What are the different types of Malfunctions and Diagnostic Events?

Q: What are the different types of Malfunctions and Diagnostic Events?

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A:

	Table 4	\\glick\customer service\Technical Support\DriverTech Info\Technical Information\HOS\Standard Coding for Required Compliance Malfunction and Data Diagnostic Table 4.xlsx
	Marks Table 4	ELD Software Changes-http://confluence.drivertech.com:8090/display/FR/ELD+Software+Changes
		Standard Coding for Required Compliance Malfunction and Data Diagnostic Event Detection
Malfunction Code	Malfunction Description	Definition
P	"Power compliance" malfunction	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. Power Compliance Malfunctions occur when the ELD is not powered for a cumulative driving time of 30 minutes or more over a 24 hour period across all driver profiles, including the unidentified driving profile. **My implementation** of this ELD event is to: 1. Aggregate the all Power Data Diagnostic Events across the entire day. 2. I will only be aggregating those events that also have .1 miles of mileage discrepancy to limit it to those cases with unrecorded movement. 3. This event will be logged as event type = 7 & event code = 1 - i.e. And ELD malfunction logged. 4. This event will be cleared less than 30 minutes of accumulated understatement exists in a rolling 24hr period.
E	"Engine synchronization compliance" malfunction	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 (pg 444) is lost for more than 30 minutes during a 24-hour period aggregated across all driver profiles, including the unidentified driver profile. **My implementation** For this event will cause the event to be triggered when the aggregation of the event-synchronization data diagnostic events is more than 30 minutes in a rolling 24hr period. If this event is signaled it will be cleared when the next day begins if the device is left on. If the device is powered down to the next day beginning the event will clear once the unit boots in the new day
T	"Timing compliance" malfunction	Timing Compliance Malfunction occurs when the ELD is not able to synchronize with UTC time and cannot go beyond a difference of 10 minutes at any time. **My implementation** For this event will cause a event to be triggered once the time/clock has been corrected. In the case that the device boots up and the system clearly knows the clock is wrong (way in the future or past) the system will show a malfunction indicator, but no malfunction event will be logged because the time for the event will be wrong and the system is not designed to deal with events with bad time stamps (events are stored and sorted on time). When time is corrected a event is triggered as event type = 7 & event code = 2 - i.e. ELD malfunction cleared.

L	"Positioning compliance" malfunction	Failure to acquire valid position persists for 60 minutes over a 24-hour period. **My implementation** For this event will be that aggregate the elapsed time when the system could not acquire a position within 5 minutes. When value reaches 60 minutes in a day the system triggers the position compliance malfunction (event type = 7 & event code = 1). The event is cleared when next day is reached. We will have to store the aggregated value along with the corresponding day.
R	"Data recording compliance" malfunction	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.
S	"Data transfer compliance" malfunction	Data transfer data malfunction event **My implementation for this event is:** If 3 days have elapsed since we signaled 'data transfer data diagnostic event' then a 'data transfer data malfunction event' will be signaled. The event will not be cleared until until a log has been transmitted successfully
O	"Other" ELD detected malfunction	
Diagnostic Code	Data Diagnostic Event	Definition
1	"Power data diagnostic" event	4.3.1.1. An ELD must be powered and become fully functional within 1 minute of the vehicle's engine receiving power and must remain powered for as long as the vehicle's engine stays powered. My implementation of this ELD event is to 1. Upon the engine turning on signal an 'engine on' event - fill out starting engine time and odometer for this event. 2. **Update** the ending odometer and ending engine time on the **current 'engine on'** event **until** the engine is no longer running and an **'engine off'** event is triggered. 3. When the engine starts running again and we find that the current engine time from the vehicle is greater than **six minutes** (to avoid round off error) as compared to the ending values for the prior engine on event (i.e. in step 1). Then log this event with the engine time & mileage discrepancy. 4. When this event is logged it will be logged with event type = 7 & event code = 4 - i.e. Data diagnostic event cleared. The reason we signal the cleared event (i.e. **problem is over)** is that it is not possible to signal the beginning of when the problem began because the ELD was **not 'on' or functioning when the discrepancy occurred.** **My implementation** of this ELD event is to: 1. Aggregate the all Power Data Diagnostic Events across the entire day. 2. I will only be aggregating those events that also have .1 miles of mileage discrepancy to limit it to those cases with unrecorded movement. 3. This event will be logged as event type = 7 & event code = 1 - i.e. And ELD malfunction logged. 4. This event will be cleared less than 30 minutes of accumulated understatement exists in a rolling 24hr period. 5. Data diagnostic event cleared. The reason we signal the cleared event (i.e. problem is over) is that is is not possible to signal the beginning of when the problem began because the ELD was not 'on' or function when the discrepancy occurred.

2	"Engine synchroniz ation data diagnostic" event	Engine-Synchronization Compliance Malfunction - 30 minutes in a 24-hour period Our implementation for this event will cause the event to be triggered when the aggregation of the event-synchronization data diagnostic events is more than 30 minutes in a rolling 24hr period. If this event is signaled it will be cleared when the next day begins if the device is left on. If the device is powered down to the next day beginning the event will clear once the unit boots in the new day. 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. **Engine-Synchronization Data Diagnostics Event - more than 5 seconds of need:** **My implementation** For this event will cause the event to be triggered when: If RPM is being received & we don't receive Odometer within two minutes of last RPM value Engine time within two minutes Road speed within 5 seconds If we are receiving any other type of JBUS data we don't receive RPM within 5 seconds If vehicle movement is detected using GPS as a source for one minute and we don't receive RPM If this event is signaled is will be logged as event type = 7 & event code = 4 - i.e. Data diagnostic event logged. The corresponding 'data diagnostic event cleared' will be signaled once all of the above conditions are not true.
3	"Missing required data elements data diagnostic" event	Missing Data Diagnostic Events occurs when required data is missing at the time of a status entry
4	"Data transfer data diagnostic" event	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. **Data transfer data diagnostic event:** **My implementation** For this event is that if We haven't successfully transmitted an HOS log within the last 7 day and The device must have been powered for on at least 24 hours within current day or prior 6 days as determined by the ELD on/off diagnostic events When conditions a & b are true then we signal a Data transfer diagnostic event (event type = 7 & event code = 3) The event will not be cleared until (event type = 7 & event code = 4) until a log has been transmitted successfully
5	"Unidentifi ed driving records data diagnostic" event	Unidentified Driving Events occurs when more than 30 minutes of driving time has accumulated over a 24 hour period while no driver profile is logged into the ELD **My implementation** For this event is that when we reach 30 minutes in the current 24 hour period I will signal this event (event type = 7 & event code = 1). The event will not be cleared until (event type = 7 & event code = 1) until the unassigned driving drops below 15 minutes for today and the past 7 days.
6	"Other" ELD identified diagnostic event	

What are the different types of Malfunctions and Diagnostic

ELD Mandate Meeting Notes:(Thursday, November 16,20179:33 AM)

What are the primary rule changes – How do they affect the driver?

- o The biggest change that the driver will notice is how the driving/motion detection is handles
  - o **Personal Use/Yard Move – What takes the driver out of these modes?**
    - ■ The unit will no longer take the driver out of these modes as soon as the engine is turned off
    - ■ The unit will wait 10 seconds after seeing that the engine is turned off and ask the driver if he is still in this mode
    - ■ This is in the later versions ofDTCore6.0 but Marc is unsure of which version exactly
    - ■ **What duty status is needed to log edits and certification?**
      - • Last duty status of the day (interpreted as Off-Duty)
      - • **Will ELD mode be set by the truck?**
        - o This will be determined by either S/N of unit or date it was made (before or after 12/18/2017)
        - o If a unit is AOBR, it will remain AOBR until replaced with ELD or grandfather period is over (12/2019)
        - o A driver can slip seat between an AOBR and ELD,but will have to use ELD functions/rules when operating on an ELD

Data Diagnostic Event only:

Unassigned Driving

- ■ 30 minutes or more of unassigned driving for the current day
- ■ This malfunction will clear when there is under 15 minutes of unassigned driving for the 8 day period

Malfunctions:

- **Power**
  - o Any type of unmonitored mileage/movement will cause this malfunction
  - o This malfunction will clear after 24 hours if no further instance of unmonitored movement has occurred
- **Position**
  - ■ After 5 miles (based onodometer) of no GPS,unitwill record time of no GPS up to 60 minutes when the unit is then in malfunction
  - ■ This malfunction will clear once there is a 24 hour period with less than 60 minutes of no GPS
- **Data Recording**
  - • Not able to write anything to the disk – Caused by the disk is full or corrupted
  - • This malfunction can clear itself if it becomes able to write to the disk
- **Engine Sync**
  - o Not able to get road speed within 5 seconds when it is requested as needed (once a minute)
  - o This malfunction will clear after 24 hours if no further instance of this has occurred
- **Data Transfer**
  - ■ Inability to transfer logs i.e no communication
  - ■ This malfunction can clear itself once it becomes able to transfer logs

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- How does the unit warn for Personal Use limits?
- How-to send HOS ELD logs to Enforcement Officer for Roadside Audit
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- Who can Certify an HOS log?
- What is Required to Trigger an Auto-Arrival (Workflow)?

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