

# Electronic On-Board Recorders Guiding Principles

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**Electronics Subcommittee**

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# EOBR Guiding Principles

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- EMA recognizes that EOBR's are in use today and will find greater use in the future through a combination of market pressures and government regulations such as Federal Motor Carrier Safety Regulation § 395.16.
- EOBR's should have a standardized size, mounting, connectors and pin-outs. EMA prefers a single connection point with power (+12 Vdc and ground) with a defined interface (connector) with primary data communications provided by the SAE J1939. The required GPS interface needs careful consideration to achieve acceptable performance and a standardized interface, especially as technology for differential GPS is deployed and multiple GPS antennae are used in vehicles. Single and double DIN mounting, similar to radios, is recommended. Installation in the factory or in the aftermarket should be simple.
- EOBR's must work in the real world of trucking. Therefore, they should meet the same requirements of other electronics in the cab. A) Ensure compliance to SAE standards, J1455, J1587/J1708 (if applicable) J1939-15, J1939-13, J1939-21, J1939-71, J1939-73, J1939-81, etc.; B) Test under all EOBR fault conditions; C) Test all request messages sent by EOBR; D) Test with maximum expected bus utilization. E) Test for reaction to 12/24 volt supply interruption, low and high voltage conditions (part of J1455). Test for proper recovery and network performance during cold cranking conditions. F) Any specific test conditions of a specific OEM.

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- EOBRs must be certified by government approved third party companies. For the on-board system, it should include basic data bus communication behavior, diagnostics quiescent current drain and environmental requirements. For the entire on-board off-board system, the ability to get accurate data out of the vehicle, transmitting through the back-end infrastructure, and to the inspection device (if TAS is adopted). The software compliance to HOS rule is certainly part of it as well.
- Truck and engine manufacturers have some strong desires and concerns about the impact on J1939. We do not want the device to have the ability to control or interfere with the data bus. However, monitoring and responding to messaging needs more discussion. The EOBR must be designed and demonstrated to work with the vehicle. EOBR manufacturers must not be allowed to say the vehicle is the problem, or force the vehicle design to adapt to the EOBR requirements (such as provide clean power and temperatures suitable for consumer electronics in the home).
- Truck and engine manufacturers accept the responsibility to provide accurate data to the EOBR device per this language in the rule “FMCSA requires on-board recording devices be integrally synchronized to the engine.” “Integral synchronization with the engine” regards the availability of data for certain default assumptions that determine operating state (when drivers do not provide the data input) and accurate recording of vehicle speed and miles traveled. It does not require any new functions be incorporated into the engine beyond that which exists today. Vehicle speed accuracy will have the same issues in EOBRs as has been previously discussed for EDRs and VSLs.

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- Truck and engine manufacturers recognize that any EOBR device need to be reasonably tamper resistant. The more inflexible systems become as a hedge against tampering, the wider the error band experienced on the recorded data is likely to be (e.g., tire sizes that are fixed by the incomplete vehicle manufacturer). The addition of extra sensors as tampering countermeasures increases the installed costs and impacts the cost benefit calculations.
- Truck and engine manufacturers are concerned about the safe operation of the equipment to avoid hazards and driver distraction. Some methods for electronics records transfer (to law enforcement personnel) and storage may require long lengths of wire which can become a hazard. The methods chosen need to be agreeable to MCSAC and to be open (or industry agreed upon) standards and not proprietary intellectual property. FMCSA can specify an IEEE, SAE, or ISO standard. EMA does not advocate removable displays or tethered displays.
- EOBRs shall include a standardized method to input and display EOBR information to the driver. Truck and engine manufacturers do not forbid visual or audible alerts while driving due to HOS violations or near violations. However, reasonable care should be taken to avoid unnecessary driver distractions. Truck and engine manufacturers generally discourage the display of EOBR system faults to the driver unless they impact performance and/or require corrective action (i.e., switch to manual logs). When displayed, faults should be described, rather than limited to simple fault codes.