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Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics —

Part 2: Guidance on terms, definitions, abbreviations and acronyms

Véhicules routiers — Communications entre un véhicule et un équipement externe pour le diagnostic relatif aux émissions —

Partie 2: Lignes directrices sur les termes, les définitions, les abréviations et les acronymes

Reference number
ISO 15031-2:2010(E)

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15031-2 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

This first edition of ISO 15031-2 cancels and replaces ISO/TR 15031-2:2004, which has been technically revised.

ISO 15031 consists of the following parts, under the general title *Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics*:

— *Part 1: General information and use case definition*

— *Part 2: Guidance on terms, definitions, abbreviations and acronyms*

— *Part 3: Diagnostic connector and related electrical circuits, specification and use*

— *Part 4: External test equipment*

— *Part 5: Emissions-related diagnostic services*

— *Part 6: Diagnostic trouble code definitions*

— *Part 7: Data link security*

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Introduction

0.1 Overview

The various parts of ISO 15031, when taken together, provide a coherent, consistent set of specifications for facilitating emissions-related diagnostics. ISO 15031-2 to ISO 15031-7 are based on recommended practices of the Society of Automotive Engineers (SAE). This part of ISO 15031 is based on SAE J1930.

See ISO 15031-1 for general information and an introduction to ISO 15031.

As the number of sophisticated electrical and electronic (E/E) systems on motor vehicles has increased, the number of terms, abbreviations and acronyms which describe various components of these systems has increased enormously.

The nomenclature used to convey automotive service information is being standardized in order to more accurately convey information to technicians faced with the diagnosis and repair of increasingly complex vehicles.

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 and with the set of words from which names are built.

— The procedure allows the complete description of objects and systems without ambiguity and the generation of 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 procedure allows already existing, imprecise, names to be suitably changed and future names to be assigned in a predictable way that will reliably convey meaning to the technician.

0.2 SAE document reference concept

This part of ISO 15031 references several SAE documents which contain all the terms, data and diagnostic trouble code (DTC) definitions.

This is illustrated in Figure 1. Additional information on the content of the referenced documents is given below.

— SAE J1930: the document is concerned with a procedure for naming objects and systems and with the set of words from which names are built. It references SAE J1930-DA, which contains all standardized naming objects, terms and abbreviations.

— SAE J1979: the document is concerned with the definition of emissions-related diagnostic services (diagnostic test modes). It references SAE J1979-DA, which contains all standardized data items like PIDs, Test Ids, Monitor Ids and InfoType Ids.

— SAE J2012: the document is concerned with the procedure for defining emissions-related diagnostic trouble codes. It references SAE J2012-DA, which contains all standardized data items like DTCs and failure type bytes (FTBs).

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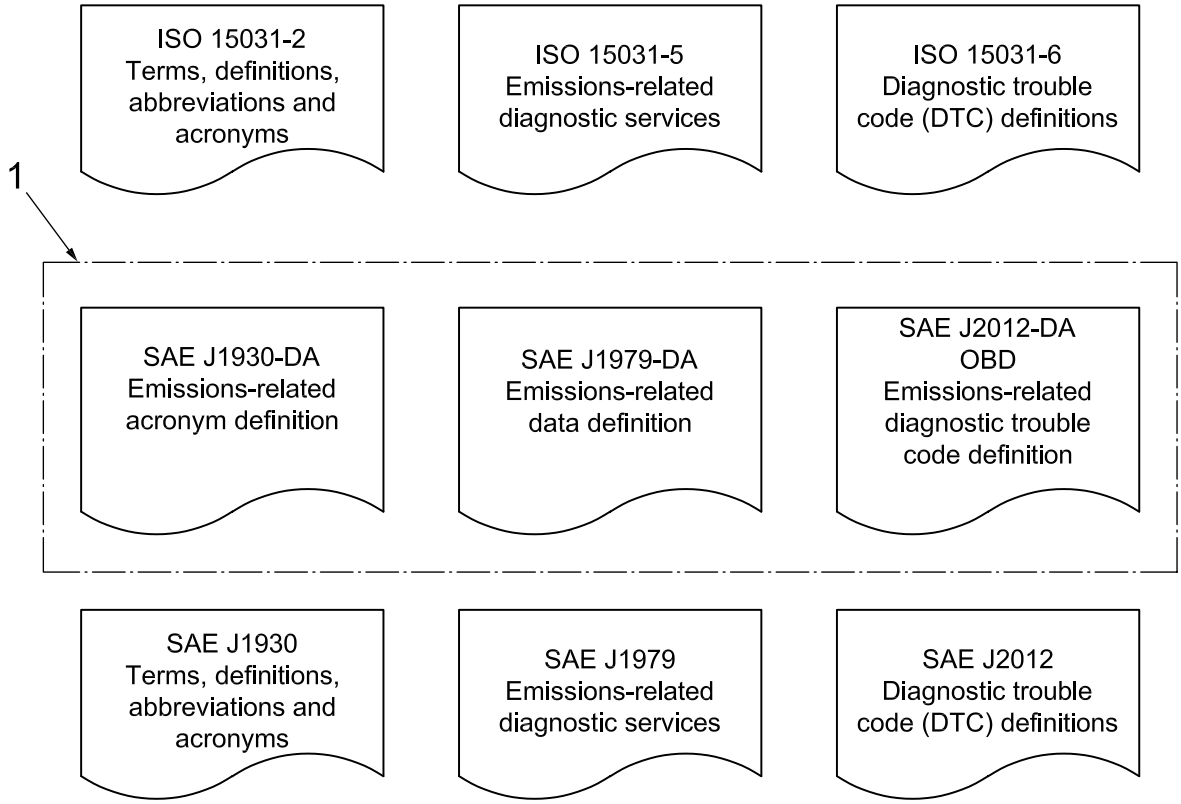

Key

1 SAE Digital Annexes

Figure 1 — SAE Digital Annex document reference

0.3 SAE J1930-DA Digital Annex

This part of ISO 15031 references the SAE J1930-DA. The SAE J1930-DA is concerned with the terms, abbreviations and acronyms which are defined according to the procedure for naming objects and systems.

The SAE J1930-DA includes several appendices:

— Approved terms;

— SAE J1979 parameter ID (PID) acronyms;

— Glossary and Control Module Naming;

— Figures to assist in the identification of the proper terms;

— Historical reference for acronym usage in previous publications.

0.4 SAE Digital Annex revision procedure

New emissions-related regulatory requirements drive new in-vehicle technology to lower emissions. New technology-related OBD (on-board diagnostic) monitor data and diagnostic trouble codes need to be standardized to support the external (off-board) “generic” test equipment. All relevant information is proposed by the automotive industry represented by members of the appropriate SAE task force.

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Revision request forms and instructions for updating the registers to this part of ISO 15031 can be obtained on the Registration Authority's web site at:

http://www.sae.org/servlets/works/committeeHome.do?comtID=TEVDS7

The column titled “Resources” shows a document with the title: J1930-DA_Revision_Request_Form.doc. Double click on the name and you will be asked to download the document with the filename:

SAE_J1930-DA_Revision_Request_Form.doc

Fill out the revision request form with your request.

Please send an e-mail with the completed revision request form as an attachment to:

SAE Headquarters
755 West Big Beaver Road
Suite 1600
Troy, MI 48084-4093, USA
Fax: (248) 273-2494
Email: saej1930@sae.org

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Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics —

Part 2:
Guidance on terms, definitions, abbreviations and acronyms

1 Scope

This part of ISO 15031 provides guidance on the usage of terms, definitions, abbreviations and acronyms used in emissions-related diagnostics, with respect to the communication between road vehicles and external equipment used in that field. It also specifies a procedure for constructing new terms. As it gives recommended usage of diagnostic terms applicable to electrical/electronic systems, it also makes reference to related mechanical terms, definitions, abbreviations and acronyms.

This part of ISO 15031 is applicable to all light-duty gasoline and diesel passenger vehicles and trucks, and to heavy-duty gasoline vehicles. Specific applications of this document include diagnostic, service and repair manuals, bulletins and updates, training manuals, repair databases, underhood emission labels and emission certification applications.

The introduction of a term, abbreviation or acronym not covered by this part of ISO 15031 is not prohibited.

This part of ISO 15031 is intended to help industry provide standard terms, definitions, abbreviations and acronyms with a view to establishing a common terminology for diagnostic tools and publications.

This part of ISO 15031 references the SAE J1930-Digital Annex (DA), which includes all standard terms, definitions, abbreviations and acronyms.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 15031-5, *Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 5: Emissions-related diagnostic services*

ISO 15031-6, *Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 6: Diagnostic trouble code definitions*

SAE J1930-DA, *J1930 Electrical/Electronic Systems Diagnostic Terms, Definitions, Abbreviations, and Acronyms Web Tool Spreadsheet*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15031-5 and ISO 15031-6 apply.

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4 General information

Certain terms have already been in common use and are readily understood by manufacturers and technicians, but do not strictly follow the methodology of this document. The SAE J1930 committee may approve these terms that are already considered industry standard. 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.

5 Document overview

Figure 2 illustrates the document references.

The protocol initialization identifies whether ISO 15765-4 DoCAN or SAE J1850 or ISO 14230-4 DoK-Line or ISO 9141-2 is the data link layer supported by the vehicle. ISO 15031 references the standard as an applicable data link for emissions-related OBD.

ISO 15031-5 specifies the applicable emissions-related diagnostic services. This part of ISO 15031 specifies the data record structures and references SAE J1930-DA, SAE J1979-DA and SAE J2012-DA which include all emissions-related OBD data definitions.

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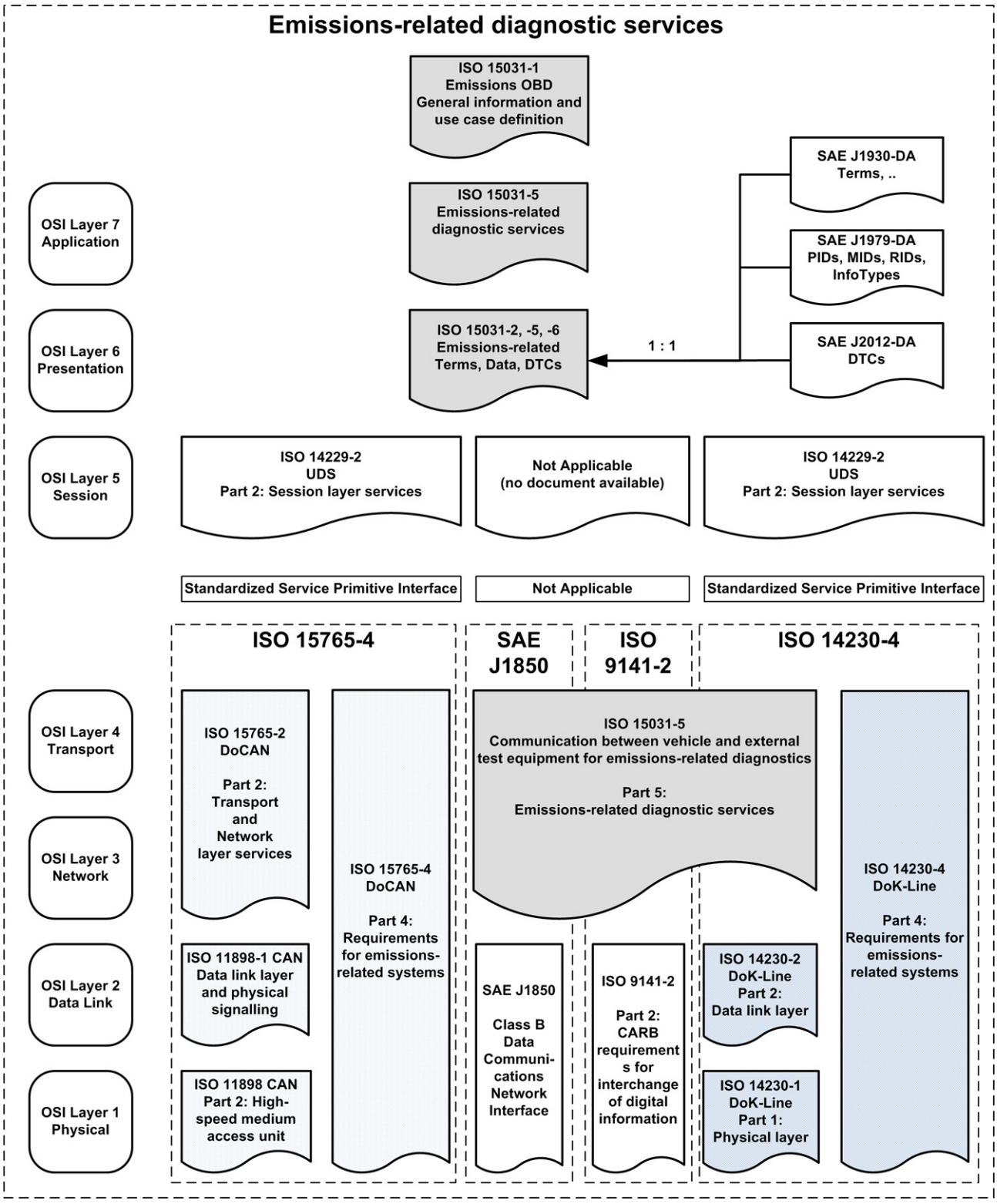

Figure 2 — Implementation of emissions-related OBD in OSI model

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6 Methodology

6.1 Naming objects

6.1.1 General information

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.

When building names, select the most descriptive base word from the Glossary of Terms (see SAE J1930-DA). 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. Table 1 shows 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 the 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.

See Table 1 for naming methodology of describing objects and systems using modifiers attached to base words.

Table 1 — Modifier usage example

Modifiers				Base word	
What is its 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	Most specific
Instrumentation	Engine	Coolant	Temperature	Sensor	
Least	**<---------- SIGNIFICANCE ---------->**				**Most**

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 electrical/electronic terms for base words. Base words which describe non-electrical objects (e.g. bolt, screw, bumper) should be used as in the past. Often, names for these objects are created by attaching the appropriate electrical/electronic object name to the mechanical base word. When using a common multiple word modifier, see SAE J1930-DA to be sure that the modifier is acceptable or if it should be replaced with a more precise term.

6.1.2 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.

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6.1.3 Modifiers

Modifiers provide functional/applicational meaning, system differentiation and locational/directional information. Modifiers usually express non-electrical ideas to describe base words which, in turn, convey electrical/ electronic 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” are adjectives, the meaning of “Airflow 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 positions.

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”.

6.1.4 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 Airflow 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 “Airflow 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.

6.2 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”.

6.3 Shortened names

6.3.1 General information

Techniques of shortening, including acronyms and abbreviations, are often necessary when space is limited and when names become awkwardly long. It is preferable to create a name first and its shortened form later, rather than the other way around.

Abbreviations and acronyms may be constructed not only of the letters of the alphabet, but of numbers, space characters, punctuation marks (such as “/” and “–”), subscripts and any other ASCII characters. Treat the individual acronyms, modifier abbreviations, and base-word abbreviations as words, separating them by space characters.

6.3.2 Acronyms

Specific definitions of acronyms vary, but for the purpose of this document, an acronym is a memorable combination of the first letters of the words of a name. While abbreviations are useful in text where space is limited, acronyms are particularly convenient for shortening verbal communication in addition to written materials. For this reason, acronyms are often pronounceable, which also makes them easy to remember. They are especially useful if a name is long and bulky both on paper and in conversation.

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Use acronyms as modifiers or base words within names, such as “EGR System” and “Primary ECM”. Do not use them as entire names, like “EGRS”. Acronyms and other modifiers may be combined in any meaningful order to modify a base word. The following are examples of acceptable uses of acronyms:

EXAMPLE EGR System EGRT Sensor Low Speed FC Switch High Speed FC Switch

Because there are a limited number of useful letter combinations for acronyms, new acronyms should be created for only the most commonly used terms. Also, avoid creating new acronyms by adding letters to those that already exist. For example, when using the acronym “FC” (Fan Control), do not add “H” or “L” to indicate “High Speed” or “Low Speed”. Instead, use additional modifiers.

Usually, the first letters of each word of a name are used to build an acronym, but if a particular word is of little significance, it may be omitted (“United States of America” becomes “USA”). Also, more than the first letter of each word may be used (“Radio Detecting And Ranging” becomes “RADAR”). An acronym like “USA” which contains three letters or fewer may have its letters spoken separately, but a longer acronym such as “RADAR” must be pronounceable or its purpose will be defeated.

All of the letters of an acronym should be capitalized. Acronyms should not contain periods. Until an acronym is widely well-known, it should be accompanied by the spelled-out form when necessary for accurate reader comprehension in any given context.

In the very rare cases of strong historical meaning across all manufacturers, the rules for naming and acronym usage may be broken. For example, “AIR” is the approved acronym for “Secondary Air Injection”, instead of “SAI”. In fact, because there is no approved name “Primary Air Injection”, the term “Secondary Air Injection” would be considered inappropriate. Despite this, historical precedent renders “AIR” and “Secondary Air Injection” the most easily understood terms. “AIR” originally meant “Air Injection Reactor”. However, vehicles no longer necessarily use a separate air injector reactor, but instead might have additional air injected to the catalytic converter. Because of the similarity to the previous system, technicians have expressed a strong desire to retain “AIR” rather than “SAI”.

Before using a new acronym, be sure to check the SAE J1930-DA for any conflicts with acronyms already in use.

6.3.3 Abbreviations

Use abbreviations to shorten base words and directional modifiers in written materials. Unlike an acronym, an abbreviation should have only its first letter capitalized and should end with a period. Wire colours are an exception to the rules of capitalization and punctuation. As in the past, they should continue to be completely capitalized in text and not followed by a period (for example, “a BLK wire”). Currently identified abbreviations for base words and modifiers are found in the SAE J1930-DA.

6.4 Indexing of name

Service information index designers consider the importance of each term in a name, and select the most appropriate word(s) to index. They most frequently index base words, following each by its modifier(s) to enhance users' retrieval. This document allows the designer flexibility to choose the indexed word(s), while describing, in detail, the methodology for the conversational word order in text and illustrations. For example, the designer can conform to the methodology of this document and provide the user with the effective retrieval of the conversational name “Left Front Wheel Speed Sensor” by indexing it as “Sensor, Left Front Wheel Speed”.

6.5 Alphanumeric descriptors

Subclauses 6.1, 6.2 and 6.3 describe the appropriate methodology to completely describe objects and systems without ambiguity. This section includes naming objects (with base words, modifiers and technological terms), naming systems and building shortened names.

An “alphanumeric descriptor” can be used in information delivered to the end-user of a scan tool having an eight-character display limitation. An alphanumeric descriptor is not recommended for general use, but can be

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built from a recommended term by replacing position modifier words with numeric digits, and omitting certain self-evident letters.

Alphanumeric position modifiers in an alphanumeric descriptor should be positioned to follow the base word, rather than the conversational practice of preceding the base word.

Table 2 illustrates how several recommended terms and acronyms can be further shortened into alphanumeric descriptors. The following guidelines should be followed when using or developing alphanumeric descriptors.

a) First consult the SAE J1930-DA to determine if the term has already been defined.

b) If the term is not included, build a suitable term using the definition in 6.1 or 6.2. Then, shorten the term using the definition in 6.3.

c) If the resultant term is too long for a scan tool with an eight-character display limitation, build an alphanumeric descriptor for electronic delivery according to the pattern shown in Table 2.

d) Delete or replace characters as required.

e) Omit spaces depending on the display limitation.

EXAMPLE FUEL PRES becomes FUELPRES.

f) Consult the SAE J1930-DA for a matching alphanumeric descriptor.

g) If the SAE J1930-DA does not contain a matching alphanumeric descriptor, request an addition using the Registration Authority for SAE J1930-DA Revision Request Form.

Table 2 — Alphanumeric descriptors example

Recommended term	Acceptable acronized usage	Alphanumeric descriptor
Diagnostic Trouble Code	DTC Freeze Frame	DTC FRZF
Engine Coolant Temperature	ECT	None required
Flexible Fuel	FF	None required
Freeze Frame	Freeze Frame	FRZF
Fuel Pressure	Fuel Pressure	FUEL PRES
Fuel System 1 Status	Fuel System 1 Status	FUEL SYS 1
Long Term Fuel Trim Bank 2	Long Term FT Bank 2	LONG FT 2
Oxygen Sensor Location Bank 1 Position 1	02S Bank 1 Position 1	02SLOC11

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[2] ISO 9141-2:1994/Amd.1:1996, *Road vehicles — Diagnostic systems — Part 2: CARB requirements for interchange of digital information — Amendment 1*

[3] ISO 14230-4:2000, *Road vehicles — Keyword protocol 2000 for diagnostic systems — Part 4: Requirements for emission-related systems*

[4] ISO 15031-1, *Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 1: General information and use case definition*

[5] ISO 15031-3, *Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 3: Diagnostic connector and related electrical circuits, specification and use*

[6] ISO 15031-4, *Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 4: External test equipment*

[7] ISO 15031-7, *Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 7: Data link security*

[8] ISO 15765-4, *Road vehicles — Diagnostics over Controller Area Network (DoCAN) — Part 4: Requirements for emissions-related systems*

[9] SAE J1850:2001, *Class B Data Communications Network Interface*

[10] SAE J1930, *Electrical/Electronic Systems Diagnostic Terms, Definitions, Abbreviations, and Acronyms*

[11] SAE J1962, *Diagnostic Connector*

[12] SAE J1978, *OBD II Scan Tool*

[13] SAE J1979, *E/E Diagnostic Test Modes*

[14] SAE J1979-DA, *Digital Annex of E/E Diagnostic Test Modes*

[15] SAE J2012, *Diagnostic Trouble Code Definitions*

[16] SAE J2012-DA, *Digital Annex of Diagnostic Trouble Code Definitions*

[17] SAE J2186, *E/E Data Link Security*

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