



SURFACE VEHICLE RECOMMENDED PRACTICE

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Medium/Heavy-Duty E/E Systems Diagnosis Nomenclature

RATIONALE

This document has been updated to comply with the SAE Five-Year Review policy. Appendix A (Request Form) was removed.

FOREWORD

The nomenclature consisting of terms, definitions, abbreviations, and acronyms describing various components of the EPA-defined heavy-duty (HD), including CARB-defined medium-duty (MD), compression ignition, and spark-ignited engine systems, has increased enormously due to the number of sophisticated electrical and electronic (E/E) systems. To bring some order to the proliferation of such nomenclature, the Electrical and Electronics Committee of the SAE Truck and Bus Council has prepared this document. This document was developed using the SAE J1930 Vehicle E/E Systems Diagnostic Committee's document as a starting point.

The nomenclature used to convey MD and HD service information is being standardized in order to more accurately convey information to technicians faced with the diagnosis and repair of increasingly complex electronically controlled engine and vehicle systems. This includes many types and configurations of conventional mechanically controlled engines.

To be properly descriptive, each type of automotive nomenclature requires a consistent methodology. This document is concerned with a methodology for naming objects and systems utilizing a set of words upon which names are built.

The methodology allows objects and systems to be completely described without ambiguity. It also is able to generate names which distinguish among similar objects or systems without confusion but with brevity. Using terms which are well-defined within the context of the automotive service industry, the methodology allows already existing imprecise names to be suitably changed and future names to be assigned in a predictable way which will reliably convey meaning to the technician.

The structure of this SAE document is open-ended by design. As the need arises, additional entries can be added. Because of this flexibility, particular attention should be paid to the month and year publishing code contained in the full "J" number designation.

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1. SCOPE

This SAE Recommended Practice is applicable to all E/E systems on MD and HD vehicles. The terms defined are largely focused on compression-ignited and spark-ignited engines. Specific applications of this document include diagnostic, service and repair manuals, bulletins and updates, training manuals, repair data bases, under-hood emission labels, and emission certification applications.

This document focuses on diagnostic terms, definitions, abbreviations, and acronyms applicable to E/E systems. It also covers mechanical systems which require definition.

Nothing in this document should be construed as prohibiting the introduction of a term, abbreviation, or acronym not covered by this document. The use and appropriate updating of this document is strongly encouraged.

Certain terms have already been in common use and are readily understood by manufacturers and technicians, but do not follow the methodology of this document. These terms fall into three categories:

- a. Acronyms that do not logically fit the term.
- b. Acronyms existing at the component level (i.e., their terms contain the base word or noun that describes the generic item that is being further defined).
- c. Acronyms for terms that appear to contain the base word, but are frequently used as a modifier to another base word. (This use may possibly be thought of as following the methodology, since the acronym is normally used as a modifier.)

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J2403DA Digital Annex for Medium/Heavy-Duty E/E Systems Diagnosis Nomenclature

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J1587	Electronic Data Interchange Between Microcomputer Systems in Heavy-Duty Vehicle Applications
SAE J1930	Electrical/Electronic Systems Diagnostic Terms, Definitions, Abbreviations, and Acronyms - Equivalent to ISO 15031-2
SAE J1939	Serial Control and Communications Heavy-Duty Vehicle Network - Top-Level Document

SAE J1939DA J1939 Digital Annex

SAE J1939-71 Vehicle Application Layer

SAE J1939-73 Application Layer - Diagnostics

3. HOW TO USE THIS DOCUMENT

Refer to SAE J2403DA to find the recommended term corresponding to a previously used term, currently used term, and acceptable abbreviation/acronym. The parameter names sometimes convey location in addition to the signal being defined (e.g., intake air temperature, intake manifold air temperature, ambient air temperature).

Use Section 4 to construct a new name.

3.1 Definitions

Refer to SAE J2403DA for relevant definitions.

4. METHODOLOGY

This naming methodology of describing objects and systems uses modifiers attached to base words. Appropriate modifiers are added to a base word until an object or system is uniquely specified within its context.

4.1 Naming Objects

When building names, select the most descriptive base word from the “Glossary” tab in SAE J2403DA. Add modifiers as necessary or as desirable within the context, in the order of most significance to least significance. The most significant word will be the base word, which denotes the basic function of the object. The most significant modifier will be adjacent to the base word, the second most significant will be next to that modifier, and so on, until the least significant modifier is added. For the sake of future clarity, an additional modifier can be added to a name at any time, even if there is no present conflict with another object name. Figure 1 illustrates how modifiers can be added to build the name “instrumentation engine coolant temperature sensor.”

When naming an object, it is tempting to choose the first modifiers according to the initial purpose for which the object was designed, but this will not always result in the name which is most helpful in the long run to a service technician. The information a technician needs is most often supplied by a term which describes a functional attribute, not purpose.

Modifiers				Base Word		
What is the purpose?	Where is it?	Which temperature?	What does it sense?	What is it?		
				Sensor	Most Generic	
			Temperature	Sensor		
		Coolant	Temperature	Sensor		
	Engine	Coolant	Temperature	Sensor		
Instrumentation	Engine	Coolant	Temperature	Sensor	Most Specific	
Least <-----			Significance	-----> Most		

Figure 1 - Modifier usage example

To ensure accuracy, always check the glossary definitions of base words and modifiers before including them in a name. The glossary is intended for diagnostic purposes, but provides only E/E terms for base words. Base words which describe nonelectrical objects (e.g., bolt, screw, bumper) should be used as in the past. Often, names for these objects are created by attaching the appropriate E/E object name to the mechanical base word. When using a common multiple word modifier, refer to the “Terms” tab in the latest published SAE J2403DA to be sure that the modifier is acceptable or if it should be replaced with a more precise term.

4.1.1 Base Words

The base word is the most generic term in a name. Simply stated, it answers the question, “What is this object?” In answering this question, the base word does not include information about the location or function of an object within a particular system. Specific information like this is provided by modifiers that are added to the base word. The following are examples of base words: diode, engine, module, motor, pump, relay, sensor, solenoid, switch, valve. The base word is always a noun and the last term in a name.

4.1.2 Modifiers

Modifiers provide functional/application meaning, system differentiation, and location/direction information. Modifiers usually express nonelectrical ideas to describe base words which, in turn, convey E/E meaning. The range of modifiers is not limited and is used as necessary to uniquely describe an object in light of present knowledge, past experience, and potential future conflicts.

Although modifiers are used as adjectives, they are not necessarily terms which would normally be classified as adjectives. While neither “air” nor “flow” is an adjective, the meaning of “air flow valve” is clear to technicians; it is the name of a valve which regulates the flow of air. Both modifiers are nouns functioning as adjectives because of their position.

System modifiers can be added to object names to describe an object’s purpose. When using a system name as a modifier in an object name, the word “system” is not included. For example, the device that directs the exhaust gases in the exhaust gas recirculation (EGR) system is named “exhaust gas recirculation (EGR) valve.”

As technology and system capabilities evolve, the range and/or resolution of parametric data may not be sufficient for desired functionality. New parameters may be created with a higher resolution or a larger range. These parameters will be distinguished from the earlier parameters by the parenthetical modifier “(high resolution)” or “(extended range)” being added to the end of the parameter name. Display devices and service literature are not required to include the parenthetical modifier when displaying or using the parameter.

Another method of incorporating a higher resolution value is to create a new parameter that is simply added to an existing parameter to obtain the total value. This new parameter would only contain the fractional part of the total value. In this case, the parenthetical modifier “(fractional)” is appended to the parameter name.

4.1.3 Technological Terms

Technologically specific terms tend to lengthen names without adding a corresponding level of useful service information about the function of an object. Add an appropriate technological modifier to a name only when it describes the primary difference between two objects. For example, the “thick film” technology used to construct the internal circuit of an Air Flow Sensor should not be identified in the object’s name. However, if necessary for clarity, it would be appropriate to differentiate the relation to a specific external provision by adding “hot wire” to “air flow sensor.”

A technological term should be the first modifier conversationally (farthest from the base word, the position of least significance), unless a directional modifier is also present.

4.2 Naming Systems

When constructing a name for a system, consider it to be a combination of a “concept” and the word “system.” Develop the concept name according to the rules for object naming and add the word “system.” Keep in mind that a concept’s most basic attribute is its purpose and that this attribute is described by the term closest to the word “system.” For example, “recirculation” is the basic attribute of the exhaust gas recirculation (EGR) concept. The group of components that embody the concept are together named the “EGR system.”