

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

Part 6: Diagnostic trouble code definitions

ICS 13.040.50; 43.040.10

National foreword

This British Standard reproduces verbatim ISO 15031-6:2005 and implements it as the UK national standard.

The UK participation in its preparation was entrusted to Technical Committee AUE/16, Electrical and electronic equipment, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international publications referred to in this document may be found in the *BSI Catalogue* under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, the ISO title page, pages ii to v, a blank page, pages 1 to 129 and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 25 January 2006

© BSI 25 January 2006

INTERNATIONAL STANDARD

ISO
15031-6

First edition
2005-12-01

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

Part 6: Diagnostic trouble code definitions

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

Partie 6: Définition des codes d'anomalie de diagnostic



Reference number
ISO 15031-6:2005(E)



Documents

Document Sharing Hub

Contents

Page

Foreword.....	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions.....	1
4 General specifications.....	6
5 Format structure	7
5.1 Description	7
5.2 ISO/SAE controlled codes (core DTCs)	8
5.3 Manufacturer controlled codes (non-uniform DTCs)	8
5.4 Body system groupings (DTC numbers and descriptions are given in Annex C)	8
5.5 Chassis system groupings (DTC numbers and descriptions are given in Annex B)	9
5.6 Powertrain system groupings (DTC numbers and descriptions are given in Annex C)	9
5.7 Network groupings (DTC numbers and descriptions are given in Annex C)	9
6 Diagnostic trouble code descriptions	9
6.1 Diagnostic trouble code application.....	9
6.2 Powertrain systems	9
6.3 Body systems.....	10
6.4 Chassis systems.....	10
6.5 Network and vehicle integration systems	10
7 Change requests.....	11
Annex A (normative) Diagnostic trouble code naming guidelines	12
Annex B (normative) Powertrain system diagnostic trouble codes	15
Annex C (normative) Network communication system, body system, and chassis system groupings	90
Annex D (normative) DTC Failure Category and Subtype definition	118

Foreword

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

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

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

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

ISO 15031-6 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

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

- *Part 1: General information*
- *Part 2: Terms, definitions, abbreviations and acronyms*
- *Part 3: Diagnostic connector and related electrical circuits, specification and use*
- *Part 4: External test equipment*
- *Part 5: Emissions-related diagnostic services*
- *Part 6: Diagnostic trouble code definitions*
- *Part 7: Data link security*

Introduction

ISO 15031 consists of a number of parts which taken together provide a coherent self-consistent set of specifications to facilitate emissions-related diagnostics. Parts 2 through 7 are based on SAE-recommended practices.

This part of ISO 15031 is based on SAE J2012: MAR99 (Recommended Practice for Diagnostic Trouble Code Definitions).

ISO 15031-1 provides an introduction to the series of International Standards.

Most automobile manufacturers equip at least a portion of their product line with some on-board diagnostic (OBD) capability. These systems provide an indication as to the general location of the diagnosed malfunction. This information is provided through an alphanumeric code.

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

Part 6: Diagnostic trouble code definitions

1 Scope

This part of ISO 15031 provides recommended uniformity for alphanumeric trouble codes. It further provides guidance for uniform messages associated with these codes.

It specifies several sections addressing format, structure, messages and a few examples, and is applicable to electrical/electronic systems diagnostics of motor vehicles.

Annex A specifies the diagnostic trouble code naming guidelines for signals from components, signals to components, system based diagnostics, and signals using a subfault strategy.

Annex B specifies the actual code assignments and description for powertrain system diagnostic trouble codes.

Annex C specifies the actual code assignments and description for network communication system diagnostic trouble codes, body system diagnostic trouble codes, and chassis system diagnostic trouble codes.

Annex D specifies the DTC failure category and Subtype definition of the DTC failure type byte which is an extension of a base DTC to more precisely describe the fault symptom of the DTC.

2 Normative references

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

ISO/TR 15031-2, *Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 2: Terms, definitions, abbreviations and acronyms*

ISO 14229-1, *Road vehicles — Unified diagnostic services (UDS) — Part 1: Specification and requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15031-2 and the following apply.

3.1

circuit/open

fixed value or no response from the system where specific high or low detection is not feasible or can be used in conjunction with circuit low and high codes where all three circuit conditions can be detected

NOTE The term “malfunction” has, in most cases, been deleted from the DTC description.

3.2
range/performance

circuit in the normal operating range, but not correct for current operating conditions

NOTE This may be used to indicate stuck or skewed values indicating poor performance of a circuit, component or system.

3.3
low input

circuit voltage, frequency, or other characteristic measured at the control module input terminal or pin that is below the normal operating range

3.4
high input

circuit voltage, frequency, or other characteristic measured at the control module input terminal or pin that is above the normal operating range

3.5
bank
specific group of cylinders sharing a common control sensor

NOTE 1 Bank 1 always contains cylinder number 1; bank 2 is the opposite bank.

NOTE 2 If there is only one bank, bank 1 DTCs are used, and the word “bank” may be omitted. With a single bank system using multiple sensors, bank 1 is used.

3.6
sensor location

location of a sensor in relation to the engine air flow, starting from the fresh air intake through to the vehicle tailpipe or fuel flow from the fuel tank to the engine, numbered in order 1, 2, 3 and so on

NOTE See Figure 1 through Figure 7.

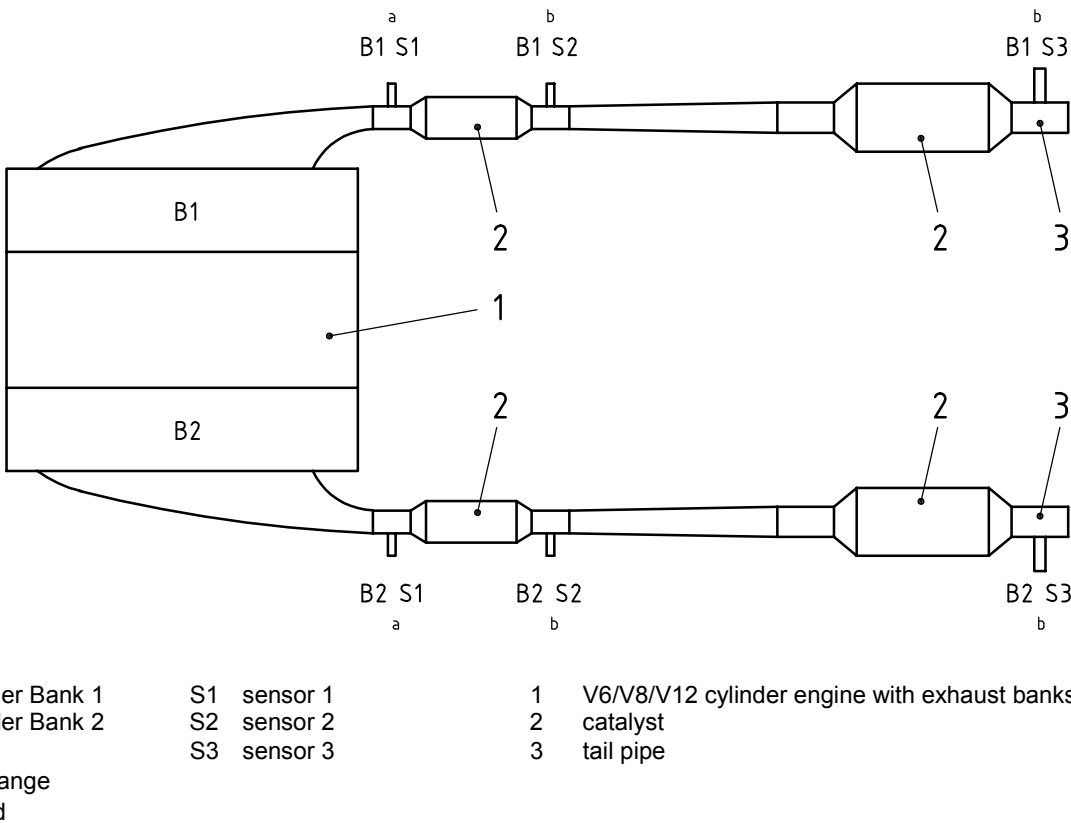
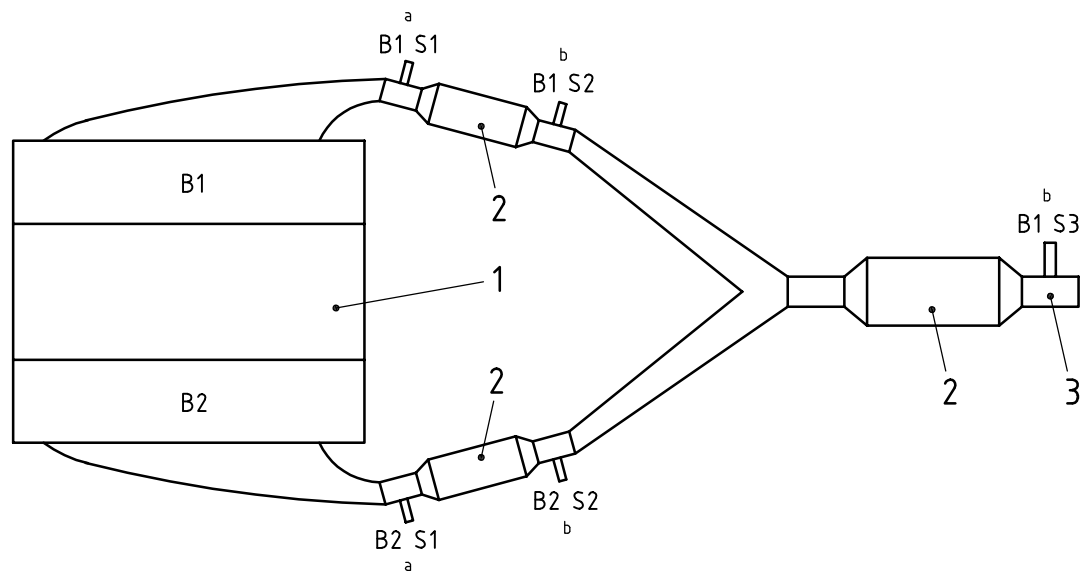
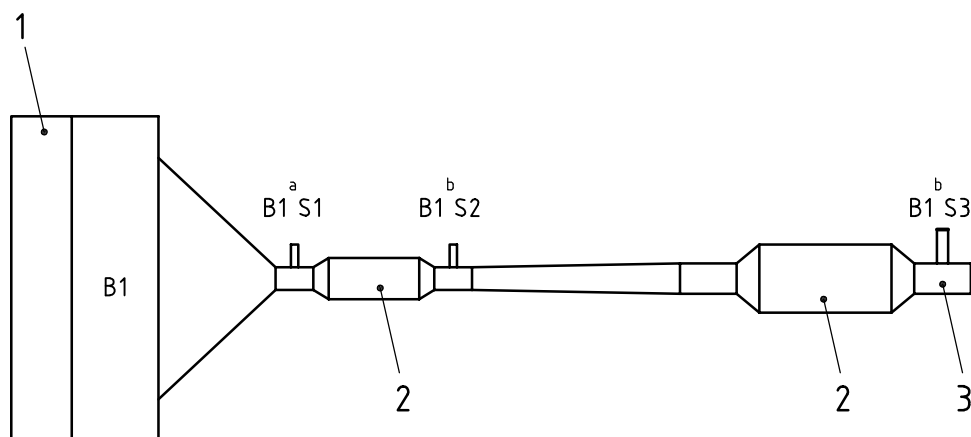


Figure 1 — Example of V6/V8/V12 cylinder engine with two exhaust banks and four catalysts

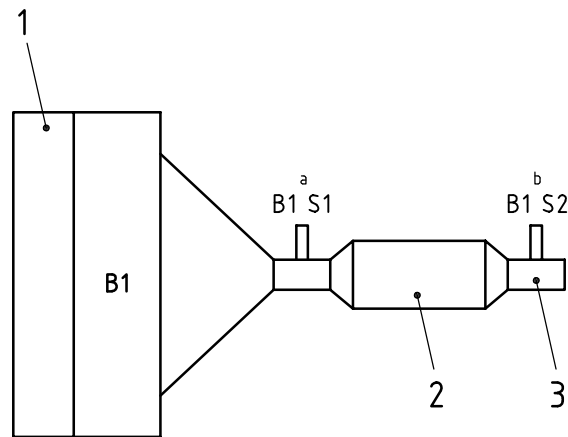
**Key**

B1	cylinder Bank 1	S1	sensor 1	1	V6/V8/V12 cylinder engine with exhaust banks
B2	cylinder Bank 2	S2	sensor 2	2	catalyst
		S3	sensor 3	3	tail pipe
a	wide range				
b	heated				

Figure 2 — Example of V6/V8/V12 cylinder engine with two exhaust banks and three catalysts**Key**

B1	cylinder Bank 1	S1	sensor 1	1	4-cylinder engine with exhaust banks
		S2	sensor 2	2	catalyst
		S3	sensor 3	3	tail pipe
a	wide range				
b	heated				

Figure 3 — Example of L4/L5/L6 cylinder engine with one exhaust bank and two catalysts

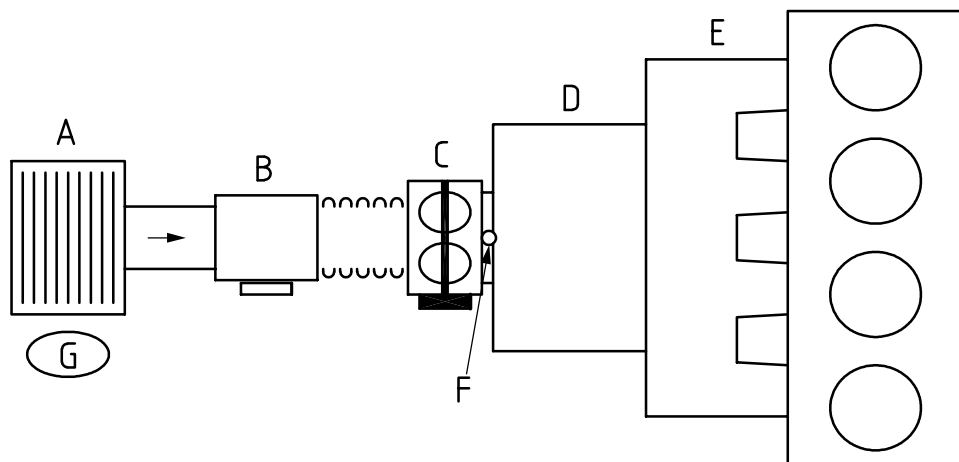


Key

B1	cylinder Bank 1	S1	sensor 1	1	4-cylinder engine with exhaust banks
		S2	sensor 2	2	catalyst
				3	tail pipe
a	wide range				
b	heated				

Figure 4 — Example of L4/L5/L6 cylinder engine with one exhaust bank and one catalyst

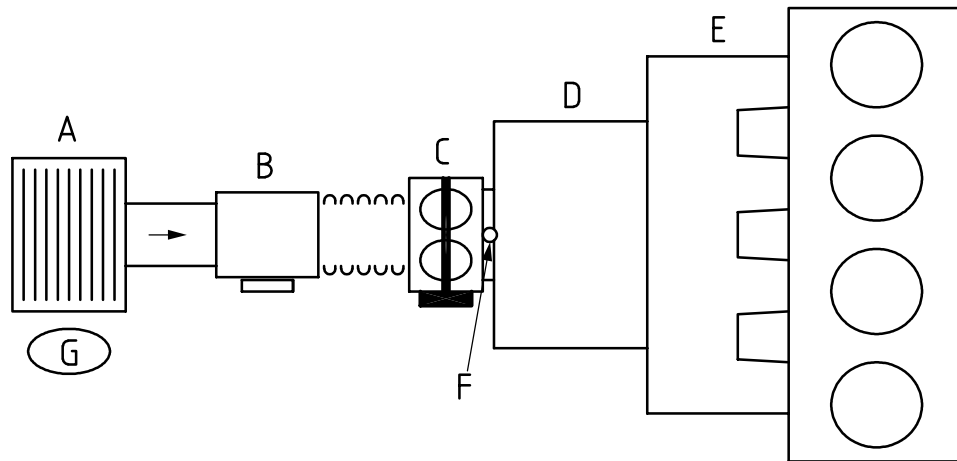
Intake air system pressure sensor location for boosted applications in relation to the engine air flow, including the fresh air inlet, boost device and engine manifold.



Components

A	air cleaner
B	MAF
C	throttle body
D	turbocharger/supercharger
E	MAP (manifold pressure closest to the intake valves)
F	inlet (pressure after the throttle body, but before the pressurizing device)
G	BARO (atmospheric pressure)

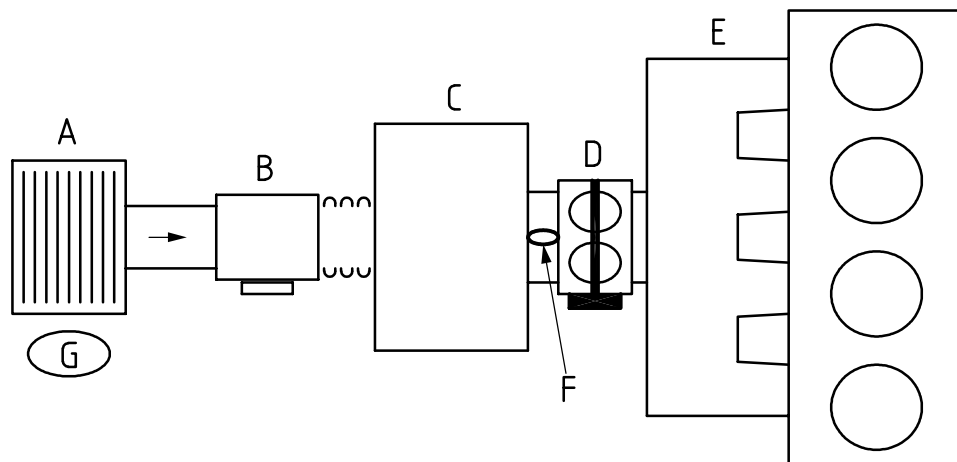
Figure 5 — Turbocharger/supercharger pressure sensor location draw-thru system



Components

- A air cleaner
- B MAF
- C throttle body
- D turbocharger/supercharger
- E MAP (manifold pressure closest to the intake valves)
- F boost (pressure after the pressurizing device, but before the throttle body)
- G BARO (atmospheric pressure)

Figure 6 — Turbocharger/supercharger pressure sensor location blow-thru system



Components

- A air cleaner
- B MAF
- D Turbocharger/supercharger
- E MAP (manifold pressure closest to the intake valves)
- G BARO (atmospheric pressure)

Figure 7 — Turbocharger/supercharger pressure sensor location no throttle body (diesel)

3.7**left/right and front/rear**

component identified by its position as if it can be viewed from the drivers seating position

3.8**“A” “B”**

manufacturer defined when components indicated by a letter

3.9**intermittent/erratic**

temporarily discontinuous signal where the duration of the fault is not sufficient to be considered open or short, or the rate of change is excessive

4 General specifications

Table 1 specifies systems, code categories, hexadecimal values and particular sections of electrical/electronic systems diagnostic.

Table 1 — General code specifications

System	Code categories	Hex value	Appendix
Body	B0xxx – B3xxx	8xxx – Bxxx	B
Chassis	C0xxx – C3xxx	4xxx – 7xxx	C
Powertrain	P0xxx – P3xxx	0xxx – 3xxx	P
Network	U0xxx – U3xxx	Cxxx – Fxxx	U

The recommended DTCs consist of a three-digit numeric code preceded by an alphanumeric designator. The alphanumeric designators are “B0”, “B1”, “B2”, “B3”, “C0”, “C1”, “C2”, “C3”, “P0”, “P1”, “P2”, “P3”, “U0”, “U1”, “U2”, “U3”, corresponding to four sets of body, four sets of chassis, four sets of powertrain and four sets of network trouble codes. The code structure itself is partially open-ended. A portion of the available numeric sequences (portions of “B0”, “C0”, “P0”, “P2”, “P3”, “U0” and “U3”) is reserved for uniform codes assigned by this or future updates. Detailed specifications of the DTC format structure are specified in Clause 5. Most circuit, component, or system diagnostic trouble codes that do not support a subfault strategy are specified by four basic categories:

- Circuit/open,
- Range/performance,
- Circuit low, and
- Circuit high.

Circuit low is measured with the external circuit, component, or system connected. The signal type (voltage, frequency, etc.) shall be included in the message after circuit low or circuit high.

Circuit high is measured with the external circuit, component, or system connected. The signal type (voltage, frequency, etc.) may be included in the message after circuit low or circuit high.

5 Format structure

5.1 Description

The diagnostic trouble code consists of an alphanumeric designator, B0-B3 for body, C0-C3 for chassis, P0-P3 for powertrain, and U0-U3 for network communication, followed by three characters. The assignment of the proper alpha designator should be determined by the area most appropriate for that function. In most cases, the alpha designator will be implied since diagnostic information will be requested from a particular controller. However, this does not imply that all codes supported by a particular controller shall have the same alphanumeric designator. The codes are structured as in Figure 8.

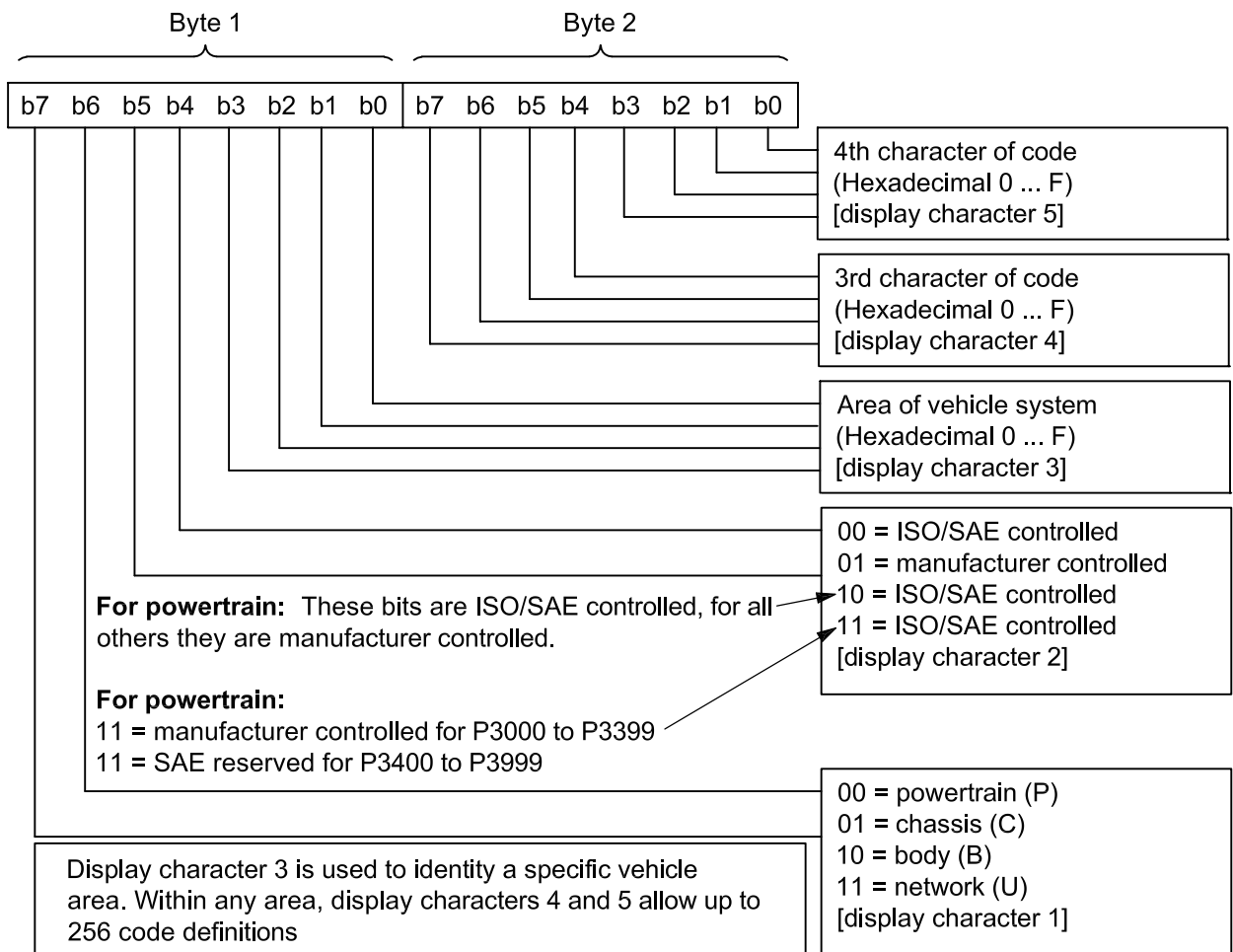


Figure 8 — Structure of diagnostic trouble codes

EXAMPLE 1 The 2-byte DTC as a data bus value \$9234 would be displayed to technicians as the manufacturer controlled body code B1234 (see Figure 9).

DTC High Byte								DTC Low Byte							
\$9				\$2				\$3				\$4			
1	0	0	1	0	0	1	0	0	0	1	1	0	1	0	0
B				1				3				4			

Figure 9 — Example of 2-byte diagnostic trouble code structure

EXAMPLE 2 The 3-byte DTC as a data bus value \$923400 would be displayed to technicians as the manufacturer controlled body code B1234-00 (see Figure 10). See Annex D for DTC Low Byte (Failure Type Byte) definitions. The low byte shall be displayed in hexadecimal format, e.g. \$1A shall be displayed as 1A.

DTC High Byte				DTC Middle Byte				DTC Low Byte			
\$9		\$2		\$3		\$4		\$0		\$0	
1	0	0	1	0	0	1	0	0	0	0	0
B	1	2		3		4		0		0	

Figure 10 — Example of 3-byte diagnostic trouble code structure

Codes have been specified to indicate a suspected trouble or problem areas, and are intended to be used as a directive to the proper service procedure. To minimize service confusion, fault codes should not be used to indicate the absence of problems or the status of parts of the system (e.g. powertrain system O.K., or MIL activated), but should be confined to indicate areas in need of service attention.

Ranges have been expanded beyond 100 numbers by using the hexadecimal base 16 number system.

5.2 ISO/SAE controlled codes (core DTCs)

ISO/SAE-controlled diagnostic trouble codes are those codes where industry uniformity has been achieved. These codes were felt to be common enough across most manufacturers' applications that a common number and fault message could be assigned. All unspecified numbers in each grouping are ISO/SAE reserved for future growth. Although service procedures may differ widely amongst manufacturers, the fault being indicated is common enough to be assigned a particular fault code. Codes in this area are not to be used by manufacturers until they have been approved by ISO/SAE.

5.3 Manufacturer controlled codes (non-uniform DTCs)

Areas within each alpha designator have been made available for manufacturer-controlled DTCs. These are fault codes that will not generally be used by a majority of the manufacturers due to basic system differences, implementation differences, or diagnostic strategy differences. Each vehicle manufacturer or supplier who designs and specifies diagnostic algorithms, software and diagnostic trouble codes are strongly encouraged to remain consistent across their product line when assigning codes in the manufacturer-controlled area. For powertrain codes, where possible, the same groupings should be used as in the ISO/SAE controlled area, i.e. 100's and 200's for fuel and air metering, 300's for ignition system or misfire, etc.

While each manufacturer has the ability to define the controlled DTCs to meet its specific controller algorithms, all DTC words shall meet ISO 15031-2.

5.4 Body system groupings (DTC numbers and descriptions are given in Annex C)

5.4.1 B0XXX ISO/SAE controlled

5.4.2 B1XXX manufacturer controlled

5.4.3 B2XXX manufacturer controlled

5.4.4 B3XXX reserved by document

5.5 Chassis system groupings (DTC numbers and descriptions are given in Annex C)

5.5.1 C0XXX ISO/SAE controlled

5.5.2 C1XXX manufacturer controlled

5.5.3 C2XXX manufacturer controlled

5.5.4 C3XXX reserved by document

5.6 Powertrain system groupings (DTC numbers and descriptions are given in Annex B)

5.6.1 P0XXX ISO/SAE controlled

5.6.2 P1XXX manufacturer control

5.6.3 P2XXX ISO/SAE controlled

5.6.4 P3XXX manufacturer controlled and ISO/SAE reserved

5.7 Network groupings (DTC numbers and descriptions are given in Annex C)

5.7.1 U0XXX ISO/SAE controlled

5.7.2 U1XXX manufacturer controlled

5.7.3 U2XXX manufacturer controlled

5.7.4 U3XXX manufacturer controlled and ISO/SAE reserved

6 Diagnostic trouble code descriptions

6.1 Diagnostic trouble code application

Recent developments have expanded the scope of this documentation to include additional DTCs and descriptions for network systems, body systems and chassis systems. Two different DTC application methods are required depending on the system. Powertrain DTCs require the assignment of a unique DTC number and description for each failure mode (e.g. circuit low, circuit high, rationality, etc.). Body and chassis systems descriptions are more general and require the assignment of a single DTC number and description for each component, not failure mode. Unique body and chassis failure mode identification is still possible, but is dependent upon using diagnostic protocols that support a subfault failure strategy. One example is ISO 14229-1, which uses a "Failure Type Byte" associated with each DTC to describe the failure mode (e.g. circuit low, circuit high, rationality, etc.). However, any protocol supporting a subfault strategy will work with these DTCs. Manufacturers shall select the appropriate failure mode to apply to the base DTC description.

6.2 Powertrain systems

The powertrain systems category covers functions that include engine, transmission and associated drivetrain accessories. For powertrain systems, each specified fault code has been assigned a description to indicate the circuit, component or system area that was determined to be at fault. The descriptions are organized such that different descriptions related to a particular sensor or system are grouped together. In cases where there are various fault descriptions for different types of faults, the group also has a "generic" description as the first code/message of the group. A manufacturer has a choice when implementing diagnostics, based on the specific strategy and complexity of the diagnostic.

Where more specific fault descriptions for a circuit, component or system exist, manufacturers should choose the code most applicable to their diagnosable fault. The descriptions are intended to be somewhat general to allow manufacturers to use them as often as possible yet still not conflict with their specific repair procedures.

The terms “low” and “high” when used in a description, especially those related to input signals, refer to the voltage, frequency, etc. at the pin of the controller. The specific level of “low” and “high” shall be specified by each manufacturer to best meet their needs.

For example, in diagnosing a 5 V reference Throttle Position Sensor (TP Sensor), if the input signal at the Powertrain Control Module (PCM) is stuck near 0 V, a manufacturer has the flexibility to select from either of two codes — P0120 (Throttle/Pedal Position Sensor/Switch A Circuit) or P0122 (Throttle/Pedal Position Sensor/Switch A Circuit Low), depending on the manufacturer’s diagnostic procedures. If the input signal at the PCM is stuck near 5 V, a manufacturer has the flexibility to select from either of two codes — P0120 (Throttle/Pedal Position Sensor/Switch A Circuit) or P0123 (Throttle/Pedal Position Sensor/Switch A Circuit High), depending on the manufacturer’s diagnostic procedures. If the input signal at the PCM is stuck at 1,5 V at idle instead of the expected 1,0 V, the manufacturer has the flexibility to select from either of two codes — P0120 (Throttle/Pedal Position Sensor/Switch A Circuit) or P0121 (Throttle/Pedal Position Sensor/Switch A Circuit Range/Performance), depending on the manufacturer’s diagnostic procedures. The root cause of the higher than expected TP Sensor voltage may be either a faulty TP Sensor, corrosion in the TP Sensor connections or an improperly adjusted throttle plate. Identification of the root cause is done using the diagnostic procedures, and is not implied by the DTC message, thus allowing the manufacturer flexibility in assigning DTCs.

6.3 Body systems

The body systems category covers functions that are, generally, inside of the passenger compartment. These functions provide the vehicle occupants with assistance, comfort, convenience and safety. Each specified trouble code has been assigned a description to indicate the component or system area that was determined to be at fault. Unlike powertrain systems, the body system trouble code descriptions are intended to be general. Powertrain DTCs typically include separate DTCs for each failure mode (e.g. circuit low, circuit high, rationality, etc.) within each DTC description. Body system DTCs are designed to only support the base component in the description, which makes these DTCs dependent upon diagnostic protocols that support a subfault failure strategy. Manufacturers must select the appropriate failure mode (e.g. circuit short to ground, circuit short to battery, signal plausibility failure, etc.) to apply to the general DTC description. The supported body subsection included in this group is Restraints.

6.4 Chassis systems

The chassis systems category covers functions that are, generally, outside of the passenger compartment. These functions typically include mechanical systems such as brakes, steering and suspension. Each specified trouble code has been assigned a description to indicate the component or system area that was determined to be at fault. Unlike powertrain systems, the chassis system trouble code descriptions are intended to be general. Powertrain DTCs typically include separate DTCs for each failure mode (e.g. circuit low, circuit high, rationality, etc.) within each DTC description. Chassis system DTCs are designed to only support the base component in the description, which makes these DTCs dependent upon diagnostic protocols that support a subfault failure strategy. Manufacturers must select the appropriate failure mode (e.g. circuit short to ground, circuit short to battery, signal plausibility failure, etc.) to apply to the general DTC description. The supported chassis subsections included in this group are Brakes and Traction Control.

6.5 Network and vehicle integration systems

The network communication and vehicle integration systems category covers functions that are shared among computers and/or systems on the vehicle. Each specified trouble code has been assigned a description to indicate the component or system area that was determined to be at fault. The descriptions of data links are intended to be general in order to allow manufacturers to use them for different communication protocols. The descriptions of control modules are intended to be general in order to allow manufacturers to reuse the DTC for new control modules as technologies evolve. Also, the descriptions may be supplemented with additional subfault information such as the “Failure Type Byte” data defined in Annex D. The subsections included in this group are Network Electrical, Network Communication, Network Software, Network Data and Control Module/Power Distribution.

7 Change requests

Use this form to pass your request:

Request Form for new ISO 15031-6/SAE J2012 controlled DTC

What is the purpose of the component, circuit, or system?

Example: Exhaust Gas Recirculation.

What is the purpose of the diagnostic?

Example: Detect low EGR flow.

Requested Group Number _____

Requested DTC Number _____

Requested DTC Nomenclature _____

Example: EGR Low Flow Detected.

Requested by: _____

Phone/Fax _____

Email _____

Address _____

Date:

Please send completed form(s) to both addresses:

FAKRA
Normenausschuß Kraftfahrzeuge
Postfach 17 05 63
D-60079 Frankfurt/Main
Germany
ATTN: ISO/TC22/SC3/WG1
Fax: +49-69-97507-209
e-mail: fritzsche@vda.de

SAE Headquarters
755 West Big Beaver Road
Suite 1600
Troy, MI 48084
USA
ATTN: J2012 Committee Chairman

Annex A (normative)

Diagnostic trouble code naming guidelines

A.1 Discussion

Table A.1 is a guideline used to help in determining DTC descriptions. Annex B shows applications for recommended industry-common trouble codes for the powertrain control system while Annex C shows applications for recommended industry common trouble codes for the body, chassis and network control systems. The DTCs in Annex B include systems that might be integrated into an electronic control module that would be used for controlling engine functions, such as fuel, spark, idle speed and vehicle speed (cruise control), as well as those for transmission control. The fact that a code is recommended as a common industry code does not imply that it is a required code (legislated), an emission-related code, nor that it indicates a fault that will cause the malfunction indicator to be illuminated.

Table A.1 — DTC naming guidelines for signals from components

Component/System ISO 15031-2/ SAE J1930 ^a	Acronym ISO 15031-2/ SAE J1930 ^a	Modifier (if used) ^a	Noun Name ^a	Circuit ^a	Intermittent (if used) ^a	State (if used) ^a	Parameter (if used) ^a	Location (if used) ^a
Throttle Position	TP		Sensor	Circuit		Low	Voltage	
Throttle Position	TP		Sensor	Circuit		Performance		
Manifold Absolute Pressure	MAP		Sensor	Circuit		High	Voltage	
Engine Coolant Temperature	ECT		Sensor	Circuit		Low	Voltage	
Intake Air Temperature	IAT		Sensor	Circuit		High	Voltage	
Vehicle Speed Sensor	VSS		included in acronym	Circuit		High	Voltage	
Vehicle Speed Sensor	VSS		included in acronym	Circuit	Intermittent			
Heated Oxygen Sensor	HO2S		included in acronym	Circuit				
Heated Oxygen Sensor	HO2S		included in acronym	Circuit		Low	Voltage	Bank (B1) Sensor 1 (S1)
Idle Air Control	IAC		Valve	Circuit		Low	Voltage	
Mass Air Flow	MAF		Sensor	Circuit		High	Frequency	
Mass Air Flow	MAF		Sensor	Circuit		Performance		
Knock Sensor	KS		included in acronym	Circuit				Bank 1
Knock Sensor	KS		included in acronym	Circuit		Performance		
Crankshaft Position	CKP		Sensor	Circuit				
Evaporative Emissions	EVAP	Canister Purge	Valve	Circuit				
Engine Speed	RPM		Input	Circuit				
Air Conditioning	A/C	Clutch Status	N/A	Circuit		Low	Voltage	
Heated Oxygen Sensor	HO2S		included in acronym	Circuit		Transition Time Ratio		Bank 1 (B1) Sensor (S1)
Heated Oxygen Sensor	HO2S		included in acronym	Circuit		Insufficient Switching		Bank 1 (B1) Sensor 1 (S1)
Distributor Ignition	DI	Low Resolution		Circuit	Intermittent			
Distributor Ignition	DI	High Resolution		Circuit				

^a The Service Information uses Component/System from ISO 15031-2/SAE J1930 or Acronym from ISO 15031-2/SAE J1930, Modifier, Noun Name, Circuit, Intermittent, State, Parameter and Location.

Table A.2 — DTC naming guidelines for signals to components

Component/System ISO 15031-2/ SAE J1930 ^a	Acronym ISO 15031-2/ SAE J1930 ^a	Modifier (if used) ^a	Noun Name ^a	Control ^a	Circuit ^a	Intermittent (if used) ^a	State (if used) ^a	Parameter (if used) ^a	Location (if used) ^a
Malfunction Indicator Lamp	MIL		included in acronym	Control	Circuit				
Injector	N/A		N/A	Control	Circuit				
Fan Control	FC	1		Control	Circuit				
Fan Control	FC	2		Control	Circuit		Low		
Exhaust Gas Recirculation	EGR		Solenoid	Control	Circuit		High		
Secondary Air Injection	AIR		Solenoid	Control	Circuit		High		
Evaporative Emissions	EVAP	Purge	Solenoid	Control	Circuit				
Air Conditioning	A/C	Clutch	Relay	Control	Circuit				
Idle Air Control	IAC		Valve	Control	Circuit		Low		
Ignition Control	IC		N/A	included in acronym	Circuit		Low	Voltage	
Ignition Control	IC		N/A	included in acronym	Circuit		High	Voltage	
Torque Converter Clutch	TCC		Solenoid	Control	Circuit		Stuck on		

^a The Service Information uses Component/System from ISO 15031-2/SAE J1930 or Acronym from ISO 15031-2/SAE J1930, Modifier, Noun Name, Circuit, Intermittent, State, Parameter and Location.

Table A.3 — DTC naming guidelines involving several components or systems

Component/System ISO 15031-2/SAE J1930 ^a	Acronym ISO 15031-2/ SAE J1930 ^a	Modifier ^a	System ^a	Intermittent ^a	State ^a	Parameter ^a	Location ^a
Exhaust Gas Recirculation	EGR		System				
Fuel Trim	FT		System		Lean		Bank 1
Secondary Air Injection	AIR		System				Bank 1

^a The Service Information uses Component/System from ISO 15031-2/SAE J1930 or Acronym from ISO 15031-2/SAE J1930, Modifier, Noun Name, Circuit, Intermittent, State, Parameter and Location.

Table A.4 — DTC naming guidelines for signals using a subfault strategy

Location	Component/System ISO 15031-2/ SAE J1930 ^a	Acronym ISO 15031-2/ SAE J1930 ^a	Modifier (if used) ^a	Noun Name ^a	Subfault Failure Type ^b
Left Front	Wheel		Speed	Sensor	signal amplitude < minimum
Passenger	Seat		Occupant Classification	Sensor	circuit open
Second Row Left	Seatbelt			Sensor	no Subtype information
Driver	Frontal		Stage 1	Deployment Control	circuit resistance out of range

^a The Service Information uses Location, Component/System from ISO 15031-2/SAE J1930 or Acronym from ISO 15031-2/SAE J1930, Modifier, Noun Name and Subfault Failure Type.

^b These DTCs require the addition of a failure mode supported via a diagnostic protocol (e.g. ISO 14229-1), which supports DTC subfaults. These are not intended to be used with protocols that do not support a subfault strategy. Reference Annex D for recommended Failure Type Byte assignments.

Annex B (normative)

Powertrain system diagnostic trouble codes

B.1 P00XX Fuel and air metering and auxiliary emission controls

Table B.1 — P00XX Fuel and air metering and auxiliary emission controls

DTC number	DTC naming	Location
P0000	ISO/SAE reserved	
P0001	Fuel Volume Regulator Control Circuit/Open	
P0002	Fuel Volume Regulator Control Circuit Range/Performance	
P0003	Fuel Volume Regulator Control Circuit Low	
P0004	Fuel Volume Regulator Control Circuit High	
P0005	Fuel Shutoff Valve "A" Control Circuit/Open	
P0006	Fuel Shutoff Valve "A" Control Circuit Low	
P0007	Fuel Shutoff Valve "A" Control Circuit High	
P0008	Engine Position System Performance	Bank 1
P0009	Engine Position System Performance	Bank 2
P000A	"A" Camshaft Position Slow Response	Bank 1
P000B	"B" Camshaft Position Slow Response	Bank 1
P000C	"A" Camshaft Position Slow Response	Bank 2
P000D	"B" Camshaft Position Slow Response	Bank 2
P000E	ISO/SAE reserved	
P000F	ISO/SAE reserved	
P0010 ^a	"A" Camshaft Position Actuator Circuit / Open	Bank 1
P0011 ^a	"A" Camshaft Position – Timing Over-Advanced or System Performance	Bank 1
P0012 ^a	"A" Camshaft Position – Timing Over-Retarded	Bank 1
P0013 ^b	"B" Camshaft Position – Actuator Circuit / Open	Bank 1
P0014 ^b	"B" Camshaft Position – Timing Over-Advanced or System Performance	Bank 1
P0015 ^b	"B" Camshaft Position – Timing Over-Retarded	Bank 1
P0016	Crankshaft Position – Camshaft Position Correlation	Bank 1 Sensor A
P0017	Crankshaft Position – Camshaft Position Correlation	Bank 1 Sensor B
P0018	Crankshaft Position – Camshaft Position Correlation	Bank 2 Sensor A
P0019	Crankshaft Position – Camshaft Position Correlation	Bank 2 Sensor B
P0020 ^a	"A" Camshaft Position Actuator Circuit / Open	Bank 2
P0021 ^a	"A" Camshaft Position – Timing Over-Advanced or System Performance	Bank 2
P0022 ^a	"A" Camshaft Position – Timing Over-Retarded	Bank 2

Table B.1 (continued)

DTC number	DTC naming	Location
P0023 ^b	"B" Camshaft Position – Actuator Circuit / Open	Bank 2
P0024 ^b	"B" Camshaft Position – Timing Over-Advanced or System Performance	Bank 2
P0025 ^b	"B" Camshaft Position – Timing Over-Retarded	Bank 2
P0026	Intake Valve Control Solenoid Circuit Range/Performance	Bank 1
P0027	Exhaust Valve Control Solenoid Circuit Range/Performance	Bank 1
P0028	Intake Valve Control Solenoid Circuit Range/Performance	Bank 2
P0029	Exhaust Valve Control Solenoid Circuit Range/Performance	Bank 2
P0030	HO2S Heater Control Circuit	Bank 1 Sensor 1
P0031	HO2S Heater Control Circuit Low	Bank 1 Sensor 1
P0032	HO2S Heater Control Circuit High	Bank 1 Sensor 1
P0033	Turbocharger/Supercharger Bypass Valve Control Circuit	
P0034	Turbocharger/Supercharger Bypass Valve Control Circuit Low	
P0035	Turbocharger/Supercharger Bypass Valve Control Circuit High	
P0036	HO2S Heater Control Circuit	Bank 1 Sensor 2
P0037	HO2S Heater Control Circuit Low	Bank 1 Sensor 2
P0038	HO2S Heater Control Circuit High	Bank 1 Sensor 2
P0039	Turbocharger/Supercharger Bypass Valve Control Circuit Range/Performance	
P0040	O2 Sensor Signals Swapped Bank 1 Sensor 1/Bank 2 Sensor 1	
P0041	O2 Sensor Signals Swapped Bank 1 Sensor 2/Bank 2 Sensor 2	
P0042	HO2S Heater Control Circuit	Bank 1 Sensor 3
P0043	HO2S Heater Control Circuit Low	Bank 1 Sensor 3
P0044	HO2S Heater Control Circuit High	Bank 1 Sensor 3
P0045	Turbocharger/Supercharger Boost Control Solenoid "A" Circuit/Open	
P0046	Turbocharger/Supercharger Boost Control Solenoid "A" Circuit Range/Performance	
P0047	Turbocharger/Supercharger Boost Control Solenoid "A" Circuit Low	
P0048	Turbocharger/Supercharger Boost Control Solenoid "A" Circuit High	
P0049	Turbocharger/Supercharger Turbine Overspeed	
P004A	Turbocharger/Supercharger Boost Control Solenoid "B" Circuit / Open	
P004B	Turbocharger/Supercharger Boost Control Solenoid "B" Circuit Range/Performance	
P004C	Turbocharger/Supercharger Boost Control Solenoid "B" Circuit Low	
P004D	Turbocharger/Supercharger Boost Control Solenoid "B" Circuit High	
P004E	Turbocharger/Supercharger Boost Control Solenoid "A" Circuit Intermittent/Erratic	
P004F	Turbocharger/Supercharger Boost Control Solenoid "B" Circuit Intermittent/Erratic	
P0050	HO2S Heater Control Circuit	Bank 2 Sensor 1
P0051	HO2S Heater Control Circuit Low	Bank 2 Sensor 1
P0052	HO2S Heater Control Circuit High	Bank 2 Sensor 1

Table B.1 (continued)

DTC number	DTC naming	Location
P0053	HO2S Heater Resistance	Bank 1 Sensor 1
P0054	HO2S Heater Resistance	Bank 1 Sensor 2
P0055	HO2S Heater Resistance	Bank 1 Sensor 3
P0056	HO2S Heater Control Circuit	Bank 2 Sensor 2
P0057	HO2S Heater Control Circuit Low	Bank 2 Sensor 2
P0058	HO2S Heater Control Circuit High	Bank 2 Sensor 2
P0059	HO2S Heater Resistance	Bank 2 Sensor 1
P0060	HO2S Heater Resistance	Bank 2 Sensor 2
P0061	HO2S Heater Resistance	Bank 2 Sensor 3
P0062	HO2S Heater Control Circuit	Bank 2 Sensor 3
P0063	HO2S Heater Control Circuit Low	Bank 2 Sensor 3
P0064	HO2S Heater Control Circuit High	Bank 2 Sensor 3
P0065	Air Assisted Injector Control Range/Performance	
P0066	Air Assisted Injector Control Circuit or Circuit Low	
P0067	Air Assisted Injector Control Circuit High	
P0068	MAP/MAF – Throttle Position Correlation	
P0069	Manifold Absolute Pressure – Barometric Pressure Correlation	
P006A	MAP – Mass or Volume Air Flow Correlation	
P006B	MAP – Exhaust Pressure Correlation	
P006C	MAP – Turbocharger/Supercharger Inlet Pressure Correlation	
P006D	Barometric Pressure – Turbocharger/Supercharger Inlet Pressure Correlation	
P006E	ISO/SAE reserved	
P006F	ISO/SAE reserved	
P0070	Ambient Air Temperature Sensor Circuit	
P0071	Ambient Air Temperature Sensor Range/Performance	
P0072	Ambient Air Temperature Sensor Circuit Low	
P0073	Ambient Air Temperature Sensor Circuit High	
P0074	Ambient Air Temperature Sensor Circuit Intermittent	
P0075	Intake Valve Control Solenoid Circuit	Bank 1
P0076	Intake Valve Control Solenoid Circuit Low	Bank 1
P0077	Intake Valve Control Solenoid Circuit High	Bank 1
P0078	Exhaust Valve Control Solenoid Circuit	Bank 1
P0079	Exhaust Valve Control Solenoid Circuit Low	Bank 1
P0080	Exhaust Valve Control Solenoid Circuit High	Bank 1
P0081	Intake Valve Control Solenoid Circuit	Bank 2
P0082	Intake Valve Control Solenoid Circuit Low	Bank 2
P0083	Intake Valve Control Solenoid Circuit High	Bank 2
P0084	Exhaust Valve Control Solenoid Circuit	Bank 2

Table B.1 (continued)

DTC number	DTC naming	Location
P0085	Exhaust Valve Control Solenoid Circuit Low	Bank 2
P0086	Exhaust Valve Control Solenoid Circuit High	Bank 2
P0087	Fuel Rail/System Pressure – Too Low	
P0088	Fuel Rail/System Pressure – Too High	
P0089	Fuel Pressure Regulator 1 Performance	
P0090	Fuel Pressure Regulator 1 Control Circuit	
P0091	Fuel Pressure Regulator 1 Control Circuit Low	
P0092	Fuel Pressure Regulator 1 Control Circuit High	
P0093	Fuel System Leak Detected – Large Leak	
P0094	Fuel System Leak Detected – Small Leak	
P0095	Intake Air Temperature Sensor 2 Circuit	
P0096	Intake Air Temperature Sensor 2 Circuit Range/Performance	
P0097	Intake Air Temperature Sensor 2 Circuit Low	
P0098	Intake Air Temperature Sensor 2 Circuit High	
P0099	Intake Air Temperature Sensor 2 Circuit Intermittent/Erratic	
P009A	Intake Air Temperature / Ambient Air Temperature Correlation	
^a The “A” camshaft shall be either the “intake”, “left”, or “front” camshaft. Left/Right and Front/Rear are determined as if viewed from the driver’s seating position. Bank 1 contains cylinder number one, Bank 2 is the opposite bank. ^b The “B” camshaft shall be either the “exhaust”, “right”, or “rear” camshaft. Left/Right and Front/Rear are determined as if viewed from the driver’s seating position. Bank 1 contains cylinder number one, Bank 2 is the opposite bank.		

B.2 P01XX Fuel and air metering

Table B.2 — P01XX Fuel and air metering

DTC number	DTC naming	Location
P0100	Mass or Volume Air Flow “A” Circuit	
P0101	Mass or Volume Air Flow “A” Circuit Range/Performance	
P0102	Mass or Volume Air Flow “A” Circuit Low	
P0103	Mass or Volume Air Flow “A” Circuit High	
P0104	Mass or Volume Air Flow “A” Circuit Intermittent	
P0105	Manifold Absolute Pressure/Barometric Pressure Circuit	
P0106	Manifold Absolute Pressure/Barometric Pressure Circuit Range/Performance	
P0107	Manifold Absolute Pressure/Barometric Pressure Circuit Low	
P0108	Manifold Absolute Pressure/Barometric Pressure Circuit High	
P0109	Manifold Absolute Pressure/Barometric Pressure Circuit Intermittent	
P010A	Mass or Volume Air Flow “B” Circuit	
P010B	Mass or Volume Air Flow “B” Circuit Range/Performance	

Table B.2 (continued)

DTC number	DTC naming	Location
P010C	Mass or Volume Air Flow "B" Circuit Low	
P010D	Mass or Volume Air Flow "B" Circuit High	
P010E	Mass or Volume Air Flow "B" Circuit Intermittent/Erratic	
P010F	Mass or Volume Air Flow Sensor A/B Correlation	
P0110	Intake Air Temperature Sensor 1 Circuit	
P0111	Intake Air Temperature Sensor 1 Circuit Range/Performance	
P0112	Intake Air Temperature Sensor 1 Circuit Low	
P0113	Intake Air Temperature Sensor 1 Circuit High	
P0114	Intake Air Temperature Sensor 1 Circuit Intermittent	
P0115	Engine Coolant Temperature Sensor 1 Circuit	
P0116	Engine Coolant Temperature Sensor 1 Circuit Range/Performance	
P0117	Engine Coolant Temperature Sensor 1 Circuit Low	
P0118	Engine Coolant Temperature Sensor 1 Circuit High	
P0119	Engine Coolant Temperature Sensor 1 Circuit Intermittent	
P011A	Engine Coolant Temperature Sensor 1/2 Correlation	
P0120	Throttle/Pedal Position Sensor/Switch "A" Circuit	
P0121	Throttle/Pedal Position Sensor/Switch "A" Circuit Range/Performance	
P0122	Throttle/Pedal Position Sensor/Switch "A" Circuit Low	
P0123	Throttle/Pedal Position Sensor/Switch "A" Circuit High	
P0124	Throttle/Pedal Position Sensor/Switch "A" Circuit Intermittent	
P0125	Insufficient Coolant Temperature for Closed Loop Fuel Control	
P0126	Insufficient Coolant Temperature for Stable Operation	
P0127	Intake Air Temperature Too High	
P0128	Coolant Thermostat (Coolant Temperature Below Thermostat Regulating Temperature)	
P0129	Barometric Pressure Too Low	
P012A	Turbocharger/Supercharger Inlet Pressure Sensor Circuit	
P012B	Turbocharger/Supercharger Inlet Pressure Sensor Circuit Range/Performance	
P012C	Turbocharger/Supercharger Inlet Pressure Sensor Circuit Low	
P012D	Turbocharger/Supercharger Inlet Pressure Sensor Circuit High	
P012E	Turbocharger/Supercharger Inlet Pressure Sensor Circuit Intermittent/Erratic	
P012F	ISO/SAE reserved	
P0130	O2 Sensor Circuit	Bank 1 Sensor 1
P0131	O2 Sensor Circuit Low Voltage	Bank 1 Sensor 1
P0132	O2 Sensor Circuit High Voltage	Bank 1 Sensor 1
P0133	O2 Sensor Circuit Slow Response	Bank 1 Sensor 1
P0134	O2 Sensor Circuit No Activity Detected	Bank 1 Sensor 1
P0135	O2 Sensor Heater Circuit	Bank 1 Sensor 1

Table B.2 (continued)

DTC number	DTC naming	Location
P0136	O2 Sensor Circuit	Bank 1 Sensor 2
P0137	O2 Sensor Circuit Low Voltage	Bank 1 Sensor 2
P0138	O2 Sensor Circuit High Voltage	Bank 1 Sensor 2
P0139	O2 Sensor Circuit Slow Response	Bank 1 Sensor 2
P0140	O2 Sensor Circuit No Activity Detected	Bank 1 Sensor 2
P0141	O2 Sensor Heater Circuit	Bank 1 Sensor 2
P0142	O2 Sensor Circuit	Bank 1 Sensor 3
P0143	O2 Sensor Circuit Low Voltage	Bank 1 Sensor 3
P0144	O2 Sensor Circuit High Voltage	Bank 1 Sensor 3
P0145	O2 Sensor Circuit Slow Response	Bank 1 Sensor 3
P0146	O2 Sensor Circuit No Activity Detected	Bank 1 Sensor 3
P0147	O2 Sensor Heater Circuit	Bank 1 Sensor 3
P0148	Fuel Delivery Error	
P0149	Fuel Timing Error	
P0150	O2 Sensor Circuit	Bank 2 Sensor 1
P0151	O2 Sensor Circuit Low Voltage	Bank 2 Sensor 1
P0152	O2 Sensor Circuit High Voltage	Bank 2 Sensor 1
P0153	O2 Sensor Circuit Slow Response	Bank 2 Sensor 1
P0154	O2 Sensor Circuit No Activity Detected	Bank 2 Sensor 1
P0155	O2 Sensor Heater Circuit	Bank 2 Sensor 1
P0156	O2 Sensor Circuit	Bank 2 Sensor 2
P0157	O2 Sensor Circuit Low Voltage	Bank 2 Sensor 2
P0158	O2 Sensor Circuit High Voltage	Bank 2 Sensor 2
P0159	O2 Sensor Circuit Slow Response	Bank 2 Sensor 2
P0160	O2 Sensor Circuit No Activity Detected	Bank 2 Sensor 2
P0161	O2 Sensor Heater Circuit	Bank 2 Sensor 2
P0162	O2 Sensor Circuit	Bank 2 Sensor 3
P0163	O2 Sensor Circuit Low Voltage	Bank 2 Sensor 3
P0164	O2 Sensor Circuit High Voltage	Bank 2 Sensor 3
P0165	O2 Sensor Circuit Slow Response	Bank 2 Sensor 3
P0166	O2 Sensor Circuit No Activity Detected	Bank 2 Sensor 3
P0167	O2 Sensor Heater Circuit	Bank 2 Sensor 3
P0168	Fuel Temperature Too High	
P0169	Incorrect Fuel Composition	
P0170	Fuel Trim	Bank 1
P0171	System Too Lean	Bank 1
P0172	System Too Rich	Bank 1
P0173	Fuel Trim	Bank 2

Table B.2 (continued)

DTC number	DTC naming	Location
P0174	System Too Lean	Bank 2
P0175	System Too Rich	Bank 2
P0176	Fuel Composition Sensor Circuit	
P0177	Fuel Composition Sensor Circuit Range/Performance	
P0178	Fuel Composition Sensor Circuit Low	
P0179	Fuel Composition Sensor Circuit High	
P0180	Fuel Temperature Sensor "A" Circuit	
P0181	Fuel Temperature Sensor "A" Circuit Range/Performance	
P0182	Fuel Temperature Sensor "A" Circuit Low	
P0183	Fuel Temperature Sensor "A" Circuit High	
P0184	Fuel Temperature Sensor "A" Circuit Intermittent	
P0185	Fuel Temperature Sensor "B" Circuit	
P0186	Fuel Temperature Sensor "B" Circuit Range/Performance	
P0187	Fuel Temperature Sensor "B" Circuit Low	
P0188	Fuel Temperature Sensor "B" Circuit High	
P0189	Fuel Temperature Sensor "B" Circuit Intermittent	
P018A	Fuel Pressure Sensor "B" Circuit	
P018B	Fuel Pressure Sensor "B" Circuit Range/Performance	
P018C	Fuel Pressure Sensor "B" Circuit Low	
P018D	Fuel Pressure Sensor "B" Circuit High	
P018E	Fuel Pressure Sensor "B" Circuit Intermittent/Erratic	
P018F	ISO/SAE reserved	
P0190	Fuel Rail Pressure Sensor "A" Circuit	
P0191	Fuel Rail Pressure Sensor "A" Circuit Range/Performance	
P0192	Fuel Rail Pressure Sensor "A" Circuit Low	
P0193	Fuel Rail Pressure Sensor "A" Circuit High	
P0194	Fuel Rail Pressure Sensor "A" Circuit Intermittent/Erratic	
P0195	Engine Oil Temperature Sensor	
P0196	Engine Oil Temperature Sensor Range/Performance	
P0197	Engine Oil Temperature Sensor Low	
P0198	Engine Oil Temperature Sensor High	
P0199	Engine Oil Temperature Sensor Intermittent	

B.3 P02XX Fuel and air metering

Table B.3 — P02XX Fuel and air metering

DTC number	DTC naming	Location
P0200	Injector Circuit/Open	
P0201	Injector Circuit/Open – Cylinder 1	
P0202	Injector Circuit/Open – Cylinder 2	
P0203	Injector Circuit/Open – Cylinder 3	
P0204	Injector Circuit/Open – Cylinder 4	
P0205	Injector Circuit/Open – Cylinder 5	
P0206	Injector Circuit/Open – Cylinder 6	
P0207	Injector Circuit/Open – Cylinder 7	
P0208	Injector Circuit/Open – Cylinder 8	
P0209	Injector Circuit/Open – Cylinder 9	
P020A	Cylinder 1 Injection Timing	
P020B	Cylinder 2 Injection Timing	
P020C	Cylinder 3 Injection Timing	
P020D	Cylinder 4 Injection Timing	
P020E	Cylinder 5 Injection Timing	
P020F	Cylinder 6 Injection Timing	
P0210	Injector Circuit/Open – Cylinder 10	
P0211	Injector Circuit/Open – Cylinder 11	
P0212	Injector Circuit/Open – Cylinder 12	
P0213	Cold Start Injector 1	
P0214	Cold Start Injector 2	
P0215	Engine Shutoff Solenoid	
P0216	Injector/Injection Timing Control Circuit	
P0217	Engine Coolant Over Temperature Condition	
P0218	Transmission Fluid Over Temperature Condition	
P0219	Engine Overspeed Condition	
P021A	Cylinder 7 Injection Timing	
P021B	Cylinder 8 Injection Timing	
P021C	Cylinder 9 Injection Timing	
P021D	Cylinder 10 Injection Timing	
P021E	Cylinder 11 Injection Timing	
P021F	Cylinder 12 Injection Timing	
P0220	Throttle/Pedal Position Sensor/Switch “B” Circuit	
P0221	Throttle/Pedal Position Sensor/Switch “B” Circuit Range/Performance	
P0222	Throttle/Pedal Position Sensor/Switch “B” Circuit Low	
P0223	Throttle/Pedal Position Sensor/Switch “B” Circuit High	

Table B.3 (continued)

DTC number	DTC naming	Location
P0224	Throttle/Pedal Position Sensor/Switch "B" Circuit Intermittent	
P0225	Throttle/Pedal Position Sensor/Switch "C" Circuit	
P0226	Throttle/Pedal Position Sensor/Switch "C" Circuit Range/Performance	
P0227	Throttle/Pedal Position Sensor/Switch "C" Circuit Low	
P0228	Throttle/Pedal Position Sensor/Switch "C" Circuit High	
P0229	Throttle/Pedal Position Sensor/Switch "C" Circuit Intermittent	
P022A	Charge Air Cooler Bypass Control "A" Circuit /Open	
P022B	Charge Air Cooler Bypass Control "A" Circuit Low	
P022C	Charge Air Cooler Bypass Control "A" Circuit High	
P022D	Charge Air Cooler Bypass Control "B" Circuit /Open	
P022E	Charge Air Cooler Bypass Control "B" Circuit Low	
P022F	Charge Air Cooler Bypass Control "B" Circuit High	
P0230	Fuel Pump Primary Circuit	
P0231	Fuel Pump Secondary Circuit Low	
P0232	Fuel Pump Secondary Circuit High	
P0233	Fuel Pump Secondary Circuit Intermittent	
P0234	Turbocharger/Supercharger Overboost Condition	
P0235	Turbocharger/Supercharger Boost Sensor "A" Circuit	
P0236	Turbocharger/Supercharger Boost Sensor "A" Circuit Range/Performance	
P0237	Turbocharger/Supercharger Boost Sensor "A" Circuit Low	
P0238	Turbocharger/Supercharger Boost Sensor "A" Circuit High	
P0239	Turbocharger/Supercharger Boost Sensor "B" Circuit	
P023A	Charge Air Cooler Coolant Pump Control Circuit/Open	
P023B	Charge Air Cooler Coolant Pump Control Circuit Low	
P023C	Charge Air Cooler Coolant Pump Control Circuit High	
P023D	Manifold Absolute Pressure – Turbocharger/Supercharger Boost Sensor "A" Correlation	
P023E	Manifold Absolute Pressure – Turbocharger/Supercharger Boost Sensor "B" Correlation	
P023F	ISO/SAE reserved	
P0240	Turbocharger/Supercharger Boost Sensor "B" Circuit Range/Performance	
P0241	Turbocharger/Supercharger Boost Sensor "B" Circuit Low	
P0242	Turbocharger/Supercharger Boost Sensor "B" Circuit High	
P0243	Turbocharger/Supercharger Wastegate Solenoid "A"	
P0244	Turbocharger/Supercharger Wastegate Solenoid "A" Range/Performance	
P0245	Turbocharger/Supercharger Wastegate Solenoid "A" Low	
P0246	Turbocharger/Supercharger Wastegate Solenoid "A" High	
P0247	Turbocharger/Supercharger Wastegate Solenoid "B"	

Table B.3 (continued)

DTC number	DTC naming	Location
P0248	Turbocharger/Supercharger Wastegate Solenoid "B" Range/Performance	
P0249	Turbocharger/Supercharger Wastegate Solenoid "B" Low	
P024A	Charge Air Cooler Bypass Control "A" Range/Performance	
P024B	Charge Air Cooler Bypass Control "A" Stuck	
P024C	Charge Air Cooler Bypass Position Sensor "A" Circuit	
P024D	Charge Air Cooler Bypass Position Sensor "A" Circuit Range/Performance	
P024E	Charge Air Cooler Bypass Position Sensor "A" Circuit Low	
P024F	Charge Air Cooler Bypass Position Sensor "A" Circuit High	
P0250	Turbocharger/Supercharger Wastegate Solenoid "B" High	
P0251	Injection Pump Fuel Metering Control "A" (Cam/Rotor/Injector)	
P0252	Injection Pump Fuel Metering Control "A" Range/Performance (Cam/Rotor/Injector)	
P0253	Injection Pump Fuel Metering Control "A" Low (Cam/Rotor/Injector)	
P0254	Injection Pump Fuel Metering Control "A" High (Cam/Rotor/Injector)	
P0255	Injection Pump Fuel Metering Control "A" Intermittent (Cam/Rotor/Injector)	
P0256	Injection Pump Fuel Metering Control "B" (Cam/Rotor/Injector)	
P0257	Injection Pump Fuel Metering Control "B" Range/Performance (Cam/Rotor/Injector)	
P0258	Injection Pump Fuel Metering Control "B" Low (Cam/Rotor/Injector)	
P0259	Injection Pump Fuel Metering Control "B" High (Cam/Rotor/Injector)	
P025A	Fuel Pump Module Control Circuit/Open	
P025B	Fuel Pump Module Control Circuit Range/Performance	
P025C	Fuel Pump Module Control Circuit Low	
P025D	Fuel Pump Module Control Circuit High	
P0260	Injection Pump Fuel Metering Control "B" Intermittent (Cam/Rotor/Injector)	
P0261	Cylinder 1 Injector Circuit Low	
P0262	Cylinder 1 Injector Circuit High	
P0263	Cylinder 1 Contribution/Balance	
P0264	Cylinder 2 Injector Circuit Low	
P0265	Cylinder 2 Injector Circuit High	
P0266	Cylinder 2 Contribution/Balance	
P0267	Cylinder 3 Injector Circuit Low	
P0268	Cylinder 3 Injector Circuit High	
P0269	Cylinder 3 Contribution/Balance	
P0270	Cylinder 4 Injector Circuit Low	
P0271	Cylinder 4 Injector Circuit High	
P0272	Cylinder 4 Contribution/Balance	
P0273	Cylinder 5 Injector Circuit Low	
P0274	Cylinder 5 Injector Circuit High	
P0275	Cylinder 5 Contribution/Balance	

Table B.3 (continued)

DTC number	DTC naming	Location
P0276	Cylinder 6 Injector Circuit Low	
P0277	Cylinder 6 Injector Circuit High	
P0278	Cylinder 6 Contribution/Balance	
P0279	Cylinder 7 Injector Circuit Low	
P0280	Cylinder 7 Injector Circuit High	
P0281	Cylinder 7 Contribution/Balance	
P0282	Cylinder 8 Injector Circuit Low	
P0283	Cylinder 8 Injector Circuit High	
P0284	Cylinder 8 Contribution/Balance	
P0285	Cylinder 9 Injector Circuit Low	
P0286	Cylinder 9 Injector Circuit High	
P0287	Cylinder 9 Contribution/Balance	
P0288	Cylinder 10 Injector Circuit Low	
P0289	Cylinder 10 Injector Circuit High	
P0290	Cylinder 10 Contribution/Balance	
P0291	Cylinder 11 Injector Circuit Low	
P0292	Cylinder 11 Injector Circuit High	
P0293	Cylinder 11 Contribution/Balance	
P0294	Cylinder 12 Injector Circuit Low	
P0295	Cylinder 12 Injector Circuit High	
P0296	Cylinder 12 Contribution/Balance	
P0297	Vehicle Overspeed Condition	
P0298	Engine Oil Over Temperature	
P0299	Turbocharger/Supercharger Underboost	

B.4 P03XX Ignition system or misfire

Table B.4 — P03XX Ignition system or misfire

DTC number	DTC naming	Location
P0300	Random/Multiple Cylinder Misfire Detected	
P0301	Cylinder 1 Misfire Detected	
P0302	Cylinder 2 Misfire Detected	
P0303	Cylinder 3 Misfire Detected	
P0304	Cylinder 4 Misfire Detected	
P0305	Cylinder 5 Misfire Detected	
P0306	Cylinder 6 Misfire Detected	
P0307	Cylinder 7 Misfire Detected	
P0308	Cylinder 8 Misfire Detected	
P0309	Cylinder 9 Misfire Detected	
P0310	Cylinder 10 Misfire Detected	
P0311	Cylinder 11 Misfire Detected	
P0312	Cylinder 12 Misfire Detected	
P0313	Misfire Detected With Low Fuel	
P0314	Single Cylinder Misfire (Cylinder not Specified)	
P0315	Crankshaft Position System Variation Not Learned	
P0316	Engine Misfire Detected on Startup (First 1000 Revolutions)	
P0317	Rough Road Hardware Not Present	
P0318	Rough Road Sensor "A" Signal Circuit	
P0319	Rough Road Sensor "B" Signal Circuit	
P0320	Ignition/Distributor Engine Speed Input Circuit	
P0321	Ignition/Distributor Engine Speed Input Circuit Range/Performance	
P0322	Ignition/Distributor Engine Speed Input Circuit No Signal	
P0323	Ignition/Distributor Engine Speed Input Circuit Intermittent	
P0324	Knock Control System Error	
P0325	Knock Sensor 1 Circuit	Bank 1 or Single Sensor
P0326	Knock Sensor 1 Circuit Range/Performance	Bank 1 or Single Sensor
P0327	Knock Sensor 1 Circuit Low	Bank 1 or Single Sensor
P0328	Knock Sensor 1 Circuit High	Bank 1 or Single Sensor
P0329	Knock Sensor 1 Circuit Intermittent	Bank 1 or Single Sensor
P0330	Knock Sensor 2 Circuit	Bank 2
P0331	Knock Sensor 2 Circuit Range/Performance	Bank 2
P0332	Knock Sensor 2 Circuit Low	Bank 2

Table B.4 (continued)

DTC number	DTC naming	Location
P0333	Knock Sensor 2 Circuit High	Bank 2
P0334	Knock Sensor 2 Circuit Intermittent	Bank 2
P0335	Crankshaft Position Sensor "A" Circuit	
P0336	Crankshaft Position Sensor "A" Circuit Range/Performance	
P0337	Crankshaft Position Sensor "A" Circuit Low	
P0338	Crankshaft Position Sensor "A" Circuit High	
P0339	Crankshaft Position Sensor "A" Circuit Intermittent	
P0340	Camshaft Position Sensor "A" Circuit	Bank 1 or Single Sensor
P0341	Camshaft Position Sensor "A" Circuit Range/Performance	Bank 1 or Single Sensor
P0342	Camshaft Position Sensor "A" Circuit Low	Bank 1 or Single Sensor
P0343	Camshaft Position Sensor "A" Circuit High	Bank 1 or Single Sensor
P0344	Camshaft Position Sensor "A" Circuit Intermittent	Bank 1 or Single Sensor
P0345	Camshaft Position Sensor "A" Circuit	Bank 2
P0346	Camshaft Position Sensor "A" Circuit Range/Performance	Bank 2
P0347	Camshaft Position Sensor "A" Circuit Low	Bank 2
P0348	Camshaft Position Sensor "A" Circuit High	Bank 2
P0349	Camshaft Position Sensor "A" Circuit Intermittent	Bank 2
P0350	Ignition Coil Primary/Secondary Circuit	
P0351	Ignition Coil "A" Primary/Secondary Circuit	
P0352	Ignition Coil "B" Primary/Secondary Circuit	
P0353	Ignition Coil "C" Primary/Secondary Circuit	
P0354	Ignition Coil "D" Primary/Secondary Circuit	
P0355	Ignition Coil "E" Primary/Secondary Circuit	
P0356	Ignition Coil "F" Primary/Secondary Circuit	
P0357	Ignition Coil "G" Primary/Secondary Circuit	
P0358	Ignition Coil "H" Primary/Secondary Circuit	
P0359	Ignition Coil "I" Primary/Secondary Circuit	
P0360	Ignition Coil "J" Primary/Secondary Circuit	
P0361	Ignition Coil "K" Primary/Secondary Circuit	
P0362	Ignition Coil "L" Primary/Secondary Circuit	
P0363	Misfire Detected – Fueling Disabled	
P0364	ISO/SAE reserved	
P0365	Camshaft Position Sensor "B" Circuit	Bank 1
P0366	Camshaft Position Sensor "B" Circuit Range/Performance	Bank 1
P0367	Camshaft Position Sensor "B" Circuit Low	Bank 1

Table B.4 (continued)

DTC number	DTC naming	Location
P0368	Camshaft Position Sensor "B" Circuit High	Bank 1
P0369	Camshaft Position Sensor "B" Circuit Intermittent	Bank 1
P0370	Timing Reference High Resolution Signal "A"	
P0371	Timing Reference High Resolution Signal "A" Too Many Pulses	
P0372	Timing Reference High Resolution Signal "A" Too Few Pulses	
P0373	Timing Reference High Resolution Signal "A" Intermittent/Erratic Pulses	
P0374	Timing Reference High Resolution Signal "A" No Pulse	
P0375	Timing Reference High Resolution Signal "B"	
P0376	Timing Reference High Resolution Signal "B" Too Many Pulses	
P0377	Timing Reference High Resolution Signal "B" Too Few Pulses	
P0378	Timing Reference High Resolution Signal "B" Intermittent/Erratic Pulses	
P0379	Timing Reference High Resolution Signal "B" No Pulses	
P0380	Glow Plug/Heater Circuit "A"	
P0381	Glow Plug/Heater Indicator Circuit	
P0382	Glow Plug/Heater Circuit "B"	
P0383	Glow Plug Control Module Control Circuit Low	
P0384	Glow Plug Control Module Control Circuit High	
P0385	Crankshaft Position Sensor "B" Circuit	
P0386	Crankshaft Position Sensor "B" Circuit Range/Performance	
P0387	Crankshaft Position Sensor "B" Circuit Low	
P0388	Crankshaft Position Sensor "B" Circuit High	
P0389	Crankshaft Position Sensor "B" Circuit Intermittent	
P0390	Camshaft Position Sensor "B" Circuit	Bank 2
P0391	Camshaft Position Sensor "B" Circuit Range/Performance	Bank 2
P0392	Camshaft Position Sensor "B" Circuit Low	Bank 2
P0393	Camshaft Position Sensor "B" Circuit High	Bank 2
P0394	Camshaft Position Sensor "B" Circuit Intermittent	Bank 2

B.5 P04XX Auxiliary emission controls

Table B.5 — P04XX Auxiliary emission controls

DTC number	DTC naming	Location
P0400	Exhaust Gas Recirculation Flow	
P0401	Exhaust Gas Recirculation Flow Insufficient Detected	
P0402	Exhaust Gas Recirculation Flow Excessive Detected	
P0403	Exhaust Gas Recirculation Control Circuit	
P0404	Exhaust Gas Recirculation Control Circuit Range/Performance	
P0405	Exhaust Gas Recirculation Sensor "A" Circuit Low	
P0406	Exhaust Gas Recirculation Sensor "A" Circuit High	
P0407	Exhaust Gas Recirculation Sensor "B" Circuit Low	
P0408	Exhaust Gas Recirculation Sensor "B" Circuit High	
P0409	Exhaust Gas Recirculation Sensor "A" Circuit	
P040A	Exhaust Gas Recirculation Temperature Sensor "A" Circuit	
P040B	Exhaust Gas Recirculation Temperature Sensor "A" Circuit Range/Performance	
P040C	Exhaust Gas Recirculation Temperature Sensor "A" Circuit Low	
P040D	Exhaust Gas Recirculation Temperature Sensor "A" Circuit High	
P040E	Exhaust Gas Recirculation Temperature Sensor "A" Circuit Intermittent/Erratic	
P040F	Exhaust Gas Recirculation Temperature Sensor "A"/"B" Correlation	
P0410	Secondary Air Injection System	
P0411	Secondary Air Injection System Incorrect Flow Detected	
P0412	Secondary Air Injection System Switching Valve "A" Circuit	
P0413	Secondary Air Injection System Switching Valve "A" Circuit Open	
P0414	Secondary Air Injection System Switching Valve "A" Circuit Shorted	
P0415	Secondary Air Injection System Switching Valve "B" Circuit	
P0416	Secondary Air Injection System Switching Valve "B" Circuit Open	
P0417	Secondary Air Injection System Switching Valve "B" Circuit Shorted	
P0418	Secondary Air Injection System Control "A" Circuit	
P0419	Secondary Air Injection System Control "B" Circuit	
P041A	Exhaust Gas Recirculation Temperature Sensor "B" Circuit	
P041B	Exhaust Gas Recirculation Temperature Sensor "B" Circuit Range/Performance	
P041C	Exhaust Gas Recirculation Temperature Sensor "B" Circuit Low	
P041D	Exhaust Gas Recirculation Temperature Sensor "B" Circuit High	
P041E	Exhaust Gas Recirculation Temperature Sensor "B" Circuit Intermittent/Erratic	
P041F	ISO/SAE reserved	
P0420	Catalyst System Efficiency Below Threshold	Bank 1
P0421	Warm Up Catalyst Efficiency Below Threshold	Bank 1
P0422	Main Catalyst Efficiency Below Threshold	Bank 1
P0423	Heated Catalyst Efficiency Below Threshold	Bank 1

Table B.5 (continued)

DTC number	DTC naming	Location
P0424	Heated Catalyst Temperature Below Threshold	Bank 1
P0425	Catalyst Temperature Sensor Circuit	Bank 1 Sensor 1
P0426	Catalyst Temperature Sensor Circuit Range/Performance	Bank 1 Sensor 1
P0427	Catalyst Temperature Sensor Circuit Low	Bank 1 Sensor 1
P0428	Catalyst Temperature Sensor Circuit High	Bank 1 Sensor 1
P0429	Catalyst Heater Control Circuit	Bank 1
P042A	Catalyst Temperature Sensor Circuit	Bank 1 Sensor 2
P042B	Catalyst Temperature Sensor Circuit Range/Performance	Bank 1 Sensor 2
P042C	Catalyst Temperature Sensor Circuit Low	Bank 1 Sensor 2
P042D	Catalyst Temperature Sensor Circuit High	Bank 1 Sensor 2
P042E	ISO/SAE reserved	
P042F	ISO/SAE reserved	
P0430	Catalyst System Efficiency Below Threshold	Bank 2
P0431	Warm Up Catalyst Efficiency Below Threshold	Bank 2
P0432	Main Catalyst Efficiency Below Threshold	Bank 2
P0433	Heated Catalyst Efficiency Below Threshold	Bank 2
P0434	Heated Catalyst Temperature Below Threshold	Bank 2
P0435	Catalyst Temperature Sensor Circuit	Bank 2 Sensor 1
P0436	Catalyst Temperature Sensor Circuit Range/Performance	Bank 2 Sensor 1
P0437	Catalyst Temperature Sensor Circuit Low	Bank 2 Sensor 1
P0438	Catalyst Temperature Sensor Circuit High	Bank 2 Sensor 1
P0439	Catalyst Heater Control Circuit	Bank 2
P043A	Catalyst Temperature Sensor Circuit	Bank 2 Sensor 2
P043B	Catalyst Temperature Sensor Circuit Range/Performance	Bank 2 Sensor 2
P043C	Catalyst Temperature Sensor Circuit Low	Bank 2 Sensor 2
P043D	Catalyst Temperature Sensor Circuit High	Bank 2 Sensor 2
P043E	Evaporative Emission System Leak Detection Reference Orifice Low Flow	
P043F	Evaporative Emission System Leak Detection Reference Orifice High Flow	
P0440	Evaporative Emission System	
P0441	Evaporative Emission System Incorrect Purge Flow	
P0442	Evaporative Emission System Leak Detected (small leak)	
P0443	Evaporative Emission System Purge Control Valve Circuit	
P0444	Evaporative Emission System Purge Control Valve Circuit Open	
P0445	Evaporative Emission System Purge Control Valve Circuit Shorted	
P0446	Evaporative Emission System Vent Control Circuit	
P0447	Evaporative Emission System Vent Control Circuit Open	
P0448	Evaporative Emission System Vent Control Circuit Shorted	
P0449	Evaporative Emission System Vent Valve/Solenoid Circuit	

Table B.5 (continued)

DTC number	DTC naming	Location
P0450	Evaporative Emission System Pressure Sensor/Switch	
P0451	Evaporative Emission System Pressure Sensor/Switch Range/Performance	
P0452	Evaporative Emission System Pressure Sensor/Switch Low	
P0453	Evaporative Emission System Pressure Sensor/Switch High	
P0454	Evaporative Emission System Pressure Sensor/Switch Intermittent	
P0455	Evaporative Emission System Leak Detected (large leak)	
P0456	Evaporative Emission System Leak Detected (very small leak)	
P0457	Evaporative Emission System Leak Detected (fuel cap loose/off)	
P0458	Evaporative Emission System Purge Control Valve Circuit Low	
P0459	Evaporative Emission System Purge Control Valve Circuit High	
P0460	Fuel Level Sensor "A" Circuit	
P0461	Fuel Level Sensor "A" Circuit Range/Performance	
P0462	Fuel Level Sensor "A" Circuit Low	
P0463	Fuel Level Sensor "A" Circuit High	
P0464	Fuel Level Sensor "A" Circuit Intermittent	
P0465	EVAP Purge Flow Sensor Circuit	
P0466	EVAP Purge Flow Sensor Circuit Range/Performance	
P0467	EVAP Purge Flow Sensor Circuit Low	
P0468	EVAP Purge Flow Sensor Circuit High	
P0469	EVAP Purge Flow Sensor Circuit Intermittent	
P0470	Exhaust Pressure Sensor "A" Circuit	
P0471	Exhaust Pressure Sensor "A" Circuit Range/Performance	
P0472	Exhaust Pressure Sensor "A" Circuit Low	
P0473	Exhaust Pressure Sensor "A" Circuit High	
P0474	Exhaust Pressure Sensor "A" Circuit Intermittent/Erratic	
P0475	Exhaust Pressure Control Valve	
P0476	Exhaust Pressure Control Valve Range/Performance	
P0477	Exhaust Pressure Control Valve Low	
P0478	Exhaust Pressure Control Valve High	
P0479	Exhaust Pressure Control Valve Intermittent	
P047A	Exhaust Pressure Sensor "B" Circuit	
P047B	Exhaust Pressure Sensor "B" Circuit Range/Performance	
P047C	Exhaust Pressure Sensor "B" Circuit Low	
P047D	Exhaust Pressure Sensor "B" Circuit High	
P047E	Exhaust Pressure Sensor "B" Circuit Intermittent/Erratic	
P047F	ISO/SAE reserved	
P0480	Fan 1 Control Circuit	
P0481	Fan 2 Control Circuit	

Table B.5 (continued)

DTC number	DTC naming	Location
P0482	Fan 3 Control Circuit	
P0483	Fan Rationality Check	
P0484	Fan Circuit Over Current	
P0485	Fan Power/Ground Circuit	
P0486	Exhaust Gas Recirculation Sensor "B" Circuit	
P0487	Exhaust Gas Recirculation Throttle Control Circuit "A" /Open	
P0488	Exhaust Gas Recirculation Throttle Control Circuit "A" Range/Performance	
P0489	Exhaust Gas Recirculation Control Circuit "A" Low	
P0490	Exhaust Gas Recirculation Control Circuit "A" High	
P0491	Secondary Air Injection System Insufficient Flow	Bank 1
P0492	Secondary Air Injection System Insufficient Flow	Bank 2
P0493	Fan Overspeed	
P0494	Fan Speed Low	
P0495	Fan Speed High	
P0496	Evaporative Emission System High Purge Flow	
P0497	Evaporative Emission System Low Purge Flow	
P0498	Evaporative Emission System Vent Valve Control Circuit Low	
P0499	Evaporative Emission System Vent Valve Control Circuit High	

B.6 P05XX Vehicle speed, idle control, and auxiliary inputs

Table B.6 — P05XX Vehicle speed, idle control and auxiliary inputs

DTC number	DTC naming	Location
P0500	Vehicle Speed Sensor "A"	
P0501	Vehicle Speed Sensor "A" Range/Performance	
P0502	Vehicle Speed Sensor "A" Circuit Low	
P0503	Vehicle Speed Sensor "A" Intermittent/Erratic/High	
P0504	Brake Switch "A"/"B" Correlation	
P0505	Idle Air Control System	
P0506	Idle Air Control System RPM Lower Than Expected	
P0507	Idle Air Control System RPM Higher Than Expected	
P0508	Idle Air Control System Circuit Low	
P0509	Idle Air Control System Circuit High	
P050A	Cold Start Idle Air Control System Performance	
P050B	Cold Start Ignition Timing Performance	
P050C	Cold Start Engine Coolant Temperature Performance	

Table B.6 (continued)

DTC number	DTC naming	Location
P050D	Cold Start Rough Idle	
P050E	ISO/SAE reserved	
P050F	ISO/SAE reserved	
P0510	Closed Throttle Position Switch	
P0511	Idle Air Control Circuit	
P0512	Starter Request Circuit	
P0513	Incorrect Immobilizer Key	
P0514	Battery Temperature Sensor Circuit Range/Performance	
P0515	Battery Temperature Sensor Circuit	
P0516	Battery Temperature Sensor Circuit Low	
P0517	Battery Temperature Sensor Circuit High	
P0518	Idle Air Control Circuit Intermittent	
P0519	Idle Air Control System Performance	
P0520	Engine Oil Pressure Sensor/Switch Circuit	
P0521	Engine Oil Pressure Sensor/Switch Range/Performance	
P0522	Engine Oil Pressure Sensor/Switch Low	
P0523	Engine Oil Pressure Sensor/Switch High	
P0524	Engine Oil Pressure Too Low	
P0525	Cruise Control Servo Control Circuit Range/Performance	
P0526	Fan Speed Sensor Circuit	
P0527	Fan Speed Sensor Circuit Range/Performance	
P0528	Fan Speed Sensor Circuit No Signal	
P0529	Fan Speed Sensor Circuit Intermittent	
P0530	A/C Refrigerant Pressure Sensor "A" Circuit	
P0531	A/C Refrigerant Pressure Sensor "A" Circuit Range/Performance	
P0532	A/C Refrigerant Pressure Sensor "A" Circuit Low	
P0533	A/C Refrigerant Pressure Sensor "A" Circuit High	
P0534	A/C Refrigerant Charge Loss	
P0535	A/C Evaporator Temperature Sensor Circuit	
P0536	A/C Evaporator Temperature Sensor Circuit Range/Performance	
P0537	A/C Evaporator Temperature Sensor Circuit Low	
P0538	A/C Evaporator Temperature Sensor Circuit High	
P0539	A/C Evaporator Temperature Sensor Circuit Intermittent	
P053A	Positive Crankcase Ventilation Heater Control Circuit /Open	
P053B	Positive Crankcase Ventilation Heater Control Circuit Low	
P053C	Positive Crankcase Ventilation Heater Control Circuit High	
P0540 ^a	Intake Air Heater "A" Circuit	
P0541 ^a	Intake Air Heater "A" Circuit Low	

Table B.6 (continued)

DTC number	DTC naming	Location
P0542 ^a	Intake Air Heater "A" Circuit High	
P0543 ^a	Intake Air Heater "A" Circuit Open	
P0544	Exhaust Gas Temperature Sensor Circuit	Bank 1 Sensor 1
P0545	Exhaust Gas Temperature Sensor Circuit Low	Bank 1 Sensor 1
P0546	Exhaust Gas Temperature Sensor Circuit High	Bank 1 Sensor 1
P0547	Exhaust Gas Temperature Sensor Circuit	Bank 2 Sensor 1
P0548	Exhaust Gas Temperature Sensor Circuit Low	Bank 2 Sensor 1
P0549	Exhaust Gas Temperature Sensor Circuit High	Bank 2 Sensor 1
P0550	Power Steering Pressure Sensor/Switch Circuit	
P0551	Power Steering Pressure Sensor/Switch Circuit Range/Performance	
P0552	Power Steering Pressure Sensor/Switch Circuit Low	
P0553	Power Steering Pressure Sensor/Switch Circuit High	
P0554	Power Steering Pressure Sensor/Switch Circuit Intermittent	
P0555	Brake Booster Pressure Sensor Circuit	
P0556	Brake Booster Pressure Sensor Circuit Range/Performance	
P0557	Brake Booster Pressure Sensor Circuit Low	
P0558	Brake Booster Pressure Sensor Circuit High	
P0559	Brake Booster Pressure Sensor Circuit Intermittent	
P0560	System Voltage	
P0561	System Voltage Unstable	
P0562	System Voltage Low	
P0563	System Voltage High	
P0564	Cruise Control Multi-Function Input "A" Circuit	
P0565	Cruise Control "On" Signal	
P0566	Cruise Control "Off" Signal	
P0567	Cruise Control "Resume" Signal	
P0568	Cruise Control "Set" Signal	
P0569	Cruise Control "Coast" Signal	
P056A	Cruise Control "Increase Distance" Signal	
P056B	Cruise Control "Decrease Distance" Signal	
P0570	Cruise Control "Accelerate" Signal	
P0571	Brake Switch "A" Circuit	
P0572	Brake Switch "A" Circuit Low	
P0573	Brake Switch "A" Circuit High	
P0574	Cruise Control System – Vehicle Speed Too High	
P0575	Cruise Control Input Circuit	
P0576	Cruise Control Input Circuit Low	
P0577	Cruise Control Input Circuit High	