INTERNATIONAL STANDARD

ISO

27145-2

First edition
2012-08-15

Road vehicles — Implementation of World-Wide Harmonized On-Board Diagnostics (WWH-OBD) communication requirements —

Part 2:
Common data dictionary通用数据词典

Véhicules routiers — Mise en application des exigences de communication pour le diagnostic embarqué harmonisé à l'échelle mondiale (WWH-OBD) —

Partie 2: Dictionnaire de données communes

Contents

Page

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 27145-2 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

This first edition of ISO 27145-2 cancels and replaces ISO/PAS 27145-2:2006, which has been technically revised.

ISO 27145 consists of the following parts, under the general title *Road vehicles — Implementation of World-Wide Harmonized On-Board Diagnostics (WWH-OBD) communication requirements*:

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

— *Part 2: Common data dictionary*

— *Part 3: Common message dictionary*

— *Part 4: Connection between vehicle and test equipment*

The following parts are under preparation:

— *Part 6: External test equipment*

0 Introduction 介绍

0.1 Overview

The ISO 27145 series includes the communication between the vehicle's on-board diagnostics (OBD) systems and external test equipment within the scope of the World-Wide Harmonized On-Board Diagnostics Global Technical Regulations (WWH-OBD GTR).

ISO 27145系列包括车载诊断系统(OBD)与全球协调统一在线诊断技术法规(WWH-OBD GTR)范围内的外部测试设备之间的通信。

It has been established in order to apply the unified diagnostic services (specified in ISO 14229-1) to WWH-OBD systems.

它的建立是为了将统一的诊断服务(在ISO 14229-1中指定)应用于WWH-OBD系统。

The ISO 27145 series includes the communication between the vehicle's WWH-OBD systems and external (off-board) "generic" test equipment within the scope of the country-specific regulatory requirements.

ISO 27145系列包括车辆的WWH-OBD系统与外部(非车载)"通用"测试设备之间的通信，这些测试设备属于国家特定法规要求的范围

To achieve this, it is based on the Open Systems Interconnection (OSI) Basic Reference Model in ISO/IEC 7498-1 and ISO/IEC 10731, which structures communication systems into seven layers. Where mapped on this model, the services specified by ISO 27145 are divided into

为此，它基于ISO/IEC 7498-1和ISO/IEC 10731中规定的开放系统互连(OSI)基本参考模型，该模型将通信系统分为七层。在此模型上映射的服务，由ISO 27145指定的服务被划分为

— diagnostic services (layer 7), specified in ISO 27145-3 with reference to ISO 14229-1

    诊断服务(第7层)，在ISO 27145-3中参照ISO 14229-1指定

— presentation layer (layer 6), specified in this part of ISO 27145 with reference to SAE J1930-DA, SAE J1939 Companion Spreadsheet (SPNs), SAE J1939-73:2010, Appendix A (FMIs), SAE J1979-DA and SAE J2012-DA,

    表示层(第6层)，在ISO 27145-2中参照SAE J1930-DA、SAE J 1939 配套电子表格(SPN)、SAE J 1939-73：2010、附录A(FMI)、SAE J1979-DA和SAE J2012-DA，指定了表示层(第6层)。

— session layer services (layer 5), specified in ISO 14229-2,

    会话层服务(第5层)，在ISO 14229-2中指定，

— transport layer services (layer 4), specified in ISO 27145-4 with reference to ISO 13400-2, ISO 15765-2 and ISO 15765-4,

    传输层服务(第4层)，在iso 27145-4中参照iso 13400-2、iso 15765-2和iso 15765-4指定

— network layer services (layer 3), specified in ISO 27145-4 with reference to ISO 15765-4, ISO 15765-2 and ISO 13400-2,

    网络层服务(第3层)，在ISO 27145-4中参照ISO 15765-4、ISO 15765-2和ISO 13400-2指定，

— data link layer (layer 2), specified in ISO 27145-4 with reference to ISO 11898-1, ISO 11898-2, ISO 15765-4, ISO 13400-3 and IEEE 802.3, and

    数据链路层(第2层)，在iso 27145-4中参照ISO 11898-1、ISO 11898-2、ISO 15765-4、ISO 13400-3和ieee 802.3指定

— physical layer (layer 1), specified in ISO 27145-4 with reference to ISO 11898-1, ISO 11898-2, ISO 15765-4, ISO 13400-3 and IEEE 802.3,

    物理层(第1层)，在ISO 27145-4中参照ISO 11898-1、ISO 11898-2、ISO 15765-4、ISO 13400-3和IEEE802.3指定，

in accordance with Table 1.

Table 1 — WWH-OBD specification reference applicable to the OSI layers
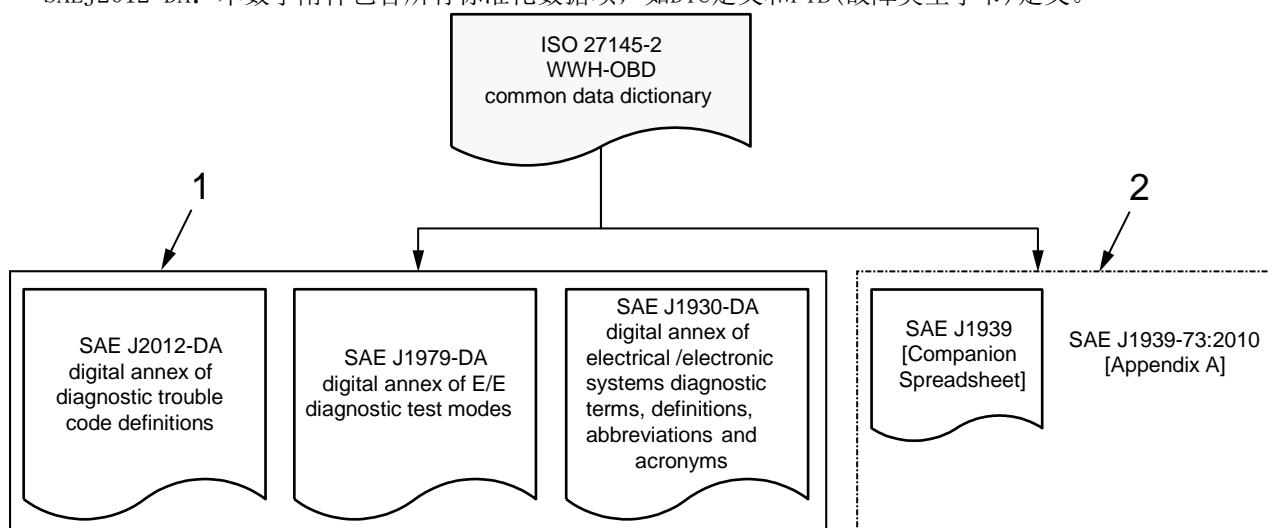
| Applicability	OSI seven layer	WWH-OBD reference		
Seven layers according to ISO/IEC 7498-1 and ISO/IEC 10731	Application (layer 7)	ISO 14229-1, ISO 27145-3		
	Presentation (layer 6)	This part of ISO 27145, SAE J1930-DA, SAE J1939 Companion Spreadsheet (SPNs), SAE J1939-73:2010, Appendix A (FMIs), SAE J1979-DA, SAE J2012-DA		
	Session (layer 5)	ISO 14229-2		
	Transport (layer 4)	ISO 15765-2 DoCAN, ISO 15765-4 DoCAN	ISO 27145-4	ISO 13400-2 DoIP TCP and IP
	Network (layer 3)			
	Data link (layer 2)	ISO 11898-1 CAN DLL, ISO 11898-2 CAN HS, ISO 15765-4 DoCAN		ISO 13400-3 DoIP, IEEE 802.3
	Physical (layer 1)			

0.2 SAE document reference concept SAE文档参考概念

ISO 27145 makes reference to several SAE documents which contain the relevant terms, data and diagnostic trouble code (DTC) definitions. ISO 27145引用了一些包含术语、数据和诊断故障代码定义的SAE文档。
ISO 27145-2 defines a common data dictionary for the ISO 27145 series, according to the definitions in the following documents (see Figure 1): ISO27145-2中的定义了ISO27145系列的通用数据字典。以下文件（见图1）：

— SAE J1930-DA: this digital annex contains all standardized naming objects, terms and abbreviations.
  SAE J1930-DA：本数字附件包含所有标准化命名对象、术语和缩写术语。
— SAE J1939 Companion Spreadsheet and SAE J1939-73: SAE J1939 Companion Spreadsheet indexes names for suspect parameter numbers (SPNs), which provide an alternative presentation format for SAE J2012-DA DTCs. SPNs are combined with failure mode indicators (FMIs) to form the full alternative presentation. FMIs are described in SAE J1939-73:2010, Appendix A.
  SAE J1939 配套电子表格和SAE J1939-73：SAE J1939配套电子表格索引可疑参数编号(SPN)，为SAE J2012-DA DTCs提供一种替代的表示格式。SPN与故障模式指示器(FMI)相结合，形成完整的备选表示。FMI在SAE J1939-73：2010，附录A中作了描述。
  NOTE   The SAE J1939 Companion Spreadsheet is a document which supplements the SAE J1939 family of standards and contains SPNs and PGNs.
  注意，SAE J1939附录电子表格是一份补充SAE J1939标准族的文档，其中包含SPN和参数组号(PGNs)
— SAE J1979-DA: this digital annex contains all standardized data items such as data identifiers (DIDs), test identifiers (TIDs), monitor identifiers (MIDs) and info type identifiers (ITIDs).
  SAE J1979-DA：本数字附件包含所有标准化数据项，如数据标识符(DID)、测试标识符(TID)、监视器标识符(MID)和信息类型标识符(ITID)
— SAE J2012-DA: this digital annex contains all standardized data items such as DTC definitions and failure type byte (FTB) definitions.
  SAEJ2012-DA：本数字附件包含所有标准化数据项，如DTC定义和FTB(故障类型字节)定义。

Key

1   SAE digital annexes: data definitions

2   SAE J1939 series of documents: DTC definitions

Figure 1 — SAE digital annex document reference SAE数字附件文档参考

0.3 SAE digital annex revision procedure SAE数字附件修订程序

New regulatory requirements drive new in-vehicle technology to lower emissions, improve safety, etc. It is important to standardize new technology-related OBD monitor data and diagnostic trouble codes in order 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.
新的法规要求推动新的车内技术降低排放，提高安全性等。重要的是标准化新技术相关的OBD监测数据和DTCs，以支持外部(非车载)"通用"测试设备。所有相关信息都由汽车行业提出，由适当的SAE工作队成员代表。

This part of ISO 27145 references a "Change request form" for use with new data items to be defined by the SAE task force for standardization. It is intended that the standardized data items be defined in SAE J1930-DA, SAE J1979-DA, SAE J2012-DA and SAE J1939. It is intended that the documents be published on the SAE store website once the information has been balloted and approved.
ISO 27145 的这一部分引用了一个 "更改请求表单"，以便与 SAE 标准化工作组定义的新数据项一起使用。 其目的是在 SAE J1930-DA、SAE J1979-DA、SAE J2012-DA 和 SAEJ1939 中定义标准化数据项。一旦信息被抽

签和批准, 它打算在 SAE 存储网站上公布这些文件。

The revision request forms and instructions for updating the registers to ISO 27145 can be obtained on the following data registration websites.

— For SAE J1930-DA: http://www.sae.org/servlets/works/committeeHome.do?comtID=TEVDS7

The column entitled "Resources" shows a document with the title: J1930-DA_Revision_Request_Form.doc. Double click on the name to download the document with the filename: "SAE_J1930-DA_Revision_Request_Form.doc".

题为"参考资料"的列显示了一个标题为：J1930-DA_REVIEW_REVENT_FORM的文档。双击文件名下载文档的名称："SAE_J1930-DA_REVIEW_Request_Form.doc"。

— For SAE J1939: http://www.sae.org/

Search "J1939 Request", select "J1939 Request Processing Group", and select " J1939 Request Processing Form and Guidelines".

搜索"J 1939请求"，选择"J 1939请求处理组"，并选择"J 1939请求处理表单和指南"。

— For SAE J1979-DA: http://www.sae.org/servlets/works/committeeHome.do?comtID=TEVDS14

The column entitled "Resources" shows a document with the title: J1979-DA_Revision_Request_Form.doc. Double click on the name to download the document with the filename: "SAE_J1979-DA_Revision_Request_Form.doc".
题为"参考资料"的一栏显示了一个标题为：J1979-DA_REVIEW_REVENT_FORM的文档。双击文件名下载文档："SAE_J1979-DA_REVIEW_Request_Form.doc"。

— For SAE J2012-DA: http://www.sae.org/servlets/works/committeeHome.do?comtID=TEVDS9

The column entitled "Resources" shows a document with the title: J2012-DA_Revision_Request_Form.doc. Double click on the name to download the document with the filename: "SAE_J2012-DA_Revision_Request_Form.doc".

题为"参考资料"的列显示了一个标题为：J2012-DA_REVIEW_Request_FORM的文档。双击文件名下载文档的名称："SAE_J2012-DA_REVIEW_Request_Form.doc"。

It is intended that the revision request form be filled out with the request.
需要该版本的请填写相关请求。

It is intended that e-mails with completed revision request forms as attachments be sent to:
并将填好的请求表作为附件的电子邮件发送至：

E-mail: saej1930@sae.org

E-mail: saej1979@sae.org

E-mail: saej2012@sae.org

E-mail: saej1939@sae.org

Road vehicles — Implementation of World-Wide Harmonized On-Board Diagnostics (WWH-OBD) communication requirements —

Part 2:
Common data dictionary 通用数据词典

1 Scope

This part of ISO 27145 defines all regulatory data elements of the ISO 27145 series. The data elements are used to provide the external test equipment with the diagnostic status of the vehicle on-board diagnostics (VOBD) system in the vehicle. All data elements are communicated with the unified diagnostic services as defined in ISO 27145-3. The data elements are diagnostic trouble codes (DTCs), data identifiers (DIDs) and routine identifiers (RIDs). The mapping from parameter identifiers (PIDs), monitor identifiers (MIDs) and info type identifiers (ITIDs) is described in this part of ISO 27145.

ISO 27145的这一部分定义了ISO 27145系列的所有管理数据元素。数据元素用于为外部测试设备提供车辆车载诊断 (VOBD) 系统的诊断状态。所有数据元素都与ISO 27145-3中定义的统一诊断服务通信。数据元素是诊断故障代码 (DTCs)、数据标识符 (DIDs) 和常规标识符 (RIDs)。来自参数标识符 (PIDs)、监视器标识符 (MIDs) 和信息类型标识符 (ITIDs) 的映射在 ISO 27145 的这一部分中描述。

If new legislated WWH-OBD GTR modules are established, it is intended that ISO 27145 be applicable with possible extensions, which can be included in this part of ISO 27145, can be specified as enhancements of the SAE Digital Annexes or can even be part of other referenced documents which are intended to include the applicable data definitions.

如果建立了新的立法 WWH-OBD GTR 模块, 它的目的是ISO 27145适用于可能的扩展, 可以包括在ISO 27145 的这一部分, 可以指定为增强 SAE 数字附件或甚至可以是其他的一部分用于包含适用的数据定义的引用文档。

ISO 27145 is intended to become the single communication standard for access to OBD-related information (VOBD). To allow for a smooth migration from the existing communication standards to this future world-wide communication standard, the communication concept as specified in ISO 27145-4 is based on two different data links: ISO 15765-4 and ISO 13400 (all parts).

ISO 27145 旨在成为获得与 VOBD 相关信息的单一通信标准。为了允许从现有通信标准顺利迁移到这个未来的全球通信标准, ISO 27145-4 中指定的通信概念基于两个不同的数据链接: ISO 15765-4 和ISO 13400 (所有部分)。

In view of the usage of standard network layer protocols, future extensions to optional physical layers (e.g. wireless) are possible.

鉴于标准网络层协议的使用, 将来可以扩展到可选物理层 (例如无线)。

NOTE   It is expected to extend ISO 27145-4 as necessary upon introduction of additional communication media.
注意   在引入额外的通信媒体时, 预计在必要时将 ISO 27145-4 扩展。

ISO 27145-4 is the entry point to establish communication with the vehicle. Based on the results of the initialization, the external test equipment determines which protocol and diagnostic services are supported by the vehicle's emissions-related system, i.e.

ISO 27145-4 是与车辆建立通信的切入点。根据初始化的结果, 外部测试设备确定了车辆与排放有关的系统支持哪些协议和诊断服务, 即:

— legislated OBD: ISO 15031 series, and 法定OBD: ISO 15031 系列, 以及

— legislated WWH-OBD: ISO 27145. 法定WWH-OBD:ISO 27145

Vehicles according to ISO 27145 provide VOBD system support as envisioned for WWH-OBD by Global Technical Regulation (GTR) No. 5.

根据 ISO 27145 的车辆提供 VOBD 系统支持, WWH-OBD 全球技术法规 (GTR) 5 号的设想。

IMPORTANT — Use cases deriving from country-specific implementation of GTR No. 5 into local legislation are not included in this part of ISO 27145.

重点——在 ISO 27145 的这一部分中不包括从国家具体执行GTR No.5号标准到地方立法的重要用例。

2   Normative references 规范性参考文件

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.
以下参考文档对于本文档的应用是必不可少的。对于日期引用, 仅适用引用的版本。对于未注明日期的引用, 引用文档的最新版本 (包括任何修订) 适用。

ISO 14229-1:— [1]), *Road vehicles — Unified diagnostic services (UDS) — Part 1: Specification and requirements*
ISO 14229-1:-1) 道路车辆. 统一诊断服务 (UDS). 第1部分: 规范和要求

ISO 14229-2, *Road vehicles — Unified diagnostic services (UDS) — Part 2: Session layer interfaces*
ISO 14229-2 道路车辆. 统一诊断服务 (UDS). 第2部分: 会话层接口

ISO 27145-1, *Road vehicles — Implementation of World-Wide Harmonized On-Board Diagnostics (WWH-OBD) communication requirements — Part 1: General information and use case definition*
ISO 27145-1 道路车辆. 全球统一的板载诊断 (WWH) 通信要求的实施. 第1部分: 一般信息和用例定义

ISO 27145-3, *Road vehicles — Implementation of World-Wide Harmonized On-Board Diagnostics (WWH-OBD) communication requirements — Part 3: Common message dictionary*
ISO 27145-3 道路车辆. 全球统一的板载诊断 (WWH) 通信要求的实施. 第3部分: 通用消息字典

ISO 27145-4, *Road vehicles — Implementation of World-Wide Harmonized On-Board Diagnostics (WWH-OBD) communication requirements — Part 4: Connection between vehicle and test equipment*
ISO 27145-4 道路车辆. 全球统一的板载诊断 (WWH) 通信要求的实施. 第4部分: 车辆与试验设备之间的连接

SAE J1939, *Companion Spreadsheet*
SAE J1939, 配套电子表格

SAE J1939-73:2010, *Application layer — Diagnostics*
SAE J1939-73:2010, 应用层-诊断

SAE J1979-DA, *Digital Annex of E/E Diagnostic Test Modes*
SAE J1979-DA，电子/电子诊断测试模式的数字附件

SAE J2012-DA, *Digital Annex of Diagnostic Trouble Code Definitions and Failure Type Byte Definitions*
SAE J2012-DA, 诊断故障代码定义和故障类型字节定义的数字附件

3   Terms, definitions and abbreviated terms 术语、定义和缩写术语
3.1 Terms and definitions

For the purposes of this document, the following terms and definitions given in ISO 27145-1 and ISO 14229-1 apply. 为本文件的目的, ISO 14229-1 和以下的条款和定义适用于

3.1.1
calibration identifier 标定标识符
CALID
identification code for the software installed in the electronic control unit 电子控制单元安装软件的识别码
3.1.2
calibration verification number 标定验证号
CVN
server/ECU calculated verification number used to verify the integrity of the software in the electronic control unit 用于验证电子控制单元中软件完整性的服务器/ECU 计算验证号
3.1.3
central gateway 中央网关
CGW
electronic control unit that connects in-vehicle communication networks 连接车载通信网络的电子控制单元
3.1.4
data identifier 数据标识符
DID
indicator making reference to a data item in the server 对服务器中的数据项进行引用的指示器

3.1.5

diagnostic trouble code 诊断故障代码

DTC

value making reference to a specific fault in a system implemented in the server对服务器中实现的系统中的特定故障进行引用的值

NOTE   It is defined in SAE J2012-DA or as SPN and FMI as defined in SAE J1939 Companion Spreadsheet and SAE J1939-73:2010, Appendix A.

注意   它是在 SAEJ2012-DA 中定义的, 或者是在 SAE J1939 伴电子表格和 SAEJ1939-73:2010 (附录 A) 中定义的 SPN 和 FMI。

3.1.6

info type identifier 信息类型标识符

ITID

indicator making reference to identification information 标识信息参考指示器

EXAMPLE   Calibration identifier in the server. 服务器中的校准标识符

NOTE   The ITIDs are defined in SAE J1979-DA. ITIDs 是在 SAE J1979-DA 中定义的。

3.1.7

malfunction indicator 故障指示器

MI

display or gauge that clearly informs the driver of the vehicle in the event of a malfunction/failure

在发生故障/故障时明确通知车辆驾驶员的显示器或仪表

NOTE   Additional details are included in the WWH-OBD GTR. 额外的细节包括在 WWH-OBD GTR。

3.1.8

monitor identifier 监控标识符

MID

indicator making reference to an OBD monitor function 对一个检测功能的参考指示器

NOTE   An example of an OBD monitor function is a misfire monitor in the server. The MID is defined in SAE J1979-DA. 在服务器中, 一个用于检测OBD监测功能的例子是失火监测。 MID是定义在 SAE J1979-DA。

3.1.9

standard/manufacturer monitor test identifier 标准/制造商监控测试标识符

SMTID

OBD identifier which is defined in SAE J1979-DA or by the vehicle manufacturer

在 SAE J1979-DA 或由汽车制造商定义的OBD可识别标识

3.1.10

parameter identifier 参数标识符

PID

unique identifier used to refer to a specific data value within a server

用于引用服务器中特定数据值的唯一标识符

3.1.11

routine identifier 常规标识符

RID

identifier making reference to a routine function 对常规函数进行引用的标识符

NOTE 1   An example of a routine function is an evaporation monitor routine in the server.

NOTE 2   Routine identifiers are defined in SAE J1979-DA.

3.1.12

suspect parameter number 可疑参数编号

SPN

numeral that identifies a particular element, a fault associated with a component, such as a sensor, or a parameter associated with an ECU

标识特定元素的数字、与组件相关的错误 (如传感器) 或与 ECU 关联的参数

3.1.13
uniform resource locator 统一资源定位器
URL
uniform resource identifier which, in addition to identifying a resource, provides a means of locating the resource by describing its primary access mechanism
统一资源标识符, 除了标识资源之外, 还提供了一种通过描述其主要访问机制来查找资源的方法。

NOTE   An example of primary access mechanism is its network location. 主访问机制的一个示例是其网络位置。

3.2 Abbreviated terms

CALID	calibration identification 标定标识
CAN	controller area network 控制器区域网络
CGW	central gateway 中央网关
CM	conversion method 转换方法
CVN	calibration verification number 标定验证号
DID	data identifier 诊断数据标识符
DoCAN	diagnostics communication over controller area network 基于CAN通信网络上的诊断通信
DoIP	diagnostics communication over internet protocol 基于internet网络协议的诊断通信
DP	data parameter 数据参数
DP_DB	data parameter data byte 数据参数数据字节
DTC	diagnostic trouble code 诊断故障代码
ECM	engine control module 发动机控制模块
ECU	electronic control unit 电子控制单元
ECUNAME	electronic control unit name 电子控制单元名称
EVAP	evaporative system 蒸发系统
FMI	failure mode indicator 故障模式指示器
FTB	failure type byte 故障类型字节
GTR	global technical regulation 全球技术法规
ITID	info type identifier 信息类型标识符
IUPT	in-use performance tracking 使用性能跟踪
ITP	info type parameter 信息类型参数
ITP_DB	info type parameter data byte 信息类型参数数据字节
MI	malfunction indicator 故障指示器
MID	monitor identifier 中间监视器标识符
Mod	module 模块
MP	monitor parameter 监视器参数
MP_DB	monitor parameter data byte 显示器参数数据字节
N/A	not applicable 不适用
OC	occurrence count 发生计数
Param	parameter 参数
PID	parameter identifier 参数标识符
req	requirement 要求
RID	routine identifier 常规标识符

RP_DB   routine parameter data byte 常规参数数据字节

SF   sub-function 子函数

SID   service identifier 服务标识符

SMTID   standard/manufacturer monitor test identifier 标准/制造商监视器测试标识符

SPN   suspect parameter number 可疑参数编号

URL   uniform resource locator 统一资源定位器

VIN   vehicle identification number 车辆识别号

VOBD   vehicle on-board diagnostics 车载诊断

WWH-OBD   world-wide harmonized on-board diagnostics 全球统一的在线诊断

4 Conventions 公约

The ISO 27145 series is based on the conventions discussed in the OSI Service Conventions (ISO/IEC 10731) as they apply to diagnostic services.
ISO27145 系列基于 OSI 服务公约 (ISO/IEC 10731) 中讨论的约定, 因为它们适用于诊断服务。

5 Document overview

Figure 2 shows the reference documents for the ISO 27145 series. 图2显示了 ISO 27145 系列的参考文档。

The ISO 27145 series specifies or includes the following references. ISO 27145 系列指定或包含以下引用。

a) ISO 27145-1 specifies the general structure of the ISO 27145 series and the WWH-OBD GTR applicable use cases.
   ISO 27145-1 指定的 ISO 27145 系列的一般结构和 WWH-OBD GTR的适用用例。

b) This part of ISO 27145 specifies the common data dictionary with references to the following documents:
   ISO 27145 的这一部分指定通用数据字典, 引用以下文档

   1) SAE J1930-DA, which defines the terms, definitions, abbreviated terms, etc.;
      SAE J1930-DA 定义术语、定义、缩写词等。
   2) SAE J1939 Companion Spreadsheet, which specifies the SPNs;
      SAE J1939包含的SPNs电子表格
   3) SAE J1939-73:2010, Appendix A, which specifies the FMIs;
      SAE J1939-73:2010附录A指定的FMIs
   4) SAE J1979-DA, which specifies all data items;
      SAE 1979-DA, 它指定所有数据项
   5) SAE J2012-DA, which specifies the DTC definitions and FTB definitions.
      SAE J2012-DA, 它指定 DTC 定义和 FTB 定义

NOTE   The SAE J1939 series of documents are concerned with the definition of emissions-related SPNs and FMIs for use as DTCs.   SAE J1939系列文件涉及与排放相关的SPN和信息系统的定义，用作 DTCs。

c) ISO 27145-3 specifies the diagnostic services defined in ISO 14229-1 that are applicable to WWH-OBD GTR.
   ISO 27145-3指定了在ISO14229-1 中定义的诊断服务，改诊断服务用于WWH-OBD GTR。
d) ISO 14229-2 specifies the standardized service primitive interface to separate application and session layers from protocol transport and network layers.
   ISO 14229-2 指定标准化的服务基元接口, 将应用程序和会话层与协议传输和网络层分开。
e) ISO 27145-4 specifies the initialization procedure and includes references to
   ISO 27145-4 指定初始化过程, 并包括对
   1) ISO 15765-4 DoCAN, and
   2) ISO 13400 (all parts) DoIP.

Unified diagnostic services (UDS)

ISO 27145-1
WWH-OBD
general information and
use case definition

| OSI layer 7 Application | ISO 14229-1 UDS specification and requirements | subset → | ISO 27145-3 WWH-OBD common message dictionary | 1 : 1 | SAE J 1930-DA Terms , .. |

1 : 1 — SAE J 1979-DA PIDs, MIDs, RIDs , ITIDs

OSI layer 6 Presentation

ISO 27145-2
WWH-OBD
common data
dictionary

1 : 1 — SAE J 2012-DA WWH-OBD DTCs

| OSI layer 5 Session | ISO 14229-2 UDS session layer interfaces | 1 : 1 → | ISO 14229-2 UDS session layer interfaces | subset | SAE J1939 Companion Spreadsheet SAE J1939-73:2011, Appendix A |

Standardized service primitive interface

Diagnostic communication over CAN and Internet Protocol

DoCAN   DoIP

| OSI layer 4 Transport | ISO 15765-2 DoCAN transport protocol and network layer services | | ISO 13400-2 DoIP transport protocol and network layer services |

OSI layer 3 Network

ISO 15765-4 DoCAN requirements for emissions-related systems

ISO 27145-4 WWH-OBD connection between vehicle and test equipment

| OSI layer 2 Data link | ISO 11898-1 CAN data link layer and physical signalling | | ISO 13400-3 DoIP wired vehicle interface based on IEEE 802.3 |

ISO 11898-2 CAN
high-speed
medium access unit

OSI layer 1 Physical

Figure 2 — Reference documents for implementation of WWH-OBDonCAN and WWH-OBDonIP according to the OSI model

6 Common data dictionary requirements 通用数据字典要求

6.1 Data range layout 数据范围布局

This subclause specifies the reserved ranges for DIDs and RIDs. 此小节指定 DIDs 和 rid 的保留范围。

IMPORTANT — DIDs and RIDs do not share the same 2-byte range. DIDs和RID不共享相同的2字节范围。

ISO 14229-1 reserves the DID/MID/ITID/RID ranges. ISO 14229-1 保留DID/MID/ITID/RID 的范围。

6.2 Diagnostic trouble code (DTC) range layout 诊断故障代码 (DTC) 范围布局

This subclause specifies the data range layout for DTCs, which is backward compatible to the existing standards: 此小节指定 DTCs 的数据范围布局, 后者与现有标准向后兼容:

— the DTC definition in SAE J2012-DA for all BaseDTCs and FailureTypeBytes (FTB);
在SAE J2012-DA 内定义的DTC适用于所有的BaseDTCs 和 FailureTypeBytes (FTB);

— the DTC definition in SAE J1939 Companion Spreadsheet (SPN), and SAE J1939-73:2010, Appendix A (FMI).
DTC 定义在SAEJ1939 附属电子表格 (SPN) 和SAEJ1939-73:2010 ,附录A(FMI) 中。

This part of ISO 27145 defines a 3-byte DTC range, which consists of a BaseDTC number and a FailureTypeByte (FTB), both defined in SAE J2012-DA, or an SPN and an FMI, both defined in SAE J1939 Companion Spreadsheet (SPN) and SAE J1939-73:2010, Appendix A.
ISO 27145 的这一部分定义了一个3字节的DTC范围, 其中包括在SAEJ2012-DA 中定义的BaseDTC 数字和 FailureTypeByte (FTB), 或者是在SAE J1939 助理电子表格 (SPN)和SAE J1939-73:2010 (附录A) 中定义的 SPN 和 FMI。

Figure 3 depicts an overview of the DTC range definitions. 图3描述了 DTC 范围定义的概述
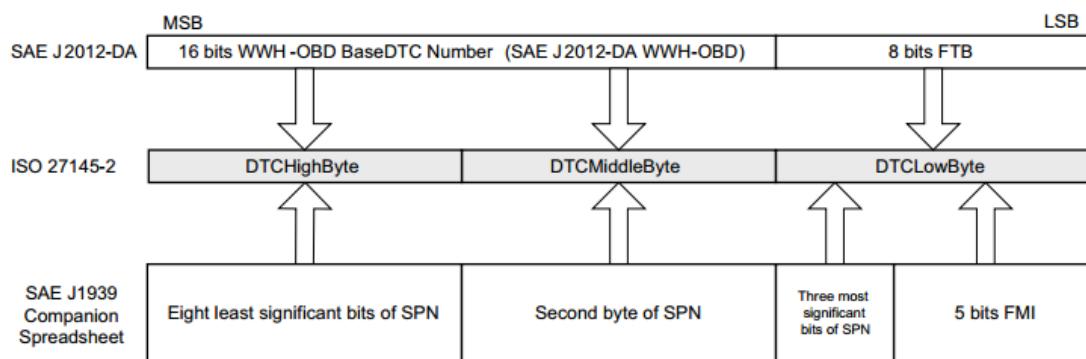
Figure 3 — Overview of the DTC range definitions

Table 2 provides an overview of the available DTC range as specified in SAE J2012-DA and SAE J1939 Companion Spreadsheet (SPN) and SAE J1939-73:2010, Appendix A (FMI).
表2概述了SAEJ2012-DA 和SAEJ1939 伴电子表格 (SPN) 和SAEJ1939-73:2010 附录 A (FMI) 中指定的可用 DTC 范围。

Table 2 — WWH-OBD DTC ranges as defined in this part of ISO 27145

DTC range	BaseDTC range	FTB/FMI range	DTC mnemonic	Description
0x000000 – 0xFFFFFF	16 bits = 2^{16}-1 = 65535	FTB: 8 bits 2^8 = 256	SAE_J2012-DA_ DTCFormat_04	DTCs as defined in SAE J2012-DA WWH-OBD
0x000000 – 0xFFFFFF	19 bits = 2^{19}-1 = 524287	FMI: 5 bits 2^5 = 32	SAE_J1939-73_DTCFormat	SPNs as defined in SAE J1939, Companion Spreadsheet, and FMIs as defined in SAE J1939-73:2010, Appendix A

7 Data identifier and routine identifier data record requirements
数据标识符和常规标识符数据记录要求

7.1 Data identifier and routine identifier definitions 数据标识符和常规标识符定义

7.1.1 ISO 14229-1 and SAE J1979-DA DID/RID mapping 映射

The DIDs and RIDs are of different size depending on the specification from which they derive:
DIDs 和RIDs 的大小不同, 这取决于它们派生的规范。

— SAE J1979-DA specifies 1-byte DIDs (PIDs, MIDs, ITIDs) and RIDs;
— ISO 14229-1:—, Annex C, supports 2-byte DIDs and RIDs.

Figure 4 shows how the 2-byte data identifier and routine identifier are defined based on the SAE J1979-DA specification. 图4显示了如何根据 SAE J1979-DA 规范定义2字节数据标识符和例程标识符。

The "low byte" of the 2-byte identifier is derived from the 1-byte SAE J1979-DA defined identifiers. The "high byte" of the 2-byte data identifier is defined in ISO 14229-1.
2字节标识符的 "低字节 " 是从1字节 SAE J1979-DA 定义的标识符派生的。2字节数据标识符 "高字节 "在 ISO 14229-1 中定义了。
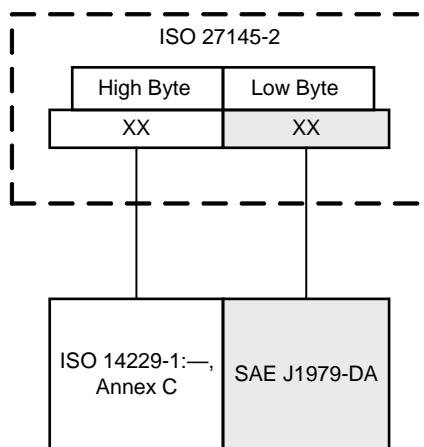
Figure 4 — 2-byte DID and RID assembly

7.1.2 DID (PID, MID and ITID) and RID-supported definition 支持的定义

The vehicle system supports a subset of DID (PID, MID, ITID) and RID based on the emissions regulation to which the vehicle shall comply.
车辆系统支持一个DID的一个子集 (PID, MID, ITID)，且RID是基于车辆需要遵守的排放法规的。

The concept of supporting DIDs (PIDs, MIDs, ITIDs) is carried out with service ReadDataByIdentifier with the DID (PID, MID, ITID) (low byte = 0x00/0x20/0x40/0x60/0x80/0xA0/0xC0) as specified in SAE J1979-DA.
支持 DIDs (PIDs、MIDs、ITIDs) 的概念是按照 SAE ReadDataByIdentifier 中指定的服务 ITID 执行的 (PID、中、0x00) (低字节 = 0x20/0x40/0x60/0x80/0xA0/0xC0/J1979-DA)。

The concept of supporting RIDs is carried out with service RoutineControl with the RID (low byte = 0x00) as specified in SAE J1979-DA.
支持RID的概念是使用 SAE J1979-DA 中指定的RID(低字节 = 0x00) 的服务 RoutineControl 进行的。

7.2 DID and RID data record definition 数据记录定义
7.2.1 Supported data types 支持数据类型
7.2.1.1 General 概述

The message format as specified in ISO 27145-3 uses a 2-byte DID in service ReadDataByIdentifier as a label for a dataRecord[] including the data parameters, e.g. PID data, MID data, ITID data.
ISO 27145-3 中指定的消息格式使用2字节的服务 ReadDataByIdentifier 作为 dataRecord [] 的标签, 包括数据参数, 例如 PID 数据、MID数据、ITID 数据。

The message format as specified in ISO 27145-3 uses a 2-byte RID in service RoutineControl as a label for a routineStatusRecord[] including the data parameters, e.g. RID data.

ISO 27145-3 中指定的消息格式使用服务 RoutineControl 中的2字节 RID 作为 routineStatusRecord [] 的标签, 包括数据参数, 例如RID数据。

A data parameter can either be of status type (discrete) or of measured type (analogue).
数据参数可以是状态类型 (离散) 或测量类型 (模拟)。

Status specifies the present state of a multi-state parameter or function as a result of action taken by the transmitting server. This action is the result of a calculation, which uses local and/or network "measured" and "status" information.
状态指定多状态参数或函数的当前状态, 这是传输服务器所采取的操作的结果。此操作是计算的结果, 它使用本地和/或网络 "测量" 和 "状态" 信息

EXAMPLE 1 Status-type data are: engine brakes are enabled, cruise control is active, the cruise control is in the "set" state of operation (as opposed to a measured indication that the "set" switch contacts are closed), diagnostic trouble codes, torque/speed control override modes, desired speed/speed limit, engine torque mode, engine's desired operating speed, engine's operating speed asymmetry adjustment, etc..
示例1　状态类型数据为: 启用引擎制动器, 巡航控制处于活动状态, 巡航控制处于 "设置" 操作状况 (相对于 "设置" 开关联系人已关闭)、诊断故障代码、扭矩/速度的测量指示。控制覆盖模式, 所需速度/速度限制, 发动机扭矩模式, 发动机所需的运行速度, 发动机的运行速度不对称调整等。

Measured data convey the current value of a parameter as measured or observed by the transmitting server to determine the condition of the defined parameter.
测量数据传递由传输服务器测量或观察到的参数的当前值, 以确定已定义参数的条件。

EXAMPLE 2 Measured-type data are: boost pressure, ignition on/off, cruise set switch activated, maximum cruise speed, cruise set speed, engine speed, % load at current speed, etc..
示例2　测量类型的数据有: 升压压力, 点火开/关, 巡航设置开关激活, 最大巡航速度, 巡航设定速度, 发动机转速,% 负载在当前速度, 等等。

A RoutineControl can be either to request which routines are implemented in the server or to request that the server start executing a routine.
RoutineControl （常规控制）可以是请求在服务器中实现哪些例程, 或者请求服务器开始执行例程

EXAMPLE 3 RoutineStatusRecords are: Evaporative system leak test; Diesel particulate filter regeneration.
示例3　　常规状态记录: 蒸发系统泄漏试验;柴油微粒过滤器再生。

7.2.1.2 ISO LATIN 1 ASCII character set

The servers shall implement those characters which are required to report information as specified in SAE J1979-DA. 服务器应实现在 SAE J1979-DA 中指定的报告信息所需的字符。

7.2.2 dataRecord[] structure definition结构定义

7.2.2.1 Overview概述

The dataRecord[] is included in the response message of the ReadDataByIdentifier service as specified in ISO 27145-3.
dataRecord [] 包含在 ISO 27145-3 中指定的 ReadDataByIdentifier 服务的响应消息中。

A dataRecord[] consists of one of the following three dataRecords[] and each dataRecord[] is specified by a DID: 一个dataRecord [] 由以下三 个dataRecords[] 之一组成, 并且每个dataRecord [] 由一个DID指定：

— PID dataRecord[] SAE J1979-DA Parameter Identifier data record including Data Parameter(s) (DP), or
PID dataRecord [] SAE J1979-DA 参数标识符数据记录, 包括数据参数 (DP), 或

— MID dataRecord[] SAE J1979-DA Monitor Identifier data record including Monitor Parameter(s) (MP), or
MID dataRecord [] SAE J1979-DA 监视器标识符数据记录, 包括监视器参数 (MP), 或

— ITID dataRecord[] SAE J1979-DA InfoType Identifier data record including InfoType Parameter(s) (ITP).
ITID dataRecord [] SAE J1979-DA 信息类型标识符数据记录, 包括信息类型参数 (ITP)

IMPORTANT — The DID dataRecord always starts with A_Data byte #4 because it is preceded by the Service Identifier (SID) of the message and the 2-byte Data Identifier (DID).
注意——DID dataRecord 总是以 A_Data 字节 #4 开始, 因为它前面有消息的服务标识符 (SID) 和2字节数据标识符 (DID)。

7.2.2.2   PID dataRecord[] with SAE J1979-DA PID data

Table 3 specifies the PID dataRecord[] with SAE J1979-DA derived parameters.
表3 使用 SAE J1979-DA 派生参数指定 PID dataRecord []。

Table 3 — PID dataRecord[] definition 定义

A_Data byte	Parameter name	Cvt	Byte Value	Mnemonic
#4	PID dataRecord[] = [DP_DB#1	M	0x00-0xFF	PID_DREC_ DP_DB#1
: #n	: DP_DB#k]	: C_1	: 0x00-0xFF	: DP_DB#k
C_1: The parameter is only present if defined in the PID dataRecord[] of the referenced PID in SAE J1979-DA.				

C1：该参数只有在 SAE J1979-DA 中引用的 pid 的 pid dataRecord [] 中定义了时才存在。

See ISO 27145-3 for the definition of the ReadDataByIdentifier service.
有关 ReadDataByIdentifier 服务的定义, 请参阅 ISO 27145-3。

Table 4 specifies the parameters of the PID dataRecord[] included in the positive response message of the ReadDataByIdentifier service. 表4指定了 ReadDataByIdentifier 服务的正响应消息中包含的 PID dataRecord [] 的参数。

Table 4 — PID dataRecord[] response message data parameter definition

Definition
PID dataRecord[]
This parameter is used by the ReadDataByIdentifier positive response message to provide the requested data record values to the client. The content of the PID dataRecord[] is defined in SAE J1979-DA.
DP_DB#1–#k (Data Parameter Data Byte)
The Data Parameter data may consist of analogue (A/D converter), discrete (input/output states) or internal WWH-OBD system data.

7.2.2.3   MID dataRecord[] with SAE J1979-DA Monitor ID data

Table 5 specifies the MID dataRecord[] with SAE J1979-DA derived parameters.
表5 指定了由SAE J1979-DA派生参数的MID dataRecord[]

Table 5 — MID dataRecord[] definition

A_Data byte	Parameter name		Cvt	Byte value	Mnemonic
	MID dataRecord[]#1 = [				MID_DREC#1_
#4	MP_SMTID;	Monitor Param. Std/Manuf. Test ID	M	0x00-0xFF	MP_SMTID
#5	MP_UASID;	Monitor Param. Unit and Scaling ID	M	0x00-0xFF	MP_UASID
#6	MP_TVHI;	Monitor Param. Test Value (HB)	M	0x00-0xFF	MP_TVHI
#7	MP_TVLO;	Monitor Param. Test Value (LB)	M	0x00-0xFF	MP_TVLO
#8	MP_MINTLHI;	Monitor Param. Min. Test Limit (HB)	M	0x00-0xFF	MP_MINTLHI
#9	MP_MINTLLO;	Monitor Param. Min. Test Limit (LB)	M	0x00-0xFF	MP_MINTLLO
#10	MP_MAXTLHI;	Monitor Param. Max. Test Limit (HB)	M	0x00-0xFF	MP_MAXTLHI
#11	MP_MAXTLLO;	Monitor Param. Max. Test Limit (LB)	M	0x00-0xFF	MP_MAXTLLO
	]				
:	:		:	:	:
	MID dataRecord[]#k = [				MID_DREC#k_
#n-7	MP_SMTID;	Monitor Param. Std/Manuf. Test ID	C_1	0x00-0xFF	MP_SMTID
#n-6	MP_UASID;	Monitor Param. Unit and Scaling ID	C_1	0x00-0xFF	MP_UASID
#n-5	MP_TVHI;	Monitor Param. Test Value (HB)	C_1	0x00-0xFF	MP_TVHI
#n-4	MP_TVLO;	Monitor Param. Test Value (LB)	C_1	0x00-0xFF	MP_TVLO
#n-3	MP_MINTLHI;	Monitor Param. Min. Test Limit (HB)	C_1	0x00-0xFF	MP_MINTLHI
#n-2	MP_MINTLLO;	Monitor Param. Min. Test Limit (LB)	C_1	0x00-0xFF	MP_MINTLLO
#n-1	MP_MAXTLHI;	Monitor Param. Max. Test Limit (HB)	C_1	0x00-0xFF	MP_MAXTLHI
#n	MP_MAXTLLO;	Monitor Param. Max. Test Limit (LB)	C_1	0x00-0xFF	MP_MAXTLLO
	]				
C_1: The parameter is only present if the monitor referred to by the MID uses more than one Monitor Parameter Standard/Manufacturer Test ID (MP_SMTID).					

C1：只有在中引用的监视器使用多个监视器参数标准/制造商测试 ID (MP_SMTID) 时, 才会出现该参数。

Multiple Monitor Parameter Standard/Manufacturer Test IDs may be supported for a single OBD Monitor ID. In such a case, a MID dataRecord[] is included in the response message for each Monitor Parameter Standard/Manufacturer Test ID supported by the OBD Monitor ID.
多个监视器参数标准/制造商测试IDs可以支持一个单信号OBD监测ID。在这种情况下, 一个MID dataRecord [] 包含在响应消息中, 这个相应消息是由OBD监视ID支持的每个监视器参数标准/制造商测试ID。

NOTE   The second and following MID dataRecords[] are not preceded by the 2-byte Monitor Identifier (MID). Those MID dataRecords[] include Monitor Parameter Standardized/Manufacturer Test ID (MP_SMTID) specific data. An MID can make reference to more than one MP_SMTID.
注意   第二个和下面的MID dataRecords [] 前面没有2字节的监视器标识符 (MID)。那些MID dataRecords [] 包括监视器参数标准化/制造商测试 ID (MP_SMTID) 特定数据。一个MID可以引用不止一个 MP_SMTID。

See ISO 27145-3 for definition of the ReadDataByIdentifier service.
有关 ReadDataByIdentifier 服务的定义, 请参阅 ISO 27145-3

Table 7 specifies the parameters of the MID dataRecord[] included in the positive response message of the ReadDataByIdentifier service.
表6 指定了包含在 ReadDataByIdentifier 服务的正响应消息中的MID dataRecord [] 参数。

Table 6 — MID dataRecord response message data parameter definition
表 6 ——MID dataRecord响应消息数据参数定义

Definition
MID dataRecord[] (#1 to #k) This parameter is used by the ReadDataByIdentifier positive response message to provide the requested data record values to the client. The content of the MID dataRecord[] is defined in this part of ISO 27145. 这个参数是ReadDataByIdentifier 正面响应消息用来向客户端提供所请求的数据记录值。这个MID dataRecord []的内容在 ISO 27145中定义的。
MP_SMTID (Monitor Parameter Standardized and Manufacturer Test ID)(监控参数标准化和制造商测试 ID) The Standardized and Manufacturer Defined Test ID is a 1-byte parameter. Many OBD monitors have multiple tests, which are carried out in either a serial or parallel manner. If a monitor uses multiple OBD Monitor ID/Test ID combinations and it is possible for them not to be completed at the same time, the following method shall be used to update the stored test results at the time of monitor completion: 标准化和制造商定义的测试 ID 是一个1字节的参数。许多OBD检测仪都有多个测试, 它们是以串行或并行方式进行的。如果一个诊断使用多OBD监测ID/测试ID的组合, 并且可能不同时完成, 则应使用以下方法在诊断完成时更新存储的测试结果: After the monitor completes, update all Monitor ID/Test ID combinations (or "test results") which were utilized by the monitor with appropriate passing or failing results. If a test result (or "Monitor ID/Test ID") was not utilized during this monitoring event, set the Test Values and Minimum and Maximum Test Limits to their initial values (0x0000, test not completed). Test results from the previously completed monitoring events shall not be mixed with test results from the currently completed monitoring event. 诊断完成后, 请更新诊断所使用的所有OBD ID/测试ID组合 (或 "测试结果 "), 并通过适当的传递或失败的结果。如果在此诊断事件期间未使用测试结果 (或 "OBD ID/测试ID"), 请将测试值和最小和最大测试限制设置为其初始值 (0x0000, 测试未完成)。以前完成的诊断事件的测试结果不应与当前完成的诊断事件中的测试结果混合使用。 In some cases, test results (or "Monitor ID/Test ID combinations") are displayed as being incomplete even though the monitor (as indicated by PID 0xF441) was successfully completed and either passed or failed. In other cases, some Test IDs show passing results while others show failing results after the monitor (as indicated by PID 0x41) was successfully completed and failed. Note that OBD-II regulations prohibit a passing monitor from showing any failing test results. If an initial, serial test indicates a failure and a subsequent retest of the system indicates a passing result, the test that was utilized to make the passing determination should be displayed, while the failing test that was utilized to make the initial determination should be reset to its initial values (0x0000, test not completed). 在某些情况下, 测试结果 (或 " Monitor ID/Test ID 组合 ") 显示为不完整, 即使诊断 (如 PID 0xF441 所示) 已成功完成, 或者已通过或失败。在其他情况下, 某些测试IDs显示传递结果, 而另一些则在诊断 (如 PID 0x41 存储指示) 成功完成并失败后显示失败的结果。请注意, OBD-II法规禁止通过诊断显示任何失败的测试结果。如果初始的串行测试指示出现故障, 并且系统随后的重新测试指示传递结果, 则应显示用于进行传递确定的测试, 而失败测试用于使初始确定应重置为其初始值 (0x0000, 测试未完成)。 EXAMPLE   A serial monitor, e.g. an evaporative system monitor, can fail for a large evaporative system leak and never continue to test for small leaks or very small leaks. In this case, the Test ID for the large leak shows a failing result, while the small leak test and the very small leak test show incomplete. As an example of the parallel monitor, a purge valve flow monitor can pass by having a large rich lambda shift, a large lean lambda shift or a large engine r/min increase. If the purge valve is activated and a large rich lambda shift occurs, the Test ID for the rich lambda shift shows a passing result while the other two Test IDs show incomplete. Since some Test IDs for a completed monitor can show incomplete, DPID "Monitor status this driving cycle" shall be used to determine monitor completion status. 举例   一个串行诊断(如蒸发系统诊断), 可能会因大型蒸发系统泄漏而失败, 并且从不继续测试小泄漏或非常小的泄漏。在这种情况下, 大泄漏的测试ID显示一个失败的结果, 而小的泄漏测试和非常小的泄漏测试显示不完整。举一个并联诊断的例子, 清除阀流量诊断可以通过具有大量的 lambda 移位、大的倾斜 lambda 移位或大的发动机 r/分钟的增加来传递。如果清除阀被激活并且发生大量的 lambda 移位, 则丰富 lambda 移位的测试ID将显示一个传递结果, 而其他两个测试ID 显示不完整。由于已完成诊断的某些测试ID可能显示不完整, DPID "诊断状态此驱动周期 " 应用于确定诊断完成状态。
MP_UASID (Monitor Parameter Unit and Scaling ID) (监视（诊断）参数单位和缩放 ID) The Unit and Scaling ID is a 1-byte identifier for making reference to the scaling and unit to be used by the external test equipment to calculate and display the test values (results), Minimum Test Limit, and the Maximum Test Limit for the Standardized and Manufacturer Defined Test ID requested. All standardized Unit And Scaling IDs are specified in SAE J1979-DA. 单位和缩放ID是一个1字节标识符, 用于引用外部测试设备用于计算和显示测试值 (结果)、最小测试限制和标准化和制造商的最大测试限制的缩放和单元。请求的已定义测试ID。所有标准化单位和刻度ID都在SAE J1979-DA 中指定。
MP_TVHI and MP_TVLO (Monitor Parameter Test Value) (监视(诊断)参数测试值) Test Value (Result) — This value is a 2-byte parameter and shall be calculated and displayed by the external test equipment based on the Unit and Scaling ID included in the response message. The Test Value shall be within the Minimum and Maximum Test Limit to indicate a "Pass" result. 测试值 (结果)-----此值为2字节参数, 应根据响应消息中包含的单位和缩放ID由外部测试设备来计算和显示。测试值应在最小和最大测试限制范围内, 以指示 "通过 " 结果。

MP_MINTLHI and MP_MINTLLO (Monitor Parameter Minimum Test Limit High and Low)（诊断参数最小测试限值的高和低）

The Minimum Test Limit is a 2-byte parameter and shall be calculated and displayed by the external test equipment based on the Unit and Scaling ID included in the response message. The Unit and Scaling IDs are specified in SAE J1979-DA. The Minimum Test Limit shall be the minimum value for the monitor identified by the On-Board Diagnostic Monitor ID. For the Standardized Test IDs that are constant values, the Minimum Test Limit shall be the same value as reported for the Test Value.

最小测试限制是一个2字节的参数，并应根据响应消息中包含的单位和缩放 ID 来计算和显示外部测试设备。单位和刻度IDs 在 SAE J1979-DA 中指定。最小测试限制应为OBD诊断ID所标识的最小值。对于常量值的标准化测试IDs，最小测试限制应与报告的测试值的值相同。

The following conditions apply:以下条件适用

— if the Test Value is less than the Minimum Test Value, this results in a "Fail" condition;

　　如果测试值小于最小测试值，则会导致 "失败 " 条件; 否则为

— if the Test Value equals the Minimum Test Value, this results in a "Pass" condition;

　　如果测试值等于最小测试值，则会产生 "通过" 条件。

— if the Test Value is greater than the Minimum Test Value, this results in a "Pass" condition.

　　如果测试值大于最小测试值，则会产生 "通过" 条件。

MP_MAXTLHI and MP_MAXTLLO (Monitor Parameter Maximum Test Limit High and Low)诊断参数最大测试限值高和低

The Maximum Test Limit is a 2-byte parameter and shall be calculated and displayed by the external test equipment based on the Unit and Scaling ID included in the response message. The Unit and Scaling IDs are specified in SAE J1979-DA. The Maximum Test Limit shall be the maximum value for the monitor identified by the OBD Monitor ID. For the Standardized Test IDs, that are constant values, the Maximum Test Limit shall be the same value as reported for the Test Value.

最大测试限制是一个2字节的参数，并应根据响应消息中包含的单位和缩放ID有外部测试设备来计算和显示。单位和刻度IDs 在 SAE J1979-DA 中指定。最大测试限制应为由该OBD诊断ID 标识的最大值。对于标准测试IDs (即常量值)，最大测试限制应与为测试值报告的值相同。

The following conditions apply:以下条件适用

— if the Test Value is less than the Maximum Test Value, this results in a "Pass" condition;

　　如果测试值小于最大测试值，则会产生 "通过" 条件。

— if the Test Value equals the Maximum Test Value, this results in a "Pass" condition;

　　如果测试值等于最大测试值，则会产生 "通过" 条件。

— if the Test Value is greater than the Maximum Test Value, this results in a "Fail" condition.

　　如果测试值大于最大测试值，则会导致 "失败" 条件

7.2.2.4 ITID dataRecord[] with SAE J1979-DA InfoType ID data

Table 7 specifies the ITID dataRecord[] with SAE J1979-DA derived parameters.
表7 使用SAE J1979-DA派生参数指定的 ITID dataRecord[]

Table 7 — ITID dataRecord[] definition 定义

A_Data byte	Parameter name		Cvt	Byte value	Mnemonic

#4
#5
:
#n
	ITID dataRecord[]#1 = [
	    ITP_DB#1;
	    ITP_DB#2;
	    :
	    ITP_DB#k;
	    ]
		InfoType Param. Data Byte #1
		InfoType Param. Data Byte #2
		:
		InfoType Param. Data Byte #k
			C_1
			C_1
			:
			C_1
				0x00-0xFF
				0x00-0xFF
				:
				0x00-0xFF
					ITID_DREC_
					ITP_DB#1
					ITP_DB#2
					:
					ITP_DB#k

C_1:	The parameter is only present if defined in the ITID dataRecord[] of the referenced ITID in SAE J1979-DA.				

See ISO 27145-3 for the definition of the ReadDataByIdentifier service.
参考ISO27145-3中对于按标识符读取数据（ReadDataByIdentifier）服务的定义

Table 8 specifies the InfoType parameters of the ITID dataRecord[] included in the positive response message of the ReadDataByIdentifier service.
表8 通过标识符服务指定读取数据的正响应消息中包含的 ITID dataRecord [] 的信息类型参数。

Table 8 — ITID dataRecord[] response message data parameter definition
表8---- ITID dataRecord[]响应消息数据参数定义

Definition
ITID dataRecord[]
This parameter is used by the ReadDataByIdentifier positive response message to provide the requested data record values to the client. The content of the ITID dataRecord[] is defined in SAE J1979-DA.
这个参数是被ReadDataByIdentifier 正面响应消息用来向客户端提供所请求的数据记录值。ITID dataRecord [] 的内容定义在 SAE J1979-DA 中。
ITP_DB (InfoType Parameter Data Byte)
The InfoType Parameter data may consist of VIN, CALID, CVN, ECUNAME, IUPT and other InfoType data expected to be defined in the future.
这些信息类型参数数据可能包括 CALID、CVN、ECUNAME、IUPT 和预期将来定义的其他信息类型数据。

7.2.3 RID routineStatusRecord[] definition RID清除常规状态记录 [] 定义

Table 9 specifies the RID routineStatusRecord[] with SAE J1979-DA derived parameters.
表9 使用SAE J1979-DA派生参数指定的 RID routineStatusRecord[]

Table 9 — RID routineStatusRecord[] definition

A_Data byte	Parameter name		Cvt	Byte value	Mnemonic

#6
:
#n
	RID routineStatusRecord[] = [
	    RP_DB#1;
	    RP_DB#k;
	    ]
		routineStatus #1
		:
		routineStatus #k
			C_1
			:
			C_1
				0x00-0xFF
				:
				0x00-0xFF
					RID_DREC_
					RP_DB#1
					:
					RP_DB#k

C_1:	The routineStatus #1–#k shall only be included in the RID routineStatusRecord[] if specified for the routineIdentifier (RID) in SAE J1979-DA.				

C_1：如果为 SAE J1979-DA 中的 routineIdentifier (rid) 指定, 则常规状态 #1-#k 只应包括在 rid routineStatusRecord [] 中。

IMPORTANT — The RID routineStatusRecord[] always starts with A_Data byte #6 because it is preceded by the Service Identifier 1-byte (SID) of the message, 1-byte sub-function, 2-byte routineIdentifier (RID) and the 1-byte routineInfo (see ISO 27145-3) parameter.
重点——RID routineStatusRecord [] 始终以A_Data字节#6开始, 因为它前面有消息的服务标识符1字节 (SID)、1字节子函数、2字节 routineIdentifier (RID) 和1字节routineInfo (参见 ISO 27145-3) 参数。

See ISO 27145-3 for the definition of the RoutineControl service
请参阅 ISO 27145-3中有关 RoutineControl 服务的定义

Table 10 specifies the parameters of the RID routineStatusRecord[] included in the positive response message of the service RoutineControl.　　RID 常规状态记录 []

表10 指定服务 RoutineControl 的正响应消息中包含的 RID routineStatusRecord [] 的参数。

Table 10 — RID routineStatusRecord[] response message data parameter definition

Definition
RID routineStatusRecord[]
This parameter is used by the RoutineControl positive response message to provide the requested data record values to the client. The content of the RID routineStatusRecord[] is defined in SAE J1979-DA. 这个参数用于RoutineControl 正响应消息中向客户端提供所请求的数据记录值。RID routineStatusRecord [] 的内容定义在 SAE J1979-DA 中。
RP_DB (Routine Parameter Data Byte) 常规参数数据字节
The Routine Parameter data (routineStatus #1 – routineStatus #k) are defined in SAE J1979-DA for each routineIdentifier (RID). 常规参数数据 (例行状态 #1-常规状态 #k) 是在 SAE J1979-DA 中为每个常规标识符 (RID) 定义。

8　Diagnostic trouble code definition 诊断故障代码定义

8.1　Overview 概述

The ReadDTCInformation service as specified in ISO 27145-3 defines a 3-byte diagnostic trouble code format in order to provide backward compatibility to the:
ISO 27145-3 中指定的读取 DTC 信息服务定义了一个3字节的诊断故障代码格式, 以便提供向后兼容性:

— SAE J2012-DA defined DTC format; SAE J2012-DA 定义的 DTC 格式

— SAE J1939 Companion Spreadsheet (SPN) and SAE J1939-73:2010, Appendix A (FMI), defined DTC format. SAE J1939 附属电子表格 (SPN) 和 SAE J1939-73:2010, 附录 A (FMI), 定义的 DTC 格式

Each DTC format is supported by the ReadDTCInformation or ClearDTCInformation service as specified in ISO 27145-3. Each DTC format is identified by the DTCFormatIdentifier as specified in ISO 27145-3.
每个DTC格式都受 ISO 27145-3 中指定的读取DTC信息或清除DTC信息服务的支持。每个DTC格式都由在 ISO 27145-3 中指定的DTC格式标识符标识。

Figure 5 illustrates the mapping of DTCs defined by SAE J2012-DA and SAE J1939 Companion Spreadsheet (SPN) and SAE J1939-73:2010, Appendix A, into the ISO 27145-3 format.
图5说明了由SAEJ2012-DA 和SAEJ1939 助理电子表格 (SPN) 和SAEJ1939-73:2010 附录 A 定义的 DTCs 到 ISO 27145-3 格式的映射.
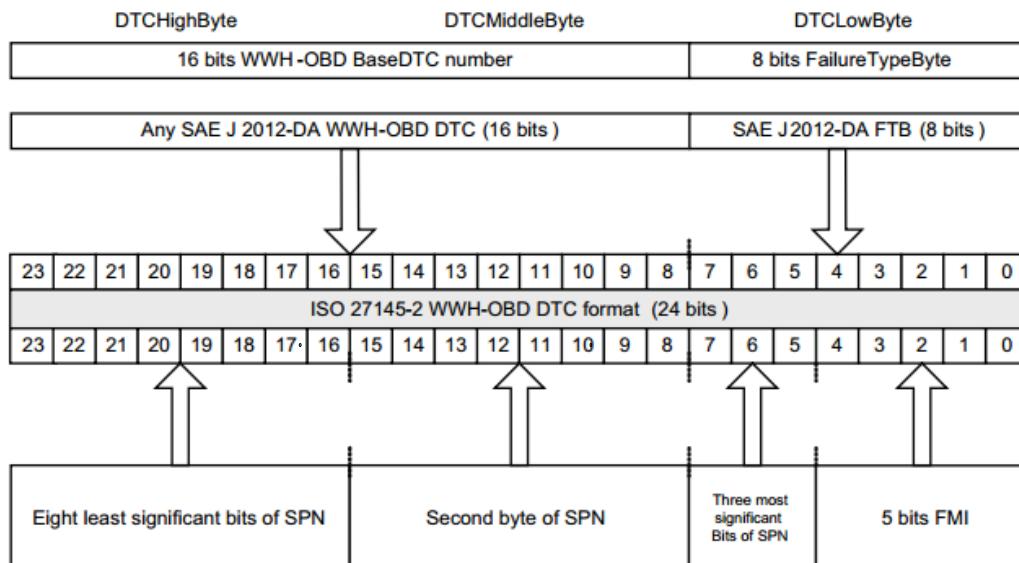
Figure 5 — Overview of DTC format mapping

8.2 SAE J2012-DA and SAE J1939-73 DTCs
8.2.1 SAE J2012-DA DTC format definition格式定义

SAE J2012-DA defines 3-byte DTCs (2-byte BaseDTC + 1-byte FTB). Each DTC number represents a unique fault and is associated with a unique fault description.
SAE J2012-DA 定义了3字节 DTCs (2 字节基 DTC + 1 字节 FTB)。每个 DTC 编号表示唯一的错误, 并与唯一的故障描述关联。

The DTCFormatIdentifier of the ReadDTCInformation response message as defined in ISO 27145-3 shall be set to "SAE_J2012-DA_DTCFormat_04 = 0x04".
ISO 27145-3 中定义的读取DTC信息响应消息的DTC格式标识符应设置为 "SAE_J2012-DA_DTCFormat_04 = 0x04 "。

Figure 6 illustrates the mapping of DTCs which derive from SAE J2012-DA and use the standardized definition of the FTB to define different failure types of a BaseDTC.
图6说明了从 SAE J2012-DA派生的DTCs 的映射, 并使用FTB的标准化定义来定义基本DTC的不同故障类型。
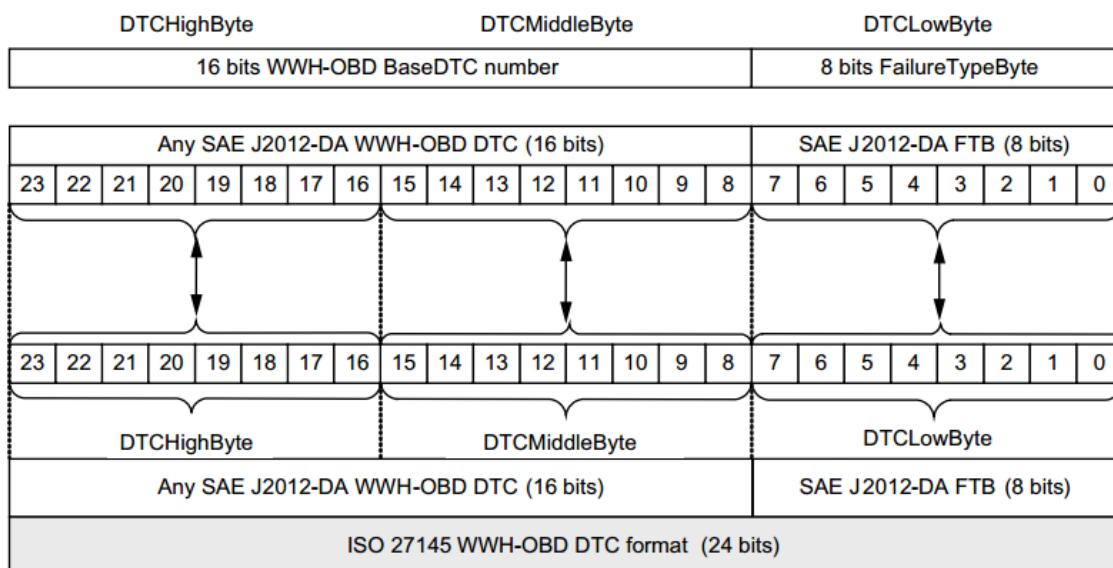
Figure 6 — Mapping of SAE J2012-DA DTC into 3-byte DTC format

The mapping of the SAE J2012-DA DTC into 3-byte DTC format is based on the following requirements:
SAE J2012-DA DTC到3字节DTC格式的映射基于以下要求:

a) bit 15 to bit 0 of the SAE J2012-DA BaseDTC are mapped into bit 23 to bit 8 (high byte and middle byte) of the WWH-OBD DTC, where bit 23 is the most significant bit;
SAE J2012-DA BaseDTC中定义的15bit到0bit对应映射成WWH-OBD DTC的23bit到8bit (高字节和中间字节), 其中23bit是最重要的位;

b) bit 7 to bit 0 represent the value of the FTB as defined in SAE J2012-DA.
7bit到0bit代表 SAE J2012-DA中定义的 FTB 的值.

The encoding is defined in SAE J2012-DA. 编码是在 SAE J2012-DA 中定义的。

IMPORTANT — ISO 27145-3 defines the SAE_J2012-DA_DTCFormat_04. This parameter indicates the DTC format used by the server(s) of the external test equipment.
重点—ISO 27145-3 定义了SAE_J2012-DA_DTC Format_04。此参数指示外部测试设备服务使用的 DTC 格式。

8.2.2 SAE J1939 DTC format definition 格式定义

8.2.2.1 Mapping definition 映射定义

SAE J1939 defines a 4-byte DTC (19 bits SPN + 5 bits FMI + 1 bit CM + 7 bits OC). The Conversion Method (CM) and Occurrence Count (OC) are not included in the DTC format as defined in this part of ISO 27145. The relevant DTC information for this part of ISO 27145 is represented by the SPN and the FMI, including a unique fault description.
SAE J1939 定义了一个4字节的 DTC (19 位 SPN + 5 位 FMI + 1 位 CM + 7 位 OC)。转换方法 (CM) 和出现计数 (OC) 不包括在这部分 ISO 27145 定义的 DTC 格式中。此部分 ISO 27145 的相关 DTC 信息由 SPN 和 FMI 表示, 包括唯一的故障描述。

A 5-bit state encoded FMI is part of the 3-byte DTC. Each state of the FMI has a unique failure mode description. The combination of the SPN and FMI provides the description of the DTC. 5位状态编码的FMI 是3字节DTC的一部分。FMI的每个状态都有唯一的失败模式描述。SPN和FMI的组合提供了DTC的

Figure 7 illustrates the mapping from a DTC of the SAE J1939-73 CAN frame into the DTC format of this part of ISO 27145. 图7 说明了从SAE J1939-73 CAN 的DTC映射到 ISO 27145 这一部分的DTC格式。

The encoding of the DTC is defined in SAE J1939-73. DTC 的编码是在 SAE J1939-73 中定义的。
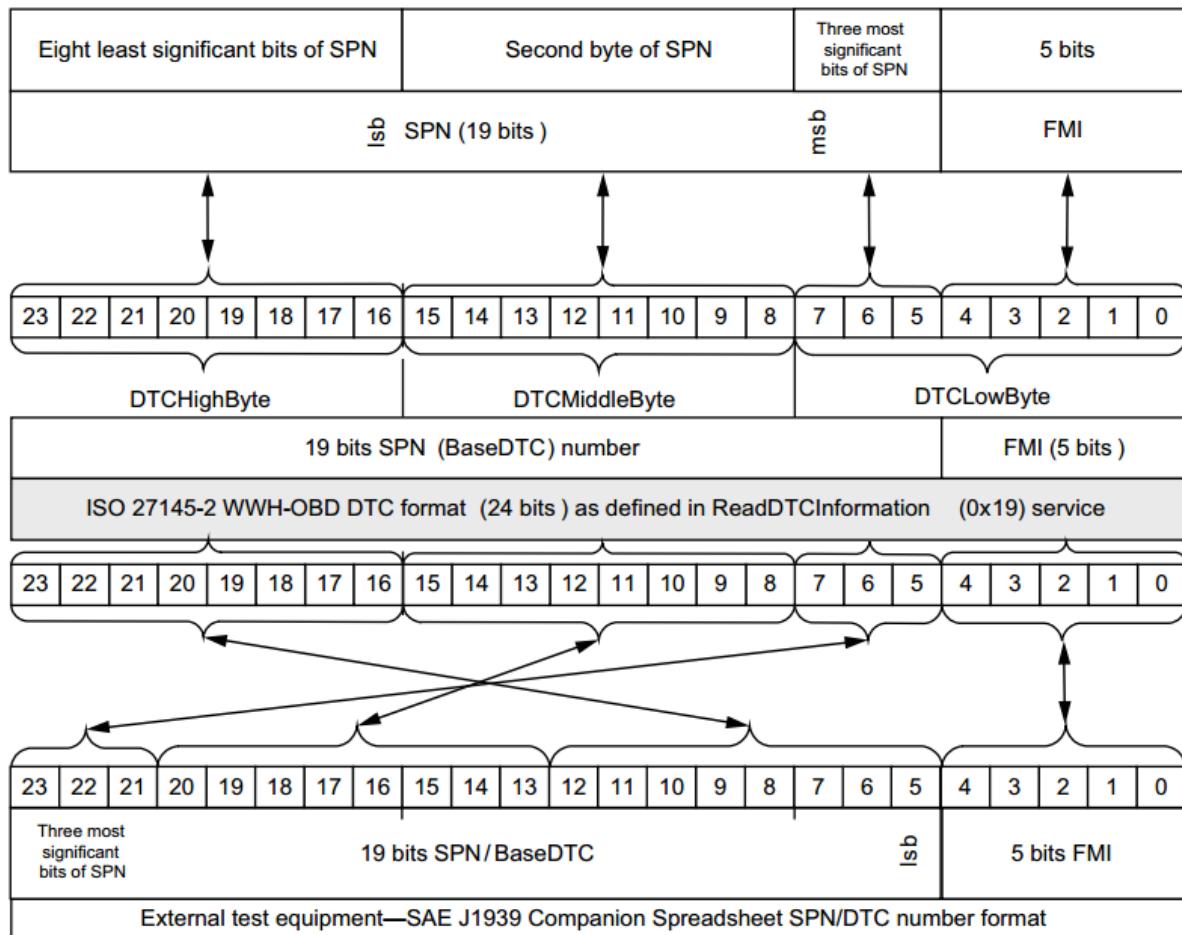
Figure 7 — Mapping of SAE J1939 Companion Spreadsheet SPN and SAE J1939-73 FMI into 3-byte DTC format

The mapping of DTC information derived from SAE J1939 Companion Spreadsheet (SPN), and SAE J1939-73:2010, Appendix A (FMI), into the format specified in service (0x19) ReadDTCInformation is a 1:1 copy of the SAE J1939 SPN and FMI values.
从 SAEJ1939 附属电子表格 (SPN) 和SAE J1939-73:2010, 附录 A (FMI) 派生的DTC信息映射到服务 (0x19) 读取 DTC 信息中指定的格式是 SAE J1939 SPN 和 FMI 值的1:1 个副本。

The external test equipment shall perform the following mapping to provide an SAE J1939-compliant decimal DTC (SPN and FMI) number: 外部测试设备应执行以下映射，以提供SAE J1939 兼容的十进制 DTC (SPN 和 FMI) 数字:

a) bit 23 to bit 16 of the DTCHighByte shall be mapped to bit 12 to bit 5 of the 24 bit DTC conversion buffer in the external test equipment,
    DTC 高字节的23位到16位应映射到外部测试设备中24位DTC转换缓冲区的12位到5位.

b) bit 15 to bit 8 of the DTCMiddleByte shall be mapped to bit 20 to bit 13 of the 24 bit DTC conversion buffer in the external test equipment,
    DTC 中间字节的15位到8位应映射到外部测试设备中24位 DTC 转换缓冲区的20位到13位。

c) bit 7 to bit 5 of the DTCLowByte shall be mapped to bit 23 to bit 21 of the 24 bit DTC conversion buffer in the external test equipment,
    DTC 低字节的7位到5位应映射到外部测试设备中24位 DTC 转换缓冲区的23位到21位

d) bit 4 to bit 0 of the DTCLowByte shall be mapped to bit 4 to bit 0 of the 24 bit DTC conversion buffer in the external test equipment;

IMPORTANT — ISO 27145-3 defines the SAE_J1939-73_DTCFormat. This parameter indicates the DTC format used by the server(s) of the external test equipment.
重要-----ISO 27145-3 定义了 SAE_J1939-73_DTC 格式。此参数指示外部测试设备的服务器使用的DTC格式。

8.2.2.2 Mapping example 映射举例

This example maps an SAE J1939-defined DTC in the DTC format defined by this part of ISO 27145. The SPN 1208d defined by SAE J1939 Companion Spreadsheet represents the "Pre-Filter Oil Pressure".
本示例在 ISO 27145 的此部分定义的DTC格式中映射 SAE J1939 定义的DTC。SAE J1939 附属电子表格定义的 SPN 1208d 表示 "预过滤油压力 "。

Table 11 shows an example of the SAE J1939-defined SPN and FMI. 显示了SAE J1939定义的SPN和FMI的示例

Table 11 — SAE J1939-defined SPN and FMI example

DTC description	Mnemonic	Decimal	Hexadecimal	Binary
Suspect parameter number	SPN	1208	0x04B8	000 00000100 10111000 (19 bits)
Failure mode identifier	FMI	3	0x3	00011 (5 bits)
Occurrence count (N/A)	OC	10	0xA	0001010 (7 bits)
Conversion method (N/A)	CM	---	---	0 (1 bit)
N/A = Not applicable for mapping to single DTC format 不适用于映射到单个DTC格式				

The example shows:

— the server-defined SAE J1939 DTC format and values,
    这个服务定义了SAE J1939 DTC格式和值

— the DTC data bytes in the SAE J1939 and values, and

    在 SAE J1939 和值中的 DTC 数据字节, 并
— the DTC data bytes in the DTC format and values defined by this part of ISO 27145.
    在ISO 27145的这部分定义了DTC数据字节的格式和数值。

Table 12 shows an example of the SAE J1939 Companion Spreadsheet derived SPN and FMI-defined DTC.
表12显示了 SAE J1939附属电子表格派生 SPN 和 FMI 定义的 DTC 的示例

Table 12 — SAE J1939 Companion Spreadsheet derived SPN and FMI-defined DTC example

SAE J1939 Companion Spreadsheet defined SPN/DTC			
Eight least significant bits of SPN (bit 7 most significant)	Second byte of SPN (bit 7 most significant)	Three most significant bits of SPN and the FMI (bit 7 SPN MSB and bit 4 FMI MSB)	Not applicable for mapping example
SPN		FMI	CM OC
23 ... 16	15 ... 8	7 6 5 4 ... 0	7 ... 0
1 0 1 1 1 0 0 0	0 0 0 0 0 1 0 0	0 0 0 0 0 0 1 1	0 0 0 0 1 0 1 0

Figure 8 shows an example of the mapping of an SPN defined by SAE J1939 Companion Spreadsheet (SPN) and an FMI defined by SAE J1939-73:2010, Appendix A (FMI), into a 3-byte DTC format, as defined by this part of ISO 27145.
图8显示了由SAEJ1939附属电子表格 (SPN) 定义的 SPN 和由SAE J1939-73:2010附录A (FMI) 定义的 FMI 映射为3字节 DTC 格式的示例, 同样的在这部分 ISO 27145也有定义。

17

Eight least significant bits of SPN								Second byte of SPN								Three most significant bits of SPN			5 bits				
						lsb	SPN								msb				FMI				
SAE J1939-73 DTC format (0xB8, 0x04, 0x03)																							
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8
1	0	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1

ISO 27145-3 WWH-OBD DTC format (0xB8, 0x04, 0x03)

23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1	0	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
DTCHighByte								DTCMiddleByte								DTCLowByte							
19 bits WWH-OBD BaseDTC number																			5 bits FMI				

ISO 27145 WWH-OBD DTC format (24 bits)

23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1	0	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1

23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	0	0	0	0	0	0	0	1	0	0	1	0	1	1	1	0	0	0	0	0	0	1	1
0x0 Three most significant bits of SPN			0x04								0xB8							lsb	0x03 5 bits FMI				
			19 bits SPN/BaseDTC																				

SPN 1208 0x4B8 000 00000100 10111000b (19 bits)
FMI 3 0x3 00011b (5 bits)

External test equipment—SAE J1939 Companion Spreadsheet SPN/DTC number format

Figure 8 — Mapping of native SAE J1939 Companion Spreadsheet SPN and FMI into the 3-byte DTC format

9   Presentation layer requirements 表示层要求

This clause defines the requirements for the presentation layer of an ECU. This is the layer which is implementing the data conversion requirements for the diagnostic protocol (e.g. DID content, and access to the fault memory and DTCSnapshot data).
此子句定义了ECU的表示层的要求。该层实现诊断协议的数据转换要求 (例如, DID内容,以及对故障内存和 DTCSnapshot 数据的访问) 。

All application-specific requirements for data content and formatting shall be supported as defined in this part of ISO 27145. 对于数据内容和格式的所有特定于应用程序的要求, 应按照 ISO 27145 这一部分中的定义来支持。

Annex A 附件A
(normative) 规范

DID (**PID, MID, ITID**) and RID supported definition支持的定义

This annex specifies standardized hex values for use in the request message for services ReadDataByIdentifer (PID/MID/ITID) and RoutineControl (RID) to retrieve supported DIDs (PIDs, MIDs, ITIDs) and RIDs (see Table A.1).
本附件指定标准化的十六进制值, 用于服务请求消息中使用标识符 (PID/MID/ITID) 和常规控制 (RID) 以检索支持的 DIDs (PIDs、MIDs、ITIDs) 和 RID(请参见表 A. 1)。

For each legislated OBD/WWH-OBD service (e.g. ReadDataByIdentifier, RoutineControl) which requires the determination of "supported" information, the external test equipment shall update its list of expected responding legislated OBD/WWH-OBD server(s)/ECU(s) prior to any DID/RID parameter requests.
对于每项法规确定的OBD/WWH-OBD (例如, 按标识符读取数据, 常规控制), 这需要确定"支持 "信息, 外部测试设备应更新其预期响应法规确定的OBD/WWH-OBD服务/ECU (s) 在任何DID/RID参数请求时。

IMPORTANT — A WWH-OBD GTR compliant server/ECU shall only reply (positive response message) to a PID, MID, ITID and RID-supported request if the server/ECU supports at least one data parameter, monitor parameter, info type parameter or routine parameter.
重点——如果服务器/ECU支持至少一个数据参数、监测参数、信息类型参数或常规参数, 则 WWH-OBD GTR 符合标准的服务器/ECU只应将 (正响应消息) 反馈给 PID、MID、ITID 和 RID 支持的请求。

Table A.1 — Supported DID (PID/MID/ITID) and RID definition

Supported DID (PID/MID/ITID) and RID				Scaling/bit Number of data bytes = 4 bit evaluation		
service (0x22) DID			service (0x31) RID	Data A–D.Bit	Value	DID (PID/MID/ITID) and RID-supported
PID	MID	ITID				
0xF400	0xF600	0xF800	0xE000	A.7 A.6 : D.0	0x01 0x02 : 0x20	0 = not supported 1 = supported
0xF420	0xF620	0xF820	0xE020	A.7 A.6 : D.0	0x21 0x22 : 0x40	0 = not supported 1 = supported
0xF440	0xF640	0xF840	0xE040	A.7 A.6 : D.0	0x41 0x42 : 0x60	0 = not supported 1 = supported
0xF460	0xF660	0xF860	0xE060	A.7 A.6 : D.0	0x61 0x62 : 0x80	0 = not supported 1 = supported
0xF480	0xF680	0xF880	0xE080	A.7 A.6 : D.0	0x81 0x82 : 0xA0	0 = not supported 1 = supported
0xF4A0	0xF6A0	0xF8A0	0xE0A0	A.7 A.6 : D.0	0xA1 0xA2 : 0xC0	0 = not supported 1 = supported

Table A.1 (*continued*)

Supported DID (PID/MID/ITID) and RID				Scaling/bit Number of data bytes = 4 bit evaluation		
service (0x22) DID			service (0x31) RID	Data A–D.Bit	Value	DID (PID/MID/ITID) and RID-supported
PID	MID	ITID				
0xF4C0	0xF6C0	0xF8C0	0xE0C0	A.7 A.6 : D.0	0xC1 0xC2 : 0xE0	0 = not supported 1 = supported
0xF4E0	0xF6E0	0xF8E0	0xE0E0	A.7 A.6 : D.0	0xE1 0xE2 : 0xFF 0x00	0 = not supported 1 = supported
0xF500	0xF700	N/A	0xE100	A.7 A.6 : D.0	0x01 0x02 : 0x20	0 = not supported 1 = supported
0xF520	0xF720	N/A	0xE120	A.7 A.6 : D.0	0x21 0x22 : 0x40	0 = not supported 1 = supported
0xF540	0xF740	N/A	0xE140	A.7 A.6 : D.0	0x41 0x42 : 0x60	0 = not supported 1 = supported
0xF560	0xF760	N/A	0xE160	A.7 A.6 : D.0	0x61 0x62 : 0x80	0 = not supported 1 = supported
0xF580	0xF780	N/A	0xE180	A.7 A.6 : D.0	0x81 0x82 : 0xA0	0 = not supported 1 = supported
0xF5A0	0xF7A0	N/A	0xE1A0	A.7 A.6 : D.0	0xA1 0xA2 : 0xC0	0 = not supported 1 = supported
0xF5C0	0xF7C0	N/A	0xE1C0	A.7 A.6 : D.0	0xC1 0xC2 : 0xE0	0 = not supported 1 = supported
0xF5E0	0xF7E0	N/A	0xE1E0	A.7 A.6 : D.1 D.0	0xE1 0xE2 : 0xFF '0'	0 = not supported 1 = supported

Not all DIDs (PIDs/MIDs/ITIDs)/RIDs are applicable or supported by all WWH-OBD ECUs. DID (PID/MID/ITID)/RID 0xF400/0xF600/0xF800/0xE000 is a bit-encoded value which indicates for each WWH-OBD ECU which DIDs (PIDs/MIDs/ITIDs)/RIDs are supported.

并非所有的DIDs (PIDs/MIDs/ITIDs)/ RIDs都适用或支持所有WWH-OBD的ECUs。DID(PID/中/ITID)/RID 0xF400/0xF600/0xF800/0xE000 是一个位编码值,表示每个 WWH-OBD ECU (DIDs/PIDs/MIDs)/RIDs的支持。

DIDs (PID/MID/ITID/RID) 0xF400/0xF600/0xF800/0xE000 indicate support for DIDs (PIDs/MIDs/ITIDs/RIDs) from 0xF401/0xF601/0xF801/0xE001 to 0xF420/0xF620/0xF820/0xE020.
DIDs (PID/MID/ITID/RID) 0xF400/0xF600/0xF800/0xE000 表示支持 DIDs (PIDs/MIDs/ITIDs/RIDs) 从 0xF401/0xF601/0xF801/0xE001到0xF420/0xF620/0xF820/0xE020.

DIDs (PIDs/MIDs/ITIDs/RIDs) 0xF420/0xF620/0xF820/0xE020 indicate support for DIDs (PIDs/MIDs/ITIDs/RIDs) 0xF421/0xF421/0xF621/0xF821/0xE021 to 0xF440/0xF440/0xF640/0xF840/0xE040, etc..
DIDs (PIDs/MIDs/ITIDs/RIDs) 0xF420/0xF620/0xF820/0xE020表示支持DIDs (PIDs/MIDs/ITIDs/RIDs) 0xF421/0xF421/0xF621/0xF821/0xE021到 0xF440/0xF440/0xF640/0xF840/0xE040,etc.

DIDs (PIDs/MIDs/ITIDs/RIDs) 0xF4E0/0xF6E0/0xF8E0/0xE0E0 indicate support for DIDs (PIDs/MIDs/ITIDs/RIDs) 0xF4E1/0xF6E1/0xF8E1/0xE0E1 to 0xF4FF/0xF6FF/0xF8FF/0xE0FF.
DIDs (PIDs/MIDs/ITIDs/RIDs) 0xF4E0/0xF6E0/0xF8E0/0xE0E0表示支持DIDs (PIDs/MIDs/ITIDs/RIDs) 0xF4E1/0xF6E1/0xF8E1/0xE0E1 到 0xF4FF/0xF6FF/0xF8FF/0xE0FF.

DIDs (PIDs/MIDs/RIDs) in the range of 0xF500/0xF700/0xE100 use the same supported concept and shall be requested with a separate ReadDataByIdentifier service.
DIDs (PIDs/MIDs/RIDs) 在 0xF500/0xF700/0xE100 的范围内使用相同的支持概念, 并应按标识符服务请求单独的读取数据。

Figure A.1 shows the bit mapping of supported PIDs, MIDs, ITIDs and RIDs.
表A.A 显示支持的 PIDs、MIDs、ITIDs 和RIDs的位映射。
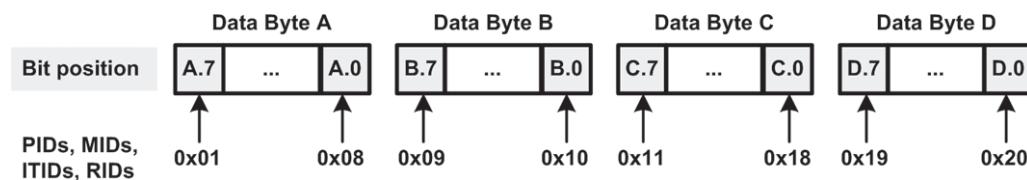
Figure A.1 — Bit mapping of supported PIDs, MIDs, ITIDs and RIDs

Annex B 附件B
(normative)规范

WWH-OBD server/ECU supported mandatory DID
WWH-OBD服务器/ECU 支持强制DID

Data parameter to support external test equipment initialization sequence.
支持外部测试设备初始化序列的数据参数

The purpose of the external test equipment initialization sequence is to automatically detect whether the vehicle is compliant to legislated WWH-OBD GTR requirements.
外部测试设备初始化序列的目的是自动检测车辆是否符合法定的 WWH-OBD GTR 要求。

The legislated WWH-OBD GTR server(s) indicate their compliance by supporting a specific PID and value upon request by the external test equipment.
法规确定的 WWH-OBD GTR 服务器通过外部测试设备的请求支持特定的 PID 和值来表示它们的遵从性。

IMPORTANT — The legislated WWH-OBD-compliant server(s) shall respond to ISO 27145-3 ReadDataByIdentifier service (0x22) with DID "protocol identification" (0xF810) request with the response data equal to ISO 14229-1 UDS (0x01).
重点——法规确定的 **WWH-OBD** 符合标准的服务器应响应**ISO 27145-3**通过标识符服务 **(0x22)**, 与 "协议标识 " **(0xF810)** 请求相同, 响应数据等于 **ISO 14229-1 UDS (0x01)**。

Annex C附件C
(informative)信息
GTR WWH-OBD emissions system parameters
GTR WWH-OBD 排放系统参数

Table C.1 includes the GTR WWH-OBD emissions-related system (GTR No. 5) mnemonic data parameters to be supported by GTR WWH-OBD-compliant vehicles.

表C.1包括了GTR WWH-OBD排放相关系统（GTR No.5） 助记器数据参数由GTR WWH-OBD符合标准的车辆支持。

Table C.1 — Annex A of GTR requirement — ECE/TRANS/180/Add.5
表C.1--附件 A 的 GTR 要求-- ECE/TRANS/180/Add.5

Require-ment number	Annex A of GTR requirement — ECE/TRANS/180/Add.5 (dated 23 January 2007)			This part of ISO 27145		
	Requirement description	Mod.	Section	SID	Mne-monic	DID/SF
1	**Erasing OBD information擦除OBD信息** The OBD system shall clear recorded OBD information in accordance with the provisions of the specific modules, where this request is provided via the external repair test equipment.当外部修复测试设备有明确请求的时候，根据具体的模块规定，OBD系统应该可以清除记录的OBD码信息。 OBD information shall not be erased by disconnection of the vehicle's battery/batteries. OBD信息在车辆断电时不应该被擦除。	A	4.4.2	0x14	group-OfDTC	0xFFFF33
2	**Component monitoring (input/output components/systems)组件监控 (输入/输出组件/系统)**	B	4.2.2	N/A	N/A	N/A
3	**Recorded information 记录的信息** The information recorded by the OBD system shall be available upon off-board request in the following package manner:由OBD系统记录的信息应该可以按以下包装方式应对off-board申请	B	4.7.1	N/A	N/A	N/A
	a) information about the engine state;发动机状态信息	B	4.7.1	N/A	N/A	N/A
	b) information about emissions-related malfunctions;排放故障相关信息	B	4.7.1	N/A	N/A	N/A
	c) information for diagnosis and repair. 用于诊断和修复的信息	B	4.7.1	N/A	N/A	N/A
4	**Information about the engine state发动机状态信息** This information provides an enforcement agency with the malfunction indicator status and associated data (e.g. continuous-MI counter, readiness). 此信息为执行机构提供了故障指示器状态和相关数据 (如连续 MI 计数器、就绪)。 The OBD system shall provide all information for the external roadside check test equipment to assimilate the data and provide an enforcement agent with the following information, which shall be accessible in read-only format (i.e. no clearing): OBD系统应该给外部路边就爱南侧设备提供全部的信息，对数据进行同步，并向执法人员提供以下信息, 这些资料应以只读格式 (即无清算) 访问:	B	4.7.1.1	N/A	N/A	N/A
	a) discriminatory/non-discriminatory display strategy 歧视性/非歧视性显示策略	B	4.7.1.1	0x22	PID	0xF490
	b) VIN (vehicle identification number)车辆识别码	B	4.7.1.1	0x22	ITID	0xF802
	c) presence of a continuous-MI 连续存在的MI	B	4.7.1.1	0x22	PID	0xF490
	d) readiness of the OBD system准备的OBD系统	B	4.7.1.1	0x22	PID	0xF490
	e) number of engine operating hours during which a continuous-MI was last activated (continuous-MI counter)上次激活连续MI (连续MI计数器) 的引擎运行小时数	B	4.7.1.1	0x22	PID	0xF490

Table C.1 (*continued*)

Require-ment number	GTR requirement — ECE/TRANS/180/Add.5 (dated 23 January 2007)			This part of ISO 27145		
	Requirement description	Mod.	Section	SID	Mne-monic	DID/SF
5	**Information about active emissions-related malfunctions有关激活的排放相关故障信息** This information provides any inspection station with a subset of engine-related OBD data, including the malfunction indicator status and associated data (MI counters), a list of active/confirmed malfunctions of classes A and B and associated data (e.g. B1-counter). The OBD system shall provide all information for the external inspection test equipment to assimilate the data and provide an inspector with the following information, which shall be accessible in read-only format (i.e. no clearing): 此信息为任何检查站提供与发动机相关的OBD检测数据的子集, 包括故障指示器状态和相关数据 (MI 计数器)、a 类 和 B类 的活动/确认故障列表以及相关数据清单 (例如,B1-counter)。该OBD系统应提供外部检验测试设备的所有信息, 并同步数据, 向检查员提供以下信息, 这些信息应以只读的方法访问格式 (即无法清除):	B	4.7.1.2	N/A	N/A	N/A
	a) the GTR (and revision) number GTR(和修订)数据	B	4.7.1.2	0x22	ITID	0xF811
	b) discriminatory/ non-discriminatory display strategy 歧视性/非歧视性显示策略	B	4.7.1.2	0x22	PID	0xF490
	c) the VIN (vehicle identification number)车辆识别码	B	4.7.1.2	0x22	ITID	0xF802
	d) the MI status MI状态	B	4.7.1.2	0x22	PID	0xF490
	e) the readiness of the OBD system OBD系统的准备	B	4.7.1.2	0x22	PID	0xF490
	f) the number of warm-up cycles and number of engine operating hours since recorded OBD information was last cleared自OBD记录信息最近一次被清除后的暖机循环数和发动机运行小时数	B	4.7.1.2	0x22	PID	0xF430 0xF44E
	g) the number of engine operating hours during which a continuous-MI was last activated (continuous-MI counter) 最近一次激活连续 MI(连续MI计数器) 的发动机运行小时数	B	4.7.1.2	0x22	PID	0xF490
	h) the cumulated operating hours with a continuous-MI (cumulative continuous-MI counter) 连续的 MI(累计连续MI 计数器) 累积的工作时间	B	4.7.1.2	0x22	PID	0xF493
	i) the value of the B1 counter with the highest number of engine operating hours; B1 计数器的值, 引擎运行时数最高;	B	4.7.1.2	0x22	PID	0xF490
	j) the confirmed and active DTCs for Class A malfunctions A类故障的确认和主动 DTCs	B	4.7.1.2	0x19	SF	0x42
	k) the confirmed and active DTCs for Classes B (B1 and B2) malfunctions B 类 (B1 和 B2) 故障的确认和主动 DTCs	B	4.7.1.2	0x19	SF	0x42
	l) the confirmed and active DTCs Class B1 malfunctions 确认和主动 DTCs 类 B1 故障	B	4.7.1.2	0x19	SF	0x42
	m) the software calibration identification(s) 软件标定标识	B	4.7.1.2	0x22	ITID	0xF804
	n) the calibration verification number(s) 标定验证编码	B	4.7.1.2	0x22	ITID	0xF806

Table C.1 (*continued*)

Requirement number	GTR requirement — ECE/TRANS/180/Add.5 (dated 23 January 2007)				This part of ISO 27145		
	Requirement description	**Mod.**	**Section**	**SID**	**Mnemonic**	**DID/SF**	
6	**Information for repair修复信息** This information provides repair technicians with all OBD data specified in this module (e.g. freeze frame information).此信息为维修技术员提供了本模块中指定的所有的OBD数据 (如冻结帧信息)。 The OBD system shall provide all information for the external repair test equipment to assimilate the data and provide a repair technician with the following information: 该OBD系统应提供外部维修测试设备的所有信息, 以同步数据, 并向维修技术员提供以下信息:	B	4.7.1.3	N/A	N/A	N/A
	a) the GTR (and revision) numberGTR (和修订) 号	B	4.7.1.3	0x22	ITID	0xF811
	b) the VIN (vehicle identification number)车辆识别码	B	4.7.1.3	0x22	ITID	0xF802
	c) the malfunction indicator status故障指示器状态	B	4.7.1.3	0x22	PID	0xF491
	d) the readiness of the OBD system OBD系统的准备	B	4.7.1.3	0x22	PID	0xF490 0xF401ᵃ 0xF441
	number of warm-up cycles and number of engine operating hours since recorded OBD information was last cleared从上一次OBD信息清除以来发动机的暖机工作循环	B	4.7.1.3	0x22	PID	0xF430 0xF44E
	monitor status (i.e. disabled for the rest of this drive cycle, completed this drive cycle or not completed this drive cycle) since last engine shut-off for each monitor used for readiness status监视状态(即禁用当前剩余驾驶循环, 完成该驾驶循环, 或未完成当前驾驶循环)	B	4.7.1.3	0x22	PID	0xF441
	the number of engine operating hours since the malfunction indicator has been activated(continuous-MI counter) 从故障指示灯激活开始发动机驾驶小时数	B	4.7.1.3	0x22	PID	0xF491
	the confirmed and active DTCs for Class A malfunctions确认和激活的A类故障DTCs	B	4.7.1.3	0x19	SF	0x42
	the confirmed and active DTCs for Classes B (B1 and B2) malfunctions; 确认和激活的B类（B1和和B2）故障DTCs	B	4.7.1.3	0x19	SF	0x42
	the cumulated operating hours with a continuous-MI (cumulative continuous-MI counter)一个连续的故障指示灯累计运行时间（累计连续MI计数器）	B	4.7.1.3	0x22	PID	0xF493
	the value of the B1 counter with the highest number of engine operating hours发动机运行时数最高的B1计数器值	B	4.7.1.3	0x22	PID	0xF491
				0x19	SF	0x06, 0x90
	the confirmed and active DTCs for Class B1 malfunctions and the number of engine operating hours from the B1-counter(s) 确认和激活的B1故障DTCs, 从B1计数器开始的发动机运行小时数	B	4.7.1.3	0x19	SF	0x42
				0x19	SF	0x06, 0x90
				0x22	PID	0xF491
	the confirmed and active DTCs for Class C malfunctions确认和激活的C类故障DTCs	B	4.7.1.3	0x19	SF	0x42
	n) the pending DTCs and their associated classes 挂起的 DTCs 及其关联的类	B	4.7.1.3	0x19	SF	0x42
	the previously active DTCs and their associated classes 以前激活的 DTCs 及其关联的类	B	4.7.1.3	0x19	SF	0x42
	p) real-time information on OEM selected and supported sensor signals, internal and output signals OEM选定的实时信息和支持的传感器信号, 内部和外部输出信号	B	4.7.1.3	N/A	N/A	N/A
	q) the freeze frame data requested by this module 该模块要求的冻结帧	B	4.7.1.3	N/A	N/A	N/A
	r) the software calibration identification(s)软件标定标识	B	4.7.1.3	0x22	ITID	0xF804
	s) the calibration verification number(s)标定验证码	B	4.7.1.3	0x22	ITID	0xF806
	The OBD system shall clear all the recorded malfunctions of the engine system and related data (operating time information, freeze frame, etc.) in accordance with the provisions of this module, where this request is provided via the external repair test equipment.当外部维修测试设备提出请求时, OBD系统应该根据规定, 清除发动机系统和相关数据 (操作时间信息, 冻结帧等) 的所有记录故障。	B	4.7.1.3	0x14	group OfDTC	0xFFFF 33

Table C.1 (*continued*)

Require-ment number	GTR requirement — ECE/TRANS/180/Add.5 (dated 23 January 2007)			This part of ISO 27145		
	Requirement description	Mod.	Section	SID	Mne-monic	DID/SF
7	**Freeze frame information冻结帧信息** If required by a contracting party, the OBD system may provide access to a subset of the following requirements:如果按照约定的要求，OBD系统可以提供以下访问请求：	B	4.7.1.4	N/A	N/A	N/A
	At least one freeze frame of information shall be stored at the time which either a potential DTC or a confirmed and active DTC is stored at the decision of the manufacturer. The manufacturer is allowed to update the freeze frame information whenever the pending DTC is detected again. 至少有一个冻结帧信息应存储在可能的DTC或确认和激活的DTC存储在制造商决定的时候。每当检测到挂起的DTC 时，允许制造商更新冻结帧信息。	B	4.7.1.4	0x19	SF	0x04, record # 0x00
	The freeze frame shall provide the operating conditions of the vehicle at the time of malfunction detection and the DTC associated with the stored data. 冻结帧应在故障检测和与存储数据相关的DTC时提供车辆的操作条件。	B	4.7.1.4	0x19	SF	0x04, record # 0x00
	Storage of freeze frame information associated with a Class A malfunction shall take precedence over information associated with a Class B1 malfunction, which shall take precedence over information associated with a Class B2 malfunction and likewise for information associated with a Class C malfunction. The first malfunction detected shall take precedence over the most recent malfunction unless the most recent malfunction is of a higher class. 存储与冻结帧信息相关的A类故障应优先于与B1类故障信息，B1类故障信息优于B2类故障信息，同样对于与C类故障相关的信息。第一次故障检测应优先于最近的故障，除非最近的故障是一个较高的类。	B	4.7.1.4	0x19	SF	0x04, record # 0x00
8	**Readiness就绪状态** Readiness shall be set to "complete" whenever a monitor or a group of monitors addressed by this status has/have run since the last erasing by request of an external OBD scan-tool. 当监视器或由该状态处理的监视器组自上次通过外部的扫描工具请求擦除后，就绪状态应设置为"完成 "。 Readiness shall be set to "not complete" by erasing the fault code memory of a monitor or group of monitors by request of an external scan-tool.当外部扫描工具请求擦除一个监视器或一组监视器的错误码内存时，就绪状态应设置为"未完成"	B	4.7.1.5	N/A	N/A	N/A
	Normal engine shutdown shall not cause the readiness to change. 正常的发动机停机不应导致就绪状态变更。	B	4.7.1.5	N/A	N/A	N/A
	The manufacturer may request, subject to approval by the certification authority, that the ready status for a monitor be set to indicate "complete" without the monitor having completed, if monitoring is disabled for a multiple number of operating sequences due to the continued presence of extreme operating conditions (e.g. cold ambient temperatures, high altitudes). Any such request shall specify the conditions for monitoring system disablement and the number of operating sequences which can pass without monitor completion before ready status can be indicated as "complete". 如果针对多个操作序列禁用了监视，则制造商可要求在证书颁发机构批准的情况下设置监视器的就绪状态，以指示 "完成 ", 因为极端操作条件的持续存在 (如寒冷的环境温度、高海拔)。任何此类请求均应指明监测系统障碍的条件，以及在就绪状态标识为"完成 "之前可以通过的操作序列的数量。	B	4.7.1.5	N/A	N/A	N/A

Table C.1 (*continued*)

Require-ment number	GTR requirement — ECE/TRANS/180/Add.5 (dated 23 January 2007)			This part of ISO 27145		
	Requirement description需求说明	Mod.	Section	SID	Mne-monic	DID/SF
9	Data stream information数据流信息 If required by a contracting party, the OBD system may provide access to a subset of the following requirements. 按照约定，OBD系统需要提供以下的访问请求	B	4.7.2	N/A	N/A	N/A
	Upon request, the OBD system shall make the information available to a scan tool in real time (actual signal values should be used in favour of surrogate values). 按要求，OBD系统应将信息实时提供给扫描工具 (实际信号值用于替代值)。	B	4.7.2	N/A	N/A	N/A
	For the purposes of the calculated load and torque parameters, the OBD system shall report the most accurate values which are calculated within the applicable electronic control unit (e.g. the engine control computer). 为了计算负载和扭矩参数, OBD系统应报告在适用的电子控制单元(如ECU) 中计算的最准确值。	B	4.7.2	N/A	N/A	N/A
	Access to OBD information获得OBD信息 Access to OBD information shall be possible by means of a wired connection.通过连线就可以获得OBD信息 OBD data shall be provided by the OBD system upon request using a scan tool which complies with the requirements of the applicable standards mentioned in module A, annex 1 (communication with external tester). OBD系统应提供OBD数据，当(与外部测试人员通信)使用的是符合模块A、附件1所述适用标准要求的扫描工具时。	B	4.7.3	N/A	N/A	N/A
	Erasing/resetting OBD information by a scan tool擦除和重置OBD信息通过扫描工具 On request of the scan tool, the following data shall be erased or reset to the value specified in this GTR from the computer memory:根据扫描工具的要求，下列数据应被擦除或重置到指定的值从电脑内存中到这个GTR — MI status (value to be reset);故障指示状态 — readiness of the OBD system (value to be reset);系统就绪状态(要重置的值) — number of engine operating hours since the malfunction indicator has been activated (continuous MI-counter) (data to be erased); 从故障指示器激活开始（连续的MI计数）的发动机运行小时数（数据被擦除） — all DTCs (data to be erased);所有DTCs — the value of the B1 counter with the highest number of engine operating hours (value to be reset); 引擎运行小时数最高的B1计数器的值 — the number of engine operating hours from the B1-counter(s) (value to be reset);从B1计数开始发动机运行小时数 — the freeze frame data requested by this module/ECU (data to be erased).该模块/ECU要求的冻结帧数据	B	4.7.4	0x14	group OfDTC	0xFFFF33
12	Calculated load (engine torque as a percentage of maximum torque available at the current engine speed) 计算负载 (发动机扭矩最大扭矩百分比可用在当前的引擎速度下)	B	GTR #5 Module B, Annex 5, Table 1; 4.7.1.4, 4.7.2	0x22	PID	0xF404
	Driver's demand engine torque (as a percentage of maximum engine torque) 驾驶员需求的引擎扭矩 (作为最大发动机扭矩百分比)	B		0x22	PID	0xF461
	Actual engine torque (calculated as a percentage of maximum engine torque, e.g. calculated from commanded injection fuel quantity) 实际的发动机扭矩 (计算为最大发动机扭矩百分比,如计算的指令注入燃料数量)	B		0x22	PID	0xF462
	Reference engine maximum torque参考发动机最大扭矩	B		0x22	PID	0xF463
	Reference maximum engine torque as a function of engine speed参考最大发动机扭矩作为发动机转速的函数	B		0x22	PID	0xF464
	Engine coolant temperature (or equivalent) 发动机冷却剂温度 (或当量)	B		0x22	PID	0xF467
	Engine speed 发动机转速	B		0x22	PID	0xF40C
	Time elapsed since engine start引擎启动后所经过的时间	B		0x22	PID	0xF41F

Table C.1 (*continued*)

Require-ment number	GTR requirement — ECE/TRANS/180/Add.5 (dated 23 January 2007) Requirement description	Mod.	Section	This part of ISO 27145 SID	Mne-monic	DID/SF
13	Driver's demand engine torque (as a percentage of maximum engine torque)驾驶员需求发动机扭矩(作为最大发动机扭矩的百分比)	B	GTR #5 Module B, Annex 5, Table 2, 4.7.1.4, 4.7.2	0x22	PID	0xF461
	Actual engine torque (calculated as a percentage of maximum engine torque, e.g. calculated from commanded injection fuel quantity) 实际的发动机扭矩 (计算为最大发动机扭矩的百分比, 如计算的指令注入燃料数量)	B		0x22	PID	0xF462
	Reference engine maximum torque参考发动机最大扭矩	B		0x22	PID	0xF463
	Reference maximum engine torque as a function of engine speed参考最大发动机扭矩作为发动机转速的函数	B		0x22	PID	0xF464
	Time elapsed since engine start引擎启动后所经过的时间	B		0x22	PID	0xF41F
14	Fuel level燃油水平	B	GTR #5 Module B, Annex 5; Table 3; 4.7.1.4, 4.7.2	0x22	PID	0xF42F
	Engine oil temperature引擎燃油温度	B		0x22	PID	0xF45C
	Vehicle speed车速	B		0x22	PID	0xF40D
	Engine control computer system voltage (for the main control chip) 发动机控制计算机系统电压 (主控芯片)	B		0x22	PID	0xF442
15	Absolute throttle position/intake air throttle position (position of valve used to regulate intake air) 绝对油门位置/进气节气门位置 (用于调节进气空气的阀门位置)	B	GTR #5 Module B, Annex 5, Table 4; 4.7.1.4, 4.7.2	0x22	PID	0xF46A
	Diesel fuel control system status in case of a close loop system (e.g. in case of a fuel pressure close loop system) 柴油控制系统在闭环系统情况下的状态 (例如, 在燃油压力关闭回路系统的情况下)	B		0x22	PID	0xF492
	Fuel rail pressure燃油共轨压力	B		0x22	PID	0xF46D
	Injection control pressure (i.e. pressure of the fluid controlling fuel injection) 喷射控制压力 (即流体控制燃油喷射的压力)	B		0x22	PID	0xF46E
	Representative fuel injection timing (beginning of first main injection) 典型燃油喷射定时 (第一次主喷射开始)	B		0x22	PID	0xF45D
	Commanded fuel rail pressure需求燃料共轨压力	B		0x22	PID	0xF46D
	Commanded injection control pressure (i.e. pressure of the fluid controlling fuel injection)需求喷射压力	B		0x22	PID	0xF46E
	Intake air temperature进气温度	B		0x22	PID	0xF468
	Ambient air temperature环境空气温度	B		0x22	PID	0xF446
	Turbocharger inlet/outlet air temperature (compressor and turbine) 涡轮增压器进/出口空气温度 (压缩机和涡轮)	B		0x22	PID	0xF475 0xF476
	Turbocharger inlet/outlet pressure (compressor and turbine) 涡轮增压器进/出口压力 (压缩机和涡轮)	B		0x22	PID	0xF46F 0xF470 0xF473
	Charge air temperature (post intercooler, if fitted) 装载温度 (后中冷器, 如果安装)	B		0x22	PID	0xF477
	Actual boost pressure实际升压压力	B		0x22	PID	0xF470
	Air flow rate from mass air flow sensor质量空气流量传感器的气流速率	B		0x22	PID	0xF466
	Commanded exhaust gas recirculation (EGR) valve duty cycle/position, (provided EGR is so controlled) 命令废气再循环 (egr) 阀门的工作周期/位置, (提供的EGR 是如此控制)	B		0x22	PID	0xF469
	Actual EGR valve duty cycle/position实际 EGR 阀工作周期/位置	B		0x22	PID	0xF469
	PTO status (active or not active) PTO状态（激活或不激活）	B		0x22	PID	0xF465
	Accelerator pedal position油门踏板位置	B		0x22	PID	0xF44A 0xF44B

Table C.1 (*continued*)

Require-ment number	GTR requirement — ECE/TRANS/180/Add.5 (dated 23 January 2007)				This part of ISO 27145		
	Requirement description	**Mod.**	**Section**		**SID**	**Mne-monic**	**DID/SF**
15	Redundant absolute pedal position冗余绝对踏板位置	B	GTR #5 Module B, Annex 5, Table 4; 4.7.1.4, 4.7.2		0x22	PID	0xF45A
	Instantaneous fuel consumption瞬时油耗	B			0x22	PID	0xF45E
	Commanded/target boost pressure (if boost pressure used to control turbo operation) 指令 / 目标升压压力 (如果增压力用于控制涡作)	B			0x22	PID	0xF470
	DPF inlet pressure DPF 进口压力	B			0x22	PID	0xF47A 0xF47B
	DPF outlet pressure出口压力	B			0x22	PID	0xF47A 0xF47B
	DPF delta pressure delta压力	B			0x22	PID	0xF47A 0xF47B
	Engine-out exhaust pressure 发动机排气压力	B			0x22	PID	0xF473
	DPF inlet temperature[a]入口温度	B			0x22	PID	0xF47C
	DPF outlet temperature[a]出口温度	B			0x22	PID	0xF47C
	Engine-out exhaust gas temperature[a]发动机排气温度	B			0x22	PID	0xF478 0xF479
	Turbocharger/turbine speed 涡轮增压器/涡轮速度	B			0x22	PID	0xF474
	Variable geometry turbo position 可变几何涡轮位置	B			0x22	PID	0xF471
	Commanded variable geometry turbo position 指令可变几何涡轮位置	B			0x22	PID	0xF471
	Wastegate valve position 废气旁通阀位置	B			0x22	PID	0xF472
	Air:fuel ratio sensor output 空气: 燃料比感器输出	B			0x22	PID	0xF48C[b]
	Oxygen sensor output 氧传感器输出	B			0x22	PID	0xF48C[b]
	NOx sensor output NOx 传感器输出	B			0x22	PID	0xF483

NOTE   This table only provides an overview of how this part of ISO 27145 and ISO 27145-3 can be used to fulfil the WWH-OBD GTR. There is no guarantee that this table is complete with respect to the most recent version of the WWH-OBD GTR or different local legislations. The notation "N/A" indicates that a specific legislative requirement described in the requirement description column does not contain a communication requirement and it is the responsibility of the vehicle manufacturer to ensure that these non-communication requirements are implemented according to the applicable regulation.

注意 本表仅概述了如何使用ISO 27145 和ISO 27145-3 的这一部分来实现WWH的GTR。对于最新版本的WWH或不同的地方立法, 这张表格是完全没有保证的。表示法"N/A "表示 "需求说明" 列中描述的特定立法要求不包含通信要求, 而汽车制造商有责任确保这些非通信要求是根据适用的规定执行的。

[a]   PID 0xF401 is mandatory in the case of servers which support more than Comprehensive Components Monitoring. If the server supports only Comprehensive Components Monitoring, then PID 0xF401 is optional.

对于支持超过全面组件监视的服务器, PID 0xF401 是强制性的。如果服务器只支持全面的组件监视, 则 PID 0xF401 是可选的。

[b]   It is the responsibility of the vehicle manufacturer to choose the correct oxygen sensor and air/fuel ration sensor DID(s) depending on the signal from the respective sensor.

汽车制造商有责任根据传感器的信号选择正确的氧传感器和空气/燃料定量传感器。

Annex D
(normative)标准的

GTR WWH-OBD DTCExtendedDataRecord content
GTR WWH-OBD DTC 扩展数据记录内容

The DTCExtendedDataRecord 0x90 - FailureSpecificB1Counter shall be requested by the external test equipment using service "ReadDTCInformation (0x19)" with sub-function "reportDTCExtendedDataRecord-ByDTCNumber (0x06)".
GTR WWH-OBD DTC 扩展数据记录0x90 ---外部测试设备使用服务"读取DTC信息 (0x19) " 与子函数 "报告 DTC扩展数据记录-通过DTC编号 (0x06) " 来请求故障特定 B1 计数器。

Table D.1 specifies the FailureSpecificB1Counter. 指定特定故障的 B1 计数器。

Table D.1 — FailureSpecificB1Counter response data parameter definition

Definition
FailureSpecificB1Counter The FailureSpecificB1Counter provides an individual B1 counter, supported by the system. The counter provides the number of hours during which the B1 failure has been confirmed and active. 故障特定的 B1 计数器提供了一个单独的 B1 计数器, 由系统支持。计数器提供确认和激活 B1 故障的小时数。 Data length: 2 bytes Resolution: 0,1 h/bit, 0 offset Data range: 0 to 6553,5 h

Annex E
(informative)
Definition guidelines for new DID (PID, MID, ITID) assignments
新的DID(PID,MID,ITID)分配定义指南

E.1 Received signal validity implementation guidelines 收到的信号有效性实施指南

The data parameters defined in this part of ISO 27145 are based on system functionality and are independent of the electronic system architecture implemented by the vehicle manufacturer.
ISO 27145 这一部分中定义的数据参数是基于系统功能的, 独立于汽车制造商实施的电子系统体系结构。

A data record specified by a DID and defined in SAE J1979-DA includes a set of data parameters, e.g. analogue and discrete parameters which are grouped together to provide a valuable set of information to the external test equipment to meet the use case definitions as specified in ISO 27145-1. The definition of validity status for each DID is defined in SAE J1979-DA.
由1个DID所指定并在 SAE J1979-DA 中定义的数据记录包括一组数据参数, 如模拟和离散参数, 它们组合在一起, 为外部测试设备提供一组有价值的信息, 以满足用例定义, 如在 ISO 27145-1 中指定。在 SAE J1979-DA 中定义了每种方法的有效性状态定义。

Table E.1 defines the validity encoding of a signal parameter data specified by the DID. This validity encoding scheme is recommended for application to DID definitions in SAE J1979-DA as part of the data parameter definition.
表 E. 1 定义了DID所指定的信号参数数据的有效性编码。建议使用此有效性编码方案将SAE J1979-DA 中的定义作为数据参数定义的一部分。

Table E.1 — Received signal validity status definition 收到信号有效性状态定义

Validity status	Description
Valid and un-defaulted data signal有效和未默认的数据信号	This is a valid data signal. Data is un-defaulted and represents the raw value. 这是一个有效的数据信号。数据未默认, 表示原始值。
Networked data unavailable网络数据不可用	The data signal cannot be received due to a faulty network. The data signal is unavailable. The transmitted value can either represent the last known valid value or the default value used by the fail-safe strategy. 由于网络故障, 无法接收数据信号。数据信号不可用。传输的值可以表示最后一个已知的有效值或故障安全策略使用的默认值。
Invalid remote sub-node data signal 无效的远程子节点数据信号	The data signal is received from a remote sub-node and this single status represents the following two cases: 从远程子节点接收到数据信号, 此单一状态表示以下两种情况: — the data signal is invalid because of a faulty remote sub-node circuit; 由于有故障的远程子节点电路, 数据信号无效; — this includes signals still under evaluation as valid after the signal has been identified as invalid (e.g. engine coolant temperature can need a soak start to evaluate whether or not the sensor is stuck at high temperature). 这包括在被识别为无效信号后仍处于评估中的信号 (例如, 发动机冷却剂温度可能需要浸泡开始, 以评估传感器是否还在高温下停留)。 For both cases, the data bytes shall represent the transmitted value received from the remote sub-node. 对于这两种情况, 数据字节应表示从远程子节点接收到的传输值。
Unsupported/data signal not available 不支持/数据信号不可用	The data signal is not supported or not available by system design. If the data parameter represents an analogue signal, each data byte of the data parameter shall be set to 0xFF. If the data parameter represents a discrete signal, 2 bits shall be defined and set to "1b" (unsupported, not available, not installed). 系统设计不支持或不提供数据信号。如果数据参数表示模拟信号, 则数据参数的每个数据字节应设置为0xFF。如果数据参数表示离散信号, 则应定义2位, 并将其设置为 "1b " (不支持、不可用、未安装)。

E.2 Remotely received sub-node information and validity远程接收的子节点信息和有效性

The data parameters defined in this part of ISO 27145 are based on system functionality and are independent of the electronic system architecture implemented by the vehicle manufacturer. ISO 27145 这一部分中定义的数据参数是基于系统功能的, 独立于汽车制造商实施的电子系统体系结构。

A data record specified by a DID and defined in SAE J1979-DA includes a set of data parameters, e.g. analogue and discrete parameters which are grouped together to provide a valuable set of information to the external test equipment to meet the use case definitions as specified in ISO 27145-1. 由DID所指定并在 SAE J1979-DA 中定义的数据记录包括一组数据参数, 如模拟和离散参数(它们组合在一起), 为外部测试设备提供一组有价值的信息, 以满足在 ISO 27145-1 中指定用例的定义。

Sensors and switches can be hard-wired to the server, which is connected to the external test equipment or connected to a remote sub-node, which communicates via a subnet to the server. Since system functions can be distributed across several remote sub-nodes and partially implemented in the server, which is connected to the external test equipment, it is important that all data parameters based on sensed signals provide validity status information where reported to the external test equipment.

传感器和交换机可以硬连线到服务器, 连接到外部测试设备或连接到远程子节点, 通过子网与服务器进行通信。由于系统功能可以分布在多个远程子节点上, 并且在服务器中部分实现, 连接到外部测试设备, 重要的是, 所有基于感知信号的数据参数都提供了向外部测试设备报告的有效性状态信息。
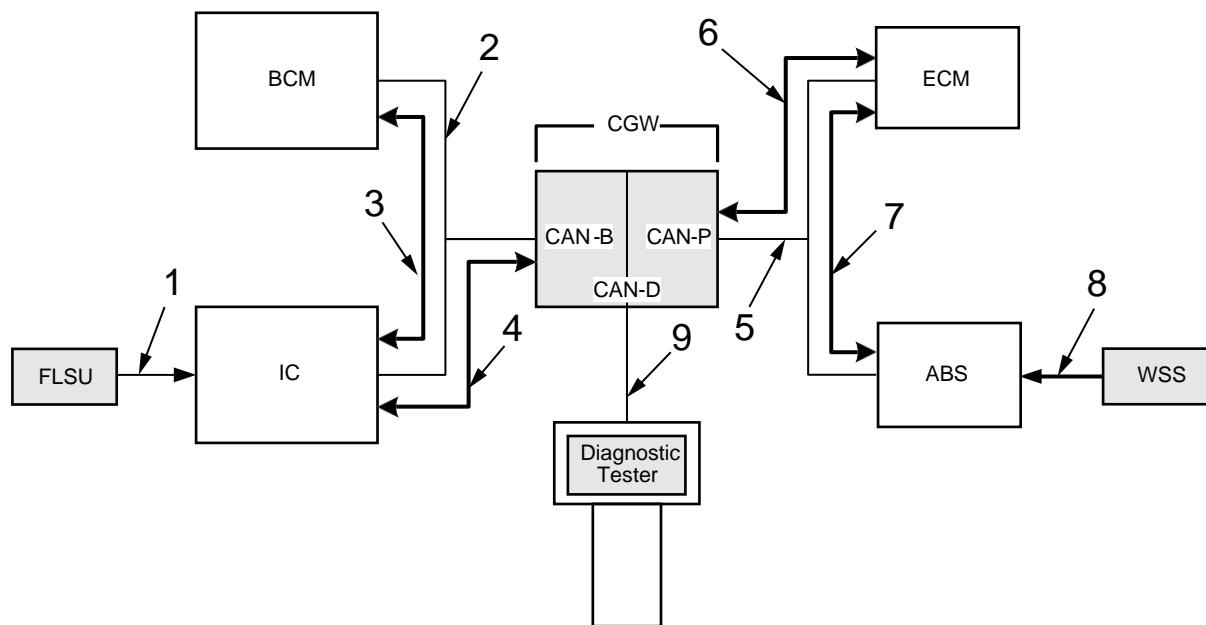
Table E.2 describes possible failure conditions. 描述可能的故障条件

Table E.2 — Possible fault case description of Fuel Level Sending Unit input via network message
表E.2 ----基于网络消息的燃油液位发送单元输入的可能故障案例描述

Fault case	Failure mode 故障模式	Failure conditions 故障条件
1	Loss of Fuel Level Sending Unit data (functionally impacts Powertrain CAN network operation) 燃油液位的发送单位数据 丢失(功能影响动力总成CAN网络操作)	Fuel Level Sending Unit electrical circuit continuity failure (low, high or open circuit) 燃油液位发送单元电路连续性故障 (低、高或开路) Fuel Level Sending Unit rationality failure (inactive, stuck or erratic performance) 燃油液位发送单位合理性失效 (非活动, 卡住或不稳定的性能)
2	Loss of IC messages丢失IC信息 (functionally impacts both BODY CAN and POWERTRAIN CAN network operation)功能影响在车身CAN和动力CAN网络操作	IC internal failure IC 内部故障 BODY CAN transceiver hardware failure 收发器硬件故障 BODY CAN electrical circuit continuity failure (dual open circuit) 电路单元连续性失效（双开路电路）
3	Loss of CGW (Central Gateway) BODY CAN messages (functionally impacts POWERTRAIN CAN network operation) 丢失CGW（中央网关）车身CAN信息功能性影响动力CAN网络操作	CGW internal failure CGW内部故障 BODY CAN transceiver hardware failure 车身CAN传输硬件故障 BODY CAN electrical circuit continuity failure (dual open circuit) 车身CAN电路单元连续性失效（双开路电路）
4	Loss of CGW POWERTRAIN CAN messages (functionally impacts BODY CAN network operation) 丢失动力CAN中央网关信号（功能性影响车身CAN网络操作）	CGW internal failure CGW内部故障 POWERTRAIN CAN transceiver hardware failure动力CAN传输硬件故障 POWERTRAIN CAN electrical circuit continuity failure (low, high or open circuit)动力CAN电路连续性故障 (低、高或开路)
5	Loss of ABS messages ABS信息丢失 (functionally impacts both BODY CAN and POWERTRAIN CAN network operation) 功能性影响到车身CAN和动力CAN操作	ABS internal failure ABS内部失效 POWERTRAIN CAN transceiver hardware failure动力CAN传输硬件故障 POWERTRAIN CAN electrical circuit continuity failure (low, high or open circuit) 动力CAN电路连续性故障 (低、高或开路)
6	Loss of Wheel Speed Sensor data (functionally impacts both BODY CAN and POWERTRAIN CAN network operation) 丢失轮速传感器数据 功能性影响到车身CAN和动力CAN操作	Wheel Speed Sensor electrical circuit continuity failure (low, high or open circuit) 车轮速度传感器电路连续性故障 (低、高或开路) Wheel Speed Sensor rationality failure (inactive, stuck or erratic performance) 车轮速度传感器合理性故障 (非活动, 卡住或不稳定的性能)

Figure E.1 illustrates a possible configuration of providing fuel level and vehicle speed information to the external test equipment.

图 E. 1 说明了为外部测试设备提供燃油液位和车速信息的可能配置。

Key

1   fuel level sending unit connected to instrument cluster via A/D hardwire link 通过A/D硬件链连接到仪器的燃油液位发送单元
2   body CAN bus 车身CAN 总线
3   IC sends fuel level data to BCM   IC发送燃油液位数据到BCM
4   IC sends fuel level data to CGW   IC发送燃油液位数据到CGW
5   powertrain CAN bus   动力总成CAN总线
6   ECM sends wheel speed data to CGW   ECM发送车轮速度数据给CGW
7   ABS sends wheel speed data to ECM via Powertrain CAN bus   ABS通过动力总成CAN总线发送车轮速度数据给ECM
8   wheel speed sensor connected to ABS via Powertrain CAN (networked wheel speed read for ECM)
    车轮速度传感器连接到 ABS 通过动力总成CAN总线 (通过网络给ECM读取车轮速度)
9   diagnostic CAN bus   诊断CAN总线

ABS   Anti-lock brake control module 防抱制动控制模块
BCM   Body Control module   车身控制模块
CAN-B Body CAN bus 车身CAN总线
CAN-P Powertrain CAN bus 动力总成CAN总线
CAN-D Diagnostic CAN bus   诊断CAN总线
CGW Central gateway 中央网关
ECM   Engine control module   发动机控制器
FLSU   Fuel level sending unit 燃油液位发送单元
 IC   Instrument cluster 仪表集成
WSS   Wheel speed sensor轮速传感器

Figure E.1 — Example of fuel level sending unit input via network message
图E.1 ----燃油液位发动单元通过网络传输信息示例

Bibliography书目

[1]   ISO/IEC 7498-1, *Information technology — Open Systems Interconnection — Basic Reference Model: The Basic Model*

[2]   ISO/IEC 10731, *Information technology — Open Systems Interconnection — Basic Reference Model — Conventions for the definition of OSI services*

[3]   ISO 11898-1, *Road vehicles — Controller area network (CAN) — Part 1: Data link layer and physical signalling*

[4]   ISO 11898-2, *Road vehicles — Controller area network (CAN) — Part 2: High-speed medium access unit*

[5]   ISO 13400 (all parts), *Road vehicles — Diagnostic communication over Internet Protocol (DoIP)*

[6]   ISO 15031 (all parts), *Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics*

[7]   ISO 15765-2, *Road vehicles — Diagnostic communication over Controller Area Networks (DoCAN) — Part 2: Transport protocol and network layer services*

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

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

[10]   SAE J1939-03, *On-Board Diagnostics Implementation Guide*

[11]   IEEE 802.3, *IEEE Standard for Information technology — Specific requirements — Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications*

[12]   CCR 1968.2 Title 13, California Code Regulations, Section 1968.2, Malfunction and Diagnostic System Requirements for 2004 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines (OBD II), available at: http://www.arb.ca.gov/msprog/obdprog/obdregs.htm

[13]   CCR 1971.1 Title 13, California Code Regulations, Section 1971.1, On-Board Diagnostic System Requirements for 2010 and Subsequent Model-Year Heavy-Duty Engines (HD OBD), available at: http://www.arb.ca.gov/msprog/obdprog/hdobdreg.htm

[14]   *Global Technical Regulation No. 5, Technical Requirements for On-Board Diagnostic Systems (OBD) for Road Vehicles.* (established in the Global Registry on 15 November 2006); document: ECE/TRANS/180/Add.5 dated 23 January 2007, available at: http://live.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29registry/gtr5.html