerted to connectivity and device integrity issues. There should never be a fatigue violation because the driver would stop driving when alerted to a daily limit being reached.*
- Use independent supporting documents (that cannot be created or modified by the driver) to verify the accuracy of each driver's records. Supporting documents may include fuel receipts, bills of lading with shipping times, GPS records, or meal/hotel receipts, toll receipts, etc. *ELD: This is still required the ELD does not understand intent. If a driver logs off duty for a on duty activity such as loading the ELD will not detect an incorrect duty status violation.*

- Where an Electronic Onboard Recording Device (EOBR) is used in place of a hardcopy log, verify that the driver's on-duty and off-duty hours are accurate. For example, ensure that the EOBR has not recorded loading or unloading time as "off-duty" time. *ELD: Only certified ELD are to be used. The header will contain the ELD Authentication Value and ELD Identifier to confirm device certification.*
- When violations are identified in a driver's records, take appropriate remedial action. All action(s) taken must be documented in the driver's file and must include the date the violation was identified, and date issue was addressed.
- Prepare a monthly report of your findings and any corrective action(s) taken. Retain all reports for the current year and the preceding 4 years. The report should include a calculation of each driver's Fatigue Violation Rate (FVR) and of the company's overall FVR using the formula below:

$$\text{FVR} = \frac{\text{Number of days with 1 or more fatigue-related violations}}{\text{Total number of days checked}} \times 100\%$$
- The report should also include a calculation of every driver's Form and Manner Violation Rate (FMVR) using the formula below:

$$\text{FMVR} = \frac{\text{Number of days with 1 or more form and manner violations}}{\text{Total number of days checked}} \times 100\%$$
- It is recommended that carriers with one to ten drivers check every driver at least once a month for hours-of-service violations.
- Carriers with more than ten drivers should check at least ten drivers plus 10 per cent of the remaining drivers on a monthly basis. For example, a carrier with 30 drivers would check 10 drivers plus 10 per cent of the remaining 20 drivers, for a total of 12 drivers each month. In a larger company, every driver should be checked for hours-of-service compliance at least once annually. NOTE: A "driver" includes any person authorized to operate an NSC vehicle registered to the carrier. This includes full or part time employees, volunteers, mechanics, salespeople, dispatchers, office staff, owners, managers, supervisors, etc.

To satisfy the reporting regulation a carrier needs to prepare a monthly report of any findings and corrective action taken. Retain all reports for the current year and the preceding 4 years. The report should include a calculation of each driver's Fatigue Violation Rate (FVR) and of the company's overall FVR using the formula below:

$$\text{FVR} = \frac{\text{Number of days with 1 or more fatigue-related violations}}{\text{Total number of days checked}} \times 100\%$$

- The report should also include a calculation of every driver's Form and Manner Violation Rate (FMVR) using the formula below:

FMVR = Number of days with 1 or more form and manner violations x 100% Total number of days checked.

ELD: Using the compliance reports generated by the ELD a daily, weekly, or monthly compliance report can be generated for every driver that has an account. The carrier should never have drivers with daily limit violations because the ELD is alerting the driver, and the carrier is monitoring the driver using the dashboard. Use the ELD reports and compare to two different records with known information and review for falsification. Hint: DVIR is not regulated in the Hours of Service, therefore DVIR is not in the Technical Standard. This means a DVIR can be used to monitor for hours of service and the data is already in the same system.

SCHEDULE XVIII

(Sections 1 to 4)

Motor Vehicle Transport Act

Commercial Vehicle Drivers Hours of Service Regulations

87(1) Failure to monitor driver's compliance with the Regulations is \$2000.00

87(2) Failure to take remedial action and record required information is \$2000.00