**SAE J1979 Committee Comments for OBD-II Light Duty Rulemaking**

**Comprehensive Component Changes to 15.2.1(B) (page 83)**

*(ii) For all other inputs: component circuit and out of range faults shall be separately detected and store different fault codes for each distinct malfunction (e.g., out-of-range low, out-of-range high, open circuit, shorted high, shorted low, etc.)*

Comments:

1) This new requirement does not improve diagnostics for the service technician. Out-Of-Range High/Low will always include the shorted high and shorted low failure modes. ARB policy is to pull in shorted high and shorted low codes, where possible, to include OOR High and OOR Low. This policy has worked well in service for 20 years.

2) It adds more complexity (2 new DTCs per component) with no benefit to air quality or repair effectiveness/efficiency.

3) It requires manufacturers to add hundreds of new tests to their software, and requires SAE to retroactively assign hundreds of new DTCs to map to these new tests.

4) The existing SAE J2012 structure does not support this requirement. J2012 is running short of DTCs. Adding 2 additional DTCs exacerbates this issue. J2012 supports the following DTC structure for inputs and for outputs. It does not distinguish between OOR and “Circuit High/Low” codes.





**(g)(4.2.1) (C) (g)(4.2.2) (B) Data Stream Parameters (page 173, 174)**

*(g)(4.2.1)**(C) Additionally, for 30 percent of 2019, 60 percent of 2020, and 100 percent of 2021 and subsequent model year vehicles: cylinder fuel rate, engine fuel rate, vehicle fuel rate, modeled exhaust flow (mass/time), engine reference torque, engine friction – percent torque, actual engine – percent torque, and odometer reading.*

 *(g)(4.2.2)*(*B) Additionally, for all 2013 and subsequent model year vehicles so equipped: (i) EGR temperature, variable geometry turbo control status (e.g., open loop, closed loop), reductant level (e.g., urea tank fill level), alcohol fuel percentage, NOx adsorber regeneration status, NOx adsorber deSOx status, hybrid battery pack remaining charge; and (ii) distance traveled while low/empty SCR reductant driver warning/inducement active.*

Comment: PIDs used to be grouped into distinct categories that made it easy for manufactures to identify what PIDs were required gasoline and diesel applications. New PIDs are being added in general categories making it difficult for manufacturers and ARB staff to determine what PIDs are required for a given application. For example, turbochargers are part of a major monitor for diesels but part of CCM for gasoline. Traditionally, turbo PIDs were utilized on diesel applications but not on gasoline. Another example is cylinder fuel rate not used by PEMS and is required only for diesel. The J1979 Committee could clarify this by using the J1979 DA document to specify the applicability of each PID for gasoline, diesel and hybrid applications. The Committee can work with ARB staff to clarify this for the next ballot version.

**(g)(4.2.8) Data Stream Parameters (page 176)**

*(g)(4.2.8) For purposes of the calculated load, torque, fuel rate, and modeled exhaust flow parameters in sections (g)(4.2.1)(A), (g)(4.2.1)(C), and (g)(4.2.5)(A), manufacturers shall report the most accurate values that are calculated within the applicable electronic control unit (e.g., the engine control module). “Most accurate values”, in this context, shall be of sufficient accuracy, resolution, and filtering to be used for the purposes of in-use emission testing with the engine still in a vehicle (e.g., using portable emission measurement equipment).*

Comment: The language is not quantifiable. Use J1979 definition of the various PEMS PIDs that has been developed by OEMs and PEMS equipment manufactures. We recommend deleting (4.2.8)

**(g)(4.7.4)(A) CVN Default (page 182)**

*(g)(4.7.4) (A) Except as provided below in section (g)(4.7.4)(B), when a CVN request is received, the on-board computer may not respond with negative response codes (i.e., may not use delayed timing in sending the CVN and may not response with a message indicating the CVN value is not currently available) and may not respond with a default value. Default value is defined as any value or space holder that is not a valid CVN value.*

Comment: The ISOR states that “default values would create more confusion for technicians because the default values may be mistaken for actual CVN values, or may cause technicians to mistakenly believe that CVN is not supported when in fact it is”.

J1979 provides clear direction on how an ECU should respond when data is not available from both a hardwired sensor and from an OBD device that communicates over a network. The general principle is to indicate to a service technician that the device is failed by reporting a value that is easily identified as out of range or not normal. J1979 says “The reported value shall be determined by the manufacturer based on system design and network architecture to represent the least likely value to be expected under normal conditions.” In the case on CALID, CVN and VIN, specific default values were specified after discussions with OEMs, scan tool manufactures and I/M test equipment manufacturers. Prohibiting default values for CALID, CVN and VIN is inconsistent with the remainder of J1979 and previous ARB direction for J1979 PIDs with faulted data. The J1979 Committee believes that a CVN of 00000000 and CALID of ???????? would not be mistaken for valid values. If fact we believe that an ECU that is not communicating, yet reporting valid value is the more confusing case for a technician to understand.

Recommendation: Remove default value wording.

**(g)(4.10.1) Erasure of Emission-Related Diagnostic (page 183)**

*(g)(4.10.1)**For purposes of section (g)(4.10), “emission-related diagnostic information” includes all the following: (A) Readiness status (section (g)(4.1)), (B) Data stream information (section (g)(4.2)) including MIL status, number of stored confirmed fault codes, distance………..*

Comment: This section duplicates J1979 which has the same list. The J1979 document keeps pace with all the changes that are made within the document and is better equipped to keep an accurate list.

Many people interpret “all” to mean “only the data listed below”. Elsewhere, the requirement is to erase “all” information. Enumerating the specific information will most lead to lead to discrepancies.

Recommendation: Remove duplicate section from the reg or replace “all” with “at least”

**(g)(4.10.2) Erasure of Emission-Related Diagnostic (page 183/184)**

*(g)(4.10.2) …if any of the emission-related diagnostic information is erased as a result of a command by a scan tool, all emission-related diagnostic information from all control units shall be erased. The OBD II system may not erase a subset of the emission-related diagnostic information in response to a scan tool command (e.g., in such cases, the OBD II system may not erase only one of three stored fault codes or only information from one control unit without erasing information from the other control unit(s)).”*

Comment: This requirement prohibits erasing OBD information in only one OBD module. It requires erasing OBD information in all the OBD modules in the vehicle. It prohibits what is commonly referred to as a physical code clear. Physical code clears are routinely used during assembly plant testing and technician service procedures by many OEMs. Service technicians normally repair one module at a time and use a physical code clear to determine if the issue was fixed before moving on to the next module. A technician would lose this ability to repair one module at a time since a code clear would clear out freeze frame and DTCs from any other module that had a fault at the same time. This requirement will force manufactures to change software in every OBD module and force them to change repair procedures. Ironically, this requirement can easily be bypassed today by simply depowering the module that you don’t want to clear.

For heavy duty vehicles, it is normal for a transmission to be serviced in one shop and the engine serviced in another. This requirement will make it impossible for a vehicle owner to get his vehicle serviced within reasonable time. It both an engine and a transmission fault exist, the second shop will not be able to perform diagnostics after the first shop clears codes since all DTCs, freeze frame and Mode 06 data will be erased. The vehicle would have to be driven to reset the fault which for some diesel monitors can take a considerable amount of time.

This requirement can inconvenience customers going to I/M stations, particularly on diesel vehicles where some monitors like DPF monitors can take 500 miles to complete. For example, a vehicle owner gets a TCM repaired but the clearing codes in the TCM causes the ECM to reset all I/M readiness bits. It may take 500 miles of driving to get the vehicle ready again.

The original idea behind prohibiting physical code clears was to prevent cheating at I/M. For example, a customer could clear MIL codes on a TCM just before entering a I/M check lane and get through I/M before the MIL illuminates again. Clearing all ECU would make the ECM not ready and prevent such behavior. In fact, Permanent DTCs were developed and implemented by OEMs in 2010 MY to prevent such behavior. Although the code clearing requirement is easily bypassed by depowering a module, a permanent code will remain until the OBD monitor that set it runs again and passes making it impossible to bypass.

Recommendation: Remove “all” control units as a requirement.

**(g)(4.10.2) Erasure of Emission-Related Diagnostic (page 183/184)**

*(g)(4.10.3) A manufacturer may request Executive Officer approval to erase all emission-related diagnostic information from all control units during alternate conditions (i.e., conditions other than or in addition to the key on, engine off position) for the purposes of safety or component protection. The Executive Officer shall approve the alternate conditions upon determining that the manufacturer has demonstrated all of the following: (A) The alternate erasure conditions are required for safety or component protection……*

Comment: This requirement appears to require manufacturers to request E O approval to clear codes with the engine running, in addition to engine off requirement. Many OEMs do allow clearing codes with the engine running. After discussion at a J1979 meeting, this appears to be a misinterpretation of an OEM requirement that only allows codes to be clears at the end of a driving cycle rather than at the time the clear codes request was made. An ignition key cycle is required to complete the code clear in order to reset the failure mode/default actions taken in the presence of some faults.

Recommendation: Revise the wording to include the underlined section below:

*(g)*(4.10.3) A manufacturer may request Executive Officer approval to erase all emission-related diagnostic information from all control units during alternate conditions (e. g., engine off conditions requiring an ignition key cycle) for the purposes of safety or component protection. The Executive Officer shall approve the alternate conditions upon determining that the manufacturer has demonstrated all of the following:

**(g)(6)Vehicle Operation Tracking Requirements (page 186-190)**

Comment: The PIDs are not yet defined in J1979. The reg specifies 4 byte PIDs with specific units, e.g. distance in meters, fuel usage in ml, etc. OEMs have concerns about their ability to resolve distances to that fine a resolution. Other OEMS have brought up concerns with the feasibility of accurately determining grid energy delivered to the vehicle for propulsion. The J1979 Committee believes that defining units, resolution, and accuracy is best handled by the cross-function team of experts that participate in the committee along with ARB input on the functional requirements.

The ISOR states that “The data, by design, could only be accessed from the vehicle by physically plugging a specialized tool into the diagnostic port located inside the vehicle while the vehicle is on, ensuring such data could not be broadcast, transmitted, or otherwise obtained remotely”. The J1979 Committee would like to remind ARB that any generic scan will be able to access this data. There are many devices that plug into the OBD Data Link Connector that have access to all J1979 data and can wirelessly broadcast that data to its servers. Some of these devices are installed by customers with a corresponding app on their phone, e.g. Dash Labs. Those apps often pull as much OBD data as possible and download it to their servers for data mining purposes. There are others that are installed by third parties. Insurance company dongles are examples of a third party device that could very easily gather and transmit vehicle tracking information to a server and use it for insurance rate adjustments or other purposes. The data is vehicle specific because the VIN is available as part of the data.

Definitions:

*“Calculated load value” refers to an indication of the percent engine capacity that is being used and is defined in SAE International (SAE) J1979 "E/E Diagnostic Test Modes", (SAE J1979), incorporated by reference (section (g)(1.4)1). For diesel applications, in lieu of the definition in SAE J1979, the calculated load value may alternatively be determined by the ratio of current engine torque to maximum engine torque at current engine speed as defined by suspect parameter number (SPN) 92 of SAE J1939 “Recommended Practice for a Serial Control and Communications Vehicle Network” (SAE J1939), incorporated by reference.*

Comment: References to SAE J1939 are not applicable Light Duty vehicles referenced by 1968.2 since SAE J1939 is not an allowed OBD protocol. Remove all SAE J1939 documents from References:

(1.10) SAE J1939 consisting of:

(1.10.1) J1939 “Recommended Practice for a Serial Control and Communications Vehicle Network”, March 2009August 2013;

(1.10.2) J1939/1 “Recommended Practice forOn-Highway Equipment Control and Communications Network for On-Highway Equipment”, September 01, 2000November 2012;

(1.10.3) J1939/11 “Physical Layer, 250K bits/s, Twisted Shielded Pair”, September 18, 2006September 2012;

(1.10.4) J1939/13 “Off-Board Diagnostic Connector”, March 11, 2004October 2011;

(1.10.5) J1939/15 “Reduced Physical Layer, 250K bits/sec, UN-Shielded Twisted Pair (UTP)”, August 21, 2008May 2014;

(1.10.6) J1939/21 “Data Link Layer”, December 22, 20062010;

(1.10.7) J1939/31 “Network Layer”, April 02, 2004April 2014;

(1.10.8) J1939/71 “Vehicle Application Layer (Through February 2008)”, January 20, 2009April 2014;

(1.10.9) J1939/73 “Application Layer - Diagnostics”, September 08, 2006July 2013;

(1.10.10) J1939/81 “Network Management”, May 08, 2003June 2011; and

(1.10.11) J1939/84 “OBD Communications Compliance Test Cases For Heavy Duty Components and Vehicles”, December 2008February 2015.

Replace: (1.11) SAE J1699-3 – “Vehicle OBD II Compliance Test Cases”, May 2006May 2012 (SAE J1699-3).with:

SAE J1699-3 – “Vehicle OBD II Compliance Test Cases”, July 2015 (SAE J1699-3)