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(54) Remote diagnosis of vehicles

Ferndiagnose von Fahrzeugen

Diagnostic de véhicules à distance

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Description

BACKGROUND TO THE INVENTION AND PRIOR ART

[0001] The present invention relates generally to solutions for fault diagnosis of vehicles.

[0002] It is generally preferred to minimise the time which a motor vehicle spends at workshops for servicing or repairs. This applies in particular to commercial vehicles, e.g. trucks and buses, for which a maximum degree of effective utilisation is desired. There are therefore various current solutions for remotely identifying and, wherever possible, remedying faults which occur on vehicles. Even if a fault cannot be remedied locally, it is most commonly advantageous if it can be identified before the vehicle reaches the workshop or before a repairer reaches the vehicle. This makes it possible to prepare for the repair, leading to minimisation of outage time.

[0003] GB 2 366 407 describes a system for remote diagnosis of faults in a vehicle, whereby a two-way connection is set up between the vehicle and a central server. The vehicle uses said connection to convey details of its type and its current fault state, whereupon the server returns a description of possible causes and/or guidance information relating to continued fault identification. The server has access to a database of historical fault data for the specific vehicle, enabling it to "learn" to diagnose the vehicle increasingly effectively. Also US 2007/100519 describes a telediagnostic system for performing vehicle diagnosis.

PROBLEMS ASSOCIATED WITH PRIOR ART

[0004] Before a proper fault diagnosis can be established, however, significant amounts of data need to be transmitted from the vehicle to the central server. Inter alia the server needs to be provided with full details of the vehicle's current configuration, i.e. what components are incorporated in the vehicle and what functions they are programmed to be able to perform. What is also normally necessary is a relatively comprehensive step-by-step exchange of questions and answers between server and vehicle until all the particulars relevant for the diagnosis have been conveyed to the server.

SUMMARY OF THE INVENTION

[0005] The object of the present invention is to propose a solution which alleviates the above problem and thereby makes more effective remote diagnosis of a motor vehicle possible. The invention includes embodiments relating to the system of claim 1 and to the method of claim 6. According to an aspect of the invention, the object is achieved by the system described in the introduction whereby the central processor resource is connected to a data storage space which contains for example a database. The central processor resource is also configured to check whether a current configuration file specific

to the vehicle, or corresponding data describing a prevailing configuration of the vehicle, is stored in the data storage space. If the data storage space is found to contain a current configuration file, the central processor resource is configured to read it out from the data storage space to serve as a basis for the diagnosis engine to determine the fault diagnosis. If on the contrary the data storage space is found not to contain a current vehicle-specific configuration file, the central processor resource is configured to send to the vehicle a request for a configuration file specific to it. In response to receiving from the vehicle a configuration file specific to it, the central processor resource is configured to read it in, to serve as a basis for the diagnosis engine to determine the fault diagnosis.

[0006] This system is advantageous in avoiding unnecessary provision of data describing the vehicle's configuration. As today's commercial vehicles are typically very complex as regards possible equipment alternatives and choice of software-implemented functions, a relatively large amount of data is needed to properly describe the configuration of a particular vehicle. Moreover, providing said data may involve a comprehensive dialogue procedure between a central processor resource and the respective vehicle. Minimising the provision of configuration data thus saves both data traffic costs and time.

[0007] According to an embodiment of this aspect of the invention, the vehicle-specific configuration file is regarded as describing a current configuration of the vehicle if it is associated with a timestamp indicating a file age which is less than a first predetermined value. By simple comparison between current time and the timestamp value it is thus possible to decide whether the configuration file may be deemed up to date or not.

[0008] According to another embodiment of this aspect of the invention, the vehicle-specific configuration file is regarded as describing a current configuration of the vehicle if a history stored for said file in conjunction with the central processor resource indicates that the vehicle's configuration has changed less frequently than a second predetermined value. If this condition is fulfilled, further investigation of the configuration file may be avoided, saving a considerable amount of time and resources. This investigation may of course be combined dynamically with the aforesaid age check so that the configuration file is regarded as current if the time since the latest recorded change to the configuration file is shorter than a historical average interval between two consecutive updates of the file.

[0009] According to a further embodiment of this aspect of the invention, the vehicle-specific configuration file is associated with a checksum. The diagnosis request transmitted from the vehicle to the central processor resource further includes the checksum associated with the vehicle-specific configuration file. To this end, the central processor resource comprises a comparator configured to compare the checksum received via diagnosis requests with a checksum calculated in the central proc-

essor resource for a configuration file for the vehicle stored in the data storage space. If the checksum received corresponds to the calculated checksum, the data storage space is regarded as containing a current configuration file for the vehicle, so no further provision of data is required. The checksum is based on the content of the configuration file in such a way that a match between two checksums very probably indicates that the respective configuration files are also identical. The conclusion from this comparison may therefore be drawn with a high degree of safety.

[0010] It is also preferred that the central processor resource be configured to calculate a checksum for a configuration file received for storage in the data storage space, and then to store the calculated checksum in the data storage space in association with the configuration file received. The stored checksum is subsequently read out from the data storage space for comparison with a checksum received via a diagnosis request. The amount of time spent receiving a diagnosis request from a vehicle is thus appreciably minimised.

[0011] According to yet another embodiment of this aspect of the invention, the vehicle-specific configuration file is associated with a checksum. The vehicle is here supposed to have a local processing unit configured to receive an order message from the central processor resource. The order message is in response to a diagnosis request from the vehicle and includes a checksum associated with a vehicle-specific configuration file which is stored in the data storage space connected to the central processor resource. The local processing unit is also supposed to be configured to compare the checksum received from the central processor resource with a checksum calculated locally in the vehicle for a current configuration file for the vehicle. The data storage space is found to contain a current configuration file if the checksum received by the vehicle corresponds to the checksum calculated locally in the vehicle. As above, unnecessary provision of configuration data can thus be avoided while at the same time it is possible to verify with a high degree of safety that a previously transmitted configuration file describes a current configuration of the vehicle.

[0012] According to a yet further embodiment of this aspect of the invention, the vehicle-specific configuration file is associated with a checksum. The vehicle is further supposed to have a local processing unit configured to calculate a new local checksum for said file. To this end, the vehicle is assumed to be adapted to transmitting said new local checksum and a diagnosis request to the central processor resource. The central processor resource comprises a comparator configured to compare said new locally calculated checksum with a stored previously received locally calculated checksum for a configuration file stored in the data storage space. The data storage space is here found to contain a current configuration file if said new locally calculated checksum corresponds to said previously received said locally calculated check-

sum.

[0013] Alternatively, the aforesaid comparator may be situated in the vehicle so that the comparison is instead done in the vehicle and the calculation of the checksums takes place in the central processor resource. This reduces the vehicle's computing burden.

[0014] According to another aspect of the invention, the object is achieved by the method described in the introduction which comprises checking whether a current vehicle-specific configuration file describing a prevailing configuration of the vehicle is stored in a data storage space connected to the central processor resource. If the data storage space is found to contain a current configuration file, the method comprises reading it out from the data storage space to serve as a basis for the diagnosis engine to determine the fault diagnosis. If on the contrary the data storage space is found not to contain a current vehicle-specific configuration file, the central processor resource sends to the vehicle a request for such a file. In response to receiving a vehicle-specific configuration file from the vehicle, the diagnosis engine reads it in, to serve as a basis for determining the fault diagnosis. The advantages of this method and of its preferred embodiments are indicated by the above discussion pertaining to the proposed system.

[0015] According to a further aspect of the invention, the object is achieved by a computer programme which can be directly downloaded to the internal memory of a computer and comprises software for controlling the steps according to the method proposed above when said programme is run on a computer.

[0016] According to a further aspect of the invention, the object is achieved by a computer-readable medium which has stored on it a programme adapted to enabling a computer to control the steps according to the method proposed above.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] The present invention is explained below in more detail on the basis of embodiments described by way of examples with reference to the attached drawings.

Figure 1 is a schematic diagram of a preferred remote diagnosis system, and
 Figure 2 is a flowchart illustrating the general method according to the invention.

DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0018] We refer initially to Figure 1 depicting an embodiment of a system according to the invention. The system comprises a central processor resource 100 and a data storage space 120 and is adapted to remote-diagnosing a vehicle 180.

[0019] The central processor resource 100 is configured to communicate wirelessly with at least one vehicle

180 via a communication means 182 located in the vehicle. The communication means 182 is itself adapted to receiving information about a functional status of the vehicle 180 from a data gathering means 184 located in the vehicle. Thus the communication means 182 handles inter alia fault signals and fault reports from ECUs (electronic control units) located in the vehicle. The vehicle 180 is configured to generate, and by means of the communication means 182 send to the central processor resource 100, a diagnosis request DR. The diagnosis request DR will include a fault report describing a functional status of the vehicle 180 and may for example be transmitted to the central processor resource 100 via a base station 160 and one or more communication networks 150, e.g. Internet.

[0020] On the basis of the fault report the central processor resource 100 is configured to use a diagnosis engine to determine a fault diagnosis for the vehicle 180. With the object of making the diagnosis process more effective, the central processor resource 100 is connected to a data storage space 120 which for example contains a database. The central processor resource 100 is further configured to check whether a current vehicle-specific configuration file CF describing a prevailing configuration of the vehicle 180 is stored in the data storage space 120.

[0021] If the data storage space 120 is found to contain a current configuration file CF, the central processor resource 100 is adapted to reading it out from the data storage space 120 to the diagnosis engine 110 to serve as a basis for determining the fault diagnosis for the vehicle 180. If the data storage space 120 is found *not* to contain a current vehicle-specific configuration file CF, the central processor resource 100 is adapted instead to sending to the vehicle 180 a request CFR for such a file. In response to receiving a vehicle-specific configuration file CF from the vehicle 180, the central processor resource 100 is further adapted to reading it into the diagnosis engine 110 to serve as a basis for determining the fault diagnosis.

[0022] According to an embodiment of the invention, the vehicle-specific configuration file CF is regarded as describing a current configuration of the vehicle 180 if it is associated with a timestamp which indicates its age at less than a first predetermined value, e.g. a week, a month, a half-year or a year, depending on vehicle type and/or model, equipment and, where applicable, a dynamic parameter such as a configuration history. According to another embodiment of the invention, the vehicle-specific configuration file CF is regarded as describing a current configuration of the vehicle 180 if a history H stored in conjunction with the central processor resource 100 for the file indicates that the configuration of the vehicle 180 has changed less frequently than a second predetermined value. The history H is stored with advantage in a database 130 which may either be accommodated in the same storage space as, or be stored separately from, the data storage space 120.

[0023] According to embodiments of the invention, with the object of achieving increased reliability in assessing whether a configuration file CF stored for a particular vehicle 180 in the data storage space 120 describes a current configuration (i.e. whether the file properly indicates the units with which the vehicle is equipped and which software and versions thereof have been loaded to control them), the file is associated with a checksum calculated, for example, by so-called hashing. The checksum may be calculated locally in the vehicle 180 and be designated $\#_v$, or be calculated centrally in the central processor resource 100 and be designated $\#_c$.

[0024] For example, diagnosis requests DR transmitted from the vehicle 180 to the central processor resource 100 may include the checksum $\#_v$ associated with the vehicle-specific configuration file CF. In this case the central processor resource 100 comprises a comparator 140 configured to compare the checksum $\#_v$ received via diagnosis requests DR with a checksum $\#_c$ calculated in the central processor resource 100 for a configuration file CF for the vehicle 180 which is stored in the data storage space 120. The data storage space 120 is here found to contain a current configuration file CF if the checksum $\#_v$ received corresponds to the centrally calculated checksum $\#_c$.

[0025] For reasons of effectiveness it may be advantageous to arrive at the centrally calculated checksum $\#_c$ beforehand, i.e. for the central processor resource 100 to be configured to calculate for a configuration file CF received a checksum $\#_c$ with a view to the file being stored in the data storage space 120. The central processor resource 100 stores the calculated checksum $\#_c$ in the data storage space 120 in association with the configuration file CF received, either at a shared location or with suitable linking. The central processor resource 100 is further adapted to reading the checksum $\#_c$ out from the data storage space 120 for comparison with a checksum $\#_v$ received via a diagnosis request DR. Valuable computing time is thus saved at the time of the comparison.

[0026] As an alternative to the above, the comparison between the checksums may instead be performed in the vehicle 180. In this case the vehicle 180 is supposed to have a local processing unit 186 configured to receive an order message OM from the central processor resource 100. The order message OM is sent to the vehicle 180 in response to a diagnosis request DR from it. The order message OM includes a checksum $\#_c$ associated with a vehicle-specific configuration file CF for the vehicle 180 which is stored in the data storage space 120. The local processing unit 186 is adapted to comparing the checksum $\#_c$ received from the central processor resource 100 with a checksum $\#_v$ calculated locally in the vehicle 180 for a current configuration file CF for the vehicle.

[0027] As above, the data storage space 120 is found to contain a current configuration file CF if the checksum $\#_c$ received in the vehicle 180 corresponds to the checksum $\#_v$ calculated locally in the vehicle.

[0028] According to the invention there is of course no need for the comparison of the checksums to be performed at the same location as that where the respective checksums $\#_c$ and $\#_v$ are calculated.

[0029] Thus the local processing unit 186 of the vehicle 180 may for example be configured to calculate a new local checksum $\#_v$ for a current configuration file CF for the vehicle 180. In this case the vehicle 180 is further configured to be able to transmit the new local checksum $\#_v$ to the central processor resource 100, e.g. via the communication means 182, advantageously at the same time as transmitting a diagnosis request DR. The new locally calculated checksum $\#_v$ is compared with a stored previously received locally calculated checksum $\#_v$ for a configuration file CF stored in the data storage space 120. The data storage space 120 is found to contain a current configuration file CF if the new locally calculated checksum $\#_v$ corresponds to the previously received said locally calculated checksum $\#_v$.

[0030] As a further alternative, the allocation of work between the vehicle 180 and the central processor resource 100 may be reversed so that a similar comparator is located in the vehicle 180 and the calculation of checksums $\#_c$ is performed in the central processor resource 100.

[0031] It is preferable that the central processor resource 100 be configured to function in accordance with the instructions contained in software which is executed in the processor resource 100. It is therefore advantageous if the central processor resource 100 includes, or is in some other way linked to, a memory module M containing software which, when executed in the central processor resource 100, causes the procedure described above to be performed.

[0032] To summarise, the general method according to the invention will now be described with reference to the flowchart in Figure 2.

[0033] A first step 210 checks whether a diagnosis request DR from a vehicle has been received. The diagnosis request DR will include a fault report describing a functional status of the vehicle concerned. If such a diagnosis request DR has been received, a step 220 follows, otherwise the procedure loops back and comes to a halt at step 210. Step 220 checks whether a current vehicle-specific configuration file describing a prevailing configuration of the vehicle is stored in an accessible data storage space. If such is the case, a step 230 reads said configuration file CF out from the data storage space to serve as a basis for a diagnosis engine. A subsequent step 240 determines a fault diagnosis for the vehicle on the basis of the configuration file CF and the fault report received.

[0034] If at step 220 it turns out that the data storage space does not contain a current vehicle-specific configuration file for the vehicle, a step 250 follows whereby the vehicle is sent a request for a vehicle-specific configuration file CF. A step 260 then checks whether such a file has been received. The procedure loops to step

250 until such a configuration file CF is received. Receipt of the configuration file CF is followed by a step 270 which reads the configuration file CF received into the diagnosis engine to serve in conjunction with the fault report as a basis for determining the fault diagnosis, which takes place at step 240.

[0035] When the fault diagnosis has been established at step 240, the procedure loops back to step 210.

[0036] The method steps described with reference to Figure 2 may be controlled by means of programmed computer apparatus. In addition, although the embodiments of the invention described above with reference to the diagrams comprise a computer and processes conducted in a computer, the invention extends to computer programmes, especially computer programmes on or in a carrier suited to practically implementing the invention. The programme may be in the form of source code, object code, a code intermediate between source and object code, e.g. in partly compiled form, or in any other form suitable for use in implementing the process according to the invention. The carrier may be any entity or device capable of carrying a programme. For example, the carrier may comprise a storage medium such as a flash memory, an ROM (read only memory), e.g. a CD (compact disc) or semiconductor ROM, EPROM (electrically programmable ROM), EEPROM (erasable EPROM) or a magnetic recording medium, e.g. a floppy disc or a hard disc. The carrier may also be a transmitting carrier such as an electrical or optical signal which can be conveyed by an electrical or optical cable or via radio or in some other way. Where the programme is in the form of a signal which can be conveyed directly by cable or some other device or means, the carrier may take the form of such a cable, device or means. Alternatively the carrier may be an integrated circuit in which the programme is embedded and which is adapted to conducting, or to being used in conducting, the relevant processes.

[0037] The invention is not restricted to the embodiments described with reference to the diagrams but may be varied freely within the scope of the claims set out below.

Claims

1. A system for diagnosis of vehicles (180), comprising a central processor resource (100) configured to communicate wirelessly with at least one vehicle (180) via a communication means (182) located in the vehicle and adapted to receiving information about a functional status of the vehicle (180) from a data gathering means (184) located in the vehicle (180), said at least one vehicle (180) being configured to generate and send to the central processor resource (100) by means of said communication means (182) a diagnosis request (DR) which includes a fault report describing a functional status of the vehicle (180), and

the central processor resource (100) being configured to determining on the basis of the fault report a fault diagnosis for the vehicle (180) by using a diagnosis engine (110),

characterised in that the central processor resource (100) is connected to a data storage space (120) and is further configured

to check whether a current vehicle-specific configuration file (CF) describing a prevailing configuration of the vehicle (180) is stored in the data storage space (120),

if the data storage space (120) is found to contain a current vehicle-specific configuration file (CF), to read it out from the data storage space (120) to serve as a basis for the diagnosis engine (110) to determine the fault diagnosis,

if the data storage space (120) is found not to contain a current vehicle-specific configuration file (CF),

to send to the vehicle (180) a request (CFR) for a vehicle-specific configuration file (CF), and to respond to receiving a vehicle-specific configuration file (CF) from the vehicle (180) by reading it in, to serve as a basis for the diagnosis engine (110) to determine the fault diagnosis,

whereby the vehicle-specific configuration file (CF) is regarded as describing a current configuration of the vehicle (180) if it is associated with a timestamp which indicates its age as less than a first predetermined value and if a history (H) stored for said file in conjunction with the central processor resource (100) indicates that the vehicle-specific configuration file of the vehicle (180) has changed less frequently than a second predetermined value, so that the vehicle-specific configuration file is regarded as current if the time since the latest recorded change to the vehicle-specific configuration file is shorter than a historical average interval between two consecutive updates of the file.

2. The system according to claim 1, whereby the vehicle-specific configuration file (CF) is associated with a checksum ($\#_v \#_c$), said diagnosis request (DR) transmitted from the vehicle (180) to the central processor resource (100) includes the checksum ($\#_v$) associated with the vehicle-specific configuration file (CF), and the central processor resource (100) comprises

a comparator (140) configured to compare the checksum ($\#_v$) received via diagnosis requests (DR) with a checksum ($\#_c$) calculated in the central processor resource (100) for a configuration file (CF) for the vehicle (180) which is stored in the data storage space (120), and

whereby the data storage space (120) is found to contain a current configuration file (CF) if the checksum ($\#_v$) received corresponds to the calculated

checksum ($\#_c$).

3. The system according to claim 2, whereby the central processor resource (100) is configured to calculate a checksum ($\#_c$) for a configuration file (CF) received with a view to storing it in the data storage space (120), to store the calculated checksum ($\#_c$) in the data storage space (120) in association with the configuration file (CF) received, and to read the stored checksum ($\#_c$) out from the data storage space (120) for comparison with a checksum ($\#_v$) received via a diagnosis request (DR).
4. The system according to claim 1, whereby the vehicle-specific configuration file (CF) is associated with a checksum ($\#_v \#_c$) and the vehicle (180) is supposed to have a local processing unit (186) configured to receive from the central processor resource (100) an order message (OM) which is sent in response to a diagnosis request (DR) from the vehicle (180) and includes a checksum ($\#_c$) associated with a vehicle-specific configuration file (CF) for the vehicle (180) which is stored in the data storage space (120) connected to the central processor resource (100), and to compare the checksum ($\#_c$) received from the central processor resource (100) with a checksum ($\#_v$) calculated locally in the vehicle (180) for a current configuration file (CF) for the vehicle (180), and the data storage space (120) is found to contain a current configuration file (CF) if said checksum ($\#_c$) received in the vehicle (180) corresponds to said locally calculated checksum ($\#_v$).
5. The system according to claims 1, whereby the vehicle-specific configuration file (CF) is associated with a checksum ($\#_v \#_c$), the vehicle (180) being supposed to have a local processing unit (186) configured to calculate a new local checksum ($\#_v$) for said file (CF), and being adapted to transmitting to the central processor resource (100) said new local checksum ($\#_v$) and a diagnosis request (DR), the central processor resource (100) comprising a comparator (140) configured to compare said new local checksum ($\#_v$) with a stored local checksum ($\#_v$) received previously for a configuration file (CF) stored in the data storage space (120), and whereby the data storage space (120) is found to contain a current configuration file (CF) if said new local checksum ($\#_v$) corresponds to said previously received local checksum ($\#_v$).
6. A method for diagnosis of vehicles (180), comprising conveying to a central processor resource (100) from a vehicle (180) a diagnosis request (DR) which includes a fault report describing a functional status of

the vehicle (180),

on the basis of the fault report, determining a fault diagnosis for the vehicle (180) by means of a diagnosis engine (110) in the central processor resource (100),

characterised in that the method comprises checking whether a current vehicle-specific configuration file (CF) describing a prevailing configuration of the vehicle (180) is stored in a data storage space (120) connected to the central processor resource (100),

if the data storage space (120) is found to contain a current vehicle-specific configuration file (CF), reading it out from the data storage space (120) to serve as a basis for the diagnosis engine (110) to determine the fault diagnosis,

if the data storage space (120) is found not to contain a current vehicle-specific configuration file (CF),

sending from the central processor resource (100) to the vehicle (180) a request (CFR) for a vehicle-specific configuration file (CF), and responding to receiving a vehicle-specific configuration file (CF) from the vehicle (180) by reading it in, to serve as a basis for the diagnosis engine (110) to determine the fault diagnosis,

whereby the vehicle-specific configuration file (CF) is regarded as describing a current configuration of the vehicle (180) if it is associated with a timestamp indicating its age as less than a first predetermined value and if a history (H) stored for said file in conjunction with the central processor resource (100) indicates that the vehicle-specific configuration of the vehicle (180) has changed less frequently than a second predetermined value, so that the vehicle-specific configuration file is regarded as current if the time since the latest recorded change to the vehicle-specific configuration file is shorter than a historical average interval between two consecutive updates of the file.

7. The method according to claim 6, whereby the vehicle-specific configuration file (CF) is associated with a checksum ($\#_v \#_c$), said diagnosis request (DR) transmitted from the vehicle (180) to the central processor resource (100) includes the checksum ($\#_v$) associated with the vehicle-specific configuration file (CF), and the method comprises comparing the checksum ($\#_v$) received via diagnosis requests (DR) with a checksum ($\#_c$) calculated in the central processor resource (100) for a configuration file (CF) for the vehicle (180) which is stored in the data storage space (120), and whereby the data storage space (120) is found to contain a current configuration file (CF) if the checksum ($\#_v$) received from the vehicle (180) corresponds to the calculated checksum ($\#_c$).

8. The method according to claim 7, comprising calculating in the central processor resource (100) a checksum ($\#_c$) for a configuration file (CF) received, with a view to storing it in the data storage space (120), storing the calculated checksum ($\#_c$) in the data storage space (120) in association with the configuration file (CF) received, and reading the stored checksum ($\#_c$) out from the data storage space (120) for comparison with a checksum ($\#_v$) received via a diagnosis request (DR).

9. The method according to claim 6, whereby the vehicle-specific configuration file (CF) is associated with a checksum ($\#_v \#_c$) and the method comprises in response to a diagnosis request (DR) received, transmitting from the central processor resource (100) to the vehicle (180) a checksum ($\#_c$) associated with a vehicle-specific configuration file (CF) for the vehicle (180) which is stored in the data storage space (120), comparing in the vehicle (180) the checksum ($\#_c$) received from the central processor resource (100) with a checksum ($\#_v$) calculated locally for a current configuration file (CF) for the vehicle (180), and whereby the data storage space (120) is found to contain a current configuration file (CF) if the checksum ($\#_c$) received in the vehicle (180) corresponds to the locally calculated checksum ($\#_v$).

10. The method according to claim 6, whereby the vehicle-specific configuration file (CF) is associated with a checksum ($\#_v \#_c$) and the method comprises transmitting a diagnosis request (DR) from the vehicle (180) to the central processor resource (100), calculating in the vehicle (180) a new local checksum ($\#_v$) for said file (CF), and transmitting said new local checksum ($\#_v$) from the vehicle (180) to the central processor resource (100), and comparing in the central processor resource (100) said new local checksum ($\#_v$) with a stored previously received local checksum ($\#_v$) for a configuration file (CF) stored in the data storage space (120), and whereby the data storage space (120) is found to contain a current configuration file (CF) if said new local checksum ($\#_v$) corresponds to said previously received local checksum ($\#_v$).

11. A computer-readable medium (M) which has stored on it a programme adapted to enabling a computer to control the steps according to any one of claims 6 to 10.

Patentansprüche

1. System zur Diagnose von Fahrzeugen (180), auf-

weisend
 eine Zentralprozessorressource (100), die zur draht-
 losen Kommunikation mit mindestens einem Fahr-
 zeug (180) über ein Kommunikationsmittel (182)
 konfiguriert ist, das sich im Fahrzeug (180) befindet
 und dazu eingerichtet ist, Informationen über den
 funktionalen Status des Fahrzeugs (180) von einem
 Datenerfassungsmittel (184) zu empfangen, das
 sich im Fahrzeug (180) befindet, wobei das mindes-
 tens eine Fahrzeug (180) zum Erzeugen und Sen-
 den einer Diagnoseanforderung (DR), die eine einen
 funktionalen Status des Fahrzeugs (180) beschrei-
 bende Fehlermeldung enthält, mittels des Kommu-
 nikationsmittels (182) an die Zentralprozessorres-
 source (100) konfiguriert ist, und
 die Zentralprozessorressource (100) konfiguriert ist,
 auf Basis der Fehlermeldung eine Fehlerdiagnose
 für das Fahrzeug (180) durch Anwenden einer Dia-
 gnosemaschine (110) zu bestimmen,
dadurch gekennzeichnet, dass die Zentralprozes-
 sorressource (100) mit einem Datenspeicherplatz
 (120) verbunden und ferner konfiguriert ist
 zu prüfen, ob eine aktuelle fahrzeugspezifische Kon-
 figurationsdatei (CF), die eine derzeitige Konfigura-
 tion des Fahrzeugs (180) beschreibt, im Datenspei-
 cherplatz (120) gespeichert ist,
 wenn festgestellt wird, dass der Datenspeicherplatz
 (120) eine aktuelle fahrzeugspezifische Konfigura-
 tionsdatei (CF) enthält,
 diese aus dem Datenspeicherplatz (120) auszule-
 sen, um als Basis für die Diagnosemaschine (110)
 zur Bestimmung der Fehlerdiagnose zu dienen,
 wenn festgestellt wird, dass der Datenspeicherplatz
 (120) keine aktuelle fahrzeugspezifische Konfigura-
 tionsdatei (CF) enthält,
 eine Anforderung (CFR) an das Fahrzeug (180) für
 eine fahrzeugspezifische Konfigurationsdatei (CF)
 zu senden, und
 auf den Empfang einer fahrzeugspezifischen Konfi-
 gurationsdatei (CF) vom Fahrzeug (180) zu reagie-
 ren, indem diese eingelesen wird, um als Basis für
 die Diagnosemaschine (110) zur Bestimmung der
 Fehlerdiagnose zu dienen,
 wobei die fahrzeugspezifische Konfigurationsdatei
 (CF) als Beschreibung einer aktuellen Konfiguration
 des Fahrzeugs (180) betrachtet wird, wenn sie mit
 einem Zeitstempel versehen ist, der ihr Alter als un-
 ter einem ersten vorgegebenen Wert angibt, und
 wenn ein für diese Datei zusammen mit der Zentral-
 prozessorressource (100) gespeicherter zeitlicher
 Verlauf (H) angibt, dass sich die fahrzeugspezifische
 Konfigurationsdatei des Fahrzeugs (180) nicht so
 häufig geändert hat, wie ein zweiter vorgegebener
 Wert, so dass die fahrzeugspezifische Konfigura-
 tionsdatei als aktuell betrachtet wird, wenn die Zeit
 seit der letzten erfassten Änderung der fahrzeugspe-
 zifischen Konfigurationsdatei kürzer ist als ein histo-
 risches durchschnittliches Intervall zwischen zwei

aufeinanderfolgenden Aktualisierungen der Datei.

2. System nach Anspruch 1, wobei der fahrzeugspezi-
 fischen Konfigurationsdatei (CF) eine Prüfsumme
 ($\#_v$, $\#_c$) zugeordnet ist, wobei die vom Fahrzeug
 (180) an die Zentralprozessorressource (100) ge-
 sendete Diagnoseanforderung (DR) die der fahr-
 zeugspezifischen Konfigurationsdatei (CF) zuge-
 ordnete Prüfsumme ($\#_v$) enthält, und die Zentralpro-
 zessorressource (100) aufweist
 einen Komparator (140), der zum Vergleichen der
 über Diagnoseanforderungen (DR) empfangenen
 Prüfsumme ($\#_v$) mit einer Prüfsumme ($\#_c$), die in der
 Zentralprozessorressource (100) für eine im Daten-
 speicherplatz (120) gespeicherte Konfigurationsda-
 tei (CF) für das Fahrzeug (180) berechnet wird, konfi-
 guriert ist, und
 wobei festgestellt wird, dass der Datenspeicherplatz
 (120) eine aktuelle Konfigurationsdatei (CF) enthält,
 wenn die empfangene Prüfsumme ($\#_v$) der berech-
 neten Prüfsumme ($\#_c$) entspricht.
3. System nach Anspruch 2, wobei die Zentralprozes-
 sorressource (100) konfiguriert ist
 zum Berechnen einer Prüfsumme ($\#_c$) für eine Kon-
 figurationsdatei (CF), die mit der Aussicht auf ihre
 Speicherung im Datenspeicherplatz (120) empfan-
 gen wird,
 zum Speichern der berechneten Prüfsumme ($\#_c$) im
 Datenspeicherplatz (120) zusammen mit der emp-
 fangenen Konfigurationsdatei (CF), und
 zum Auslesen der gespeicherten Prüfsumme ($\#_c$)
 aus dem Datenspeicherplatz (120) zum Vergleichen
 mit einer Prüfsumme ($\#_v$), die über eine Diagnose-
 anforderung (DR) empfangen wird.
4. System nach Anspruch 1, wobei der fahrzeugspezi-
 fischen Konfigurationsdatei (CF) eine Prüfsumme
 ($\#_v$, $\#_c$) zugeordnet ist, und angenommen wird, dass
 das Fahrzeug (180) eine lokale Verarbeitungseinheit
 (186) hat, die konfiguriert ist
 zum Empfangen einer Befehls-Meldung (OM) von
 der Zentralprozessorressource (100), die als Ant-
 wort auf eine Diagnoseanforderung (DR) vom Fahr-
 zeug (180) gesendet wird, und die eine einer fahr-
 zeugspezifischen Konfigurationsdatei (CF) für das
 Fahrzeug (180) zugeordnete Prüfsumme ($\#_c$) ent-
 hält, die in dem mit der Zentralprozessorressource
 (100) verbundenen Datenspeicherplatz (120) ge-
 speichert ist,
 zum Vergleichen der von der Zentralprozessorres-
 source (100) empfangenen Prüfsumme ($\#_c$) mit ei-
 ner Prüfsumme ($\#_v$), die lokal im Fahrzeug (180) für
 eine aktuelle Konfigurationsdatei (CF) für das Fahr-
 zeug (180) berechnet wird, und
 wobei festgestellt wird, dass der Datenspeicherplatz
 (120) eine aktuelle Konfigurationsdatei (CF) enthält,
 wenn die empfangene Prüfsumme ($\#_c$) der lokal be-

rechneten Prüfsumme ($\#_v$) entspricht.

5. System nach Anspruch 1, wobei der fahrzeugspezifischen Konfigurationsdatei (CF) eine Prüfsumme ($\#_v$, $\#_c$) zugeordnet ist, wobei angenommen wird, dass das Fahrzeug (180) eine lokale Verarbeitungseinheit (186) hat, die zum Berechnen einer neuen lokalen Prüfsumme ($\#_v$) für die Datei (CF) konfiguriert ist, und zum Senden der neuen lokalen Prüfsumme ($\#_v$) und einer Diagnoseanforderung (DR) an die Zentralprozessorressource (100) eingerichtet ist, wobei die Zentralprozessorressource (100) einen Komparator (140) aufweist, der zum Vergleichen der neuen lokalen Prüfsumme ($\#_v$) mit einer gespeicherten lokalen Prüfsumme ($\#_v$) konfiguriert ist, die zuvor für eine im Datenspeicherplatz (120) gespeicherte Konfigurationsdatei (CF) empfangen wurde, und wobei festgestellt wird, dass der Datenspeicherplatz (120) eine aktuelle Konfigurationsdatei (CF) enthält, wenn die neue lokale Prüfsumme ($\#_v$) der zuvor empfangen lokalen Prüfsumme ($\#_v$) entspricht.
6. Verfahren zur Diagnose von Fahrzeugen (180), aufweisend:
- Übermitteln einer Diagnoseanforderung (DR), die eine einen funktionalen Status des Fahrzeugs (180) beschreibende Fehlermeldung enthält, an eine Zentralprozessorressource (100) von einem Fahrzeug (180),
Bestimmen einer Fehlerdiagnose für das Fahrzeug (180) mittels einer Diagnosemaschine (110) in der Zentralprozessorressource (100) auf Basis der Fehlermeldung **dadurch gekennzeichnet, dass** das Verfahren aufweist Prüfen, ob eine aktuelle fahrzeugspezifische Konfigurationsdatei (CF), die eine derzeitige Konfiguration des Fahrzeugs (180) beschreibt, in dem mit der Zentralprozessorressource (100) verbundenen Datenspeicherplatz (120) gespeichert ist, wenn festgestellt wird, dass der Datenspeicherplatz (120) eine aktuelle fahrzeugspezifische Konfigurationsdatei (CF) enthält, diese aus dem Datenspeicherplatz (120) auslesen, um als Basis für die Diagnosemaschine (110) zur Bestimmung der Fehlerdiagnose zu dienen, wenn festgestellt wird, dass der Datenspeicherplatz (120) keine aktuelle fahrzeugspezifische Konfigurationsdatei (CF) enthält, eine Anforderung (CFR) an das Fahrzeug (180) für eine fahrzeugspezifische Konfigurationsdatei (CF) von der Zentralprozessorressource (100) senden, und auf den Empfang einer fahrzeugspezifischen Konfigurationsdatei (CF) vom Fahrzeug (180)

reagieren, indem diese eingelesen wird, um als Basis für die Diagnosemaschine (110) zur Bestimmung der Fehlerdiagnose zu dienen, wobei die fahrzeugspezifische Konfigurationsdatei (CF) als Beschreibung einer aktuellen Konfiguration des Fahrzeugs (180) betrachtet wird, wenn sie mit einem Zeitstempel versehen ist, der ihr Alter als unter einem ersten vorgegebenen Wert angibt, und wenn ein für diese Datei zusammen mit der Zentralprozessorressource (100) gespeicherter zeitlicher Verlauf (H) angibt, dass sich die fahrzeugspezifische Konfigurationsdatei des Fahrzeugs (180) nicht so häufig geändert hat, wie ein zweiter vorgegebener Wert, so dass die fahrzeugspezifische Konfigurationsdatei als aktuell betrachtet wird, wenn die Zeit seit der letzten erfassten Änderung der fahrzeugspezifischen Konfigurationsdatei kürzer ist als ein historisches durchschnittliches Intervall zwischen zwei aufeinanderfolgenden Aktualisierungen der Datei.

7. Verfahren nach Anspruch 6, wobei der fahrzeugspezifischen Konfigurationsdatei (CF) eine Prüfsumme ($\#_v$, $\#_c$) zugeordnet ist, wobei die vom Fahrzeug (180) an die Zentralprozessorressource (100) gesendete Diagnoseanforderung (DR) die der fahrzeugspezifischen Konfigurationsdatei (CF) zugeordnete Prüfsumme ($\#_v$) enthält, und das Verfahren aufweist Vergleichen der über eine Diagnoseanforderung (DR) empfangenen Prüfsumme ($\#_v$) mit einer Prüfsumme ($\#_c$), die in der Zentralprozessorressource (100) für eine Konfigurationsdatei (CF) für das Fahrzeug, die im Datenspeicherplatz (120) gespeichert ist, berechnet wird, und wobei festgestellt wird, dass der Datenspeicherplatz (120) eine aktuelle Konfigurationsdatei (CF) enthält, wenn die vom Fahrzeug (180) empfangene Prüfsumme ($\#_v$) der berechneten Prüfsumme ($\#_c$) entspricht.
8. Verfahren nach Anspruch 7, aufweisend Berechnen einer Prüfsumme ($\#_c$) für eine Konfigurationsdatei (CF), die in der Zentralprozessorressource (100), die mit der Aussicht auf ihre Speicherung im Datenspeicherplatz (120) empfangen wird, Speichern der berechneten Prüfsumme ($\#_c$) im Datenspeicherplatz (120) zusammen mit der empfangenen Konfigurationsdatei (CF), und Auslesen der gespeicherten Prüfsumme ($\#_c$) aus dem Datenspeicherplatz (120) zum Vergleichen mit einer Prüfsumme ($\#_v$), die über eine Diagnoseanforderung (DR) empfangen wird.
9. Verfahren nach Anspruch 6, wobei der fahrzeugspezifischen Konfigurationsdatei (CF) eine Prüfsumme ($\#_v$, $\#_c$) zugeordnet ist, und das Verfahren aufweist

als Antwort auf eine empfangene Diagnoseanforderung (DR), Senden einer der fahrzeugspezifischen Konfigurationsdatei (CF) zugeordneten Prüfsumme ($\#_c$) von der Zentralprozessorressource (100) an das Fahrzeug (180), die im Datenspeicherplatz (120) gespeichert ist,

Vergleichen der von der Zentralprozessorressource (100) empfangenen Prüfsumme ($\#_c$) mit einer Prüfsumme ($\#_v$) im Fahrzeug (180), die lokal für eine aktuelle Konfigurationsdatei (CF) für das Fahrzeug (180) berechnet wird, und

wobei festgestellt wird, dass der Datenspeicherplatz (120) eine aktuelle Konfigurationsdatei (CF) enthält, wenn die empfangene Prüfsumme ($\#_c$) der lokal berechneten Prüfsumme ($\#_v$) entspricht.

10. Verfahren nach Anspruch 6, wobei der fahrzeugspezifischen Konfigurationsdatei (CF) eine Prüfsumme ($\#_v$, $\#_c$) zugeordnet ist, und das Verfahren aufweist Senden einer Diagnoseanforderung (DR) vom Fahrzeug (180) an die Zentralprozessorressource (100), Berechnen einer neuen lokalen Prüfsumme ($\#_v$) für die Datei (CF) im Fahrzeug (180), und Senden der neuen lokalen Prüfsumme ($\#_v$) vom Fahrzeug (180) an die Zentralprozessorressource (100), und Vergleichen der neuen lokalen Prüfsumme ($\#_v$) in der Zentralprozessorressource (100) mit einer gespeicherten zuvor empfangenen lokalen Prüfsumme ($\#_v$) für im Datenspeicherplatz (120) gespeicherte die Konfigurationsdatei (CF), und wobei festgestellt wird, dass der Datenspeicherplatz (120) eine aktuelle Konfigurationsdatei (CF) enthält, wenn die neue lokale Prüfsumme ($\#_v$) der zuvor empfangenen lokalen Prüfsumme ($\#_v$) entspricht.
11. Computerlesbares Medium (M), auf dem ein Programm gespeichert ist, das dazu eingerichtet ist, einen Computer in die Lage zu versetzen, die Schritte nach einem der Ansprüche 6 bis 10 auszuführen.

Revendications

1. Système de diagnostic de véhicules (180), comprenant une ressource de processeur central (100) configurée pour communiquer sans fil avec au moins un véhicule (180) via des moyens de communication (182) situés dans le véhicule et adaptés pour recevoir des informations sur un état fonctionnel du véhicule (180) à partir de moyens de collecte de données (184) situés dans le véhicule (180), ledit au moins un véhicule (180) étant configuré pour générer et envoyer à la ressource de processeur central (100) par l'intermédiaire desdits moyens de communication (182) une demande de diagnostic (DR) qui comprend un rapport de panne décrivant un état

fonctionnel du véhicule (180), et la ressource de processeur central (100) étant configurée pour déterminer sur la base du rapport de panne un diagnostic de panne pour le véhicule (180) en utilisant un moteur de diagnostic (110),

caractérisé en ce que la ressource de processeur central (100) est connectée à un espace de stockage de données (120) et est en outre configurée pour vérifier si un fichier de configuration (CF) courant spécifique au véhicule décrivant une configuration du véhicule (180) qui prévaut est stocké dans l'espace de stockage de données (120), s'il est constaté que l'espace de stockage de données (120) contient un fichier de configuration (CF) courant spécifique au véhicule, pour le lire à partir de l'espace de stockage de données (120) afin de servir de base au moteur de diagnostic (110) pour déterminer le diagnostic de panne, s'il est constaté que l'espace de stockage de données (120) ne contient pas un fichier de configuration (CF) courant spécifique au véhicule,

pour envoyer au véhicule (180) une demande (CFR) d'un fichier de configuration (CF) spécifique au véhicule, et

pour répondre à la réception d'un fichier de configuration (CF) spécifique au véhicule provenant du véhicule (180) en le lisant, pour servir de base au moteur de diagnostic (110) pour déterminer le diagnostic de panne,

dans lequel le fichier de configuration (CF) spécifique au véhicule est considéré comme décrivant une configuration courante du véhicule (180) s'il est associé à un horodatage qui indique que son âge est inférieur à une première valeur prédéterminée et si un historique (H) stocké pour ledit fichier en association avec la ressource de processeur central (100) indique que le fichier de configuration spécifique au véhicule du véhicule (180) a changé moins fréquemment qu'une seconde valeur prédéterminée, de sorte que le fichier de configuration spécifique au véhicule est considéré comme étant courant si le temps écoulé depuis le dernier changement enregistré du fichier de configuration spécifique au véhicule est plus court qu'un intervalle moyen d'historique entre deux mises à jour consécutives du fichier.

2. Système selon la revendication 1, dans lequel le fichier de configuration (CF) spécifique au véhicule est associé à une somme de contrôle ($\#_v$, $\#_c$), ladite demande de diagnostic (DR) transmise du véhicule (180) à la ressource processeur central (100) inclut la somme de contrôle ($\#_v$) associée au fichier de configuration (CF) spécifique au véhicule, et la ressource de processeur central (100) comprend un comparateur (140) configuré pour comparer la somme de contrôle ($\#_v$) reçue via des demandes de

- diagnostic (DR) à une somme de contrôle ($\#_c$) calculée dans la ressource de processeur central (100) pour un fichier de configuration (CF) pour le véhicule (180) qui est stocké dans l'espace de stockage de données (120), et
dans lequel il est constaté que l'espace de stockage de données (120) contient un fichier de configuration (CF) courant si la somme de contrôle ($\#_v$) reçue correspond à la somme de contrôle ($\#_c$) calculée.
3. Système selon la revendication 2, dans lequel la ressource de processeur central (100) est configurée pour calculer une somme de contrôle ($\#_c$) pour un fichier de configuration (CF) reçu en vue de le stocker dans l'espace de stockage de données (120), pour stocker la somme de contrôle ($\#_c$) calculée dans l'espace de stockage de données (120) en association avec le fichier de configuration (CF) reçu, et pour lire la somme de contrôle ($\#_c$) stockée à partir de l'espace de stockage de données (120) afin de la comparer à une somme de contrôle ($\#_v$) reçue via une demande de diagnostic (DR).
4. Système selon la revendication 1, dans lequel le fichier de configuration (CF) spécifique au véhicule est associé à une somme de contrôle ($\#_v$, $\#_c$) et le véhicule (180) est supposé avoir une unité de traitement locale (186) configurée pour recevoir de la ressource de processeur central (100) un message de commande (OM) qui est envoyé en réponse à une demande de diagnostic (DR) provenant du véhicule (180) et inclut une somme de contrôle ($\#_c$) associée à un fichier de configuration (CF) spécifique au véhicule (180), qui est stocké dans l'espace de stockage de données (120) connecté à la ressource de processeur central (100), et comparer la somme de contrôle ($\#_c$) reçue de la ressource de processeur central (100) à une somme de contrôle ($\#_v$) calculée localement dans le véhicule (180) pour un fichier de configuration (CF) courant pour le véhicule (180), et dans lequel il est constaté que l'espace de stockage de données (120) contient un fichier de configuration (CF) courant si ladite somme de contrôle ($\#_c$) reçue dans le véhicule (180) correspond à ladite somme de contrôle ($\#_v$) calculée localement.
5. Système selon la revendication 1, dans lequel le fichier de configuration (CF) spécifique au véhicule est associé à une somme de contrôle ($\#_v$, $\#_c$), le véhicule (180) étant supposé avoir une unité de traitement locale (186) configurée pour calculer une nouvelle somme de contrôle ($\#_v$) locale pour ledit fichier (CF), et étant adaptée pour transmettre à la ressource de processeur central (100) ladite nouvelle somme de contrôle ($\#_v$) locale et une demande de diagnostic (DR), la ressource de processeur central (100) comprenant un comparateur (140) configuré pour comparer ladite nouvelle somme de contrôle ($\#_v$) locale à une somme de contrôle ($\#_c$) locale stockée reçue précédemment pour un fichier de configuration (CF) stocké dans l'espace de stockage de données (120), et dans lequel il est constaté que l'espace de stockage de données (120) contient un fichier de configuration (CF) courant si ladite nouvelle somme de contrôle ($\#_v$) locale correspond à ladite somme de contrôle ($\#_c$) locale précédemment reçue.
6. Procédé de diagnostic de véhicules (180), comprenant les étapes consistant à acheminer vers une ressource de processeur central (100) à partir d'un véhicule (180) une demande de diagnostic (DR) qui comprend un rapport de panne décrivant un état fonctionnel du véhicule (180), sur la base du rapport de panne, déterminer un diagnostic de panne pour le véhicule (180) par l'intermédiaire d'un moteur de diagnostic (110) dans la ressource de processeur central (100), **caractérisé en ce que** le procédé comprend les étapes consistant à vérifier si un fichier de configuration (CF) courant spécifique au véhicule décrivant une configuration du véhicule (180) qui prévaut est stocké dans un espace de stockage de données (120) connecté à la ressource de processeur central (100), s'il est constaté que l'espace de stockage de données (120) contient un fichier de configuration (CF) courant spécifique au véhicule, le lire à partir de l'espace de stockage de données (120) afin de servir de base au moteur de diagnostic (110) pour déterminer le diagnostic de panne, s'il est constaté que l'espace de stockage de données (120) ne contient pas un fichier de configuration (CF) courant spécifique au véhicule, envoyer à partir de la ressource de processeur central (100) au véhicule (180) une demande (CFR) d'un fichier de configuration (CF) spécifique au véhicule, et répondre à la réception d'un fichier de configuration (CF) spécifique au véhicule provenant du véhicule (180) en le lisant, pour qu'il serve de base au moteur de diagnostic (110) pour déterminer le diagnostic de panne, dans lequel le fichier de configuration (CF) spécifique au véhicule est considéré comme décrivant une configuration courante du véhicule (180) s'il est associé à un horodatage qui indique que son âge est inférieur à une première valeur prédéterminée et si un historique (H) stocké pour ledit fichier en association avec la ressource de processeur central (100) indique que la configuration spécifique au véhicule du véhicule (180) a changé moins fréquemment qu'une seconde valeur prédéterminée, de sorte que

le fichier de configuration spécifique au véhicule est considéré comme étant courant si le temps écoulé depuis le dernier changement enregistré du fichier de configuration spécifique au véhicule est plus court qu'un intervalle moyen d'historique entre deux mises à jour consécutives du fichier.

7. Procédé selon la revendication 6, dans lequel le fichier de configuration (CF) spécifique au véhicule est associé à une somme de contrôle ($\#_v \#_c$), ladite demande de diagnostic (DR) transmise du véhicule (180) à la ressource de processeur central (100) inclut la somme de contrôle ($\#_v$) associée au fichier de configuration (CF) spécifique au véhicule, et le procédé comprend l'étape consistant à comparer la somme de contrôle ($\#_v$) reçue via des demandes de diagnostic (DR) à une somme de contrôle ($\#_c$) calculée dans la ressource de processeur central (100) pour un fichier de configuration (CF) pour le véhicule (180) qui est stocké dans l'espace de stockage de données (120), et dans lequel il est constaté que l'espace de stockage de données (120) contient un fichier de configuration (CF) courant si la somme de contrôle ($\#_v$) reçue du véhicule (180) correspond à la somme de contrôle ($\#_c$) calculée.
8. Procédé selon la revendication 7, comprenant les étapes de calculer dans la ressource de processeur central (100) une somme de contrôle ($\#_c$) pour un fichier de configuration (CF) reçu, en vue de le stocker dans l'espace de stockage de données (120), stocker la somme de contrôle ($\#_c$) calculée dans l'espace de stockage de données (120) en association avec le fichier de configuration (CF) reçu, et lire la somme de contrôle ($\#_c$) stockée à partir de l'espace de stockage de données (120) pour la comparer à une somme de contrôle ($\#_v$) reçue via une demande de diagnostic (DR).
9. Procédé selon la revendication 6, dans lequel le fichier de configuration (CF) spécifique au véhicule est associé à une somme de contrôle ($\#_v \#_c$) et dans lequel le procédé comprend les étapes de en réponse à une demande de diagnostic (DR) reçue, transmettre de la ressource de processeur central (100) au véhicule (180) une somme de contrôle ($\#_c$) associée à un fichier de configuration (CF) spécifique au véhicule pour le véhicule (180) qui est stocké dans l'espace de stockage de données (120), comparer dans le véhicule (180) la somme de contrôle ($\#_c$) reçue à partir de la ressource de processeur central (100) à une somme de contrôle ($\#_v$) calculée localement pour un fichier de configuration (CF) courant pour le véhicule (180), et dans lequel il est constaté que l'espace de stockage de données (120) contient un fichier de confi-

guration (CF) courant si la somme de contrôle ($\#_c$) reçue dans le véhicule (180) correspond à la somme de contrôle ($\#_v$) calculée localement.

10. Procédé selon la revendication 6, dans lequel le fichier de configuration (CF) spécifique au véhicule est associé à une somme de contrôle ($\#_v \#_c$) et dans lequel le procédé comprend les étapes de transmettre une demande de diagnostic (DR) du véhicule (180) à la ressource de processeur central (100), calculer dans le véhicule (180) une nouvelle somme de contrôle ($\#_v$) locale pour ledit fichier (CF), et transmettre ladite nouvelle somme de contrôle ($\#_v$) locale du véhicule (180) à la ressource de processeur central (100), et comparer dans la ressource de processeur central (100) ladite nouvelle somme de contrôle ($\#_v$) locale à une somme de contrôle ($\#_v$) locale précédemment stockée pour un fichier de configuration (CF) stocké dans l'espace de stockage de données (120), et dans lequel il est constaté que l'espace de stockage de données (120) contient un fichier de configuration (CF) courant si ladite nouvelle somme de contrôle ($\#_v$) locale correspond à ladite somme de contrôle ($\#_v$) locale précédemment reçue.
11. Support (M) lisible par ordinateur sur lequel est stocké un programme adapté pour permettre à un ordinateur de commander les étapes selon l'une quelconque des revendications 6 à 10.

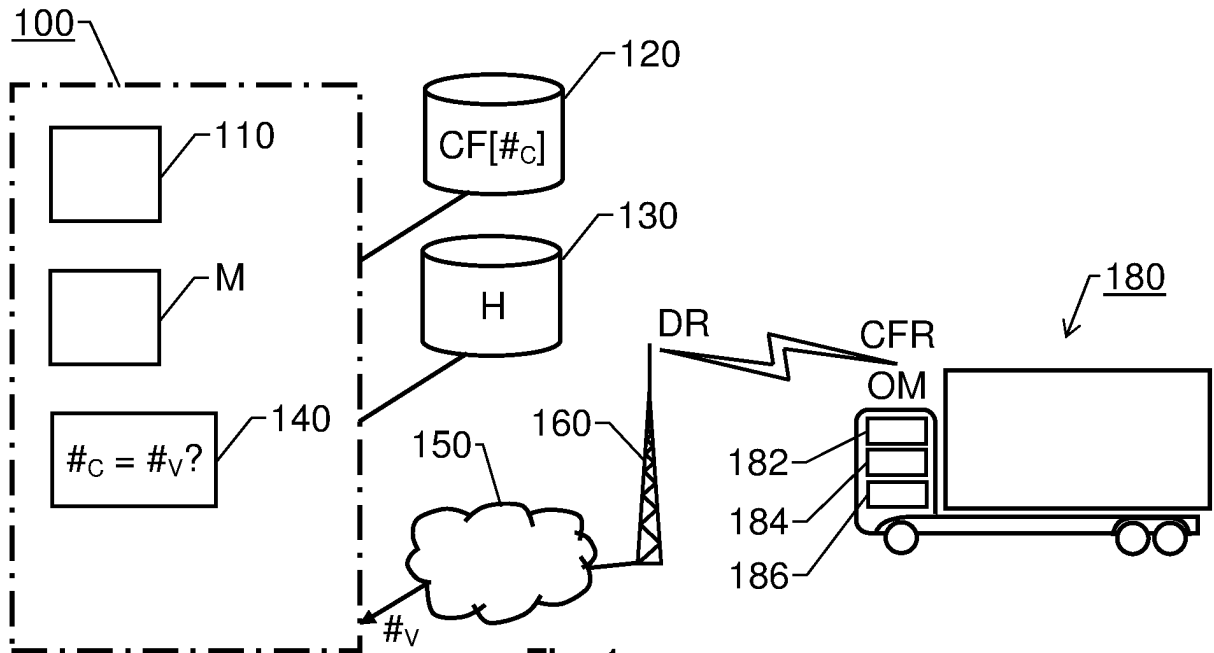


Fig. 1

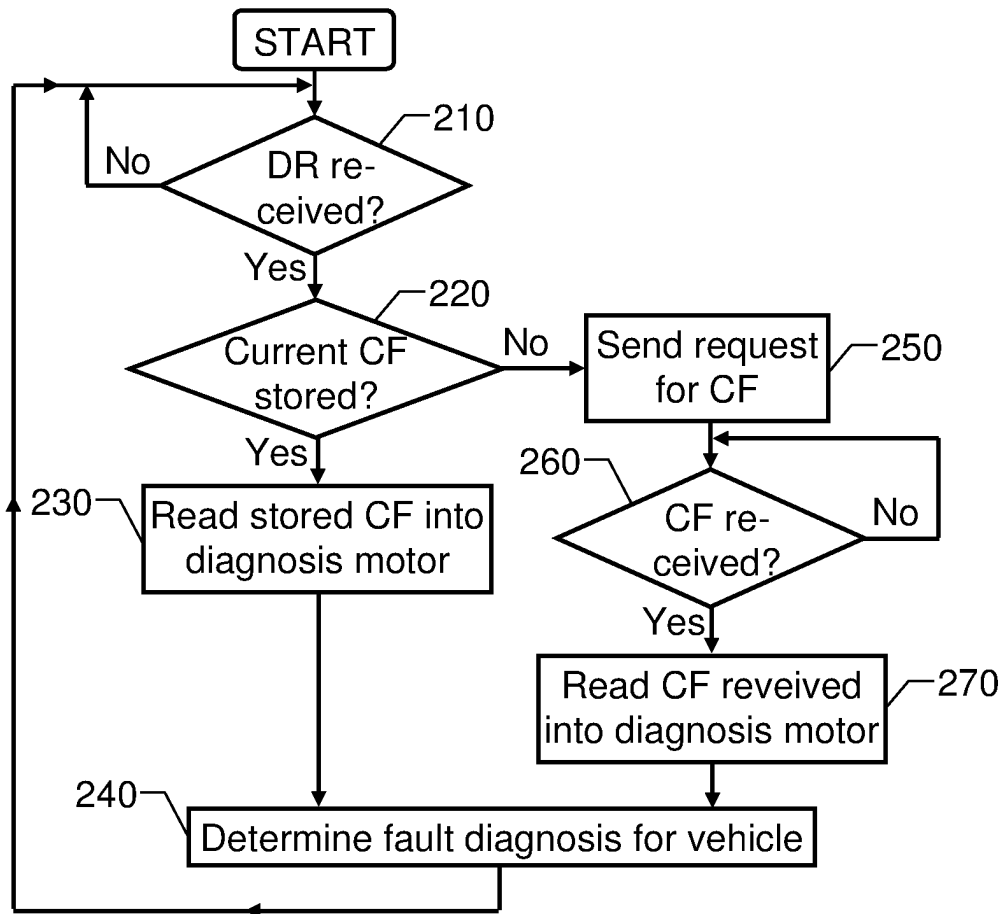


Fig. 2

REFERENCES CITED IN THE DESCRIPTION

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