

OBD System Monitoring

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Introduction

- “Standardization” is a crucial part of OBD II
 - Frequent misunderstanding about what really is “standardized”
 - Session will cover some commonly asked questions
 - Clarify which items are truly standardized and why others are not
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Common Questions

- Why aren't the connectors all in the same place?
 - Why do manufacturers use different communication protocols?
 - Why does the evaporative system readiness code say not supported on some cars even though it has an evaporative system?
 - Why do some “continuous” monitor readiness codes say “not supported” or “not ready”?
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Common Questions (cont.)

- During the bulb check, why is MIL status commanded “off” for most vehicles but commanded “on” for others?
 - Why aren’t all the fault codes standardized?
 - Why don’t all monitors work the same way?
 - Why don’t all manufacturers use the same “drive-cycle” to run all the monitors?
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Common Questions (cont.)

- Why does the list of DTCs that disable a given monitor vary from manufacturer to manufacturer?
 - Why don't all scan tools work on all cars?
 - Why do some manufacturers turn the MIL on in one trip for a fault and others take two trips for the same fault?
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What really is “Standardized”?

- OBD II is a combination of performance requirements and standardized requirements
 - Performance requirements:
 - Determine which components have to be monitored
 - Set a threshold between good and bad (e.g., “1.5 x std”)
 - But do not dictate the method used to meet the requirement
 - Standardized requirements:
 - Establish specific methods, procedures, protocols that all vehicles must adhere to in a prescribed manner
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Example Performance Requirements

- Detect a deteriorated catalyst before emissions exceed 1.75 x standards
 - Detect a leak in the evaporative system equal or larger to a 0.020" diameter hole
 - Detect sensor/component electrical failures such as shorts and opens
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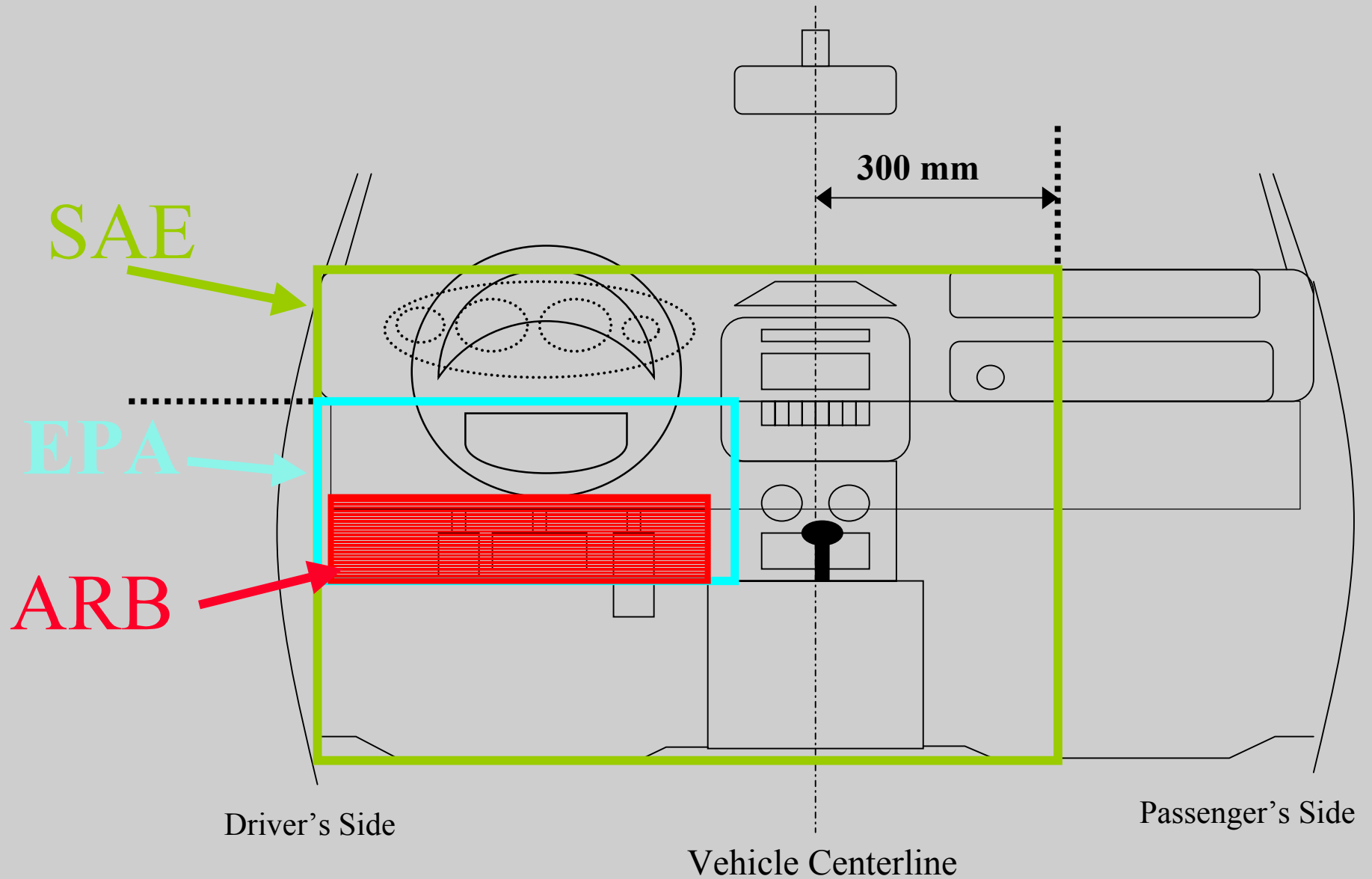
Example Standardized Requirements

- Conform to SAE and ISO specifications for:
 - Diagnostic terms, definitions, abbreviations, acronyms
 - Diagnostic connector location, shape, pins, wiring
 - Communication protocol
 - Diagnostic messages/data between car and scan tool
 - Fault code format
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Response to Specific Questions

- Why aren't the connectors all in the same place?
 - SAE specification allows considerable latitude
 - ARB/EPA also provided flexibility for vehicle interior design
 - Actions to improve the future
 - EPA specified preferred location (12/14/98 letter)
 - New ARB regulations restrict location even further
 - New EPA audit testing for certification vehicles
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Connector Location



Response to Specific Questions (cont.)

- Why do manufacturers use different communication protocols?
 - Different protocols were in use prior to OBD II
 - Changing protocols is expensive and requires lead time
 - The existing regulations allowed different protocols
 - Actions to improve the future
 - New ARB regulation requires use of ISO 15765-4 (CAN) for all manufacturers for 2008 and later model years
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Response to Specific Questions (cont.)

- Why does the evaporative system readiness code say not supported on some cars even though it has an evaporative system?
 - Evap system monitoring requirements were phased-in from 1996 to 1998 model years
 - **Actions to improve the future**
 - All 1998 and later gasoline fueled vehicles are required to have an evap system monitor
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Response to Specific Questions (cont.)

- Why do some “continuous” monitor readiness codes say “not supported” or “not ready”?
 - Diesel and alt. fuel vehicles
 - In some cases, caused by software errors
 - No impact on diagnostic function
 - **Actions to improve the future**
 - New ARB production vehicle test requirements
 - New EPA audit testing for certification vehicles
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Response to Specific Questions (cont.)

- During bulb check, why is MIL status commanded “off” for most vehicles but commanded “on” for others?
 - OBD II regulation did not specify either way
 - SAE specification did not specify
 - **Actions to improve the future**
 - New ARB regulation requires MIL status to be commanded “off” during bulb check
 - New ARB production vehicle testing requirements
 - New EPA audit testing for certification vehicles
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Response to Specific Questions (cont.)

- Why aren't all the fault codes standardized?
 - Not practical to have standard code for unique systems (examples to be presented later)
 - Standard codes lag behind rapidly changing technology
 - Actions to improve the future
 - New ARB regulation requires use of standard codes as soon as practical after they become available
 - Remaining questions will be addressed at end of presentation
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Why not standardize everything?

- Unique engine & emission control hardware
 - Allows each manufacturer to optimize for its particular configuration
 - Monitoring requirements are often “technology-forcing” -- flexibility is essential to promote creative new technologies
 - Fosters competition to find best monitoring technology
 - Doesn't preclude new and better ways of monitoring
 - Not necessary as long as diagnostic performance is good
 - The following examples illustrate these points
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