

(21) Application No 9304300.8

(22) Date of Filing 03.03.1993

(71) Applicant(s)  
**Janet Patricia Cardwell**  
**Stocks Farm Cottage, Bentley Lane, Mawdesley,**  
**ORMSKIRK, Lancashire, L40 3SN, United Kingdom**

(72) Inventor(s)  
**Janet Patricia Cardwell**

(74) Agent and/or Address for Service  
**Roystons**  
**Tower Building, Water Street, LIVERPOOL, L3 1BA,**  
**United Kingdom**

(51) INT CL<sup>5</sup>  
**E05B 65/36**

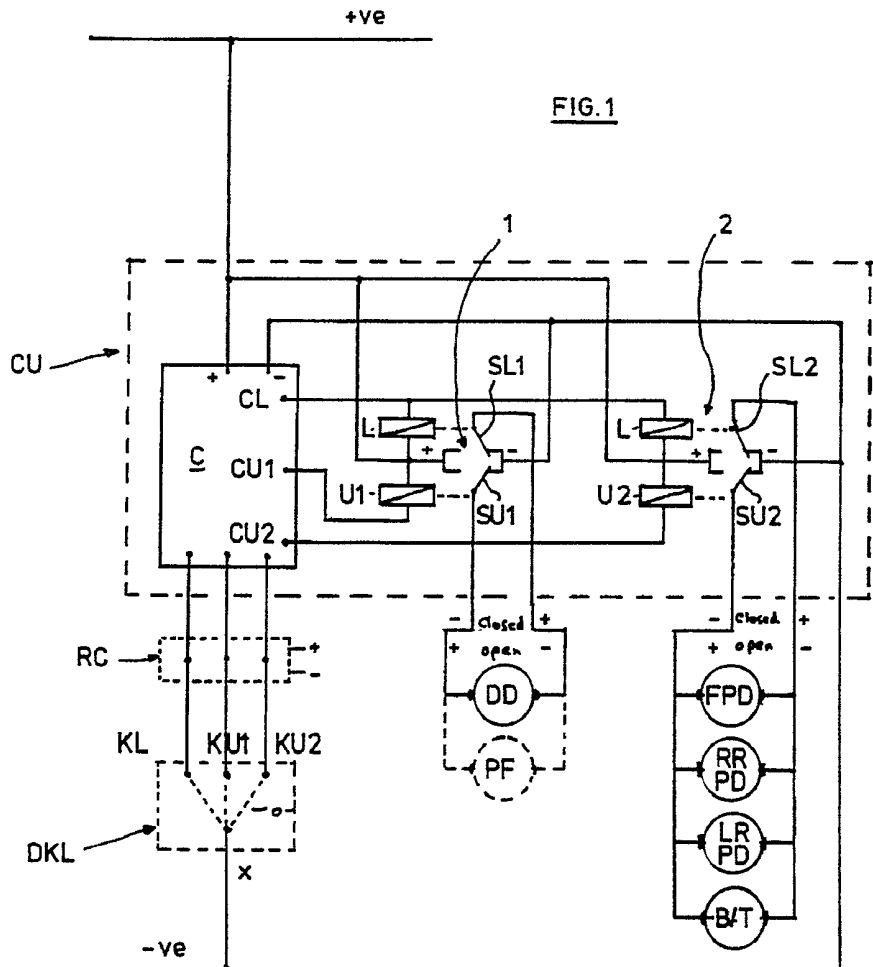
(52) UK CL (Edition M )  
**E2A ABX A401 A402 A431**

(56) Documents Cited  
**GB 0915995 A EP 0357965 A US 5030949 A**

(58) Field of Search  
 UK CL (Edition L ) **E2A ABM ABX ALT AMX**  
 INT CL<sup>5</sup> **E05B**

(54) **Vehicle central locking.**

(57) A vehicle central locking system comprises at least two selectable options for unlocking access closures of the vehicle. A first option unlocks the driver's door, whilst a second option unlocks the passenger doors and/or boot or tailgate. The two options may be operated by key or remote control. Alternatively a separate control switch may be provided to select which access closures are operable by the central locking system.



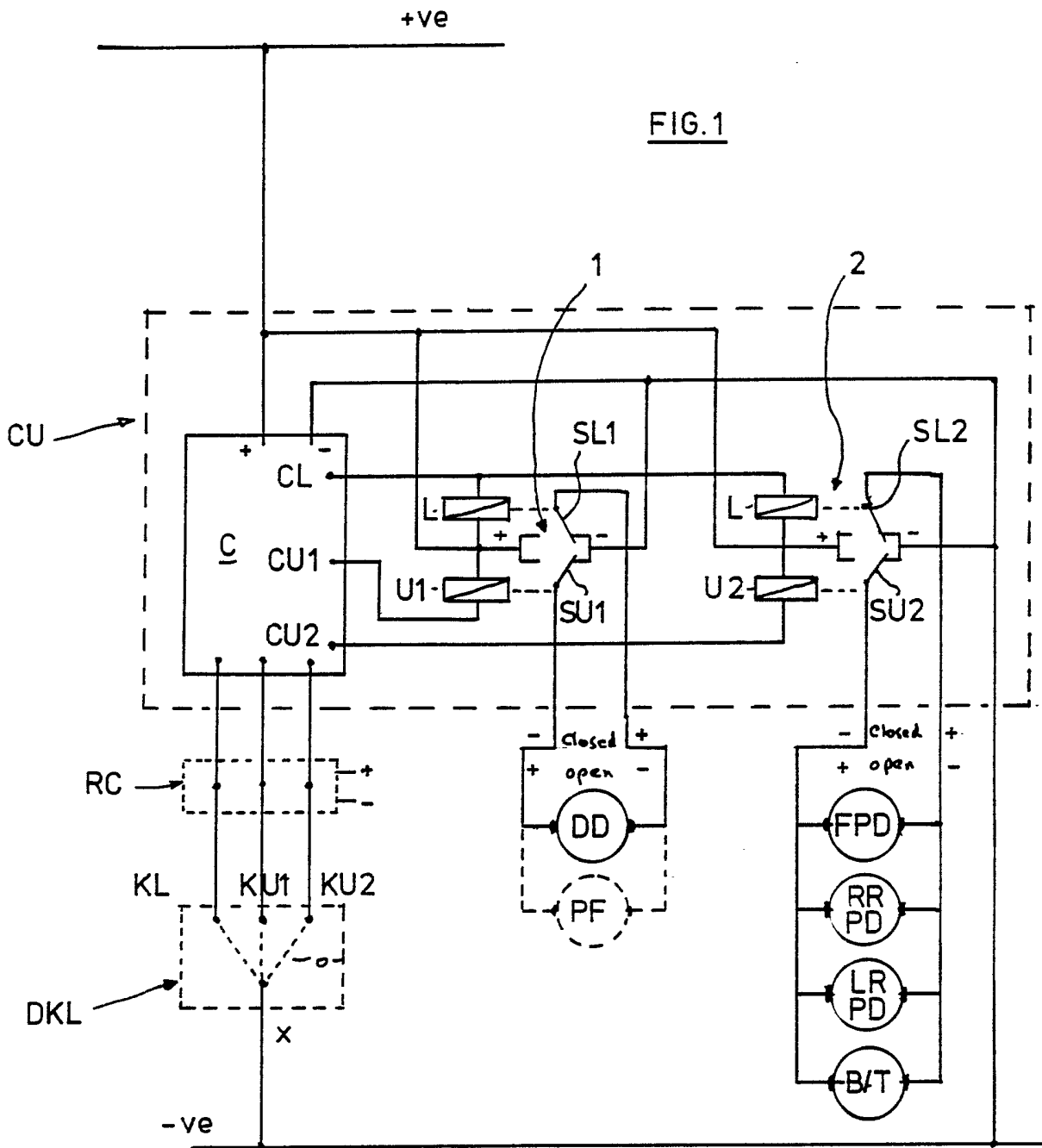


FIG.1

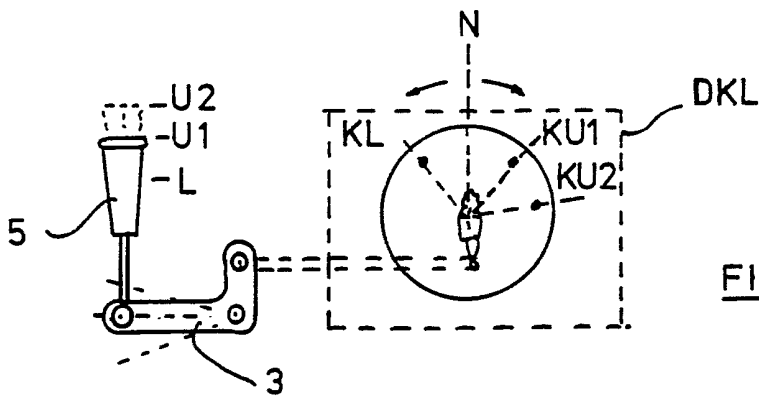


FIG.2

Title: Vehicle central locking

DESCRIPTION

The present invention relates to vehicle central locking.

5           So-called vehicle central locking is provided increasingly frequently on motor vehicles as a convenience for locking and unlocking all the vehicle doors simultaneously by a single locking or unlocking action. This may be by a key inserted in the driver's  
10 door lock or by a remote controller such as of infra-red type. Increasingly the vehicle boot or tail gate lock is also controlled simultaneously from the same source and in some vehicles access to the petrol filler may be by way of a lockable flap controlled from the central  
15 locking system. For convenience in the following description we will refer to the likes of doors, boot, tail gate and petrol filler access flaps as access closures.

20           A feature of known systems is that a respective locking or unlocking action locks or unlocks all the access closures simultaneously. The existing arrangement as far as locking is concerned is seen as convenient and good for security purposes when leaving a vehicle unattended. However, simultaneous unlocking of

all the closures is seen as disadvantageous in many instances. For example, there are many occasions when a driver may be travelling alone in a vehicle and in the event of a vehicle being stationary in traffic this would permit access to the vehicle. Thus, a villain could gain access to an unlocked boot to raid its contents or can gain access to the car to steal personal possessions (handbags are frequently left on the passenger seat when a female is driving alone) or worse still to carry out a car-jacking or an assault on the driver. A person getting in a passenger door is unlikely to attract the suspicions of passersby.

Of course, once the driver is inside the vehicle one option is to activate the interior driver's door lock to lock all the access closures but this is seen as inconvenient since having all the doors locked could hamper access to the vehicle in the event of an accident or hinder a rapid exit.

The present invention aims to capitalise on the advantages of a central locking system whilst minimising the disadvantages.

Accordingly, the present invention provides a vehicle central locking system in which there are at least two selectable options for unlocking the access closures.

As herein-defined the access closures may

comprise the vehicle doors, the boot or tail gate or any other external access device which has a lockable facility traditionally controlled from a central source.

One selectable option unlocks the driver's door, whilst a second selectable option unlocks all the access closures which are provided with a remotely operable actuating mechanism.

A convenient approach utilises two-stage unlocking, with one stage unlocking the driver's door and a second stage unlocking all, or all the other, the access closures. It is envisaged that the locking action will be a single stage which locks all the closures simultaneously. Where the petrol filler access is controlled as part of the central locking system this could conveniently unlock with the driver's door. For a key operated system it is envisaged that the key actuated lock mechanism will have three control positions, namely a locked position actuating all closures, a first unlock position actuating the driver's door (possibly also the petrol filler access flap) and a second unlock position actuating all the access closures or remaining access closures. In addition there will usually be a key insert and release position.

It will be appreciated that with this system a person travelling alone can simply unlock the driver's door for access and on subsequently leaving the vehicle

the locking function will serve to lock the unlocked closure, namely the driver's door. If the driver has accompanying passengers then the key can be moved to the second position, unlocking the driver's door and the remaining access closures (eg. other doors, etc.). Usually the key will be returned to a release position. A subsequent locking action (usually in the other direction) serves to lock all the unlocked access closures.

It is envisaged that in certain circumstances the driver having only opened his door to gain entry to the vehicle may subsequently need to unlock the other vehicle closures, for example to pick up legitimate passengers. This could be accompanied by physically leaning over to unlock a door by moving an internal door unlocking lever as was the case before the advent of central locking. However, since the driver's door will usually be provided with an internally accessible locking mechanism this can be structured as a two-stage mechanism. For example, with the button-type locking mechanisms unlocking the driver's door in a first stage operation would serve to move the button from a, for example, depressed position to a first elevated position corresponding to the driver's door being unlocked, whilst actuating the second stage release would move it to a further elevated position corresponding to all the

access closures being unlocked. Thus, in the event where a driver had got into a vehicle simply unlocking the driver's door the internal release button on the driver's door would be in its first elevated position and it is a simple matter to raise this to its second position which would trigger opening of all the other closures. The above proposals are seen as providing an improved security situation without adding unduly to the complexity of the vehicle central locking system.

Further developments of the system can be envisaged in which the combination of access closures which is unlocked at a first or second stage can be programmed by the user. Indeed the selective unlocking may be extended to any desired number of unlocking and/or locking stages. A further alternative contemplates a master control switch within the vehicle in which selected access closures may be opened or locked once the driver was inside the vehicle. This would have the convenience of facilitating locking of closures without seeking out the internal locks which are often placed inconveniently for use once inside the vehicle.

The above two-stage operation has been described for convenience with reference to a key operated system but it will be appreciated that many central locking systems are now operated from a remote controller and it

will be appreciated that the system can be adapted for use by such a controller either by use of a sequential system in which a first unlocking command serves to operate the first stage of the unlocking procedure and a second unlocking command operates the second stage. A third command could serve to effect locking of all the closures or locking could follow a two-stage locking procedure where this simplifies the electronic circuitry. A further alternative is to provide additional buttons on the controller for the two stages. For example, the remote control unit could easily be provided with a separate button for each unlocking stage and preferably a single locking button.

According to another embodiment, albeit a less preferred embodiment, the two selectable options could be implemented by a control which enables or disables unlocking all or selected ones of the access closures other than the driver's door. This control is located conveniently inside the vehicle. Thus a driver who usually travels alone would have the control set to disable so that a normal unlocking action, be it by key or remote control, would only unlock the driver's door. Once inside the vehicle, moving the control to the enable position can serve to unlock the other access closures. Of course if the control is in the enable position then the normal unlocking action would then



unlock all the vehicle closures.

The present invention will now be described further, by way of example only, with reference to the accompanying drawings, in which:-

5           Figure 1 is a circuit diagram for a central locking system embodying the invention, and

          Figure 2 is a schematic illustration of a three position door button lock.

          Referring to the drawing of Figure 1, there is  
10           illustrated a circuit diagram for a central locking system embodying the invention, comprising a driver's door key lock, DKL having three switch contacts KL, KU1 and KU2 which can be made in turn by moving a key in the lock. Wiring from the lock communicates with a  
15           control unit CU disposed in any convenient location in the vehicle and supplied with power from the vehicle battery (not illustrated). The control unit includes a switching unit C and two electromagnetic switch units 1 and 2 each having a locking coil L and an unlocking coil  
20           U and a respective associated switch member SL and SU controlling locking and unlocking of the servo motors connected thereto.

          The first electromagnetic switch unit 1 connects with a servo motor DD controlling the driver's door  
25           lock. Optionally it may also connect with a lockable petrol filler access flap, PF, shown in dotted outline.

In the illustrated embodiment the second electromagnetic switch unit 2 connects with servo motors for the front passenger door FPD, the right and left rear passenger doors RRPD and LRPD and the boot or tailgate B/T.

5           The polarity of the current directed to the servo motors controls opening or closing movements which is determined by energisation of the coils L, U1 or U2. This is controlled by the position of the driver's key lock. Thus moving the key from an insert position, say  
10 position N of Figure 2 to the right, will make the connection across contacts X-KU1. This will make a circuit on CU1 (usually indirectly eg. via a relay) energising coil U1 and moving switch SU1 to the +ve side and performing an opening movement of servo motor DD and  
15 any other on circuit 1. Thus primarily the driver's door is unlocked permitting entry into the vehicle.

          If the driver wishes to have the remaining access closures open, then the key is moved to position KU2 which makes a circuit at CU2 and energises coil U2  
20 controlling SU2 to open all the locks controlled by servo motors on circuit 2, eg. FPD, RRPD, LRPD and B/T.

          On leaving the vehicle, the key is inserted in the lock and moved to position KL which makes a circuit through CL energising both coils L and simultaneously  
25 moving switches SL1 and SL2 to reverse the polarity to the servo motors and perform a closing/locking movement.

The switches SL, SU are biased to the position illustrated when not energised, ie. when the key is returned from any of its switching positions to the release position N.

5           By a suitable linkage, including say bell crank 3, see Figure 2, an indicator button on the interior of the driver's door can be controlled by movement of the key in the lock. More particularly, movement of the button can serve to move the key lock and actuate the various switch contacts according to its position. By 10 this means the access closures may be locked from inside the vehicle and unlocked selectively.

          It will be appreciated that the various connectors between the control unit and the servo motors could be readily tailored to suit individual 15 requirements. For example, the connections to motor FPDD could be made to switch 1 instead of switch 2 if the user so wished.

          It is readily possible to introduce remote 20 control by connecting in a remote control switch unit, shown diagrammatically for example at RC, which can respond to say infra red signals. A three switch controller would facilitate operation of the locking and the two unlocking circuits.

25           It will be understood that the detailed execution of the circuitry and the control devices will be

tailored to the vehicle to which the invention is applied.

## CLAIMS

1. A vehicle central locking system in which there are at least two selectable options for unlocking access closures of the vehicle.
- 5 2. A system as claimed in claim 1 in which a first selectable option unlocks a driver's door.
3. A system as claimed in claim 1 or 2 in which a second selection option unlocks all the access closures.
4. A system as claimed in claim 2 in which the  
10 second selectable option unlocks all the other access closures.
5. A system as claimed in claim 1 in which unlocking is performed in two stages, a first stage unlocking at least the driver's door and a second stage unlock any  
15 other access closure provided with a remotely operable actuating mechanism and not unlocked in the first stage.
6. A system as claimed in any one of the preceding claims in which locking of all the access closures is performed simultaneously.
- 20 7. A system as claimed in any one of the proceeding claims in which a key operated lock mechanism has two unlocking positions and at least one locking positions.
8. A system as claimed in any one of the preceding claims in which the two selectable options for  
25 unlocking the access closures are controlled by a

wireless remote controller.

9. A system as claimed in claim 8 in which the remote controller has a respective control for each unlocking option.

5 10. A system as claimed in claim 1 in which the access closures which are unlocked by each selectable option are selected from two or more of driver's door, front passenger door, left and right rear passenger doors, boot/tailgate or petrol filler access.

10 11. A vehicle central locking system as claimed in claim 1 in which two selectable unlocking options are provided by a control which enables or disables unlocking of one or more access closures other than the driver's door.

15 12. A vehicle central locking system constructed and arranged substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings of Figures 1 or as modified according to Figure 2.

**Amendments to the claims have been filed as follows**

1. A vehicle central locking system in which there are at least two selectable options for unlocking access closures to the vehicle of which a first selectable option unlocks at least a driver's door, characterised  
5 in that the selectable options are operated from a key operated mechanism in the driver's door having two unlocking positions and at least one locking position.

2. A vehicle central locking system in which there are at least two selectable options for unlocking  
10 access closures to the vehicle of which a first selectable option unlocks at least a driver's door, characterised in that the two selectable options are controlled by a wireless remote controller.

3. A vehicle central locking system in which there are at least two selectable options for unlocking access closures to the vehicle, characterised in that said  
15 selectable unlocking options are operable sequentially in two stages of which a first stage unlocks at least a driver's door.  
20

4. A system as claimed in claim 1, 2 or 3 in which a second selectable option unlocks all the access closures.

5. A system as claimed in claim 1, 2 or 3 in which  
25 the second selectable option unlocks all the other

access closures.

6. A system as claimed in claim 1, 2 or 3 in which  
unlocking is performed in two stages, a first stage  
unlocking at least the driver's door and a second stage  
5 unlocking any other access closure provided with a  
remotely operable actuating mechanism and not unlocked  
in the first stage.

7. A system as claimed in any one of the preceding  
claims in which locking of all the access closures is  
10 performed simultaneously.

8. A system as claimed in claim 2 in which the  
remote controller has a respective control for each  
unlocking option.

9. A system as claimed in claim 1, 2 or 3 in which  
15 the access closures which are unlocked by each  
selectable option are selected from two or more of  
driver's door, front passenger door, left and right rear  
passenger doors, boot/tailgate or petrol filler access.

10. A vehicle central locking system as claimed in  
20 claim 1, 2 or 3 in which two selectable unlocking  
options are provided by a control which enables or  
disables unlocking of one or more access closures other  
than the driver's door.

11. A vehicle central locking system as claimed in  
25 any one of the preceding claims in which the second  
unlocking stage is also operable from inside the vehicle



to unlock other access closures.

12. A vehicle central locking system as claimed in claim 11 in which an internally accessible locking mechanism of the vehicle driver's door is used to control said internal unlocking stage.

13. A vehicle central locking system constructed and arranged substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings of Figures 1 or as modified according to Figure

2.

**Patents Act 1977**  
**Examiner's report to the Comptroller under**  
**Section 17 (The Search Report)**

Application number

GB 9304300.8

-16-

**Relevant Technical fields**

(i) UK CI (Edition L ) E2A (AMX, ALT, ABM, ABX)

(ii) Int CI (Edition 5 ) E05B

**Search Examiner**

P A MAKIN

**Date of Search**

13.4.93

**Databases (see over)**

(i) UK Patent Office

(ii)

Documents considered relevant following a search in respect of claims 1-12

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 915995 (DAIMLER-BENZ) whole document	1-6
X	EP 0357965 (DAIMLER-BENZ) whole document	1-5
X	US 5030949 (DAIMLER-BENZ) whole document	1-5



**Categories of documents**

**X:** Document indicating lack of novelty or of inventive step.

**Y:** Document indicating lack of inventive step if combined with one or more other documents of the same category.

**A:** Document indicating technological background and/or state of the art.

**P:** Document published on or after the declared priority date but before the filing date of the present application.

**E:** Patent document published on or after, but with priority date earlier than, the filing date of the present application.

**&:** Member of the same patent family, corresponding document.

**Databases:** The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).