SURFACE VEHICLE RECOMMENDED PRACTICE

SAE J1939	
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Recommended Practice for a Serial Control and Communications Vehicle Network

Forward

This series of SAE Recommended Practices has been developed by the Truck & Bus Control and Communications Network Subcommittee of the Truck & Bus Electrical & Electronics Committee. The objectives of the subcommittee are to develop information reports, recommended practices and standards concerned with the requirements, design, and usage of ECUs which transmit electrical signals and control information among vehicle components. The usage of these Recommended Practices is not limited to truck and bus applications; other applications may be accommodated with immediate support being provided for construction and agricultural equipment, and stationary power systems.

These SAE Recommended Practices are intended as a guide toward standard practice and are subject to change so as to keep pace with experience and technical advances.

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These Recommended Practices are being generated to continue the work accomplished by the J1708, J1587, and J1922 Recommended Practices. The J1939 series of Recommended Practices will offer a higher performance alternative to these earlier documents.

This document reflects changes and additions approved and balloted through December 2001.

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SAE J1939 Revised AUG2003

1. Scope

These Recommended Practices are intended for light, medium, and heavy duty vehicles used on or off road as well as appropriate stationary applications which use vehicle derived components (e.g. generator sets). Vehicles of interest include, but are not limited to: on and off highway trucks and their trailers; construction equipment; and agricultural equipment and implements.

The purpose of these Recommended Practices is to provide an open interconnect system for electronic systems. It is the intention of these Recommended Practices to allow Electronic Control Units to communicate with each other by providing a standard architecture.

1.1   Degree of Openness

A J1939 network is open to the degree that any two ECUs which conform to the same J1939/0*X* document can be connected via the network and communicate with each other without functional interference. The J1939/0X dcouments describe a specific type of application, typically representing a specific industry to which it pertains such as agricultural or heavy duty trucks. ECUs which conform to a different J1939/0*X* document may not be capable of communicating directly with one another and in some cases may cause degradation or complete disruption of the entire network.

1.2   Proof of Compliance

There is no procedure presently in place to test, validate, or provide formal approval for ECUs utilizing the J1939 network. Each developer is expected to design their products to the spirit of, as well as the specific content of, this recommended practice. Provisions are made in J1939/11 and J1939/12 for self certification to these documents. In the future, it is hoped that procedures will be defined and implemented to test new products to ensure full compliance with all appropriate J1939 documents. Until that time, compliance will be honorarily determined. Should questions arise regarding the use or interpretation of any part of these recommended practices they should be directed to the SAE Control and Communications Subcommittee for resolution.

2.   References

2.1   Publications

ISO 7498	Information Processing Systems - Open Systems Interconnection (OSI) - Basic Reference Model.
ISO 11898	Road Vehicles — Interchange of Digital Information — Controller Area Network (CAN) for High Speed Communication, December 1992
ISO 11992	Road Vehicles - Electrical Connections Between Towing and Towed Vehicles - Interchange of Digital Information (Parts 1, 2, 3)
SAE J1213	Glossary of Automotive Electronic Terms
SAE J1708	Recommended Practice for Serial Data Communication Between Microcomputer Systems in Heavy Duty Vehicle Applications.
SAE J1587	Recommended Practice for Electronic Data Interchange Between Microcomputer Systems in Heavy Duty Vehicle Applications
SAE J1922	Powertrain Control Interface for Electronic Controls Used in Medium and Heavy Duty Diesel On-Highway Vehicle Applications

SAE publications are available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001. ISO publications are available from ANSI, 11 West 42nd Street, New York, NY 10036.

2.2   Definitions and Abbreviations

Definitions provided herein will supersede those contained in SAE J1213. SAE J1213 will otherwise apply throughout.

2.2.1   Definitions

Acknowledgment (ACK) — Confirms that the requested action has been understood and performed.

Address — The 8 bit field (or fields) used to define the source (and destination when applicable) of a message (e.g. engine, transmission, etc.).

Arbitration — The process by which one or more ECUs resolve conflicts in obtaining access to a shared network bus.

Bit Stuffing — A procedure used to assure the transmitted and received messages maintain a minimum number of dominant to recessive edges, and vise versa, to maintain the proper resynchronization within the string of bits in a CAN Data Frame. See CAN specification for a more detailed discussion.

Bridge — A device which stores and forwards messages between two J1939 network segments.   This permits changes in the media, the electrical interface, and data rate between segments. The protocol and address space remain the same on both sides of the bridge. Note that a bridge may selectively filter messages going across it so that the bus load is minimized on each segment.

Bus — See Segment.

CAN Data Frame — The ordered bit fields necessary to create a CAN frame used to convey data, beginning with an SOF and ending with an EOF.

Cyclic Redundancy Check (CRC) — An error control mechanism. A 15 bit cyclic redundancy check is performed for detecting transmission errors.   Given a k-bit frame or message, the transmitter generates an n-bit sequence, known as a frame check sequence so that the resulting frame, consisting of $k + n$ bits is exactly divisible by some predefined number. The receiver then divides the incoming frame by the same number and, if there is no remainder, assumes that there was no error.

Data Field — A 0 to 64-bit field normally placed in a CAN data frame which contains the data as defined in the Application Layer (document J1939/7X).

Data Page — One bit in the Identifier portion of the CAN Arbitration Field is used to select one of two pages of Parameter Group Numbers. This provides for the future growth of Parameter Group definitions. It also is one of the fields used to determine the Parameter Group Number which labels the data field of the CAN Data Frame.

Destination Address (DA) — This is a Protocol Data Unit (PDU) specific field in the 29 bit CAN identifier used to indicate the address of the ECU intended to receive the J1939 message.

Device — A physical component with one or more ECUs and network connections.

Electronic Control Unit (ECU) — A computer based electronic assembly from which J1939 messages may be sent or received.

End of Frame (EOF) — A 7 bit field marking the ending of a CAN data frame.

Extended Frame — A CAN data frame using a 29 bit identifier as defined in the CAN 2.0 specification.

Frame — A series of data bits making up a complete message. The frame is subdivided into a number of fields, each field containing a predefined type of data. See CAN Data Frame

Function — A capability of a vehicle system having one or more ECUs that are connected to a J1939 bus segment of a Vehicle System. The function value is used in the 8 bit Function field in the 64 bit NAME entity (See J1939/81, Section 4.1)

Gateway — This device permits data to be transferred between two networks with different protocols or message sets. The gateway provides a means to repackage parameters into new message groups when transferring messages from one segment to another.

Group Extension (GE) — This is a PDU specific field of a J1939 CAN Data Frame that is used as part of the information necessary to determine the Parameter Group Number.

Identifier — The identifier portion of the CAN arbitration field.

Idle — A state on the CAN bus where no node is transmitting or attempting to transmit data.

Implement — A machine consisting of one or more ECUs which may be attached to or detached from the vehicle as a unit.

Media — The physical entity which conveys the electrical transmission (or equivalent means of communication) between ECUs on the network. For J1939/11, the media consists of shielded twisted pair copper wires.

Message — A "message" is equivalent to one or more "CAN Data Frames" that have the same Parameter Group Number. For instance the information related to a single Parameter Group Number to be transferred on the bus may take several CAN data frames.

Multipacket Messages — A type of J1939 message which is used when more than one CAN data frame is required to transmit all data specific to a given Parameter Group Number. Each CAN data frame will have the same identifier but will contain different data in each packet.

NAME - An 8 byte value which uniquely identifies the primary function of an ECU and its instance on the network. A device's NAME must be unique, no two devices may share the same NAME value on a given vehicle network.

Node — A specific hardware connection of an ECU to the physical media. A specific node may have more than one address claimed on the network.

Non-Volatile — Retention of changeable memory values even though power is turned off for any reason. This term is used with respect to data values, such as ECU addresses or NAMEs, that are changed during use. Read Only Memory (ROM) is technically non-volatile, but is not changeable during use and thus not what is referred to in these documents.

Negative-Acknowledgment (NACK) — A response which indicates that a message has not been understood or a requested action could not be performed.

Packet — A single CAN data frame. This can also be a message if the Parameter Group to be transferred can be expressed in one CAN data frame.

Parameter Group (PG) — A collection of parameters that are conveyed in a J1939 message. Parameter Groups include commands, data, requests, acknowledgments, and negative-acknowledgments. The PG identifies the data in a message, regardless of whether it is a single packet or multipacket message. Parameter Groups are not dependent on the source address field thus allowing any source to send any Parameter Group.

Parameter Group Number (PGN) — A three byte, 24 bit, representation of the Reserved Bit, Data Page, PDU Format, and GE fields. The Parameter Group Number uniquely identifies a particular Parameter Group.

PDU Format (PF) — An 8 bit field in the 29 bit identifier that identifies the PDU format and is used in whole or in part to provide a label for a Parameter Group. It also is one of the fields used to determine the Parameter Group Number which labels the data field of the CAN Data Frame.

PDU Specific (PS) — An 8-bit field in the 29 bit identifier whose definition depends upon the value of the PDU Format field. It can be either a destination address (DA) or Group Extension (GE). It also is one of the fields used to determine the Parameter Group Number which labels the data field of the CAN Data Frame.

PDU1 Format — A PDU format used for messages that are to be sent to a destination address (DA). The PS field contains the destination address (specific or global).

PDU2 Format — A PDU format used to send information that has been labeled using the Group Extension technique. This PDU does not contain a destination address. The PS field contains the Group Extension in the case of PDU2 formats.

Preferred Address — The address that an ECU will attempt to use first when claiming an address. Preferred Addresses are assigned by the committee.

Priority — A 3-bit field in an identifier that establishes the arbitration priority of the information communicated. The highest priority is zero and the lowest priority is seven.

Protocol Data Unit (PDU) — A PDU is a J1939 specific CAN Data Frame format.

Remote Transmission Request (RTR) — A feature of the CAN protocol allowing an ECU to request that another ECU or ECUs send a message. This feature of CAN is not used in J1939. An alternate request mechanism is specified for J1939.

Repeater — An ECU which regenerates the bus signal onto another segment of media. This permits the network to connect more electrical loads (ECUs) onto the bus, or to connect to another type of media (Physical Layer Expansion). The speed (data rate), protocol (data link layer), and address space are the same on both sides of the repeater. For J1939, any delays in regenerating the data signal must be kept to a very small fraction of one bit interval.

Reserved Bit —A bit in a J1939 29 bit identifier reserved for future definition by SAE. It also is one of the fields used to determine the Parameter Group Number which labels the data field of the CAN Data Frame.

Router— An ECU which allows segments with independent address spaces, data rates, and media to exchange messages. A router may permit each segment to operate with minimum bus loading yet still obtain critical messages from remote segments. The protocol remains the same across all segments. Note that the router must have look up tables to permit the translation and routing of a message with ID X on segment 1 to ID Y on segment 2.

Segment — The physical media and attached nodes of a network not interconnected by network interconnection ECUs. A single segment of a network is characterized by all of the ECUs "seeing" the signal at the same time (i.e., there is no intermediate ECU between electrical sections of the network). Multiple segments can be connected together by network interconnection ECUs including repeaters, bridges, and routers.

Source Address (SA) — An 8-bit field in the 29 bit identifier which allows for the unique identification of the source of a message. The SA field contains the address of the ECU that is sending the message.

Standard Frame — A CAN data frame using an 11 bit identifier as defined in the CAN 2.0b specification.

Start of Frame (SOF) — The initial bit in a CAN frame serving only to indicate the beginning of the frame.

Subnetwork — This refers to the network activity (message traffic) on a specific J1939 segment when multiple segments are used. Subnetworks may include: Tractor; Trailer, Implement, and Braking System. Note that they may be separated by a bridge or router to minimize total bus loading. Collectively the subnetworks are the J1939 Vehicle Network.

Vehicle — A machine which, in most applications, includes a capability to propel itself and includes one or more J1939 segments. A vehicle may be assembled of one or more Vehicle systems which are connected together to form the whole vehicle.

Vehicle System — A subcomponent of a vehicle, or a component that is analogous to a subcomponent of a vehicle, that includes one or more J1939 segments and may be connected or disconnected from the vehicle. A Vehicle System may be made up of one or more Functions, which have ECU's that are connected to a J1939 segment of the Vehicle System.

2.2.2 Abbreviations

ABS	Antilock Braking System
ACK	Acknowledgment
AP	Accelerator Pedal
ASR	Acceleration Slip Regulation (Traction Control)
ASCII	American Standard Code for Information Interchange
CAN	Controller Area Network
Con-Ag	Construction-Agriculture Industry
CRC	Cyclic Redundancy Check
DA	Destination Address
DLC	Data Length Code
DP	Data Page
ECU	Electronic Control Unit
EOF	End of Frame
GE	Group Extension
ID	Identifier
IDE	Identifier Extension Bit
LLC	Logical Link Control
LSB	Least Significant Byte or Least Significant Bit
MAC	Medium Access Control
MID	Message Identifier
MSB	Most Significant Byte or Most Significant Bit
NA	Not Allowed
NA	Not Available
NACK	Negative-Acknowledgment
OSI	Open System Interconnect
P	Priority
PDU	Protocol Data Unit
PF	PDU Format
PG	Parameter Group
PGN	Parameter Group Number
PID	Parameter Identifier
PS	PDU Specific
PS_GE	PDU Specific - Group Extension
PS_DA	PDU Specific - Destination Address
PTO	Power Take-Off
R	Reserved
RTR	Remote Transmission Request
SA	Source Address
SID	Subsystem Identifier
SLOT	Scaling, Limits, Offset, and Transfer Function
SOF	Start of Frame
SPN	Suspect Parameter Number
SRR	Substitute Remote Request
un	Undefined

2.3   References to the OSI Model:

The Open System Interconnect (OSI) model was developed by the International Organization for Standardization (ISO) in 1984 as a model of a computer communications architecture. There are seven layers to the OSI model as shown in Figure 1. The intent is that protocols be developed to perform the functions of each layer as needed. J1939 is structured into several parts based on this ISO Model. While there is a J1939 document allocated to each layer, not all of them are explicitly identified by having their own J1939 document.

Some of the layers not having their own documents are supported by functionality included within other documents.

OSI NETWORK
MODEL LAYER

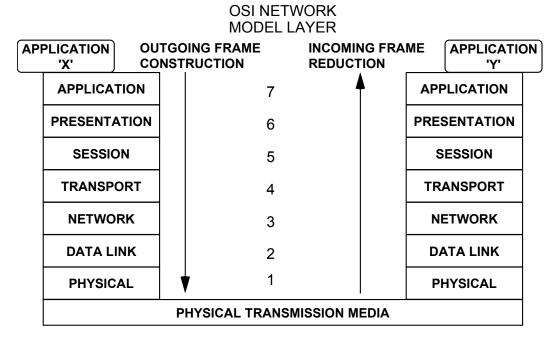| APPLICATION 'X'	OUTGOING FRAME CONSTRUCTION		INCOMING FRAME REDUCTION	APPLICATION 'Y'
APPLICATION	7			**APPLICATION**
PRESENTATION	6			**PRESENTATION**
SESSION	5			**SESSION**
TRANSPORT	4			**TRANSPORT**
NETWORK	3			**NETWORK**
DATA LINK	2			**DATA LINK**
PHYSICAL	1			**PHYSICAL**
PHYSICAL TRANSMISSION MEDIA				

FIGURE 1 - The OSI Seven Layer Model

The functionality of each layer is:

1. Physical — Concerns the transmission of structured bit stream over physical media; deals with the mechanical, electrical, functional, and procedural characteristics to access the physical media
2. Data Link — Provides the reliable transfer of information across the physical layer; sends blocks of data (frames) with the necessary synchronization, error control, sequence control, and flow control;
3. Network — Provides upper layers with independence from the data transmission and switching technologies used to connect systems; responsible for establishing, maintaining, and terminating connections;
4. Transport — Provides reliable, transparent transfer of data between end points; provides end-to-end error recovery and flow control; provides segmentation and reassembly of very large messages;
5. Session — Provides the control structure for communication between applications; establishes, manages, and terminates connections (sessions) between cooperating applications;
6. Presentation — Provide independence to the application process from differences in data representation (syntax); and
7. Application — Provides access to the OSI environment for users and also provides distributed information services.

The purpose of the OSI model is to provide a common basis for coordinating standards development by placing them within the perspective of the overall model. Any resulting standard, such as J1939, is not required to be explicitly partitioned into these seven layers as long as the fundamental functionality is supported. In addition, the hardware and software which perform the functions of each layer need not be rigidly defined such that each layer is recognizable within the system design. The distinction between layers can become totally obscured upon allocating these functions to a specific system design. In reviewing the J1939 layer documents, it can be seen that some J1939 layers include some functions normally associated with other OSI layers. This usually occurs when a layer may not require, or justify having, a standalone document of its own.

Because the J1939 network is a specific communications system, supporting specific sets of applications and a specific industry, rather than being generalized, not all of the OSI layers are required. Only those layers which are required for the anticipated J1939 uses will be defined, with a separate document being used for each of these layers.

2.4   Documentation Structure and Guide

This J1939 document is merely the top level of a hierarchy of related documents. A separate document, identified as J1939/*N*, has been defined for each application of the network and for each of the seven OSI model layers. To accommodate multiple versions of any one layer, a second slash digit (*X*) is used to identify the version of a document. Thus to determine the total network definition for a particular application, such as for North American agricultural equipment, one must obtain the top level application document, J1939/02, which identifies all of the layer versions used, and then obtain each of these individual layer documents. The presently defined documents and numbering system are as follows:

J1939	This top level document describes the network in general, the OSI layering structure, the subordinate document structure, and provides control for all preassigned values and names.
J1939/0*X*	An application document, where *X* refers to a specific network/application version of the network. This document will identify the industry or applications for which it pertains and will list the specific versions of each layer that makes up this network.
J1939/01	Truck and Bus Control and Communications Network.
J1939/02	(Draft) Agricultural Equipment Control and Communications Network.
J1939/1*X*	A Physical Layer document, where *X* refers to a specific version of the Physical Layer.
J1939/11	Physical Layer, 250K Bits/sec, Shielded Twisted Pair.
J1939/12	(Draft) Physical Layer, 250K Bits/sec, Twisted Quad.
J1939/13	Physical Layer, Diagnostic Connector
J 1939/15	(Draft) Reduced Physical Layer, 250K bits/sec, Unshielded Twisted Pair (UTP)
J1939/21	Data Link Layer (no alternative versions permitted)
J1939/3*X*	Network Layer document, where *X* refers to a specific version of the Network Layer.
J1939/31	Network Layer,
J1939/4*X*	Transport Layer document, where *X* refers to a specific version of the Transport Layer. No Transport Layer documents are presently defined.
J1939/5*X*	Session Layer document, where *X* refers to a specific version of the Session Layer. No Session Layer documents are presently defined.
J1939/6*X*	Presentation Layer document, where *X* refers to a specific version of the Presentation Layer. No Presentation Layer documents are presently defined.
J1939/7*X*	Applications Layer Document, where *X* refers to a specific version of the Application Layer.
J1939/71	Vehicle Application Layer.
J1939/72	(Draft) Virtual Terminal Application Layer.
J1939/73	Application Layer - Diagnostics.
J1939/74	(Draft) Application – Configurable Messaging
J1939/75	Application Layer-Generator Sets and Industrial
J1939/81	J1939 Network Management Protocol (no alternative versions permitted).
J1939/82	(Draft) Compliance

Document numbers have been assigned to all seven of the OSI model layers even though they are not all specifically defined within the present definition of J1939. This was done in part to provide an easily recognizable relationship between the documents and the OSI model and also to provide growth capabilities should it be determined later that such documents are needed. J1939/81, Network Management, is kept

separate as it represents a vertical slice through all of the layers and is thus best explained and understood as an individual subject rather than include a subset of network management within each of the affected layers.

Multiple application layer documents may be utilized simultaneously on the same network and thus must maintain compatibility. An example of such a system is a piece of agricultural equipment that utilizes both J1939/71 for the majority of communications and J1939/72 for the display terminal communications, both sets of messages being carried over the exact same network. A single vehicle/application may also utilize different physical layers within the same system but they need not be compatible if on different segments. An example is on-highway trucks where the physical layer used to connect the tractor to the trailer may be different than that used on the tractor itself.

3.   *Technical Requirements*

Beyond being an introduction to the full set of J1939 documents, this document is meant to aid those unfamiliar with J1939 by answering the most basic questions of:

· How J1939 is intended to work
· How to construct and process messages (transmit and receive)
· How to design an ECU to support J1939
· How typical control sequences are done (application examples)
· How a typical network is wired

3.1   J1939 Tutorial

The following tutorial is for the Truck and Bus Control and Communications Network as specified in J1939/01. J1939/01 is used in this tutorial as a typical example, and not to infer that all applications must follow J1939/01. Other applications may elect to utilize alternative versions of one or more layers resulting in corresponding changes to the following discussion. This section is offered as a means of illustrating and clarifying the network, not as a definition of it. See the individual sub documents, J1939/0*X* to J1939/81 for the correct definition and specification of each aspect of the network.

3.1.1   Introduction

J1939 is a high speed communications network designed to support real-time closed loop control functions between ECUs which may be physically distributed throughout the vehicle. J1708/J1587 is an older, widely used low speed network intended to provide simple information exchange, including diagnostic data, between ECUs. J1939 is capable of performing all of the functions of J1708/J1587 as well as the control system support. Any one application may utilize one or the other or both of these networks.

J1939 uses the CAN protocol which permits any ECU to transmit a message on the network when the bus is idle. Every message includes an identifier which defines the message priority, who sent it, and what data is contained within it. Collisions are avoided due to the arbitration process that occurs while the identifier is transmitted (using a non-destructive arbitration scheme). This permits high priority messages to get through with low latency (delay) times because there is equal access on the network for any ECU, but when multiple ECUs are simultaneously attempting to transmit, the highest priority message prevails.

3.1.2   Message Format and Usage (J1939/21 for 29 Bit Identifier)

J1939 provides a complete network definition using the 29 bit identifier (CAN Extended Frame) defined within the CAN protocol shown in Figure 2. J1939/21 enables 11 bit identifier (CAN Standard Frame) devices to be used within the same network, defining all messages as proprietary, permitting both device types to coexist without interference. The 11 bit identifier definition is not directly a part of J1939 but is included to assure that users of it can coexist on the same network without conflict. J1939 will not provide any further definition of the use of the 11 bit identifier. The CAN Data Frame Bits SOF, SRR, IDE, and RTR bits will not be discussed in the

following description (see J1939/21 and ISO 11898). The first 3 bits of the 29 bit identifier are used for determining message priority during the arbitration process. A value of 000 has the highest priority. Higher priority messages would typically be used for high speed control messages. An example of this is the torque control message from the transmission to the engine (see J1939/71). A lower priority would be used for data which is not time critical. An example of this is the engine configuration message. The priority field may be programmable for each message type so that network tuning can be performed by an OEM if necessary.

CAN EXTENDED FRAME FORMAT	SOF	IDENTIFIER 11 BITS											SRR	IDE	IDENTIFIER EXTENSION 18 BITS																			RTR	•••
J1939 FRAME FORMAT	SOF	PRIORITY			R	DP	PDU FORMAT (PF) 6 BITS (MSB)						SRR	IDE	PF (CONT.)		PDU SPECIFIC (PS) (DESTINATION ADDRESS, GROUP EXT. OR PROPRIETARY)								SOURCE ADDRESS								RTR	•••
		3	2	1			8	7	6	5	4	3			2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1		
J1939 FRAME BIT POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	
CAN 29 BIT ID POSITION		28	27	26	25	24	23	22	21	20	19	18			17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		

FIGURE 2, The J1939 29 Bit Identifier.

The next bit of the identifier (R) is reserved. The bit should be set to 0 for transmitted messages. This default will permit future use of the bit for other purposes as defined by the SAE committee.

The next set of 9 bits in the identifier is the Data Page (DP) bit and PDU Format (PF) field. PDU stands for Protocol Data Unit (i.e. Message Format). The DP bit is used as a page selector. Page 0 contains all the messages which are presently being defined. Page 1 provides additional expansion capacity for the future, to be assigned after page 0 has been completed. The PF field identifies one of two PDU formats able to be transmitted. PDU Formats are described in J1939/21, Section 3.3. The SRR and IDE bits are entirely defined and controlled by CAN and therefore not described or modified by J1939.

The next 8 bits of the identifier are PDU Specific (PS), meaning that they are dependent on the value of the PF. If the PF value is between 0 and 239 (PDU1), this PS field contains a destination address. If the PF field is between 240 and 255 (PDU2), the PS field contains a Group Extension (GE) to the PDU Format. The Group Extension provides a larger set of values to identify messages which can be broadcast to all ECUs on the network.

Most messages on J1939 are intended to be broadcast using the PDU2 format. Data transmitted on the network using PDU2 format cannot be directed to a specific destination. When a message must be directed to a particular ECU, it must have been assigned a PGN in the PDU1 format range of numbers so a specific destination address can be included within the identifier of the message. An example of this is the transmission commanding a specific torque value from the engine or a specific torque value from a retarder. Requiring a destination must be considered when the Parameter Group is first defined and published by the SAE committee (see J1939/21).

Collectively, the Reserved bit,Data Page, PF, and PS values define the PG being transmitted. These PGs have definitions which include the parameter assignments within the 8 byte data field of each message as well as the transmission repetition rate and priority. The term "Parameter Group" is used because they are groups of specific parameters. Parameter Groups are identified by a Parameter Group Number (PGN), which uniquely identifies each Parameter Group. The PGN structure permits a total of up to 8672 different Parameter Groups to be defined per page. Parameter Groups and Parameter Group Numbers are described in J1939/21 and current assignments are listed in Appendix A.

The last 8 bits of the identifier contain the address of the ECU transmitting the message (Source Address). For a given network, every address must be unique (254 available). Two different ECUs cannot use the same address at the same time. The PGNs are independent of the Source Address, thus any ECU can transmit any message.

3.1.3 Addresses and NAME (J1939/81 and Appendix B)

Each ECU on the network will have at least one name and one address associated with it. There are examples, such as an engine and engine retarder residing in a common ECU, wherein multiple names and multiple addresses may coexist within a single electronics unit. The address of an ECU defines a specific communications source or destination for messages, the name includes identification of the primary function performed at that address and adds an indication of the instance of that functionality in the event that multiple ECUs with the same primary function coexist on the same network. As many as 254 different ECUs of the same function can coexist on the network, each identified by their own address and name.

To uniquely name each ECU, J1939 defines a 64 bit NAME consisting of the fields shown in Table 1. The Function Instance, ECU Instance, and Identity Number fields permit multiple ECUs of the same make and model to coexist on the same network but still have unique NAMEs for each. See J1939/81 for a full description of ECU naming and address assignment and Appendix B for current committee assignments.

Table 1. NAME Fields

Arbitrary Address Capable	Industry Group	Vehicle System Instance	Vehicle System	Reserved	Function	Function Instance	ECU Instance	Manufac turer Code	Identity Number
1 bit	3 bit	4 bit	7 bit	1 bit	8 bit	5 bit	3 bit	11 bit	21 bit

NAMEs identify the primary vehicle function or functions which an ECU performs and uniquely identify each ECU, even when there are more than one of the same type on the network. But with a length of 64 bits, a NAME is inconvenient to use in normal communications. Therefore, once the network is fully initialized, each ECU utilizes an 8 bit address as its source identifier or "handle" to provide a way to uniquely access a given ECU on the network. For example, an engine may be assigned address 0, but if a second engine is present, it needs a separate, unique address (e.g. 1) and instance. ECUs that accept destination specific commands may require multiple addresses. This permits distinguishing which action is to occur. For example, if the transmission is commanding a specific torque value from the engine (address 0), this must be differentiated from commanding a specific torque value from the engine brake (retarder)(address 15). As can be seen by this example, a single ECU on the network may have multiple addresses and each address will have an associated NAME. To facilitate the initialization process of determining the address(es) for each ECU on the network, commonly used devices have Preferred Addresses assigned by the committee (Preferred Addresses are listed in Tables B2 - B9). Using the Preferred Addresses minimizes the frequency of multiple devices attempting to claim the same address.

In general, most ECUs will use their Preferred Addresses immediately upon power up. A specific procedure (defined in J1939/81 and elaborated on in J1939/01) for assigning addresses after powerup is used to resolve any conflicts that may occur. Each ECU must be capable of announcing which address(es) it intends to use. This is the address claim feature. Two options are available:

> 1) Upon power-up and whenever requested, an ECU must send an Address Claimed message to claim an address. When an ECU sends the Address Claimed message, all ECUs record or compare this newly claimed address to their own table of addresses on the network. Not all ECUs are required to maintain such a table, but all must at least compare the newly claimed address with their own. Should multiple ECUs claim the same address, the one having the lowest value NAME uses this address and the other(s) must claim a different address or stop transmitting on the network.

2) An ECU may send a request for Address Claimed message to determine addresses claimed by other ECUs. When an ECU sends a request for Address Claimed, all requested ECUs then send their Address Claimed messages. This permits transitional ECUs (tools, trailers, etc.) or ECUs powering up late to obtain the current address table so that an available address can be found and claimed or to determine which ECUs are currently on the network. This approach permits the option of self-configurable addresses for those ECUs which may need it, but does not make this a requirement for all ECUs. Self-configurable addressing is optional; those ECUs which might be expected to encounter address conflicts are recommended to support this capability.

When an address conflict has been detected, the following four options are available, depending upon the capabilities of the ECU involved:

Self-Configurable ECUs — a self-configurable ECU is capable of dynamically computing and claiming an unused address. Most service tools and bridges will have this capability.
Command Configurable ECUs — A network interconnection ECU, such as a bridge, or a service tool may command another ECU to use a given address. The ECU having the unclaimable address would then issue an Address Claimed message to acknowledge acceptance of this new commanded address. The ECU may be commanded to accept a new address even though it has already claimed a valid address.
Service Configurable ECUs — ECUs which are modifiable by service personnel, usually by the means of DIP switches or a service tool. When "commanded address" messages are used, his option differs from the Command Configurable in that a service tool is required and will often use proprietary techniques.
Non-Configurable ECUs — Those ECUs that are neither self-configurable nor reprogrammable would have to cease transmitting if they fail to claim a valid address.

3.1.4 Communication Methods

Three primary communication methods exist within J1939 and appropriate use of each type allows effective use of the available Parameter Group Numbers. The three communications methods are:

Destination specific communications, using PDU1 (PF values 0 - 239) (includes the use of the global destination address - 255)
Broadcast Communications using PDU2 (PF values 240 - 255)
Proprietary Communications using either PDU1 or PDU2 format

Each of the communications methods has an appropriate use. Destination specific Parameter Group Numbers are needed where the message must be directed to one or another specific destination and not to both. J1939 currently defines a torque control message which may be sent to an engine or retarder. In the case of more than one engine, this message must be sent only to the desired engine and a destination specific Parameter Group Number is needed and has been assigned.

Broadcast Communications apply in several situations, including:

Messages sent from a single or multiple sources to a single destination
Messages sent from a single or multiple sources to multiple destinations

Broadcast Communications cannot be used where a message must be sent to one or another destination and not to both.

The third communications method in J1939, proprietary communications, is provided by the use of two proprietary Parameter Group Numbers. A Parameter Group Number has been assigned for broadcast proprietary communications and a Parameter Group Number has been assigned for destination specific proprietary communications. This allows for two functions. One, a specific source can send its proprietary message in a PDU2 type format (broadcast). Two, it allows for situations where a service tool must direct its communication to a specific destination out of a possible group of ECUs. For instance this case arises when an engine uses more than one controller but the service tool must be able to perform calibration/reprogramming while all ECUs are connected to the same network. In this case the proprietary protocol needs to be destination specific. Note that the destination ECU must be capable of properly interpreting the proprietary data.

Proprietary communications are useful in two situations:

> Where it is unnecessary to have standardized communications
> Where it is important to communicate proprietary information

3.1.5 Transmitting Messages (Using J1939/21 and J1939/7X)

In addition to the 29 bit identifier shown in Figure 2, a CAN Data Frame includes a 6 bit control field, a data field which is typically 8 bytes, and terminates with CRC, ACK, and EOF fields. To send a particular data item, a message must be constructed by properly filling each of these fields. This is done by first referencing the applicable J1939 documents. This process will define the Parameter Group Number (PGN) to use, the message update (transmission) rate, and default priority. Since multiple data items are typically packed together within a message, it will also define the data field format. Note that when the ECU does not have data available for a given parameter it sets those bits to "not available" so that a receiver knows that the data is not provided.

Parameter Groups which have more than eight bytes of data must be sent as multipacket messages using the Transport Protocol functions defined in J1939/21 Section 3.10.

3.1.6 Receiving Messages (Using J1939/21 and J1939/7X)

There are various techniques (and electronic ICs) available for capturing selected messages off the network. Several general observations can be made however regarding received messages.

1. If it is a destination specific request or command, the ECU must determine if there is an address match between itself and the incoming messages' destination address. If there is, it must process the message and provide some type of acknowledgment.
2. If a message is a global request, every ECU, even the originator, must process it and respond if the data is available.
3. If a message is broadcast, each ECU must determine if it is relevant or not.

3.1.7 ECU Design (Using J1939/11, J1939/21, and J1939/7X)

Although every manufacturer will have different performance requirements for the ECU contained within their product, several observations should be made regarding the resources needed to support J1939. The current data rate of J1939/11 is 250 kbps (400µS/bit). A typical message containing 8 data bytes is 128 bits long (excluding bits used for bit stuffing) which is approximately 0.5 ms. The shortest message is 64 bits long. This means that a new message could be present every 250 microseconds. Even though not every message is relevant, nor is the bus loading likely to be above 50%, the receiving processor must still be able to handle (or buffer) multiple back to back messages. This will require some RAM space as well as processor time for the memory transfers. The requirement is that no messages should be lost due to ECU hardware or software design limitations.

3.1.8   Network Topology — J1939/01 Using Physical Layer J1939/11 and Network Layer J1939/31

The J1939/01 network defines a system containing one or more segments connected by network interconnecting ECUs. Each J1939 segment consists of a single, linear, shielded twisted pair of wires running around a section of the vehicle to each ECU. A short stub is permitted to connect this "bus" to each ECU. This simplifies the routing of the main bus wiring by not requiring it to come in direct proximity with each ECU. The linear bus is necessary at a data rate of 250 Kbps in order to minimize reflections of the electrical signals. The termination resistor at each end of the bus also reduces reflections. To support a tractor pulling one or more trailers, and the frequent removal and addition of new trailers, a separate J1939 segment (subnetwork) is used within the tractor and in each trailer or dolly.

The J1939 network may thus be composed of multiple segments, with a network interconnection ECU (bridge) between them. These segments need not be directly compatible with each other, as they may operate at different data rates or use different physical media. For example, a bridge provides electrical isolation between segments, provides initialization support for the subnetwork connected to it, and can provide message filtering to prevent unnecessary message traffic on the subnetworks. In the event of a bus failure on the wires exposed between the tractor and trailer, the main J1939 subnetwork on the tractor will continue to function.

3.2   Preassigned Values

Application specific parameters and Parameter Groups are defined in the J1939/7*X* documents. Parameter Groups that are used for control and management of the network are defined in J1939/21, J1939/31, and J1939/81. Assignments for Preferred Addresses, NAME elements, and Parameter Group Numbers are maintained in the appendices to this document. Each of these items are described in this section. The actual values that have been assigned are listed in the Appendices. If new values are required that are not already assigned, developers may request new values to be assigned by the SAE Control and Communications Network Subcommittee. See Appendix D for information on making a request. Users of the documents should assure that this base document is newer or has the same revision date as the particular application document they are using to avoid making requests that are obsolete at the time of submittal.

3.2.1   Parameter Group Numbers

Parameter Group Numbers are assigned specifically to use either PDU1 format or PDU2 format (PDU types are described in Section 3.1.2 and in J1939/21, Section 3.3). Once assigned to a format the other PDU type is not available for that Parameter Group. The assignment of a Parameter Group Number should be done keeping in mind the following characteristics: priority, update rate, importance of the data in the packet to other ECUs, and length of the data associated with the Parameter Group. Appendix A includes a template for assigning Parameter Group Numbers and the current assignments.

Parameter Group Numbers are assigned linearly to the various sections of the Parameter Group list in Appendix A based on the criteria provided on the Parameter Group Request form (Appendix D).

Much of the communications between ECUs constructed by a single manufacturer do not require standardization. The information that is communicated is not generally useful to other ECUs on the network. In this situation the proprietary Parameter Groups can be used. The use of standardized communications is preferred and should be used whenever practical, however the proprietary option is offered as a means of solving unique problems and situations.

If proprietary information is being communicated, or the information to be communicated is not of general interest, the proprietary method should be used.   If the information is of general interest and does not require direction of the message to a particular ECU, a Parameter Group Number utilizing the PDU2 broadcast format should be sought. Finally, if the information is of general interest but requires direction to one or another ECUs then destination specific addressing is needed and a PDU1 format Parameter Group Number should be sought.   Proprietary and PDU1 communications methods should be considered carefully and used sparingly.

3.2.2 Data Field Grouping

Minimizing message overhead with CAN based systems requires full use of the data fields of messages. Except in the case of very time critical messages, parameters should be grouped to fill the 8 byte data field. Following this principle conserves PGNs for future assignment and allows for minimum network loading when all data bytes are known by and sent from the same address. Strong justification is needed to allow definition of Parameter Group Numbers that result in sparsely used data fields.

Parameters should be grouped as follows:

1. By common subsystem (the ECU likely to measure and send the data)
2. With similar update rates (to minimize unnecessary overhead)
3. By function (Oil, Coolant, Fuel, etc.)

It should be recognized that, while these are guidelines, in most cases when parameters are grouped together they will end up violating one or more of the above rules. Since all parameters defined in J1939 have a technique for identifying when they are not available it is not critical that all of the parameters in one Parameter Group come from the same ECU. If a new parameter is defined and there are spare bytes or bits in an existing Parameter Group, then it can be easily added there. When the update rate is fast, it is desirable to make sure that a Parameter Group is as fully utilized as possible (i.e. uses all 8 data bytes) before defining another PG and preferable that all parameters are normally coming from one specific ECU.

For the slower update rate data it is not as critical that all of the parameters in a Parameter Group come from the same ECU. Even though it is desirable to have parameters come from one ECU, the intention of J1939 is to provide a means for communicating the data and not dictating which ECU is to send what data.

3.2.3 NAME Systems and Functions

A Function is a capability of a component or group of components served by one or more ECUs. The Function of each ECU is identified within an 8 bit field of that ECU's NAME. As there may be multiple ECUs which identify themselves with the same Function, the Function Instance field of NAME is used to distinguish between them. The same Function value (upper 128 only) may mean different things for different Industry Groups or Vehicle Systems, therefore the Function (upper 128 only) identification is dependent upon the Industry Group, and the Vehicle System as shown in Figure 3 (see J1939/81 Section 4.1.12).

A Vehicle System is a subcomponent of a vehicle or an analogous component that includes one or more J1939 network segments and may be connected or disconnected from the total vehicle. A Vehicle System may be made up of one or more Functions, which have ECUs that are connected to a J1939 network segment of that Vehicle System. A typical on-highway Vehicle System is a tractor or trailer. Because the definition of Vehicle Systems will vary from one industry to another, the System definition is dependent upon the Industry Group as shown in Figure 3 (see J1939/81 Section 4.1.12).
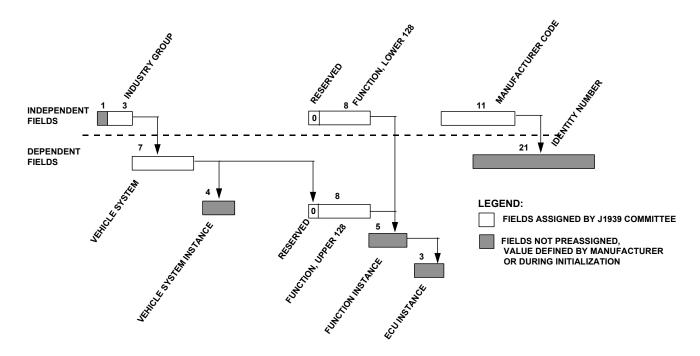
Figure 3. Dependencies in the NAME Fields.

A single ECU on the network may combine multiple Functions, and would then have the option to claim a separate address for each supported function. The assigned Vehicle System and Function values are listed in Appendix B, Tables B11 and B12.

3.2.4 Industry Group

To permit multiple industries to use J1939, an Industry Group code is used to identify the industry to which the ECU is associated. Code 0 is a special category of Industry Group in that it identifies Preferred Addresses and NAMEs that are common to all industries. Any ECU which may be used in more than one industry application, such as diesel engines, should have NAMEs and Preferred Addresses within this global group. It is the responsibility of those requesting new definitions to consider if this may be the case, and to request the new definition in the correct group. To avoid running out of NAME or address values, it is requested that global values be used only when truly applicable, if an ECU may exist in only one group, such as agricultural equipment, it would be preferable to add the definition to the applicable group rather than to use a global value. Industry Group codes are listed in Appendix B, Table B1.

3.2.5 Manufacturer Code

As defined in J1939/81, the NAME convention includes a Manufacturer Code, permitting a unique Identity Number to be a part of the full name. This Identity Number is assigned by the manufacturer and can be an individual ECU's serial number if desired. To enable the Identity Numbers to be unique to a given manufacturer, all manufacturers using J1939 are assigned a code. The Manufacturer's Code numbers are listed in Appendix B, Table B10. A manufacturer is permitted to have multiple codes, such as when there are multiple divisions or major product lines. Having a unique Manufacturer Code for each individual product would be discouraged as this would quickly exhaust the range of available codes. There are 21 bits available in the Identity Number field of NAME, permitting the manufacturer to include a reference to each particular product if desired.

3.2.6 Preferred Address

The number of addresses within a given system cannot exceed 254 (null and global cannot be claimed by devices). Most ECUs that operate on a J1939 network will have an assigned Preferred Address that the ECU may use. If the ECU's Preferred Address has been claimed or is in use by another ECU on the network, the conflict will be resolved using the procedures outlined in Section 3.1.3 and detailed in J1939/81 Sections 4.2 and 5. There may be additional contraints or procedures defined in the applicable J1939/0X document. For instance, on-highway trailer bridges and devices have address claiming constraints that differ from Con-Ag systems. A supplier of a Self Configurable ECU may provide any strategy for selecting an address to attempt to claim. However, if an alternative approach is not defined, it should attempt to claim an address in the range 128 - 247, starting at 128. Individual reserved Preferred Address assignments begin at zero and are assigned in a linear fashion as follows:

0 to 127	Reserved for most conventional ECUs in Industry Group 0 - Global
128 to 247	Reserved for Industry Specific assignments
248 to 253	Reserved for special ECUs
254	Null Address
255	Global Address

The current Preferred Address assignments are provided in Appendix B and information for requesting new assignments can be found in Appendix D. For further information, see J1939/81.

3.2.7 Suspect Parameter Number (SPN)

A Suspect Parameter Number (SPN) is a 19 bit number used to identify a particular element, component, or parameter associated with an ECU. This capability is especially useful for diagnostics, permitting an ECU which has detected a fault associated with a particular component, such as a sensor, to transmit a fault message identifying the faulty component. SPNs are assigned by the Committee and are listed in Appendix C. The first 511 SPNs are reserved and will be assigned, when possible, to the exact same number as the Parameter Identifier (PID) of J1587. For example, J1587 PID 91 is "Percent Accelerator Pedal Position" and an accelerator pedal position parameter fault could be reported in J1939 by using SPN 91. All following SPNs will be assigned in order as they are received.

Due to the very large number of SPNs which may ultimately be assigned, and their assignment in order of request, it will be very difficult for one interested in finding the SPN value of a particular component of interest simply by looking through the table. To facilitate the verification that new SPN requests are not duplications of existing assignments, the committee retains this table as an MS Excel™ spreadsheet, with additional data beyond that shown in Table C1. This permits sorting based upon SPN number, name, description, attribute (actuator, pressure, temperature, solenoid, etc.), J1587 attributes (MID, PID, SID), J1939 document paragraph, source name, and source address. It would be desirable for those developing J1939 applications or wishing to request the assignment of a new SPN to have access to an up-to-date version of this spreadsheet so that they can perform various sorts and searches of the data. At the time of publication, the SAE has not yet determined how this data can best be made available to the users of J1939 who are not committee participants.

3.3 Application Examples

A typical shift sequence consists of a series of commands from the transmission to the engine for controlling engine RPM and torque. Messages from the engine provide status and information which is used to determine when a particular condition has occurred. Other messages may also be sent regularly to disable the engine retarder at the proper time interval, or to inhibit ASR functions which might effect engine demand during portions of the shift sequence.

Parameter Group	Msg. Type	Sender	Using ECU	Action/Function
ETC1	Info	Trans	Eng, ASR	Transmission decision to shift (Shift in progress)
TSC1	Cmd	Trans	Eng.	Override Priority bits set for Trans. (01 priority) Torque control, Torque = 0
TSC1	Cmd	Trans	Retarder (Eng.)	Disable Mode, Torque = 0
EEC1	Info	Eng.	Trans	Torque = 0 (Clutch may be disengaged)
TSC1	Cmd	Trans	Eng	Speed Control Mode, Requested Speed = X
EEC1	Info	Eng	Trans	Speed = X (Clutch may be engaged)
TSC1	Cmd	Trans	Eng	Speed/Torque Limit Mode (11 priority)
ETC1	Info	Trans	ASR	Allow ASR (11 priority)
TSC1	Cmd	Trans	Ret (Eng)	Enable Mode
TSC1	Cmd	Trans	Eng	Override Disable
ETC1	Info	Trans	Eng, ASR	Shift complete

A typical ABS sequence will cause a message to be transmitted which indicates that the engine should reduce torque and the driveline (transmission) to remain in its existing (stable) state. If the ABS condition is "significant" (i.e. not just bouncing tires), it may request that the driveline also be disengaged. Note that this message must be sent at regular intervals to maintain the condition. Once the event is over, the ABS inactive indicates that the transmission and engine may return to "normal" operation

Parameter Group	Msg. Type	Sender	Using ECU	Action/Function
				ABS decision to modulate brakes
EBC1	Cmd	ABS	Eng, Trans	ABS active
TSC1	Cmd	ABS	Retarder (Eng.)	Disable Mode, Torque = 0 (Prevent engine stall)
TC1	Cmd	ABS	Trans	Disengage Driveline
				ABS event over
EBC1	Cmd	ABS	Eng, Trans	ABS inactive

A typical ASR sequence will attempt to reduce torque by sending torque limit messages to the engine. Torque can also be reduced by requesting more driveline retardation or permitting some clutch slip. Ultimately an upshift may be requested in order to achieve acceptable torque values. Note that the transmission takes over engine control during the shift.

Parameter Group	Msg. Type	Sender	Using ECU	Action/Function
				ASR Torque Reduction Decision
EBC1	Cmd	ASR	Eng, Trans, Retarder (Drvl)	ASR Torque control active
TSC1	Cmd	ASR	Eng	Torque Limit
TSC1	Cmd	ASR	Retarder (Drvl.)	Request more retardation
TC1	Cmd	ASR	Trans	Request more clutch slip
TC1	Cmd	ASR	Trans	Request new gear selection,
				No clutch slip request
				Shift if possible
				Shift complete, ASR continues torque limit
				ASR event over
EBC1	Cmd	ASR	Eng, Trans, Retarder (Drvl)	ASR inactive, disable override

Prepared by the SAE Truck and Bus Control and Communications Subcommittee of the SAE Truck and Bus Electrical/Electronics Committee.

APPENDIX A

PARAMETER GROUP ASSIGNMENTS

TABLE A1
J1939 Parameter Group Template

<u>Legend</u>:

DP	=	Data Page (1 bit)		GE	=	Group Extension (8 bits)
PF	=	PDU Format (8 bits)		DA	=	Destination Address (8 bits)
PS	=	PDU Specific Field (8 bits)		NA	=	Not Allowed
		(either DA or GE)		un	=	Undefined

PGN = Parameter Group Number (3 bytes) (see J1939-21, Section 4.1.7 for description)

DP	PF	PS	Parameter Group Definition	Multipacket PGN
0	0	DA	PDU1 Format	NA
0	1	DA		
			↓	↓
(Less than or equal to 100ms)				
Boundary x				
(Greater than or equal to 100ms)			↑	↑
0	238	DA	PDU1 Format	Allowed
0	239	DA	PDU1 Format Proprietary	
0	240	0	PDU2 Format	NA
0	240	1		
			↓	↓
(Less than or equal to 100ms)				
Boundary y				
(Greater than or equal to 100ms)			↑	↑
0	254	254		
0	254	255	PDU2 Format	Allowed
0	255	0 - 255*	PDU2 Format - Proprietary	
1	0	DA	PDU1 Format	NA
1	1	DA		
			↓	↓
(Less than or equal to 100ms)				
Boundary x1				
(Greater than or equal to 100ms)			↑	↑
1	238	DA		
1	239	DA	PDU1 Format	Allowed
1	240	0	PDU2 Format	NA
1	240	1		
			↓	↓
(Less than or equal to 100ms)				
Boundary y1				
(Greater than or equal to 100ms)			↑	↑
1	255	254		
1	255	255	PDU2 Format	Allowed

* Definition is up to the manufacturer

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TABLE A2
J1939 Parameter Groups

<u>Legend</u>:

DP	= Data Page (1 bit)	GE = Group Extension (8 bits)
PF	= PDU Format (8 bits)	DA = Destination Address (8 bits)
PS	= PDU Specific Field (8 bits)	X = Allowed
	(either DA or GE)	un = Undefined

PGN = Parameter Group Number (3 bytes) (see J1939-21, Section 4.1.7 for description)

REV	DP	PF	PS	PARAMETER GROUP LABEL	ACRONYM	MULTI-PACKET	PGN	J1939-	SECTION
	0	0	DA	Torque-Speed Control #1	TSC1		0	-71	5.3.1
	0	1	DA	Transmission Control #1	TC1		256	-71	5.3.2
	0	2	DA	Defined in ISO 11992	EBS11		512		
	0	3	DA	Defined in ISO 11992	EBS21		768		
				Less than 100 ms					
		Boundary x		-----------------------------					
				More than 100 ms					
	0	210	DA	(next available)					
(13)	0	211	DA	Calibration Information	DM19	x	54016	-73	5.7.20
(13)	0	212	DA	Data Security	DM18	x	54272	-73	5.7.19
	0	213	DA	Time/date Adjust			54528	-71	5.3.144
(13)	0	214	DA	Boot Load Data	DM17	x	54784	-73	5.7.18
(13)	0	215	DA	Binary Data Transfer	DM16	x	55040	-73	5.7.16
(13)	0	216	DA	Memory Access Response	DM15		55296	-73	5.7.15
(13)	0	217	DA	Memory Access Request	DM14		55552	-73	5.7.14
(13)	0	218	DA	Reserved for ISO 15765			55808		
(13)	0	219	DA	Reserved for ISO 15765			56064		
	0	220	DA	Anti-theft Status	ATS		56320	-71	5.3.102
	0	221	DA	Anti-theft Request	ATR		56576	-71	5.3.101
	0	222	DA	Reset	RESET		56832	-71	5.3.74
	0	223	DA	Stop Start Broadcast	DM13		57088	-73	5.7.13
	0	224	DA	Cab Message #1	CM1		57344	-71	5.3.59
	0	225	DA	Reserved for ISO 11992	GFM21		57600		
	0	226	DA	Reserved for ISO 11992	GFM11		57856		
	0	227	DA	Command non-continuously Monitored Test	DM7		58112	-73	5.7.7
	0	228	DA	Reserved for ISO 11992	GFM12		58368		
	0	229	DA	Reserved for ISO 11992	GFM22		58624		
	0	230	DA	Virtual Terminal-to-Node	VT12	x	58880	-72	3.2.4
	0	231	DA	Node-to-Virtual Terminal	VT21	x	59136	-72	3.2.4
	0	232	DA	Acknowledgment Message	ACKM		59392	-21	5.4.4

REV	DP	PF	PS	PARAMETER GROUP LABEL	ACRONYM	MULTI-PACKET	PGN	J1939-	SECTION
	0	234	DA	Request PG	RQST		59904	-21	5.4.2
	0	235	DA	Transport Protocol - Data Transfer	TP.DT		60160	-21	5.10.4
	0	236	DA	Transport Protocol - Connection Mgmt	TP.CM.xx		60416	-21	5.10.3
	0	237	DA	Network Layer	N.xx	x	60672	-31	5.5.1
(7)	0	238	DA	Address Claimed	AC		60928	-81	4.2.2.1
	0	239	DA	Proprietary A	PropA	x	61184	-21	5.4.5
	0	240	0	Electronic Retarder Controller #1	ERC1		61440	-71	5.3.3
	0	240	1	Electronic Brake Controller #1	EBC1		61441	-71	5.3.4
	0	240	2	Electronic Transmission Controller #1	ETC1		61442	-71	5.3.5
	0	240	3	Electronic Engine Controller #2	EEC2		61443	-71	5.3.6
	0	240	4	Electronic Engine Controller #1	EEC1		61444	-71	5.3.7
	0	240	5	Electronic Transmission Controller #2	ETC2		61445	-71	5.3.8
	0	240	6	Electronic Axle Controller #1	EAC1		61446	-71	5.3.9
				Less than 100 ms					
	Boundary y			-----------------------------					
				More than 100 ms					
				(next available)					
(12)	0	254	92	ISO 11992 (even) – Running Gear Equipment #2/2	RGE22		65116		
(12)	0	254	93	ISO 11992 (odd) – General Purpose Message #1/2	GPM12		65117		
(12)	0	254	94	ISO 11992 (even) – Running Gear Equipment #2/3	RGE23		65118		
(12)	0	254	95	ISO 11992 (odd) – General Purpose Message #1/3	GPM13		65119		
(12)	0	254	96	ISO 11992 (even) – General Purpose Message #2/3	GPM23		65120		
(12)	0	254	97	ISO 11992 (odd) – General Purpose Message #1/4	GPM14		65121		
(12)	0	254	98	ISO 11992 (even) – General Purpose Message #2/4	GPM24		65122		
(12)	0	254	99	ISO 11992 (odd) – General Purpose Message #1/5	GPM15		65123		
(12)	0	254	100	ISO 11992 (even) – General Purpose Message #2/5	GPM25		65124		
(12)	0	254	101	ISO 11992 (odd) – General Purpose Message #1/6	GPM16		65125		
(12)	0	254	102	Battery Main Switch Information	BM		65126	-71	
(12)	0	254	103	Climate Control Configuration	CCC		65127	-71	
(11)	0	254	104	Vehicle Fluids	VF		65128	-71	
(11)	0	254	105	Engine Temperature #3	ET3		65129	-71	
(10)	0	254	106	Reserved for Engine Fuel/lube systems	EFS		65130	-71	5.3.112

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REV	DP	PF	PS	PARAMETER GROUP LABEL	ACRONYM	MULTI-PACKET	PGN	J1939-	SECTION
(10)	0	254	107	Reserved for Driver Identification	DI	x	65131	-71	5.3.145
(10)	0	254	108	Tachograph	TCO1		65132	-71	5.3.143
(12)	0	254	109	Heater Information	HTR		65133	-71	
(10)	0	254	110	High Resolution Wheel Speed	HRW		65134	-71	5.3.142
(10)	0	254	111	Adaptive Cruise Control	ACC1		65135	-71	5.3.141
(10)	0	254	112	Combination Vehicle Weight	CVW	x	65136	-71	5.3.140
(9)	0	254	113	Laser Tracer Position	LTP		65137	-71	5.3.139
(9)	0	254	114	Laser Leveling System Blade Control	LBC		65138	-71	5.3.138
(9)	0	254	115	Laser Receiver Mast Position	LMP		65139	-71	5.3.137
(9)	0	254	116	Modify Leveling System Control Set Point	LSP		65140	-71	5.3.136
(9)	0	254	117	Laser Leveling System Vertical Deviation	LVD		65141	-71	5.3.135
(9)	0	254	118	Laser Leveling System Vertical Position Display Data	LVDD		65142	-71	5.3.134
(9)	0	254	119	Auxiliary Pressures	AP		65143	-71	5.3.133
(8)	0	254	120	Tire Pressure Control Unit Mode and Status			65144	-71	5.3.132
(8)	0	254	121	Tire Pressure Control Unit Target Pressures			65145	-71	5.3.131
(8)	0	254	122	Tire Pressure Control Unit Current Pressures			65146	-71	5.3.130
(8)	0	254	123	Combustion Time #1	CT1		65147	-71	5.3.124
(8)	0	254	124	Combustion Time #2	CT2		65148	-71	5.3.125
(8)	0	254	125	Combustion Time #3	CT3		65149	-71	5.3.126
(8)	0	254	126	Combustion Time #4	CT4		65150	-71	5.3.127
(8)	0	254	127	Combustion Time #5	CT5		65151	-71	5.3.128
(8)	0	254	128	Combustion Time #6	CT6		65152	-71	5.3.129
(8)	0	254	129	Fuel Information #2 (Gaseous) GFI2			65153	-71	5.3.123
(7)	0	254	130	Ignition Timing #1	IT1		65154	-71	5.3.117
(7)	0	254	131	Ignition Timing #2	IT2		65155	-71	5.3.118
(7)	0	254	132	Ignition Timing #3	IT3		65156	-71	5.3.119
(7)	0	254	133	Ignition Timing #4	IT4		65157	-71	5.3.120
(7)	0	254	134	Ignition Timing #5	IT5		65158	-71	5.3.121
(7)	0	254	135	Ignition Timing #6	IT6		65159	-71	5.3.122
(7)	0	254	136	Ignition Transformer Secondary Output #1	ISO1		65160	-71	5.3.114
(7)	0	254	137	Ignition Transformer Secondary Output #2	ISO2		65161	-71	5.3.115
(7)	0	254	138	Ignition Transformer Secondary Output #3	ISO3		65162	-71	5.3.116
(7)	0	254	139	Gaseous Fuel Pressure	GFP		65163	-71	5.3.113
(7)	0	254	140	Auxiliary Analog Information	AAI		65164	-71	5.3.111
(7)	0	254	141	Vehicle Electrical Power #2	VP2		65165	-71	5.3.110
(6)	0	254	142	Service #2	S2	X	65166	-71	5.3.109
(6)	0	254	143	Supply Pressure #2	SP2		65167	-71	5.3.108
(6)	0	254	144	Engine Torque History	ETH	x	65168	-71	5.3.107
(6)	0	254	145	Fuel Leakage	FL		65169	-71	5.3.106
	0	254	146	Engine Information	EI		65170	-71	5.3.105
	0	254	147	Engine Electrical System/Module Information			65171	-71	5.3.104

REV	DP	PF	PS	PARAMETER GROUP LABEL	ACRONYM	MULTI-PACKET	PGN	J1939-	SECTION
	0	254	148	Engine Auxiliary Coolant	EAC		65172	-71	5.3.103
	0	254	149	Rebuild Information	RBI		65173	-71	5.3.100
	0	254	150	Turbocharger Wastegate	TCW		65174	-71	5.3.99
	0	254	151	Turbocharger Information #5	TCI5		65175	-71	5.3.98
	0	254	152	Turbocharger Information #4	TCI4		65176	-71	5.3.97
	0	254	153	Turbocharger Information #3	TCI3		65177	-71	5.3.96
	0	254	154	Turbocharger Information #2	TCI2		65178	-71	5.3.95
	0	254	155	Turbocharger Information #1	TCI1		65179	-71	5.3.94
	0	254	156	Main Bearing Temperature #3	MBT3		65180	-71	5.3.93
	0	254	157	Main Bearing Temperature #2	MBT2		65181	-71	5.3.92
	0	254	158	Main Bearing Temperature #1	MBT1		65182	-71	5.3.91
	0	254	159	Exhaust Port Temperature #5	EPT5		65183	-71	5.3.90
	0	254	160	Exhaust Port Temperature #4	EPT4		65184	-71	5.3.89
	0	254	161	Exhaust Port Temperature #3	EPT3		65185	-71	5.3.88
	0	254	162	Exhaust Port Temperature #2	EPT2		65186	-71	5.3.87
	0	254	163	Exhaust Port Temperature #1	EPT1		65187	-71	5.3.86
	0	254	164	Engine Temperature #2	ET2		65188	-71	5.3.85
	0	254	165	Intake Manifold Information #2	IMT2		65189	-71	5.3.84
	0	254	166	Intake Manifold Information #1	IMT1		65190	-71	5.3.83
	0	254	167	Alternator Temperature	AT		65191	-71	5.3.82
	0	254	168	Articulation Control	AC		65192	-71	5.3.81
	0	254	169	Exhaust Oxygen #1	EO1		65193	-71	5.3.80
	0	254	170	Alternate Fuel #2	AF2		65194	-71	5.3.79
	0	254	171	Electronic Transmission Controller #6	ETC6		65195	-71	5.3.78
	0	254	172	Wheel Brake Lining Remaining Information	EBC4		65196	-71	5.3.77
	0	254	173	Wheel Application Pressure High Range Information	EBC3		65197	-71	5.3.76
	0	254	174	Supply Pressure	SP1		65198	-71	5.3.75
	0	254	175	Fuel Consumption (Gaseous)	GFC		65199	-71	5.3.73
	0	254	176	Trip Time Information #2	TTI2	x	65200	-71	5.3.72
	0	254	177	ECU History	EH		65201	-71	5.3.71
	0	254	178	Fuel Information #1 (Gaseous)	GFI1		65202	-71	5.3.70
	0	254	179	Fuel Information	LFI		65203	-71	5.3.69
	0	254	180	Trip Time Information #1	TTI1	x	65204	-71	5.3.68
	0	254	181	Trip Shutdown Information	TSI		65205	-71	5.3.67
	0	254	182	Trip Vehicle Speed-Cruise Distance Information			65206	-71	5.3.66
	0	254	183	Engine Speed-Load Factor Information	LF	x	65207	-71	5.3.65
	0	254	184	Trip Fuel Information (Gaseous)	GTFI	x	65208	-71	5.3.64
	0	254	185	Trip Fuel Information (Liquid)	LTFI	x	65209	-71	5.3.63
	0	254	186	Trip Distance Information	TDI	x	65210	-71	5.3.62
	0	254	187	Trip Fan Information	TFI	x	65211	-71	5.3.61
	0	254	188	Compression-Service Brake Information	CBI	x	65212	-71	5.3.60
	0	254	189	Fan Drive	FD		65213	-71	5.3.58
	0	254	190	Electronic Engine Controller #4	EEC4		65214	-71	5.3.57
	0	254	191	Wheel Speed Information	EBC2		65215	-71	5.3.56

REV	DP	PF	PS	PARAMETER GROUP LABEL	ACRONYM	MULTI-PACKET	PGN	J1939-	SECTION
	0	254	192	Service Information	SERV	X	65216	-71	5.3.55
	0	254	193	High Resolution Vehicle Distance	VDHR		65217	-71	5.3.54
	0	254	194	Electronic Retarder Controller #2	ERC2		65218	-71	5.3.53
	0	254	195	Electronic Transmission Controller #5	ETC5		65219	-71	5.3.52
	0	254	196	Reserved for ISO 11992	EBS22		65220		
	0	254	197	Electronic Transmission Controller #4	ETC4		65221	-71	5.3.51
	0	254	198	Reserved for ISO 11992	EBS23/GFM23		65222		
	0	254	199	Electronic Transmission Controller #3	ETC3		65223	-71	5.3.50
	0	254	200	Reserved for ISO 11992	GFM24		65224		
	0	254	201	Reserved for ISO 11992	EBS12		65225		
	0	254	202	Active Diagnostic Trouble Codes	DM1	x	65226	-73	5.7.1
	0	254	203	Previously Active Diagnostic Trouble Codes	DM2	x	65227	-73	5.7.2
	0	254	204	Diagnostic Data Clear/Reset Previously Active Diagnostic Trouble Codes	DM3		65228	-73	5.7.3
	0	254	205	Freeze Frame Parameters	DM4	x	65229	-73	5.7.4
	0	254	206	Diagnostic Readiness	DM5	x	65230	-73	5.7.5
	0	254	207	Continuously Monitored System Test Results	DM6	x	65231	-73	5.7.6
	0	254	208	Test Results for non-continuously monitored systems	DM8		65232	-73	5.7.8
	0	254	209	Oxygen Sensor Test Results	DM9		65233	-73	5.7.9
	0	254	210	Non-continuously monitored system test identifier support	DM10		65234	-73	5.7.10
	0	254	211	Diagnostic data Clear/Reset for active DTCs	DM11		65235	-73	5.7.11
	0	254	212	Emission Related active DTCs	DM12	x	65236	-73	5.7.12
	0	254	213	Alternator Speed	AS		65237	-71	5.3.49
	0	254	214	Reserved for Network Management			65238		
(7)	0	254	215	Reserved			65239	-81	
(7)	0	254	216	Commanded Address	CA		65240	-81	4.2.3.1
	0	254	217	Auxiliary Input/Output Status	AUXIO		65241	-71	5.3.48
	0	254	218	Software Identification	SOFT	x	65242	-71	5.3.47
	0	254	219	Engine Fluid Level/Pressure #2	EFL/P2		65243	-71	5.3.46
	0	254	220	Idle Operation	IO		65244	-71	5.3.10
	0	254	221	Turbocharger	TC		65245	-71	5.3.11
	0	254	222	Air Start Pressure	AIR2		65246	-71	5.3.12
	0	254	223	Electronic Engine Controller #3	EEC3		65247	-71	5.3.13
	0	254	224	Vehicle Distance	VD		65248	-71	5.3.14
	0	254	225	Retarder Configuration	RC	x	65249	-71	5.3.15
	0	254	226	Transmission Configuration	TCFG	x	65250	-71	5.3.16
	0	254	227	Engine Configuration	EC	x	65251	-71	5.3.17
	0	254	228	Shutdown	SHUTDOWN		65252	-71	5.3.18
	0	254	229	Engine Hours, Revolutions	HOURS		65253	-71	5.3.19
	0	254	230	Time/Date	TD		65254	-71	5.3.20
	0	254	231	Vehicle Hours	VH		65255	-71	5.3.21

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REV	DP	PF	PS	PARAMETER GROUP LABEL	ACRONYM	MULTI-PACKET	PGN	J1939-	SECTION
	0	254	232	Vehicle Direction/Speed	VDS		65256	-71	5.3.22
	0	254	233	Fuel Consumption	LFC		65257	-71	5.3.23
	0	254	234	Vehicle Weight	VW		65258	-71	5.3.24
	0	254	235	Component Identification	CI	x	65259	-71	5.3.25
	0	254	236	Vehicle Identification	VI	x	65260	-71	5.3.26
	0	254	237	Cruise Control/Vehicle Speed Setup	CCSS		65261	-71	5.3.27
	0	254	238	Engine Temperature #1	ET1		65262	-71	5.3.28
	0	254	239	Engine Fluid Level/Pressure #1	EFLP1		65263	-71	5.3.29
	0	254	240	Power Takeoff Information	PTO		65264	-71	5.3.30
	0	254	241	Cruise Control/Vehicle Speed	CCVS		65265	-71	5.3.31
	0	254	242	Fuel Economy (Liquid)	LFE		65266	-71	5.3.32
	0	254	243	Vehicle Position	VP		65267	-71	5.3.33
	0	254	244	Tire Condition	TIRE		65268	-71	5.3.34
	0	254	245	Ambient Conditions	AMB		65269	-71	5.3.35
	0	254	246	Inlet/Exhaust Conditions	IC		65270	-71	5.3.36
	0	254	247	Vehicle Electrical Power	VEP		65271	-71	5.3.37
	0	254	248	Transmission Fluids	TF		65272	-71	5.3.38
	0	254	249	Axle Information	AI		65273	-71	5.3.39
	0	254	250	Brakes	B		65274	-71	5.3.40
	0	254	251	Retarder fluids	RF		65275	-71	5.3.41
	0	254	252	Dash Display	DD		65276	-71	5.3.42
	0	254	253	Alternate Fuel #1	AF1		65277	-71	5.3.43
	0	254	254	Auxiliary Water Pump Pressure	AWPP		65278	-71	5.3.44
	0	254	255	Water in Fuel Indicator	WFI		65279	-71	5.3.45
	0	255	0-255	Proprietary B	PropB	x	65,280-65,535	-21	5.4.5

Notes: Revision dates (not all tables had revisions on all of these dates)

(1) July, 1996	(7) February 1998	(13) July 1999
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(4) April, 1997	(10) October 1998	
(5) August 1997	(11) February 1999	
(6) November 1997	(12) May 1999	

APPENDIX B

ADDRESS AND IDENTITY ASSIGNMENTS

TABLE B1
J1939 INDUSTRY GROUPS

Industry Group	Industry
0	Global, applies to all
1	On-Highway Equipment
2	Agricultural and Forestry Equipment
3	Construction Equipment
4	Marine
5	Industrial-Process Control-Stationary (Gen-Sets)
6	Reserved for future assignment
7	Not available

TABLE B2
J1939 PREFERRED ADDRESSES
INDUSTRY GROUP #0 - GLOBAL

Rev	Address	ECU-Module	Definition
	0	Engine #1	
	1	Engine #2	
	2	Turbocharger	
	3	Transmission #1	
	4	Transmission #2	
	5	Shift Console – Primary	
	6	Shift Console – Secondary	
	7	Power TakeOff - (Main or Rear)	
	8	Axle – Steering	
	9	Axle - Drive #1	
	10	Axle - Drive #2	
	11	Brakes - System Controller	
	12	Brakes - Steer Axle	
	13	Brakes - Drive axle #1	
	14	Brakes - Drive Axle #2	
	15	Retarder – Engine	Engine Compression Braking
	16	Retarder – Driveline	
	17	Cruise Control	Speed-based control
	18	Fuel System	
	19	Steering Controller	
	20	Suspension – Steer Axle	
	21	Suspension – Drive Axle #1	
	22	Suspension – Drive Axle #2	
	23	Instrument Cluster	
	24	Trip Recorder	
	25	Passenger-Operator Climate Control	
	26	Electrical Charging System	
	27	Aerodynamic Control	
	28	Vehicle Navigation	
	29	Vehicle Security	
	30	Electrical System	
	31	Starter System	
(11)	32	Tractor-Trailer Bridge #1	Tractor mounted bridge leading to trailer(s)
	33	Body Controller	
	34	Auxiliary Valve Control	
	35	Hitch Control	
	36	Power TakeOff (Front or Secondary)	
	37	Off Vehicle Gateway	
	38	Virtual Terminal (in cab)	
(11)	39	Management Computer #1	Manages vehicle systems, i.e. powertrain.

Rev	Address	ECU-Module	Definition
	40	Cab Display	Other than instruments or virtual terminal
	41	Retarder, Exhaust, Engine #1	
(12)	42	Headway Controller	Forward-looking collision warning, collision avoidance, speed controller, or speed matching
	43	On-Board Diagnostic Unit	
	44	Retarder, Exhaust, Engine #2	
	45	Endurance Braking System	
	46	Hydraulic Pump Controller	
(11)	47	Suspension - System Controller #1	
	48	Pneumatic - System Controller	
	49	Cab Controller - Primary	
	50	Cab Controller - Secondary	
	51	Tire Pressure Controller	
	52	Ignition Control Module #1	
	53	Ignition Control Module #2	
(7)	54	Seat Controls	
(7)	55	Lighting - Operator Controls	
(8)	56	Rear Axle Steering Controller #1	
(8)	57	Water Pump Controller	
(8)	58	Passenger-Operator Climate Control #2	
(9)	59	Transmission Display - Primary	Display to operate specifically in conjunction with the transmission control
(9)	60	Transmission Display - Secondary	Secondary display to operate specifically in conjunction with the transmission control
(11)	61	Exhaust Emission Controller	
(11)	62	Vehicle Dynamic Stability Controller	
(12)	63	Oil Sensor	
(12)	64	Suspension - System Controller #2	
(12)	65	Information System Controller #1	Information management system, for the vehicle's application, such as transit passenger/fare monitoring, truck cargo management, etc.
(12)	66	Ramp Control	Control of ramps, lifts, or tailgates
(12)	67	Clutch/Converter Controller	Control of either the clutch and/or hydraulic torque converter.
(12)	68	Auxiliary Heater #1	Can be air, water, or other heater type and be using engine heat, electrical, or fuel fired heating source.

Rev	Address	ECU-Module	Definition
(12)	69	Auxiliary Heater #2	Can be air, water, or other heater type and be using engine heat, electrical, or fuel fired heating source.
(12)	70	Electronic Engine Valve Controller	Electronic control used to control actuation of engine intake and/or exhaust valves
	71 -127	Reserved for future assignment by SAE	
	128-247	Industry Group Specific (see Tables B3 - B7, one per industry group)	
	248	Reserved for future use	
	249	Off Board Diagnostic-Service Tool #1	
	250	Off Board Diagnostic-Service Tool #2	
	251	On-Board Data Logger	
	252	Reserved for Experimental Use	
	253	Reserved for OEM	
	254	Null Address	
	255	GLOBAL (All-Any Node)	

Notes: Revision dates (not all tables had revisions on all of these dates)

(1) July, 1996	(7) February 1998	(13) July 1999
(2) October, 1996	(8) April 1998	
(3) January, 1997	(9) July 1998	
(4) April, 1997	(10) October 1998	
(5) August 1997	(11) February 1999	
(6) November 1997	(12) May 1999	

Table B3
J1939 PREFERRED ADDRESSES
INDUSTRY GROUP #1 - ON-HIGHWAY EQUIPMENT

Rev	Address	ECU-Module	Definition
	128-167	Reserved for future assignment by SAE but available for use by self configurable ECUs	Used for dynamic address assignment
	168	Trailer #5 Bridge	Bridge for fifth towed Vehicle System (e.g. trailer or dolly)
	169	Trailer #5 Lighting-electrical	
	170	Trailer #5 Brakes (ABS-EBS)	
	171	Trailer #5 Reefer	
	172	Trailer #5 Cargo	
(8)	173	Trailer #5 Chassis-Suspension	
	174-175	Other Trailer #5 Devices	Recommended address space for subnetwork devices
	176	Trailer #4 Bridge	Bridge for fourth towed Vehicle System (e.g. trailer or dolly)
	177	Trailer #4 Lighting-electrical	
	178	Trailer #4 Brakes (ABS-EBS)	
	179	Trailer #4 Reefer	
	180	Trailer #4 Cargo	
(8)	181	Trailer #4 Chassis-Suspension	
	182-183	Other Trailer #4 Devices	Recommended address space for subnetwork devices
	184	Trailer #3 Bridge	Bridge for third towed Vehicle System (e.g. trailer or dolly)
	185	Trailer #3 Lighting-electrical	
	186	Trailer #3 Brakes (ABS-EBS)	
	187	Trailer #3 Reefer	
	188	Trailer #3 Cargo	
(8)	189	Trailer #3 Chassis-Suspension	
	190-191	Other Trailer #3 Devices	Recommended address space for subnetwork devices
	192	Trailer #2 Bridge	Bridge for second towed Vehicle System (e.g. trailer or dolly)
	193	Trailer #2 Lighting-electrical	
	194	Trailer #2 Brakes (ABS-EBS)	
	195	Trailer #2 Reefer	
	196	Trailer #2 Cargo	

Rev	Address	ECU-Module	Definition
(8)	197	Trailer #2 Chassis-Suspension	
	198-199	Other Trailer #2 Devices	Recommended address space for subnetwork devices
	200	Trailer #1 Bridge	Bridge for first towed Vehicle System (e.g. trailer or dolly)
	201	Trailer #1 Lighting-electrical	
	202	Trailer #1 Brakes (ABS-EBS)	
	203	Trailer #1 Reefer	
	204	Trailer #1 Cargo	
(8)	205	Trailer #1 Chassis-Suspension	
	206-207	Other Trailer #1 Devices	Recommended address space for subnetwork devices
	208-231	Reserved for future assignment by SAE	To be used for individual preassigned addresses
(12)	232	Forward Road Image Processor	Views the road ahead for electronic recognition of several items
(11)	233	Door Controller # 3	
(11)	234	Door Controller #4	
(11)	235	Tractor/Trailer Bridge #2	Second tractor mounted bridge leading to trailer(s)
	236	Door Controller #1	cab drivers side or first door
	237	Door Controller #2	cab codrivers side or second door
	238	Tachograph	
	239	Electric Propulsion Control Unit #1	First or only on-board device converting torque commands to current commands in an electric vehicle system
	240	Electric Propulsion Control Unit #2	Second on-board device converting torque commands to current commands in an electric vehicle system
	241	Electric Propulsion Control Unit #3	Third on-board device converting torque commands to current commands in an electric vehicle system
	242	Electric Propulsion Control Unit #4	Fourth on-board device converting torque commands to current commands in an electric vehicle system
	243	Battery Pack Monitor #1	Device to monitor battery pack #1
	244	Battery Pack Monitor #2	Device to monitor battery pack #2
	245	Battery Pack Monitor #3	Device to monitor battery pack #3
	246	Battery Pack Monitor #4	Device to monitor battery pack #4
	247	Auxiliary Power Unit (APU)	Device used to provide auxiliary power, such as electrical, hydraulic, pneumatic, or rotary

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(5) August 1997	(11) February 1999	
(6) November 1997	(12) May 1999	

Table B4
J1939 PREFERRED ADDRESSES
INDUSTRY GROUP #2 - AGRICULTURAL AND FORESTRY EQUIPMENT

Rev	Address	ECU-Module	Definition
	128-207	Reserved for future assignment by SAE	Used for dynamic address assignment (self-configurable)
	208-240	Reserved for future assignment	Used for individual preassigned addresses
	241	Tailings Monitor	
	242	Header Control	
	243	Grain Loss Monitor	
	244	Moisture Sensor	
	245	Precision Farming Display (non-VT)	
	246	Machine Specific Operator Input	
	247	Mapping Computer (Task Controller)	

Notes: Revision dates (not all tables had revisions on all of these dates)

(1) July, 1996	(7) February 1998	(13) July 1999
(2) October, 1996	(8) April 1998	
(3) January, 1997	(9) July 1998	
(4) April, 1997	(10) October 1998	
(5) August 1997	(11) February 1999	
(6) November 1997	(12) May 1999	

Table B5
J1939 PREFERRED ADDRESSES
INDUSTRY GROUP #3 - CONSTRUCTION EQUIPMENT

Rev	Address	ECU-Module	ECU-Module
	128-207	Reserved for future assignment by SAE	Used for dynamic address assignment (self-configurable)
	208-226	Reserved for future assignment	Used for individual preassigned addresses
(12)	227	Main Controller - Skid Steer Loader	Primary system controller for skid steer loader
(11)	228	Loader Control	Controls the hydraulic system of the loader attachment of a loader/backhoe, wheel loader, skid steer, or similar vehicle
(9)	229	Laser Tracer	A device that receives a laser strike and reports the vertical and horizontal position.
(9)	230	Land Leveling System Display	This device displays position information at a remote location.
(9)	231	Single Land Leveling System Supervisor	This device is the Land Leveling System Supervisor for a single control loop.
(9)	232	Land Leveling Electric Mast	A device that moves a Sensor to maintain a specific position.
(9)	233	Single Land Leveling System Operator Interface	A component that allows the user to control the Land Leveling System and display information about the operation of the system.
(9)	234	Laser Receiver	A device that receives a laser strike, and reports the specific position.
(7)	235	Supplemental Sensor Processing Unit #1	
(7)	236	Supplemental Sensor Processing Unit #2	
(7)	237	Supplemental Sensor Processing	

		Unit #3	
(7)	238	Supplemental Sensor Processing Unit #4	
(7)	239	Supplemental Sensor Processing Unit #5	
(7)	240	Supplemental Sensor Processing Unit #6	
	241	Engine Monitor #1	
	242	Engine Monitor #2	
	243	Engine Monitor #3	
	244	Engine Monitor #4	
	245	Engine Monitor #5	
	246	Engine Monitor #6	
	247	Engine Monitor #7	

Notes: Ite Revision dates (not all tables had revisions on all of these dates)

(1) July, 1996   (7) February 1998   (13) July 1999
(2) October, 1996   (8) April 1998
(3) January, 1997   (9) July 1998
(4) April, 1997   (10) October 1998
(5) August 1997   (11) February 1999
(6) November 1997   (12) May 1999

Table B6
J1939 PREFERRED ADDRESSES
INDUSTRY GROUP #4 - MARINE EQUIPMENT

Rev	Address	ECU-Module	Definition
	128-207	Reserved for future assignment by SAE	Used for dynamic address assignment (self-configurable)
	208-247	Reserved for future assignment	Used for individual preassigned addresses

Notes: Revision dates (not all tables had revisions on all of these dates)

(1) July, 1996	(7) February 1998	(13) July 1999
(2) October, 1996	(8) April 1998	
(3) January, 1997	(9) July 1998	
(4) April, 1997	(10) October 1998	
(5) August 1997	(11) February 1999	
(6) November 1997	(12) May 1999	

Table B7
J1939 PREFERRED ADDRESSES
INDUSTRY GROUP #5 - INDUSTRIAL, PROCESS CONTROL, STATIONARY EQUIPMENT

Rev	Address	ECU-Module	Definition
	128-207	Reserved for future assignment by SAE	Used for dynamic address assignment (self-configurable)
	208-233	Reserved for future assignment	Used for individual preassigned addresses
(13)	234	Generator Set Controller	Used for data collection and control of a generator system
(7)	235	Supplemental Sensor Processing Unit #1	
(7)	236	Supplemental Sensor Processing Unit #2	
(7)	237	Supplemental Sensor Processing Unit #3	
(7)	238	Supplemental Sensor Processing Unit #4	
(7)	239	Supplemental Sensor Processing Unit #5	
(7)	240	Supplemental Sensor Processing Unit #6	
	241	Engine Monitor #1	
	242	Engine Monitor #2	
	243	Engine Monitor #3	
	244	Engine Monitor #4	
	245	Engine Monitor #5	
	246	Engine Monitor #6	
	247	Engine Monitor #7	

Notes: Revision dates (not all tables had revisions on all of these dates)
- (1) July, 1996
- (2) October, 1996
- (3) January, 1997
- (4) April, 1997
- (5) August 1997
- (6) November 1997
- (7) February 1998
- (8) April 1998
- (9) July 1998
- (10) October 1998
- (11) February 1999
- (12) May 1999
- (13) July 1999

Tables B8 through B9
J1939 PREFERRED ADDRESSES
(Industry Groups 6 to 7)
Reserved for future assignment

TABLE B10
J1939 MANUFACTURER CODES

Rev	CODE	MANUFACTURER	LOCATION
	0	Reserved	
	1	Allied Signal Inc.	Elyria, OH, USA
	2	Allison Transmission, GMC	Indianapolis, IN, USA
	3	Ametek, US Gauge Division	Sellersville, PA, USA
	4	Ametek-Dixson	Grand Junction, CO, USA
	5	AMP Inc.	Harrisburg, PA, USA
	6	Berifors Electronics AB	Stockholm, Sweden
	7	Case Corp.	Burr Ridge, IL, USA
	8	Caterpillar Inc.	Peoria, IL, USA
	9	Chrysler Corp.	Auburn Hills, MI, USA
	10	Cummins Engine Co	Columbus, IN, USA
	11	Dearborn Group Inc.	Indianapolis, IN, Farmington Hills, MI, USA
	12	Deere & Company, Precision Farming	East Moline, IL, USA
	13	Delco Electronics	Kokomo, IN, USA
	14	Detroit Diesel Corporation	Detroit, MI, USA
	15	Dickey-john Corp.	Auburn IL, USA
	16	Eaton Corp	Southfield, MI, USA
	17	Eaton Corp, Corp Res & Dev	Milwaukee, WI, USA
	18	Eaton Corp, Transmission Div.	Kalamazoo, MI, USA
	19	Eaton Corp. Trucking Info Services	Clemmons, NC, USA
	20	Eaton Ltd	Worsley, England
	21	Echlin Inc., Midland Brake Inc.	Kansas City, MO, USA
	22	Ford Motor Co., Electronic Concepts & Systems	Dearborn, MI, USA
	23	Ford Motor Co., Heavy Truck	Dearborn, MI, USA
	24	Ford Motor Co., Vehicle Controls	Dearborn, MI, USA
	25	Freightliner Corp.	Portland, OR, USA
	26	General Motors Corp, Service Technology Grp	Romulus, MI, USA
	27	GMC	Troy, MI, USA
	28	Grote Ind. Inc.	Madison, IN, USA
	29	Hino Motors Ltd.	Tokyo, Japan
	30	Isuzu Motors Ltd	Kawasaki, Japan
	31	J Pollak Corp	Boston, MA, USA
(9)	32	Jacobs Vehicle Systems	Bloomfield, CT, USA
	33	John Deere	Waterloo IA, USA
	34	Kelsey Hayes Co.	Livonia, MI, USA
	35	Kenworth Truck Co.	Kirkland, WA, USA
	36	Lucas Ind.	Solihull WMidlnd, England
	37	Mack Trucks Inc.	Hagerstown, MD, USA
	38	Micro Processor Systems Inc.	Sterling Hts, MI, USA
	39	Microfirm Inc.	Stillwater, OK, USA

Rev	CODE	MANUFACTURER	LOCATION
	40	Motorola AIEGInc.	Northbrook, IL, USA
	41	Motorola Inc.	Schaumburg, IL, USA
	42	Navistar Intl Trans Co., Engine Electronic	Melrose Park, IL, USA
	43	Navistar Intl Trans Corp.,	Fort Wayne, IN, USA
	44	Nippondenso Co. Ltd.	Kariya Aichi, Japan
	45	PACCAR	Mount Vernon, WA, USA
	46	Parasoft Computing Solutions	Winston Salem, NC, USA
	47	Phillips Semiconductor	Sunnyvale, CA, USA
	48	Pollak Alphabet	El Paso, TX, USA
	49	RE America Inc.	Cleveland, OH, USA
	50	Robert Bosch Corp	Broadview, IL, USA
	51	Robert Bosch GmbH	Stuttgart, Germany
(6)	52	Meritor Automotive, Inc. (formerly Rockwell Automotive)	Troy, MI, USA
	53	Rockwell Land Transportation	Cedar Rapids, IA, USA
	54	Meritor Wabco	Troy, MI, USA
	55	Ryder System Inc.	Miami, FL, USA
	56	SAIC	San Diego, CA, USA
	57	Sauer Sundstrand Co.	Minneapolis, MN, USA
	58	SPX Corporation, OTC Div	Owatonna, MN, USA
	59	VES Inc.	Rock Hill, SC, USA
(11)	60	Volvo Trucks North America Inc.	Greensboro, NC, USA
	61	Volvo Truck Corp.	Gothenburg, Sweden
	62	Wabco	Hanover, Germany
	63	ZF Industries Inc.	Vernon Hills, IL, USA
(8)	64	Spectra Precision, Inc. (Previously Spectra-Physics Laserplane Inc.)	Dayton, OH, USA
(11)	65	MAN Nutzfahrzeuge AG	Munich, Germany
	66	John Deere, Worldwide Industrial Equipment Division	Dubuque, IA, USA
	67	Funk Manufacturing Company	Coffeyville, KS, USA
	68	Scania	Södertälje, Sweden
	69	Trimble Navigation	Sunnyvale, CA, USA
	70	Flex-coil Limited	Saskatoon, SK, Canada
	71	Vansco Electronics Ltd.	Winnipeg, Manitoba, Canada
	72	Sisu Corporation	ESPOO, Finland
	73	LeTourneau, Inc.	Longview, Texas, USA
	74	Eaton Axle-Brake Division	Kalamazoo, MI, USA
(7)	75	Deere & Co, Agricultural Division	
(14)	76	Unused (formerly Deere & Co, Construction Division)	
(7)	77	Deere Power Systems Group	
(7)	78	Frank W. Murphy Manufacturing, Inc	Tulsa, OK, USA
(7)	79	Daimler Benz AG - Engine Division (PBM	Stuttgart, Germany
(8)	80	Twin Disc, Inc.	Racine, WI, USA
(8)	81	Fire Research Corp.	Nesconset, NY, USA
(12)	82	Melroe/Ingersoll-Rand	Fargo, ND, USA
(12)	83	Eaton VORAD Technologies	San Diego, California, USA
(14)	84	New Holland UK Limited	Basildon, Essex, UK
(14)	85	Kohler Co	Kohler, WI, USA

Rev	CODE	MANUFACTURER	LOCATION
(14)	86	C. E. Niehoff & Company	2021 Lee Street Evanston, IL 60202
(14)	87	J.C. Bamford Excavators Ltd (JCB)	Rocester, Staffordshire, UK
(14)	88	Satloc Precision GPS	Scottsdale, AZ, USA
	89 - 2047	Reserved for future assignment	

Notes: Revision dates (not all tables had revisions on all of these dates)

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(3) January, 1997	(9) July 1998	
(4) April, 1997	(10) October 1998	
(5) August 1997	(11) February 1999	
(6) November 1997	(12) May 1999	

TABLE B11
J1939 ALL-INDUSTRY-INCLUSIVE NAMES

The NAME fields are described in Section 3.1.3 and in J1939-81, Section 4.1. This table defines the Lower 128 Functions which are independent of the Vehicle System or Industry Group. These functions are used with all 8 Industry Groups, which is a distinction from Industry Group 0 which is an Industry Group itself but applicable to all industries.

		FUNCTION	NOTES
Rev	Value	Description	
	0	Engine	
	1	Auxiliary Power Unit (APU)	
	2	Electric Propulsion Control	
	3	Transmission	
	4	Battery Pack Monitor	
	5	Shift Control	
	6	Power TakeOff - (Main or Rear)	
	7	Axle - Steering	
	8	Axle - Drive	
	9	Brakes - System Controller	
	10	Brakes - Steer Axle	
	11	Brakes - Drive axle	
	12	Retarder - Engine	
	13	Retarder - Driveline	
	14	Cruise Control	
	15	Fuel System	
	16	Steering Controller	
	17	Suspension - Steer Axle	
	18	Suspension - Drive Axle	
	19	Instrument Cluster	
	20	Trip Recorder	
	21	Cab Climate Control	
	22	Aerodynamic Control	
	23	Vehicle Navigation	
	24	Vehicle Security	
	25	Network Interconnect ECU	For any Vehicle System (tractor or trailer)
	26	Body Controller	Controls the body (not chassis or cab) components
	27	Power TakeOff (Front or Secondary)	
	28	Off Vehicle Gateway	
	29	Virtual Terminal (in cab)	
(11)	30	Management Computer #1	
	31	Propulsion Battery Charger	
	32	Headway Controller	Forward looking collision avoidance, collision warning, or speed matching
	33	System Monitor	
	34	Hydraulic Pump Controller	
	35	Suspension - System Controller	
	36	Pneumatic - System Controller	
	37	Cab Controller	
	38	Tire Pressure Control	

Rev	Value	Description	NOTES
		FUNCTION	
	39	Ignition Control Module	
(7)	40	Seat Controls	
(7)	41	Lighting - Operator Controls	
(8)	42	Water Pump Control	
(9)	43	Transmission Display	
(11)	44	Exhaust Emission Control	
(11)	45	Vehicle Dynamic Stability Control	
(12)	46	Oil Sensor Unit	
(12)	47	Information System Controller #1	
(12)	48	Ramp Control	
(12)	49	Clutch/Converter Control	
(12)	50	Auxiliary Heater	
(12)	51	Forward-Looking Collision Warning System	Not to be confused with #32, Headway Controller
(14)	52	Chassis Controller	Controls the chassis (not body or cab) components
	53-127	reserved	

Notes: Revision dates (not all tables had revisions on all of these dates)

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(6) November 1997	(12) May 1999	

TABLE B12
J1939 NAMES

The NAME fields are described in Section 3.1.3 and in J1939-81, Section 4.1. This table defines the Upper 128 Functions which are dependent on the Industry Group and Vehicle System. Due to the dependencies of Vehicle System on Industry Group, and of Function on Vehicle System, the following table is used to define both Vehicle System and Function.

Rev	Industry Group	Vehicle System Value	Description	Function Value	Description	Notes
	0	0	Non-specific system			
				0-127	See Table B11	Industry non-specific
				128	Reserved	
				129	Off-board diagnostic-service tool	
				130	On-board data logger	
				131-254	Reserved for future assignment	
	1					**On-Highway Equipment**
		0	Non-specific system			
				0-127	See Table B11	Industry non-specific
				128	Tachograph	
				129	Door Controller	
				130-254	Reserved for future assignment	
		1	Tractor			Towing Vehicle System
				0-127	See Table B11	Industry non-specific
				128	Forward Road Image Processing	Determine vehicle position from lane markings. Performance, Advisory & Warning only
				129-254	Reserved for future assignment	
		2	Trailer			Towed Vehicle System
				0-127	See Table B11	Industry non-specific
				128-254	Reserved for future assignment	
	2					**Agricultural Equipment**
		0	Non-specific system			
				0-127	See Table B11	Industry non-specific
(7)				128	Precision Farming Display (non-VT)	
(7)				129	Machine Specific Operator Input	
(7)				130	Mapping Computer (Task Controller)	

Rev	Industry Group	Vehicle System		Function		Notes
		Value	Description	Value	Description	
(7)				131 - 254	Reserved for future assignment	
(7)		1	Tractor			Towing Vehicle System
(7)				0-127	See Table B11	Industry non-specific
(7)				128-254	Reserved for future assignment	
(7)		2	Tillage			
(7)				0-127	See Table B11	Industry non-specific
(7)				128-254	Reserved for future assignment	
(7)		3	Secondary Tillage			
(7)				0-127	See Table B11	Industry non-specific
(7)				128-254	Reserved for future assignment	
(7)		4	Planters-Seeders			
(7)				0-127	See Table B11	Industry non-specific
(7)				128-254	Reserved for future assignment	
(7)		5	Fertilizers			
(7)				0-127	See Table B11	Industry non-specific
(7)				128-254	Reserved for future assignment	
(7)		6	Sprayers			
(7)				0-127	See Table B11	Industry non-specific
(7)				128-254	Reserved for future assignment	
(7)		7	Combine Harvesters			
(7)				0-127	See Table B11	Industry non-specific
(7)				128	Tailings Monitor	
(7)				129	Header Control	
(7)				130	Grain Loss Monitor	
(7)				131	Moisture Sensor	
(7)				132-254	Reserved for future assignment	
(7)		8	Root Harvesters			
(7)				0-127	See Table B11	Industry non-specific
(7)				128-254	Reserved for future assignment	
(7)		9	Forage			
(7)				0-127	See Table B11	Industry non-specific
(7)				128-254	Reserved for future assignment	
(7)		10	Irrigation			
(7)				0-127	See Table B11	Industry non-specific
(7)				128-254	Reserved for future assignment	

Rev	Industry Group	Vehicle System		Function		Notes
		Value	Description	Value	Description	
(7)		11	Transport-Trailer			Towed Vehicle
(7)				0-127	See Table B11	Industry non-specific
(7)				128-254	Reserved for future assignment	
(7)		12	Farm Yard Operations			
(7)				0-127	See Table B11	Industry non-specific
(7)				128-254	Reserved for future assignment	
(7)		13	Powered Auxiliary Devices			
(7)				0-127	See Table B11	Industry non-specific
(7)				128-254	Reserved for future assignment	
(7)		14	Special Crops			
(7)				0-127	See Table B11	Industry non-specific
(7)				128-254	Reserved for future assignment	
(7)		15	Earth Work			
(7)				0-127	See Table B11	Industry non-specific
(7)				128-254	Reserved for future assignment	
	3					**Construction Equipment**
		0	Non-specific system			
				0-127	See Table B11	Industry non-specific
(7)				128	Supplemental Engine Control Sensing	
(9)				129	Laser Receiver	A device that receives a laser strike, and reports the specific position.
(9)				130	Single Land Leveling System Operator Interface	A component that allows the user to control the Land Leveling System and display information about the operation of the system.
(9)				131	Land Leveling Electric Mast	A device that moves a Sensor to maintain a specific position.
(9)				132	Single Land Leveling System Supervisor	This device is the Land Leveling System Supervisor for a single control loop.
(9)				133	Land Leveling System Display	This device displays position information at a remote location.

Rev	Industry Group	Vehicle System Value	Vehicle System Description	Function Value	Function Description	Notes
(9)				134	Laser Tracer	A device that receives a laser strike and reports the vertical and horizontal position.
(11)				135	Loader Control	Controls the hydraulic system of the loader attachment of a loader/backhoe, wheel loader, skid steer, or similar vehicle
(12)		1	Skid Steer Loader			
(12)				0-127	See Table B11	Industry non-specific
(12)				128	Main System Controller	
				129-254	Reserved for future assignment	
	4					**Marine**
		0	Non-specific system			
				0-127	See Table B11	Industry non-specific
				128-254	Reserved for future assignment	
	5					**Industrial-Process Control-Stationary (Gen-Sets)**
		0	Non-specific system			
				0-127	See Table B11	Industry non-specific
(7)				128	Supplemental Engine Control Sensing	
(7)				129-254	Reserved for future assignment	

Notes: Revision dates (not all tables had revisions on all of these dates)

(1) July, 1996	(7) February 1998	(13) July 1999
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(6) November 1997	(12) May 1999	

APPENDIX C

FAULT REPORTING PARAMETERS

TABLE C1

Suspect Parameter Numbers (SPN)

Note: Referenced document information may not be complete at the date of publication.

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	PID	MID	SID
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
(7)	16	Fuel Filter (Suction Side) Differential Pressure (see also SPN 1382)	-71	5.2.5.286	65130	5.3.112	3	8		16		
		Unassigned										
(8)	18	Extended Range Fuel Pressure								18		
(8)	19	Extended Range Engine Oil Pressure								19		
(8)	20	Extended Range Engine Coolant Pressure								20		

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	PID	MID	SID
(12)	21	Engine ECU Temperature (see also SPNs 1136 and 1207)(SPN 1136 is to be used)	-71	5.2.5.216	65188	5.3.085	3,4	16		21		
(12)	22	Extended Crankcase Blow-by Pressure (see also SPN 1264) (SPN 1264 is to be used)	-71	5.2.5.241	65263	5.3.029	2	8		22		
	23	Generator Oil Pressure								23		
	24	Generator Coolant Temperature								24		
		Unassigned										
		Unassigned										
(2)	27	Percent Exhaust Gas Recirculation Valve Position								27		
(1)	28	Percent Accelerator Position #3								28		
(1)	29	Percent Accelerator Position #2								29		
(1)	30	Crankcase Blowby Pressure								30		
(3)	31	Transmission Range Position								31		
	32	Transmission Splitter Position								32		
	33	Clutch Cylinder Position								33		
		Unassigned										
		Unassigned										
	36	Clutch Plates								36		
	37	Transmission Tank Air Pressure								37		
	38	Second Fuel Level (Right Side)								38		
(8)	39	Tire Pressure Check Interval	-71	5.2.5.269	65144	5.3.132	1	8		39		
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
(12)	46	Pneumatic Supply Pressure	-71	5.2.5.170	65198	5.3.075	1	8		46		
		Unassigned										
	48	Extended Range Barometric Pressure								48		
		Unassigned										

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	PID	MID	SID
		Unassigned										
	51	Throttle Position	-71	5.2.5.096	65266	5.3.032	7	8		51		
	52	Engine Intercooler Temperature	-71	5.2.5.006	65262	5.3.028	7	8		52		
	53	Transmission Synchronizer Clutch Value	-71	5.2.5.100	65221	5.3.051	1	8		53		
	54	Transmission Synchronizer Brake Value	-71	5.2.5.101	65221	5.3.051	2	8		54		
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
	59	Shift Finger Gear Position	-71	5.2.5.099	65223	5.3.050	1	8		59		
	60	Shift Finger Rail Position	-71	5.2.5.098	65223	5.3.050	2	8		60		
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
	69	Two Speed Axle Switch	-71	5.2.6.001	65265	5.3.031	1.1	2		69		
	70	Parking Brake Switch	-71	5.2.6.008	65265	5.3.031	1.3	2		70		
		Unassigned										
	72	Blower Bypass Valve Position	-71	5.2.5.069	65277	5.3.043	1	8		72		
	73	Auxiliary Pump Pressure	-71	5.2.5.022	65278	5.3.044	1	8		73		
	74	Maximum Vehicle Speed Limit	-71	5.2.5.046	65261	5.3.027	1	8		74		
	75	Steering Axle Temperature	-71	5.2.5.001	65273	5.3.039	1	8		75		
	76	Axle Lift Air Pressure								76		
	77	Forward Rear Drive Axle Temperature								77		
	78	Rear Rear Drive Axle Temperature								78		
	79	Road Surface Temperature	-71	5.2.5.009	65269	5.3.035	7,8	16		79		
	80	Washer Fluid Level	-71	5.2.5.070	65276	5.3.042	1	8		80		
	81	Particulate Trap Inlet Pressure	-71	5.2.5.041	65270	5.3.036	1	8		81		

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
	82	Air Start Pressure	-71	5.2.5.026	65246	5.3.012	1	8		82		
		Unassigned										
	84	Wheel-Based Vehicle Speed	-71	5.2.1.12	65265	5.3.031	2,3	16		84		
		Unassigned										
	86	Cruise Control Set Speed	-71	5.2.5.047	65265	5.3.031	6	8		86		
	87	Cruise Control High Set Limit Speed	-71	5.2.5.048	65261	5.3.027	2	8		87		
	88	Cruise Control Low Set Limit Speed	-71	5.2.5.049	65261	5.3.027	3	8		88		
		Unassigned										
	90	Power Takeoff Oil Temperature	-71	5.2.5.003	65264	5.3.030	1	8		90		
	91	Accelerator Pedal Position	-71	5.2.1.08	61443	5.3.006	2	8		91		
	92	Percent Load At Current Speed	-71	5.2.1.07	61443	5.3.006	3	8		92		
	93	Net Brake Torque								93		
	94	Fuel Delivery Pressure	-71	5.2.5.027	65263	5.3.029	1	8		94		
	95	Fuel Filter Differential Pressure	-71	5.2.5.035	65276	5.3.042	3	8		95		
	96	Fuel Level	-71	5.2.5.071	65276	5.3.042	2	8		96		
	97	Water In Fuel Indicator	-71	5.2.6.007	65279	5.3.045	1.1	2		97		
	98	Engine Oil Level	-71	5.2.5.072	65263	5.3.029	3	8		98		
	99	Engine Oil Filter Differential Pressure	-71	5.2.5.042	65276	5.3.042	4	8		99		
	100	Engine Oil Pressure	-71	5.2.5.028	65263	5.3.029	4	8		100		
	101	Crankcase Pressure	-71	5.2.5.040	65263	5.3.029	5,6	16		101		
	102	Boost Pressure	-71	5.2.5.036	65270	5.3.036	2	8		102		
	103	Turbocharger 1 Speed	-71	5.2.5.053	65245	5.3.011	2,3	16		103		
	104	Turbocharger Lube Oil Pressure 1	-71	5.2.5.029	65245	5.3.011	1	8		104		
	105	Intake Manifold 1 Temperature	-71	5.2.5.004	65270	5.3.036	3	8		105		
	106	Air Inlet Pressure	-71	5.2.5.037	65270	5.3.036	4	8		106		
	107	Air Filter Differential Pressure	-71	5.2.5.045	65270	5.3.036	5	8		107		
	108	Barometric Pressure	-71	5.2.5.043	65269	5.3.035	1	8		108		
	109	Coolant Pressure	-71	5.2.5.038	65263	5.3.029	7	8		109		
	110	Engine Coolant Temperature	-71	5.2.5.005	65262	5.3.028	1	8		110		
	111	Coolant Level	-71	5.2.5.073	65263	5.3.029	8	8		111		
	112	Coolant Filter Differential Pressure	-71	5.2.5.044	65270	5.3.036	8	8		112		
	113	Governor Droop								113		
	114	Net Battery Current	-71	5.2.5.078	65271	5.3.037	1	8		114		
	115	Alternator Current	-71	5.2.5.079	65271	5.3.037	2	8		115		

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Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	PID	MID	SID
	116	Brake Application Pressure	-71	5.2.5.030	65274	5.3.040	1	8		116		
	117	Brake Primary Pressure	-71	5.2.5.031	65274	5.3.040	2	8		117		
	118	Brake Secondary Pressure	-71	5.2.5.032	65274	5.3.040	3	8		118		
	119	Hydraulic Retarder Pressure	-71	5.2.5.033	65275	5.3.041	1	8		119		
	120	Hydraulic Retarder Oil Temperature	-71	5.2.5.007	65275	5.3.041	2	8		120		
		Unassigned										
	122	Engine Retarder Percent								122		
	123	Clutch Pressure	-71	5.2.5.023	65272	5.3.038	1	8		123		
	124	Transmission Oil Level	-71	5.2.5.074	65272	5.3.038	2	8		124		
		Unassigned										
	126	Transmission Filter Differential Pressure	-71	5.2.5.039	65272	5.3.038	3	8		126		
	127	Transmission Oil Pressure	-71	5.2.5.024	65272	5.3.038	4	8		127		
		Unassigned										
(6)	129	Injector Metering Rail 2 Pressure (duplicate, use SPN 1349)								129		
(3)	130	Power Specific Fuel Economy								130		
(3)	131	Exhaust Back Pressure								131		
(3)	132	Mass Air Flow								132		
(1)	133	Average Fuel Rate								133		
		Unassigned										
	135	Fuel Delivery Pressure (Absolute)								135		
(8)	136	Auxiliary Vacuum Pressure Reading	-71	5.2.5.270	65143	5.3.133	1,2	16		136		
(8)	137	Auxiliary Gage Pressure Reading #1	-71	5.2.5.271	65143	5.3.133	3,4	16		137		
(8)	138	Auxiliary Absolute Pressure Reading	-71	5.2.5.272	65143	5.3.133	5,6	16		138		
		Unassigned										
		Unassigned										
(8)	141	Trailer, Tag Or Push Channel Tire Pressure Target	-71	5.2.5.266	65145	5.3.131	1,2	16		141		
(8)	142	Drive Channel Tire Pressure Target	-71	5.2.5.267	65145	5.3.131	3,4	16		142		
(8)	143	Steer Channel Tire Pressure Target	-71	5.2.5.268	65145	5.3.131	5,6	16		143		
(8)	144	Trailer, Tag Or Push Channel Tire Pressure	-71	5.2.5.263	65146	5.3.130	1,2	16		144		
(8)	145	Drive Channel Tire Pressure	-71	5.2.5.264	65146	5.3.130	3,4	16		145		
(8)	146	Steer Channel Tire Pressure	-71	5.2.5.265	65146	5.3.130	5,6	16		146		

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
	147	Average Fuel Economy (Gaseous)								147		
	148	Instantaneous Fuel Economy (Gaseous)								148		
	149	Mass Flow Rate (Gaseous)								149		
		Unassigned										
		Unassigned										
	152	Number Of Ecu Resets								152		
	153	High Resolution Crankcase Pressure								153		
		Unassigned										
		Unassigned										
	156	Injector Timing Rail 1 Pressure	-71	5.2.5.243	65243	5.3.046	5,6	16		156		
	157	Injector Metering Rail 1 Pressure	-71	5.2.5.021	65243	5.3.046	3,4	16		157		
	158	Battery Potential (Voltage), Switched	-71	5.2.5.075	65271	5.3.037	7,8	16		158		
	159	Gas Supply Pressure	-71	5.2.5.019	65277	5.3.043	2,3	16		159		
	160	Main Shaft Speed	-71	5.2.5.054						160		
	161	Input Shaft Speed	-71	5.2.5.055	61442	5.3.005	6,7	16		161		
	162	Transmission Requested Range	-71	5.2.5.108	61445	5.3.008	5,6	16		162		
	163	Transmission Current Range	-71	5.2.5.109	61445	5.3.008	7,8	16		163		
	164	Injection Control Pressure	-71	5.2.5.020	65243	5.3.046	1,2	16		164		
	165	Compass Bearing	-71	5.2.5.083	65256	5.3.022	1,2	16		165		
	166	Rated Engine Power	-71	5.2.5.115	65214	5.3.057	1,2	16		166		
	167	Alternator Potential (Voltage)	-71	5.2.5.076	65271	5.3.037	3,4	16		167		
	168	Electrical Potential (Voltage)	-71	5.2.5.077	65271	5.3.037	5,6	16		168		
	169	Cargo Ambient Temperature	-71	5.2.5.010	65276	5.3.042	5,6	16		169		
	170	Cab Interior Temperature	-71	5.2.5.011	65269	5.3.035	2,3	16		170		
	171	Ambient Air Temperature	-71	5.2.5.012	65269	5.3.035	4,5	16		171		
	172	Air Inlet Temperature	-71	5.2.5.013	65269	5.3.035	6	8		172		
	173	Exhaust Gas Temperature	-71	5.2.5.008	65270	5.3.036	6,7	16		173		
	174	Fuel Temperature	-71	5.2.5.014	65262	5.3.028	2	8		174		
	175	Engine Oil Temperature 1	-71	5.2.5.015	65262	5.3.028	3,4	16		175		
	176	Turbo Oil Temperature	-71	5.2.5.016	65262	5.3.028	5,6	16		176		
	177	Transmission Oil Temperature	-71	5.2.5.017	65272	5.3.038	5,6	16		177		
	178	Front Axle Weight								178		

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
	179	Rear Axle Weight								179		
	180	Trailer Weight	-71	5.2.5.081	65258	5.3.024	4,5	16		180		
	181	Cargo Weight	-71	5.2.5.082	65258	5.3.024	6,7	16		181		
	182	Trip Fuel	-71	5.2.5.064	65257	5.3.023	1 - 4	32		182		
	183	Fuel Rate	-71	5.2.5.063	65266	5.3.032	1,2	16		183		
	184	Instantaneous Fuel Economy	-71	5.2.5.067	65266	5.3.032	3,4	16		184		
	185	Average Fuel Economy	-71	5.2.5.068	65266	5.3.032	5,6	16		185		
	186	Power Takeoff Speed	-71	5.2.5.056	65264	5.3.030	2,3	16		186		
	187	Power Takeoff Set Speed	-71	5.2.5.057	65264	5.3.030	4,5	16		187		
	188	Engine Speed At Idle, Point 1 (Engine Configuration)	-71	5.2.1.26	65251	5.3.017	1,2	16				
	189	Rated Engine Speed	-71	5.2.5.116	65214	5.3.057	3,4	16				
	190	Engine Speed	-71	5.2.1.09	61444	5.3.007	4,5	16		190		
	191	Output Shaft Speed	-71	5.2.1.14	61442	5.3.005	2,3	16		191		
		Unassigned										
	228	Speed Sensor Calibration								228		
	229	Total Fuel Used (Gaseous)(see SPN 1040)								229		
	230	Total Idle Fuel Used (Gaseous)(see SPN 1010)								230		
	231	Trip Fuel (Gaseous (see SPN 1039)								231		
	232	DGPS Differential Correction								232		
	233	Unit Number (Power Unit)	-71	5.2.5.089	65259	5.3.025	4	n/a	Owner assigned unit number for the power unit of the vehicle	233		
	234	Software Identification	-71	5.2.5.088	65242	5.3.047	2	n/a		234		
	235	Total Idle Hours	-71	5.2.5.059	65244	5.3.010	5 - 8	32		235		
	236	Total Idle Fuel Used	-71	5.2.5.065	65244	5.3.010	1 - 4	32		236		
	237	Vehicle Identification Number	-71	5.2.5.087	65260	5.3.026	1	n/a		237		
	238	Velocity Vector								238		
		Unassigned										
		Unassigned										
	241	Tire Pressure	-71	5.2.5.034	65268	5.3.034	2	8		241		
	242	Tire Temperature	-71	5.2.5.018	65268	5.3.034	3,4	16		242		
		Unassigned										
	244	Trip Distance	-71	5.2.5.050	65248	5.3.014	1 - 4	32		244		

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
	245	Total Vehicle Distance	-71	5.2.5.051	65248	5.3.014	5 - 8	32		245		
	246	Total Vehicle Hours	-71	5.2.5.060	65255	5.3.021	1 - 4	32		246		
	247	Total Engine Hours	-71	5.2.5.061	65253	5.3.019	1 - 4	32		247		
	248	Total Power Takeoff Hours	-71	5.2.5.062	65255	5.3.021	5 - 8	32		248		
	249	Total Engine Revolutions	-71	5.2.5.058	65253	5.3.019	5 - 8	32		249		
	250	Total Fuel Used	-71	5.2.5.066	65257	5.3.023	5 - 8	32		250		
	251	Time								251		
	252	Date								252		
		Unassigned										
		Unassigned										
		Unassigned										
		Unassigned										
	257	Cold Restart Of Specific Component								257		
	258	Warm Restart Of Specific Component								258		
	259	Acknowledgement Of Warm Or Cold Restart								259		
		Unassigned										
	378	Fare Collection Unit Status								378		
		Unassigned										
	380	Articulation Angle								380		
		Unassigned										
		Unassigned										
	383	Vehicle Acceleration								383		
		Unassigned										
	441	Auxiliary Temperature 1 (see also SPN 1385)	-71	5.2.5.249	65164	5.3.111	1	8	Temperature measured by auxiliary temperature sensor #1.	441		
	442	Auxiliary Temperature 2 (see also SPN 1386)	-71	5.2.5.249	65164	5.3.111	2	8	Temperature measured by auxiliary temperature sensor #2.	442		
	443	Auxiliary Gage Pressure Reading #2								443		
	444	Battery 2 Potential (Voltage) (see also SPN 1376)	-71	5.2.5.254	65165	5.3.110	1,2	16	The voltage for isolated battery #2.	444		
	445	Cylinder Head Temperature Bank B (right bank)								445		

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Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
	446	Cylinder Head Temperature BankA (left bank)								446		
	447	Passenger Counter								447		
		Unassigned										
	501	Signage Message								501		
	502	Fare Collection Unit - Point Of Sale								502		
	503	Fare Collection Unit - Service Detail								503		
	504	Annunciator Voice Message								504		
	505	Vehicle Control Head Keyboard Message								505		
	506	Vehicle Control Head Display Message								506		
	507	Driver Identification								507		
	508	Transit Route Identification								508		
	509	Mile Post Identification								509		
		Unassigned										
		Unassigned										
	512	Drivers Demand Engine - Percent Torque	-71	5.2.1.04	61444	5.3.007	2	8	The requested torque output of the engine by the driver.			
	513	Actual Engine - Percent Torque	-71	5.2.1.05	61444	5.3.007	3	8				
	514	Nominal Friction - Percent Torque	-71	5.2.1.06	65247	5.3.013	1	8				
	515	Engine's Desired Operating Speed	-71	5.2.1.10	65247	5.3.013	2,3	16				
	516	Ground-Based Vehicle Speed	-71	5.2.1.11					Actual ground speed of the vehicle, measured by a device such as RADAR. (1 km/h = 0.621 mph)			
	517	Navigation-Based Vehicle Speed	-71	5.2.1.13	65256	5.3.022	3,4	16				
	518	Requested Torque/Torque Limit	-71	5.2.1.15	0	5.3.001	4	8				
	519	Engine's Desired Operating Speed Asymmetry Adjustment	-71	5.2.1.16	65247	5.3.013	4	8				
	520	Actual Retarder - Percent Torque	-71	5.2.1.17	61440	5.3.003	2	8				
	521	Brake Pedal Position	-71	5.2.1.18	61441	5.3.004	2	8				
	522	Percent Clutch Slip	-71	5.2.1.20	61442	5.3.005	4	8				
	523	Current Gear	-71	5.2.1.22	61445	5.3.008	4	8				
	524	Selected Gear	-71	5.2.1.23	61445	5.3.008	1	8				
	525	Requested Gear	-71	5.2.1.24	256	5.3.002	3	8				

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
	526	Actual Gear Ratio	-71	5.2.1.25	61445	5.3.008	2,3	16				
	527	Cruise Control State	-71	5.2.2.18	65265	5.3.031	7.6	3				
	528	Engine Speed At Point 2 (Engine Configuration)	-71	5.2.1.27	65251	5.3.017	04,05	16				
	529	Engine Speed At Points 3, 4, And 5 (Engine Configuration)	-71	5.2.1.28	65251	5.3.017	07,08	16				
	530	Engine Speed At Points 3, 4, And 5 (Engine Configuration)	-71	5.2.1.28	65251	5.3.017	10,11	16				
	531	Engine Speed At Points 3, 4, And 5 (Engine Configuration)	-71	5.2.1.28	65251	5.3.017	13,14	16				
	532	Engine Speed At High Idle, Point 6 (Engine Configuration)	-71	5.2.1.29	65251	5.3.017	16,17	16				
	533	Maximum Momentary Engine Override Speed, Point 7 (Engine Configuration)	-71	5.2.1.30	65251	5.3.017	22,23	16				
	534	Maximum Momentary Override Time Limit (Engine Configuration)	-71	5.2.1.31	65251	5.3.017	24	8				
	535	Requested Speed Control Range Lower Limit (Engine Configuration)	-71	5.2.1.32	65251	5.3.017	25	8				
	536	Requested Speed Control Range Upper Limit (Engine Configuration)	-71	5.2.1.33	65251	5.3.017	26	8				
	537	Requested Torque Control Range Lower Limit (Engine Configuration)	-71	5.2.1.34	65251	5.3.017	27	8				
	538	Requested Torque Control Range Upper Limit (Engine Configuration)	-71	5.2.1.35	65251	5.3.017	28	8				
	539	Percent Torque At Idle, Point 1 (Engine Configuration)	-71	5.2.1.36	65251	5.3.017	3	8				
	540	Percent Torque At Point 2 (Engine Configuration)	-71	5.2.1.37	65251	5.3.017	6	8				
	541	Percent Torque At Points 3, 4, And 5 (Engine Configuration)	-71	5.2.1.38	65251	5.3.017	9	8				
	542	Percent Torque At Points 3, 4, And 5 (Engine Configuration)	-71	5.2.1.38	65251	5.3.017	12	8				
	543	Percent Torque At Points 3, 4, And 5 (Engine Configuration)	-71	5.2.1.38	65251	5.3.017	15	8				
	544	Reference Engine Torque (Engine Configuration)	-71	5.2.1.39	65251	5.3.017	20,21	16				

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
	545	Gain (Kp) Of The Endspeed Governor (Engine Configuration)	-71	5.2.1.40	65251	5.3.017	18,19	16				
	546	Retarder Speed At Idle, Point 1 (Retarder Configuration)	-71	5.2.1.41	65249	5.3.015	3,4	16				
	547	Retarder Speed At Peak Torque, Point 5 (Retarder Configuration)	-71	5.2.1.42	65249	5.3.015	15,16	16				
	548	Maximum Retarder Speed, Point 2 (Retarder Configuration)	-71	5.2.1.43	65249	5.3.015	6,7	16				
	549	Retarder Speed At Points 3 And 4 (Retarder Configuration)	-71	5.2.1.44	65249	5.3.015	9,10	16				
	550	Retarder Speed At Points 3 And 4 (Retarder Configuration)	-71	5.2.1.44	65249	5.3.015	12,13	16				
	551	Percent Torque At Idle, Point 1 (Retarder Configuration)	-71	5.2.1.45	65249	5.3.015	5	8				
	552	Percent Torque At Maximum Speed, Point 2 (Retarder Configuration)	-71	5.2.1.46	65249	5.3.015	8	8				
	553	Percent Torque At Points 3 And 4 (Retarder Configuration)	-71	5.2.1.47	65249	5.3.015	11	8				
	554	Percent Torque At Points 3 And 4 (Retarder Configuration)	-71	5.2.1.47	65249	5.3.015	14	8				
	555	Percent Torque At Peak Torque, Point 5 (Retarder Configuration)	-71	5.2.1.48	65249	5.3.015	19	8				
	556	Reference Retarder Torque (Retarder Configuration)	-71	5.2.1.49	65249	5.3.015	17,18	16				
	557	Retarder Control Method (Retarder Configuration)	-71	5.2.1.50	65249	5.3.015	2	8				
	558	Accelerator Pedal Low Idle Switch	-71	5.2.2.04	61443	5.3.006	1.1	2				
	559	Accelerator Pedal Kickdown Switch	-71	5.2.2.05	61443	5.3.006	1.3	2				
	560	Driveline Engaged	-71	5.2.2.06	61442	5.3.005	1.1	2				
	561	ASR Engine Control Active	-71	5.2.2.07	61441	5.3.004	1.1	2				
	562	ASR Brake Control Active	-71	5.2.2.08	61441	5.3.004	1.3	2				
	563	Anti-Lock Braking (ABS) Active	-71	5.2.2.09	61441	5.3.004	1.5	2				
	564	Differential Lock State - Central	-71	5.2.2.10	61446	5.3.009	3.1	2				
	565	Differential Lock State - Central Front	-71	5.2.2.10	61446	5.3.009	3.3	2				
	566	Differential Lock State - Central Rear	-71	5.2.2.10	61446	5.3.009	3.5	2				

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	567	Differential Lock State - Front Axle 1	-71	5.2.2.10	61446	5.3.009	2.1	2				
	568	Differential Lock State - Front Axle 2	-71	5.2.2.10	61446	5.3.009	2.3	2				
	569	Differential Lock State - Rear Axle 1	-71	5.2.2.10	61446	5.3.009	2.5	2				
	570	Differential Lock State - Rear Axle 2	-71	5.2.2.10	61446	5.3.009	2.7	2				
	571	Retarder Enable - Brake Assist Switch	-71	5.2.2.11	61440	5.3.003	1.5	2				
	572	Retarder Enable - Shift Assist Switch	-71	5.2.2.12	61440	5.3.003	1.7	2				
	573	Torque Converter Lockup Engaged	-71	5.2.2.13	61442	5.3.005	1.3	2				
	574	Shift In Process	-71	5.2.2.14	61442	5.3.005	1.5	2				
	575	ABS Offroad Switch	-71	5.2.2.15	61441	5.3.004	3.1	2				
	576	ASR Offroad Switch	-71	5.2.2.16	61441	5.3.004	3.3	2				
	577	ASR "Hill Holder" Switch	-71	5.2.2.17	61441	5.3.004	3.5	2				
	578	Drive Axle Temperature	-71	5.2.5.002	65273	5.3.039	4	8				
	579	Drive Axle Lift Air Pressure	-71	5.2.5.025	65273	5.3.039	3	8				
	580	Altitude	-71	5.2.5.052	65256	5.3.022	7,8	16				
	581	Transmission Gear Ratio	-71	5.2.4.02	65250	5.3.016	3,4	16				
	582	Axle Weight	-71	5.2.5.080	65258	5.3.024	2,3	16				
	583	Pitch	-71	5.2.5.084	65256	5.3.022	5,6	16				
	584	Latitude	-71	5.2.5.085	65267	5.3.033	1 - 4	32				
	585	Longitude	-71	5.2.5.086	65267	5.3.033	5 - 8	32				
	586	Make	-71	5.2.5.090	65259	5.3.025	1	n/a	Make of the component.			
	587	Model	-71	5.2.5.091	65259	5.3.025	2	n/a	Model of the component			
	588	Serial Number	-71	5.2.5.092	65259	5.3.025	3	n/a	Serial number of the component			
	589	Alternator Speed	-71	5.2.5.097	65237	5.3.049	1,2	16				
	590	Idle Shutdown Timer State	-71	5.2.6.002	65252	5.3.018	1.7	2				
	591	Idle Shutdown Timer Function	-71	5.2.6.003	65252	5.3.018	2.7	2				
	592	Idle Shutdown Timer Override	-71	5.2.6.004	65252	5.3.018	1.5	2				
	593	Idle Shutdown has Shutdown engine	-71	5.2.6.005	65252	5.3.018	1.1	2				
	594	Idle Shutdown Driver Alert Mode	-71	5.2.6.006	65252	5.3.018	1.3	2				
	595	Cruise Control Active	-71	5.2.6.009	65265	5.3.031	4.1	2				
	596	Cruise Control Enable Switch	-71	5.2.6.010	65265	5.3.031	4.3	2				
	597	Brake Switch	-71	5.2.6.011	65265	5.3.031	4.5	2	Switch signal which indicates that the driver operated brake foot pedal is		0	246

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Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	PID	MID	SID
									being pressed.			
	598	Clutch Switch	-71	5.2.6.012	65265	5.3.031	4.7	2			0	245
	599	Cruise Control Set Switch	-71	5.2.6.014	65265	5.3.031	5.1	2				
	600	Cruise Control Coast (Decelerate) Switch	-71	5.2.6.015	65265	5.3.031	5.3	2				
	601	Cruise Control Resume Switch	-71	5.2.6.016	65265	5.3.031	5.5	2				
	602	Cruise Control Accelerate Switch	-71	5.2.6.017	65265	5.3.031	5.7	2				
	603	Brake Pedal Switch #2									0	247
	604	Transmission Neutral Switch	-71	5.2.6.037	65219	5.3.052	2.3	2			0	226
	605	Refrigerant High Pressure Switch	-71	5.2.6.050	65252	5.3.018	3.5	2			0	228
	606	Momentary Engine Overspeed Enable	-71	5.2.3.12	61442	5.3.005	5.1	2				
	607	Progressive Shift Disable	-71	5.2.3.11	61442	5.3.005	5.3	2				
(11)	608	J1587 (previously SAE J1708 (J1587) Data Link)	-73	5.7.13.2	57088	5.7.13	1.5	2			0	250
	609	Controller #2									0	233
	610	Power Connect Device									0	236
	611	System Diagnostic Code #1									0	151
	612	System Diagnostic Code #2									0	152
	613	System Diagnostic Code #3									0	153
	614	System Diagnostic Code #4									0	154
	615	System Diagnostic Code #5									0	155
	616	Auxiliary Analog Input #1									0	227
	617	Parking Brake On Actuator									0	234
	618	Parking Brake Off Actuator									0	235
	619	Parking Brake Actuator	-71	5.2.6.013	65274	5.3.040	4.1	2				
	620	5 Volts DC Supply									0	232
	621	Antenna Electronics									219	2	
(11)	622	J1922 (previously SAE J1922 Data Link)	-73	5.7.13.3	57088	5.7.13	1.3	2			0	249
(11)	623	Red Stop Lamp (previously Diagnostic Lamp – Red)	-73	5.7.1.2	65226	5.7.1	1.5	2			0	238
(11)	624	Amber Warning Lamp (previously Diagnostic Light – Amber)	-73	5.7.1.3	65226	5.7.1	1.3	2			0	239
	625	Proprietary Data Link									0	248

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
	626	Start Enable Device							Devices that assist an Engine in starting, e.g. intake heaters and ether		0	237
	627	Power Supply									0	251
	628	Program Memory									0	240
	629	Controller #1									0	254
	630	Calibration Memory									0	253
	631	Calibration Module									0	252
	632	Fuel Shutoff Valve									128	17
	633	Fuel Control Valve #1									128	18
	634	Throttle Bypass Valve									128	19
	635	Timing Actuator #1									128	20
	636	Engine Position Sensor									128	21
	637	Timing Sensor									128	22
	638	Rack Actuator									128	23
(11)	639	J1939 Network #1, Primary Vehicle Network (previously SAE J1939 Data Link)	-73	5.7.13.4	57088	5.7.13	1.1	2			0	231
	640	External Engine Protection Input									128	25
	641	Variable Geometry Turbocharger Actuator #1									128	27
	642	Variable Geometry Turbocharger Actuator #2									128	28
	643	External Fuel Command Input									128	29
	644	External Speed Command Input									128	30
	645	Tachometer Signal Output									128	31
(4)	646	Turbocharger 1 Wastegate Drive (see also SPN 1188)	-71	5.2.5.209	65174	5.3.099	1	8			128	32
	647	Fan Clutch Output Device Driver									128	33
	648	Exhaust Back Pressure Sensor									128	34
	649	Exhaust Back Pressure Regulator Solenoid									128	35
	650	Electronic Drive Unit Power Relay									128	37
	651	Injector Cylinder #01									128	1
	652	Injector Cylinder #02									128	2
	653	Injector Cylinder #03									128	3

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
	654	Injector Cylinder #04									128	4
	655	Injector Cylinder #05									128	5
	656	Injector Cylinder #06									128	6
	657	Injector Cylinder #07									128	7
	658	Injector Cylinder #08									128	8
	659	Injector Cylinder #09									128	9
	660	Injector Cylinder #10									128	10
	661	Injector Cylinder #11									128	11
	662	Injector Cylinder #12									128	12
	663	Injector Cylinder #13									128	13
	664	Injector Cylinder #14									128	14
	665	Injector Cylinder #15									128	15
	666	Injector Cylinder #16									128	16
	667	Injector Cylinder #17									128	47
	668	Injector Cylinder #18									128	48
	669	Injector Cylinder #19									128	49
	670	Injector Cylinder #20									128	50
	671	Injector Cylinder #21									128	72
	672	Injector Cylinder #22									128	73
	673	Injector Cylinder #23									128	74
	674	Injector Cylinder #24									128	75
	675	Glow Plug Lamp									128	36
	676	Glow Plug Relay									128	38
	677	Engine Starter Motor Relay									128	39
	678	ECU 8 Volts DC Supply									128	41
	679	Injection Control Pressure Regulator									128	42
	680	Variable Swirl System Valve									128	61
	681	Gear Shift Inhibit Request	-71	5.2.3.04	256	5.3.002	1.1	2				
	682	Torque Converter Lockup Disable Request	-71	5.2.3.05	256	5.3.002	1.3	2				
	683	Disengage Driveline Request	-71	5.2.3.06	256	5.3.002	1.5	2				
	684	Requested Percent Clutch Slip	-71	5.2.1.21	256	5.3.002	2	8				
	685	Disengage Differential Lock Request - Front Axle 1	-71	5.2.3.07	256	5.3.002	4.1	2				

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Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	PID	MID	SID
	686	Disengage Differential Lock Request - Front Axle 2	-71	5.2.3.07	256	5.3.002	4.3	2				
	687	Disengage Differential Lock Request - Rear Axle 1	-71	5.2.3.07	256	5.3.002	4.5	2				
	688	Disengage Differential Lock Request - Rear Axle 2	-71	5.2.3.07	256	5.3.002	4.7	2				
	689	Disengage Differential Lock Request - Central	-71	5.2.3.07	256	5.3.002	5.1	2				
	690	Disengage Differential Lock Request - Central Front	-71	5.2.3.07	256	5.3.002	5.3	2				
	691	Disengage Differential Lock Request - Central Rear	-71	5.2.3.07	256	5.3.002	5.5	2				
	692	ABS Offroad Switch Request	-71	5.2.3.08								
	693	ASR Offroad Switch Request	-71	5.2.3.09								
	694	ASR "Hill Holder" Switch Request	-71	5.2.3.10								
	695	Override Control Mode	-71	5.2.3.01	0	5.3.001	1.1	2				
	696	Requested Speed Control Conditions	-71	5.2.3.02	0	5.3.001	1.3	2				
	697	Auxiliary PWM Driver #1									128	57
	698	Auxiliary PWM Driver #2									128	58
	699	Auxiliary PWM Driver #3									128	59
	700	Auxiliary PWM Driver #4									128	60
	701	Auxiliary I/O #01	-71	5.2.6.018	65241	5.3.048	1.7	2			128	26
	702	Auxiliary I/O #02	-71	5.2.6.018	65241	5.3.048	1.5	2			128	40
	703	Auxiliary I/O #03	-71	5.2.6.018	65241	5.3.048	1.3	2			128	51
	704	Auxiliary I/O #04	-71	5.2.6.018	65241	5.3.048	1.1	2			128	52
	705	Auxiliary I/O #05	-71	5.2.6.018	65241	5.3.048	2.7	2			128	53
	706	Auxiliary I/O #06	-71	5.2.6.018	65241	5.3.048	2.5	2			128	54
	707	Auxiliary I/O #07	-71	5.2.6.018	65241	5.3.048	2.3	2			128	55
	708	Auxiliary I/O #08	-71	5.2.6.018	65241	5.3.048	2.1	2				
	709	Auxiliary I/O #09	-71	5.2.6.018	65241	5.3.048	3.7	2				
	710	Auxiliary I/O #10	-71	5.2.6.018	65241	5.3.048	3.5	2				
	711	Auxiliary I/O #11	-71	5.2.6.018	65241	5.3.048	3.3	2				
	712	Auxiliary I/O #12	-71	5.2.6.018	65241	5.3.048	3.1	2				
	713	Auxiliary I/O #13	-71	5.2.6.018	65241	5.3.048	4.7	2				

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	PID	MID	SID
	714	Auxiliary I/O #14	-71	5.2.6.018	65241	5.3.048	4.5	2				
	715	Auxiliary I/O #15	-71	5.2.6.018	65241	5.3.048	4.3	2				
	716	Auxiliary I/O #16	-71	5.2.6.018	65241	5.3.048	4.1	2				
	717	Autoshift High Gear Actuator									128	43
	718	Autoshift Low Gear Actuator									128	44
	719	Autoshift Neutral Actuator									128	45
	720	Autoshift Common Low Side (Return)									128	46
	721	Prestroke Sensor									128	62
	722	Prestroke Actuator									128	63
	723	Engine Speed Sensor #2									128	64
	724	Heated Oxygen Sensor									128	65
	725	Ignition Control Mode Signal									128	66
	726	Ignition Control Timing Signal									128	67
	727	Secondary Turbo Inlet Pressure									128	68
	728	After Cooler-Oil Cooler Coolant Temperature									128	69
	729	Inlet Air Heater Driver #1									128	70
	730	Inlet Air Heater Driver #2									128	71
	731	Knock Sensor									128	76
	732	Gas Metering Valve									128	77
	733	Rack Position Sensor									128	24
	734	C1 Solenoid Valve									130	1
	735	C2 Solenoid Valve									130	2
	736	C3 Solenoid Valve									130	3
	737	C4 Solenoid Valve									130	4
	738	C5 Solenoid Valve									130	5
	739	C6 Solenoid Valve									130	6
	740	Lockup Clutch Actuator	-71	5.2.6.032	65223	5.3.050	6.3	2			130	7
	741	Forward Solenoid Valve									130	8
	742	Low Signal Solenoid Valve									130	9
	743	Retarder Enable Solenoid Valve									130	10
	744	Retarder Modulation Solenoid Valve									130	11
	745	Retarder Response Solenoid Valve									130	12
	746	Differential Lock Solenoid Valve									130	13

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Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
	747	Engine/Transmission Match									130	14
	748	Transmission Output Retarder	-71	5.2.6.039	65218	5.3.053	1.1	2			130	15
	749	Neutral Start Output									130	16
	750	Turbine Speed Sensor									130	17
	751	Primary Shift Selector									130	18
	752	Secondary Shift Selector									130	19
	753	Special Function Inputs									130	20
	754	C1 Clutch Pressure Indicator									130	21
	755	C2 Clutch Pressure Indicator									130	22
	756	C3 Clutch Pressure Indicator									130	23
	757	C4 Clutch Pressure Indicator									130	24
	758	C5 Clutch Pressure Indicator									130	25
	759	C6 Clutch Pressure Indicator									130	26
	760	Lockup Clutch Pressure Indicator									130	27
	761	Forward Range Pressure Indicator									130	28
	762	Neutral Range Pressure Indicator									130	29
	763	Reverse Range Pressure Indicator									130	30
	764	Retarder Response System Pressure Indicator									130	31
	765	Differential Lock Clutch Pressure Indicator									130	32
	766	Multiple Pressure Indicators									130	33
	767	Transmission Reverse Direction Switch	-71	5.2.6.038	65219	5.3.052	2.1	2			130	34
	768	Range High Actuator	-71	5.2.6.029	65223	5.3.050	5.1	2			130	35
	769	Range Low Actuator	-71	5.2.6.028	65223	5.3.050	5.3	2			130	36
	770	Splitter Direct Actuator	-71	5.2.6.027	65223	5.3.050	5.5	2			130	37
	771	Splitter Indirect Actuator	-71	5.2.6.026	65223	5.3.050	5.7	2			130	38
	772	Shift Finger Rail Actuator 1	-71	5.2.6.024	65223	5.3.050	4.1	2			130	39
	773	Shift Finger Gear Actuator 1	-71	5.2.6.022	65223	5.3.050	4.3	2			130	40
	774	Upshift Request Switch									130	41
	775	Downshift Request Switch									130	42
	776	Torque Converter Interrupt Actuator									130	43
	777	Torque Converter Lockup Actuator									130	44

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
	778	Transmission High Range Sense Switch	-71	5.2.6.035	65219	5.3.052	1.1	2			130	45
	779	Transmission Low Range Sense Switch	-71	5.2.6.034	65219	5.3.052	1.3	2			130	46
	780	Shift Finger Neutral Indicator	-71	5.2.6.019	65223	5.3.050	3.1	2			130	47
	781	Shift Finger Engagement Indicator	-71	5.2.6.020	65223	5.3.050	3.3	2			130	48
	782	Shift Finger Center Rail Indicator	-71	5.2.6.021	65223	5.3.050	3.5	2			130	49
	783	Shift Finger Rail Actuator 2	-71	5.2.6.025	65223	5.3.050	4.5	2			130	50
	784	Shift Finger Gear Actuator 2	-71	5.2.6.023	65223	5.3.050	4.7	2			130	51
	785	Hydraulic System									130	52
	786	Defuel Actuator	-71	5.2.6.031	65223	5.3.050	6.5	2			130	53
	787	Inertia Brake Actuator	-71	5.2.6.030	65223	5.3.050	6.7	2			130	54
	788	Clutch Actuator	-71	5.2.6.033	65223	5.3.050	6.1	2			130	55
	789	Wheel Sensor ABS Axle 1 Left									136	1
	790	Wheel Sensor ABS Axle 1 Right									136	2
	791	Wheel Sensor ABS Axle 2 Left									136	3
	792	Wheel Sensor ABS Axle 2 Right									136	4
	793	Wheel Sensor ABS Axle 3 Left									136	5
	794	Wheel Sensor ABS Axle 3 Right									136	6
	795	Pressure Modulation Valve ABS Axle 1 Left									136	7
	796	Pressure Modulation Valve ABS Axle 1 Right									136	8
	797	Pressure Modulation Valve ABS Axle 2 Left									136	9
	798	Pressure Modulation Valve ABS Axle 2 Right									136	10
	799	Pressure Modulation Valve ABS Axle 3 Left									136	11
	800	Pressure Modulation Valve ABS Axle 3 Right									136	12
	801	Retarder Control Relay									136	13
	802	Relay Diagonal 1									136	14
	803	Relay Diagonal 2									136	15
	804	Mode Switch ABS									136	16
	805	Mode Switch ASR									136	17

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Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
	806	Dif 1 - ASR Valve									136	18
	807	Dif 2 - ASR Valve									136	19
	808	Pneumatic Engine Control									136	20
	809	Electronic Engine Control (Servomotor)									136	21
	810	Speed Signal Input									136	22
	811	Warning Light Bulb									136	23
	812	ASR Light Bulb									136	24
	813	Wheel Sensor ABS Axle 1 Average									136	25
	814	Wheel Sensor ABS Axle 2 Average									136	26
	815	Wheel Sensor ABS Axle 3 Average									136	27
	816	Pressure Modulator, Drive Axle Relay Valve									136	28
	817	Pressure Transducer, Drive Axle Relay Valve									136	29
	818	Master Control Relay									136	30
	819	Trailer Brake Slack Out Of Adjustment Forward Axle Left									136	31
	820	Trailer Brake Slack Out Of Adjustment Forward Axle Right									136	32
	821	Trailer Brake Slack Out Of Adjustment Rear Axle Left									136	33
	822	Trailer Brake Slack Out Of Adjustment Rear Axle Right									136	34
	823	Tractor Brake Slack Out Of Adjustment Axle 1 Left									136	35
	824	Tractor Brake Slack Out Of Adjustment Axle 1 Right									136	36
	825	Tractor Brake Slack Out Of Adjustment Axle 2 Left									136	37
	826	Tractor Brake Slack Out Of Adjustment Axle 2 Right									136	38
	827	Tractor Brake Slack Out Of Adjustment Axle 3 Left									136	39
	828	Tractor Brake Slack Out Of Adjustment Axle 3 Right									136	40

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
	829	Left Fuel Level Sensor									140	1
	830	Right Fuel Level Sensor									140	2
	831	Fuel Feed Rate Sensor									140	3
	832	Fuel Return Rate Sensor									140	4
	833	Fuel Rack Position Sensor									142	3
	834	Fuel Rack Actuator									142	4
	835	Oil Level Indicator Output									142	5
	836	Tachometer Drive Output									142	6
	837	Speedometer Drive Output									142	7
	838	PWM Input (ABS/ASR)									142	8
	839	Dead Reckoning Unit									162	1
	840	Loran Receiver									162	2
	841	Global Positioning System (GPS)									162	3
	842	Integrated Navigation Unit									162	4
	843	Operator Control Panel (OCP)									166	1
	844	Pneumatic Control Unit (PCU)									166	2
	845	PCU Steer Solenoid									166	3
	846	PCU Drive Solenoid									166	4
	847	PCU Trailer, Tag, Or Push Solenoid									166	5
	848	PCU Supply Solenoid									166	6
	849	PCU Control Solenoid									166	7
	850	PCU Deflate Solenoid									166	8
	851	Pneumatic - Steer Channel									166	9
	852	Pneumatic - Drive Channel									166	10
	853	Pneumatic - Trailer, Tag Or Push Channel									166	11
	854	Heater Circuit #01									177	1
	855	Heater Circuit #02									177	2
	856	Heater Circuit #03									177	3
	857	Heater Circuit #04									177	4
	858	Heater Circuit #05									177	5
	859	Heater Circuit #06									177	6
	860	Heater Circuit #07									177	7
	861	Heater Circuit #08									177	8
	862	Heater Circuit #09									177	9

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
	863	Heater Circuit #10									177	10
	864	Heater Circuit #11									177	11
	865	Heater Circuit #12									177	12
	866	Heater Circuit #13									177	13
	867	Heater Circuit #14									177	14
	868	Heater Circuit #15									177	15
	869	Heater Circuit #16									177	16
	870	Heater Regeneration System									177	17
	871	Refrigerant Charge									190	1
	872	Refrigerant Moisture Level									190	2
	873	Non-Condensable Gas In Refrigerant									190	3
	874	Refrigerant Flow Control Solenoid									190	4
	875	Refrigerant Low Pressure Switch	-71	5.2.6.051	65252	5.3.018	3.3	2			190	5
	876	Compressor Clutch Circuit									190	6
	877	Evaporator Thermostat Circuit									190	7
	878	Clearance, Side Marker, Identification Lamp Circuit (Black)									217	9
	879	Left Turn Lamp Circuit (Yellow)									217	10
	880	Stop Lamp Circuit (Red)									217	11
	881	Right Turn Lamp Circuit (Green)									217	12
	882	Tail Lamp/License Plate Lamp Circuit (Brown)									217	13
	883	Auxiliary Lamp Circuit (Blue)									217	14
	884	Tractor Mounted Rear Axle Slider Control Unit									217	15
	885	Trailer Mounted Rear Axle Slider Control Unit									217	16
	886	Headway Controller Forward Antenna									219	1
	887	Headway Controller Brake Input Monitor									219	3
	888	Headway Controller Speaker Monitor									219	4
	889	Headway Controller Steering Sensor Monitor									219	5

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	PID	J1587 Reference MID	SID
	890	Headway Controller Speedometer Monitor									219	6
	891	Headway Controller Right Turn Signal Monitor									219	7
	892	Headway Controller Left Turn Signal Monitor									219	8
	893	Headway Controller Control Display Unit									219	9
	894	Headway Controller Right Side Sensor									219	10
	895	Headway Controller Left Side Sensor									219	11
	896	Headway Controller Rear Sensor									219	12
	897	Override Control Mode Priority	-71	5.2.3.03	0	5.3.001	1.5	2				
	898	Requested Speed	-71	5.2.1.19	0	5.3.001	2,3	16				
	899	Engine Torque Mode	-71	5.2.2.01	61444	5.3.007	1.1	4				
	900	Retarder Torque Mode	-71	5.2.2.01	61440	5.3.003	1.1	4				
	901	Retarder Type	-71	5.2.2.02	65249	5.3.015	1.1	4				
	902	Retarder Location	-71	5.2.2.03	65249	5.3.015	1.5	4				
	903	Transmission Forward Direction Switch	-71	5.2.6.036	65219	5.3.052	2.5	2				
	904	Front Axle Speed	-71	5.2.1.51	65215	5.3.056	1,2	16				
	905	Relative Speed; Front Axle, Left Wheel	-71	5.2.1.52	65215	5.3.056	3	8				
	906	Relative Speed; Front Axle, Right Wheel	-71	5.2.1.53	65215	5.3.056	4	8				
	907	Relative Speed; Rear Axle #1, Left Wheel	-71	5.2.1.54	65215	5.3.056	5	8				
	908	Relative Speed; Rear Axle #1, Right Wheel	-71	5.2.1.55	65215	5.3.056	6	8				
	909	Relative Speed; Rear Axle #2, Left Wheel	-71	5.2.1.56	65215	5.3.056	7	8				
	910	Relative Speed; Rear Axle #2, Right Wheel	-71	5.2.1.57	65215	5.3.056	8	8				
	911	Service Component Identification	-71	5.2.5.102	65216	5.3.055	1	8	Identification of component needing service.			

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
	912	Service Component Identification	-71	5.2.5.102	65216	5.3.055	4	8	Identification of component needing service.			
	913	Service Component Identification	-71	5.2.5.102	65216	5.3.055	6	8	Identification of component needing service.			
	914	Service Distance	-71	5.2.5.103	65216	5.3.055	2,3	16				
	915	Service Delay/Calendar Time Based	-71	5.2.5.104	65216	5.3.055	5	8				
	916	Service Delay/Operational Time Based	-71	5.2.5.105	65216	5.3.055	7,8	16				
	917	High Resolution Total Vehicle Distance	-71	5.2.5.106	65217	5.3.054	1 - 4	32				
	918	High Resolution Trip Distance	-71	5.2.5.107	65217	5.3.054	5 - 8	32				
	919	Ambient Light Sensor									0	223
	920	Audible Alarm									0	224
	921	Green Lamp									0	225
	922	Ride Height Relay									136	41
	923	PWM Output									142	9
	924	Auxiliary Output #1									142	10
	925	Auxiliary Output #2									142	11
	926	Auxiliary Output #3									142	12
	927	Location	-71	5.2.5.095	61446	5.3.009	1	8				
	928	Axle Location	-71	5.2.5.095	65258	5.3.024	1	8				
	929	Location	-71	5.2.5.095	65268	5.3.034	1	8				
	930	Drive Axle Location	-71	5.2.5.095	65273	5.3.039	2	8				
	931	Fuel Supply Pump Actuator									128	78
	932	Brake System Hold Modulator Valve Solenoid Axle 1 Left									136	42
	933	Brake System Hold Modulator Valve Solenoid Axle 1 Right									136	43
	934	Brake System Hold Modulator Valve Solenoid Axle 2 Left									136	44
	935	Brake System Hold Modulator Valve Solenoid Axle 2 Right									136	45
	936	Brake System Hold Modulator Valve Solenoid Axle 3 Left									136	46
	937	Brake System Hold Modulator Valve Solenoid Axle 3 Right									136	47

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	938	Brake System Dump Modulator Valve Solenoid Axle 1 Left									136	48
	939	Brake System Dump Modulator Valve Solenoid Axle 1 Right									136	49
	940	Brake System Dump Modulator Valve Solenoid Axle 2 Left									136	50
	941	Brake System Dump Modulator Valve Solenoid Axle 2 Right									136	51
	942	Brake System Dump Modulator Valve Solenoid Axle 3 Left									136	52
	943	Brake System Dump Modulator Valve Solenoid Axle 3 Right									136	53
	944	Driver Air Bag Ignitor Loop									232	1
	945	Passenger Air Bag Ignitor Loop									232	2
	946	Left Belt Tensioner Ignitor Loop									232	3
	947	Right Belt Tensioner Ignitor Loop									232	4
	948	Safety Restraint System Lamp									232	5
	949	Automotive Seat Occupancy Sensor - passenger side									232	6
	950	Side Collision Detector - Left									232	7
	951	Side Bag Ignitor Loop 1 - Left									232	8
	952	Side Bag Ignitor Loop 2 - Left									232	9
	953	Side Collision Detector - Right									232	10
	954	Side Bag Ignitor Loop 1 - Right									232	11
	955	Side Bag Ignitor Loop 2 - Right									232	12
	956	Rollover Sensor									232	13
	957	Number of Forward Gear Ratios	-71	5.2.4.04	65250	5.3.016	2	8				
	958	Number of Reverse Gear Ratios	-71	5.2.4.05	65250	5.3.016	1	8				
	959	Seconds	-71	5.2.5.093	65254	5.3.020	1	8				
	960	Minutes	-71	5.2.5.094	65254	5.3.020	2	8				
	961	Hours	-71	5.2.5.110	65254	5.3.020	3	8				
	962	Day	-71	5.2.5.111	65254	5.3.020	5	8				
	963	Month	-71	5.2.5.112	65254	5.3.020	4	8				
	964	Year	-71	5.2.5.113	65254	5.3.020	6	8				
	965	Number of Software Identification Fields	-71	5.2.5.114	65242	5.3.047	1	8				

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	966	Engine Test Mode Switch	-71	5.2.6.040	65265	5.3.031	8.5	2				
	967	Idle Decrement Switch	-71	5.2.6.041	65265	5.3.031	8.3	2				
	968	Idle Increment Switch	-71	5.2.6.042	65265	5.3.031	8.1	2				
	969	Remote Accelerator Enable Switch	-71	5.2.6.053	61441	5.3.004	4.7	2				
	970	Auxiliary Engine Shutdown Switch	-71	5.2.6.054	61441	5.3.004	4.5	2				
	971	Engine Derate Switch	-71	5.2.6.055	61441	5.3.004	4.3	2				
	972	Accelerator Interlock Switch	-71	5.2.6.056	61441	5.3.004	4.1	2				
	973	Engine Retarder Selection	-71	5.2.1.58	61441	5.3.004	5	8				
	974	Remote Accelerator	-71	5.2.1.59	61443	5.3.006	4	8				
	975	Estimated Percent Fan Speed	-71	5.2.1.60	65213	5.3.058	1	8		26		
	976	PTO State	-71	5.2.2.19	65265	5.3.031	7.1	5				
	977	Fan Drive State	-71	5.2.2.20	65213	5.3.058	2.1	4				
	978	Remote PTO Variable Speed Control Switch	-71	5.2.6.043	65264	5.3.030	6.5	2				
	979	Remote PTO Preprogrammed Speed Control Switch	-71	5.2.6.044	65264	5.3.030	6.3	2				
	980	PTO Enable Switch	-71	5.2.6.045	65264	5.3.030	6.1	2				
	981	PTO Accelerate Switch	-71	5.2.6.046	65264	5.3.030	7.7	2				
	982	PTO Resume Switch	-71	5.2.6.047	65264	5.3.030	7.5	2				
	983	PTO Coast/Decelerate Switch	-71	5.2.6.048	65264	5.3.030	7.3	2				
	984	PTO Set Switch	-71	5.2.6.049	65264	5.3.030	7.1	2				
	985	A/C High Pressure Fan Switch	-71	5.2.6.052	65252	5.3.018	3.1	2				
	986	Requested Percent Fan Speed	-71	5.2.1.61	57344	5.3.059	1	8				
(11)	987	Protect lamp	-73	5.7.1.4	65226	5.7.1	1.1	2			0	222
(1)	988	Trip Group 1	-71	5.2.3.13	56832	5.3.074	1.1	2				
(1)	989	Trip Group 2 - Proprietary	-71	5.2.3.14	56832	5.3.074	1.3	2				
(1)	990	Total Compression Brake Distance	-71	5.2.5.117	65212	5.3.060	1 - 4	32				
(1)	991	Trip Compression Brake Distance	-71	5.2.5.118	65212	5.3.060	5 - 8	32				
(1)	992	Trip Service Brake Distance	-71	5.2.5.119	65212	5.3.060	9 - 12	32				
(1)	993	Trip Service Brake Applications	-71	5.2.5.120	65212	5.3.060	13- 16	32				
(1)	994	Trip Fan On Time	-71	5.2.5.121	65211	5.3.061	1 - 4	32				
(1)	995	Trip Fan On Time Due to the Engine System	-71	5.2.5.122	65211	5.3.061	5 - 8	32				
(1)	996	Trip Fan On Time Due to a Manual Switch	-71	5.2.5.123	65211	5.3.061	9 - 12	32				

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
(1)	997	Trip Fan On Time Due to the A/C System	-71	5.2.5.124	65211	5.3.061	13-16	32				
(1)	998	Trip Distance on VSL	-71	5.2.5.125	65210	5.3.062	1 - 4	32				
(1)	999	Trip Gear Down Distance	-71	5.2.5.126	65210	5.3.062	5 - 8	32				
(1)	1000	Trip Distance in Top Gear	-71	5.2.5.127	65210	5.3.062	9 - 12	32				
(1)	1001	Trip Drive Fuel Used	-71	5.2.5.128	65209	5.3.063	1 - 4	32				
(1)	1002	Trip PTO Moving Fuel Used	-71	5.2.5.129	65209	5.3.063	5 - 8	32				
(1)	1003	Trip PTO Non-moving Fuel Used	-71	5.2.5.130	65209	5.3.063	9 - 12	32				
(1)	1004	Trip Vehicle Idle Fuel Used	-71	5.2.5.131	65209	5.3.063	13-16	32				
(1)	1005	Trip Cruise Fuel Used	-71	5.2.5.132	65209	5.3.063	17-20	32				
(1)	1006	Trip Drive Fuel Economy	-71	5.2.5.133	65209	5.3.063	21-22	16				
(1)	1007	Trip Drive Fuel Used (Gaseous)	-71	5.2.5.134	65208	5.3.064	1 - 4	32				
(1)	1008	Trip PTO Moving Fuel Used (Gaseous)	-71	5.2.5.135	65208	5.3.064	5 - 8	32				
(1)	1009	Trip PTO Non-moving Fuel Used (Gaseous)	-71	5.2.5.136	65208	5.3.064	9 - 12	32				
(1)	1010	Trip Vehicle Idle Fuel Used (Gaseous)	-71	5.2.5.137	65208	5.3.064	13-16	32				
(1)	1011	Trip Cruise Fuel Used (Gaseous)	-71	5.2.5.138	65208	5.3.064	17-20	32				
(1)	1012	Trip Drive Fuel Economy (Gaseous)	-71	5.2.5.139	65208	5.3.064	21-22	16				
(1)	1013	Trip Maximum Engine Speed	-71	5.2.5.140	65207	5.3.065	1,2	16				
(1)	1014	Trip Average Engine Speed	-71	5.2.5.141	65207	5.3.065	3,4	16				
(1)	1015	Trip Drive Average Load Factor	-71	5.2.5.142	65207	5.3.065	5	8				
(1)	1016	Total Drive Average Load Factor	-71	5.2.5.143	65207	5.3.065	6	8				
(1)	1017	Total Engine Cruise Time	-71	5.2.5.144	65207	5.3.065	7 - 10	32				
(1)	1018	Trip Maximum Vehicle Speed	-71	5.2.5.145	65206	5.3.066	1,2	16				
(1)	1019	Trip Cruise Distance	-71	5.2.5.146	65206	5.3.066	3 - 6	32				
(1)	1020	Trip Number of Hot Shutdowns	-71	5.2.5.147	65205	5.3.067	1,2	16				
(1)	1021	Trip Number of Idle Shutdowns	-71	5.2.5.148	65205	5.3.067	3,4	16				
(1)	1022	Trip Number of Idle Shutdown Overrides	-71	5.2.5.149	65205	5.3.067	5,6	16				
(1)	1023	Trip Sudden Decelerations	-71	5.2.5.150	65205	5.3.067	7,8	16				
(1)	1024	Trip Time in VSL	-71	5.2.5.151	65204	5.3.068	1 - 4	32				
(1)	1025	Trip Time in Top Gear	-71	5.2.5.152	65204	5.3.068	5 - 8	32				

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(1)	1026	Trip Time in Gear Down	-71	5.2.5.153	65204	5.3.068	9 - 12	32				
(1)	1027	Trip Time in Derate by Engine	-71	5.2.5.154	65204	5.3.068	13-16	32				
(1)	1028	Total Engine PTO Fuel Used	-71	5.2.5.155	65203	5.3.069	1 - 4	32				
(1)	1029	Trip Average Fuel Rate	-71	5.2.5.156	65203	5.3.069	5,6	16				
(1)	1030	Total Engine PTO Fuel Used (Gaseous)	-71	5.2.5.157	65202	5.3.070	1 - 4	32				
(1)	1031	Trip Average Fuel Rate (Gaseous)	-71	5.2.5.158	65202	5.3.070	5,6	16				
(1)	1032	Total ECU Distance	-71	5.2.5.159	65201	5.3.071	1 - 4	32				
(1)	1033	Total ECU Run Time	-71	5.2.5.160	65201	5.3.071	5 - 8	32				
(1)	1034	Trip Cruise Time	-71	5.2.5.161	65200	5.3.072	1 - 4	32				
(1)	1035	Trip PTO Time	-71	5.2.5.162	65200	5.3.072	5 - 8	32				
(1)	1036	Trip Engine Running Time	-71	5.2.5.163	65200	5.3.072	9 - 12	32				
(1)	1037	Trip Idle Time	-71	5.2.5.164	65200	5.3.072	13-16	32				
(1)	1038	Trip Air Compressor On Time	-71	5.2.5.165	65200	5.3.072	17-20	32				
(1)	1039	Trip Fuel (Gaseous)	-71	5.2.5.166	65199	5.3.073	1 - 4	32				
(1)	1040	Total Fuel Used (Gaseous)	-71	5.2.5.167	65199	5.3.073	5 - 8	32				
(1)	1041	Start Signal Indicator								0		219
(1)	1042	Electronic Tractor/Trailer Interface (ISO 11992)								0		220
(1)	1043	Internal Sensor Voltage Supply								0		221
(1)	1044	Hydraulic Pump Motor									136	54
(1)	1045	Brake Light Switch 1									136	55
(1)	1046	Brake Light Switch 2									136	56
(1)	1047	Electronic Pressure Control Axle 1									136	57
(1)	1048	Pneumatic Back-up Pressure Control Axle 1									136	58
(1)	1049	Brake Pressure Sensing Axle 1									136	59
(1)	1050	Electronic Pressure Control Axle 2									136	60
(1)	1051	Pneumatic Back-up Pressure Control Axle 2									136	61
(1)	1052	Brake Pressure Sensing Axle 2									136	62
(1)	1053	Electronic Pressure Control Axle 3									136	63
(1)	1054	Pneumatic Back-up Pressure Control Axle 3									136	64

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(1)	1055	Brake Pressure Sensing Axle 3									136	65
(1)	1056	Electronic Pressure Control, Trailer Control									136	66
(1)	1057	Pneumatic Back-up Pressure Control, Trailer Control									136	67
(1)	1058	Brake Pressure Sensing, Trailer Control									136	68
(1)	1059	Axle Load Sensor									136	69
(1)	1060	Lining Wear Sensor Axle 1 Left									136	70
(1)	1061	Lining Wear Sensor Axle 1 Right									136	71
(1)	1062	Lining Wear Sensor Axle 2 Left									136	72
(1)	1063	Lining Wear Sensor Axle 2 Right									136	73
(1)	1064	Lining Wear Sensor Axle 3 Left									136	74
(1)	1065	Lining Wear Sensor Axle 3 Right									136	75
(1)	1066	Brake Signal Transmitter									136	76
(1)	1067	Brake Signal Sensor 1									136	77
(1)	1068	Brake Signal Sensor 2									136	78
(1)	1069	Tire Dimension Supervision									136	79
(1)	1070	Vehicle Deceleration Control									136	80
(1)	1071	Cooling Fan Drive Output									143	27
(1)	1072	Engine (Compression) Brake Output #1								Engine Compression Brake driver circuit (includes the ECM driver and solenoid coil).		143	28
(1)	1073	Engine (Compression) Brake Output #2								Engine Compression Brake driver circuit (includes the ECM driver and solenoid coil).		143	29
(1)	1074	Engine (Exhaust) Brake Output										143	30
(2)	1075	Electric Lift Pump for Engine Fuel Supply											
(2)	1076	Fuel Injection Pump Fuel Control Valve											
(2)	1077	Fuel Injection Pump Controller											
(2)	1078	Fuel Injection Pump Speed/Position Sensor											
(2)	1079	Sensor Supply Voltage 1 (+5V DC)											
(2)	1080	Sensor Supply Voltage 2 (+5V DC)											

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(2)	1081	Wait to Start Lamp	-71	5.2.6.57	65252	5.3.018	4.1	2				
(3)	1082	Engine Coolant Load Increase	-71	5.2.2.21	61440	5.3.003	4.1	2				
(3)	1083	Auxiliary I/O Channel #1	-71	5.2.5.168	65241	5.3.048	5,6	16				
(3)	1084	Auxiliary I/O Channel #2	-71	5.2.5.168	65241	5.3.048	7,8	16				
(3)	1085	Intended Retarder Percent Torque	-71	5.2.5.169	61440	5.3.003	3	8				
(3)	1086	Parking and/or Trailer Air Pressure	-71	5.2.5.171	65198	5.3.075	2	8				
(3)	1087	Service Brake Air Pressure Circuit #1	-71	5.2.5.172	65198	5.3.075	3	8				
(3)	1088	Service Brake Air Pressure Circuit #2	-71	5.2.5.173	65198	5.3.075	4	8				
(4)	1089	Auxiliary Equipment Supply Pressure	-71	5.2.5.174	65198	5.3.075	5	8				
(4)	1090	Air Suspension Supply Pressure	-71	5.2.5.175	65198	5.3.075	6	8				
(3)	1091	Brake Application Pressure High Range, Front Axle, Left Wheel	-71	5.2.5.176	65197	5.3.076	1	8				
(3)	1092	Brake Application Pressure High Range, Front Axle, Right Wheel	-71	5.2.5.177	65197	5.3.076	2	8				
(3)	1093	Brake Application Pressure High Range, Rear Axle #1, Left Wheel	-71	5.2.5.178	65197	5.3.076	3	8				
(3)	1094	Brake Application Pressure High Range, Rear Axle #1, Right Wheel	-71	5.2.5.179	65197	5.3.076	4	8				
(3)	1095	Brake Application Pressure High Range, Rear Axle #2, Left Wheel	-71	5.2.5.180	65197	5.3.076	5	8				
(3)	1096	Brake Application Pressure High Range, Rear Axle #2, Right Wheel	-71	5.2.5.181	65197	5.3.076	6	8				
(3)	1097	Brake Application Pressure High Range, Rear Axle #2, Left Wheel	-71	5.2.5.182	65197	5.3.076	7	8				
(3)	1098	Brake Application Pressure High Range, Rear Axle #2, Right Wheel	-71	5.2.5.183	65197	5.3.076	8	8				
(3)	1099	Brake Lining Remaining, Front Axle, Left Wheel	-71	5.2.5.184	65196	5.3.077	1	8				
(3)	1100	Brake Lining Remaining, Front Axle, Right Wheel	-71	5.2.5.185	65196	5.3.077	2	8				
(3)	1101	Brake Lining Remaining, Rear Axle #1, Left Wheel	-71	5.2.5.186	65196	5.3.077	3	8				

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(3)	1102	Brake Lining Remaining, Rear Axle #1, Right Wheel	-71	5.2.5.187	65196	5.3.077	4	8				
(3)	1103	Brake Lining Remaining, Rear Axle #2, Left Wheel	-71	5.2.5.188	65196	5.3.077	5	8				
(3)	1104	Brake Lining Remaining, Rear Axle #2, Right Wheel	-71	5.2.5.189	65196	5.3.077	6	8				
(3)	1105	Brake Lining Remaining, Rear Axle #3, Left Wheel	-71	5.2.5.190	65196	5.3.077	7	8				
(3)	1106	Brake Lining Remaining, Rear Axle #3, Right Wheel	-71	5.2.5.191	65196	5.3.077	8	8				
(3)	1107	Engine Protection System Timer State	-71	5.2.6.058	65252	5.3.018	5.7	2				
(3)	1108	Engine Protection System Timer Override	-71	5.2.6.059	65252	5.3.018	5.5	2				
(3)	1109	Engine Protection System Approaching Shutdown	-71	5.2.6.060	65252	5.3.018	5.3	2				
(3)	1110	Engine Protection System has Shutdown Engine	-71	5.2.6.061	65252	5.3.018	5.1	2				
(3)	1111	Engine Protection System Configuration	-71	5.2.6.062	65252	5.3.018	6.7	2				
(4)	1112	Engine (Compression) Brake Output #3							Engine Compression Brake driver circuit (includes the ECM driver and solenoid coil).		128	82
(4)	1113	Recommended Gear	-71	5.2.5.192	65195	5.3.078	1	8				
(11)	1114	Lowest Possible Gear	-71	5.2.5.193	65195	5.3.078	3	8				
(11)	1115	Highest Possible Gear	-71	5.2.5.194	65195	5.3.078	2	8				
(4)	1116	Gaseous Fuel Correction Factor	-71	5.2.5.195	65194	5.3.079	1	8				
(4)	1117	Desired Rated Exhaust Oxygen	-71	5.2.5.196	65193	5.3.080	1,2	16				
(4)	1118	Desired Exhaust Oxygen	-71	5.2.5.197	65193	5.3.080	3,4	16				
(4)	1119	Actual Exhaust Oxygen	-71	5.2.5.198	65193	5.3.080	5,6	16				
(4)	1120	Articulation Angle	-71	5.2.5.199	65192	5.3.081	1	8				
(4)	1121	EBS Brake Switch	-71	5.2.6.071	61441	5.3.004	1.7	2				
(4)	1122	Alternator Bearing 1 Temperature	-71	5.2.5.200	65191	5.3.082	1	8				
(4)	1123	Alternator Bearing 2 Temperature	-71	5.2.5.200	65191	5.3.082	2	8				
(4)	1124	Alternator Winding 1 Temperature	-71	5.2.5.201	65191	5.3.082	3	8				
(4)	1125	Alternator Winding 2 Temperature	-71	5.2.5.201	65191	5.3.082	4	8				

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(4)	1126	Alternator Winding 3 Temperature	-71	5.2.5.201	65191	5.3.082	5	8				
(4)	1127	Turbocharger 1 Boost Pressure	-71	5.2.5.202	65190	5.3.083	1,2	16				
(4)	1128	Turbocharger 2 Boost Pressure	-71	5.2.5.202	65190	5.3.083	3,4	16				
(4)	1129	Turbocharger 3 Boost Pressure	-71	5.2.5.202	65190	5.3.083	5,6	16				
(4)	1130	Turbocharger 4 Boost Pressure	-71	5.2.5.202	65190	5.3.083	7,8	16				
(4)	1131	Intake Manifold 2 Temperature	-71	5.2.5.004	65189	5.3.084	1	8				
(4)	1132	Intake Manifold 3 Temperature	-71	5.2.5.004	65189	5.3.084	2	8				
(4)	1133	Intake Manifold 4 Temperature	-71	5.2.5.004	65189	5.3.084	3	8				
(4)	1134	Engine Intercooler Thermostat Opening	-71	5.2.5.242	65262	5.3.028	8	8				
(4)	1135	Engine Oil Temperature 2	-71	5.2.5.015	65188	5.3.085	1,2	16				
(4)	1136	Engine ECU Temperature - (see also SPN 21)	-71	5.2.5.216	65188	5.3.085	3,4	16				
(4)	1137	Exhaust Gas Port 1 Temperature	-71	5.2.5.203	65187	5.3.086	1,2	16				
(4)	1138	Exhaust Gas Port 2 Temperature	-71	5.2.5.203	65187	5.3.086	3,4	16				
(4)	1139	Exhaust Gas Port 3 Temperature	-71	5.2.5.203	65187	5.3.086	5,6	16				
(4)	1140	Exhaust Gas Port 4 Temperature	-71	5.2.5.203	65187	5.3.086	7,8	16				
(4)	1141	Exhaust Gas Port 5 Temperature	-71	5.2.5.203	65186	5.3.087	1,2	16				
(4)	1142	Exhaust Gas Port 6 Temperature	-71	5.2.5.203	65186	5.3.087	3,4	16				
(4)	1143	Exhaust Gas Port 7 Temperature	-71	5.2.5.203	65186	5.3.087	5,6	16				
(4)	1144	Exhaust Gas Port 8 Temperature	-71	5.2.5.203	65186	5.3.087	7,8	16				
(4)	1145	Exhaust Gas Port 9 Temperature	-71	5.2.5.203	65185	5.3.088	1,2	16				
(4)	1146	Exhaust Gas Port 10 Temperature	-71	5.2.5.203	65185	5.3.088	3,4	16				
(4)	1147	Exhaust Gas Port 11 Temperature	-71	5.2.5.203	65185	5.3.088	5,6	16				
(4)	1148	Exhaust Gas Port 12 Temperature	-71	5.2.5.203	65185	5.3.088	7,8	16				
(4)	1149	Exhaust Gas Port 13 Temperature	-71	5.2.5.203	65184	5.3.089	1,2	16				
(4)	1150	Exhaust Gas Port 14 Temperature	-71	5.2.5.203	65184	5.3.089	3,4	16				
(4)	1151	Exhaust Gas Port 15 Temperature	-71	5.2.5.203	65184	5.3.089	5,6	16				
(4)	1152	Exhaust Gas Port 16 Temperature	-71	5.2.5.203	65184	5.3.089	7,8	16				
(4)	1153	Exhaust Gas Port 17 Temperature	-71	5.2.5.203	65183	5.3.090	1,2	16				
(4)	1154	Exhaust Gas Port 18 Temperature	-71	5.2.5.203	65183	5.3.090	3,4	16				
(4)	1155	Exhaust Gas Port 19 Temperature	-71	5.2.5.203	65183	5.3.090	5,6	16				
(4)	1156	Exhaust Gas Port 20 Temperature	-71	5.2.5.203	65183	5.3.090	7,8	16				

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
(4)	1157	Main Bearing 1 Temperature	-71	5.2.5.204	65182	5.3.091	1,2	16				
(4)	1158	Main Bearing 2 Temperature	-71	5.2.5.204	65182	5.3.091	3,4	16				
(4)	1159	Main Bearing 3 Temperature	-71	5.2.5.204	65182	5.3.091	5,6	16				
(4)	1160	Main Bearing 4 Temperature	-71	5.2.5.204	65182	5.3.091	7,8	16				
(4)	1161	Main Bearing 5 Temperature	-71	5.2.5.204	65181	5.3.092	1,2	16				
(4)	1162	Main Bearing 6 Temperature	-71	5.2.5.204	65181	5.3.092	3,4	16				
(4)	1163	Main Bearing 7 Temperature	-71	5.2.5.204	65181	5.3.092	5,6	16				
(4)	1164	Main Bearing 8 Temperature	-71	5.2.5.204	65181	5.3.092	7,8	16				
(4)	1165	Main Bearing 9 Temperature	-71	5.2.5.204	65180	5.3.093	1,2	16				
(4)	1166	Main Bearing 10 Temperature	-71	5.2.5.204	65180	5.3.093	3,4	16				
(4)	1167	Main Bearing 11 Temperature	-71	5.2.5.204	65180	5.3.093	5,6	16				
(4)	1168	Turbocharger Lube Oil Pressure 2	-71	5.2.5.029	65179	5.3.094	1	8				
(4)	1169	Turbocharger 2 Speed	-71	5.2.5.053	65179	5.3.094	2,3	16				
(4)	1170	Turbocharger 3 Speed	-71	5.2.5.053	65179	5.3.094	4,5	16				
(4)	1171	Turbocharger 4 Speed	-71	5.2.5.053	65179	5.3.094	6,7	16				
(4)	1172	Turbocharger 1 Compressor Inlet Temperature	-71	5.2.5.205	65178	5.3.095	1	8				
(4)	1173	Turbocharger 2 Compressor Inlet Temperature	-71	5.2.5.205	65178	5.3.095	2	8				
(4)	1174	Turbocharger 3 Compressor Inlet Temperature	-71	5.2.5.205	65178	5.3.095	3	8				
(4)	1175	Turbocharger 4 Compressor Inlet Temperature	-71	5.2.5.205	65178	5.3.095	4	8				
(4)	1176	Turbocharger 1 Compressor Inlet Pressure	-71	5.2.5.206	65177	5.3.096	1,2	16				
(4)	1177	Turbocharger 2 Compressor Inlet Pressure	-71	5.2.5.206	65177	5.3.096	3,4	16				
(4)	1178	Turbocharger 3 Compressor Inlet Pressure	-71	5.2.5.206	65177	5.3.096	5,6	16				
(4)	1179	Turbocharger 4 Compressor Inlet Pressure	-71	5.2.5.206	65177	5.3.096	7,8	16				
(4)	1180	Turbocharger 1 Turbine Inlet Temperature	-71	5.2.5.207	65176	5.3.097	1,2	16				
(4)	1181	Turbocharger 2 Turbine Inlet Temperature	-71	5.2.5.207	65176	5.3.097	3,4	16				

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
(4)	1182	Turbocharger 3 Turbine Inlet Temperature	-71	5.2.5.207	65176	5.3.097	5,6	16				
(4)	1183	Turbocharger 4 Turbine Inlet Temperature	-71	5.2.5.207	65176	5.3.097	7,8	16				
(4)	1184	Turbocharger 1 Turbine Outlet Temperature	-71	5.2.5.208	65175	5.3.098	1,2	16				
(4)	1185	Turbocharger 2 Turbine Outlet Temperature	-71	5.2.5.208	65175	5.3.098	3,4	16				
(4)	1186	Turbocharger 3 Turbine Outlet Temperature	-71	5.2.5.208	65175	5.3.098	5,6	16				
(4)	1187	Turbocharger 4 Turbine Outlet Temperature	-71	5.2.5.208	65175	5.3.098	7,8	16				
(4)	1188	Turbocharger 1 Wastegate Drive - duplicate (see SPN 646)	-71	5.2.5.209	65174	5.3.099	1	0			128	32
(4)	1189	Turbocharger 2 Wastegate Drive	-71	5.2.5.209	65174	5.3.099	2	8			128	88
(4)	1190	Turbocharger 3 Wastegate Drive	-71	5.2.5.209	65174	5.3.099	3	8				
(4)	1191	Turbocharger 4 Wastegate Drive	-71	5.2.5.209	65174	5.3.099	4	8				
(4)	1192	Turbocharger Wastegate Actuator Control Air Pressure	-71	5.2.5.210	65174	5.3.099	5	8				
(4)	1193	Engine Operation Time Since Rebuild	-71	5.2.5.211	65173	5.3.100	1 - 4	32				
(4)	1194	Anti-theft Encryption Seed Present Indicator	-71	5.2.6.063	56320	5.3.102	1.1	2				
(4)	1195	Anti-theft Password Valid Indicator	-71	5.2.6.064	56320	5.3.102	1.3	2			0	217
(4)	1196	Anti-theft Component Status States	-71	5.2.6.065	56320	5.3.102	1.5	2				
(4)	1197	Anti-theft Modify Password States	-71	5.2.6.066	56320	5.3.102	1.7	2				
(4)	1198	Anti-theft Random Number	-71	5.2.5.212	56320	5.3.102	2 - 8	56				
(4)	1199	Anti-theft Encryption Indicator States	-71	5.2.6.067	56576	5.3.101	1.2	2				
(4)	1200	Anti-theft Desired Exit Mode States	-71	5.2.6.068	56576	5.3.101	1.4	2				
(4)	1201	Anti-theft Command States	-71	5.2.6.069	56576	5.3.101	1.6	3				
(4)	1202	Anti-theft Password Representation	-71	5.2.5.213	56576	5.3.101	2 - 8	56				
(6)	1203	Engine Auxiliary Coolant Pressure	-71	5.2.5.214	65172	5.3.103	1	8				
(5)	1204	Electrical Load	-71	5.2.5.215	65171	5.3.104	1,2	16				
(5)	1205	Safety Wire Status	-71	5.2.6.099	65171	5.3.104	3.1	2				
(5)	1206	Turning Gear Engaged	-71	5.2.6.100	65171	5.3.104	3.3	2				

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Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
(5)	1207	Engine ECU Temperature - duplicate (see SPNs 21 and 1136)(SPN 1136 is to be used)	-71	5.2.5.216	65188	5.3.085	3,4	16				
(5)	1208	Pre-filter Oil Pressure	-71	5.2.5.217	65170	5.3.105	1	8				
(5)	1209	Exhaust Gas Pressure	-71	5.2.5.218	65170	5.3.105	2,3	16				
(5)	1210	Rack Position	-71	5.2.5.219	65170	5.3.105	4	8				
(5)	1211	Engine Build Hours Reset	-71	5.2.6.070	56832	5.3.074	3.1	2				
(6)	1212	Engine Auxiliary Coolant Temperature	-71	5.2.5.220	65172	5.3.103	2	8				
(11)	1213	Malfunction Indicator Lamp	-73	5.7.1.1	65226	5.7.1	1.7	2				
(11)	1214	Suspect Parameter Number	-73	5.7.1.5	65226	5.7.1	3,4,5	19				
(11)	1215	Failure Mode Identifier	-73	5.7.1.6	65226	5.7.1	5	5				
(11)	1216	Occurrence Count	-73	5.7.1.6	65226	5.7.1	6	7				
(11)	1217	Freeze Frame Length	-73	5.7.4.1	65229	5.7.4	1	8				
(11)	1218	Active Trouble Codes	-73	5.7.5.1	65230	5.7.5	1	8				
(11)	1219	Previously Active Trouble Codes	-73	5.7.5.2	65230	5.7.5	2	8				
(11)	1220	OBD Compliance	-73	5.7.5.3	65230	5.7.5	3	8				
(11)	1221	Continuously Monitored Systems Support/Status	-73	5.7.5.4	65230	5.7.5	4	8				
(11)	1222	Non-continuously Monitored Systems Support	-73	5.7.5.5	65230	5.7.5	5, 6	16				
(11)	1223	Non-continuously Monitored Systems Status	-73	5.7.5.6	65230	5.7.5	7, 8	16				
(11)	1224	Test Identifier	-73	5.7.7.1	58112, 65232	5.7.7, 5.7.8	1	8				
(11)	1225	Test Type/Component Identifier	-73	5.7.8.1	65232	5.7.8	2	8				
(11)	1226	Test Value	-73	5.7.8.2	65232	5.7.8	3, 4	16				
(11)	1227	Test Limit Maximum	-73	5.7.8.3	65232	5.7.8	5, 6	16				
(11)	1228	Test Limit Minimum	-73	5.7.8.4	65232	5.7.8	7, 8	16				
(11)	1229	Test Identifiers Supported	-73	5.7.10.1	65234	5.7.10	1	64				
(11)	1230	Current Data Link	-73	5.7.13.1	57088	5.7.13	1.7	2				
(11)	1231	J1939 Network #2	-73	5.7.13.5	57088	5.7.13	2.7	2				
(11)	1232	ISO 9141	-73	5.7.13.6	57088	5.7.13	2.5	2				
(11)	1233	J1850	-73	5.7.13.7	57088	5.7.13	2.3	2				
(11)	1234	Other, Manufacturer Specified Port	-73	5.7.13.8	57088	5.7.13	2.1	2				

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	PID	MID	SID
(11)	1235	J1939 Network #3	-73	5.7.13.9	57088	5.7.13	3.7	2				
(11)	1236	Hold Signal	-73	5.7.13.10	57088	5.7.13	4.5	2				
(5)	1237	Engine Shutdown Override Switch	-71	5.2.6.102	65265	5.3.031	8.7	2				
(5)	1238	Traction Control Override Switch	-71	5.2.6.072	61441	5.3.004	3.7	2	Switch signal which indicates the position of the traction control override switch.			
(6)	1239	Fuel Leakage 1	-71	5.2.6.098	65169	5.3.106	1.1	2				
(6)	1240	Fuel Leakage 2	-71	5.2.6.098	65169	5.3.106	1.3	2				
(6)	1241	Natural Gas Mass Flow	-71	5.2.5.221	65170	5.3.105	5,6	16				
(6)	1242	Instantaneous Estimated Brake Power	-71	5.2.5.222	65170	5.3.105	7,8	16				
(6)	1243	ABS Fully Operational	-71	5.2.6.075	61441	5.3.004	6.1	2				
(6)	1244	Fuel Control Valve #2							Control valve for rear fueling actuator.		128	83
(6)	1245	Timing Actuator #2							Timing actuator for rear time actuator.		128	84
(6)	1246	Number of Calibration Records	-71	5.2.5.223	65168	5.3.107	1	8				
(6)	1247	Engine Power	-71	5.2.5.224	65168	5.3.107	2,3	16				
(6)	1248	Peak Engine Torque 1	-71	5.2.5.225	65168	5.3.107	4,5	16				
(6)	1249	Peak Engine Torque 2	-71	5.2.5.226	65168	5.3.107	6,7	16				
(6)	1250	Calibration Record Start Month	-71	5.2.5.227	65168	5.3.107	8	8				
(6)	1251	Calibration Record Start Day	-71	5.2.5.228	65168	5.3.107	9	8				
(6)	1252	Calibration Record Start Year	-71	5.2.5.229	65168	5.3.107	10	8				
(6)	1253	Calibration Record Start Duration Time	-71	5.2.5.230	65168	5.3.107	11- 14	32				
(6)	1254	Torque Limiting Feature Status	-71	5.2.6.103	65168	5.3.107	15.1	2				
(6)	1255	Transmission Gear Ratio 1	-71	5.2.5.232	65168	5.3.107	16,17	16				
(6)	1256	Engine Torque Limit 1, Transmission	-71	5.2.5.233	65168	5.3.107	18,19	16				
(6)	1257	Transmission Gear Ratio 2	-71	5.2.5.234	65168	5.3.107	20,21	16				
(6)	1258	Engine Torque Limit 2, Transmission	-71	5.2.5.235	65168	5.3.107	22,23	16				
(6)	1259	Transmission Gear Ratio 3	-71	5.2.5.236	65168	5.3.107	24,25	16				
(6)	1260	Engine Torque Limit 3, Transmission	-71	5.2.5.237	65168	5.3.107	26,27	16				
(6)	1261	Engine Torque Limit 4, Transmission	-71	5.2.5.238	65168	5.3.107	28,29	16				

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
(6)	1262	Engine Torque Limit 5, Switch	-71	5.2.5.239	65168	5.3.107	30,31	16				
(6)	1263	Engine Torque Limit 6, Axle Input	-71	5.2.5.240	65168	5.3.107	32,33	16				
(6)	1264	Extended Crankcase Blow-by Pressure - duplicate (see SPN 22)	-71	5.2.5.241	65263	5.3.029	2	8		22		
(6)	1265	Engine Oil Burn Valve							Valve to control the folow of oil to be burned off in the engine.		128	85
(6)	1266	Engine Oil Replacement Valve							Valve to control the replacement oil to the engine.		128	86
(6)	1267	Idle Shutdown Vehicle Accessories Relay Driver Circuit							When Idle Shutdown System is activated, the relay will shutdown off accessories.		128	87
(6)	1268	Ignition Coil #1							Coil for high voltage spark plug in gas engines.			
(6)	1269	Ignition Coil #2							Coil for high voltage spark plug in gas engines.			
(6)	1270	Ignition Coil #3							Coil for high voltage spark plug in gas engines.			
(6)	1271	Ignition Coil #4							Coil for high voltage spark plug in gas engines.			
(6)	1272	Ignition Coil #5							Coil for high voltage spark plug in gas engines.			
(6)	1273	Ignition Coil #6							Coil for high voltage spark plug in gas engines.			
(6)	1274	Ignition Coil #7							Coil for high voltage spark plug in gas engines.			
(6)	1275	Ignition Coil #8							Coil for high voltage spark plug in gas engines.			
(6)	1276	Ignition Coil #9							Coil for high voltage spark plug in gas engines.			
(6)	1277	Ignition Coil #10							Coil for high voltage spark plug in gas engines.			
(6)	1278	Ignition Coil #11							Coil for high voltage spark plug in gas engines.			
(6)	1279	Ignition Coil #12							Coil for high voltage spark plug in gas engines.			
(6)	1280	Ignition Coil #13							Coil for high voltage spark plug in gas			

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
									engines.			
(6)	1281	Ignition Coil #14							Coil for high voltage spark plug in gas engines.			
(6)	1282	Ignition Coil #15							Coil for high voltage spark plug in gas engines.			
(6)	1283	Ignition Coil #16							Coil for high voltage spark plug in gas engines.			
(6)	1284	Ignition Coil #17							Coil for high voltage spark plug in gas engines.			
(6)	1285	Ignition Coil #18							Coil for high voltage spark plug in gas engines.			
(6)	1286	Ignition Coil #19							Coil for high voltage spark plug in gas engines.			
(6)	1287	Ignition Coil #20							Coil for high voltage spark plug in gas engines.			
(6)	1288	Ignition Coil #21							Coil for high voltage spark plug in gas engines.			
(6)	1289	Ignition Coil #22							Coil for high voltage spark plug in gas engines.			
(6)	1290	Ignition Coil #23							Coil for high voltage spark plug in gas engines.			
(6)	1291	Ignition Coil #24							Coil for high voltage spark plug in gas engines.			
(6)	1292	Ignition Control Module #1							Electronic control unit for an ignition system.			
(6)	1293	Ignition Control Module #2							Electronic control unit for an ignition system.			
(6)	1294	Spark Plug #1							Ignition device for gas engines.			
(6)	1295	Spark Plug #2							Ignition device for gas engines.			
(6)	1296	Spark Plug #3							Ignition device for gas engines.			
(6)	1297	Spark Plug #4							Ignition device for gas engines.			
(6)	1298	Spark Plug #5							Ignition device for gas engines.			
(6)	1299	Spark Plug #6							Ignition device for gas engines.			
(6)	1300	Spark Plug #7							Ignition device for gas engines.			
(6)	1301	Spark Plug #8							Ignition device for gas engines.			

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	PID	MID	SID
(6)	1302	Spark Plug #9							Ignition device for gas engines.			
(6)	1303	Spark Plug #10							Ignition device for gas engines.			
(6)	1304	Spark Plug #11							Ignition device for gas engines.			
(6)	1305	Spark Plug #12							Ignition device for gas engines.			
(6)	1306	Spark Plug #13							Ignition device for gas engines.			
(6)	1307	Spark Plug #14							Ignition device for gas engines.			
(6)	1308	Spark Plug #15							Ignition device for gas engines.			
(6)	1309	Spark Plug #16							Ignition device for gas engines.			
(6)	1310	Spark Plug #17							Ignition device for gas engines.			
(6)	1311	Spark Plug #18							Ignition device for gas engines.			
(6)	1312	Spark Plug #19							Ignition device for gas engines.			
(6)	1313	Spark Plug #20							Ignition device for gas engines.			
(6)	1314	Spark Plug #21							Ignition device for gas engines.			
(6)	1315	Spark Plug #22							Ignition device for gas engines.			
(6)	1316	Spark Plug #23							Ignition device for gas engines.			
(6)	1317	Spark Plug #24							Ignition device for gas engines.			
(6)	1318	Exhaust Temperature Bank Imbalance							The imbalance between two banks of of exhaust port temperatures.			
(6)	1319	Intake Manifold Pressure Bank Imbalance							Imbalance between two banks of intake pressure manifolds			
(6)	1320	Externally Supplied Air Pressure	-71	5.2.5.247	65167	5.3.108	1,2	16				
(6)	1321	Starter Solenoid Lockout Relay Driver Circuit							This relay is in series with the engine starter moto relay and controled by engine ECM to prevent starter engagement		0	237
(6)	1322	Engine Misfire for Multiple Cylinders							When a misfire occurs in any one of the cylinders			
(6)	1323	Engine Misfire Cylinder #1							Engine misfire detected in cylinder			
(6)	1324	Engine Misfire Cylinder #2							Engine misfire detected in cylinder			
(6)	1325	Engine Misfire Cylinder #3							Engine misfire detected in cylinder			
(6)	1326	Engine Misfire Cylinder #4							Engine misfire detected in cylinder			
(6)	1327	Engine Misfire Cylinder #5							Engine misfire detected in cylinder			
(6)	1328	Engine Misfire Cylinder #6							Engine misfire detected in cylinder			
(6)	1329	Engine Misfire Cylinder #7							Engine misfire detected in cylinder			
(6)	1330	Engine Misfire Cylinder #8							Engine misfire detected in cylinder			

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
(6)	1331	Engine Misfire Cylinder #9							Engine misfire detected in cylinder			
(6)	1332	Engine Misfire Cylinder #10							Engine misfire detected in cylinder			
(6)	1333	Engine Misfire Cylinder #11							Engine misfire detected in cylinder			
(6)	1334	Engine Misfire Cylinder #12							Engine misfire detected in cylinder			
(6)	1335	Engine Misfire Cylinder #13							Engine misfire detected in cylinder			
(6)	1336	Engine Misfire Cylinder #14							Engine misfire detected in cylinder			
(6)	1337	Engine Misfire Cylinder #15							Engine misfire detected in cylinder			
(6)	1338	Engine Misfire Cylinder #16							Engine misfire detected in cylinder			
(6)	1339	Engine Misfire Cylinder #17							Engine misfire detected in cylinder			
(6)	1340	Engine Misfire Cylinder #18							Engine misfire detected in cylinder			
(6)	1341	Engine Misfire Cylinder #19							Engine misfire detected in cylinder			
(6)	1342	Engine Misfire Cylinder #20							Engine misfire detected in cylinder			
(6)	1343	Engine Misfire Cylinder #21							Engine misfire detected in cylinder			
(6)	1344	Engine Misfire Cylinder #22							Engine misfire detected in cylinder			
(6)	1345	Engine Misfire Cylinder #23							Engine misfire detected in cylinder			
(6)	1346	Engine Misfire Cylinder #24							Engine misfire detected in cylinder			
(6)	1347	Fuel Pump Pressurizing Assembly #1							The pumping assembly of the fuel system			
(6)	1348	Fuel Pump Pressurizing Assembly #2							The pumping assembly of the fuel system			
(6)	1349	Injector Metering Rail 2 Pressure	-71	5.2.5.244	65243	5.3.046	7,8	16		129		
(6)	1350	Time Since Last Service	-71	5.2.5.246	65166	5.3.109	2,3	16				
(6)	1351	Air Compressor Actuator Circuit							Air compressor system for pumping air to the accessories, e.g. service and parking brake		128	89
(6)	1352	Engine Cylinder #1 Knock Sensor							When either knock or pre-detonation has occurred		128	90
(6)	1353	Engine Cylinder #2 Knock Sensor							When either knock or pre-detonation has occurred		128	91
(6)	1354	Engine Cylinder #3 Knock Sensor							When either knock or pre-detonation has occurred		128	92
(6)	1355	Engine Cylinder #4 Knock Sensor							When either knock or pre-detonation has occurred		128	93
(6)	1356	Engine Cylinder #5 Knock Sensor							When either knock or pre-detonation has occurred		128	94

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(6)	1357	Engine Cylinder #6 Knock Sensor							When either knock or pre-detonation has occurred		128	95
(6)	1358	Engine Cylinder #7 Knock Sensor							When either knock or pre-detonation has occurred		128	96
(6)	1359	Engine Cylinder #8 Knock Sensor							When either knock or pre-detonation has occurred		128	97
(6)	1360	Engine Cylinder #9 Knock Sensor							When either knock or pre-detonation has occurred		128	98
(6)	1361	Engine Cylinder #10 Knock Sensor							When either knock or pre-detonation has occurred		128	99
(6)	1362	Engine Cylinder #11 Knock Sensor							When either knock or pre-detonation has occurred		128	100
(6)	1363	Engine Cylinder #12 Knock Sensor							When either knock or pre-detonation has occurred		128	101
(6)	1364	Engine Cylinder #13 Knock Sensor							When either knock or pre-detonation has occurred		128	102
(6)	1365	Engine Cylinder #14 Knock Sensor							When either knock or pre-detonation has occurred		128	103
(6)	1366	Engine Cylinder #15 Knock Sensor							When either knock or pre-detonation has occurred		128	104
(6)	1367	Engine Cylinder #16 Knock Sensor							When either knock or pre-detonation has occurred		128	105
(6)	1368	Engine Cylinder #17 Knock Sensor							When either knock or pre-detonation has occurred		128	106
(6)	1369	Engine Cylinder #18 Knock Sensor							When either knock or pre-detonation has occurred		128	107
(6)	1370	Engine Cylinder #19 Knock Sensor							When either knock or pre-detonation has occurred		128	108
(6)	1371	Engine Cylinder #20 Knock Sensor							When either knock or pre-detonation has occurred		128	109
(6)	1372	Engine Cylinder #21 Knock Sensor							When either knock or pre-detonation has occurred		128	110
(6)	1373	Engine Cylinder #22 Knock Sensor							When either knock or pre-detonation has occurred		128	111
(6)	1374	Engine Cylinder #23 Knock Sensor							When either knock or pre-detonation has occurred		128	112

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	PID	MID	SID
(6)	1375	Engine Cylinder #24 Knock Sensor							When either knock or pre-detonation has occurred		128	113
(6)	1376	Battery 2 Potential (Voltage) - duplicate (see SPN 444)	-71	5.2.5.254	65165	5.3.110	1,2	16				
(6)	1377	Multiple Unit Synchronization Switch							Switch for synchronizing the speed of multiple engines		128	114
(6)	1378	Engine Oil Change Interval							The engine oil change interval time has expired		128	115
(6)	1379	Service Component Identification	-71	5.2.5.102	65166	5.3.109	1		Identification of component needing service.			
(7)	1380	Engine Oil Level Remote Reservoir	-71	5.2.5.284	65130	5.3.112	1	8				
(7)	1381	Fuel Supply Pump Inlet Pressure	-71	5.2.5.285	65130	5.3.112	2	8				
(7)	1382	Fuel Filter (Suction Side) Differential Pressure - duplicate (see SPN 16)	-71	5.2.5.286	65130	5.3.112	3	8		16		
(7)	1383	Engine was Shut Down Hot							Abrupt engine shutdown when hot			
(7)	1384	Engine has Been Shut Down from Data Link Information							Engine commanded to shutdown via the datalink			
(7)	1385	Auxiliary Temperature 1 - duplicate (see SPN 441)	-71	5.2.5.249	65164	5.3.111	1	0				
(7)	1386	Auxiliary Temperature 2 - duplicate (see SPN 442)	-71	5.2.5.249	65164	5.3.111	2	0				
(7)	1387	Auxiliary Pressure 1	-71	5.2.5.248	65164	5.3.111	3	8				
(7)	1388	Auxiliary Pressure 2	-71	5.2.5.248	65164	5.3.111	4	8				
(7)	1389	Fuel Specific Gravity	-71	5.2.5.245	65202	5.3.070	7,8	16				
(7)	1390	Absolute Fuel Valve Inlet Pressure	-71	5.2.5.250	65163	5.3.113	1,2	16				
(7)	1391	Outlet to Inlet Fuel Valve Differential Pressure	-71	5.2.5.251	65163	5.3.113	3,4	16				
(7)	1392	Air to Fuel Differential Pressure	-71	5.2.5.252	65163	5.3.113	5,6	16				
(7)	1393	Cylinder 1 Ignition Transformer Secondary Output	-71	5.2.5.253	65160	5.3.114	1	8				
(7)	1394	Cylinder 2 Ignition Transformer Secondary Output	-71	5.2.5.253	65160	5.3.114	2	8				
(7)	1395	Cylinder 3 Ignition Transformer Secondary Output	-71	5.2.5.253	65160	5.3.114	3	8				
(7)	1396	Cylinder 4 Ignition Transformer Secondary Output	-71	5.2.5.253	65160	5.3.114	4	8				

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(7)	1397	Cylinder 5 Ignition Transformer Secondary Output	-71	5.2.5.253	65160	5.3.114	5	8				
(7)	1398	Cylinder 6 Ignition Transformer Secondary Output	-71	5.2.5.253	65160	5.3.114	6	8				
(7)	1399	Cylinder 7 Ignition Transformer Secondary Output	-71	5.2.5.253	65160	5.3.114	7	8				
(7)	1400	Cylinder 8 Ignition Transformer Secondary Output	-71	5.2.5.253	65160	5.3.114	8	8				
(7)	1401	Cylinder 9 Ignition Transformer Secondary Output	-71	5.2.5.253	65161	5.3.115	1	8				
(7)	1402	Cylinder 10 Ignition Transformer Secondary Output	-71	5.2.5.253	65161	5.3.115	2	8				
(7)	1403	Cylinder 11 Ignition Transformer Secondary Output	-71	5.2.5.253	65161	5.3.115	3	8				
(7)	1404	Cylinder 12 Ignition Transformer Secondary Output	-71	5.2.5.253	65161	5.3.115	4	8				
(7)	1405	Cylinder 13 Ignition Transformer Secondary Output	-71	5.2.5.253	65161	5.3.115	5	8				
(7)	1406	Cylinder 14 Ignition Transformer Secondary Output	-71	5.2.5.253	65161	5.3.115	6	8				
(7)	1407	Cylinder 15 Ignition Transformer Secondary Output	-71	5.2.5.253	65161	5.3.115	7	8				
(7)	1408	Cylinder 16 Ignition Transformer Secondary Output	-71	5.2.5.253	65161	5.3.115	8	8				
(7)	1409	Cylinder 17 Ignition Transformer Secondary Output	-71	5.2.5.253	65162	5.3.116	1	8				
(7)	1410	Cylinder 18 Ignition Transformer Secondary Output	-71	5.2.5.253	65162	5.3.116	2	8				
(7)	1411	Cylinder 19 Ignition Transformer Secondary Output	-71	5.2.5.253	65162	5.3.116	3	8				
(7)	1412	Cylinder 20 Ignition Transformer Secondary Output	-71	5.2.5.253	65162	5.3.116	4	8				
(7)	1413	Cylinder 1 Ignition Timing	-71	5.2.5.257	65154	5.3.117	1,2	16				
(7)	1414	Cylinder 2 Ignition Timing	-71	5.2.5.257	65154	5.3.117	3,4	16				
(7)	1415	Cylinder 3 Ignition Timing	-71	5.2.5.257	65154	5.3.117	5,6	16				
(7)	1416	Cylinder 4 Ignition Timing	-71	5.2.5.257	65154	5.3.117	7,8	16				
(7)	1417	Cylinder 5 Ignition Timing	-71	5.2.5.257	65155	5.3.118	1,2	16				

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(7)	1418	Cylinder 6 Ignition Timing	-71	5.2.5.257	65155	5.3.118	3,4	16				
(7)	1419	Cylinder 7 Ignition Timing	-71	5.2.5.257	65155	5.3.118	5,6	16				
(7)	1420	Cylinder 8 Ignition Timing	-71	5.2.5.257	65155	5.3.118	7,8	16				
(7)	1421	Cylinder 9 Ignition Timing	-71	5.2.5.257	65156	5.3.119	1,2	16				
(7)	1422	Cylinder 10 Ignition Timing	-71	5.2.5.257	65156	5.3.119	3,4	16				
(7)	1423	Cylinder 11 Ignition Timing	-71	5.2.5.257	65156	5.3.119	5,6	16				
(7)	1424	Cylinder 12 Ignition Timing	-71	5.2.5.257	65156	5.3.119	7,8	16				
(7)	1425	Cylinder 13 Ignition Timing	-71	5.2.5.257	65157	5.3.120	1,2	16				
(7)	1426	Cylinder 14 Ignition Timing	-71	5.2.5.257	65157	5.3.120	3,4	16				
(7)	1427	Cylinder 15 Ignition Timing	-71	5.2.5.257	65157	5.3.120	5,6	16				
(7)	1428	Cylinder 16 Ignition Timing	-71	5.2.5.257	65157	5.3.120	7,8	16				
(7)	1429	Cylinder 17 Ignition Timing	-71	5.2.5.257	65158	5.3.121	1,2	16				
(7)	1430	Cylinder 18 Ignition Timing	-71	5.2.5.257	65158	5.3.121	3,4	16				
(7)	1431	Cylinder 19 Ignition Timing	-71	5.2.5.257	65158	5.3.121	5,6	16				
(7)	1432	Cylinder 20 Ignition Timing	-71	5.2.5.257	65158	5.3.121	7,8	16				
(7)	1433	Desired Ignition Timing 1	-71	5.2.5.256	65159	5.3.122	1,2	16				
(7)	1434	Desired Ignition Timing 2	-71	5.2.5.256	65159	5.3.122	3,4	16				
(7)	1435	Desired Ignition Timing 3	-71	5.2.5.256	65159	5.3.122	5,6	16				
(7)	1436	Actual Ignition Timing	-71	5.2.5.255	65159	5.3.122	7,8	16				
(7)	1437	Road Speed Limit Status	-71	5.2.6.076	61443	5.3.006	1.5	2				
(7)	1438	ABS/EBS Amber Warning State	-71	5.2.6.073	61441	5.3.004	6.5	2	The ABS/EBS amber warning state is set as non-critical faults are detected in the ABS/EBS system.			
(7)	1439	EBS Red Warning State	-71	5.2.6.074	61441	5.3.004	6.3	2				
(8)	1440	Fuel Flow Rate 1	-71	5.2.5.262	65153	5.3.123	1,2	16				
(8)	1441	Fuel Flow Rate 2	-71	5.2.5.262	65153	5.3.123	3,4	16				
(8)	1442	Fuel Valve 1 Position	-71	5.2.5.261	65153	5.3.123	5	8				
(8)	1443	Fuel Valve 2 Position	-71	5.2.5.261	65153	5.3.123	6	8				
(8)	1444	Cylinder 1 Combustion Time	-71	5.2.5.260	65147	5.3.124	1,2	16				
(8)	1445	Cylinder 2 Combustion Time	-71	5.2.5.260	65147	5.3.124	3,4	16				
(8)	1446	Cylinder 3 Combustion Time	-71	5.2.5.260	65147	5.3.124	5,6	16				
(8)	1447	Cylinder 4 Combustion Time	-71	5.2.5.260	65147	5.3.124	7,8	16				
(8)	1448	Cylinder 5 Combustion Time	-71	5.2.5.260	65148	5.3.125	1,2	16				
(8)	1449	Cylinder 6 Combustion Time	-71	5.2.5.260	65148	5.3.125	3,4	16				
(8)	1450	Cylinder 7 Combustion Time	-71	5.2.5.260	65148	5.3.125	5,6	16				

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(8)	1451	Cylinder 8 Combustion Time	-71	5.2.5.260	65148	5.3.125	7,8	16				
(8)	1452	Cylinder 9 Combustion Time	-71	5.2.5.260	65149	5.3.126	1,2	16				
(8)	1453	Cylinder 10 Combustion Time	-71	5.2.5.260	65149	5.3.126	3,4	16				
(8)	1454	Cylinder 11 Combustion Time	-71	5.2.5.260	65149	5.3.126	5,6	16				
(8)	1455	Cylinder 12 Combustion Time	-71	5.2.5.260	65149	5.3.126	7,8	16				
(8)	1456	Cylinder 13 Combustion Time	-71	5.2.5.260	65150	5.3.127	1,2	16				
(8)	1457	Cylinder 14 Combustion Time	-71	5.2.5.260	65150	5.3.127	3,4	16				
(8)	1458	Cylinder 15 Combustion Time	-71	5.2.5.260	65150	5.3.127	5,6	16				
(8)	1459	Cylinder 16 Combustion Time	-71	5.2.5.260	65150	5.3.127	7,8	16				
(8)	1460	Cylinder 17 Combustion Time	-71	5.2.5.260	65151	5.3.128	1,2	16				
(8)	1461	Cylinder 18 Combustion Time	-71	5.2.5.260	65151	5.3.128	3,4	16				
(8)	1462	Cylinder 19 Combustion Time	-71	5.2.5.260	65151	5.3.128	5,6	16				
(8)	1463	Cylinder 20 Combustion Time	-71	5.2.5.260	65151	5.3.128	7,8	16				
(8)	1464	Desired Combustion Time	-71	5.2.5.258	65152	5.3.129	1,2	16				
(8)	1465	Average Engine Combustion Time	-71	5.2.5.259	65152	5.3.129	3,4	16				
(8)	1466	Steer Channel Mode	-71	5.2.6.088	65144	5.3.132	2.1	4				
(8)	1467	Trailer/tag Channel Mode	-71	5.2.6.089	65144	5.3.132	3.1	4				
(8)	1468	Drive Channel Mode	-71	5.2.6.090	65144	5.3.132	3.5	4				
(8)	1469	PCU Drive Solenoid Status	-71	5.2.6.091	65144	5.3.132	4.1	2				
(8)	1470	PCU Steer Solenoid Status	-71	5.2.6.092	65144	5.3.132	4.3	2				
(8)	1471	Tire Pressure Supply Switch	-71	5.2.6.093	65144	5.3.132	4.5	2				
(8)	1472	PCU Deflate Solenoid Status	-71	5.2.6.094	65144	5.3.132	5.1	2				
(8)	1473	PCU Control Solenoid Status	-71	5.2.6.095	65144	5.3.132	5.3	2				
(8)	1474	PCU Supply Solenoid Status	-71	5.2.6.096	65144	5.3.132	5.5	2				
(8)	1475	PCU Trailer, Tag or Push Solenoid Status	-71	5.2.6.097	65144	5.3.132	5.7	2				
(8)	1476	Engine Oil Specific Resistance	-71	5.2.5.231								
(8)	1477	Engine Oil Kinematic Viscosity	-71	5.2.5.302								
(8)	1478	Engine Oil Relative Dielectricity	-71	5.2.5.303								
(11)	1479	Security Entity Type	-73	5.8.5.1	54272	5.8.5	2.5	4				
(8)	1480	Source Address of Controlling Device for Retarder Control	-71	5.2.5.300	61440	5.3.003	5	8				
(8)	1481	Source Address of Controlling Device for Brake Control	-71	5.2.5.299	61441	5.3.004	7	8				

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(8)	1482	Source Address of Controlling Device for Transmission Control	-71	5.2.5.301	61442	5.3.005	8	8				
(8)	1483	Source Address of Controlling Device for Engine Control	-71	5.2.5.298	61444	5.3.007	6	8				
(8)	1484	Other ECUs Have Reported Fault Codes Affecting Operation							Indication of fault codes for other devices		0	216
(8)	1485	ECU Main Relay									0	218
(9)	1486	Concave Position							Combine Concave Clearance Measurement			
(12)	1487	Illumination Brightness Percent	-71		53248		1	8	Commanded Backlight Brightness Level			
(9)	1488	Thresher Speed							Threshing or cylinder speed measurement			
(9)	1489	Cleaning Fan Speed							Cleaning Fan speed measurement			
(9)	1490	Header Backshaft Speed							Header drive speed measurement			
(9)	1491	Instrument Panel #1 Backlighting Driver							Output Drive Circuit for first instrument panel backlight			
(9)	1492	Instrument Panel #2 Backlighting Driver							Output Drive Circuit for second instrument panel backlight			
(9)	1493	Tailings System							Tailings measurement system			
(9)	1494	Tailings Sensor #1							First Tailings Sensor circuit			
(9)	1495	Tailings Sensor #2							Second Tailing Sensor circuit			
(9)	1496	Tailings Elevator Paddles							Tailings Elevator Paddles (e.g., missing)			
(9)	1497	Unloading Auger Drive							Drive circuit which engages the unloading auger system.			
(9)	1498	Header Drive							Drive circuit which engages the unloading header system.			
(9)	1499	Separator Drive							Drive circuit which engages the unloading separator system.			
(9)	1500	Tachometer Module Switch Matrix							Switch input matrix that controls monitoring functions of tachometer module			
(9)	1501	Grain Loss Module Switch Matrix							Switch input matrix that controls monitoring functions of grain loss module			

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	PID	MID	SID
(9)	1502	Automatic Header Control Switch Matrix							Switch input matrix that controls monitoring functions of automatic header module			
(9)	1503	Arm Rest Switch Matrix							Switch input matrix for module located in the arm rest			
(9)	1504	Operator Seat Switch						2	This switch senses the presence of the operator in the seat.			
(9)	1505	Automatic Header Sensitivity Adjustment							Input to adjust the reaction sensitivity of the automatic header system			
(9)	1506	Automatic Header Rate Adjustment Input							Input to adjust the reaction rate of the automatic header system			
(9)	1507	Discharge Beater Speed Disable Adjustment							Input to adjust the discharge beater speed			
(9)	1508	Hydraulic Reservoir Temperature							Temperature of Common reservoir for drive and machine operation			
(9)	1509	Thresher Separator Hydraulic Drive #1 Temperature							Temperature of first thresher separator hydraulic drive			
(9)	1510	Chopper Vane Angle Adjustment							Operator input to adjust chopper vane angle			
(9)	1511	Rightmost Cleaning Shoe Grain Loss							Circuit and sensor associated with providing the rightmost cleaning shoe grain loss parameter			
(9)	1512	Leftmost Cleaning Shoe Grain Loss							Circuit and sensor associated with providing the leftmost cleaning shoe grain loss parameter			
(9)	1513	Rightmost Separator Grain Loss							Circuit and sensor associated with providing the rightmost separator grain loss parameter			
(9)	1514	Leftmost Separator Grain Loss							Circuit and sensor associated with providing the leftmost separator grain loss parameter			
(9)	1515	Header Height System							General fault in the system that controls the header			
(9)	1516	Header							Mechanical problem with Header System			
(9)	1517	Header Lift Cylinder Pressure							Circuit and sensor associated with			

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									providing the header lift cylinder pressure parameter			
(9)	1518	Header Identification							Method of identifying which header is attached			
(9)	1519	Header Raise Valve Drive							Output circuit that drives the header raise valve			
(9)	1520	Header Lower Valve Drive							Output circuit that drives the header lower valve			
(9)	1521	Header Tilt Left Valve Drive							Output circuit that drives the header tilt left valve			
(9)	1522	Header Tilt Right Valve Drive							Output circuit that drives the header tilt right valve			
(9)	1523	Header Lift Cylinder Pressure Diverter Valve Drive							Output circuit that drives the header lift cylinder pressure diverter valve			
(9)	1524	Reel Position Forward Actuator							Output circuit that drives the reel position forward actuator			
(9)	1525	Reel Position Aft Actuator							Output circuit that drives the reel position aft actuator			
(9)	1526	Reel Position Raise Actuator							Output circuit that drives the reel position raise actuator			
(9)	1527	Reel Position Lower Actuator							Output circuit that drives the reel position lower actuator			
(9)	1528	Header Drop Rate Control Valve Drive							Output circuit that drives the header drop rate control valve			
(9)	1529	Header Lift Cylinder Accumulator Shutoff Valve Drive							Output circuit that drives this valve			
(9)	1530	Unloading Auger Flow Bypass Valve Drive							Output circuit that drives this valve			
(9)	1531	Reel Drive Motor Speed Increase Valve Drive							Output circuit that drives this valve			
(9)	1532	Reel Drive Motor Speed Decrease Valve Drive							Output circuit that drives this valve			
(9)	1533	Feederhouse Angle							Circuit and sensor for measuring the feederhouse angle parameter			
(9)	1534	Header Leftmost Height							Circuit and sensor for measuring the leftmost header height parameter			

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(9)	1535	Header Rightmost Height							Circuit and sensor for measuring the rightmost header height parameter			
(9)	1536	Header Center Height							Circuit and sensor for measuring the center header height parameter			
(9)	1537	Reel Fore-Aft Position							Circuit and sensor for measuring the reel fore-aft position parameter			
(9)	1538	Reel Up-Down Position							Circuit and sensor for measuring the reel up-down position parameter			
(9)	1539	Header Lateral Tilt Angle							Circuit and sensor for measuring the header lateral tilt angle parameter			
(9)	1540	Reel Speed Actuator Position							Circuit and sensor for measuring the reel speed actuator position parameter			
(9)	1541	Reel Speed							Circuit and sensor for measuring the reel speed parameter			
(9)	1542	ECU Power Supply Voltage #2							2nd supply voltage in module			
(9)	1543	ECU Power Supply Voltage #3							third supply voltage in module			
(9)	1544	Hydro Handle Matrix Switch							Multi-function handle circuit			
(9)	1545	Not used - reserved										
(9)	1546	HVAC Coolant Valve Position							Circuit and sensor associated with providing the HVAC coolant valve position parameter			
(9)	1547	A/C Evaporator Temperature							Circuit and sensor associated with providing the A/C evaporator temperature parameter			
(9)	1548	HVAC Duct Temperature							Circuit and sensor associated with providing the HVAC Duct Temperature parameter			
(9)	1549	HVAC Coolant Valve Drive							Output circuit that drives this valve			
(9)	1550	Not used - reserved										
(9)	1551	HVAC Pressurizer Drive							Output circuit that drives the blower that pressurizes the cab			
(9)	1552	HVAC Temperature Setpoint Adjustment							Circuit and sensor for measuring the HVAC temperature setpoint parameter			
(9)	1553	HVAC Blower Motor Speed Adjustment							Circuit and sensor for measuring the HVAC blower motor speed adjustment parameter			

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
(9)	1554	Clean Grain Elevator Speed							Circuit and sensor associated with providing the clean grain elevator speed parameter			
(9)	1555	Moisture Sensor Cell Frequency							critical parameter of moisture sensor			
(9)	1556	Datalog memory Card							Removable memory pack			
(9)	1557	Not used - reserved										
(9)	1558	Programming Error, Device Refused to Enter Programming Mode							Device to be programmed reporting that is cannot			
(9)	1559	Programming Error, Device Timed Out While Entering the Programming Mode							Tool timed out waiting for device to enter program mode			
(9)	1560	Programming Error, Device Timed Out While Erasing							Tool timed out waiting for device to erase			
(9)	1561	Programming Error, Device Timed Out While Programming							Tool timed out waiting for device to program			
(9)	1562	Programming Error, Device Did Not Accept Program Line							Device to be programmed reporting that it cannot accept program block			
(9)	1563	Incompatible Controller							An incompatible device has been detected on the network.			
(9)	1564	CCD Data Link							An incompatible device has been detected on the network.			
(9)	1565	Armrest Status							Parameter associated with Armrest Module Status			
(9)	1566	Armrest Rotary Inputs							Parameter associated with Armrest Module Rotary Inputs			
(9)	1567	Header Height Control Mode Selector Switches							Parameter associated with header height control mode selector switches			
(9)	1568	Torque Curve Selection							The mechanism used to select different torque curves. This SPN would be used to indicate a problem has been encountered with the device which indicates the desired Torque Curve.			
(9)	1569	Engine Protection Torque Derate							Torque derated for protection of engine			
(9)	1570	Implement Disconnected							Previously connected implement is no longer connected			

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
(9)	1571	Display Conflict							Multiple controllers contending for a display resource (region)			
(9)	1572	Display Overload							Display not able to keep up with display commands			
(9)	1573	LED Display Data #1	-71	5.2.6.105	65142	5.3.134	1	8				
(9)	1574	Laser Strike Vertical Deviation	-71	5.2.5.305	65141	5.3.135	1,2	16				
(9)	1575	Modify Set Point	-71	5.2.5.306	65140	5.3.136	1,2	16				
(9)	1576	Mast Position	-71	5.2.5.307	65139	5.3.137	1,2	16				
(9)	1577	Blade Duration and Direction	-71	5.2.5.308	65138	5.3.138	1,2	16				
(9)	1578	Blade Control Mode	-71	5.2.5.107	65138	5.3.138	3	8				
(9)	1579	Laser Tracer Target Deviation	-71	5.2.5.310	65137	5.3.139	1,2	16				
(9)	1580	Laser Tracer Vertical Distance	-71	5.2.5.311	65137	5.3.139	3,4	16				
(9)	1581	Laser Tracer Horizontal Deviation	-71	5.2.5.312	65137	5.3.139	5	8				
(9)	1582	LED Display Data #2	-71	5.2.6.106	65137	5.3.139	6	8				
(9)	1583	Laser Tracer Information	-71	5.2.5.108	65137	5.3.139	7	8				
(9)	1584	Service Component Identification	-71	5.2.5.102	56832	5.3.074	2	8	Identification of component needing service.			
(9)	1585	Powered Vehicle Weight	-71	5.2.5.273	65136	5.3.140	1,2	16				
(9)	1586	Speed of Forward Vehicle	-71	5.2.5.274	65135	5.3.141	1	8				
(9)	1587	Distance to Forward Vehicle	-71	5.2.5.275	65135	5.3.141	2	8				
(9)	1588	Adaptive Cruise Control Set Speed	-71	5.2.5.276	65135	5.3.141	3	8				
(9)	1589	Adaptive Cruise Control Set Distance Mode	-71	5.2.6.086	65135	5.3.141	4.4	3				
(9)	1590	Adaptive Cruise Control State	-71	5.2.6.087	65135	5.3.141	4.1	3				
(9)	1591	Road Curvature	-71	5.2.5.277	65135	5.3.141	5,6	16				
(9)	1592	Front Axle, Left Wheel Speed	-71	5.2.5.278	65134	5.3.142	1,2	16				
(9)	1593	Front Axle, Right Wheel Speed	-71	5.2.5.279	65134	5.3.142	3,4	16				
(9)	1594	Rear Axle, Left Wheel Speed	-71	5.2.5.280	65134	5.3.142	5,6	16				
(9)	1595	Rear Axle, Right Wheel Speed	-71	5.2.5.281	65134	5.3.142	7,8	16				
(11)	1596	Security Entity Length	-73	5.8.5.2	54272	5.8.5	1, 2.1	12				
(12)	1597	Data Security Parameter	-73	5.8.5.3	54272	5.8.5	3	na				
(9)	1598	PGN of message to be authenticated	-73									
(11)	1599	Seed	-73	5.8.2.4	55296	5.8.2	7, 8	16				

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
(9)	1600	Authentication message data parameter	-73									
(9)	1601	Local Minute Offset	-71	5.2.5.296	65254	5.3.020	7	8				
(9)	1602	Local Hour Offset	-71	5.2.5.297	65254	5.3.020	8	8				
(9)	1603	Adjust Seconds	-71	5.2.5.288	54528	5.3.144	1	8				
(9)	1604	Adjust Minutes	-71	5.2.5.289	54528	5.3.144	2	8				
(9)	1605	Adjust Hours	-71	5.2.5.290	54528	5.3.144	3	8				
(9)	1606	Adjust Month	-71	5.2.5.291	54528	5.3.144	4	8				
(9)	1607	Adjust Day	-71	5.2.5.292	54528	5.3.144	5	8				
(9)	1608	Adjust Year	-71	5.2.5.293	54528	5.3.144	6	8				
(9)	1609	Adjust Local Minute Offset	-71	5.2.5.294	54528	5.3.144	7	8				
(9)	1610	Adjust Local Hour Offset	-71	5.2.5.295	54528	5.3.144	8	8				
(9)	1611	Drive Recognize	-71	5.2.6.078	65132	5.3.143	1.7	2				
(9)	1612	Driver 1 Working State	-71	5.2.6.077	65132	5.3.143	1.1	3				
(9)	1613	Driver 2 Working State	-71	5.2.6.077	65132	5.3.143	1.4	3				
(9)	1614	Overspeed	-71	5.2.6.081	65132	5.3.143	2.7	2	Indicates whether the vehicle is exceeding the legal speed limit set in the tachograph.			
(9)	1615	Driver Card, Driver 1	-71	5.2.6.080	65132	5.3.143	2.5	2				
(9)	1616	Driver Card, Driver 2	-71	5.2.6.080	65132	5.3.143	3.5	2				
(9)	1617	Driver 1 Time Related States	-71	5.2.6.079	65132	5.3.143	2.1	4				
(9)	1618	Driver 2 Time Related States	-71	5.2.6.079	65132	5.3.143	3.1	4				
(9)	1619	Direction Indicator	-71	5.2.6.085	65132	5.3.143	4.7	2				
(9)	1620	Tachograph Performance	-71	5.2.6.084	65132	5.3.143	4.5	2				
(9)	1621	Handling Information	-71	5.2.6.083	65132	5.3.143	4.3	2				
(9)	1622	System Event	-71	5.2.6.082	65132	5.3.143	4.1	2				
(9)	1623	Tachograph Output Shaft Speed	-71	5.2.5.282	65132	5.3.143	5,6	16				
(9)	1624	Tachograph Vehicle Speed	-71	5.2.5.283	65132	5.3.143	7,8	16				
(9)	1625	Driver 1 Identification	-71	5.2.5.287	65131	5.3.145	1, 2	na				
(9)	1626	Driver 2 Identification	-71	5.2.5.287	65131	5.3.145	Var.	na				
(9)	1627	Reserved for Certification agency ID	-73									
(9)	1628	Reserved for Certification seed/key length	-73									
(9)	1629	Reserved for Certification signature	-73									
(9)	1630	Reserved for Certification public key	-73									

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(9)	1631	Reserved for Certification vehicle identification number	-73									
(6)	1632	Torque Limit Feature	-71	5.2.6.104	65168	5.3.107	15.3	3				
(11)	1633	Cruise Control Pause Switch	-71		65265	5.3.31	1.5	2	Switch signal which indicates the position of the Cruise Control Pause Switch used on Remote Cruise Control applications			
(11)	1634	Calibration Verification Number	-73	5.8.6.1	54016	5.8.6	1-4	32	Checksum of entire calibration, including code and data. Excludes RAM parameters, nonvolatile parameters that change during the life cycle of the module (hours of operation, freeze frame data, etc), or non emissions related parameters that may be changed			
(11)	1635	Calibration Identification	-73	5.8.6.2	54016	5.8.6	5 - 20	128				
(11)	1636	Intake Manifold 1 Air Temperature (High Resolution)	-71		65129		1,2	16	Temperature of pre-combustion air found in intake manifold of engine air supply system. The higher resolution is required for control purposes.			
(11)	1637	Engine Coolant Temperature (High Resolution)	-71		65129		3,4	16	Temperature of liquid found in engine cooling system. The higher resolution is required for control purposes.			
(11)	1638	Hydraulic Temperature	-71		65128		1	8	Temperature of the hydraulic fluid.			
(11)	1639	Fan Speed	-71		65213		3,4	16	The speed of the fan associated with engine coolant system.			
(11)	1640	Length/Number Requested	-73		55552	5.8.1	1, 2.1	11				
(11)	1641	Pointer Type	-73	5.8.1.1	55552	5.8.1	2.8	1				
(12)	1642	Command	-73	5.8.1.6	55552	5.8.1	2.5	3				
(11)	1643	Pointer Extension	-73	5.8.1.2	55552	5.8.1	6	8				
(11)	1644	Pointer	-73	5.8.1.3	55552	5.8.1	3 – 5	24				
(11)	1645	Key/User_Level	-73	5.8.2.1	55552	5.8.1	7 - 8	16				
(12)	1646	Status (for DM 17)	-73	5.8.1.6	55296	5.8.2	2.5	3				
(11)	1647	EDCP Extension	-73	5.8.2.2	55296	5.8.2	6	8				
(11)	1648	Error Indicator/EDC Parameter	-73	5.8.2.5	55296	5.8.2	3 - 5	24				
(11)	1649	Length/Number Allowed	-73	5.8.2.4	55296	5.8.2	1- 2.1	11				

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(11)	1650	Number of Occurrences of Raw Binary Data	-73	5.8.3.1	55040	5.8.3	1	8				
(11)	1651	Raw Binary Data	-73	5.8.3.2	55040	5.8.4	2 - 8 +	8				
(11)	1652	Boot Load Data	-73		54784			8				
(12)	1653	Vehicle Limiting Speed Governor Enable Switch	-71		57344	5.3.059	5.7	2	Switch signal which enables the Vehicle Limiting Speed Governor (VLSG) such that the vehicle speed may be either increased or decreased when the engine is off idle.			
(12)	1654	Vehicle Limiting Speed Governor Increment Switch	-71		57344	5.3.059	5.5	2	Switch signal which increases the Vehicle Limiting Speed Governor (VLSG).			
(12)	1655	Vehicle Limiting Speed Governor Decrement Switch	-71		57344	5.3.059	5.3	2	Switch signal which decreases the Vehicle Limiting Speed Governor (VLSG).			
(12)	1656	Engine Automatic Start System Enable Switch			57344	5.3.059	6.7	2	Switch signal which enables the idle management system to be enabled. When this system is enabled with the engine in an idle mode and safe operating conditions existing, then the engine may be started or stopped automatically.			
(12)	1657	Injector Needle Lift Sensor #1							The injector needle lift sensor is used to detect the initial movement of the injector component which correlates to the start of fuel injection.	128	118	
(12)	1658	Injector Needle Lift Sensor #2							The injector needle lift sensor is used to detect the initial movement of the injector component which correlates to the start of fuel injection.	128	119	
(12)	1659	Coolant System Thermostat							Coolant System Thermostat monitors the temperature of the coolant, and based on that temperature can cycle the coolant through the radiator, or bypass the radiator.	128	120	
(12)	1660	Engine Automatic Start Alarm							The Auto Start Alarm is an audio alarm which is activated just before the Auto Start Feature is engaged.	128	121	
(12)	1661	Engine Automatic Start Lamp							The Auto Start Lamp is a visible indication to the driver/operator that the Auto Start Feature has	128	122	

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
									been engaged.			
(12)	1662	Cab Interior Temperature Thermostat							The Cab Interior Temperature Thermostat is used by the driver/operator to set the desired cab temperature			215
(12)	1663	Engine Automatic Start Safety Interlock Circuit							The Auto Start Safety Interlock Circuit looks at a series of switches to determine that it is safe enough for the Auto Start feature to start the engine. An example of the monitored switches are: Hood position switch (open/closed), Parking Brake postion (engaged/disengaged), Neutral switch (transmission is in Neutral or not), and some customer definible switches.		128	123
(12)	1664	Engine Automatic Start Failed (Engine)							The Auto Start feature starts the engine to maintain the driver/operator desired cab temperature. Other conditions may also influence Auto Start of Engine.		128	124
(12)	1665	Turbo Oil Level Switch			65245	5.3.011	4.7	2	Switch signal which indicates the presence of oil at the turbocharger			
(12)	1666	Automatic Gear Shifting Enable Switch			57344	5.3.059	6.5	2				
(12)	1667	Retarder Brake Light Request	-71		61440	5.3.003	4.3	2	Indicates that whether the retarder is requesting that the brake lights are illuminated.			
(12)	1668	J1939 Network # 4										
(12)	1669	J1939 Network # 5										
(12)	1670	J1939 Network # 6										
(12)	1671	J1939 Network # 7										
(12)	1672	J1939 Network # 8										
(12)	1673	J1939 Network # 9										
(12)	1674	J1939 Network # 10										
(12)	1675	Engine Starter Mode	-71		61444	5.3.007	7.1	4	there are several phases in a starting action and different reasons, why a start cannot take place.			
(12)	1676	Heater Water Pump Status	-71		65133		5.1	2	State of heater water pump			
(12)	1677	Heater Mode	-71		65133	5.3.???	4.1	4	State of the heater			
(12)	1678	Cab Ventilation	-71		65133	5.3.???	5.3	2	Parameter indicating whether the cab is being ventilated or not.			
(12)	1679	Engine Heating Zone	-71		65133	5.3.???	5.5	2	Parameter indicating whether the engine zone is being heated.			
(12)	1680	Cab Heating Zone	-71		65133	5.3.???	5.7	2	Parameter indicating whether the cab zone is being heated.			

Rev. Num	SPN	J1939 Reference Parameter		J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
(12)	1681	Battery Main Switch Hold State		-71		65126	5.3.???	1.1	2	Parameter indicating whether the battery main switch is held due to an external request or not. The state Batter Main Switch Held indicates that the batter main switch is about to shut off.			
(12)	1682	Battery Main Switch Hold Request		-71		57344	5.3.059	4.3	2	Request to hold the batter main switch			
(12)	1683	Heater Mode Request		-71		57344	5.3.059	7.1	4	Request to activate the heater.			
(12)	1684	Heater Coolant Pump Request		-71		57344	5.3.059	4.1	2	Request to activate a coolant circulation pump external to the engine.			
(12)	1685	Request Engine Zone Heating		-71		57344	5.3.059	7.5	2	Request to activate engine zone heating.			
(12)	1686	Request Cab Zone Heating		-71		57344	5.3.059	7.7	2	Request to activate cab zone heating.			
(12)	1687	Heater Output Coolant Temperature		-71		65133		1	8	Temperature of the coolant in a water heater system.			
(12)	1688	Heater Input Air Temperature		-71		65133		2	8	Temperature of the input air in a heater system.			
(12)	1689	Heater Output Power Percent		-71		65133		3	8	Current heater output power, relative to the heater maximum output power.			
(12)	1690	Heater Maximum Output Power		-71		65127	5.3.???	1,2	16	The maximum output power of the heater.			
(12)	1691	Cab Interior Temperature Request		-71		57344	5.3.059	2,3	16	Parameter used to request a certain cab interior temperature.			
(12)	1692	Desired Absolute Intake Manifold Pressure (Turbo Boost Limit)					5.3.079	2,3	16	The desired absolute intake manifold pressure of the engine.			
(12)	1693	Wastegate Valve Position		-71		65194	5.3.079	4	8	The position of the turbocharger wastegate valve (not the electronic wastegate control valve).			
(12)	1694	Gas Mass Flow Sensor Fueling Correction				65194	5.3.079	5		The amount of fuel the Gas Mass Flow Sensor is sensing should be added or subtracted compared to the maximum amount of fuel the control system allows the sensor to add or subtract.			
(12)	1695	Exhaust Gas Oxygen Sensor Fueling Correction				65193	5.3.080	7	8	The amount of fuel the Exhaust Gas Oxygen (EGO) Sensor is snesing should be added or subtracted compared to the maximum amount of fuel the control system allows the sensor to add or subtract.			
(12)	1696	Exhaust Gas Oxygen Sensor Closed Loop Operation				65193	5.3.080	8.7	2	An indicator stating whether the engine is operating using the Exhaust Gas Oxygen sensor to control the air/fuel ratio which the engine is operating. Mode 00 means engine not using the Exhaust Gas Oxygen sensor. Mode 01 means engine using the Exhaust Gas Oxygen sensor or a closed loop operation.			
(12)	1697	CTI Wheel End Electrical Fault		-71	5.3.34	65268	5.3.034	5.5	2	Indicates the status of electrical fault on CTI wheel interface			
(12)	1698	CTI Tire Status		-71	5.3.34	65268	5.3.034	5.3	2	Indicates the status of the tire			
(12)	1699	CTI Wheel Sensor Status		-71	5.3.34	65268	5.3.034	5.1	2	Indicates whether the wheel is being monitored by the CTI controller.			
(12)	1700	Lane Departure Imminent, Left Side		-71		61447	5.3.???	1.7	2	Indicates departure imminent on left			

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	PID	MID	SID
									side of lane.			
(12)	1701	Lane Departure Imminent, Right Side	-71		61447	5.3.???	1.5	2	Indicates departure imminent on right side of lane			
(12)	1702	Lane Departure Indication Enable Status			65115	5.3.???	1.7	2	Indicates whether Lane departure active			
(12)	1703	Lane Tracking Speaker - Right Side	-71						Lane tracking right side output diagnostic object			
(12)	1704	Lane Tracking Speaker - Left Side	-71						Lane tracking left side output diagnostic object			
(12)	1705	Forward View Imager System	-71						Forward Imager system condition			
(12)	1706	SPN Conversion Method	-73									
	1707-1708	Unassigned										
	1709	Transmission Controller Power Relay										
(13)												
(13)												
(13)												
(13)												
(13)												
(13)												
(13)												
(13)												
(13)												
(13)												
(13)												
	1710 to 1999	Unassigned										
(10)	2000	Source Address 0										
(10)	2001	Source Address 1										
(10)	2002	Source Address 2										
(10)	2003	Source Address 3										
(10)	2004	Source Address 4										
(10)	2005	Source Address 5										

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(10)	2006	Source Address 6										
(10)	2007	Source Address 7										
(10)	2008	Source Address 8										
(10)	2009	Source Address 9										
(10)	2010	Source Address 10										
(10)	2011	Source Address 11										
(10)	2012	Source Address 12										
(10)	2013	Source Address 13										
(10)	2014	Source Address 14										
(10)	2015	Source Address 15										
(10)	2016	Source Address 16										
(10)	2017	Source Address 17										
(10)	2018	Source Address 18										
(10)	2019	Source Address 19										
(10)	2020	Source Address 20										
(10)	2021	Source Address 21										
(10)	2022	Source Address 22										
(10)	2023	Source Address 23										
(10)	2024	Source Address 24										
(10)	2025	Source Address 25										
(10)	2026	Source Address 26										
(10)	2027	Source Address 27										
(10)	2028	Source Address 28										
(10)	2029	Source Address 29										
(10)	2030	Source Address 30										
(10)	2031	Source Address 31										
(10)	2032	Source Address 32										
(10)	2033	Source Address 33										
(10)	2034	Source Address 34										
(10)	2035	Source Address 35										
(10)	2036	Source Address 36										
(10)	2037	Source Address 37										
(10)	2038	Source Address 38										
(10)	2039	Source Address 39										
(10)	2040	Source Address 40										

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(10)	2041	Source Address 41										
(10)	2042	Source Address 42										
(10)	2043	Source Address 43										
(10)	2044	Source Address 44										
(10)	2045	Source Address 45										
(10)	2046	Source Address 46										
(10)	2047	Source Address 47										
(10)	2048	Source Address 48										
(10)	2049	Source Address 49										
(10)	2050	Source Address 50										
(10)	2051	Source Address 51										
(10)	2052	Source Address 52										
(10)	2053	Source Address 53										
(10)	2054	Source Address 54										
(10)	2055	Source Address 55										
(10)	2056	Source Address 56										
(10)	2057	Source Address 57										
(10)	2058	Source Address 58										
(10)	2059	Source Address 59										
(10)	2060	Source Address 60										
(10)	2061	Source Address 61										
(10)	2062	Source Address 62										
(10)	2063	Source Address 63										
(10)	2064	Source Address 64										
(10)	2065	Source Address 65										
(10)	2066	Source Address 66										
(10)	2067	Source Address 67										
(10)	2068	Source Address 68										
(10)	2069	Source Address 69										
(10)	2070	Source Address 70										
(10)	2071	Source Address 71										
(10)	2072	Source Address 72										
(10)	2073	Source Address 73										
(10)	2074	Source Address 74										
(10)	2075	Source Address 75										

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	PID	MID	SID
(10)	2076	Source Address 76										
(10)	2077	Source Address 77										
(10)	2078	Source Address 78										
(10)	2079	Source Address 79										
(10)	2080	Source Address 80										
(10)	2081	Source Address 81										
(10)	2082	Source Address 82										
(10)	2083	Source Address 83										
(10)	2084	Source Address 84										
(10)	2085	Source Address 85										
(10)	2086	Source Address 86										
(10)	2087	Source Address 87										
(10)	2088	Source Address 88										
(10)	2089	Source Address 89										
(10)	2090	Source Address 90										
(10)	2091	Source Address 91										
(10)	2092	Source Address 92										
(10)	2093	Source Address 93										
(10)	2094	Source Address 94										
(10)	2095	Source Address 95										
(10)	2096	Source Address 96										
(10)	2097	Source Address 97										
(10)	2098	Source Address 98										
(10)	2099	Source Address 99										
(10)	2100	Source Address 100										
(10)	2101	Source Address 101										
(10)	2102	Source Address 102										
(10)	2103	Source Address 103										
(10)	2104	Source Address 104										
(10)	2105	Source Address 105										
(10)	2106	Source Address 106										
(10)	2107	Source Address 107										
(10)	2108	Source Address 108										
(10)	2109	Source Address 109										
(10)	2110	Source Address 110										

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	PID	MID	SID
(10)	2111	Source Address 111										
(10)	2112	Source Address 112										
(10)	2113	Source Address 113										
(10)	2114	Source Address 114										
(10)	2115	Source Address 115										
(10)	2116	Source Address 116										
(10)	2117	Source Address 117										
(10)	2118	Source Address 118										
(10)	2119	Source Address 119										
(10)	2120	Source Address 120										
(10)	2121	Source Address 121										
(10)	2122	Source Address 122										
(10)	2123	Source Address 123										
(10)	2124	Source Address 124										
(10)	2125	Source Address 125										
(10)	2126	Source Address 126										
(10)	2127	Source Address 127										
(10)	2128	Source Address 128										
(10)	2129	Source Address 129										
(10)	2130	Source Address 130										
(10)	2131	Source Address 131										
(10)	2132	Source Address 132										
(10)	2133	Source Address 133										
(10)	2134	Source Address 134										
(10)	2135	Source Address 135										
(10)	2136	Source Address 136										
(10)	2137	Source Address 137										
(10)	2138	Source Address 138										
(10)	2139	Source Address 139										
(10)	2140	Source Address 140										
(10)	2141	Source Address 141										
(10)	2142	Source Address 142										
(10)	2143	Source Address 143										
(10)	2144	Source Address 144										
(10)	2145	Source Address 145										

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	PID	MID	SID
(10)	2146	Source Address 146										
(10)	2147	Source Address 147										
(10)	2148	Source Address 148										
(10)	2149	Source Address 149										
(10)	2150	Source Address 150										
(10)	2151	Source Address 151										
(10)	2152	Source Address 152										
(10)	2153	Source Address 153										
(10)	2154	Source Address 154										
(10)	2155	Source Address 155										
(10)	2156	Source Address 156										
(10)	2157	Source Address 157										
(10)	2158	Source Address 158										
(10)	2159	Source Address 159										
(10)	2160	Source Address 160										
(10)	2161	Source Address 161										
(10)	2162	Source Address 162										
(10)	2163	Source Address 163										
(10)	2164	Source Address 164										
(10)	2165	Source Address 165										
(10)	2166	Source Address 166										
(10)	2167	Source Address 167										
(10)	2168	Source Address 168										
(10)	2169	Source Address 169										
(10)	2170	Source Address 170										
(10)	2171	Source Address 171										
(10)	2172	Source Address 172										
(10)	2173	Source Address 173										
(10)	2174	Source Address 174										
(10)	2175	Source Address 175										
(10)	2176	Source Address 176										
(10)	2177	Source Address 177										
(10)	2178	Source Address 178										
(10)	2179	Source Address 179										
(10)	2180	Source Address 180										

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	PID	MID	SID
(10)	2181	Source Address 181										
(10)	2182	Source Address 182										
(10)	2183	Source Address 183										
(10)	2184	Source Address 184										
(10)	2185	Source Address 185										
(10)	2186	Source Address 186										
(10)	2187	Source Address 187										
(10)	2188	Source Address 188										
(10)	2189	Source Address 189										
(10)	2190	Source Address 190										
(10)	2191	Source Address 191										
(10)	2192	Source Address 192										
(10)	2193	Source Address 193										
(10)	2194	Source Address 194										
(10)	2195	Source Address 195										
(10)	2196	Source Address 196										
(10)	2197	Source Address 197										
(10)	2198	Source Address 198										
(10)	2199	Source Address 199										
(10)	2200	Source Address 200										
(10)	2201	Source Address 201										
(10)	2202	Source Address 202										
(10)	2203	Source Address 203										
(10)	2204	Source Address 204										
(10)	2205	Source Address 205										
(10)	2206	Source Address 206										
(10)	2207	Source Address 207										
(10)	2208	Source Address 208										
(10)	2209	Source Address 209										
(10)	2210	Source Address 210										
(10)	2211	Source Address 211										
(10)	2212	Source Address 212										
(10)	2213	Source Address 213										
(10)	2214	Source Address 214										
(10)	2215	Source Address 215										

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
(10)	2216	Source Address 216										
(10)	2217	Source Address 217										
(10)	2218	Source Address 218										
(10)	2219	Source Address 219										
(10)	2220	Source Address 220										
(10)	2221	Source Address 221										
(10)	2222	Source Address 222										
(10)	2223	Source Address 223										
(10)	2224	Source Address 224										
(10)	2225	Source Address 225										
(10)	2226	Source Address 226										
(10)	2227	Source Address 227										
(10)	2228	Source Address 228										
(10)	2229	Source Address 229										
(10)	2230	Source Address 230										
(10)	2231	Source Address 231										
(10)	2232	Source Address 232										
(10)	2233	Source Address 233										
(10)	2234	Source Address 234										
(10)	2235	Source Address 235										
(10)	2236	Source Address 236										
(10)	2237	Source Address 237										
(10)	2238	Source Address 238										
(10)	2239	Source Address 239										
(10)	2240	Source Address 240										
(10)	2241	Source Address 241										
(10)	2242	Source Address 242										
(10)	2243	Source Address 243										
(10)	2244	Source Address 244										
(10)	2245	Source Address 245										
(10)	2246	Source Address 246										
(10)	2247	Source Address 247										
(10)	2248	Source Address 248										
(10)	2249	Source Address 249										
(10)	2250	Source Address 250										

Rev. Num	SPN	J1939 Reference Parameter	J1939 Doc.	Doc. Para	PGN Number	PGN Para	Pos. in PG	Bit Size	SPN Description	J1587 Reference PID	MID	SID
(10)	2251	Source Address 251										
(10)	2252	Source Address 252										
(10)	2253	Source Address 253										
(10)	2254	Source Address 254										
(10)	2255	Source Address 255										

Notes: Revision dates (not all tables had revisions on all of these dates)

(1) July, 1996   (7) February 1998   (13) July 1999
(2) October, 1996   (8) April 1998
(3) January, 1997   (9) July 1998
(4) April, 1997   (10) October 1998
(5) August 1997   (11) February 1999
6) November 1997   (12) May 1999

APPENDIX D

ASSIGNMENT REQUEST FORMS

The request process and forms are maintained on the SAE web site under the public FORUM area:

http://forums.sae.org/access/dispatch.cgi/TETEpf/docProfile/100077/d20030507173653/No/SAE%20J1939%20Request%20Form%20R1.3.doc

Rationale

Section 2.4 was updated to include the latest information on which documents within the J1939 family of documents have been published.

Appendix A, B and C were revised to include changes and additions approved and balloted through December 2001.

Appendix D has been completely revised. Paper request forms will no longer be used. All requests will be made electronically.

Relationship of SAE Standard to ISO Standard

Not applicable.

Application

These Recommended Practices are intended for light, medium, and heavy duty vehicles used on or off road as well as appropriate stationary applications which use vehicle derived components (e.g. generator sets). Vehicles of interest include, but are not limited to: on and off highway trucks and their trailers; construction equipment; and agricultural equipment and implements.

The purpose of these Recommended Practices is to provide an open interconnect system for electronic systems. It is the intention of these Recommended Practices to allow Electronic Control Units to communicate with each other by providing a standard architecture.

Reference Section

ISO 7498 Information Processing Systems - Open Systems Interconnection (OSI) - Basic Reference Model.

ISO 11898 Road Vehicles — Interchange of Digital Information — Controller Area Network (CAN) for High Speed Communication, December 1992

ISO 11992 Road Vehicles - Electrical Connections Between Towing and Towed Vehicles - Interchange of Digital Information (Parts 1, 2, 3)

SAE J1213 Glossary of Automotive Electronic Terms

SAE J1708 Recommended Practice for Serial Data Communication Between Microcomputer Systems in Heavy Duty Vehicle Applications.

SAE J1587 Recommended Practice for Electronic Data Interchange Between Microcomputer Systems in Heavy Duty Vehicle Applications

SAE J1922 Powertrain Control Interface for Electronic Controls Used in Medium and Heavy Duty Diesel On-Highway Vehicle ApplicationsSAE J551—The RefItems style tag is used to list the documents.

Developed By the SAE Truck and Bus Control and Communications Network Subcommittee

Sponsored By the SAE Truck and Bus Electrical/Electronics Committee