BRITISH STANDARD

BS ISO 22902-6:2006

Road vehicles — Automotive multimedia interface —

Part 6: Vehicle interface requirements

ICS 43.040.15

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National foreword

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Road vehicles — Automotive multimedia interface —

Part 6: Vehicle interface requirements

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Foreword

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

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

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

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

ISO 22902-6 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

ISO 22902 consists of the following parts, under the general title *Road vehicles — Automotive multimedia interface*:

— *Part 1: General technical overview*

— *Part 2: Use cases*

— *Part 3: System requirements*

— *Part 4: Network protocol requirements for vehicle interface access*

— *Part 5: Common message set*

— *Part 6: Vehicle interface requirements*

— *Part 7: Physical specification*

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Introduction

A **Vehicle Interface** is defined as a component that provides access to vehicle services from a compliant network. It may act as a gateway to a vehicle-manufacturer-defined network, or it may implement some or all of the vehicle services directly. The **Vehicle Services Interface** is defined as the logical collection of vehicle services implemented by all Vehicle Interfaces in the vehicle.

This document describes the services typically associated with the Vehicle Interface in a system that is compliant with the “AMI-C” specification. These services are grouped into four categories: vehicle services, power management services, Human-Machine Interface (HMI) services, and audio services.

A vehicle service is a function that controls vehicle operations such as door locking and unlocking, data related to the vehicle itself such as diagnostic information, or a system signal indicating vehicle status information such as vehicle speed or fuel level. Vehicle services must be implemented in a Vehicle Interface component.

Power management services control the states, and transition between power states, of the multimedia system, and provide for orderly startup and shutdown of system components. The policy for managing the power states and transitions is derived from carmaker-specific requirements but is implemented as a standard interface on the “AMI-C” system. Power Management Services must be implemented in a Vehicle Interface component.

HMI services provide a standard interface to displays and/or audible interfaces intended for occupants of the vehicle. The policy for displaying and/or annunciating conditions and information in the vehicle is owned by the carmaker. The HMI services are likely to be implemented in a Vehicle Interface component, however they may be partitioned elsewhere at the carmaker’s discretion.

Audio services provide a method for devices in the “AMI-C” system to access audio resources. Since it is possible that more than one source may be vying for the use of a resource at a single time, the policy regarding the priority of individual services requesting access to audio services and the arbitration scheme used to ultimately grant access to one or more functions is owned by the carmaker. The audio services are likely to be implemented in a Vehicle Interface component; however, they may be partitioned elsewhere if the carmaker deems this appropriate.

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Road vehicles — Automotive multimedia interface —

Part 6:
Vehicle interface requirements

1 Scope

This part of ISO 22902 defines the services provided by the Vehicle Interface. Those services are implemented in an “AMI-C” system in one or both of two ways:

1) as messages on a multimedia network, and

2) as Java Classes in the vehicle interface API (Application Programming Interface).

These are described in separate specifications.

This part of ISO 22902 has the following sections:

— **Vehicle services**. This section presents core services, the vehicle body status and control group, audio services, the powertrain status and control group, security services, and the vehicle diagnostics group.

— **Power management systems**. This section presents system state, power mode, boot sequence messages and shutdown sequence messages.

— **HMI services**. This section provides information about messages sent to the HMI manager as well as the messages that form HMI manager responses. Details about HMI manager are included in Annex A.

— **Audio services**. This section describes elements of audio services typically found in vehicles.

— **Requirements for compliance**. This section presents requirements for “AMI-C” compliance of an implementation of vehicle interface.

2 Normative references

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

Reference specifications may change. The user must check with the publishing organization and/or automakers for the current requirements.

ISO 22902-1, *Road vehicles — Automotive multimedia interface — Part 1: General technical overview*

ISO 3779, *Road vehicles — Vehicle identification number (VIN) — Content and structure*

ISO 639-1, *Codes for the representation of names of languages — Part 1: Alpha-2 code*

ISO 639-2, *Codes for the representation of names of languages — Part 2: Alpha-3 code*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 22902-1 and the following apply.

3.1
subscription types
service that allows a requestor to register for updates to a parameter without explicitly requesting each update

NOTE There are two types of subscription services, periodic and notification.

3.2
periodic subscription
subscription where the basis for a message being sent is the expiration of a timer

3.3
notification
subscription where the basis for the transmission of the message is that the parameter contained in the message has changed

3.4
service primitive reference
terms which are used in the definitions of the Vehicle Interface Services

3.5
Request
term used in the service primitive to indicate the part of the service where the value of a parameter is being queried

EXAMPLE `Request: Inquire VehicleCore Make-Model`

3.6
Reply
term used in the service primitive to indicate the part of the service where the value of a parameter is being provided

EXAMPLE `Reply:  Report VehicleCore Make-Model <Make-Modeldata>`

3.7
Inquire
term used in the service primitive as the key word for the process of querying a parameter

EXAMPLE `Request: Inquire VehicleCore Make-Model`

3.8
Report
term used in the service primitive as the key word for the process of responding with the value of a parameter

EXAMPLE `Reply:  Report VehicleCore Make-Model <Make-Modeldata>`

3.9
Command
term used in the service primitive to indicate the part of the service where control is being exercised over the value of a parameter

EXAMPLE `Command: Audio SoundChime <chimetype> [on, off]`

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3.10
Update
term used in the service primitive to indicate the part of the service where a periodic subscription is being initiated

EXAMPLE `Request: Update VehicleStatus Speed`

3.11
EndUpdate
term used in the service primitive to indicate the part of the service where a periodic subscription is being cancelled

EXAMPLE `Request: EndUpdate VehicleStatus Speed`

3.12
Notify
term used in the service primitive to indicate the part of the service where a notification subscription is being initiated

EXAMPLE `Request: Notify If VehicleStatus OdometerDelta`

3.13
EndNotify
term used in the service primitive to indicate the part of the service where a notification subscription is being cancelled

EXAMPLE `Request: EndNotify VehicleStatus OdometerDelta`

4 Vehicle services

4.1 Core services

The core services must be present in every vehicle interface to comply with the specification. These services represent the basic elements needed to implement a compliant vehicle interface.

The first group of core services provides vehicle identification and configuration information to components. The configuration information is required to allow compliant components to inter-operate between different vehicles.

In the descriptions below, individual functions are identified using courier font. Parameters are enclosed in angle brackets, and alternatives are enclosed in square brackets.

4.1.1 VIN (vehicle identification number) status

This service shall provide the VIN to any node on the network that requests it. The associated messages are:

```
Request:      Inquire VehicleCore VIN
Reply:        Report VehicleCore VIN <VINdata>
```

Where `<VINdata>` is a (17 character) string, the format of the string will correspond to that specified in ISO 3779 or one of the regional variants of that standard.

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4.1.2 Manufacturer, model, and model year status

This service shall return information regarding the vehicle manufacturer, model and date of manufacture.

```
Request:        Inquire VehicleCore Make-Model
Reply:          Report VehicleCore Make-Model <Make-Modeldata>
```

Where `<Make-Modeldata>` is a triplet consisting of two strings and a date. The first string (32 characters max) contains the manufacturer name, the second the model name (also 32 characters max). The date is the vehicle's model year as a four digit number. This should correspond to the model year encoded in the VIN.

4.1.3 Manufacturing date and location status

This service returns the date the vehicle was manufactured and the location.

```
Request:        Inquire VehicleStatus DateOfManufacture
Reply:          Report VehicleStatus DateOfManufacture <day> <month>
                <year> <location>
```

where <day> = (1..31), <month> = (1..12), <year> = (0..9999), and <location> is a string (max length of 32 characters). The vehicle manufacturer defines the possible values of this string.

4.1.4 Language status

The service returns the default language code to be used by the vehicle HMI.

```
Request:        Inquire VehicleStatus Language
Reply:          Report VehicleStatus Language <code>
```

where <code> is a field encapsulating the two-digit ISO 639 value for the default language. Examples of the these codes are listed in the table below:

ISO 639 Language Codes (2 byte character)					
en = English	es = Spanish	fr = French	it = Italian	de = German	ja = Japanese
zh = Chinese	ru = Russian	pt = Portuguese	ko = Korean	el = Greek	sv = Swedish
nl = Netherlands					

4.1.5 Vehicle description data status

This service shall return information about the physical description of the vehicle and systems that are present in the vehicle, such as number of doors, number of power windows, number of power seats, fuel tank capacity, cruise control, ABS, etc.

```
Request:        Inquire VehicleCore VehicleDescription
Reply:          Report VehicleCore VehicleDescription
                <VehicleDataStructure>
```

The vehicle data structure shall contain the following data:

- Display Units - This field indicates the units displayed by the vehicle HMI:
  - Displayed Units of Speed 0=Metric 1=English
  - Displayed Units of Distance 0=Metric 1=English

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- Displayed Units of Volume 0=Metric 1=English
- Displayed Units of Temp 0=Metric 1=English

— Number of Doors – the number of doors in the vehicle. A door with any of the following characteristics is a candidate for inclusion in this count:

— the open/closed status can be determined

— the locked/unlocked status can be determined

— the locked/unlocked status can be changed

— Door Configuration - This field provides a door description including:

- the capability of the vehicle to report the closed or not closed status of doors (0=no capability; 1=other, 2=driver door explicit, all others combined; 3=all doors explicit).
- the capability to determine the locked vs unlocked status of doors (0=no capability; 1=other, 2=driver door explicit, all others combined; 3=all doors explicit).
- the capability to change the locked vs unlocked status of doors (0=no capability; 1=other, 2=driver door explicit, all others combined; 3=all doors explicit).

— Number and location of seats – This service shall return a data object consisting of the number of seats in the vehicle (integer) and the position of the seats in the vehicle in the form of a Boolean array:

Row 1			Row 2			Row 3			Row 4			Row 5		
L	C	R	L	C	R	L	C	R	L	C	R	L	C	R

Where L=left, C=center, R=right. A “true” indicates that the vehicle has a seat in the row and corresponding position.

— Controllable seats

```
<seatDescription> = <n> <Seat 1> <Seat 2> ... <Seat n>
```

Where each seat has the form:

```
<position> <tilt> <height> <forward> <lumbar> <number of memory
positions> <heater>
```

<position> is a value from an enumerated list of seat positions <position> = driver=1, middlefront=2, passenger=3, secondrowleft=4, secondrowmiddle=5, secondrowright=6, thirdrowleft=7, thirdrowmiddle=8, thirdrowright=9, fourthrowleft=10, fourthrowmiddle=11, fourthrowright=12, fifthrowleft=13, fifthrowmiddle=14, fifthrowright=15.

<tilt> <height> <forward> <lumbar> are each values from an enumerated list that includes 0=no control or position reported, 1=control but no position, 2=no control but position reported, 3=both control and position reported

<number of memory positions> is an integer indicating the number of possible memory presets supported by the seat.

<heater> is a Boolean indicating that the seat is equipped with a seat heater that can be controlled via the network.

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— Number / location of windows - this service returns a window description including:

  — The number of windows. Windows that can be either controlled, or whose position can be known (or both) are candidates for inclusion in this count.

  — A parameter that describes the configuration of controllable windows 0=none; 1=other, 2=coupe (driver and passenger windows); 3=sedan (four controllable windows); 4=wagon (4 plus rear window).

  — A parameter that indicates if the vehicle is capable of reporting no information about position, windows are open, windows are closed, or specific window positions.

Windshield Washer Liquid Capacity – indicates the capacity of the front, rear and headlamp washer liquid tanks in liters.

Wheels – an integer indicating the number of wheels on the vehicle.

— Mirrors (number, type) - This service returns a data object with the form:

```
<mirrorDescription> = <n> <mirror 1> ... <mirror n>
```

where each mirror has the form:

```
<position> <l limit> <r limit> <u limit> <d limit> <surface>
```

<position> is a value from an enumerated list of mirror locations including Driver, Center and Passenger.

<l limit> and <u limit> are negative values indicating the maximum movement in the left or up directions.

<r limit> and <d limit> are positive values indicating the maximum movement in the right or down directions.

NOTE the normal or unrotated position of the mirror is 0 in the left and right direction and 0 in the up and down position.

<surface> is a Boolean value indicating the presence of a photo chromic surface.

— Interior lights capability - a value from an enumerated list including no control/no reporting, control/no reporting, no control/reporting, reporting and control.

— Exterior lights capability - a value from an enumerated list including no control/no reporting, control/no reporting, no control/reporting, reporting and control.

— Engine description - This service returns a data object of the form:

<engineDescription> = < Engine Identification> < Engine type> <Number of cylinders> <displacement> <rated power>

where:

<Engine Identification> a string representing the manufacturer's name for the engine.

<Engine type> (SI, Diesel, Electric, Hybrid, Other)

<Number of cylinders> = 0 to 16

<Displacement> = Cubic Centimeters

<Rated power> = kilowatts

— Cruise Control - the vehicle’s cruise control type. Supported types are none, standard, adaptive.

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— Number of Gears – indicates the number of gears in the vehicle's transmission.

— Sunroofs – indicates the number of sunroofs in the vehicle.

— Transmission Type - the transmission type in the vehicle. Supported types are: manual, automatic or semi-automatic.

— ABS - the vehicle's antilock brake system type, where <type> = none, two wheel, four wheel.

— Traction Control – [present, not present]

— Variable Suspension – [present, not present]

— Vehicle AntiTheft System - indicates the presence (or lack) of a system to prevent a vehicle from being stolen (Immobilizer or restart inhibit systems).

— Content Theft System - indicates the presence (or lack) of a system to deter a thief from stealing possessions from inside a vehicle or entering the vehicle to attempt to steal it (Warning Siren or Burglar Alarm systems).

— Door Lock Type – indicates if the vehicle has manual or electrically actuated door locks.

— Convertible Top Type – none, manual soft top, automatic soft top or hard top.

— Fuel Capacity - the vehicle fuel capacity. Includes parameters for tank and capacity where <tank> = (first, second), and <capacity> is the individual tank's capacity in liters.

— Fuel Type – an enumerated list indicating the type (or types) of fuel used in the vehicle. Supported types are: unleaded gasoline, leaded gasoline, electric, diesel, natural gas, and methanol.

— Vehicle Dimensions – indicates the vehicle length (m), width (m), height (m) and weight (kg).

— Drive Type – indicates front, rear, 4-wheel or all wheel drive type.

— Steering Wheel Location – Indicates right or left hand drive.

— System Voltage – allows indication of 12, 24 or 42 volts systems (a single vehicle may have more than one type indicated).

— Tire Monitoring System – indicates in the vehicle has a tire inflation monitoring system (no absolute pressure available), an actual tire pressure monitoring system, or no monitoring system installed.

— OBD code regional variant - [U.S., Europe, Japan] - This field shall indicate the regional variant of the OBD codes used by the vehicle.

— Implemented warning lights—binary vector indicating the warning lights implemented in the vehicle.

```
For each field, the data structure may return a value of "no
                information". This means that the vehicle services
                interface has no information about the corresponding
                characteristics of the vehicle and also that it does
                not implement any services that use that feature.
```

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4.1.6 AMI-C version / release status

This service returns the data describing the version of the ISO 22902 specification that is implemented by this system.

```
Request:        Inquire VehicleCore AMI-C version
Reply:          Report VehicleCore AMI-C version <versiondata>
```

Where <versiondata> consists of:

majorRelease INTEGER (2..31)

minorRelease INTEGER (0..31)

majorVersion INTEGER (0..31)

minorVersion INTEGER (0..31)

4.1.7 Configured services status

Describe the services that the vehicle interface supports, returning a Vehicle Interface Service structure with each of the supported services described.

```
Request:        Inquire VehicleCore Services
Reply:          Report VehicleCore Services <Vehicle Interface
                Service Structure>
```

The Vehicle Interface Service Structure is a Boolean vector with one entry for each vehicle service described in this specification., including the core services. The entry is TRUE if the corresponding service is implemented in the vehicle interface and FALSE otherwise. The Vehicle service structure may be used to determine if the vehicle interface will support the set of services required for a particular application.

4.2 Vehicle status and control group

This group includes services that return information on the current state of the vehicle, such as vehicle speed, odometer reading, etc. This information is provided in response to a request, so each service consists of a request, reply pair.

4.2.1 Vehicle speed status

Vehicle speed is returned by this service. The value is returned in kilometers per hour.

```
Request:        Inquire VehicleStatus Speed
Reply:          Report VehicleStatus Speed <Speed>
```

where <Speed> is a number from 0 to 4095, with each bit equal to 0.1 kph.

Vehicle speed may also be requested as a periodic service (or subscription).

```
Request:        Update VehicleStatus Speed
Reply:          Report VehicleStatus Speed <Speed>
Request:        EndUpdate VehicleStatus Speed
```

The response is the same message as the response to a single vehicle speed request, but it is repeated at a rate of one message every 100 ms.

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4.2.2 Vehicle location status

Vehicle location is included in the vehicle interface, in the expectation that it may be implemented on the vehicle side of the interface rather than the

ISO 22902 side. However, it might also be included in the navigation interface specification.

```
Request:      Inquire Vehicle Location Coordinates
Reply:        Report Vehicle Location Coordinates <year>, <month>,
              <day>, <hours>, <minutes>, <secs>, <latitudeZone>,
              <latitudeDegree>, <latitudeMinute>,
              <latitudeSubMinute>, <longitudeZone>,
              <longitudeDegree>, <longitudeMinute>,
              <longitudeSubMinute>, <velocity>, <direction>
```

Where:

<year>=INTEGER(0..255)

<month>=INTEGER(1..12)

<day>=INTEGER(1..31)

<hours>=INTEGER(0..23)

<minutes>=INTEGER(0..59)

<secs>=INTEGER(0..59)

<latitudeZone>=INTEGER(0..1)

<latitudeDegree>=INTEGER(0..90)

<latitudeMinute>=INTEGER(0..59)

<latitudeSubMinute>=INTEGER(0..9999)

<longitudeZone>=INTEGER(2..3)

<longitudeDegree>=INTEGER(0..179)

<longitudeMinute>=INTEGER(0..59)

<longitudeSubMinute>=INTEGER(0..9999)

<velocity>=INTEGER(0..255)

<direction>=INTEGER(0..359)

Vehicle location information may also be requested as a periodic service (or subscription).

```
Request:      Update Vehicle Location Coordinates <interval>
Reply:        Report Vehicle Location Coordinates <year>, <month>,
              <day>, <hours>, <minutes>, <secs>, <latitudeZone>,
              <latitudeDegree>, <latitudeMinute>,
              <latitudeSubMinute>, <longitudeZone>,
              <longitudeDegree>, <longitudeMinute>,
              <longitudeSubMinute>, <velocity>, <direction>
Request:      EndUpdate Vehicle Location Coordinates
```

The response is the same message as the response to a single Vehicle location request; however it is repeated at the rate of one message every 1000 ms.

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4.2.3 Odometer reading status

This service returns the current odometer reading in kilometers.

```
Request:      Inquire VehicleStatus Odometer
Reply:        Report VehicleStatus Odometer <value>
```

where <value> is an integer from 0 to 999,999.

It is also possible to request notification[1)] on a change of this parameter.

```
Request:      Notify If VehicleStatus OdometerDelta
Reply:        Report VehicleStatus Odometer <value>
Request:      EndNotify VehicleStatus OdometerDelta
```

4.2.4 High resolution distance accumulator status

This is a higher accuracy distance indicator.

```
Request:      Inquire VehicleStatus DifferentialOdometer
Reply:        Report VehicleStatus DifferentialOdometer <value>
```

where <value> is a number from 0 to 9999. The resolution of this value is 0.1 km per bit.

The high-resolution odometer may also be requested as a periodic service (or subscription).

```
Request:      Update VehicleStatus DifferentialOdometer
Reply:        Report VehicleStatus DifferentialOdometer <Value>
Request:      EndUpdate VehicleStatus DifferentialOdometer
```

The response is the same message as the response to a single high-resolution odometer request, but it is repeated at the rate of one message every 250 ms.

4.2.5 Fuel level status

This service returns the fuel tank level in liters.

```
Request:      Inquire VehicleStatus FuelLevel <tank>
Reply:        Report VehicleStatus FuelLevel <tank> <value>
```

The <tank> parameter is for vehicles that have more than one fuel tank. The return parameter <value> is a number from 0 to 4095. The resolution is 0.1l per bit.

4.2.6 Battery charge status

This service returns battery charge as a percentage of full charge.

```
Request:      Inquire VehicleStatus BatteryCharge <battery>
Reply:        Report VehicleStatus BatteryCharge <battery> <value>
```

The `<battery>` parameter is for vehicles that have more than one battery, and <value> is a number from 0 to 255, representing the state of charge of the battery (0=0%, 255=100%)

---

1) A request for *Notification* indicates that the requester requires that a message be transmitted only when the value of the parameter changes. This allows data monitors to be 'notified' when the parameter changes as opposed to having to poll the data owner to determine when a change occurs.

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4.2.7 Airbag status

This service allows an application to discover whether a given airbag is installed and if so, deployed.

```
Request:      Inquire VehicleStatus AirBags <seatposition>
Reply:        Report VehicleStatus AirBags <seatposition>
              <installed_airbags><airbag_status>
```

<seatposition> = driver=1, middlefront=2, passenger=3, secondrowleft=4, secondrowmiddle=5, secondrowright=6, thirdrowleft=7, thirdrowmiddle=8, thirdrowright=9, fourthrowleft=10, fourthrowmiddle=11, fourthrowright=12, fifthrowleft=13, fifthrowmiddle=14, fifthrowright=15.

<installed_airbags> and <airbag_status> are bit strings of the form:

```
<installed_airbags>
      bit0     Front Airbag  1=Present 0=Not Present
      bit1     Side Airbag   1=Present 0=Not Present
      bit2     Head Airbag   1=Present 0=Not Present

<airbag_status>
      bit0     Front Airbag  1=Deployed   0=Not Deployed
      bit1     Side Airbag   1=Deployed   0=Not Deployed
      bit2     Head Airbag   1=Deployed   0=Not Deployed
```

It is also possible to request notification on a change of this parameter. A device requesting notification will be provided a message on the change of status of any airbag associated with any seat.

```
Request: Notify if VehicleStatus AirBagsDelta
Reply:   Report VehicleStatus AirBags <seatposition>
         <installed_airbags><airbag_status>
Request: EndNotify VehicleStatus AirBagsDelta
```

4.2.8 Seat belt status

```
Request:      Inquire VehicleStatus SeatBelt <position>
Reply:        Report VehicleStatus SeatBelt <position> <SBstate>
```

Where <SBstate> = [latched, unlatched]

It is also possible to request notification on a change of this parameter:

```
Request:      Notify if VehicleStatus SeatBeltDelta
Reply:        Report VehicleStatus SeatBelt <position> <SBstate>
Request:      EndNotify VehicleStatus SeatBeltDelta
```

4.2.9 Brake applied status

This service returns whether or not a particular brake is applied.

```
Request:      Inquire VehicleStatus BrakeApplied <wheel>
Reply:        Report VehicleStatus BrakeApplied <wheel> [applied,
              not applied]
```

Where <wheel> = [any, front left, front right, rear left, rear right]

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4.2.10 Brake status

This service returns the value of the brake on-off switch. This indicates whether the (main) braking system is engaged.

```
Request:      Inquire VehicleStatus BrakeOnOff
Reply:        Report VehicleStatus BrakeOnOff <state>
```

Where <state> = [Off, On]

It is also possible to request notification on a change of this parameter:

```
Request:      Notify if VehicleStatus BrakeOnOffDelta
Reply:        Report VehicleStatus BrakeOnOff <state>
Request:      EndNotify VehicleStatus BrakeOnOffDelta
```

4.2.11 Hand Brake status

This service returns the value of the hand brake (also known as the park brake). This indicates whether the hand brake is engaged.

```
Request:      Inquire VehicleStatus HandBrake
Reply:        Report VehicleStatus HandBrake <state>
```

Where <state> = [not engaged, engaged]

It is also possible to request notification on a change of this parameter:

```
Request:      Notify if VehicleStatus HandBrakeDelta
Reply:        Report VehicleStatus HandBrake <state>
Request:      EndNotify VehicleStatus HandBrakeDelta
```

4.2.12 Traction control status

This service returns the traction control status. A client can use the vehicle data message (reference section) to determine whether traction control is present.

```
Request:      Inquire VehicleStatus TractionControl
Reply:        Report VehicleStatus TractionControl <TCstate>
```

<TCstate> = [off, on, engaged]

It is also possible to request notification on a change of this parameter:

```
Request:      Notify if VehicleStatus TractionControlDelta
Reply:        Report VehicleStatus TractionControl <TCstate>
Request:      EndNotify VehicleStatus TractionControlDelta
```

4.2.13 Anti-lock brake status

This service returns the ABS status (off, on, engaged).

```
Request:      Inquire VehicleStatus ABS
Reply:        Report VehicleStatus ABS <ABSstate>
```

Where <ABSstate> = [off, on, engaged]

Documents
Document Sharing Hub
Full document details: BS ISO 22902-6:2006