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(54) REMOTE TESTING SYSTEM FOR A VEHICLE

FERNÜBERPRÜFUNGSSYSTEM FÜR EIN KRAFTFAHRZEUG

SYSTÈME DE TEST DISTANT DE VÉHICULE

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Description

TECHNICAL FIELD

[0001] The present invention regards a remote testing system for a vehicle and a pair of adapters for such system.

[0002] In particular, the invention regards a pair of OBD adapters and an OBD remote testing system for a road vehicle, for example a motor vehicle.

PRIOR ART

[0003] As known, usually a vehicle, for example a road vehicle such as a motor vehicle, a truck or motorcycle, is provided with an OBD (On-Board Diagnostics) system, i.e. capable of performing on-board diagnostic operations, comprising several control units configured for automatically monitoring the vehicle status and its sub-systems.

[0004] The OBD system further comprises a first connector associated to the vehicle and connected to the control units, suitable to receive an output signal of the control units representing the vehicle status.

[0005] The system further comprises a testing device provided with a second connector joined to the first connector and suitable to be connected to the first connector to transmit the output signal of the control units to the testing device. In addition, the testing device is configured for decoding the output signal of the control units.

[0006] In the known systems, the testing device is provided with a connecting cable associated - at one end - to the testing device - at the opposite end - to the second connector.

[0007] Thus, in use, the testing device is always physically close to the vehicle. For example, in a motor vehicle the first connector is usually arranged in the dashboard beneath the steering wheel and, thus, the user is forced to get into the motor vehicle cockpit holding the testing device to perform the diagnosis of the means with considerable discomfort and operative difficulty. Alternatively, systems in which the testing device and the second connector can communicate in a wireless fashion in particular through Bluetooth technology are known. In such known systems, the second connector comprises an emitter suitable to transmit the output signal of the control units to a receiver associated and connected to the testing device.

[0008] However, given that the Bluetooth technology has a short radius, the user must be in the vicinity of the vehicle, for example a few meters away, and generally in the same environment. Thus, the control units may communicate with the testing device only when the operator is present, for example when the vehicle is in the garage.

[0009] Furthermore, such systems require the use of specific testing devices, which are usually very expensive

[0010] US 7 584 030 B1 discloses an equipment for

monitoring an automobile On-Board Diagnostic computer with an ODB II code reader/scanner, and more particularly a wireless connection, wherein a data link connection (DLC) cable for connecting the On-Board Diagnostic computer with a 25 pin connector of the code reader/scanner, is replaced, using two connectors which have been pre-programmed to communicate with each other.

[0011] An object of the present invention is to overcome the aforementioned drawbacks of the prior art through a solution that is simple, rational and inexpensive.

[0012] These objects are attained by the characteristics of the invention, which are outlined in the independent claim. The dependent claims outline preferred and/or particularly advantageous aspects of the invention.

DESCRIPTION OF THE INVENTION

[0013] An embodiment of the invention, in particular provides a remote testing system for a vehicle comprising: a diagnostic unit installed on-board the vehicle and configured for generating a signal representing the vehicle status and sending said signal outside the vehicle through a first ODB connecting socket; a testing device configured for receiving and processing the signal representing the vehicle status and provided with a first ODB connecting plug.

[0014] According to the invention, the system comprises a first adapter comprising a second ODB connecting plug, configured for coupling with the first connecting socket of the diagnostic unit, and a remote communication unit configured for transmitting the signal representing the vehicle status outside the first adapter; a second adapter comprising a remote communication unit configured for receiving the signal representing the vehicle status from the communication unit of the first adapter, and a second ODB connecting socket configured for coupling with the first connecting plug of the testing device.

[0015] Thanks to this solution, the system may be made up of a diagnostic unit and a conventional testing device, for example via cable, that can be placed in mutual remote communication by means of the communication unit of the first and the second adapter without the operator having to change the testing device with considerable economic burden.

[0016] According to another aspect of the invention, the system may comprise at least one communication device configured for placing the communication units of the first and the second adapter in mutual communication by means of a wireless network.

[0017] Thus, this enables expanding the communication capacity between the first and the second adapter.

[0018] According to a further aspect of the invention, said at least one communication device may comprise a router or a modem.

[0019] Thus, this enables placing the first and the second adapter in communication via telephone, internet or WiFi connection expanding the radius of action. Accord-

ing to another aspect of the invention, said at least one communication device is a mobile communication device.

[0020] Thus, the expansion of the radius of action of the system is enabled by means of common and versatile communication devices without the operator having to buy a dedicated device with considerable economic burden. Furthermore, thanks to such devices, communication is guaranteed also outside a garage or other organised facilities and, for example, the system can be used by a rescue vehicle which, during a road rescue operation, for example sends the signal representing the vehicle status to the garage so that it can be processed by the testing device.

[0021] Furthermore, the at least one communication device can be configured for connecting to the first and/or to the second adapter through a Bluetooth or WiFi connection.

[0022] Thus, the connection between the communication device and the adapters is obtained through a simple and reliable communication system.

[0023] Furthermore, the system may comprise at least one first communication device configured for connecting to the first adapter, and at least one second communication device configured for connecting to the second adapter, said first and second communication device being configured for establishing mutual communication via a wireless network.

[0024] Thanks to such devices, communication is also guaranteed outside the garage or other organised facilities.

[0025] According to another aspect of the invention, at least one from among the first and the second adapter may comprise a voltage regulator connected to the respective second connecting plug and/or the second connecting socket and configured for enabling electrical supply to the respective adapter from an external source.

[0026] Thanks to such solution, the first adapter and/or the second adapter do not require their own internal source of electrical supply, for example a battery, thus being economic and compact.

[0027] According to another aspect of the invention, the diagnostic unit is configured for generating a signal according to a predetermined standard and the second adapter can be configured for selectively replicating said standard. Thus, the second adapter is capable of replicating any standard serving as a universal adapter.

[0028] According to a further aspect of the invention, the second adapter may comprise a control microprocessor connected to connectors of the second connecting socket according to an interconnection diagram that is a function of the standard of the signal, the second adapter further comprising a switch configured for selectively modifying the interconnection between the control microprocessor and the connectors of the second connecting socket as a function of a command received from the testing device adapting the interconnection diagram to the particular standard of the vehicle.

[0029] Thus, the second adapter may easily replicate the standard of any diagnostic unit.

[0030] Furthermore, the invention provides a pair of adapters for a remote diagnosis system of a vehicle, provided with a diagnostic unit having a first connecting socket and a testing device having a first connecting plug, said pair comprising: a first adapter comprising a second connecting plug, suitable for coupling with the first connecting socket of the diagnostic unit, and a remote communication unit configured for transmitting a signal representing the vehicle status outside the first adapter; a second adapter comprising a remote communication unit configured for receiving the signal representing the vehicle status from the communication unit of the first adapter, and a second connecting socket suitable for coupling with the first connecting plug of the testing device.

[0031] Thus, there is provided a pair of adapters that enable a known system of the conventional type to perform a remote analysis of the vehicle status without the operator having to change the testing device with considerable burden of costs. In addition, the operator does not have to carry the device along all the time thus making the use of the system easier and safer.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] Further characteristics and advantages of the invention will be apparent from reading the flowing description - provided by way of non-limiting example - with reference to the figures illustrated in the attached drawings.

Figure 1 is a simplified diagram of the testing system according to an embodiment.

Figure 2 is a simplified diagram of a first adapter of the testing system.

Figure 3 is a simplified diagram of a second adapter of the testing system.

BEST EMBODIMENT OF THE INVENTION

[0033] With particular reference to such figures, an OBD (On-Board Diagnostics) testing system for a vehicle 2, for example a motor vehicle or motorcycle, is indicated in its entirety with 1.

[0034] The system comprises a diagnostic unit 10 of the vehicle 2 provided with a plurality of control units 100 connected with the main systems and sub-systems of the vehicle 2 and configured for generating a signal Y representing the vehicle status 2.

[0035] In particular, the diagnostic unit 10 is configured for generating the signal Y according to a specific standard of the type of vehicle or the vehicle maker for example: SAE J1850 PWM, SAE J1850 VPW, ISO 9141-2, ISO 14230 KWP2000 and ISO 15765 CAN.

[0036] The diagnostic unit 10 further comprises a first connecting socket 101 connected to the control units 100 and configured for transmitting the signal Y outside the

vehicle 2 according to the particular standard of the vehicle.

[0037] In particular, the first connecting socket 101 comprises a plurality of data access connectors 102 configured for enabling a stable but removal connection with a corresponding plug device to be better described hereinafter.

[0038] The first connecting socket 101 is for example arranged in proximity of the dashboard of the vehicle 2 so that the connectors 102 are easily accessible. Furthermore, the system 1 comprises a testing device 11 configured for processing the signal Y.

[0039] As regards the present invention, the testing device 11 may be a testing scanner of the conventional type provided with a central control device, for example a palmtop or a PC, provided with an external interface, for example a keypad and a display, connected by means of a cable to a first connecting plug 110 configured for coupling with a corresponding connecting socket for example to the first connecting socket 101 of the diagnostic unit 10.

[0040] The expression coupling is used to indicate that the first connecting plug 110 is suitable to be directly mechanically coupled/fitted with/in the first connecting socket 101, i.e. without the intermediation of further intermediate adapters or connectors, obtaining a mutual shape-coupling with said first connecting socket 101.

[0041] In particular, the first connecting plug 110 is provided with a plurality of connectors 111, for example to contact pins, configured to provide a stable but removable connection with a connecting socket so as to enable access to a signal transmitted from the connecting socket.

[0042] More in detail, the testing device 11 comprises a control means 112, for example a control unit, configured to process the signal and connected to connectors 111 of the first plug device 111. The testing device 11 further comprises a switch 113 configured for selectively defining the interconnection between the control means 112 and the connectors 111 of the first connecting plug 111.

[0043] The testing device 11 is further configured for controlling the switch 113 so as to selectively programme the interconnection between the control means 112 and the connectors 111 of the first connecting plug according to the programming profile corresponding to the particular standard of the vehicle 2. The system 1 further comprises a first adapter 12 configured to be removably associated to the first connecting socket 101 of the vehicle 2 and transmit the signal representing the vehicle status 2 to the testing device 11.

[0044] The first adapter is provided with a communication unit 120, configured for transmitting the signal Y connected to a second connecting plug 121 provided with connectors 122, which is also configured for coupling with the first connecting socket 101 of the diagnostic unit 10.

[0045] The expression coupling is used to indicate that the second connecting plug 121 is suitable to be directly

mechanically coupled/fitted with/in the first connecting socket 101, i.e. without the intermediation of further intermediate adapters or connectors, obtaining a mutual shape-coupling with said first connecting socket 101.

[0046] More in detail, the first adapter 12 comprises a control microprocessor 123 connected to the connectors 122 of the second connecting plug 121 and to the communication unit 120.

[0047] The first adapter 12 further comprises a second switch 124 configured for selectively defining the interconnection between the control microprocessor 123 and the connectors 122 of the second connecting plug 121.

[0048] In particular, the second switch 124 is configured for selectively programming the interconnection between the control microprocessor 123 and the connectors 122 of the second connecting plug 121 according to a programming profile corresponding to the particular standard of the vehicle 2. More in detail, as better described hereinafter, the second switch 124 is configured for selectively programming the interconnection between the control microprocessor 123 and the connectors 122 upon receiving a command from the testing device 11.

[0049] The communication unit 120 of the first adapter 12 is preferably a wireless communication unit, for example an antenna or Bluetooth and/or WiFi card.

[0050] It cannot be ruled out that the first adapter 12 may comprise several communication units, for example different from each other, and that it may comprise, besides a wireless communication unit, even one or more communication units via cable, for example a USB or mini USB port.

[0051] The communication unit 120 is connected to the control microprocessor 123 and it is configured for sending the signal Y representing the vehicle status 2 outside the first adapter and/or for transmitting to the microprocessor 123 a command for controlling the second switch 124 received from the testing device 12.

[0052] Preferably, the first adapter 12 is provided with a voltage regulator 125 connected to the connectors 122 (or at least to some of the connectors 122) of the second connecting plug 121 for the electrical supply of the first adapter 12.

[0053] The system 1 further comprises a second adapter 13 configured to be removably associated to the first connecting plug 111 of the testing device 11 and to receive the signal Y representing the vehicle status 2 from the first adapter 12 and transmit it to the testing device 11.

[0054] The second adapter 13 is provided with a communication unit 130, configured for receiving the signal Y, and connected to a second connecting socket 131 provided with connectors 132 and configured for replicating the first connecting socket 101 of the diagnostic unit 10.

[0055] The expression replicate is used to indicate that the second connecting socket 131 is a replica of the first connecting socket 101, i.e. identical to the latter or of the same type, so as to be directly mechanically coupled/fitted

ted to/with the first connecting plug 110 of the testing device 11.

[0056] More in detail, the second adapter 13 comprises a control microprocessor 133 connected to the connectors 132 of the second connecting socket 131 and to the communication unit 130.

[0057] The second adapter 13 further comprises a switch 134 configured for selectively defining the interconnection between the control microprocessor 133 and the connectors 132 of the second connecting socket 131.

[0058] In particular, the second switch 134 is configured for selectively programming the interconnection between the control microprocessor 133 and the connectors 132 of the second connecting plug 131 of the second adapter 13, according to a programming profile corresponding to the particular standard of the vehicle 2.

[0059] More in detail, the switch 134 of the second adapter 13 is configured for selectively programming the interconnection between the control microprocessor 133 and the connectors 132 upon receiving a command from the testing device 11.

[0060] The communication unit 130 of the second adapter 13 is preferably a wireless communication unit, for example an antenna or Bluetooth and/or WiFi card.

[0061] It cannot be ruled out that the second adapter 13 may comprise several communication units, for example different from each other, and that it may comprise, besides a wireless communication unit, even one or more communication units via cable, for example a USB or mini USB port.

[0062] The communication unit 130, of the second adapter 13, is connected to the control microprocessor 133 and it is configured for receiving the signal Y representing the vehicle status 2 from the first adapter 12 and/or for transmitting to the first adapter 12 a command for controlling the second switch 124, of the first adapter 12 received from the testing device 11. Preferably, the second adapter 13 is provided with a voltage regulator 135 connected to an external electrical supply device and to the connectors 132 (or at least to some of the connectors 122) of the second connecting socket 131 for the electrical supply of the testing device 12.

[0063] According to a first embodiment, the system 1 further comprises at least one communication device 14 configured to place the first and the second adapter 12, 13 in mutual communication.

[0064] According to such embodiment, the first communication device 14 is a wireless device, for example a WiFi router, configured for mutually connecting the first and the second adapter 12, 13 via a wireless network, for example a WiFi network.

[0065] According to other embodiments, the system 1 may comprise a plurality of communication devices, for example, a first and a second communication device 14, 15.

[0066] For example, according to a preferred embodiment, the first and the second communication device 14, 15 comprise a modem for connecting to a telephone

or internet network and, for example, they are smart-phones or tablets.

[0067] Each communication device 14, 15 further comprises a communication unit, preferably wireless, for example Bluetooth, configured for connecting the communication device 14, 15 to a respective adapter 12, 13, for example the first communication device 14 with the first adapter 12 and the second communication device 15 with the second adapter 13.

[0068] As described above, the testing system 1 operates as follows.

[0069] In use, the first adapter 12 is coupled to the diagnostic unit 10 of the vehicle 2 and, in particular, the second connecting plug 121 of the first adapter 12 is coupled with a stable and releasable connection directly to the first connecting socket 101 of the diagnostic unit 10.

[0070] The first adapter 13 is also connected to the first communication device 14 (for example a smartphone) by means of the communication unit 120 thereof, for example by means of a Bluetooth connection.

[0071] The second adapter 13 is coupled to the testing device 11, in particular, the second connecting socket 131 of the second adapter 13 is coupled with a stable and releasable connection to the first connecting plug 111 of the testing device 11.

[0072] The second adapter 13 is also connected to the second communication device 15 (for example a smartphone) by means of the communication unit 130 thereof, for example by means of a Bluetooth connection.

[0073] The first and the second communication device 14, 15 are mutually connected by means of a wireless network, for example a telephone connector.

[0074] Using the testing device 11, an operator selects the standard corresponding to the type of vehicle 2 so as to send to the switch 113 a programming command to modify the interconnections between the connectors 111 of the first connecting plug 110 and the control means 112 of the first connecting plug 110.

[0075] Such programming control is sent to the second adapter 13, for example through the plug-socket connection, so as to modify the interconnections between the connectors 132 of the second connecting socket 131 and the means 133 for controlling the second connecting socket 131.

[0076] In particular, such interconnections are modified so that the second connecting socket 131 takes a configuration such to replicate the first connecting socket 101 of the diagnostic unit 10.

[0077] The second adapter 13 sends the programming command to the first adapter 12 by means of the communication unit 130 thereof and through the wireless network provided by the communication devices 14, 15.

[0078] The first adapter 12 receives the programming command through the communication unit 120 thereof and the switch 124 modifies the interconnections between the connectors 122 of the second connecting plug 121 and the microprocessor 123 of the second connecting plug 121 so as to adapt them to the standard of the

first connecting socket 101 of the diagnostic unit 10. Thus, the first adapter 12 obtains access to the signal Y representing the vehicle status 2.

[0079] The first adapter 12 sends the signal Y to the second adapter 13 by means of the communication unit 132 thereof and through the wireless network provided by the communication devices 14, 15.

[0080] Thus, the testing device 11 may receive the signal Y from the second adapter 13 which precisely replicates the first connecting socket of the diagnostic unit 10. Upon receiving the signal Y, the testing device 11 may process it to enable the operator to assess the vehicle status 2.

[0081] The invention thus conceived is susceptible to numerous modifications and variants all falling within the inventive concept.

[0082] In addition, all details can be replaced by other technically equivalent elements.

[0083] Basically, the materials used as well as the shapes and contingent dimensions, may vary according to the needs without departing from the scope of protection of the claims that follow.

Claims

1. A remote testing system (1) for a vehicle (2) comprising:

- a diagnostic unit (10) installable on-board the vehicle (2) and configured for generating a signal (Y) representing a vehicle status (2) and for sending said signal outside the vehicle via a first connecting OBD socket (101);
- a testing device (11) configured for receiving and processing the signal (Y) representing the vehicle status and provided with a first connecting OBD plug (110) configured to be coupled with the first connecting OBD socket (101) of the diagnostic unit (10);
- a first adapter (12) comprising a second connecting OBD plug (121) configured for coupling with the first connecting OBD socket (101) of the diagnostic unit (10), and a remote communication unit (120) configured for transmitting the signal (Y) representing the vehicle status outside the first adapter (12);
- a second adapter (13) comprising a remote communication unit (130) configured for receiving the signal (Y) representing the vehicle status from the communication unit (120) of the first adapter (12), and a second connecting OBD socket (131) configured for coupling with the first connecting OBD plug (110) of the testing device (11).

2. The system (1) according to claim 1, **characterised in that** it comprises at least a communication device

(14, 15) configured for placing the communication units (120, 130) of the first and the second adapter (12, 13) in mutual communication by means of a wireless network.

3. The system (1) according to claim 2, comprising at least one first communication device (14) configured for connecting to the first adapter (12), and at least one second communication device (15) configured for connecting to the second adapter (13), said first and second communication device (14, 15) being configured for establishing mutual communication via a wireless network.

4. The system (1) according to claim 2 or 3, wherein said at least one communication device (14, 15) comprises a router or a modem.

5. The system (1) according to any one of claims 2 to 4, wherein said at least one communication device (14, 15) is a mobile communication device.

6. The system (1) according to any one of claims 2 to 5, wherein the at least one communication device (14, 15) is configured for connecting to the first and/or the second adapter (12, 13) via a Bluetooth or wi-fi connection.

7. The system (1) according to claim 1, wherein at least one from among the first and the second adapter (12, 13) comprises a voltage regulator connected to the respective second connecting plug (121) and/or the second connecting socket (131) and configured for enabling electrical supply to the respective adapter (12, 13) from an external source.

8. The system (1) according to claim 1, wherein the diagnostic unit is configured for generating a signal (Y) according to a predetermined standard, the second adapter (13) being configured for replicating said standard.

9. The system (1) according to claim 8, wherein the second adapter (13) comprises a control microprocessor (133) connected to connectors (132) of the second connecting socket (131) according to an interconnection diagram that is a function of the standard of the signal, the second adapter (13) further comprising a switch (134) configured for selectively modifying the interconnection between the control microprocessor (133) and the connectors (132) of the second connecting socket (131) as a function of a command received from the testing device (11) adapting the interconnection diagram to the particular standard of the vehicle (2).

10. The system (1) according to claim 9, wherein the first adapter (12) further comprises a switch (124) and a

control microprocessor (123), and wherein the remote communication unit (130) of the second adapter (13) is configured for sending a programming command to the first adapter (12), the communication unit (120) of the first adapter is configured for receiving the programming command, the switch (124) being configured to modify interconnections between connectors (122) of the second connecting OBD plug (121) and the microprocessor (123) based on said programming command, so as to adapt them to the standard of the first connecting socket (101) of the diagnostic unit (10).

Patentansprüche

1. Fernprüfsystem (1) für ein Fahrzeug (2), umfassend:

- eine Diagnoseeinheit (10), die an Bord des Fahrzeugs (2) installiert werden kann und konfiguriert ist, um ein Signal (Y) zu erzeugen, das einen Fahrzeugzustand (2) darstellt, und um das Signal über eine erste OBD-Anschlussbuchse (101) nach außerhalb des Fahrzeugs zu senden;
- eine Prüfvorrichtung (11), die konfiguriert ist, um das Signal (Y), das den Fahrzeugzustand darstellt, zu empfangen und zu verarbeiten, und die mit einem ersten OBD-Anschlussstecker (110) versehen ist, der konfiguriert ist, um mit der ersten OBD-Anschlussbuchse (101) der Diagnoseeinheit (10) gekoppelt zu werden;
- einen ersten Adapter (12), umfassend einen zweiten OBD-Anschlussstecker (121), der zum Koppeln mit der ersten OBD-Anschlussbuchse (101) der Diagnoseeinheit (10) konfiguriert ist, und eine Fernkommunikationseinheit (120), die zum Senden des Signals (Y), das den Fahrzeugzustand darstellt, nach außerhalb des ersten Adapters (12) konfiguriert ist;
- einen zweiten Adapter (13), umfassend eine Fernkommunikationseinheit (130), die zum Empfangen des Signals (Y), das den Fahrzeugzustand darstellt, von der Kommunikationseinheit (120) des ersten Adapters (12) konfiguriert ist, und eine zweite OBD-Anschlussbuchse (131), die zum Koppeln mit dem ersten OBD-Anschlussstecker (110) der Prüfvorrichtung (11) konfiguriert ist.

2. System (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** es mindestens eine Kommunikationsvorrichtung (14, 15) umfasst, die konfiguriert ist, um die Kommunikationseinheiten (120, 130) des ersten und des zweiten Adapters (12, 13) mittels eines drahtlosen Netzwerks in gegenseitige Kommunikation zu bringen.

3. System (1) nach Anspruch 2, umfassend mindestens eine erste Kommunikationsvorrichtung (14), die zum Verbinden mit dem ersten Adapter (12) konfiguriert ist, und mindestens eine zweite Kommunikationsvorrichtung (15), die zum Verbinden mit dem zweiten Adapter (13) konfiguriert ist, wobei die erste und die zweite Kommunikationsvorrichtung (14, 15) konfiguriert sind, um über ein drahtloses Netzwerk eine gegenseitige Kommunikation herzustellen.

4. Das System (1) nach Anspruch 2 oder 3, wobei die mindestens eine Kommunikationseinrichtung (14, 15) einen Router oder ein Modern umfasst.

5. System (1) nach einem der Ansprüche 2 bis 4, wobei die mindestens eine Kommunikationsvorrichtung (14, 15) eine mobile Kommunikationsvorrichtung ist.

6. System (1) nach einem der Ansprüche 2 bis 5, wobei die mindestens eine Kommunikationsvorrichtung (14, 15) zum Verbinden mit dem ersten und/oder dem zweiten Adapter (12, 13) über eine Bluetooth- oder Wi-Fi-Verbindung konfiguriert ist.

7. System (1) nach Anspruch 1, wobei mindestens einer von dem ersten und dem zweiten Adapter (12, 13) einen Spannungsregler umfasst, der mit dem jeweiligen zweiten Anschlussstecker (121) und/oder der zweiten Anschlussbuchse (131) verbunden und konfiguriert ist, um eine elektrische Versorgung zu dem jeweiligen Adapter (12, 13) von einer externen Quelle zu ermöglichen.

8. System (1) nach Anspruch 1, wobei die Diagnoseeinheit zum Erzeugen eines Signals (Y) gemäß einem vorbestimmten Standard konfiguriert ist, wobei der zweite Adapter (13) zum Replizieren dieses Standards konfiguriert ist.

9. System (1) nach Anspruch 8, wobei der zweite Adapter (13) einen Steuermikroprozessor (133) umfasst, der gemäß einem Verbindungsdiagramm, das abhängig von dem Standard des Signals ist, mit Verbindern (132) der zweiten Anschlussbuchse (131) verbunden ist, der zweite Adapter (13) ferner umfassend einen Schalter (134), der konfiguriert ist, um die Verbindung zwischen dem Steuermikroprozessor (133) und den Verbindern (132) der zweiten Anschlussbuchse (131) abhängig von einem von der Prüfvorrichtung (11) empfangenen Befehl, der das Verbindungsdiagramm an den jeweiligen Standard des Fahrzeugs (2) anpasst, selektiv zu modifizieren.

10. System (1) nach Anspruch 9, wobei der erste Adapter (12) ferner einen Schalter (124) und einen Steuermikroprozessor (123) umfasst, und wobei die Fernkommunikationseinheit (130) des zweiten Ad-

apters (13) configuré est, um einen Programmierbefehl an den ersten Adapter (12) zu senden, wobei die Kommunikationseinheit (120) des ersten Adapters konfiguriert ist, um den Programmierbefehl zu empfangen, wobei der Schalter (124) konfiguriert ist, um die Verbindungen zwischen Verbindern (122) des zweiten OBD-Anschlussteckers (121) und dem Mikroprozessor (123) basierend auf dem Programmierbefehl zu modifizieren, um sie an den Standard der ersten Anschlussbuchse (101) der Diagnoseeinheit (10) anzupassen.

Revendications

1. Système de test à distance (1) pour un véhicule (2), comprenant :

- une unité de diagnostic (10) installable à bord du véhicule (2) et configurée pour générer un signal (Y) représentant l'état d'un véhicule (2) et pour envoyer ledit signal à l'extérieur du véhicule par l'intermédiaire d'une première fiche OBD de raccordement (101) ;
- un dispositif de test (11) configuré pour recevoir et traiter le signal (Y) représentant l'état du véhicule et doté d'une première prise OBD de raccordement (110) configurée pour être couplée à la première fiche OBD de raccordement (101) de l'unité de diagnostic (10) ;
- un premier adaptateur (12) comprenant une deuxième prise OBD de raccordement (121) configurée pour être couplée à la première fiche OBD de raccordement (101) de l'unité de diagnostic (10), et une unité de communication à distance (120) configurée pour transmettre le signal (Y) représentant l'état du véhicule à l'extérieur du premier adaptateur (12) ;
- un deuxième adaptateur (13) comprenant une unité de communication à distance (130) configurée pour recevoir le signal (Y) représentant l'état du véhicule depuis l'unité de communication (120) du premier adaptateur (12), et une deuxième prise OBD de raccordement (131) configurée pour être accouplée avec la première fiche OBD de raccordement (110) du dispositif de test (11).

2. Système (1) selon la revendication 1, **caractérisé en ce qu'il** comprend au moins un dispositif de communication (14, 15) configuré pour placer les unités de communication (120, 130) du premier et du deuxième adaptateur (12, 13) en communication mutuelle grâce à un réseau sans fil.
3. Système (1) selon la revendication 2, comprenant au moins un premier dispositif de communication (14) configuré pour être connecté au premier adap-

tateur (12), et au moins un deuxième dispositif de communication (15) configuré pour être connecté au deuxième adaptateur (13), lesdits premier et deuxième dispositifs de communication (14, 15) étant configurés pour établir une communication mutuelle par l'intermédiaire d'un réseau sans fil.

4. Système (1) selon la revendication 2 ou 3, dans lequel ledit au moins un dispositif de communication (14, 15) comprend un routeur ou un modem.
5. Système (1) selon l'une quelconque des revendications 2 à 4, dans lequel ledit au moins un dispositif de communication (14, 15) est un dispositif de communication mobile.
6. Système (1) selon l'une quelconque des revendications 2 à 5, dans lequel le au moins un dispositif de communication (14, 15) est configuré pour être connecté au premier et/ou au deuxième adaptateur (12, 13) par l'intermédiaire d'une connexion Bluetooth ou Wi-Fi.
7. Système (1) selon la revendication 1, dans lequel au moins un parmi le premier et le deuxième adaptateur (12, 13) comprend un régulateur de tension connecté à la deuxième prise de raccordement (121) respective et/ou à la deuxième fiche de raccordement (131) et configuré pour permettre l'alimentation électrique de l'adaptateur (12, 13) respectif depuis une source externe.
8. Système (1) selon la revendication 1, dans lequel l'unité de diagnostic est configurée pour générer un signal (Y) selon une norme prédéterminée, le deuxième adaptateur (13) étant configuré pour répliquer ladite norme.
9. Système (1) selon la revendication 8, dans lequel le deuxième adaptateur (13) comprend un microprocesseur de commande (133) connecté aux connecteurs (132) de la deuxième fiche de raccordement (131) selon un schéma d'interconnexion qui dépend de la norme du signal, le deuxième adaptateur (13) comprenant en outre un commutateur (134) configuré pour modifier sélectivement l'interconnexion entre le microprocesseur de commande (133) et les connecteurs (132) de la deuxième fiche de raccordement (131) en fonction d'une commande reçue du dispositif de test (11) adaptant le schéma d'interconnexion à la norme particulière du véhicule (2).
10. Système (1) selon la revendication 9, dans lequel le premier adaptateur (12) comprend en outre un commutateur (124) et un microprocesseur de commande (123), et dans lequel l'unité de communication à distance (130) du deuxième adaptateur (13) est configurée pour envoyer une commande de programma-

tion au premier adaptateur (12), l'unité de communication (120) du premier adaptateur est configurée pour recevoir la commande de programmation, le commutateur (124) étant configuré pour modifier les interconnexions entre les connecteurs (122) de la deuxième prise OBD de raccordement (121) et le microprocesseur (123) sur la base de ladite commande de programmation, de façon à les adapter à la norme de la première fiche de raccordement (101) de l'unité de diagnostic (10).

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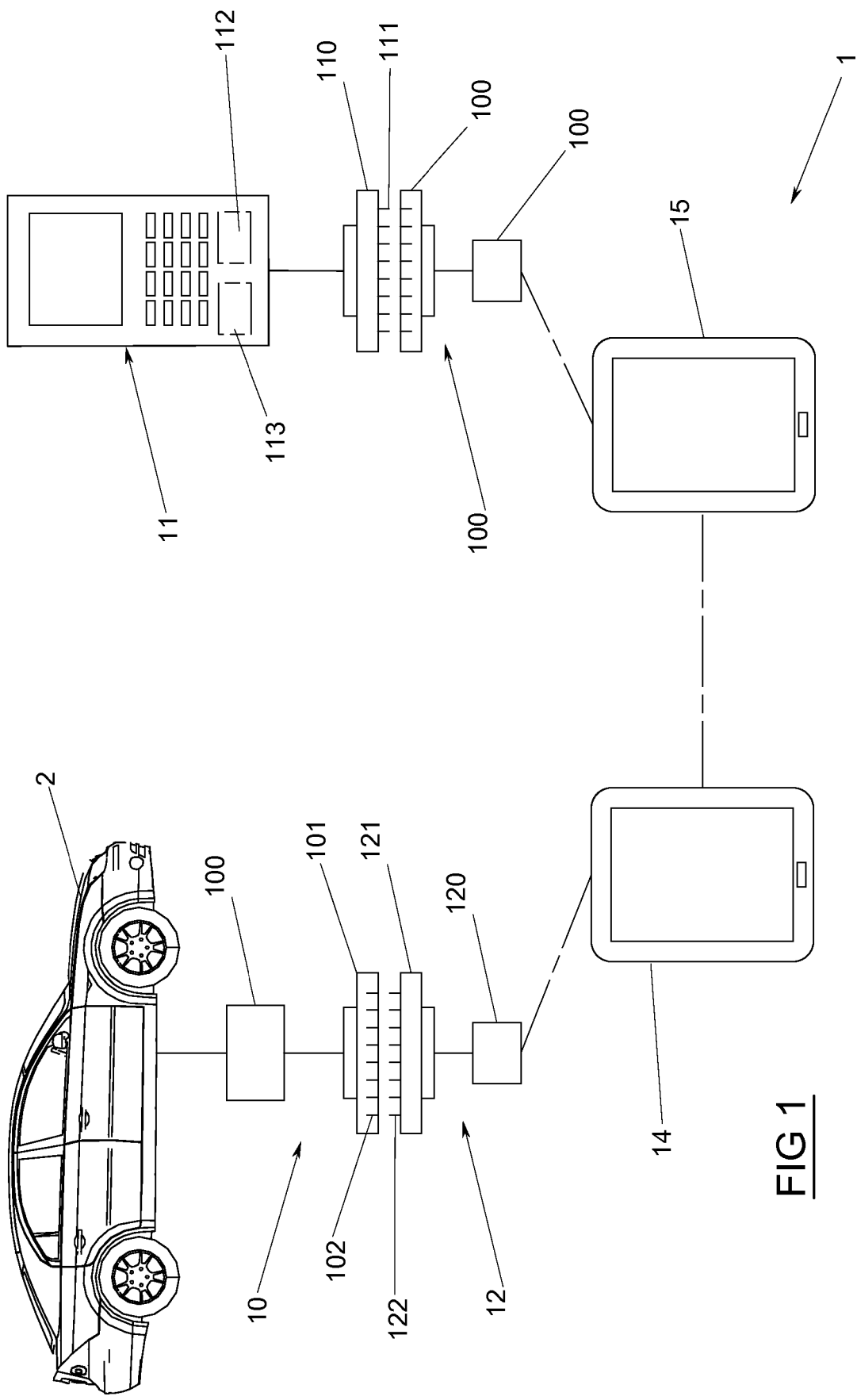


FIG 1

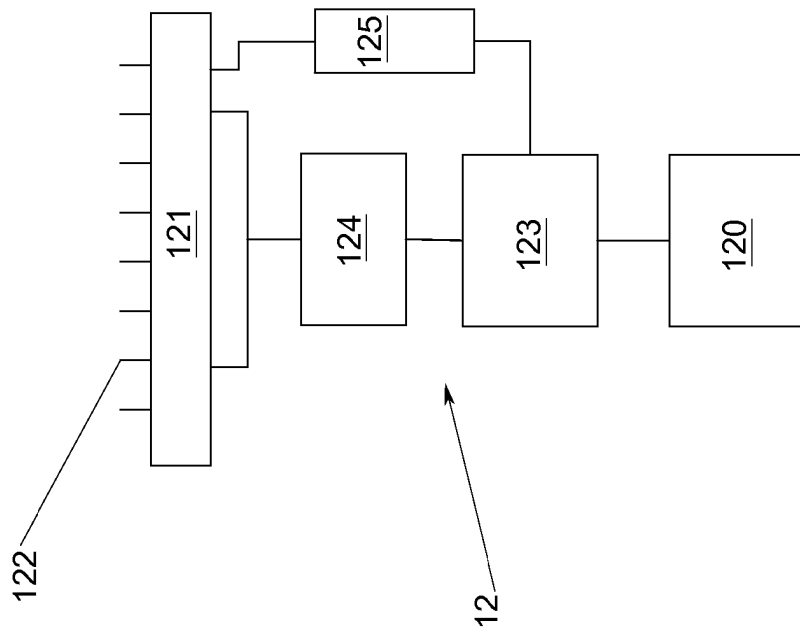


FIG 2

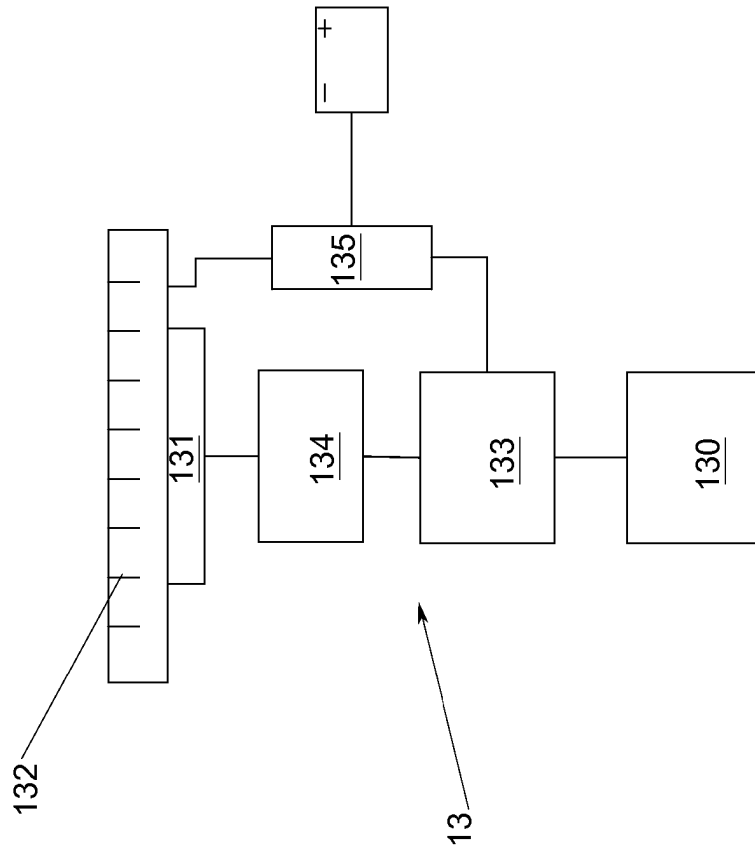


FIG 3

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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