

(19)



(11)

EP 1 907 240 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
09.09.2015 Bulletin 2015/37

(51) Int Cl.:
B60R 16/02 ^(2006.01) **G07C 5/08** ^(2006.01)
B60R 16/037 ^(2006.01)

(21) Application number: **06758099.3**

(86) International application number:
PCT/SE2006/050241

(22) Date of filing: **05.07.2006**

(87) International publication number:
WO 2007/004984 (11.01.2007 Gazette 2007/02)

(54) ARRANGEMENT IN A VEHICLE FOR SETTING SETTABLE VEHICLE FUNCTIONS IN ACCORDANCE WITH PREVIOUS SETTINGS

ANORDNUNG IN EINEM FAHRZEUG ZUM EINSTELLEN EINSTELLBARER
FAHRZEUGFUNKTIONEN GEMÄSS VORHERIGER EINSTELLUNGEN

AGENCEMENT CONTENU DANS UN VEHICULE ET DESTINE A DEFINIR DES FONCTIONS DE
VEHICULE DEFINISSABLES EN ACCORD AVEC DES DEFINITIONS ANTERIEURES

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**

(30) Priority: **06.07.2005 SE 0501582**

(43) Date of publication of application:
09.04.2008 Bulletin 2008/15

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Description

TECHNICAL FIELD

[0001] The invention relates generally to vehicles and more specifically to an arrangement in a vehicle for automatically setting settable vehicle functions in accordance with previous settings for a user of the vehicle.

BACKGROUND OF THE INVENTION

[0002] DE 38 17 495 C2 discloses such an arrangement in which the settings of different settable vehicle functions that a user of the vehicle makes are recorded in a memory in the vehicle switch key and the vehicle functions are set as recorded the next time the switch key is used.

[0003] The arrangement according to DE 38 17 495 C2 is suitable only for vehicles that are used by one and the same user all the time but unsuitable for vehicles that are frequently used by many different users such as e.g. trucks in large haulage contractor firms.

[0004] US 4,698,571 in turn discloses an arrangement with a central memory in the vehicle in which settings for four different users can be recorded. The settings are then reinstated by depressing one of four command keys on a control console.

[0005] Also the arrangement according to US 4,698,571 is unsuitable for e.g. trucks that are used by many different users, i.e. more than four different users.

[0006] US 2002/197976 discloses a vehicle customized feature activation system. The system allows multiple users to activate their preferred settings for various customizable features in a vehicle.

[0007] EP 0895199 A discloses a tachograph and its connection to an in-vehicle bus.

[0008] US 2005/ 102077 A1 discloses an interactive system for customizing at least one operational feature on a vehicle by an operator comprises an input device for receiving operator selection data and a message generating device.

[0009] US 2004/019416 A discloses a customerized driving environment setting system in which a portable memory card having multiple setting data stored therein is insertable into a card reader/writer on a motor vehicle and a motor vehicle wireless download device is controlled to download updated data from a remote customs service center wirelessly for updating the setting data of the portable memory card.

[0010] GB 2336221 A discloses individual driver selected settings for each of a plurality of functional devices, such as seat position, steering wheel height, radio, heating/ventilation and vehicle performance and driving comfort controllers may be held in a storage device such as a smart card or floppy disk.

[0011] EP 1211141 A discloses a personality module for providing information concerting desired settings for configuring environmental features of a vehicle includes

a computer-readable medium such as a memory card which contains the module and specifies an identification of a user and information for use in automatically establishing settings for the vehicle and specific to the user.

[0012] US 6 198 996 discloses an arrangement in a vehicle for automatic adjustment of settable vehicle functions in correspondence with previously stored user specific function parameters. The user specific function parameters are here set or adjusted in a plurality of subsystems throughout the vehicle by an onboard computer either according to user specific parameters as read from storage on a user smartcard being inserted in a card reader connected to the onboard computer or as collected from storage in a memory space of the onboard computer itself. Furthermore, an embodiment is described where the vehicle operator adjusts the parameters manually.

[0013] A problem associated with the above described prior art solution for automatic parameter setting of vehicle functions is related to such settings traditionally being performed by only one control unit, i.e. computer, and concerns the amount of data then being communicated. Since vehicle systems of today often are interconnected through a vehicle internal data communication network, such as a CAN, through at least one serial network bus, e.g. CAN bus, all the parameter data as well as the instructions data for adjusting such parameters according to stored user specifications are communicated on the bus to the concerned vehicle systems by the computer and the functions accordingly adjusted therein by the same. A large amount of data being communicated and occupying the serial bus at more or less the same time could, as in a case where such parameter settings are performed in a multitude of vehicle systems/subsystems simultaneously, for example upon reading such data from a user smart card or central memory storage space as described above, result in certain user specific parameters not being set as instructed by the onboard computer or control unit due to an overload condition occurring on the data bus, i.e. the sheer data load on the bus resulting in a data communication failure. In practice when this has occurred, as a security measure, a default parameter value has been set instead. Also such a data bus overload situation could, at least momentarily, jeopardize other data communication on the bus, such as between control units of the different vehicle systems, and could then be the cause of delayed vehicle function response at best and vehicle function failure at worst. Furthermore, if a function for queuing messages on the bus exists for solving such a data bus overload situation the settable vehicle functions are still adjusted at a slower rate than necessary. Also, the parameter setting computer or control unit itself could be correspondingly affected by and, for example, experience reduced capability from such a data overload situation as being the sole processing unit performing all such settings.

[0014] Thus, there is a need for an arrangement that enables automatic setting of settable vehicle functions in accordance with previous settings for a plurality of differ-

ent users of the vehicle, which is provided through a minimum of data communication on a vehicle internal bus.

SUMMARY OF THE INVENTION

[0015] The object of the invention is to bring about such an arrangement.

[0016] This is attained by the arrangement having the features set out in independent claim 1.

[0017] Hereby, since every setting of the settable vehicle functions to a preferred setting has to be done just once for each user, the stress on the users, e.g. the drivers, will henceforth be reduced to a large extent and, consequently, the traffic safety will increase due to the fact that they will not have to worry about any settings. Moreover the communication on the vehicle internal bus is distributed through the different control units recording and setting their respective own associated vehicle functions. Hence the communication on the bus can be reduced in the case where previous user settings have been recorded and stored locally on the respective control units. Furthermore, since at least some vehicle functions will be set automatically already the first time the respective potential user's card is inserted into the tachograph, the work load on the respective user will be reduced further.

[0018] Furthermore, the communication between the separate control units and the tachograph on the vehicle internal bus will be reduced even further.

[0019] In one embodiment, the settable vehicle functions are at least one of desired language of displays, desired temperature scale, desired temperature of auxiliary heater, desired alarm time of alarm clock, desired local time of time displays, desired time gap to be maintained to a vehicle in front in an activated adaptive cruise control system, desired speed not to be exceeded in an activated speed control system when travelling downhill, and desired offset speed relative to a set cruise control speed in an activated speed control system when travelling downhill.

[0020] By enabling automatic setting of the above vehicle functions, the different users of the vehicle will save a lot of time.

BRIEF DESCRIPTION OF THE DRAWING

[0021] The invention will be described more in detail below with reference to the appended drawing on which Fig. 1 is a schematic illustration of one embodiment of an arrangement according to the invention.

DESCRIPTION OF THE INVENTION

[0022] Fig. 1 is a schematic illustration of one embodiment of an arrangement according to the invention in a vehicle for automatically setting settable vehicle functions in accordance with previous settings made for a user of the vehicle.

[0023] In Fig. 1, 1 denotes a digital tachograph that is based e.g. upon European Council Regulation EEC No 3820/85 and 3821/85 amended by 2135/98 Annex 1B and that is to be installed in trucks in the near future.

5 **[0024]** The tachograph 1 in Fig. 1 has two slots 2, 3 for smart cards. A smart card 4 is shown inserted into slot 2 in Fig. 1.

[0025] The smart cards are authorization cards with user specific codes and are issued by the authorities to authorized drivers and co-drivers of trucks to keep track of the activities of the various drivers using the vehicle while inserted into the tachograph 1.

10 **[0026]** In a manner known per se, the tachograph 1 has an input/output (I/O) port 5 and is able to supply information via that I/O port 5 about the fact that a card 4 is present in the slots 2, 3 as well as about the user specific code of the particular card 4.

15 **[0027]** Since the tachograph 1 as such is not the object of this invention, it is not shown in detail in Fig. 1 but connections between the slots 2, 3 and the I/O port 5 are merely indicated by means of broken lines and the function of the tachograph 1 as such will not be further described in this connection.

20 **[0028]** In accordance with the invention, the I/O port 5 of the tachograph 1 is connected to a vehicle internal bus 6, e.g. a CAN bus, a LIN bus, a MOST bus, a USB bus, a D2B bus, a RS-232 bus or the like, to which also a number of electronic control units ECU 1, ECU2 ... ECUn are connected.

25 **[0029]** Since the control units ECU1, ECU2 ... ECUn are more or less identical, only control unit ECU 1 is shown in any detail.

30 **[0030]** The control units ECU1, ECU2 ... ECUn are associated with different settable vehicle functions, of which only the corresponding setting units SU1, SU2 ... SUN for the settable vehicle functions are shown in Fig. 1.

35 **[0031]** Since also the setting units SU1, SU2 ... SUN for the settable vehicle functions comprise more or less identical elements, at least externally, only setting unit SU1 is shown in more detail for purpose of illustration.

40 **[0032]** The setting unit SU1 in Fig. 1 comprises at least one of a display 7, a couple of knobs 8 and three buttons 9 for setting the corresponding vehicle function in accordance with the user's preferences.

45 **[0033]** The control unit ECU1 in Fig. 1 comprises a processor 13 that is connected to two I/O ports 11, 12, and to a storage unit 14 that comprises a control program memory 15 and a parameter memory 16 for recording user identities and settings related to the identities.

50 **[0034]** In the control unit ECU 1 in Fig. 1, the I/O port 11 is connected to the vehicle internal bus 6 and the I/O port 12 is connected to the setting unit SU1.

[0035] By means of the setting units SU1, SU2 ... SUN and the control units ECU1, ECU2 ... ECUn, anyone of the following vehicle functions can be set individually for a plurality of users of the vehicle in accordance with the invention as will be described more in detail below:

Desired language of displays in the vehicle

[0036] Hereby, drivers from different countries will be able to use the vehicle.

Desired temperature scale

[0037] The driver will be able to choose whether degrees Celsius or degrees Fahrenheit should be shown.

Desired temperature of auxiliary heater

[0038] This will enable each driver to easily obtain the comfort temperature that he/she is used to.

Desired alarm time of alarm clock

[0039] Hereby, the driver will not oversleep.

Desired local time of time displays

[0040] Hereby, the time display can be set to run a few minutes ahead of actual time in order for the driver to be ahead of time to e.g. a ferry port.

Desired time gap to be maintained to a vehicle in front in an activated adaptive cruise control system

[0041] Since the desired time gap is very individual to each driver, he/she will not have to bother setting it every time the vehicle is used.

Desired speed not to be exceeded in an activated speed control system when travelling downhill

[0042] By once setting the number of km/h, e.g. 80 km/h that is not to be exceeded when travelling downhill, the respective driver can drive more relaxed.

Desired offset speed relative to a set cruise control speed in an activated speed control system when travelling downhill

[0043] By once setting the maximum increase in speed, e.g. 5 km/h that can be accepted when travelling downhill, the respective driver will not have to worry about downhill driving.

[0044] Upon insertion of the smart card 4 into the slot 2 of the tachograph 1 by a user of the vehicle, the user specific code on the card 4 is read and recorded by the tachograph 1 in order to keep track of the activities of the user in a manner that will not be described in this connection.

[0045] Also, upon a restart of the vehicle with the smart card 4 already present in the tachograph 1, the user specific code on the card 4 will be read and recorded by the tachograph 1.

[0046] In accordance with one embodiment of the ar-

rangement according to the invention, the tachograph 1 transmits information about the fact that card 4 is present in slot 2 via I/O port 5 to the vehicle internal bus 6 to be received by only one of the control units ECU1, ECU2 ... ECU_n that has been appointed master control unit for this purpose, e.g. control unit ECU1.

[0047] In this case, only control unit ECU1 requests the tachograph 1 to transmit the user specific code of card 4 to identify the user, whereupon control unit ECU1 records the user specific code in parameter memory 16 and transmits the user specific code to the other control units, i.e. control units ECU2 ... ECU_n that record the user specific code, i.e. the identity of the user in their respective parameter memories 16.

[0048] Hereby, there will be less communication on the vehicle internal bus 6 between the tachograph 1 and the control units ECU2 ... ECU_n.

[0049] Suppose that card 4 has not been inserted into the tachograph 1 before, i.e. it is the first time this particular driver is about to use the vehicle in question.

[0050] When the user specific code of card 4, i.e. the identity of the user has been recorded in the parameter memory 16 of the control unit ECU1 as described above, any setting of the settable vehicle functions made by the user in accordance with the user's preferences by means of the display 7, the knobs 8 and the buttons 9 of the setting units SU1, SU2 ... SU_n as long as the card 4 remains in slot 2, will be received by the processor 13 via I/O port 12 of the control unit ECU1 and recorded in the parameter memory 16 together with the identity of the user.

[0051] Upon withdrawal of card 4 from the tachograph 1 by the user, the latest settings made by the user are saved in the parameter memory 16 together with the identity of the user in question for future use.

[0052] When a new user inserts his/her card 4 into the tachograph 1, the process described above is repeated for the new user.

[0053] It is to be understood that the process described above is also repeated upon insertion of a card into slot 3 of the tachograph 1 for setting co-driver/passenger related vehicle functions of the vehicle.

[0054] The subsequent time one and the same user inserts his/her card 4 into the tachograph 1 and his/her identity has been established by the processor 13 of the control unit ECU1, any settings recorded in parameter memories 16 together with that particular identity are transmitted via I/O ports 12 to the setting units SU1, SU2 ... SU_n to set the settable vehicle functions of the vehicle accordingly.

[0055] In accordance with an arrangement according to the invention, one of the control units ECU1, ECU2 ... ECU_n, e.g. control unit ECU1 is appointed central control unit Without necessarily having a setting unit of its own for setting settable vehicle functions.

[0056] However, in the following description, it is assumed that the now central control unit ECU1 has its own setting unit SU1 as shown in Fig. 1.

[0057] In accordance with the invention, all user specific codes and all settings of the settable vehicle functions are recorded in the parameter memory 16 of ECU1. Thus, all settings made for a user by means of setting units SU2 ... SUn are communicated via the vehicle internal bus 6 to ECU1 by the other control units ECU2 ... ECU_n.

[0058] As above, the tachograph 1 transmits information about the fact that a card 4 is present in slot 2 via I/O port 5 to the vehicle internal bus 6 to be received by only ECU1.

[0059] In this case, ECU_n1, after having received the user specific code from the tachograph 1, checks whether any settings of settable vehicle functions associated with this particular user specific code are already recorded in its parameter memory 16 both for its own setting unit SU1 and for the other control units ECU2 ... ECU_n and their respective setting units SU2 ... SUn.

[0060] If there are settings already recorded in the parameter memory 16 of ECU1, indicating that settings have been recorded in advance and/or that the card 4 in question already has been inserted into the tachograph 1 at least once and settings have been made for the user in question by means of the setting units SU2 ... SUn as communicated to ECU1 via the vehicle internal bus 6 by the other control units ECU2 ... ECU_n, ECU1 will instruct its own setting unit SU1 and, via the vehicle internal bus 6, the control units ECU2 ... ECU_n to cause their respective setting units SU2 ... SUn to set the associated settable vehicle function as recorded in the parameter memory 16 of ECU1.

[0061] If there are no settings recorded in the parameter memory 16 of ECU1, ECU1 will record the user specific code of the card 4 and any settings of the settable vehicle functions, made for the user by means of the setting units SU1, SU2 ... SUn and communicated to ECU1 by the respective control unit ECU2 ... ECU_n via the vehicle internal bus 6 while the card (4) is in the tachograph (1).

Claims

1. An arrangement in a vehicle for automatically setting settable vehicle functions in accordance with previous settings for a user of the vehicle, **characterized in**

- **that** a tachograph (1) having two slots (2, 3) for smart cards that is connected to a vehicle internal bus (6) is adapted, in response to insertion into at least one of the slots (2, 3) of the tachograph (1) of an authorization card (4) with a user specific code as a smart card, to supply the user specific code of the inserted card (4) to the vehicle internal bus (6), and
- **that** separate control units (ECU1, ECU2 ... ECU_n) associated with the respective settable

vehicle function (SU1, SU2 ... SUn) are connected to the vehicle internal bus (6) to receive the user specific code, wherein each control unit comprises a parameter memory (16) for recording user identities and settings related to the identities, each control unit (ECU1, ECU2 ... ECU_n) being adapted to check, for each card (4) inserted into at least one of the slots (2, 3) of the tachograph (1), whether the user specific code of the card (4) and any setting of the corresponding, settable vehicle function (SU1, SU2 ... SUn) for the user are recorded in the parameter memory (16) of the control unit and, if that is the case, to set the settable function (SU1, SU2 ... SUn) as recorded and, if that is not the case, to record the user specific code and any setting of the settable function made for the user in the parameter memory (16) of the control unit, while the card (4) is in one of the slots (2, 3) of the tachograph (1), wherein preferred settings of vehicle functions (SU1, SU2 ... SUn) for potential users of a vehicle are recorded in advance in the parameter memory (16) of the control units (ECU1, ECU2 ... ECU_n) of the vehicle together with the identities of the potential users of the vehicle, wherein each control unit is adapted to save the latest settings made by the user in the parameter memory (16) together with the identity of the user upon withdrawal of the authorization card (4).

2. The arrangement according to claim 1, **characterized in that** the settable vehicle functions (SU1, SU2 ... SUn) are at least one of desired language of displays, desired temperature scale, desired temperature of auxiliary heater, desired alarm time of alarm clock, desired local time of time displays, desired time gap to be maintained to a vehicle in front in an activated adaptive cruise control system, desired speed not to be exceeded in an activated speed control system when travelling downhill, and desired offset speed relative to a set cruise control speed in an activated speed control system when travelling downhill.

Patentansprüche

1. Anordnung in einem Fahrzeug zum automatischen Einstellen einstellbarer Fahrzeugfunktionen in Übereinstimmung mit vorherigen Einstellungen für einen Nutzer eines Fahrzeugs **dadurch gekennzeichnet, dass**

- ein Fahrtenschreiber (1) mit zwei Schlitz (2, 3) für Smart-Karten, der mit einem internen Fahrzeugbus (6) verbunden ist, dazu ausgebildet ist, in Antwort auf das Einfügen einer Autorisierungskarte (4) in wenigstens einen der

Schlitze (2, 3) des Fahrtenschreibers (1) mit einem nutzerspezifischen Code als Smart-Karte, um den nutzerspezifischen Code der eingeführten Karte (4) dem internen Fahrzeugbus (6) zu zuführen, und

- separate Steuereinheiten (ECU1, ECU2...ECUn), die verschiedenen einstellbaren Fahrzeugfunktionen (SU1, SU2...SUn) zugeordnet sind, mit dem internen Fahrzeugbus (6) verbunden sind, um den nutzerspezifischen Code zu empfangen, wobei jede Steuereinheit einen Parameterspeicher (16) zum Aufzeichnen von Nutzeridentitäten und Einstellungen bezüglich der Identitäten aufweist, wobei jede Steuereinheit (ECU1, ECU2...ECUn) dazu ausgebildet ist, für jede in wenigstens einen der Schlitze (2, 3) des Fahrtenschreibers (1) eingeführte Karte (4) zu prüfen, ob der nutzerspezifische Code der Karte (4) und Einstellungen der entsprechenden einstellbaren Fahrzeugfunktionen (SU1, SU2...SUn) für den Nutzer in dem Parameterspeicher (16) der Steuereinheit aufgezeichnet sind, und, falls dies der Fall ist, die einstellbaren Funktionen (SU1, SU2...SUn) wie aufgezeichnet einzustellen und, falls dies nicht der Fall ist, den nutzerspezifischen Code und jede von dem Nutzer vorgenommene Einstellung der einstellbaren Funktionen in dem Parameterspeicher (16) der Steuereinheit zu speichern, während die Karte (4) in einem der Schlitze (2, 3) des Fahrtenschreibers (1) ist, wobei bevorzugte Einstellungen der Fahrzeugfunktionen (SU1, SU2...SUn) für potentielle Nutzer eines Fahrzeugs im Voraus in dem Parameterspeicher (16) der Speichereinheiten (ECU1, ECU2...ECUn) des Fahrzeugs zusammen mit Identitäten von potentiellen Nutzern des Fahrzeugs aufgezeichnet sind, wobei jede Steuereinheit dazu ausgebildet ist, die letzten von einem Nutzer vorgenommenen Einstellungen in dem Parameterspeicher (16) zusammen mit der Identität des Nutzers auf das Entnehmen der Autorisierungskarte (4) hin zu speichern.

2. Anordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** die einstellbaren Fahrzeugfunktionen (SU1, SU2...SUn) wenigstens eine gewünschte Sprache der Anzeige, eine gewünschte Temperaturskala, eine gewünschte Temperatur der Zusatzheizung, eine gewünschte Alarmzeit der Alarmuhr, eine gewünschte Lokalzeit der Zeitanzeige, eine vorbestimmte Zeitspanne, die aufrechterhalten werden soll, zu einem vorausfahrenden Fahrzeug bei aktiviertem Tempomat, eine nicht zu überschreitende gewünschte Geschwindigkeit bei einem aktivierten Geschwindigkeitssteuersystem beim Abwärtsfahren und eine gewünschte Toleranzgeschwindigkeit relativ zu einer eingestellten Tempomat-Geschwin-

digkeit bei aktiviertem Geschwindigkeitssteuersystem beim Abwärtsfahren.

5 Revendications

1. Agencement dans un véhicule pour établir automatiquement des fonctions de véhicule réglables conformément à des réglages précédents pour un utilisateur du véhicule, **caractérisé en ce que**

- un tachygraphe (1) comportant deux fentes (2, 3) pour des cartes à puce intelligentes qui est connecté à un bus interne (6) du véhicule est adapté, en réponse à l'insertion dans au moins une des fentes (2, 3) du tachygraphe (1) d'une carte d'autorisation (4) avec un code spécifique d'utilisateur en tant que carte à puce intelligente, pour délivrer le code spécifique d'utilisateur de la carte insérée (4) au bus interne (6) du véhicule, et

- des unités de commande séparées (ECU1, ECU2, ... ECUn) associées aux fonctions de véhicule réglables respectives (SU1, SU2, ... SUn) sont connectées au bus interne (6) du véhicule pour recevoir le code spécifique d'utilisateur, dans lequel chaque unité de commande comprend une mémoire de paramètres (16) destinée à enregistrer les identités des utilisateurs et les réglages se rapportant aux identités, chaque unité de commande (ECU1, ECU2, ... ECUn) étant adaptée pour contrôler, pour chaque carte (4) insérée dans au moins l'une des fentes (2, 3) du tachygraphe (1), si le code spécifique d'utilisateur de la carte (4) et n'importe quel réglage de la fonction de véhicule réglable correspondante (SU1, SU2, ... SUn) pour l'utilisateur sont enregistrés dans la mémoire de paramètres (16) de l'unité de commande et, si c'est le cas, pour établir la fonction réglable (SU1, SU2, ... SUn) comme enregistrée et, si ce n'est pas le cas, pour enregistrer le code spécifique d'utilisateur et n'importe quel réglage de la fonction réglable réalisé pour l'utilisateur dans la mémoire de paramètres (16) de l'unité de commande, alors que la carte (4) se trouve dans l'une des fentes (2, 3) du tachygraphe (1), dans lequel les réglages préférés des fonctions de véhicule (SU1, SU2, ... SUn) pour des utilisateurs potentiels d'un véhicule sont enregistrés à l'avance dans la mémoire de paramètres (16) des unités de commande (ECU1, ECU2, ... ECUn) du véhicule conjointement avec les identités des utilisateurs potentiels du véhicule, dans lequel chaque unité de commande est adaptée pour sauvegarder les derniers réglages réalisés par l'utilisateur dans la mémoire de paramètres (16) conjointement avec l'identité de l'utilisateur sur retrait de

la carte d'autorisation (4).

2. Agencement selon la revendication 1, **caractérisé en ce que** les fonctions de véhicule réglables (SU1, SU2, ... SUn) sont au moins l'une parmi une langue d'affichage souhaitée, une échelle de température souhaitée, une température de chauffage auxiliaire souhaitée, une heure d'alarme d'une horloge souhaitée, l'affichage d'une heure locale souhaitée, l'intervalle de temps souhaité à maintenir par rapport à un véhicule à l'avant dans un système de régulation de déplacement activé, la vitesse souhaitée à ne pas dépasser dans un système de contrôle de vitesse activé en descente, et la vitesse de décalage souhaitée par rapport à une vitesse de régulateur établie dans un système de contrôle de vitesse activé en descente.

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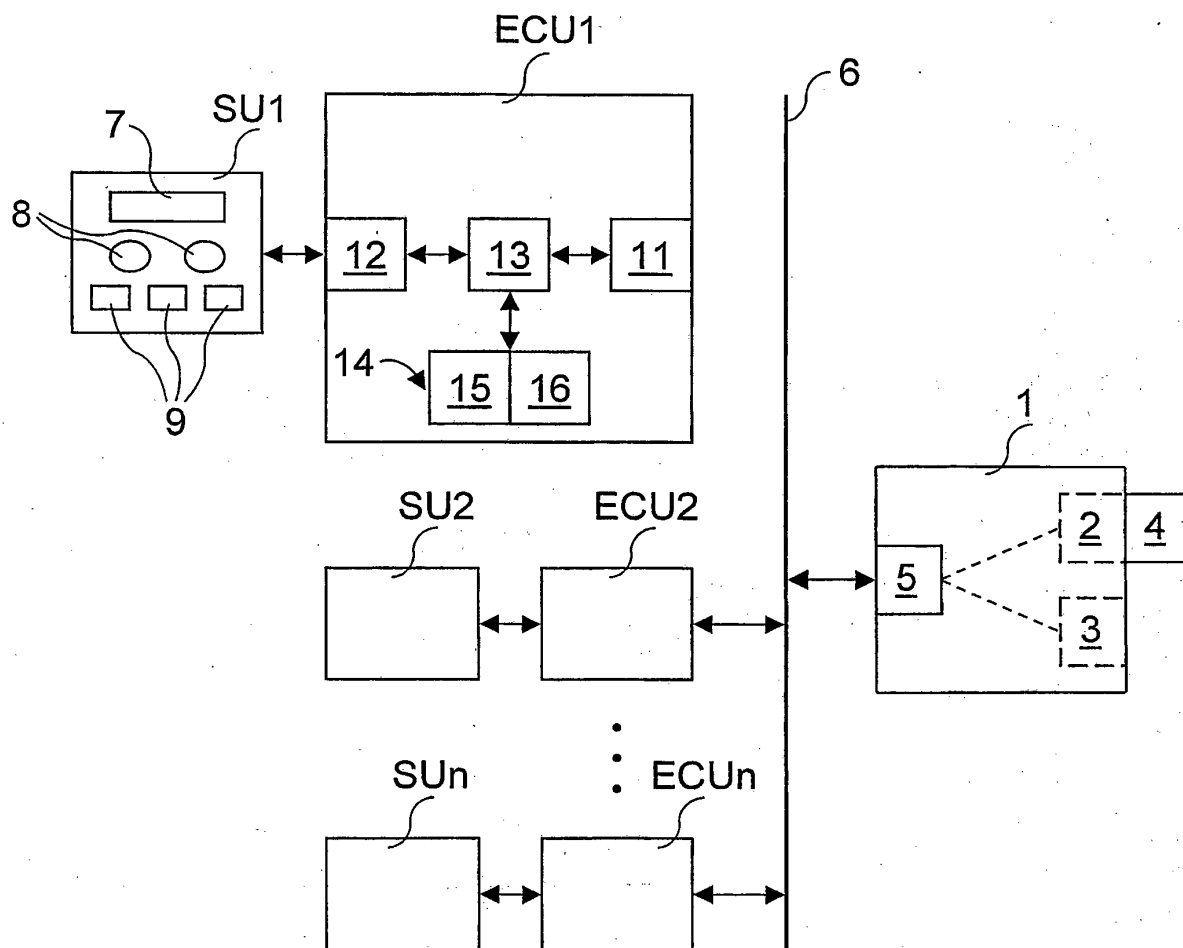


Fig. 1

REFERENCES CITED IN THE DESCRIPTION

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