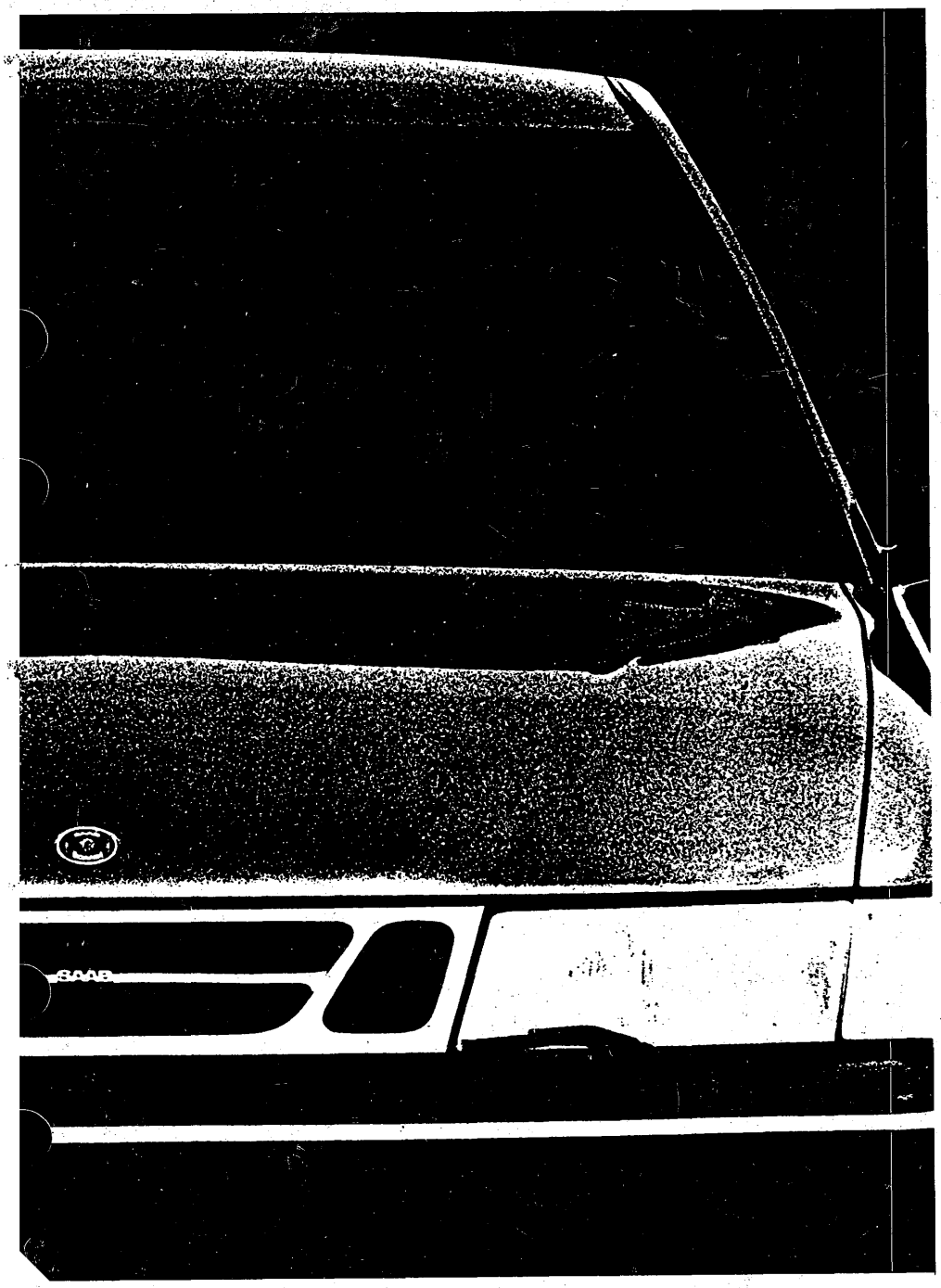
Saab 9000

Service Manual



M 1996-

ENG

Saab 9000

SERVICE MANUAL

3:5 Anti-theft alarm Anti-theft alarm with VSS

M 1996–

Foreword

All particulars and illustrations in this Service Manual are based on the version of the cars prevailing at the time of going to press. Model versions, technical data and equipment vary from market to market and may be subject to alteration without prior notice.

Saab Automobile AB

Warning, Important and Note

The headings "Warning", "Important" and "Note" occur from time to time in the Service Manual. They are used to draw the attention of the reader to information of special interest and seriousness. The importance of the information is indicated by the three different headings and the difference between them is explained below.

⚠ WARNING

Warns of the risk of material damage and grave injury to mechanics and the driver, as well as serious damage to the car.

Important

Points out the risk of minor damage to the car and also warns the mechanic of difficulties and time-wasting mistakes.

Note

Hints and tips on how the work can be done in a way that saves time and labour. This information is not supplied for reasons of safety.

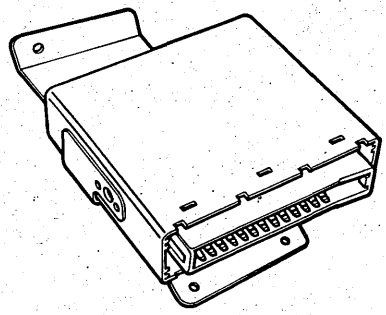
Market codes

The codes refer to market specifications

AT	Austria	GB	Great Britain
AU	Australia	GR	Greece
BE	Belgium	IS	Iceland
CA	Canada	IT	Italy
CH	Switzerland	JP	Japan
DE	Germany	ME	Middle East
DK	Denmark	NL	Netherlands
ES	Spain	NO	Norway
EU	Europe	SE	Sweden
FE	Far East	US	USA
FI	Finland	UC	US California
FR	France		

Production: Service Support, Saab Automobile AB, Trollhättan, Sweden

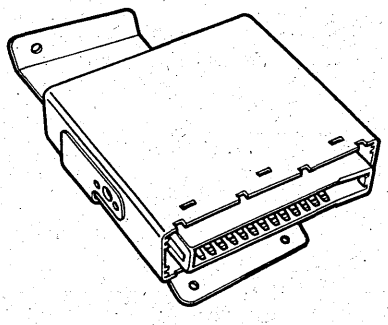
Technical data



C383W-4823

Electronic control module, anti-theft alarm

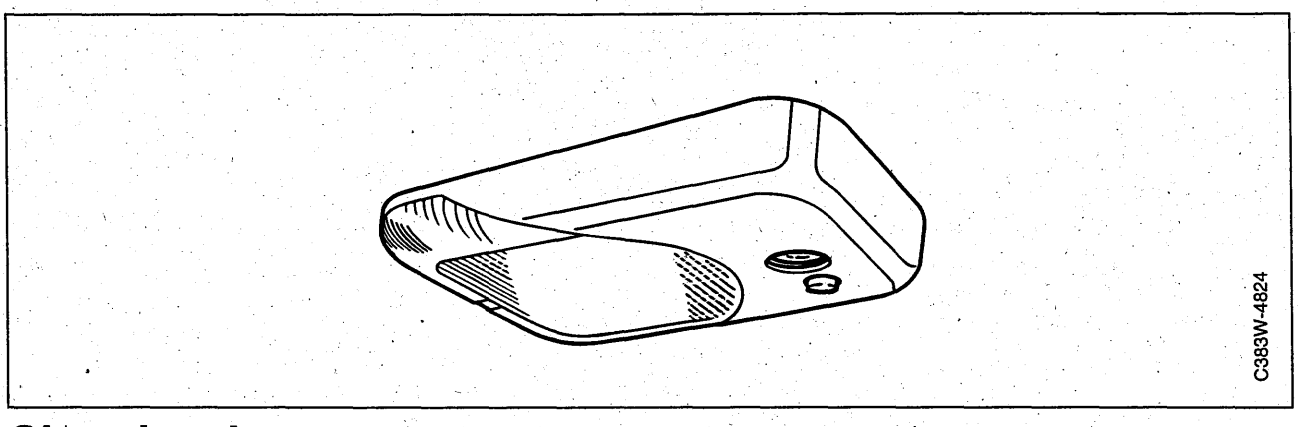
Number of pins		25
Power supply (+15 circuit)	pin No.	10
Power supply (+30 circuit)	pin No.	25
Ground	pin No.	13
Closed-circuit current consumption	alarm not armed	< 4 mA
Closed-circuit current consumption	alarm armed	< 7 mA



C383W-4823

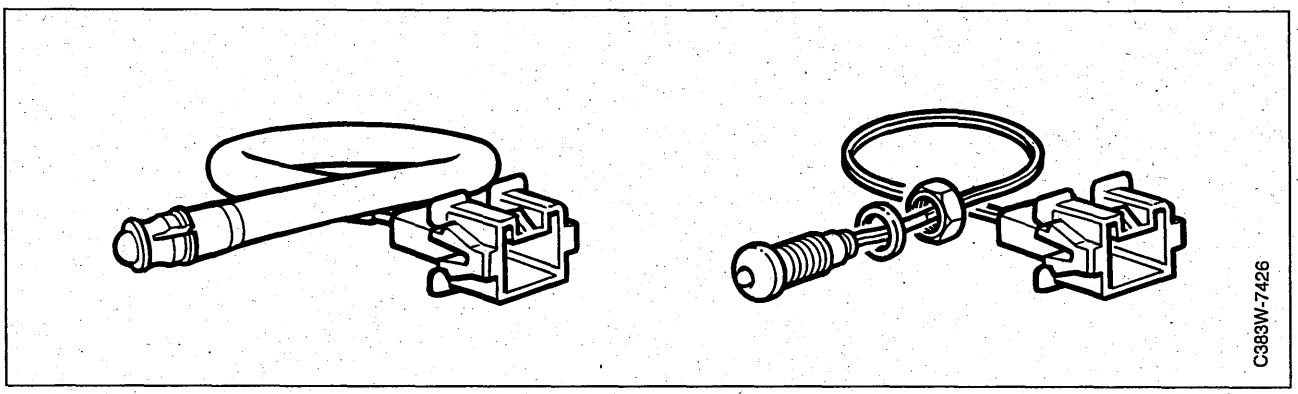
Electronic control module, anti-theft alarm with VSS

Number of pins		25
Power supply (+15 circuit)	pin No.	10
Power supply (+30 circuit)	pin No.	25
Power supply (+30 circuit), direction indicators	pin No.	22
Power supply (+B circuit)	pin No.	9
Ground	pin No.	13
Closed-circuit current consumption	alarm not armed	< 4 mA
Closed-circuit current consumption	alarm armed	< 7 mA



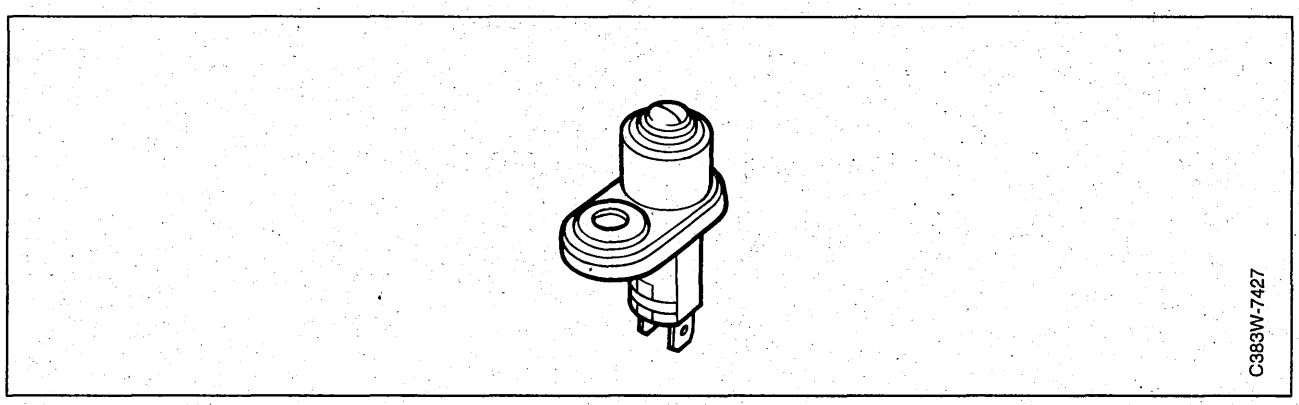
Glass breakage sensor

Location		In the interior lighting lamp
Type		Ultrasound (microphone)
Sensor voltage	pin No.	2
Ground	pin No.	4
Frequency range		40 kHz band



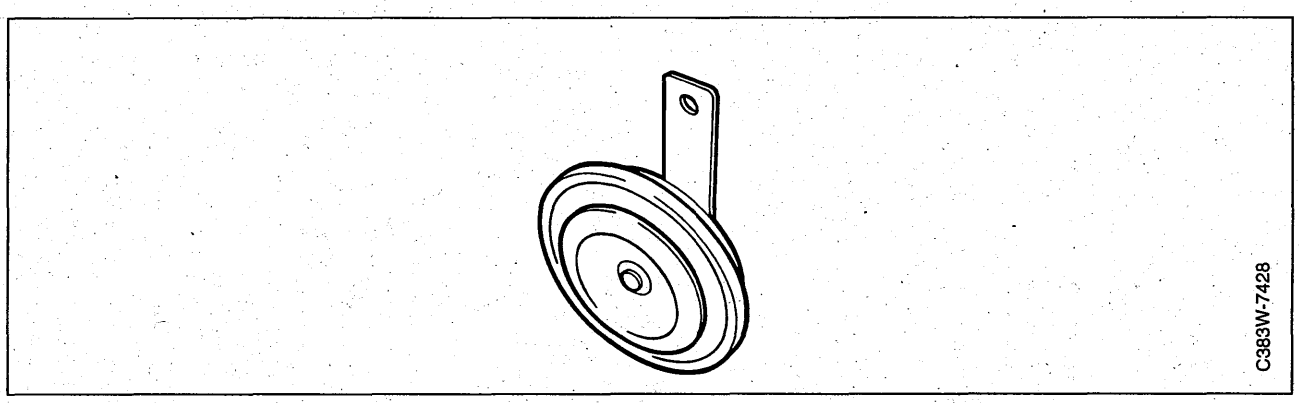
LED

Location		Loudspeaker grille on driver's side
Current limiting from electronic control module		20 mA
Power supply	pin No.	2
Ground	pin No.	1



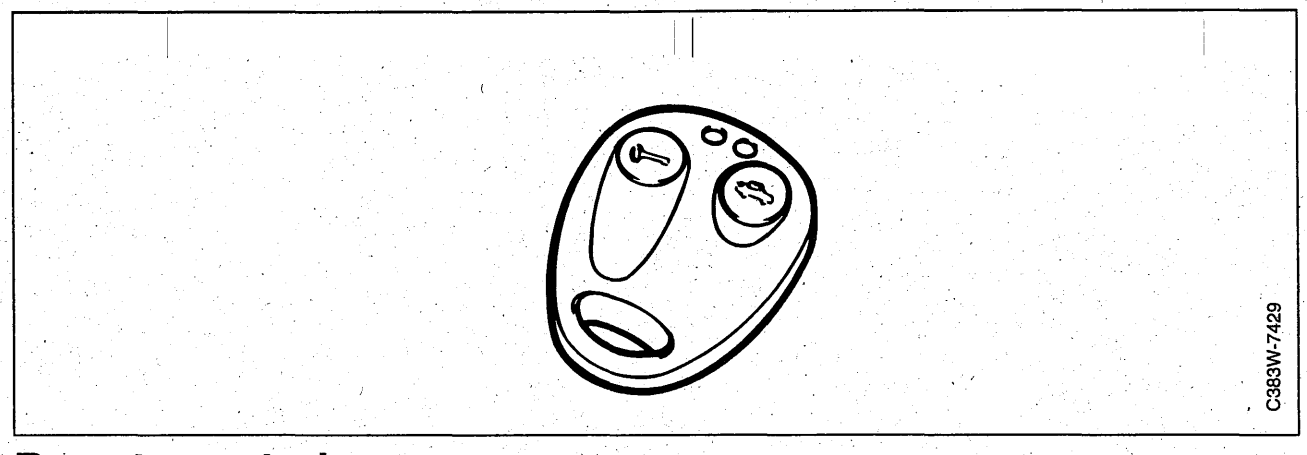
Bonnet switch

Location		Front member
Type		Normally closed
Power supply	pin No.	1
Ground	pin No.	2



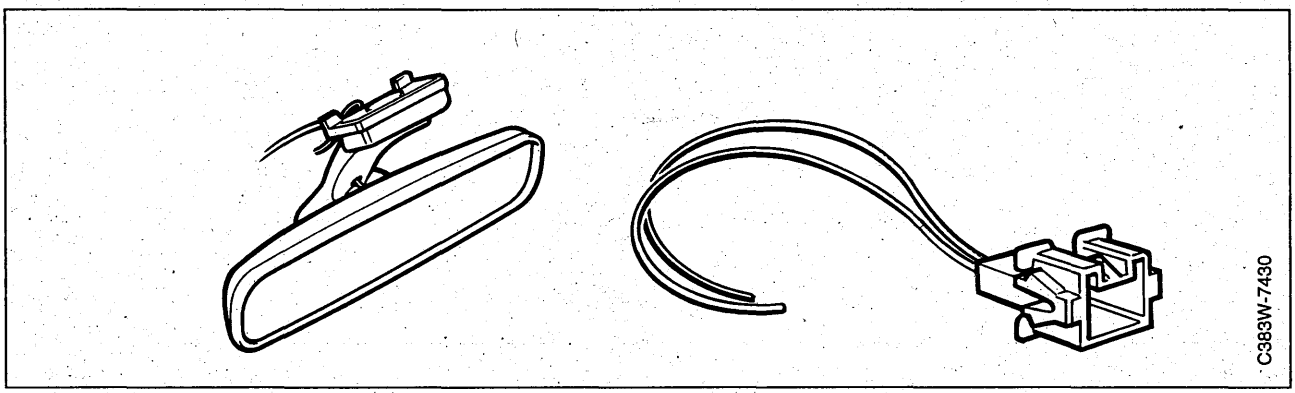
Horn

Location		Left-hand front wheel housing
Type		Diaphragm horn
Operating voltage		9-12 V
Power supply	pin No.	1
Ground	pin No.	2 (via electronic control module, pin 11)



Remote control

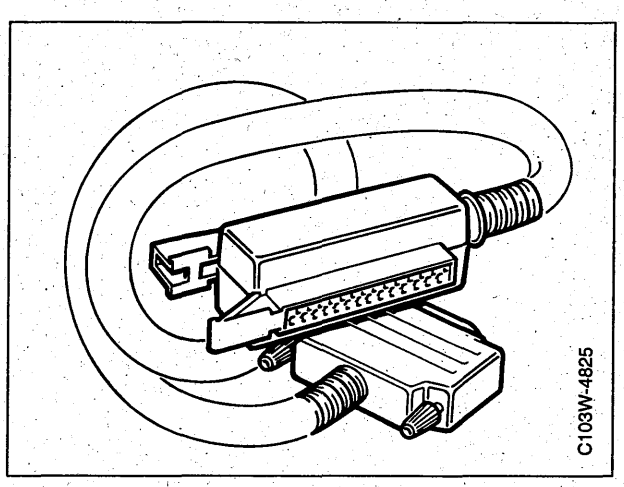
Type		Frequency modulated RF (Radio Frequency) signal
Frequency (carrier wave)	EU	433.92 MHz
	US/CA	315 MHz
	JA	315 MHz (short range)
Operating voltage	battery	2 Lithium/CR2016 (3 V)



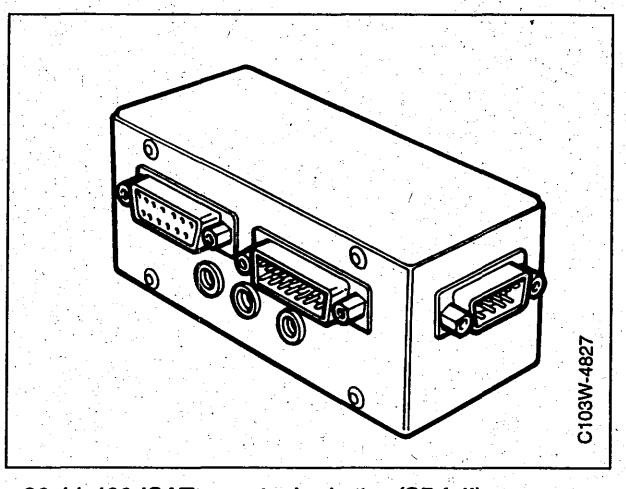
Aerial

Location	JA	Rearview mirror (interior)
	Others	Under roof console
Type	JA	Conductive
	Others	Dipole (17 cm)
Signal connection	pin No.	1
Ground	pin No.	14

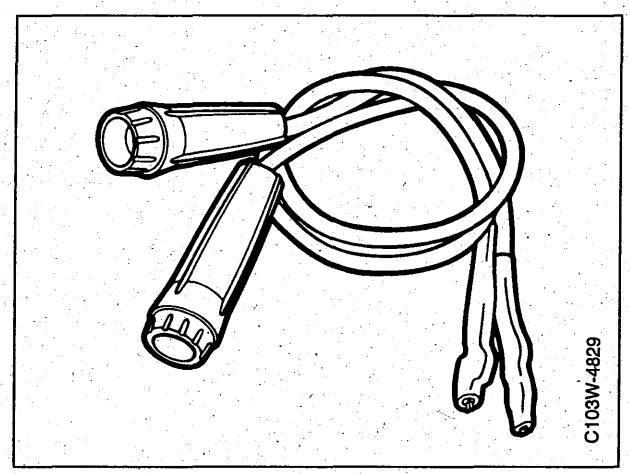
Special tools



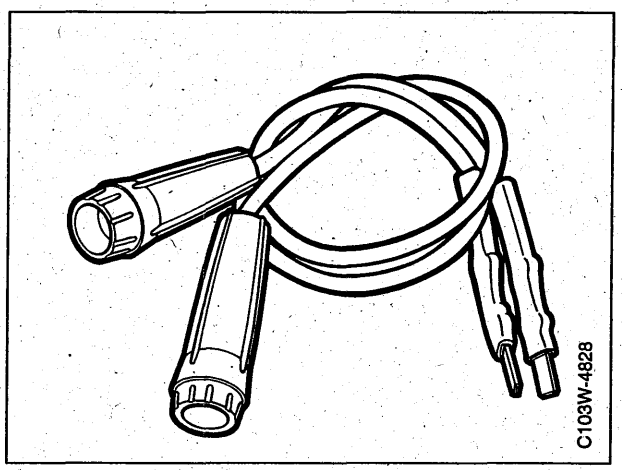
86 11 139 25-pin test lead for Saab Anti-Theft Alarm (BOB)



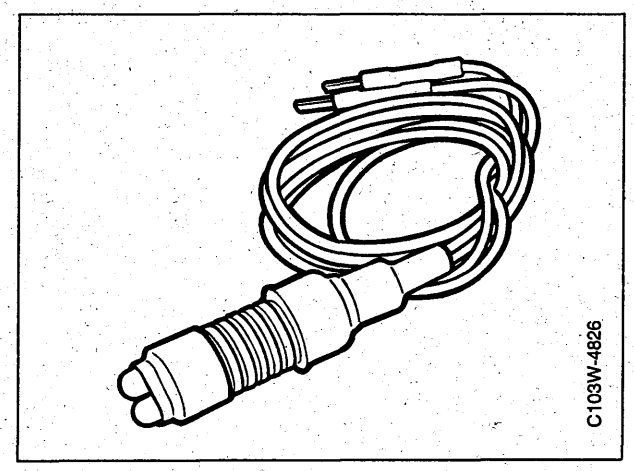
86 11 436 ISAT scan tool adapter (SDA II)



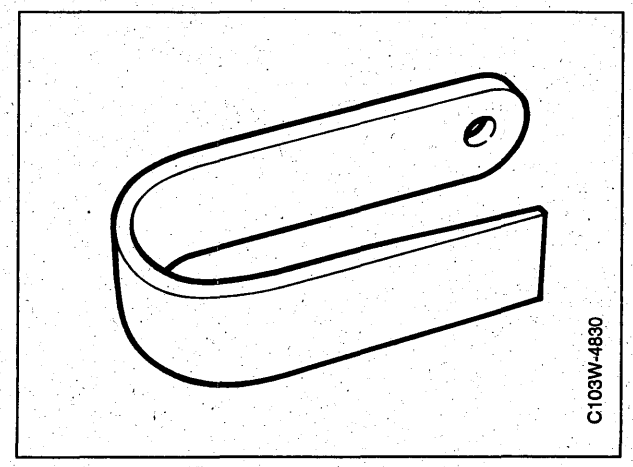
86 11 410 Test leads for pin connection (female)



86 11 352 Test leads for pin connection (male)



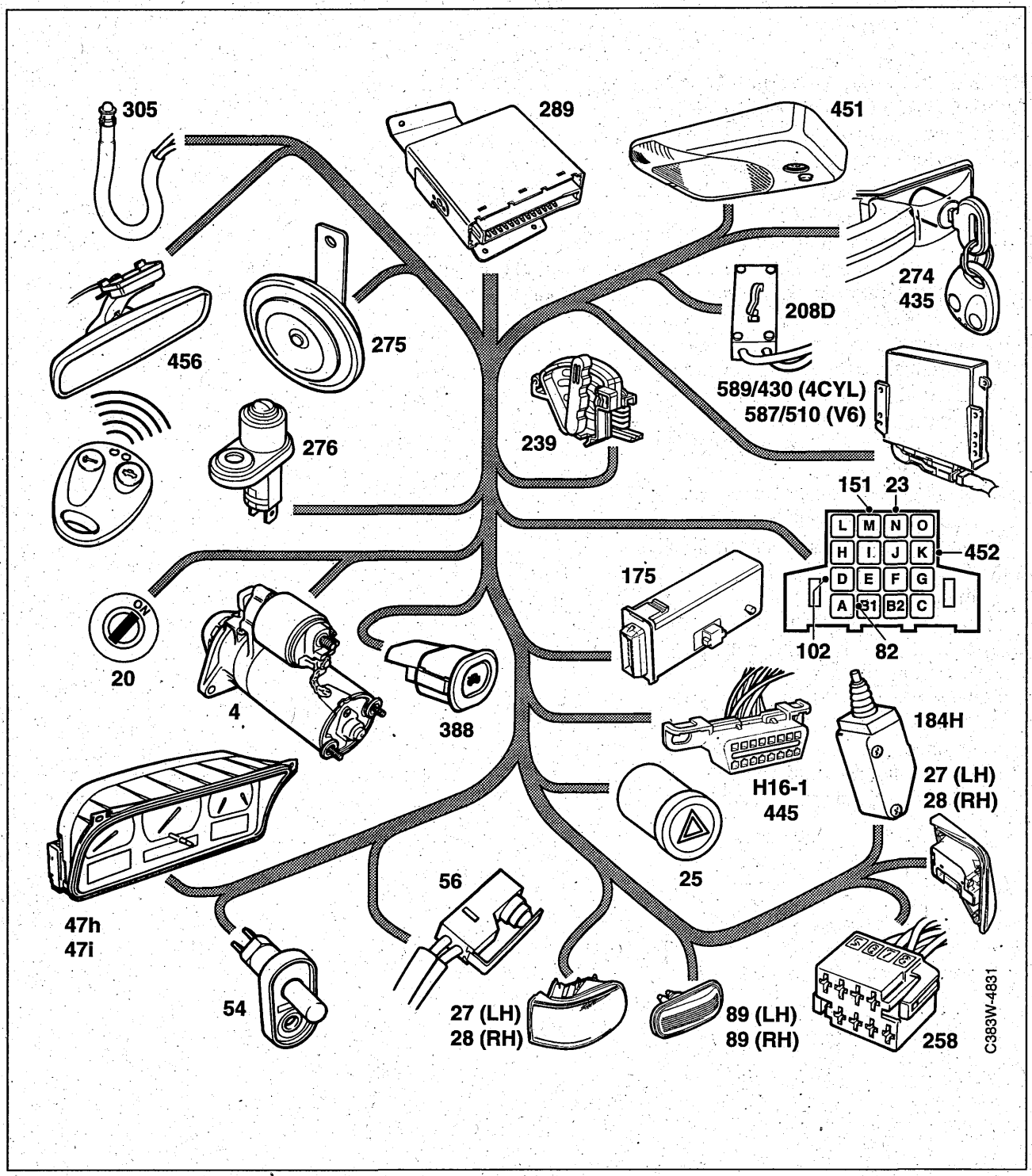
86 11 857 Test lamp



82 92 997 Removal tool for passenger airbag

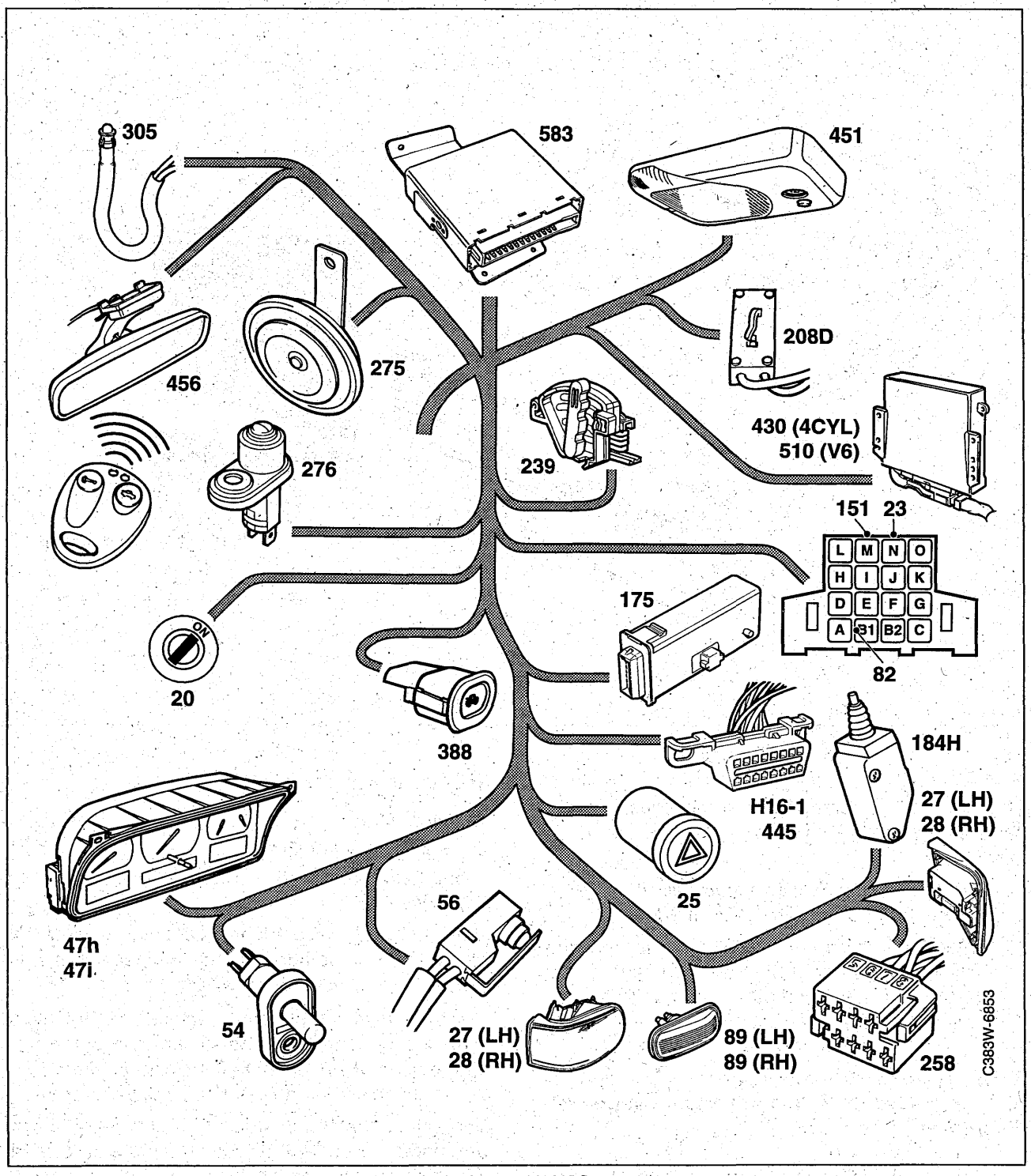
Technical description

System Overview, Anti-Theft Alarm



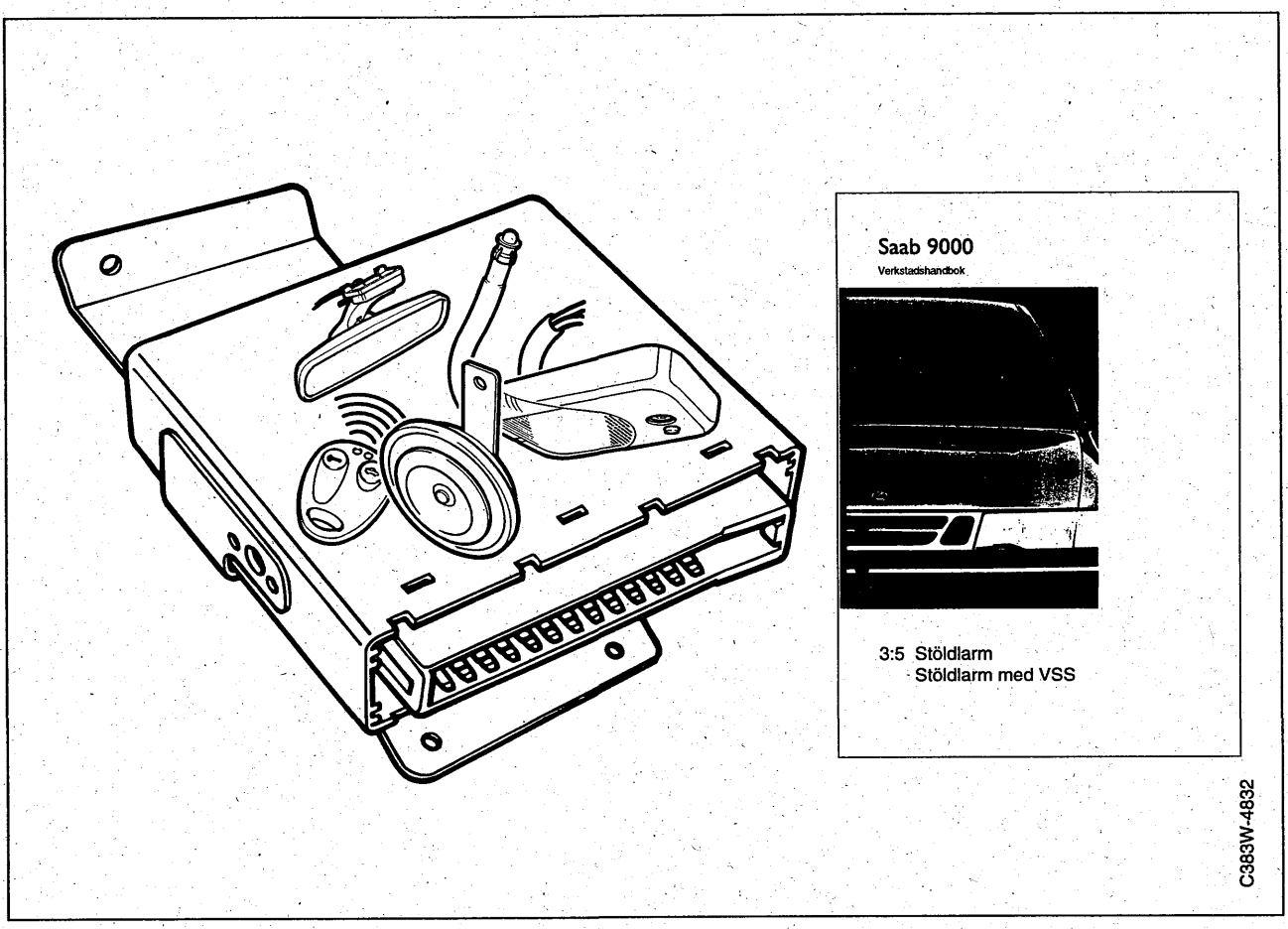
Anti-Theft Alarm 9000

System Overview, Anti-Theft Alarm with VSS



Anti-theft alarm with VSS, 9000

System Overview, anti-theft alarm (contd.)



The anti-theft system for the Saab 9000 consists of an alarm and a security system controlled by a remote control unit. Two versions of the alarm are available:

1 **Anti-theft alarm,** which is practically identical to the earlier M95 Anti-Theft Alarm 9000.
2 **Anti-theft alarm with VSS** (Vehicle Security System), which is a further development of earlier alarm designs and constitutes a more complete anti-theft alarm system.

Although most of the functions are identical in both alarm versions, there are some important differences.

"Anti-theft alarm" and "Anti-theft alarm with VSS" are headings in the service manual above descriptions of specific functions for the relevant alarm system.

The anti-theft alarm is available:

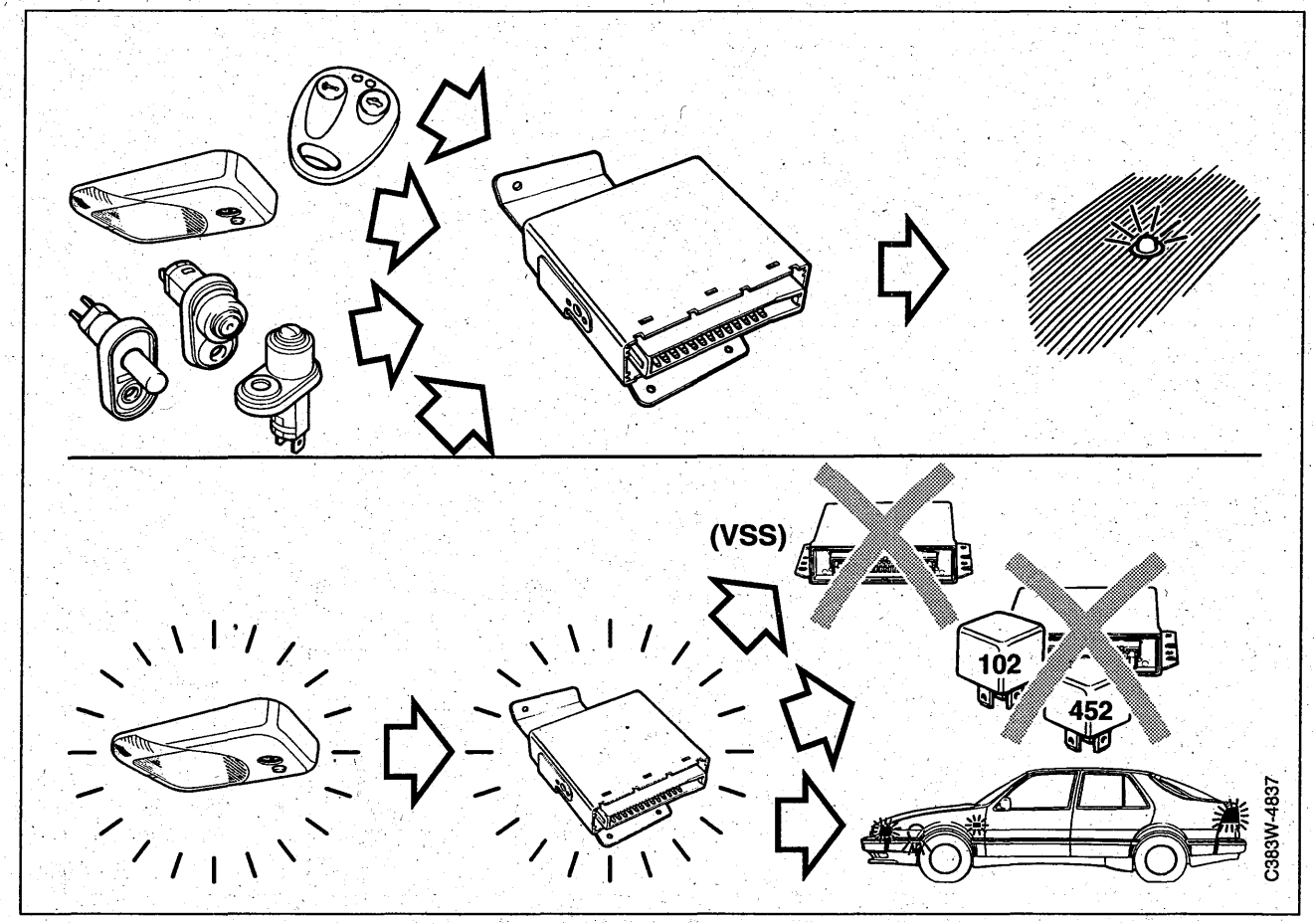
- factory-fitted
- as an accessory kit (all cars are pre-wired). The anti-theft alarm with VSS is not available as an accessory kit.

Some of the alarm components are used exclusively by the alarm and others are regular car components which are also used by the alarm.

Some of these components, such as sensors, have a monitoring function in the system and others set off the alarm. Central operational control of the system is exercised by an electronic control module.

The anti-theft alarm is programmable so that it can be adapted to meet the requirements and laws of different countries, as well as the preferences of different customers.

Basic functions of the anti-theft alarm system



Control

The "nerve centre" of the anti-theft alarm system is a main unit (electronic control module) which controls all system functions.

Sensing

The anti-theft alarm incorporates a number of sensors which are connected to the alarm's electronic control module via the car's wiring harness. These sense an attempt to break into the car and send a signal to the alarm's electronic control module.

Alarm signal

When the alarm is set off, this is made apparent with sound by the alarm horn sounding and/or light by all the direction indicators flashing.

3-circuit breaking, anti-theft alarm

Incorporated in the electronic control module for anti-theft alarms without VSS is a "3-circuit breaking" function which is activated at the same time as the alarm is set off. This prevents the engine from being started by blocking the car's ignition system, fuel supply and engine management system.

Immobilizing (anti-theft alarm with VSS

Incorporated in anti-theft alarms with VSS is an "immobilizing" function which, via the car's engine management system, always prevents unauthorized persons from starting the car

Operation

Operation, that is to say arming and disarming the anti-theft alarm, is accomplished by remote control. The anti-theft alarm without VSS can also be operated by the car key (the car key function is programmable).

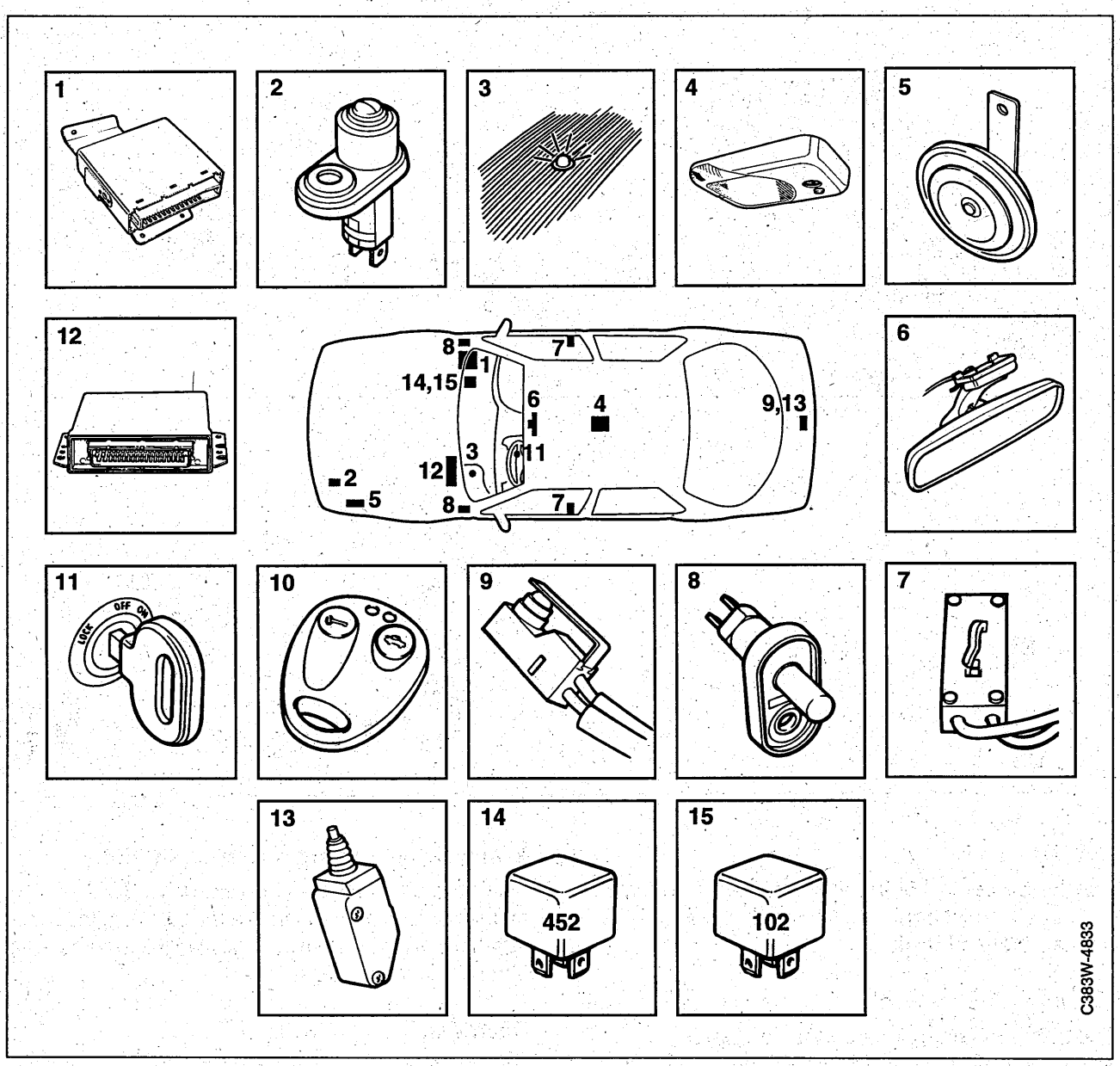
Alarm status

There is an LED in the car to show the status of the alarm. This flashes with different frequencies or is lit continuously depending on the situation.

Programming/diagnostics

The ISAT scan tool is used for programming and scan tool diagnostics on the theft alarm.

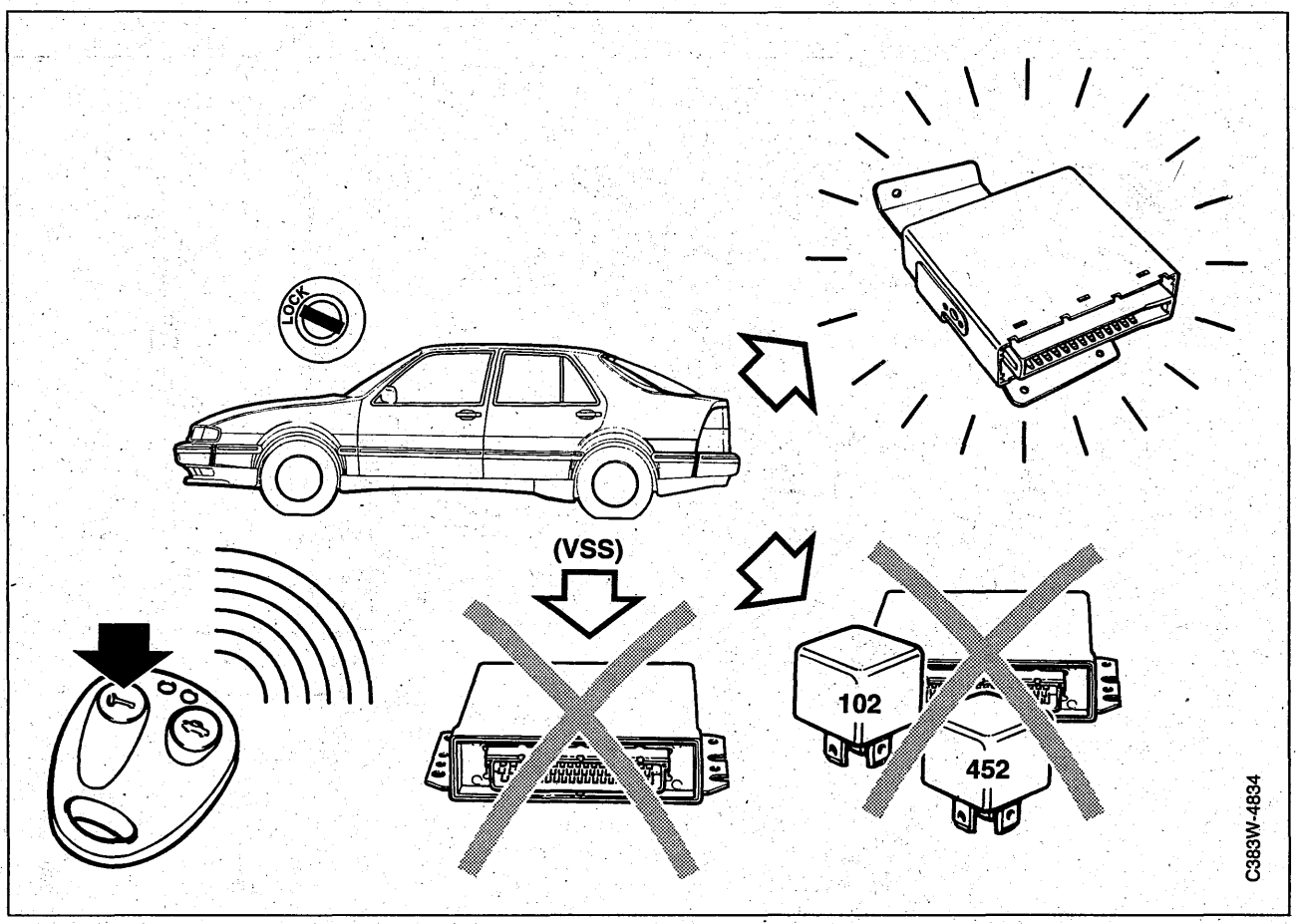
Main components of the anti-theft alarm



The anti-theft alarm systems incorporate the following main components:

1 Electronic control module
2 Bonnet switch
3 LED
4 Glass breakage sensor (integrated in the interior lighting lamp)
5 Horn
6 Aerial for remote control (under the roof console and in the interior rearview mirror)
7 Pictogram switch, driver's door
8 Door switches
9 Microswitch, tailgate lock
10 Remote control
11 Ignition switch (Anti-theft alarm with VSS)
12 Engine management system
13 Microswitch, door
14 Starter relay (Anti-theft alarm)
15 Fuel pump relay (Anti-theft alarm)

Electronic control module, description of operation



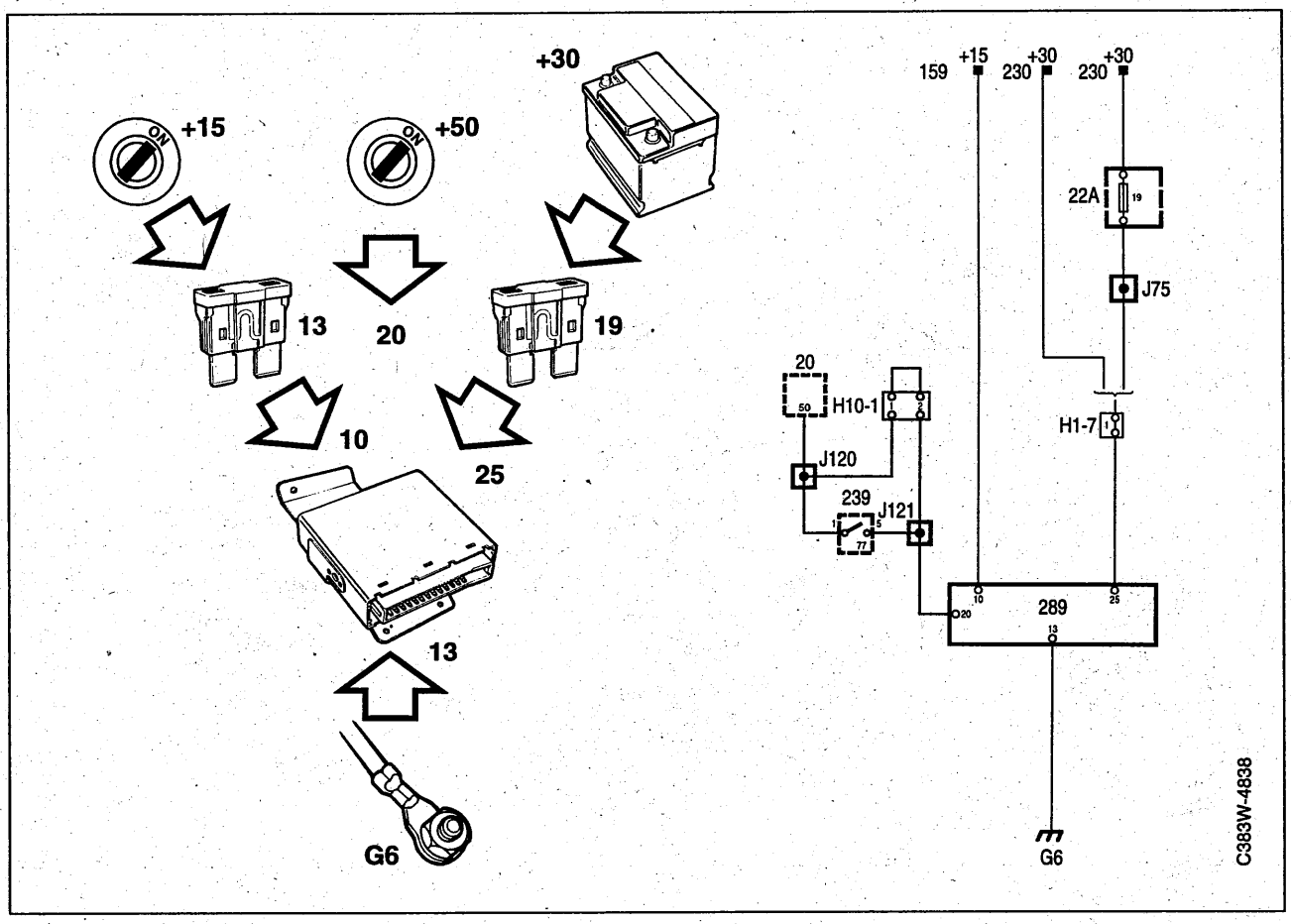
The control module is located behind the glove box or passenger airbag. It is connected to all the constituent components via a 25-pin connector.

The principal functions of the electronic control module are to check the status of the sensors when the alarm is armed, to set off the alarm via the horn and/or direction indicators and, by means of 3-circuit breaking (Anti-theft alarm) or immobilizing (Anti-theft alarm with VSS), to prevent the car from being started in the event of a break-in.

In order to achieve this, there is a central processing unit in the electronic control module, in which a control program is stored in PROM (Programmable Read Only Memory). As different markets have special requirements for the operation of the theft alarm, the theft alarm can be programmed to adapt it to the particular market. In addition, there are several possibilities when programming to adapt the function to the requirements of the customer.

Programming is carried out using the ISAT scan tool and the information is stored in EEPROM (Electrically Erasable PROM).
Earlier programming is erased when data is programmed. Stored programming does not disappear if the voltage supply is cut.

Description of operation, electronic control module power supply and ground, Anti-theft alarm



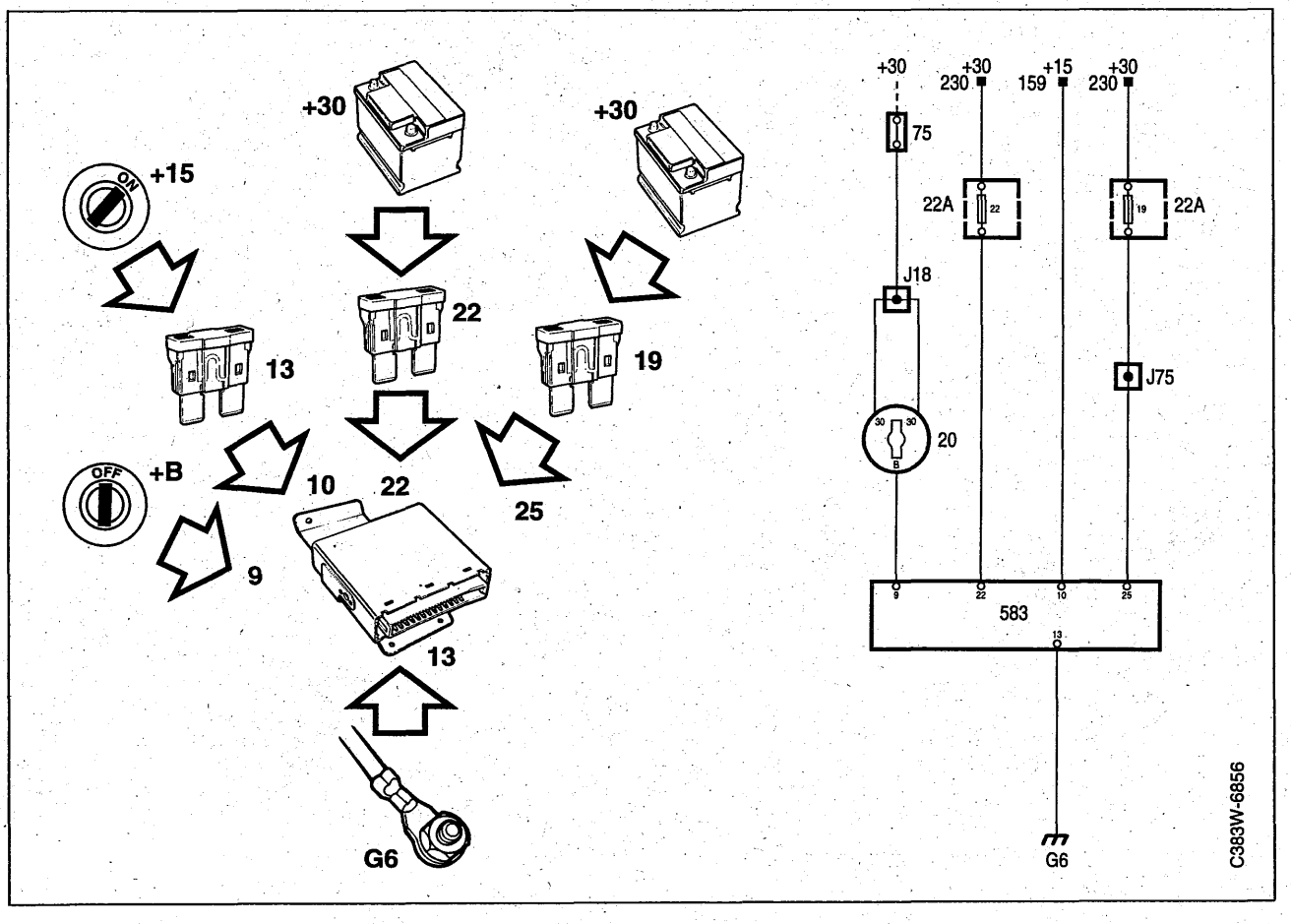
Electronic control module power supply

- The +30 power supply goes direct to pin 25 of the control module. There is no fuse in this circuit. (In certain markets the +30 power supply goes via fuse 19).
- The +15 power supply goes direct from distribution terminal 159 to pin 10 of the control module. There is no fuse in this circuit.
- The +50 power supply goes to pin 20.

Electronic control module ground

Electronic control module main ground (pin 13) is connected to grounding point G6.

Description of operation, electronic control module power supply and ground, Anti-theft alarm with VSS



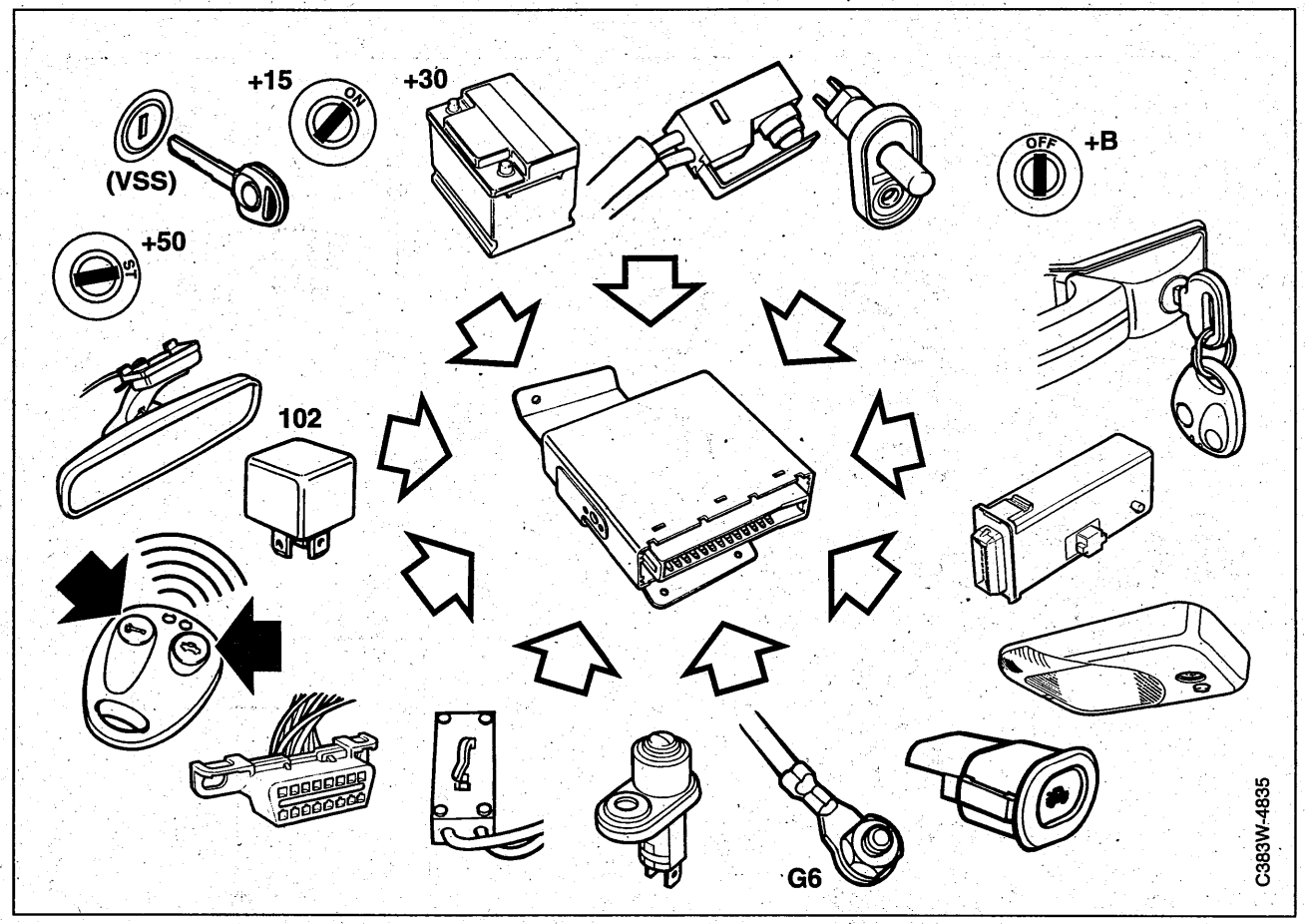
Electronic control module power supply

- The +30 power supply goes via fuse 19 to pin 25 of the control module.
- The +30 power supply for the direction indicators goes via fuse 22 to pin 22 of the electronic control module.
- The +B power supply goes to pin 9 of the electronic control module.
- The +15 power supply goes direct from distribution terminal 159 to pin 10 of the control module. There is no fuse in this circuit.

Electronic control module ground

Electronic control module main ground (pin 13) is connected to grounding point G6.

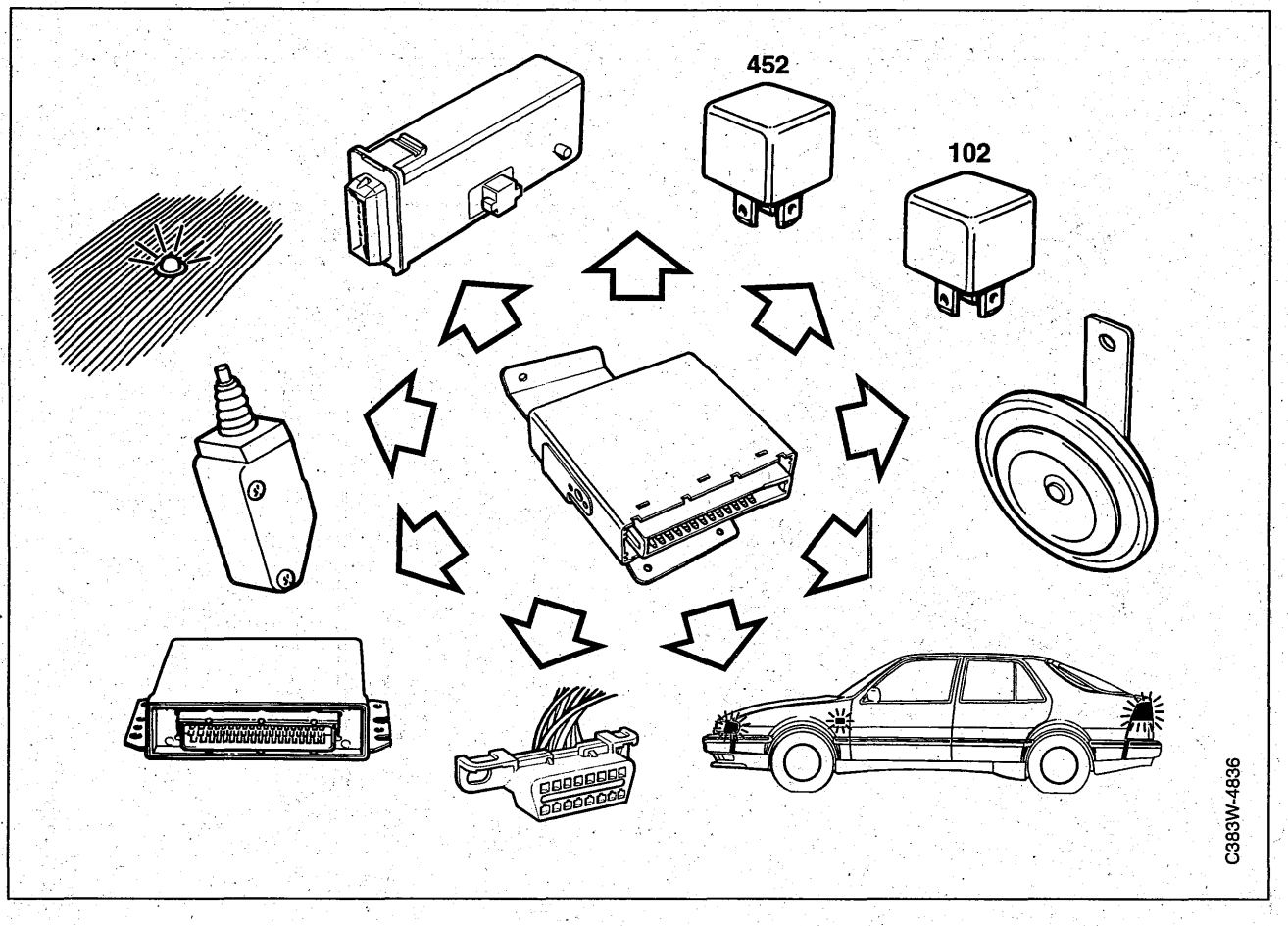
Description of operation, electronic control module inputs



Control module inputs

- Aerial, remote control, signal, see page 29
- Aerial, remote control, ground, see page 29
- Luggage compartment switch, see page 18
- Power supply for direction indicators (+30 circuit) (Anti-theft alarm with VSS), see page 15
- Central locking system, locking (car key), (anti-theft alarm), see page 34
- Central locking system, unlocking (car key), (anti-theft alarm), see page 34
- Scan tool diagnostics, ISAT scan tool, see page 39
- Door indication, driver's door, see page 18
- Door switches, see page 18
- Glass breakage sensor, ground, see page 19
- Glass breakage sensor, signal, see page 19
- Main ground, see pages 14, 15
- Microswitch, luggage compartment lock, see page 34
- Bonnet switch, see page 18
- Relay, starter motor (ignition "ST" +50), (Anti-theft alarm), see page 25
- Relay, fuel pump, (Anti-theft alarm), see page 25
- Power supply (+30 circuit), see pages 14, 15
- Ignition "ON" (+15), see pages 21, 22
- Ignition "+B" (Anti-theft alarm with VSS), see page 22

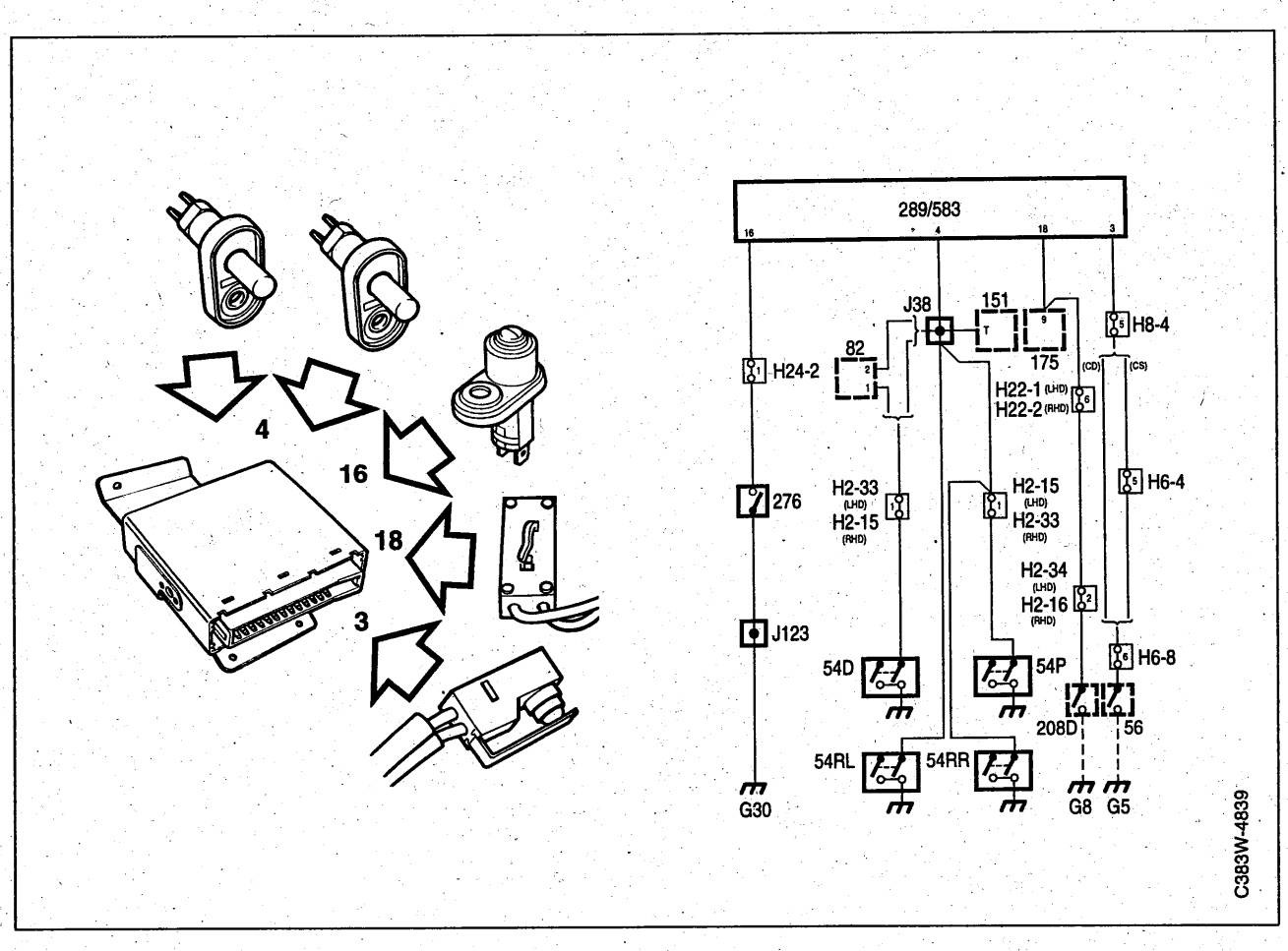
Description of operation, electronic control module outputs



Control module outputs

- Tailgate, unlocking (remote control), see page 33
- Central locking system, locking (remote control), see page 31
- Central locking system, unlocking (remote control), see page 32
- Scan tool diagnostics, ISAT scan tool, see page 39
- Right-hand direction indicators, see page 24
- Immobilizing, (Anti-theft alarm with VSS), see page 26
- LED, see page 27
- Engine management system (ignition +15), (anti-theft alarm), see page 25
- Relay, starter motor (ignition +50), (anti-theft alarm), see page 25
- Relay, fuel pump, (Anti-theft alarm), see page 25
- Horn, ground, see page 23
- Left-hand direction indicators, see page 24

Description of operation, door, luggage compartment and bonnet switches



Door and luggage compartment switches

The switches (for interior lighting) are included in the anti-theft alarm as sensors for doors and tailgate. The switches are mounted in the body, in the middle of each door and the tailgate. All door switches are connected to the alarm control module (pin 4) and the luggage compartment switch (pin 3) via the car's wiring harness. The control module then senses if a door is opened when the alarm is armed by monitoring the voltage across the switch as follows:

- When the door/tailgate is closed, the voltage between the switch and ground should be +12 V.
- The switch is grounded when the door/tailgate is opened. The voltage between the switch and ground is then 0 V. The alarm is set off.

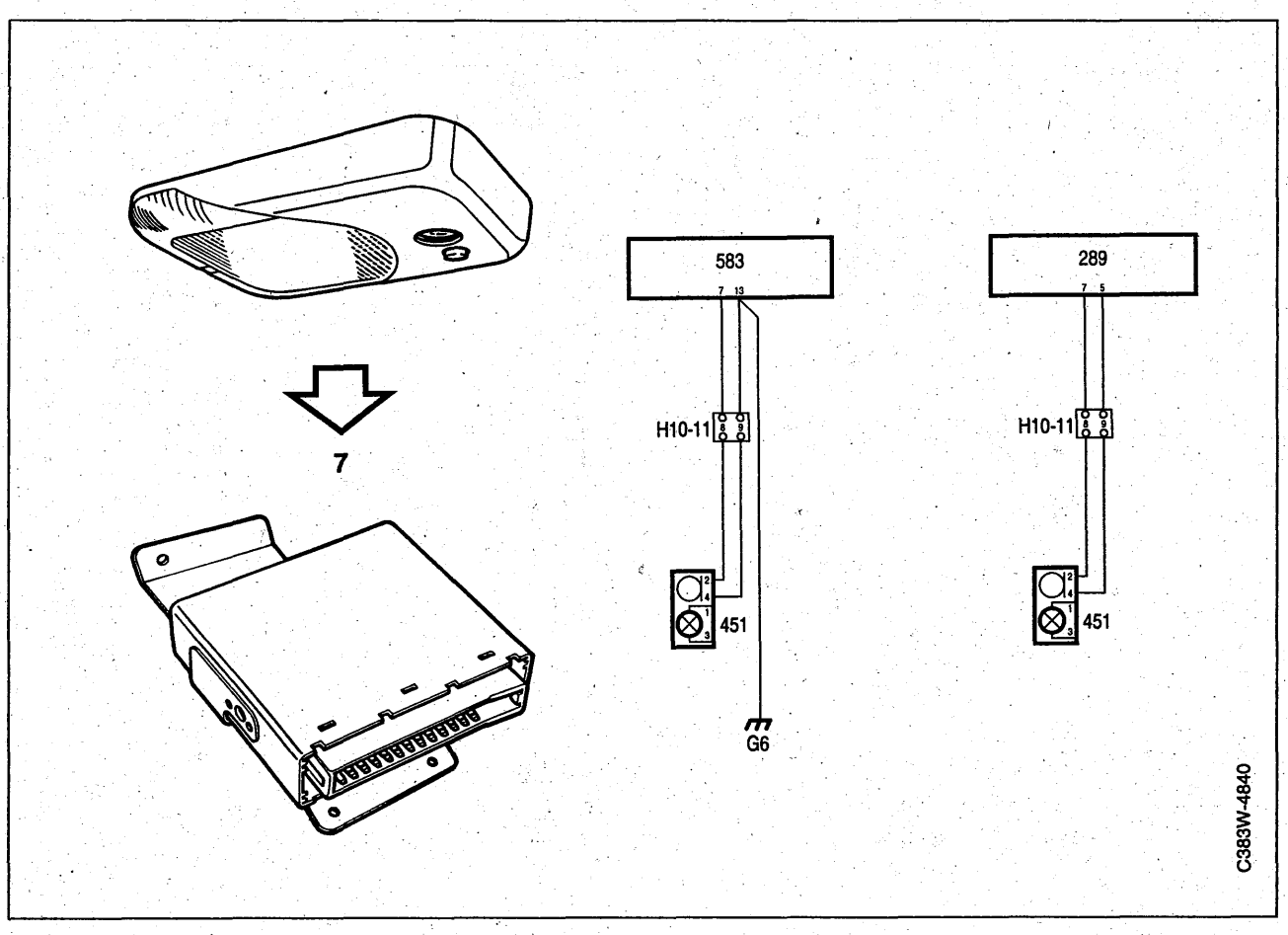
The electronic control module senses via pin 18 whether the door is open or not and if it is prevents the alarm from being armed.

Bonnet switch

The bonnet switch is located in the engine bay at the front and is included as a sensor for the bonnet. The switch is connected to the control module (pin 16).

- When the bonnet is closed, the voltage between the switch and ground should be +12 V.
- When the bonnet is opened, the switch is grounded. The voltage between the switch and ground is thus 0 V. The alarm is set off.

Description of operation, glass breakage sensor



Glass breakage sensor

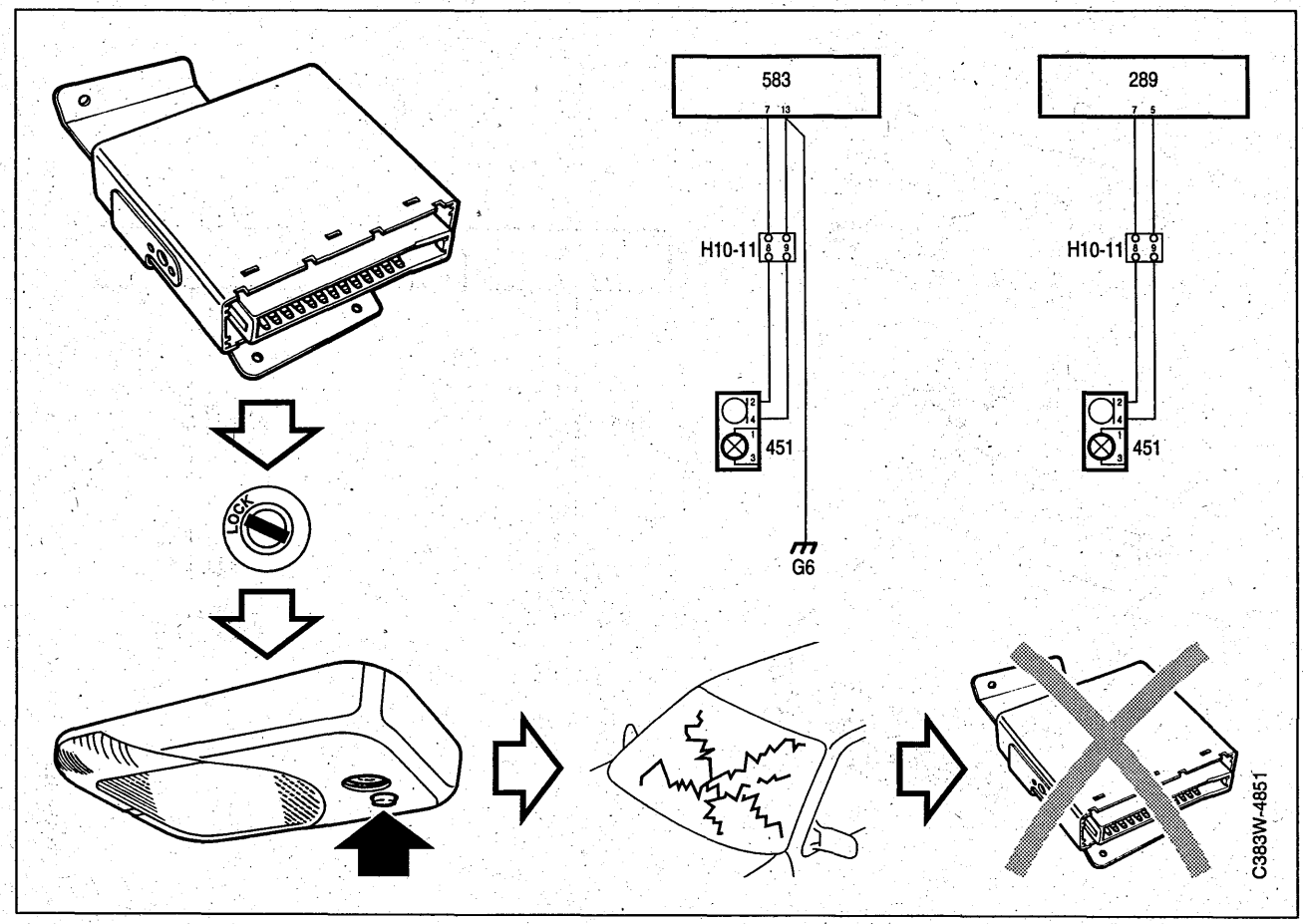
The sensor senses sound (microphone), such as a window being broken. It is integrated with the interior lighting lamp in the roof and connected to the control module as follows:

- **Anti-theft alarm,** via pin 7/signal and pin 5/ground.
- **Anti-theft alarm with VSS** via pin 7/signal and pin 13/ground.

The separate ground input for the sensor in the anti-theft alarm version without VSS has a filtering effect to avoid differences in potential between the electronic control module's main ground and the sensor's ground input.

If a window is broken while the anti-theft alarm is armed, the sensor sends an analogue signal to the electronic control module so that the alarm will be set off. The sensor also has a button for manual disconnection of the glass breakage sensor. When this button is pressed, the electronic control module senses a change in the signal level and the sensor is disconnected.

Description of operation, glass breakage sensor (contd.)



Connection

The sensor is connected when the rest of the theft alarm is armed.

Manual disconnection

The sensor can be disconnected using the disconnection button as follows:

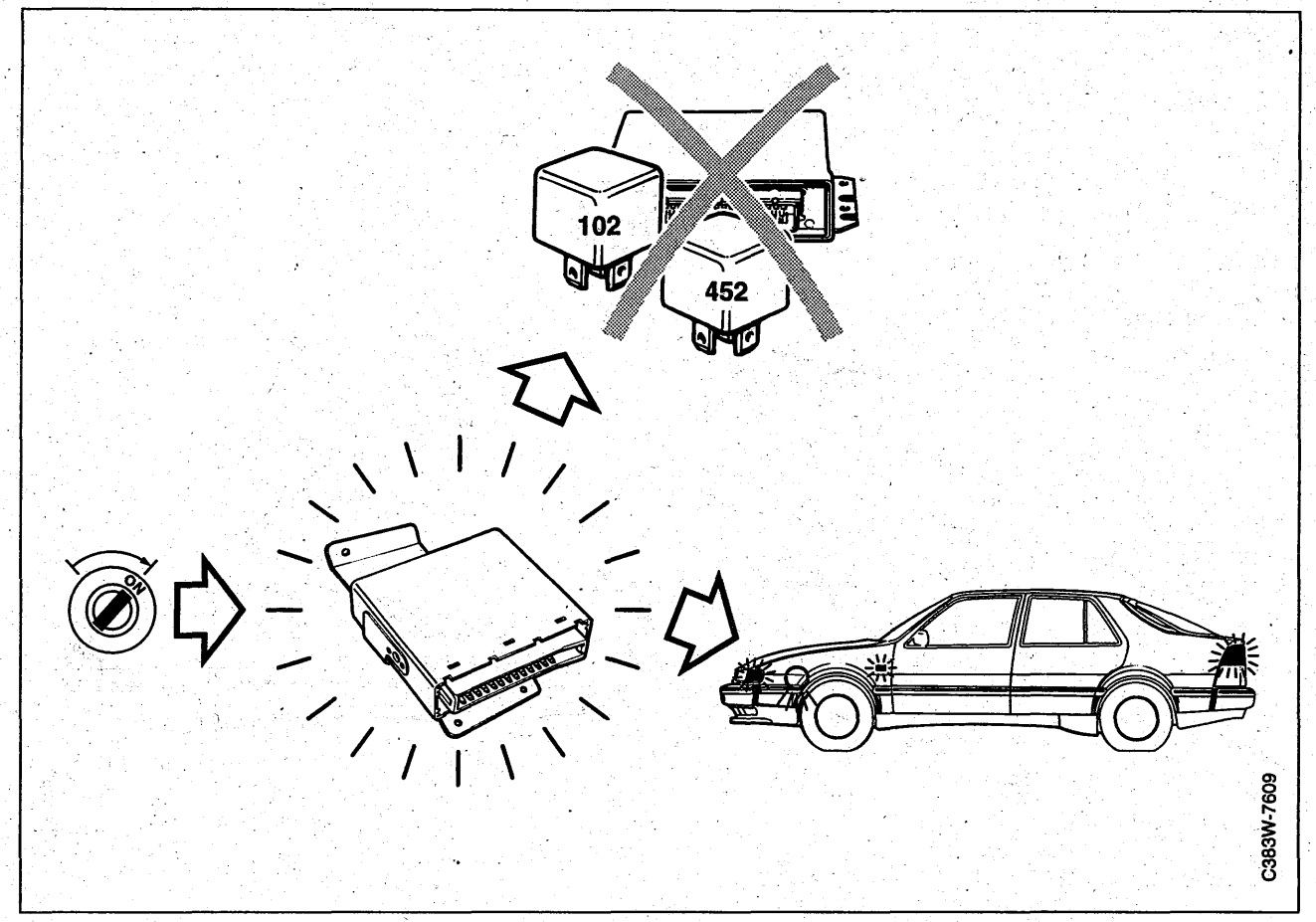
- If the button is pressed when the theft alarm is not armed and the ignition is off, the sensor will not then be connected when the theft alarm is armed. When the button is pressed, the LED flashes once every second for 10 seconds. If the theft alarm is armed before this, the LED goes to being lit continuously (normal 10 second delay).
- The sensor can be reconnected (before the anti-theft alarm is armed) by turning the ignition switch to the ON position (+15).
- Otherwise, it is necessary to disarm the alarm and then arm it again so that the sensor will be connected with the rest of the alarm.

Automatic disconnection

The sensor is automatically disconnected in the following cases:

- If the theft alarm is disarmed.
- If the tailgate alone is disarmed/unlocked.
- If a door or the tailgate is open on arming the alarm.
- If the voltage drops to lower than +8.5 V.

Description of operation, ignition, Anti-theft alarm



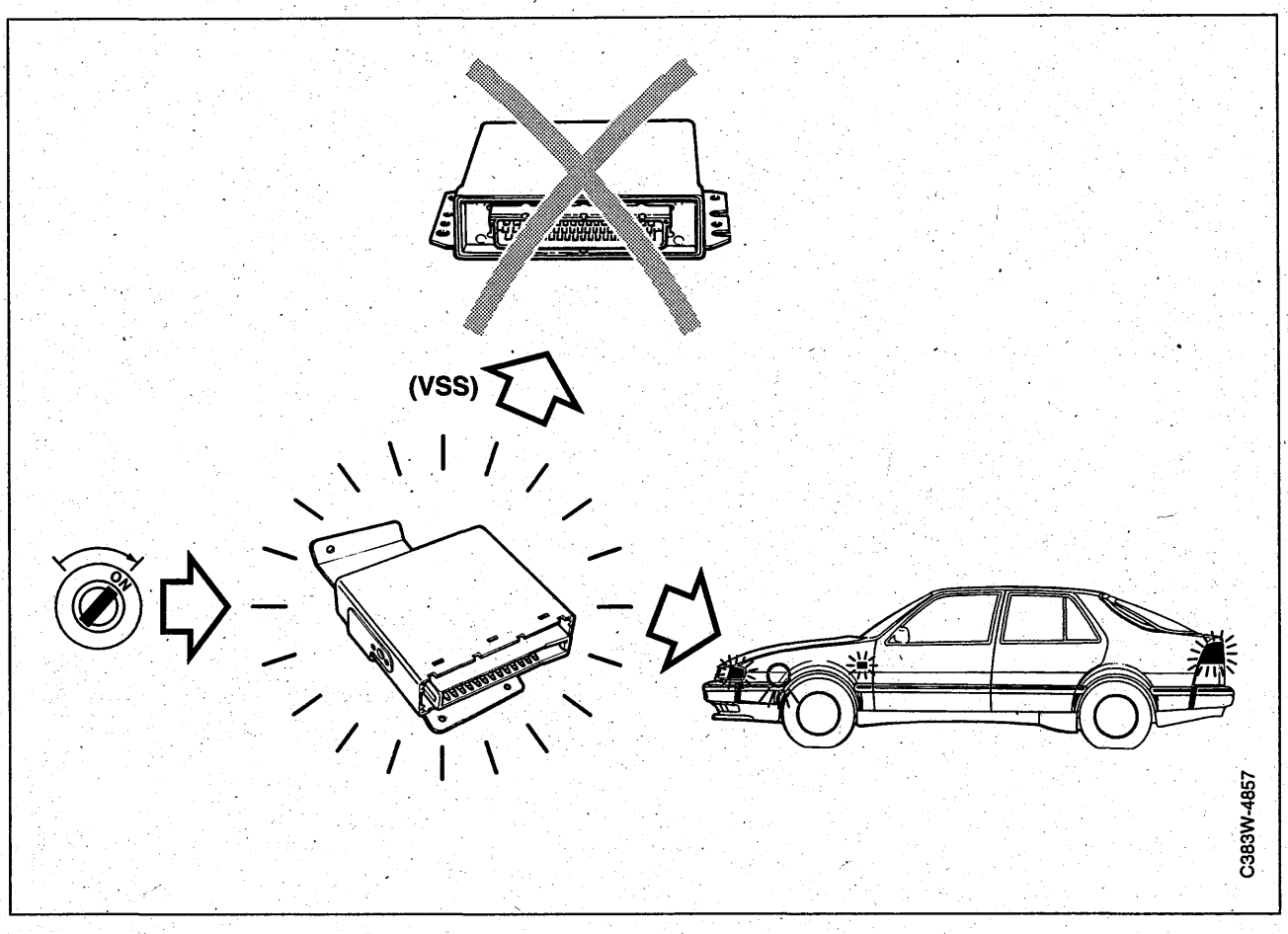
Ignition

The ignition switch is connected to the control module (pin 10) so that the control module is able to sense the voltage (+12 V) if the ignition is turned to the "ON" position (+15). The alarm is set off if the theft alarm is armed. This means that if an attempt is made to start the car, both the alarm and "3-circuit breaking" (immobilizing of starter and fuel pump relays and +15 power supply to the engine management system) are set off.

Important

- If the ignition is in the "ON" position (+15), the anti-theft alarm cannot be armed.
- If the ignition is turned to the "ON" position (+15) during the alarm delay period, the anti-theft alarm is automatically disarmed.

Description of operation, ignition, Anti-theft alarm with VSS



Ignition

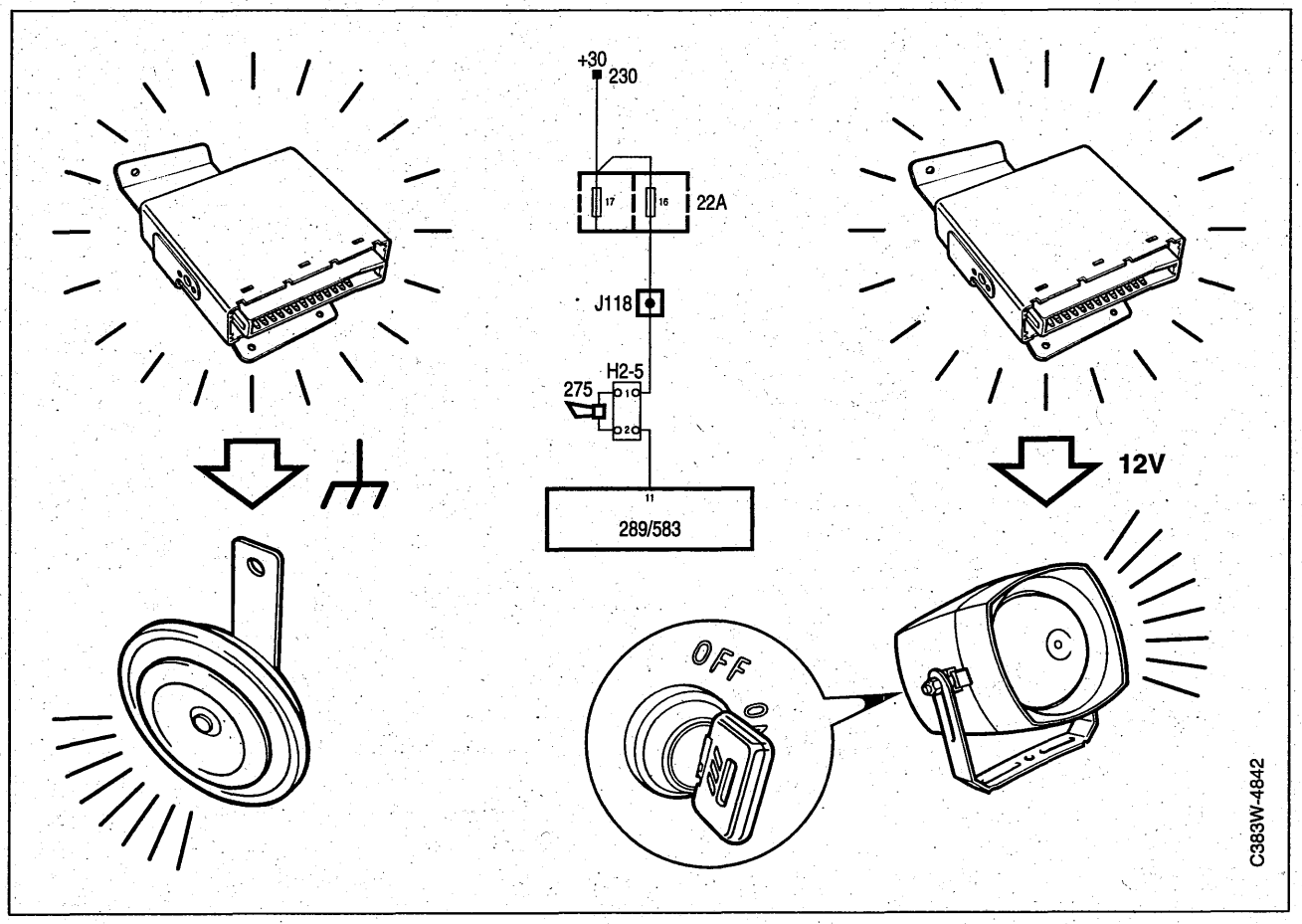
- The ignition switch is connected to the control module (pin 9). When the key is removed from the ignition switch the electronic control module senses this and immobilizes the car.
- The ignition switch is also connected to the control module (pin 10) which will then sense the voltage level (+12 V) if the ignition switch is turned to the "ON" position (+15 circuit).

If the car is immobilized it cannot be started until the engine management system has identified the correct code from the remote control unit (otherwise the engine management system will prevent the engine from being started). An alarm will be set off if the anti-theft alarm is armed, that is to say an attempt to start the car will trigger both an alarm and "immobilizing".

Important

- If the ignition is in the "ON" position (+15), the anti-theft alarm cannot be armed.
- If the ignition is turned to the "ON" position (+15) during the alarm delay period, the anti-theft alarm is automatically disarmed.

Description of operation, horn and siren



Anti-theft alarm, horn

There is a special horn in the sound alarm that sounds when the alarm is set off and also as a confirmation when a button is pressed on the remote control. This is mounted behind the wing liner in the front left-hand wheel housing.

The +30 circuit is connected to the horn. If the alarm is set off, the horn sounds by being grounded via the anti-theft alarm electronic control module (pin 11).

The length of time the horn sounds when the alarm is set off and the configuration of the confirmation are programmable.

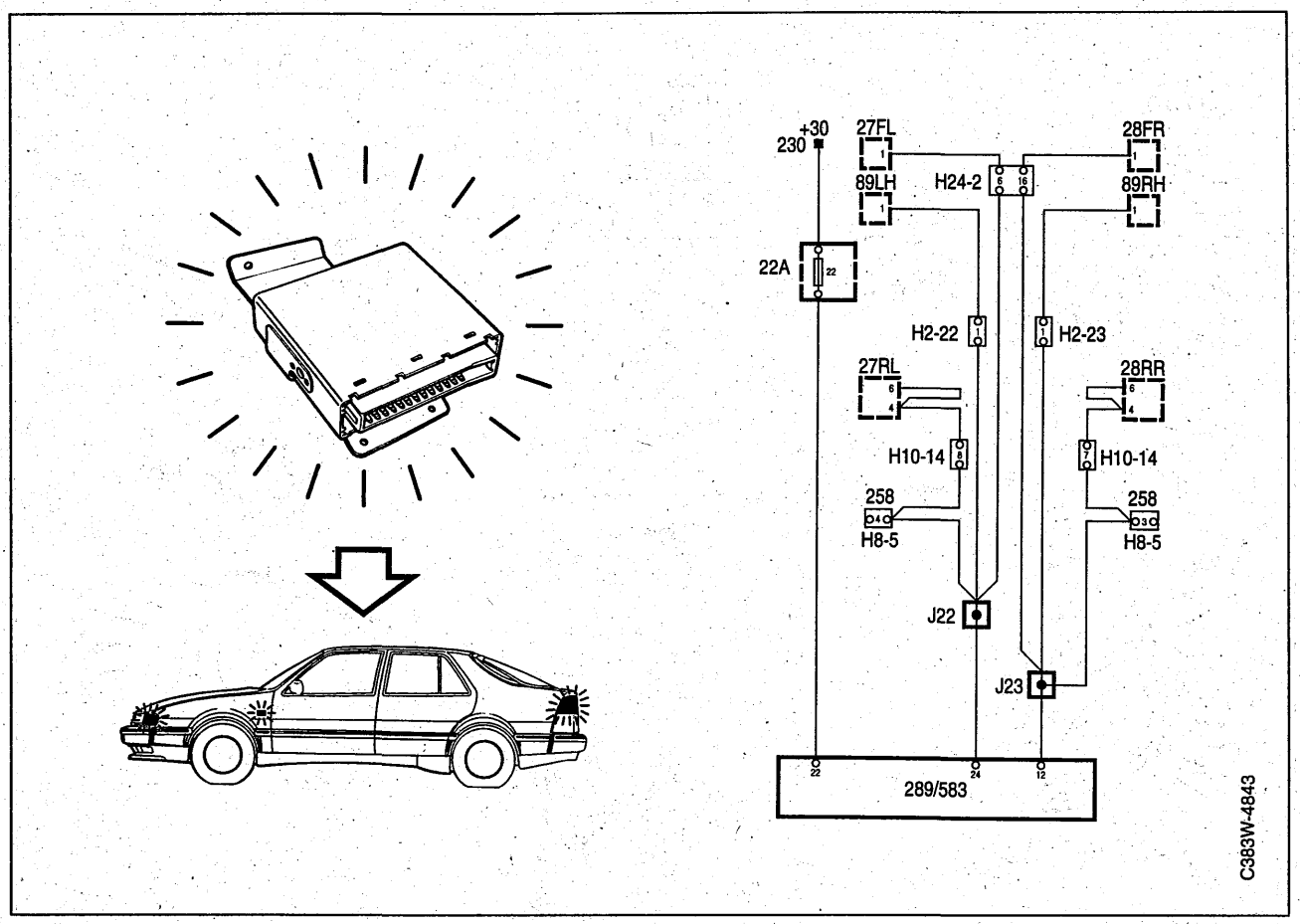
Siren

As an extra option, a siren with battery back-up can be fitted. This is then connected to the same lead (pin 11) as the horn.

Important

The siren and the horn cannot be used at the same time. The control module continuously supplies +12 V to the siren and if this supply is broken, the alarm will be set off. For this, the siren must be specially programmed.

Description of operation, direction indicators



Direction indicators

All the direction indicators on the car are used when the light alarm is set off and also as a confirmation when a button is pressed on the remote control.

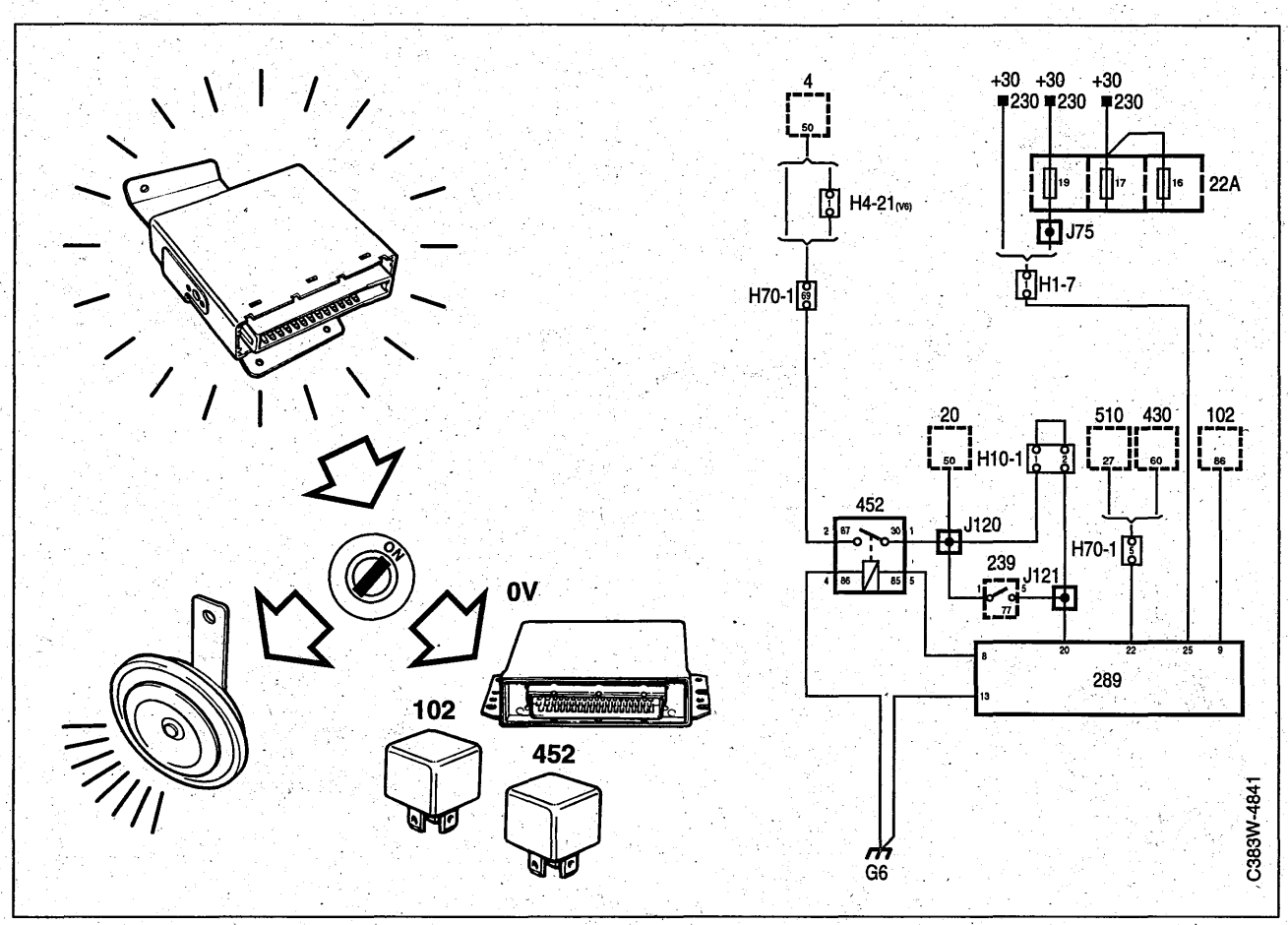
It is possible to program whether the direction indicators are included in the alarm and what the flash time should be. The configuration of the light confirmation is also programmable.

The direction indicators are connected to pins 12 (right-hand) and 24 (left-hand) of the electronic control module. The outputs are protected from shorting and if the electronic control module detects a short circuit they will be disconnected automatically from the alarm system and only an acoustic alarm will be set off. The direction indicator outputs will be reconnected next time the alarm is armed.

Anti-theft alarm with VSS

The direction indicators are supplied with power separately in that the +30 circuit is connected to pin 22 of the electronic control module. In the event of a short circuit the fuse will blow but the direction indicator circuit will still be intact.

Description of operation, 3-circuit breaking, Anti-theft alarm



3-circuit breaking

Integral with the anti-theft alarm's electronic control module is a "3-circuit breaking" function which takes over control of the following functions when the alarm is armed. This prevents the engine from being started when the alarm is set off, as follows:

- **The starter relay (ignition "ST" +50)** receives no operating current because the anti-theft alarm control module (pin 8) breaks the circuit if an attempt is made to start the car.
- **The fuel pump relay** receives no operating current because the anti-theft alarm's control module (pin 9) breaks the circuit. (The engine receives no fuel — the car cannot be push-started, either.)
- **The engine management system** does not receive a +15 supply because the alarm control module (pin 22) breaks the circuit.

Connection

The "3-circuit breaking" function is connected when the rest of the alarm is armed.

Disconnection

The "3-circuit breaking" function is disconnected when the rest of the alarm is disarmed.

Self-arming, 3-circuit breaking

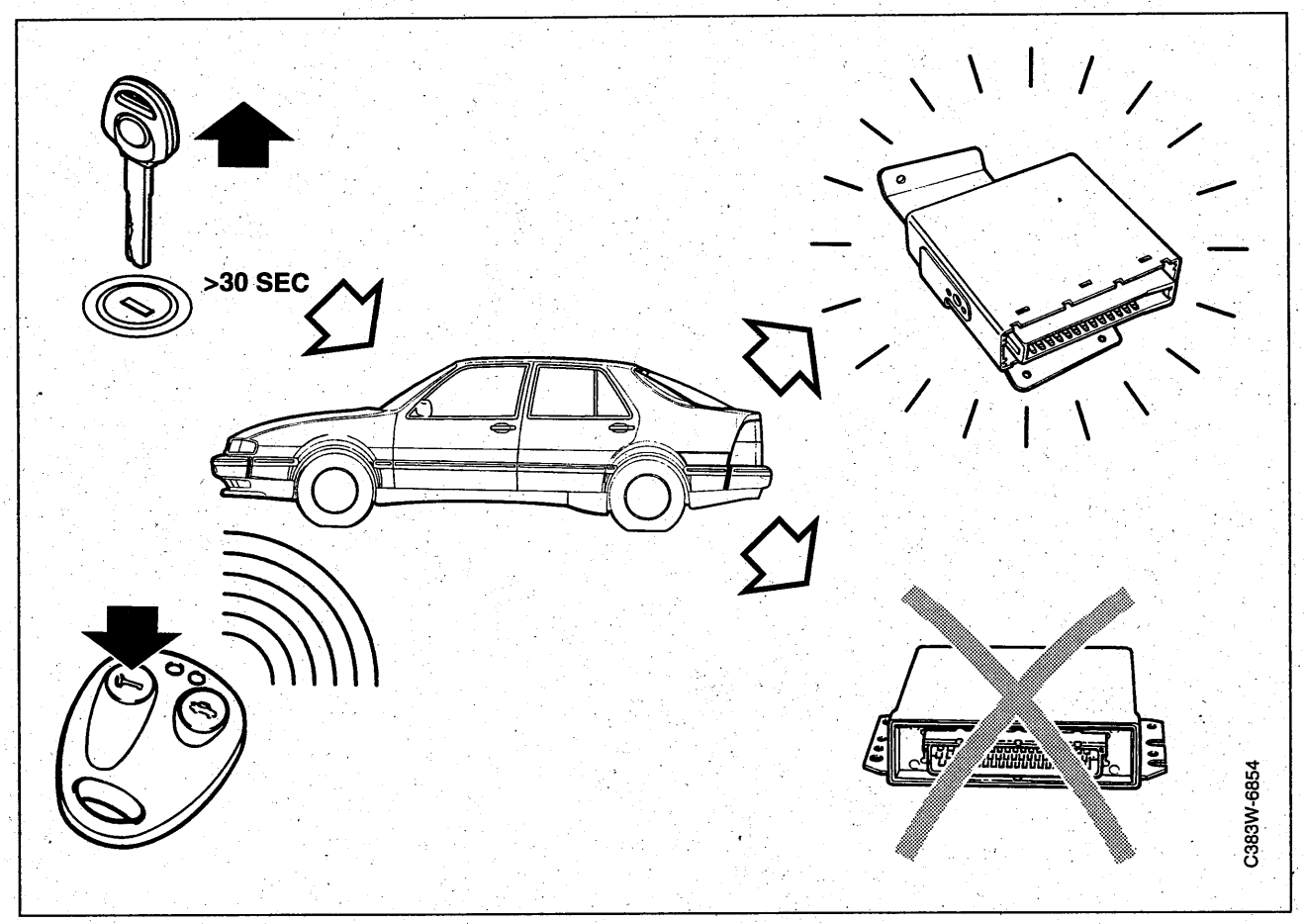
The 3-circuit breaking function can be independently programmed for self-arming, that is to say automatic arming with the use of the remote control or car key.

Self-arming, anti-theft alarm

The entire anti-theft alarm system can also be programmed for self-arming. In this case, 3-circuit breaking is automatically included when the alarm is armed.

See also the "Programming" section for more detailed information.

Description of operation, immobilizing, Anti-theft alarm with VSS



Immobilizer

Incorporated in the anti-theft alarm with VSS is an immobilizing function which in cooperation with the car's engine management system prevents the engine from being started. If an attempt is made to start the car while it is immobilized, the anti-theft alarm's electronic control module communicates with the engine management system, which then determines whether to allow starting or not.

The immobilizing function is always activated automatically after a certain time, but can be initiated manually at any time before this.

- **Manually.** The car is immobilized at the same time as it is locked and/or the alarm is armed by means of the remote control unit (left-hand button).
- **Automatically.** The car is immobilized automatically without the remote control unit being used. This takes place after a certain time and is indicated by the LED flashing at the rate of 2 flashes per second.

Self-immobilizing

Immobilizing takes place automatically:

- **30 seconds** after the ignition key is removed from the ignition switch (the time can be reprogrammed to a different time).
- **3 minutes** after disarming/unlocking, unless the ignition key is turned in the ignition switch.

Disarming of the immobilizer

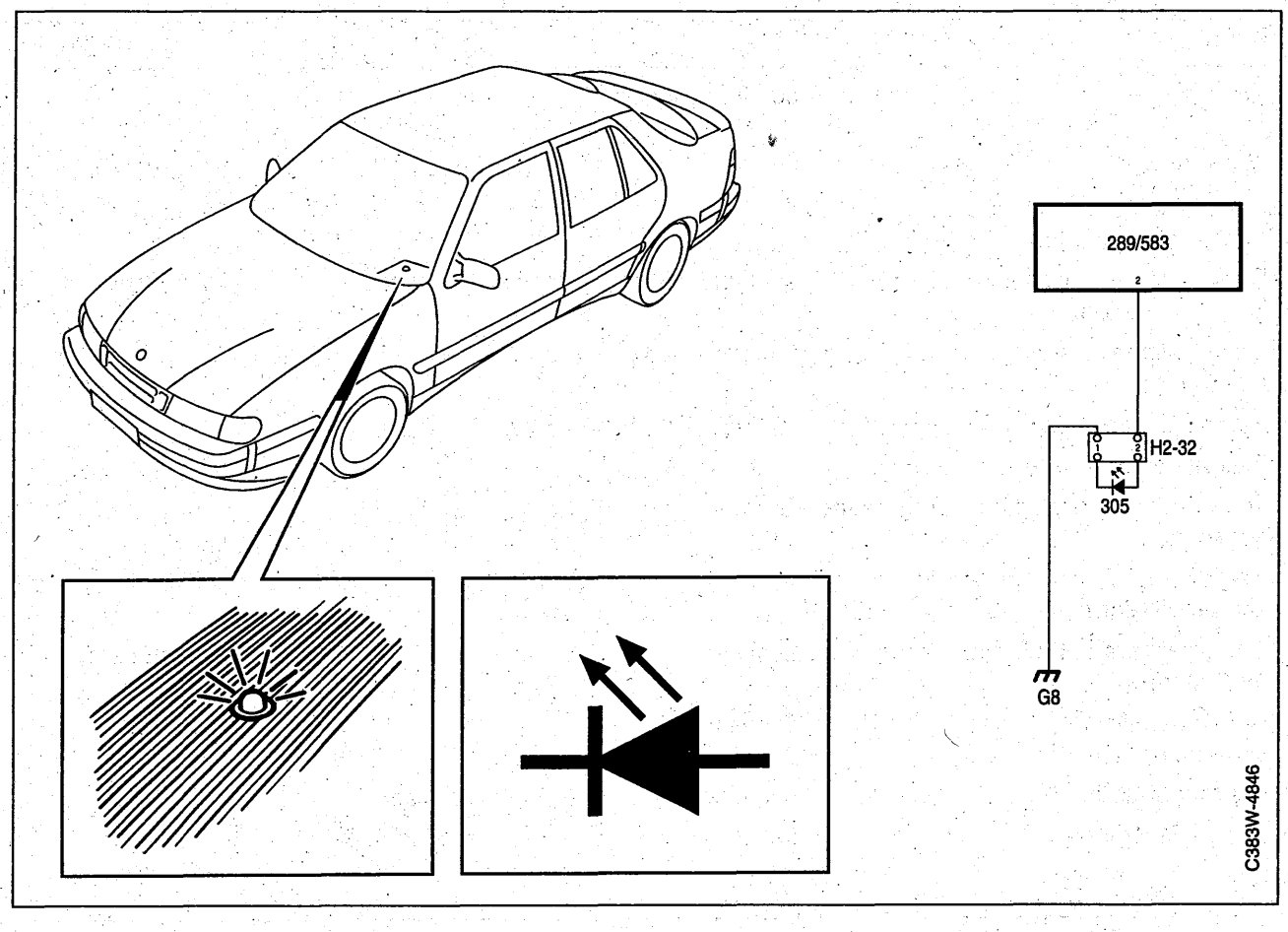
The immobilizer can be disarmed by means of the left-hand button on the remote control unit, either the immobilizer only or in conjunction with disarming of the entire alarm system if it has been armed. When the immobilizer is disarmed a code is sent from the remote control unit to the anti-theft alarm's control module.

Code identification

When the ignition switch is turned to start the engine, the engine management system checks the code it has received:

- **If the code is approved,** the car will start.
- **If the code is incorrect or absent** the engine management system will make it impossible to start the car.

Description of operation, LED



As a test function for the anti-theft alarm, an LED is mounted in the loudspeaker grille on the left-hand side of the dashboard (or right-hand side on RHD cars). This is controlled by the control module (pin 2) and flashes (at varying frequency) or remains on continuously, depending on different conditions. Some normal cases are shown in the table on the next page.

Important

The delay time (10 seconds) does not start until the delayed interior lighting (about 18 seconds) goes out.

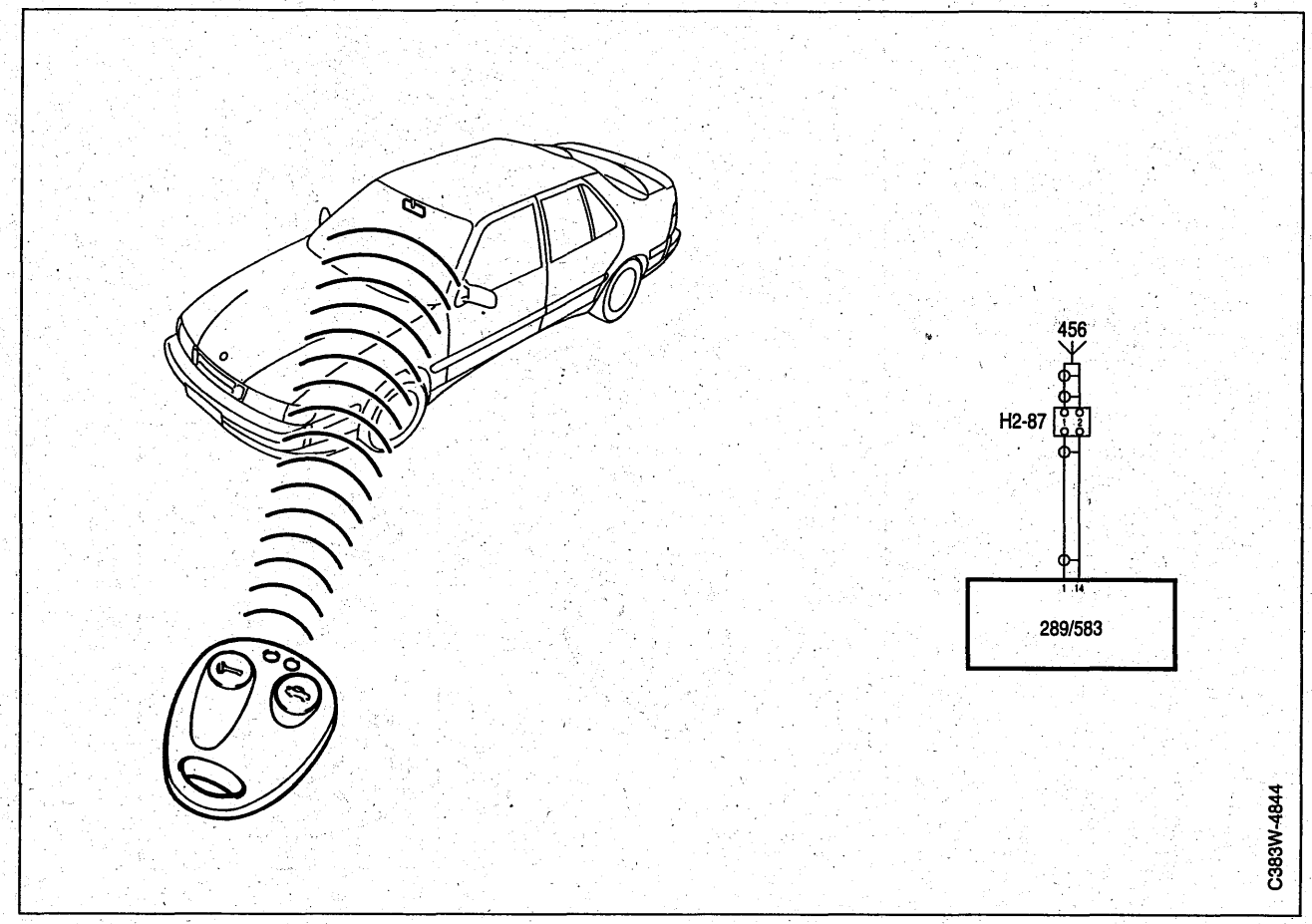
Self diagnostics

Each time the alarm is armed, a self diagnostic test is conducted during the delay period (10 sec) while the LED is lit. If a fault is revealed, a diagnostic trouble code is stored in the control module and the LED flashes once every second. Other alarm functions are not affected.

Description of operation, LED (contd.)

Function	LED	Time	Flash frequency
Arming	continuously on	10 sec (delay period)	
Alarm armed	flashes		1 flash/2 sec
Door, tailgate or bonnet open when arming takes place.	flashes	10 sec	1 flash/sec
Door, tailgate or bonnet opened during delay period.	continuously on — flashing	10 sec	1 flash/sec
Door, tailgate or bonnet closed during delay period.	flashes — continuously on	10 sec	
Tailgate closed after delay period.	flashes — continuously on	10 sec	
Tailgate opened after delay period.	flashes		1 flash/2 sec
Disconnection of glass breakage sensor (button)	flashes	10 sec	1 flash/sec
Self-arming, 3-circuit breaking (Anti-theft alarm)	flashes		double flash/2 sec
Self-arming, anti-theft alarm (Anti-theft alarm)	flashes		1 flash/2 sec
Self-immobilizing (Anti-theft alarm with VSS)	flashes		double flash/sec
Disarmed alarm	continuously on	1 sec	
Fault in system	flashes	during delay period	1 flash/sec

Description of operation, remote control unit



Remote control

The anti-theft alarm is operated by means of a remote control unit. (Anti-theft alarms without VSS can also be armed and disarmed by means of the car key.)

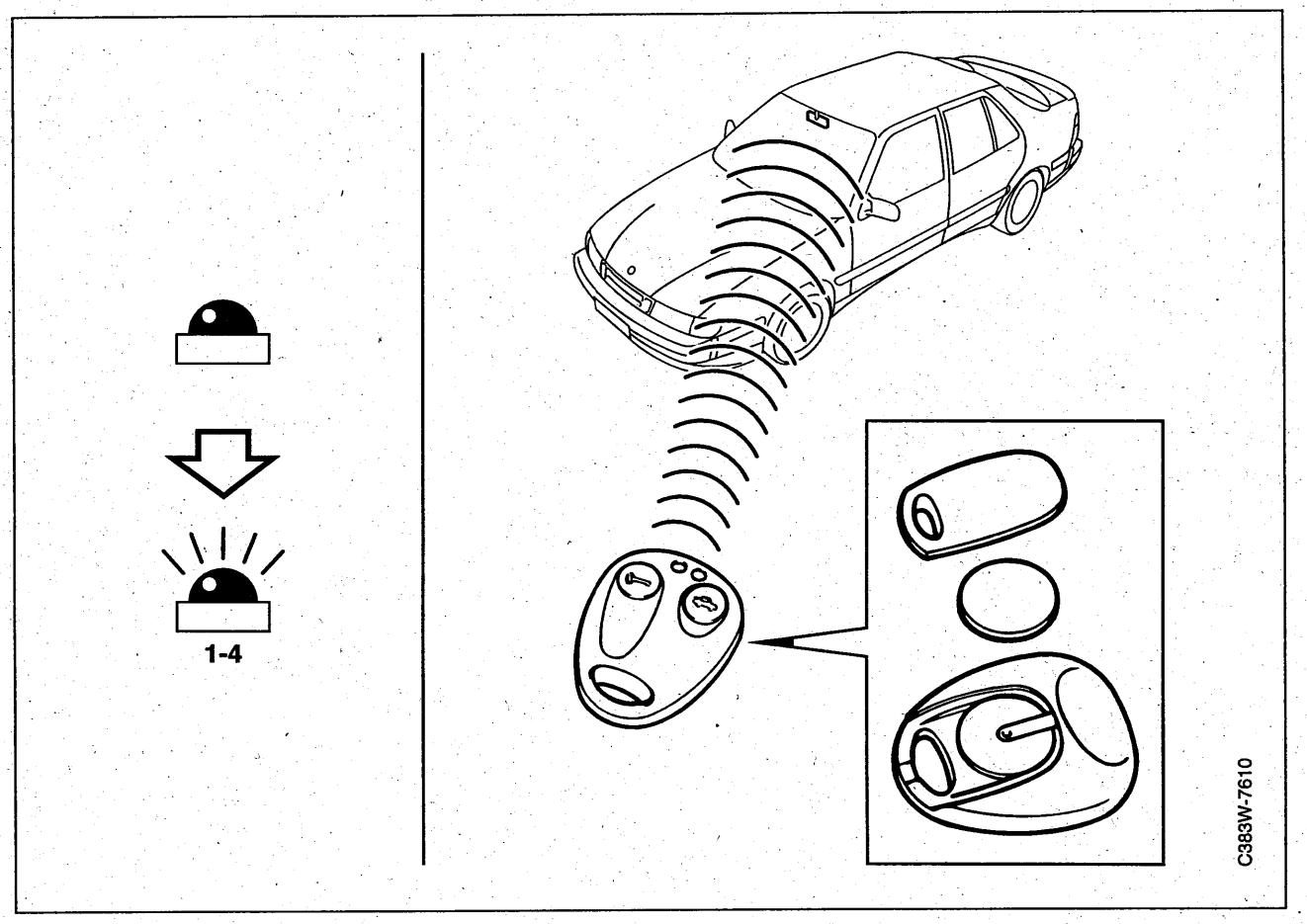
For remote control of the anti-theft alarm, an aerial is mounted next to or integral with the interior rear-view mirror. This is connected to the electronic control module (pin 1 for signal and pin 14 for ground). Point the remote control unit at the aerial, the normal range is about 8 metres but under favourable conditions may be much longer. (On account of legal requirements, the remote control unit for JA is equipped with a weaker transmitter so that it will have a shorter range.) The remote control unit is of RF (Radio Frequency) type.

The remote control unit transmits an identification code (each remote control unit has its own code) and a "rolling code" which changes every time the button is pressed. If the code is valid the electronic control module executes the command.

There are two buttons on the remote control for remote control of the alarm:

- **The left-hand button** is for locking and unlocking the central locking system and arming/disarming the anti-theft alarm. For an anti-theft alarm with VSS, the button also disarms a self-immobilized car.
- **The right-hand button** is for unlocking the tailgate and disarming it if the alarm is armed.

Description of operation, remote control unit (contd.)



Changing the battery

The remote control is powered by two batteries which should last for about 2 years of normal use. The batteries should be changed when the range of the remote control gets shorter.
For safety reasons, it is recommended that the batteries are changed every year.

Important

After the batteries have been changed, the left-hand button on the remote control must be pressed five times in a row.

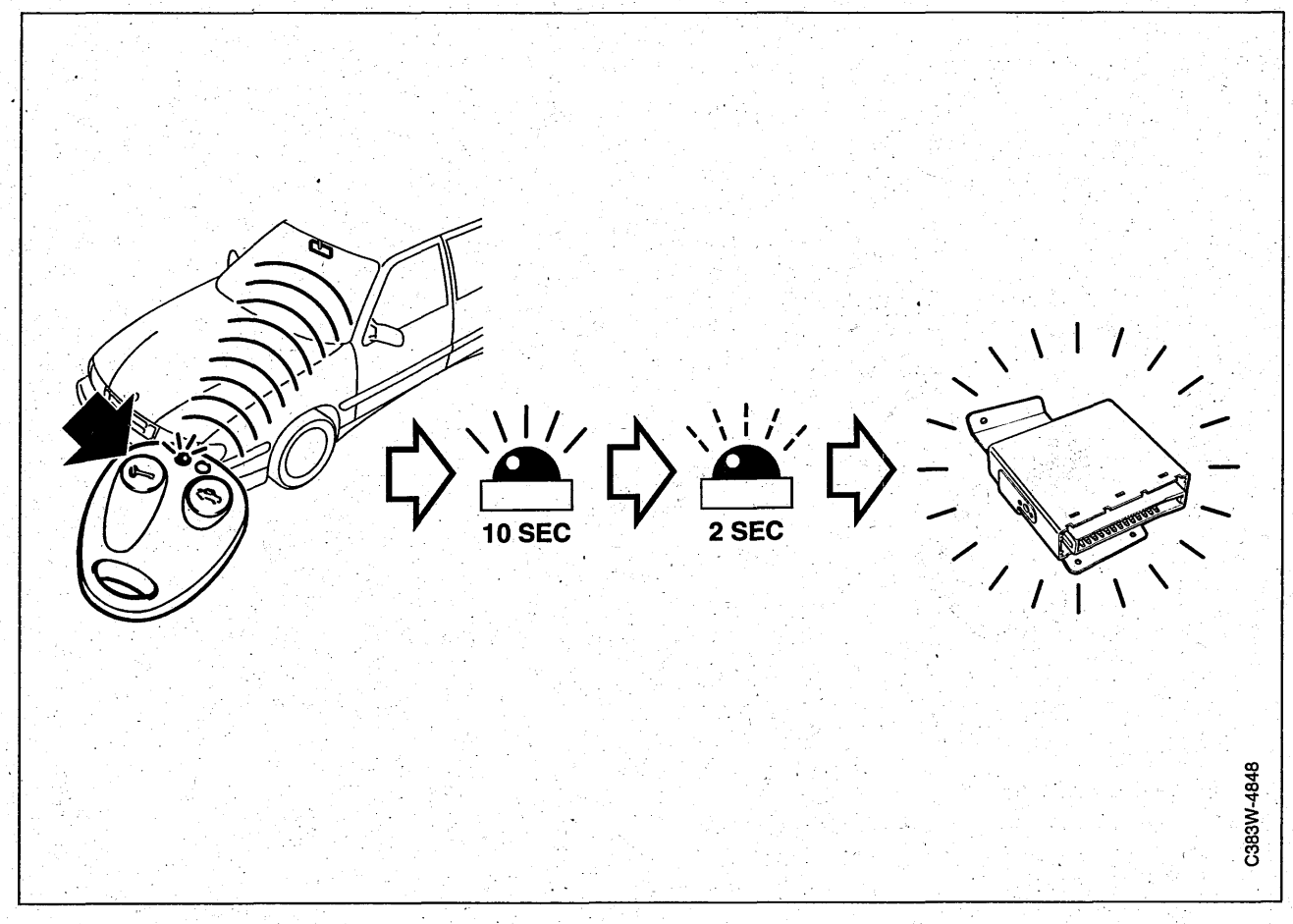
New remote control

If the remote control unit has been misplaced and a new one has been obtained, it must first be programmed (coded) to match the anti-theft alarm before it can be used. See the "Programming and adjusting" section for details of the type of alarm in question.

Check the number of programmed remote control units (Anti-theft alarm with VSS)

With the ignition switched ON, the number of programmed remote control units can be checked by pressing the right-hand button on the unit. The LED will flash once for each programmed remote control unit.

Description of operation, remote control unit (contd.)



Arming the anti-theft alarm

1 When arming, press the left-hand button on the remote control. When the button is pressed, a light confirmation is given by the car's direction indicators flashing once. The flash/light confirmation for this function is programmable.

2 The car's anti-theft alarm is then armed and all doors are locked by the central locking system which has received a signal from the alarm control module (pin 17). The tailgate is also armed if it is closed.

3 When the alarm is armed, the LED lights continuously for 10 seconds. During this so-called delay period, the alarm is not armed and the passenger doors (not the driver's door), the tailgate or the bonnet can be open without the alarm being set off.

4 If the driver's door is opened during the delay period, the anti-theft alarm will be disarmed automatically. At the end of the delay period the LED will start flashing at the rate of 1 flash every 2 seconds, which indicates that the alarm is armed.

Important

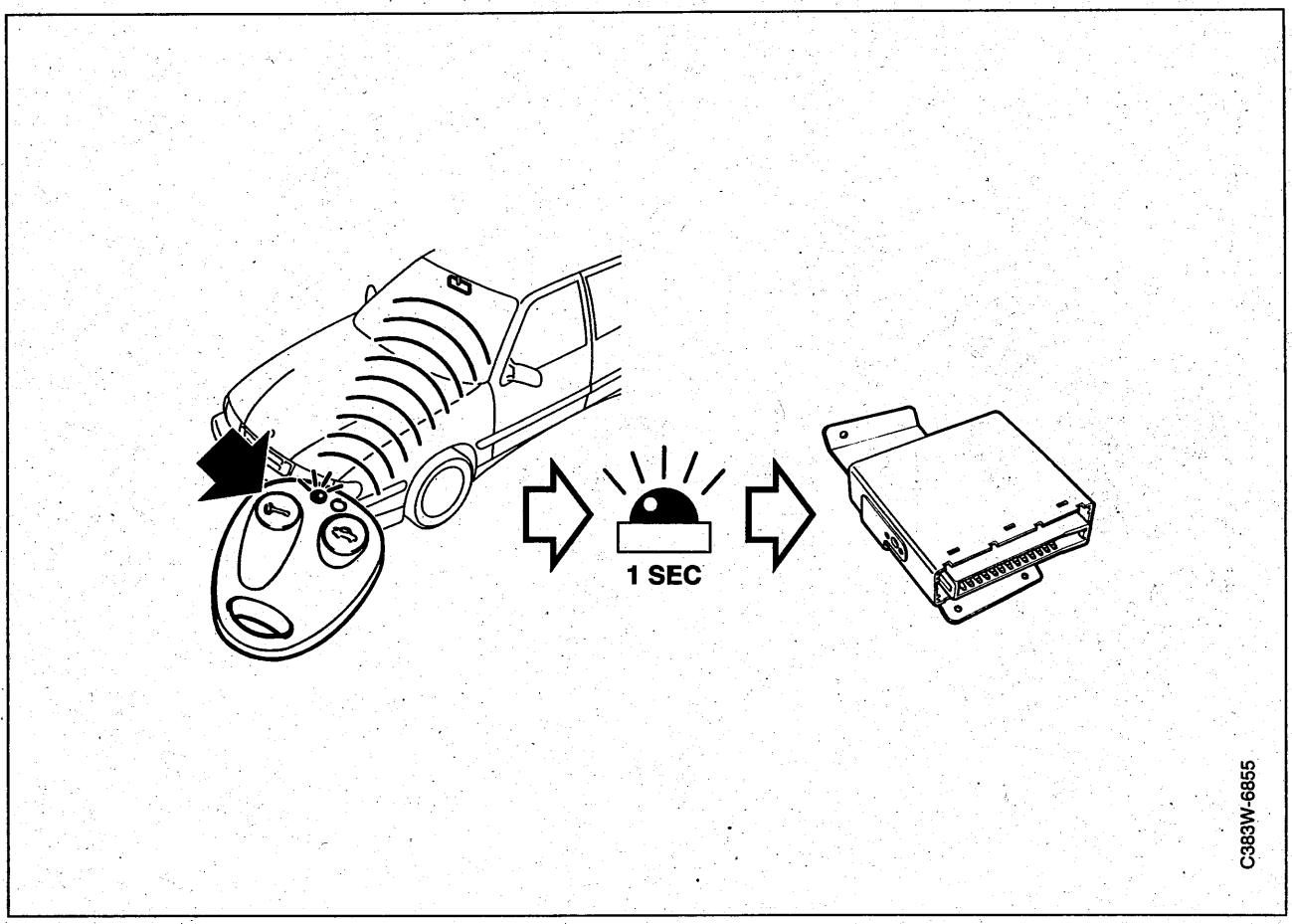
Anti-Theft Alarm

If the driver's door is open or the ignition switched on, it will not be possible to lock or unlock the car nor arm or disarm the alarm by means of the remote control unit.

Anti-theft alarm with VSS

If the driver's door is open or the ignition switched on, it will not be possible to arm the alarm nor lock or unlock the car. On the other hand, the alarm can always be disarmed if a door is open.

Description of operation, remote control unit (contd.)



Disarming the theft alarm

1 When disarming, press the left-hand button on the remote control. When the button is pressed, a light confirmation is given by the car's direction indicators flashing 3 times (if the alarm has been set off during the time it was armed, it flashes 5 times). The flash/sound confirmation of this function is programmable.

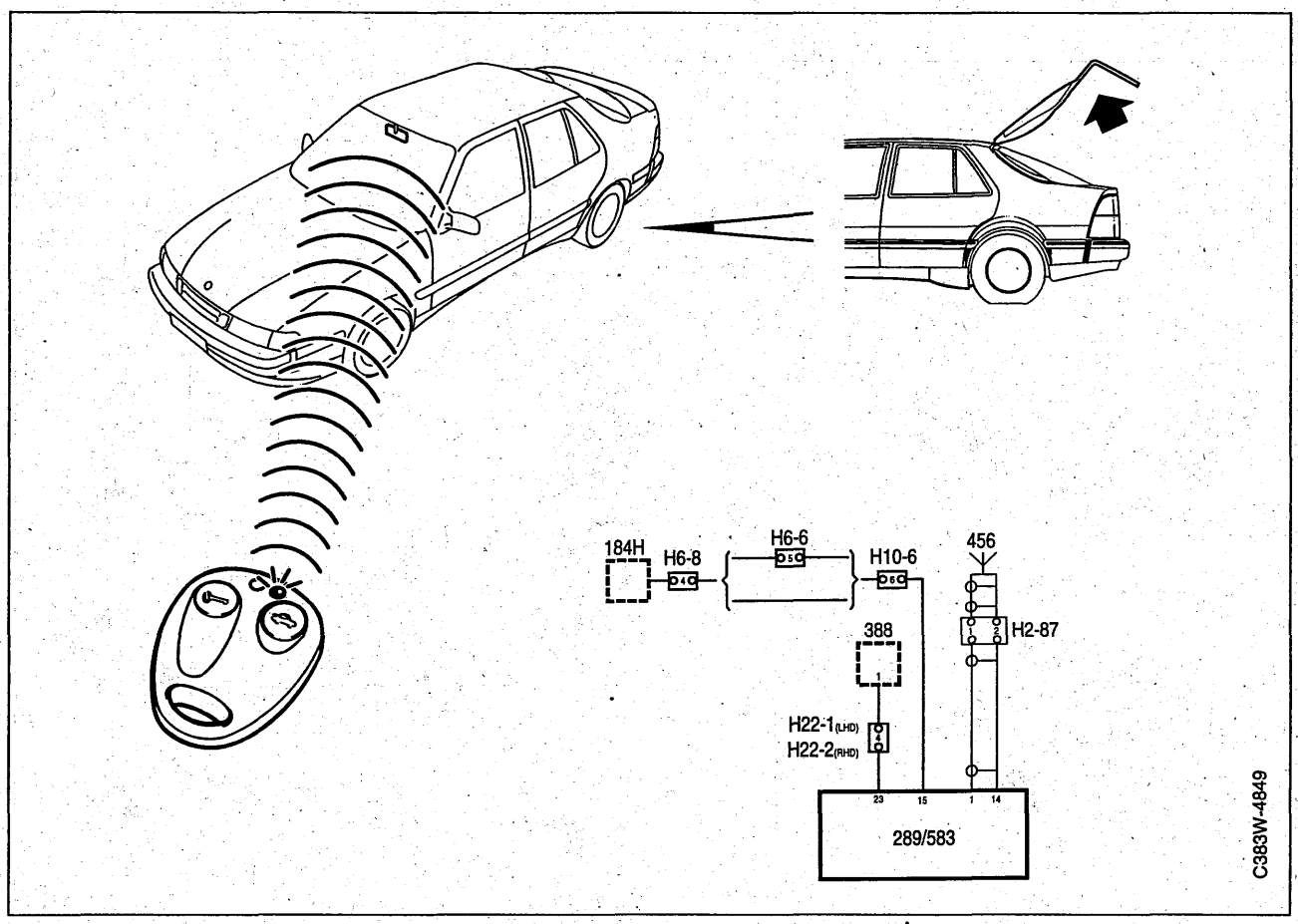
2 The car's anti-theft alarm is then disarmed and all doors (except the tailgate) are unlocked by the central locking system which receives the unlock signal from the alarm control module (pin 6).

3 When the alarm is disarmed, the LED lights for 1 second and then goes out.

Important

It is not possible to arm or disarm a VSS anti-theft alarm by means of the car key. If a door is opened with the key while the alarm is armed, it will be set off.

Description of operation, remote control unit (contd.)



Disarming/unlocking the tailgate

1 Disarming and unlocking the tailgate independently is achieved by pressing the right-hand button on the remote control. Arming of the rest of the alarm is not affected. Flash/buzz confirmation of this function is programmable.

2 If the alarm was armed, the tailgate is then excepted from the alarm. If the rest of the alarm is armed and disarming/unlocking takes place after the delay period, the LED flashes 1 flash/2 seconds. The tailgate is unlocked with a signal from the control module (pin 23).

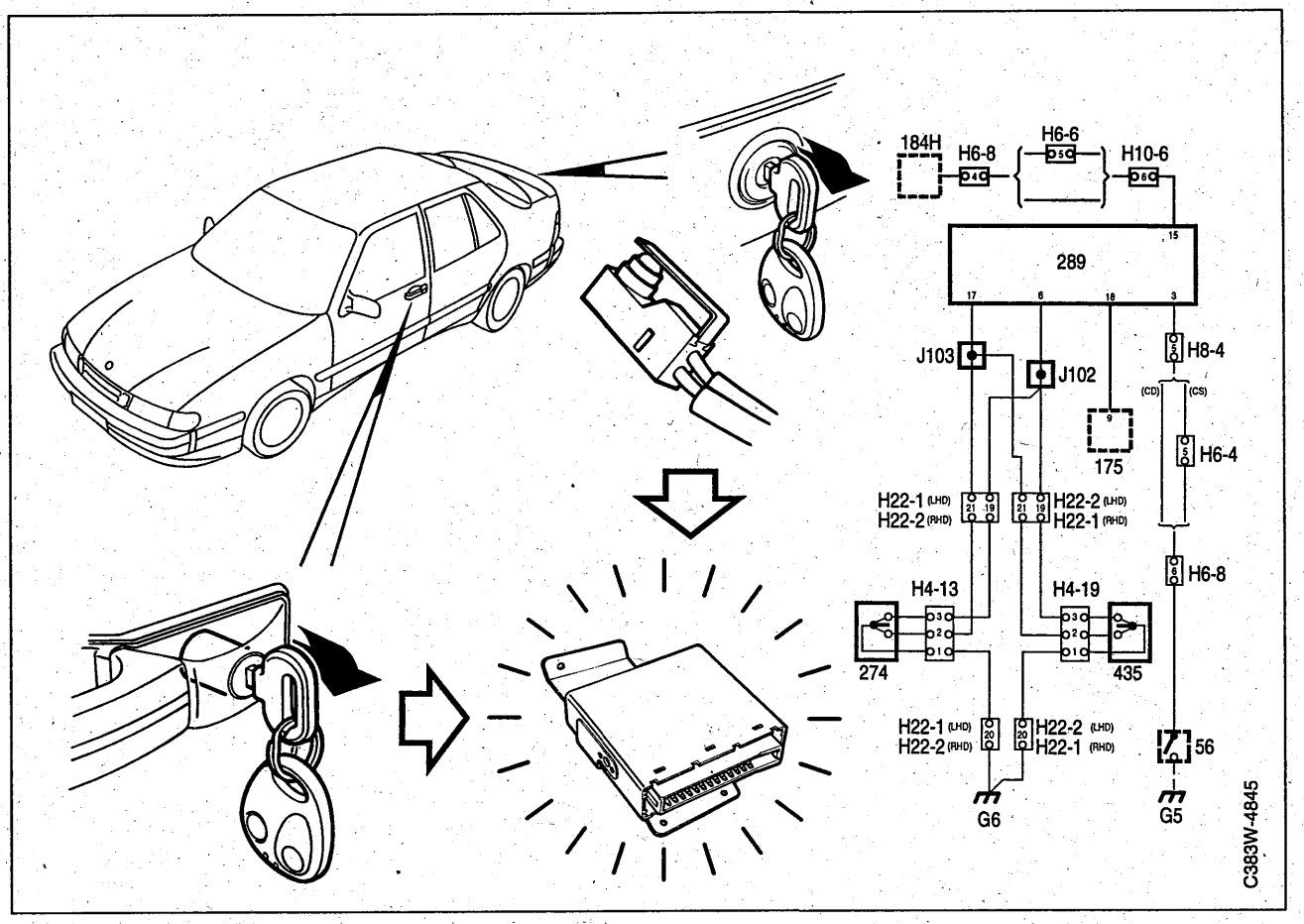
3 When the tailgate is closed, a new delay period for the tailgate starts (10 seconds). The alarm is then once again armed if the rest of the alarm system was armed.

Important

It is not possible to open the tailgate using the remote control if the ignition is on. On the other hand, this can be achieved with special programming.

The tailgate cannot be disarmed with the car key if the car is equipped with a VSS anti-theft alarm system. If the tailgate is opened with the car key when the alarm is armed, the alarm will be set off.

Description of operation, manual control with car key, Anti-theft alarm



With the car key in the door lock

The anti-theft alarm can be armed and disarmed manually by inserting the car key in the door lock. This function can be cancelled by programming, however, for those markets that so require.

Arming the anti-theft alarm

1 When arming using the car key, this is inserted into the lock in the door and turned 45 degrees to the locked position.

2 A microswitch beside the door's lock cylinder sends a locking signal to the central locking system control module and a signal to the alarm control module (pin 17) to arm the alarm. The car doors are locked.

Disarming the theft alarm

1 When disarming using the car key, this is inserted into the door lock and turned 45 degrees to the unlocked position.

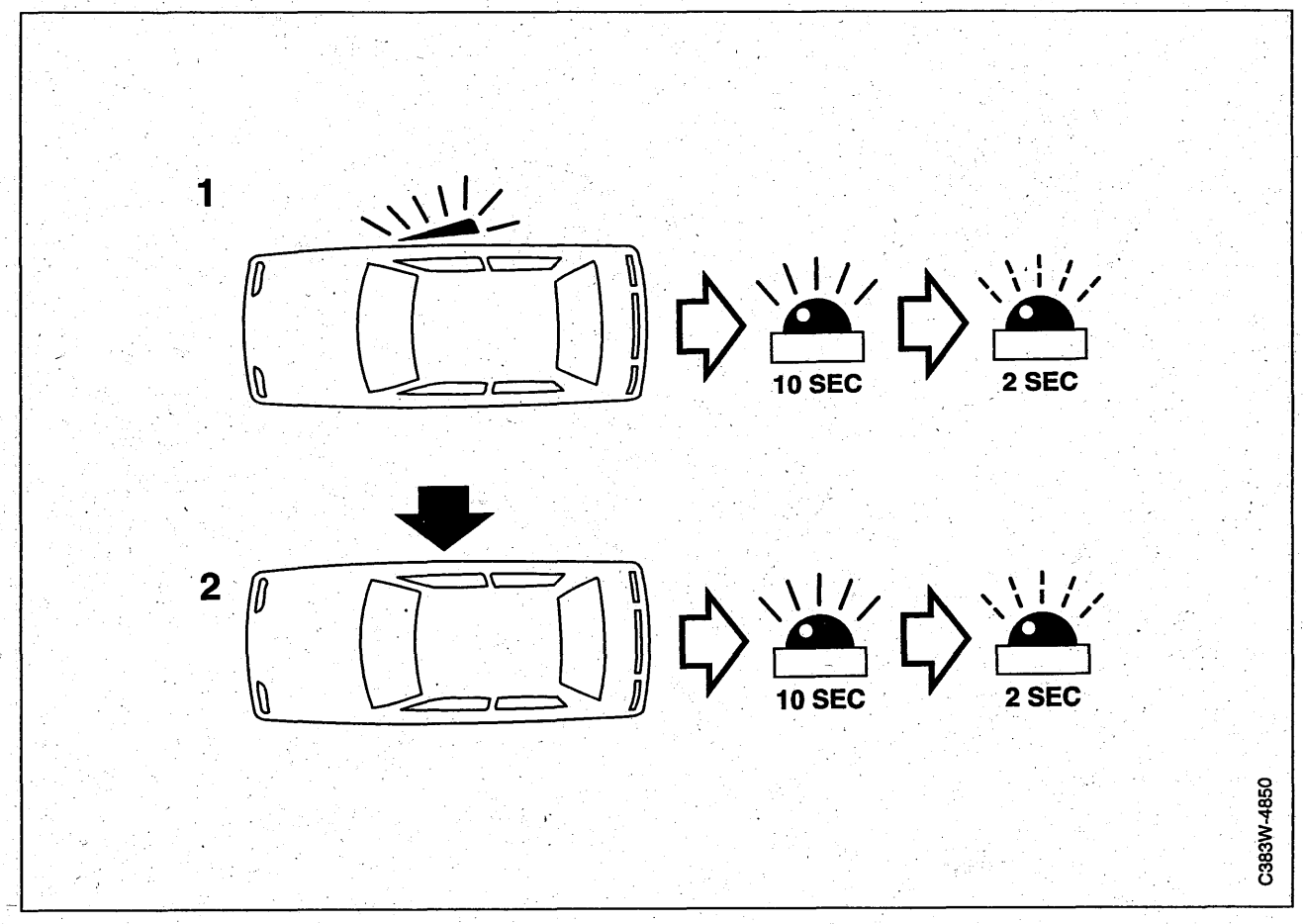
2 The microswitch by the door lock cylinder sends an unlock signal to the central locking system control module and a signal to the alarm control module (pin 6) to disarm the alarm. The car doors are unlocked.

Disarming the tailgate

1 The tailgate alone can be disarmed and unlocked by means of the car key after special programming. The rest of the alarm system remains unaffected. The flash/buzz acknowledgement of this function is programmable.

2 The microswitch in the luggage compartment lock applies a voltage to the luggage compartment lock motor so that it unlocks the tailgate and sends a signal to the alarm control module (pin 15) to disarm the alarm.

Description of operation, special arming/disarming cases



The theft alarm normally functions according to the instructions on the previous pages, but if for instance a passenger door were open when the alarm was armed, or be opened during the delay period, the following happens:

Doors (except driver's door), bonnet and tailgate

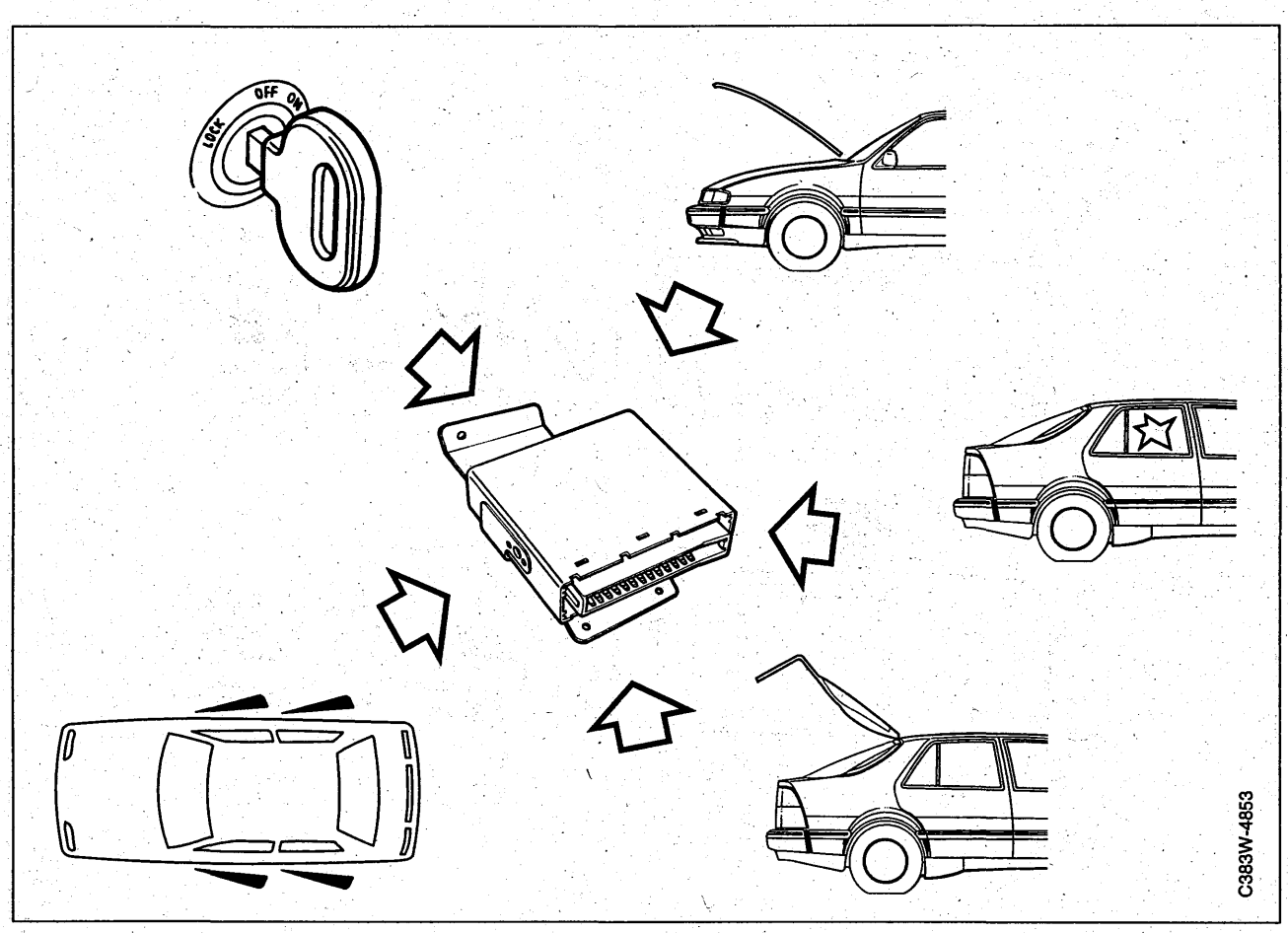
1 Door, bonnet or tailgate are open or are opened during the delay period when arming is taking place:

- The LED flashes (1 flash/second) for 10 seconds and then goes over to normal indication for armed alarm (1 flash/2 sec).
- The door, the bonnet or the tailgate is then excepted from the alarm monitoring.

2 Door, bonnet or tailgate are closed while the alarm is armed:

- The LED goes over from flashing to being lit continuously for 10 seconds, i.e. a new delay period solely for the door, bonnet or tailgate which has been closed.
- After the delay period, the door/bonnet or tailgate is again monitored by the alarm. The LED returns to normal indication for armed alarm (1 flash/2 seconds).

Description of operation, actuation of alarm



When the alarm is armed, it is set off if alarm data is received by the control module on the following connections:

- The door switch is grounded (pin 4).
- The bonnet switch is grounded (pin 16)
- The luggage compartment switch is grounded (pin 3).
- Signal from the glass breakage sensor (pin 7)
- Signal from the sensor's disconnecting button (pin 7)
- Connecting or bypassing the ignition switch, "ON" position (+15) on the ignition switch (pin 10).

When the alarm is set off, the horn sounds for 30 seconds and the direction indicators flash for 5 minutes.

Anti-theft alarm
The starter motor and fuel pump relays, and the engine management system's +15 circuit are blocked for 30 minutes. Each fresh attempt to start extends the blocking time by 30 minutes. If the ignition is switched on, blocking will continue as long as the alarm is armed.

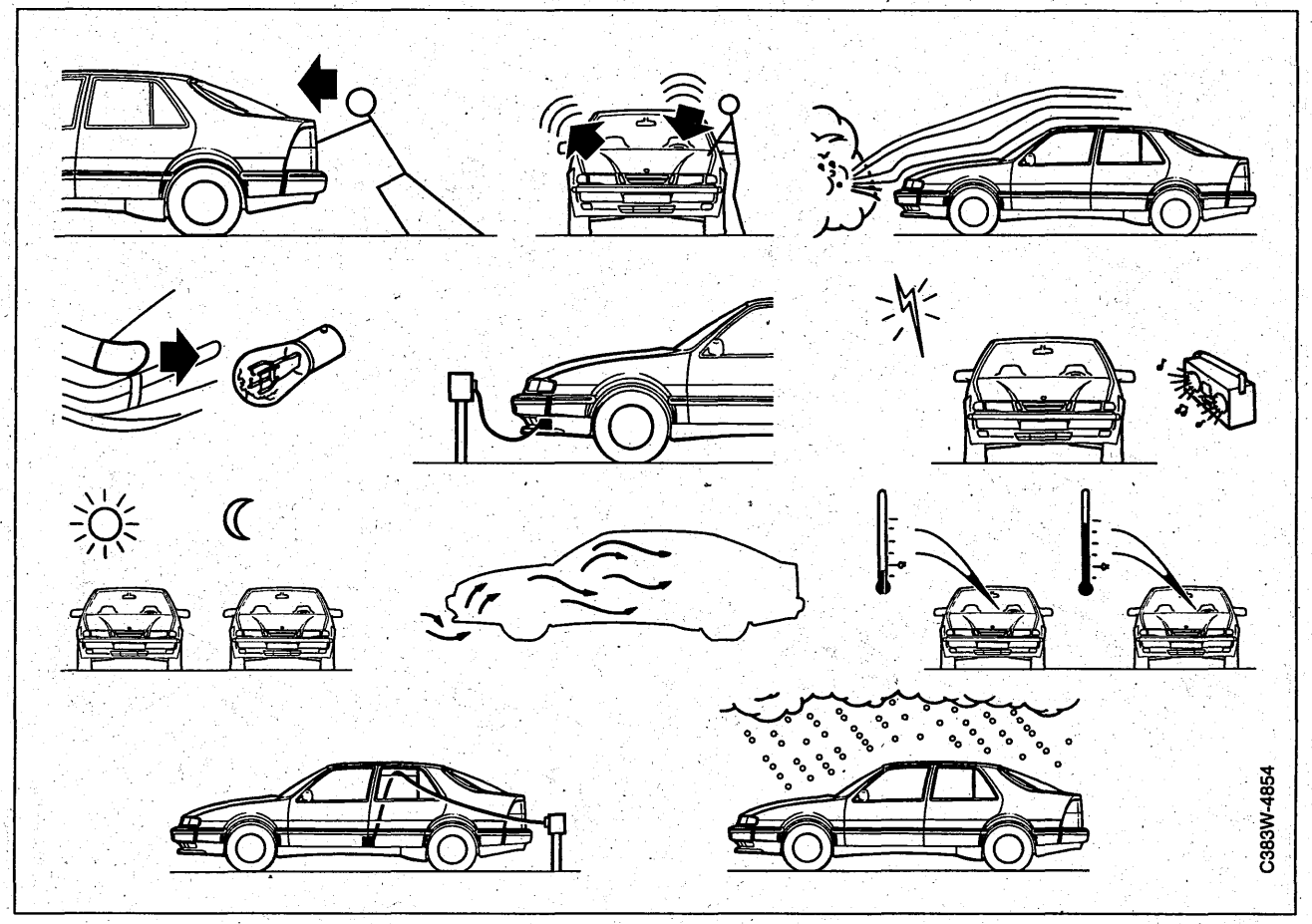
Anti-theft alarm with VSS
The engine management system prevents the engine from being started.

To turn off an actuated alarm, disarm it in the usual manner by means of the remote control unit or the car key (Anti-theft alarm).

Important

This type of alarm tripping is standard (at delivery). Flash and sound times can be reprogrammed as required by the local market.

Description of operation, false alarm



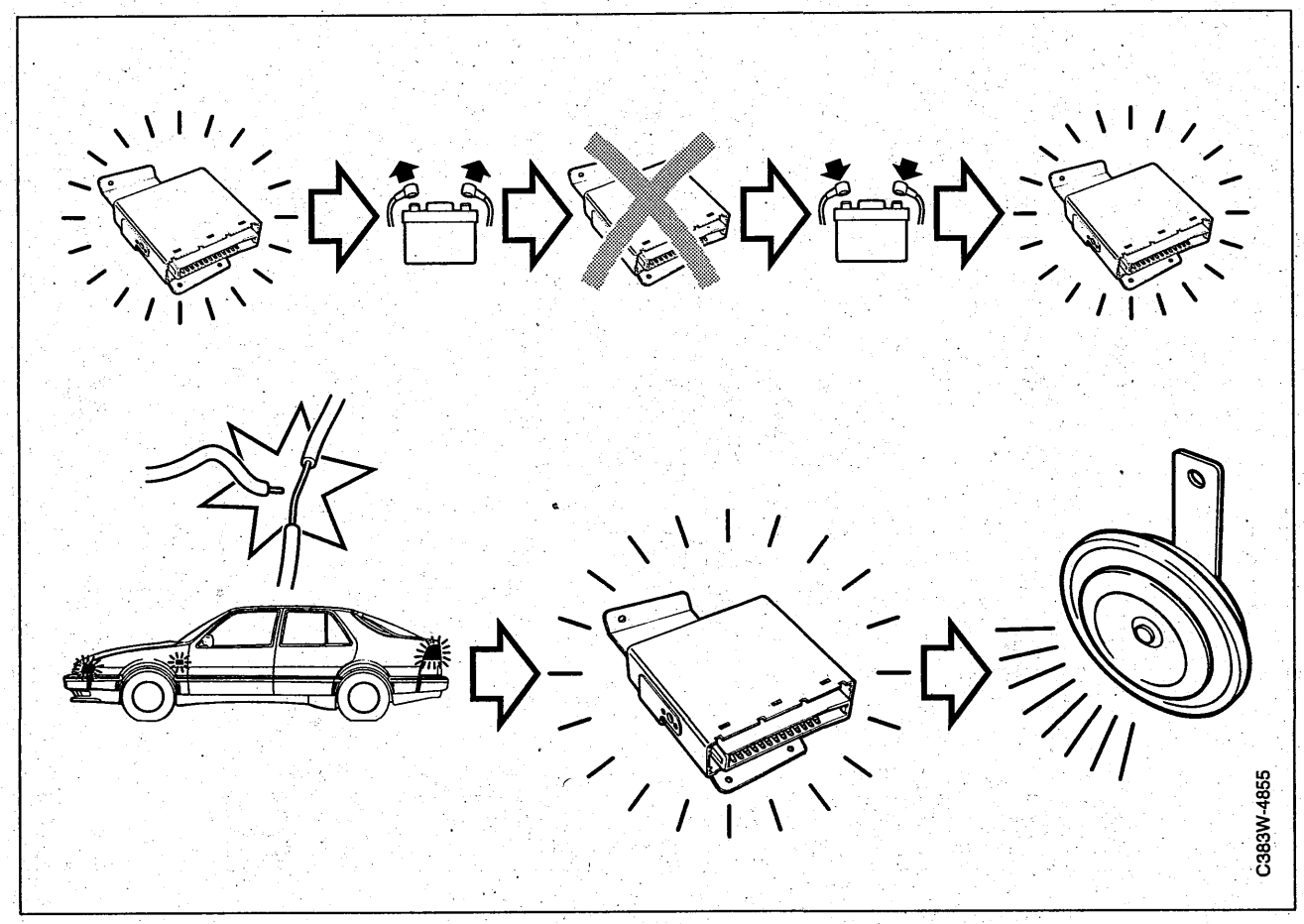
The armed alarm is proof against the following:

- Jolting the car.
- Shaking or rocking the car.
- Wind (external pressure waves)
- Automatic switching on and off of other electrical equipment in the car.
- External noise.
- Changes in the internal/external light intensity.
- Air flow and turbulence inside the car.
- Temperature changes inside the car.
- Fan noise from original/extra heaters inside the car.
- Outside noise propagated through the body to the inside of the car (e.g. rain and hail).

Important

This is the case provided that all doors/sunroof/windows in the cabin are closed.

Description of operation, reliability



Operating voltage drop (+30 circuit) for armed alarm

If battery positive voltage drops, for instance due to disconnection or discharge of the battery when the alarm is armed, the alarm is no longer armed. When the voltage returns to normal, the alarm is once again armed as it was before disconnection.

Operating voltage drop (+30 circuit) for alarm not armed (Anti-theft alarm with VSS)

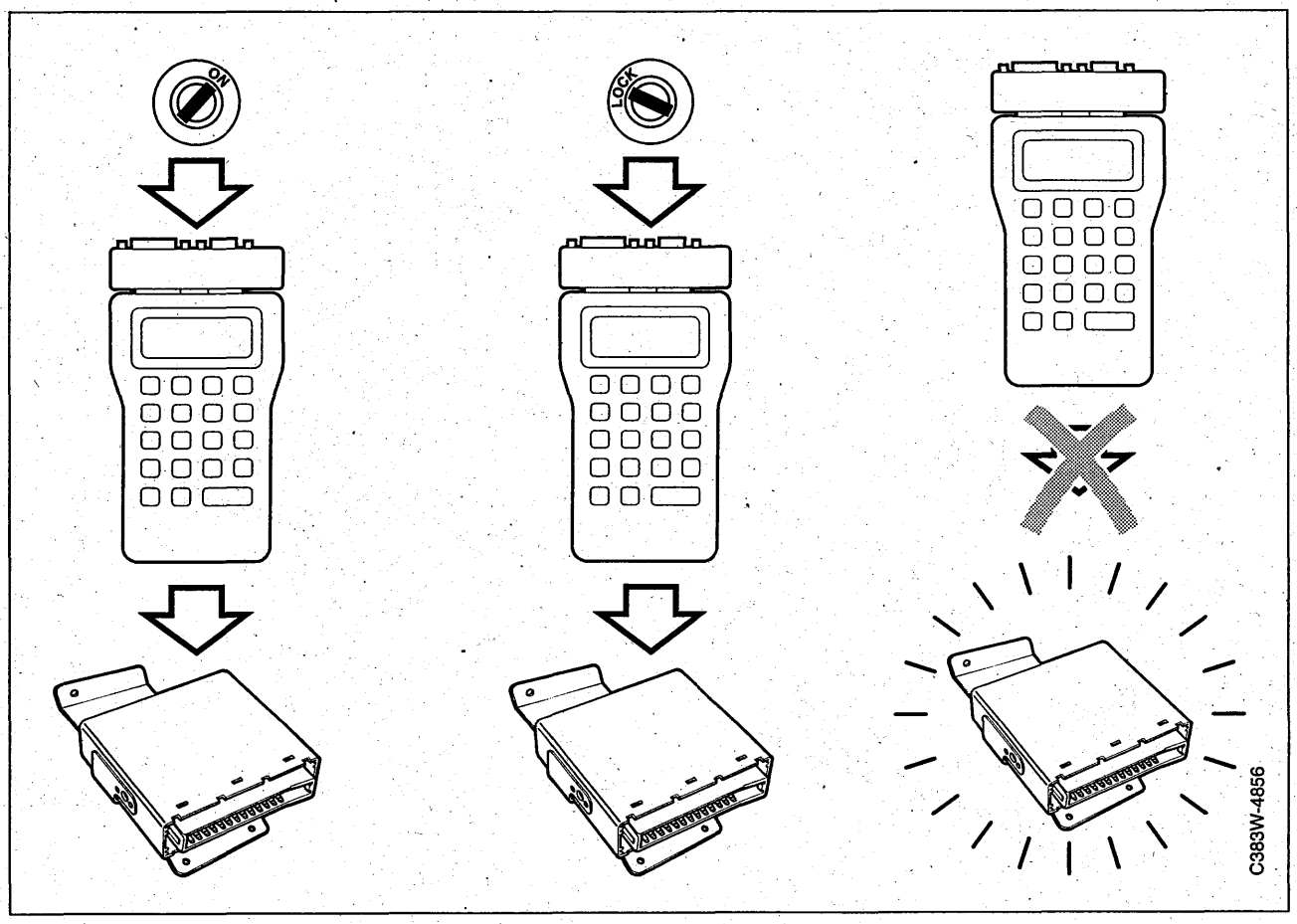
If battery voltage fails when the alarm is not armed, the car will be immobilized when battery voltage is restored.
This immobilizing can be disarmed by pressing any of the remote control unit's buttons 5 times.

Short-circuit protection for direction indicators

The anti-theft alarm control module can detect a short circuit in any of the direction indicator circuits.

If there is a short circuit, the alarm is set off with sound only and the direction indicator signals are not activated.

Description of operation, scan tool diagnostics

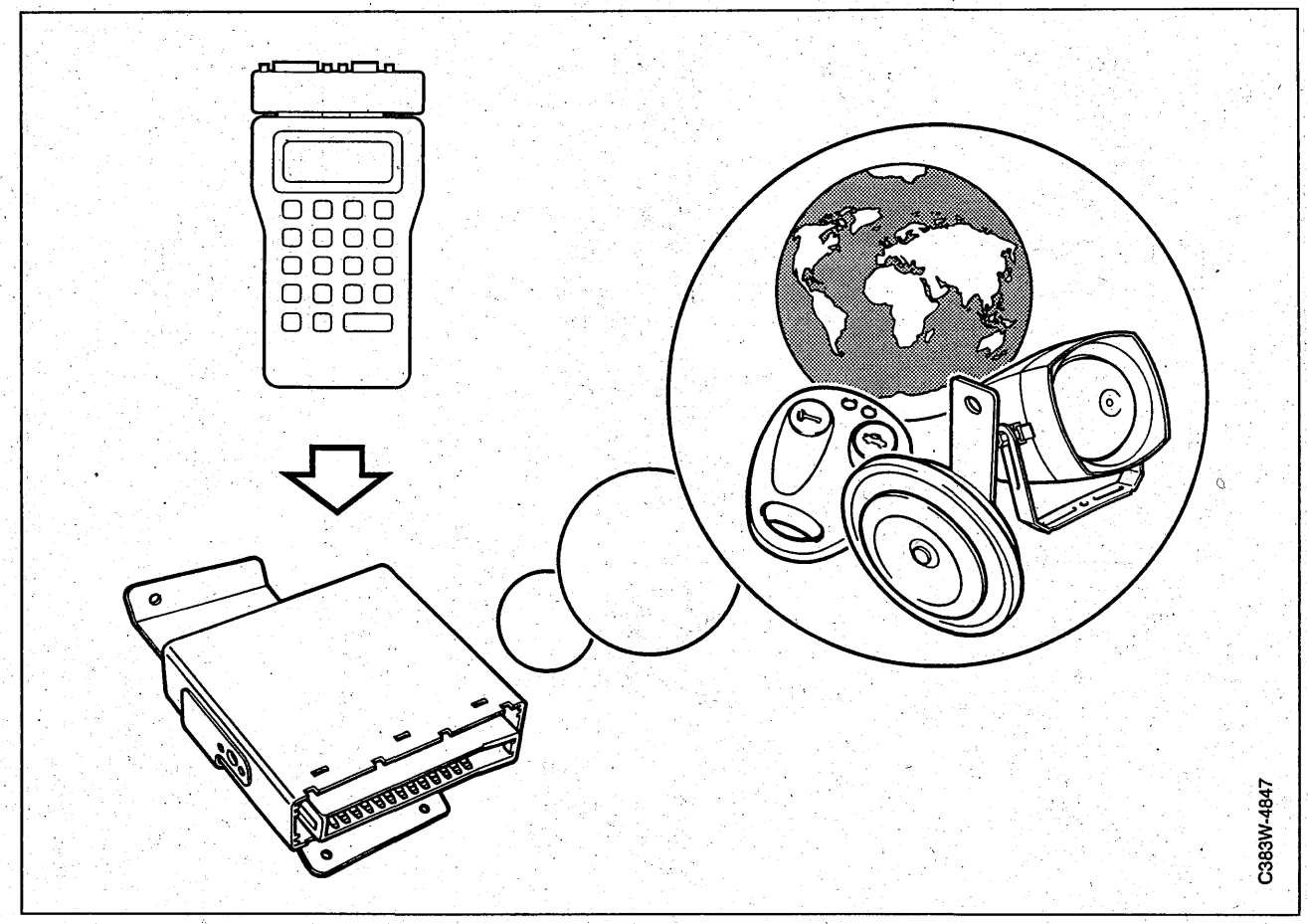


The anti-theft alarm control module communicates with the ISAT scan tool via pin 19. Communication is two-way and as such consists of both input and output signals.

The ISAT scan tool can communicate with the theft alarm when the ignition is in the "ON" position (+15), but communication normally takes place with the ignition "OFF".

Communication between the ISAT scan tool and the anti-theft alarm is **not possible** if the alarm is armed.

Description of operation, programming, Anti-theft alarm

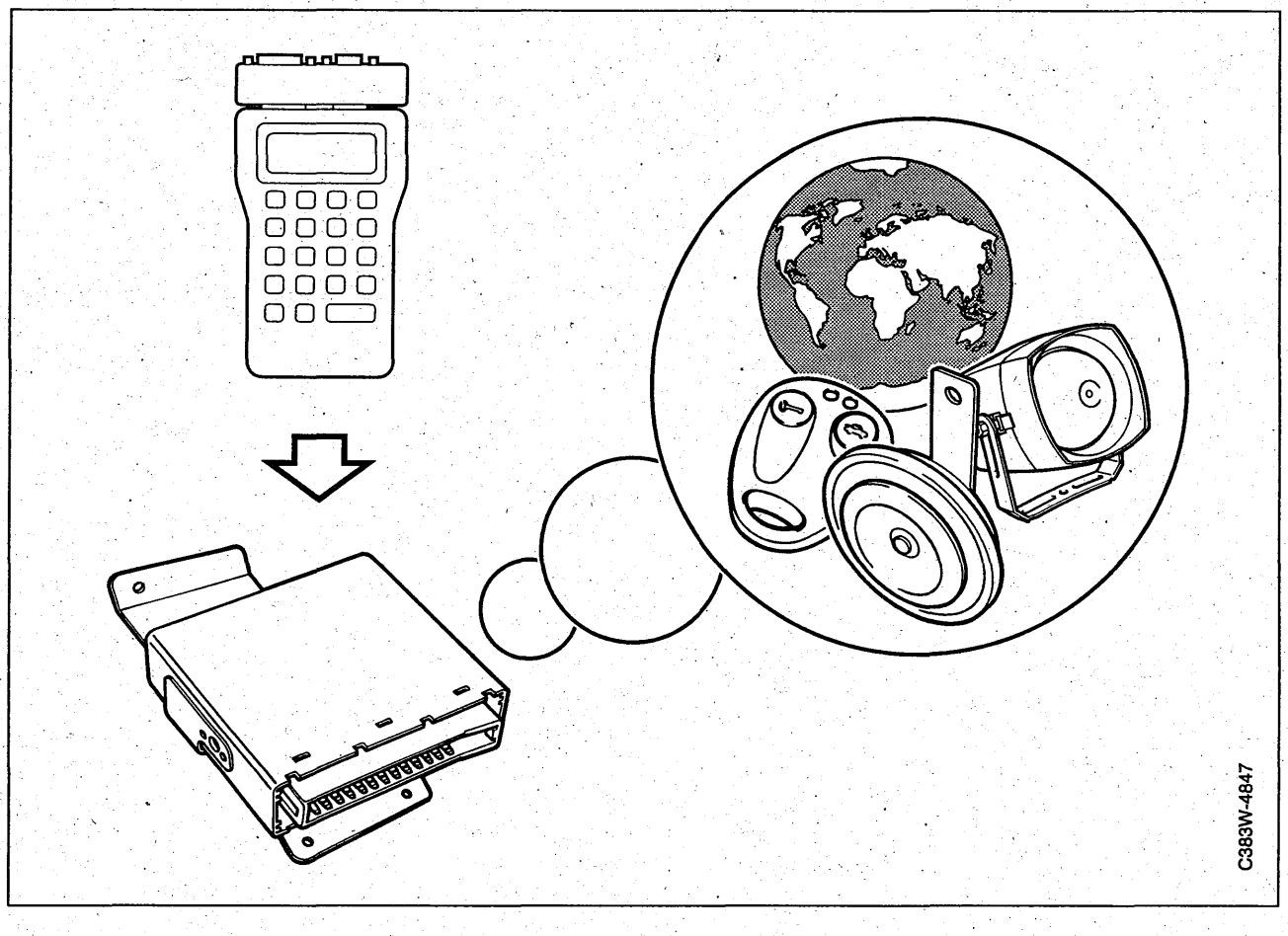


Programming options

- Country-adapted alarm signal/personalized option for alarm signal.
- Coding of remote control units (max. 4)
- Self-arming. (+15 off, +15 off door closed, off and time)
- Self-immobilizing. (On/off and time)
- Flash/buzz confirmation for remote control (Original value/adjustment)
- Flash/buzz confirmation, adjusting (Time)
- Arming/disarming with the car key. (On/off)
- Programming for siren. (On/off)
- Tailgate opening with ignition "ON" (+15). (On/off)
- Sound adjustment (Sound characteristics)

For more detailed information on programming options, see the relevant "Programming" section.

Description of operation, programming, Anti-theft alarm with VSS



Programming options

- Country-adapted alarm signal/personalized option for alarm signal.
- Coding of remote control units (max. 4)
- Self-arming. (+15 off, +15 off door closed, off)
- Self-immobilizing. (Time before activation)
- Flash/buzz confirmation for remote control (Original value/adjustment)
- Flash/buzz confirmation, adjusting (Time)
- Programming for siren. (On/off)
- Tailgate opening with ignition "ON" (+15). (On/off)
- Sound adjustment (Sound characteristics)

For more detailed information on programming options, see the relevant "Programming" section.

Fault diagnosis

ISAT menu structure, Anti-theft alarm

ANTI-THEFT ALARM

- READ FAULT CODES
- READ VALUES
- ACTIVATE
- PROGRAMMING
- ADJUSTMENT
- READ SYSTEM INFO
- CLEAR FAULT CODES
- END

READ VALUES

- LAST ALARM CAUSE
- LOCK SIGNAL
- UNLOCK SIGNAL
- PICTOGRAM SWITCH
- IGNITION +15
- TAILGATE SWITCH
- TAILGATE LOCK
- BONNET
- DOORS
- GLASS BRK SENS BUT +30
- GLASS BREAK SENSOR
- REMOTE CONTROL

ACTIVATE

- START DETENT
- HORN
- FLASHERS
- LED
- TAILGATE
- LOCK SIGNAL
- UNLOCK SIGNAL

ADJUSTMENT

- FLASH/SOUND
- LUGGAGE AT +15
- SOUND DURATION

PROGRAMMING

- COUNTRY CODE
- REMOTE CONTROL
- SELF-ARMING
- SELF-IMMOBILIZING
- FLASH/SOUND
- LOCK DEACTIVATION
- DISENGAGE BOOT
- SIREN

READ SYSTEM INFO

- SAAB PART NUMBER
- SOFTWARE VERSION
- COUNTRY CODE
- DATE OF MANUFACT

ISAT menu structure, Anti-theft alarm with VSS

READ VALUES

- LAST ALARM CAUSE
- LOCK SIGNAL
- UNLOCK SIGNAL
- PICTOGRAM SWITCH
- IGNITION +15
- TAILGATE SWITCH
- TAILGATE LOCK
- BONNET
- DOORS
- GLASS BRK SENS BUT +30
- GLASS BREAK SENSOR
- REMOTE CONTROL
- ALARM CODE

PROGRAMMING

- COUNTRY CODE
- REMOTE CONTROL
- SELF-ARMING
- SELF-IMMOBILIZING
- FLASH/SOUND
- SIREN

IMMOBILIZING

- SELECT CAR'S ENGINE MANAGEMENT SYSTEM
- TRIONIC
- MOTRONIC 2.8.1
- MOTRONIC 2.10.3

ANTI-THEFT ALARM

- **READ FAULT CODES**
- **READ VALUES**
- **ACTIVATE**
- **PROGRAMMING**
- **ADJUSTMENT**
- **IMMOBILIZING**
- **READ SYSTEM INFO**
- **CLEAR FAULT CODES**
- **END**

ACTIVATE

- HORN
- FLASHERS
- LED
- TAILGATE
- LOCK SIGNAL
- UNLOCK SIGNAL

ADJUSTMENT

- FLASH/SOUND
- LUGGAGE AT +15
- SOUND DURATION

READ SYSTEM INFO

- SAAB PART NUMBER
- SOFTWARE VERSION
- COUNTRY CODE
- DATE OF MANUFACT

Command menu "READ VALUES"

ISAT scan tool command	Function	ISAT scan tool display
LAST ALARM CAUSE	Shows the 9 last alarm causes. There are 6 possible alarm causes: 1. tailgate 2. Bonnet 3. Pictogram switch 4. Passenger doors 5. Glass breakage sensor 6. Ignition The ISAT scan tool display will be cleared if the "CLEAR FAULT CODES" command is entered.	1. TAILGATE 2. BONNET 3. PICTOGRAM SWITCH 4. PASSENGER DOORS 5. GLASS BREAK SENSOR 6. IGNITION 9. ----
LOCK SIGNAL	Shows "ACTIVE" when the door receives a lock signal, otherwise shows "NOT ACTIVE".	ACTIVE NOT ACTIVE
UNLOCK SIGNAL	Shows "ACTIVE" when the door receives an unlock signal, otherwise shows "NOT ACTIVE".	ACTIVE NOT ACTIVE
PICTOGRAM SWITCH	Shows whether driver's door is open or closed. Shows pictogram switch status.	OPEN CLOSED
IGNITION +15	Shows whether ignition is on or off.	ON OFF
TAILGATE SWITCH	Shows whether tailgate is open or closed.	OPEN CLOSED
TAILGATE LOCK	Shows whether tailgate is locked or unlocked.	OPEN CLOSED
BONNET	Shows whether bonnet is open or closed.	OPEN CLOSED
DOORS	Shows whether any passenger door is open or closed.	OPEN CLOSED
GLASS BRK SENS BUT	Shows whether the button has disconnected the glass breakage sensor.	ON OFF
+30	Shows the condition of the battery. "LOW" = less than 9 V "OK" = more than 9 V	ON OFF
GLASS BREAK SENSOR	Shows the glass breakage sensor reading.	0 - 255
REMOTE CONTROL	Shows which button has been pressed on the remote control, even if the remote control has not been programmed.	NO BUTTON LH BUTTON RH BUTTON
ALARM CODE	Shows the status of the alarm code generated by the engine management system.	CORRECT FAULTY ABSENT

Command menu "ACTIVATE"

ISAT scan tool command	Function	ISAT scan tool display
START DETENT	"ON" activates the starter motor interlock. Otherwise it shows whether the anti-theft alarm's electronic control module output is active or not.	ON OFF
HORN	"ON" activates the horn. Otherwise it shows whether the anti-theft alarm's electronic control module output is active or not.	ON OFF
FLASHERS	"ON" activates the direction indicators. Otherwise it shows whether the anti-theft alarm's electronic control module output is active or not.	ON OFF
LED	"ON" activates the LED. Otherwise it shows whether the anti-theft alarm's electronic control module output is active or not.	ON OFF
TAILGATE	"ON" activates unlocking of the tailgate. Otherwise it shows whether the anti-theft alarm's electronic control module output is active or not.	ON OFF
LOCK SIGNAL	"ON" activates locking of the doors by the central locking system. Otherwise it shows whether the anti-theft alarm's electronic control module output is active or not.	ON OFF
UNLOCK SIGNAL	"ON" activates unlocking of the doors by the central locking system. Otherwise it shows whether the anti-theft alarm's electronic control module output is active or not.	ON OFF

Command menu "PROGRAMMING"

ISAT scan tool command	Function	ISAT scan tool display
COUNTRY CODE	For selecting a country-specific or personal alternative for alarm triggering and selecting a siren with battery back-up.	GERMANY GREAT BRITAIN SWITZERLAND HOLLAND OWN ALTERNATIVE SIREN
REMOTE CONTROL	For programming and deprogramming one or more (max. 4) remote control units for the car.	
	ANTI-THEFT ALARM	
	"PROGRAMMING" for programming a remote control unit.	PROGRAMMING
	"DEPROGRAMMING" for deprogramming a remote control unit.	DEPROGRAMMING
	"DEPROGRAM ALL" for simultaneously deprogramming all remote control units.	DEPROGRAM ALL
	ANTI-THEFT ALARM with VSS	
	"PROGRAMMING" for programming all remote control units.	PROGRAMMING
	"DEPROGRAM ALL" for simultaneously deprogramming all remote control units.	DEPROGRAM ALL
SELF-ARMING	For selecting the self-arming function.	
	"OFF" for cancelling the function.	OFF
	"AT +15 OFF" when the function is to be connected.	AT +15 OFF
	"+15 OFF, DOOR CLOSED" when the function is to be connected.	+15 OFF, DOOR CLOSED
	"TIME BEFORE ACTIV." for selecting the delay before self-arming.	TIME BEFORE ACTIV.
	"ACTIVATION TIME" for selecting the length of time the function is to be activated.	ACTIVATION TIME
SELF-IMMOBILIZING	For selecting the self-immobilizing function.	
	ANTI-THEFT ALARM	
	"ON" for selecting the function.	ON
	"OFF" for cancelling the function.	OFF
	"TIME BEFORE ACTIV." for selecting the delay before self-immobilizing.	TIME BEFORE ACTIV.
	"ACTIVATION TIME" for selecting the length of time the function is to be activated.	ACTIVATION TIME
	ANTI-THEFT ALARM with VSS	
	"TIME BEFORE ACTIV." for selecting the delay before self-immobilizing.	TIME BEFORE ACTIV.

Command menu "PROGRAMMING" (contd.)

ISAT scan tool command	Function	ISAT scan tool display
FLASH/SOUND	Enables selection of the desired flash/buzz configuration as acknowledgement when any of the remote control unit's buttons is pressed.	
	"ORIGINAL VALUE" gives the same configuration as when supplied.	ORIGINAL VALUE
	"ADJUSTMENT" allows the configuration of the acknowledgement to be changed.	ADJUSTMENT
LOCK DEACTIVATION	**ANTI-THEFT ALARM** For arming/disarming the alarm with the car key.	
	"OFF" if it should only be possible to use the remote control unit.	OFF
	"ON" if it should be possible to use both the car key and the remote control unit.	ON
DISENGAGE BOOT	**ANTI-THEFT ALARM** For opening the tailgate with the car key when the alarm is armed.	
	"OFF" if it should only be possible to use the remote control unit.	OFF
	"ON" if it should be possible to use both the car key and the remote control unit.	ON
SIREN	Programming for siren with battery back-up.	
	"ON" if the siren is to be included.	ON
	"OFF" if the siren is not to be included.	OFF

Command menu "ADJUSTMENT"

ISAT scan tool command	Function	ISAT scan tool display
FLASH/SOUND	For adjusting the configuration of the flash/buzz acknowledgement if "ADJUSTMENT" was selected when programming "FLASH/SOUND".	
	"LOCK" allows adjustment of the locking acknowledgement.	LOCK
	"UNLOCK" allows adjustment of the unlocking acknowledgement.	UNLOCK
	"SEL FLASH TIME" for adjusting the flash acknowledgement.	SEL FLASH TIME
	"SEL SOUND TIME" for adjusting the acoustic confirmation.	SEL SOUND TIME
LUGGAGE AT +15	Allows opening of the tailgate with the ignition "ON".	LUGGAGE AT +15
	"OFF" for cancelling the function.	OFF
	"ON" for selecting the function.	ON
SOUND DURATION	Allows the character of the sound to be changed by selecting different sound times.	SOUND DURATION
	"5 - 10 -15 -20 - 25 - 30 msec"	10 ms

Command menu "IMMOBILIZING"

ISAT scan tool command	Function	ISAT scan tool display
SELECT CAR'S ENGINE MANAGEMENT SYSTEM	For selecting the right engine management system for the car in question.	TRIONIC MOTRONIC 2.8.1 MOTRONIC 2.10.3

Command menu "READ SYSTEM INFO"

ISAT scan tool command	Function	ISAT scan tool display
SAAB PART NUMBER	Shows the Saab part number of the anti-theft alarm	PART NUMBER: XX XXX XXX
SOFTWARE VERSION	Shows the software version installed in the anti-theft alarm's electronic control module.	SOFTWARE VERSION: XX XXX XXX
COUNTRY CODE	Shows the selected country code and the option of selecting another country code.	VALUE IS GERMANY
DATE OF MANUFACT	Shows the date of manufacture of the electronic control module.	DATE OF MANUFACT: XX XX XX

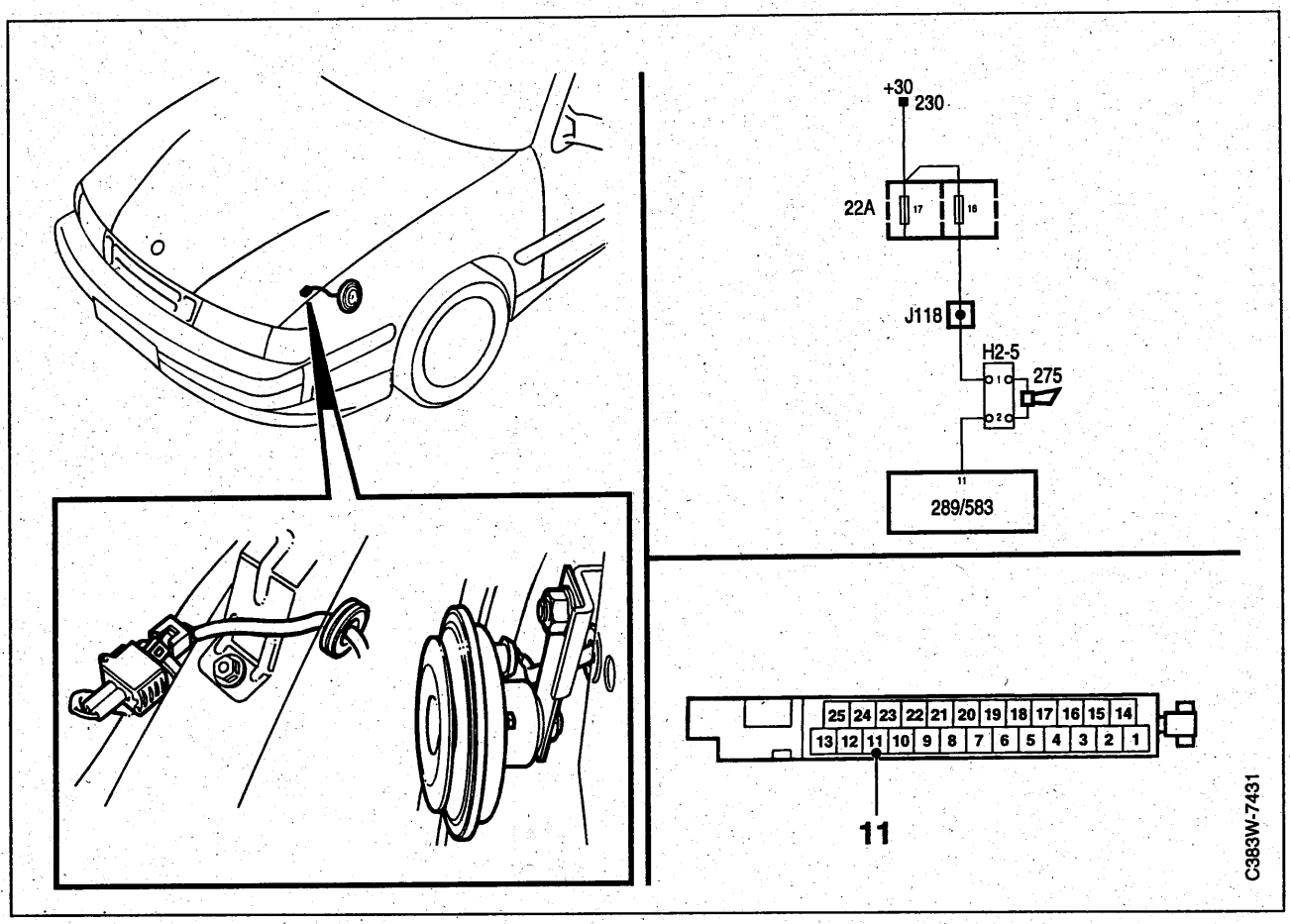
Fault diagnosis with diagnostic trouble codes, Anti-theft alarm

Diagnostic trouble code table

Diagnostic trouble code	Faulty function/ component	ISAT scan tool display	Procedure see page
B1193	Horn Break/open circuit	FAULT XX B1193 HORN OPEN CIRCUIT	56
B1605	Electronic control module Internal fault	FAULT XX B1605 CONTR MODULE INTERN	60

Diagnostic trouble code B1193

Horn, open circuit



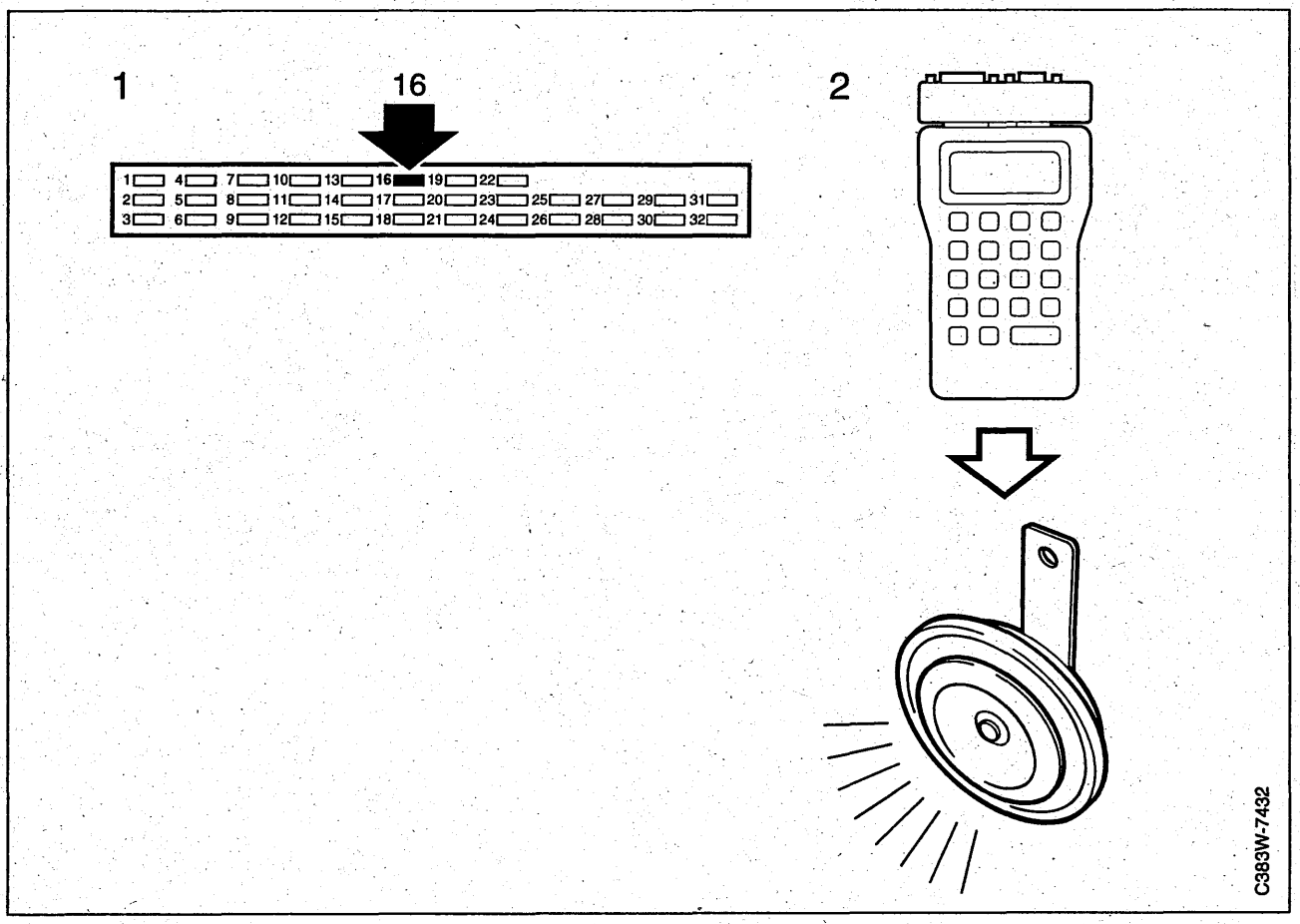
Fault symptom

The horn does not work.
The LED flashes during the delay period.

Condition

Open circuit generates a diagnostic trouble code

Diagnostic trouble code B1193 (contd.)



Diagnostic procedure

1 **Check fuse 16**

2 **Check operation of the horn.**

- Connect an ISAT scan tool.
- Select "ACTIVATE".
- Select "HORN".
- Select "ON".

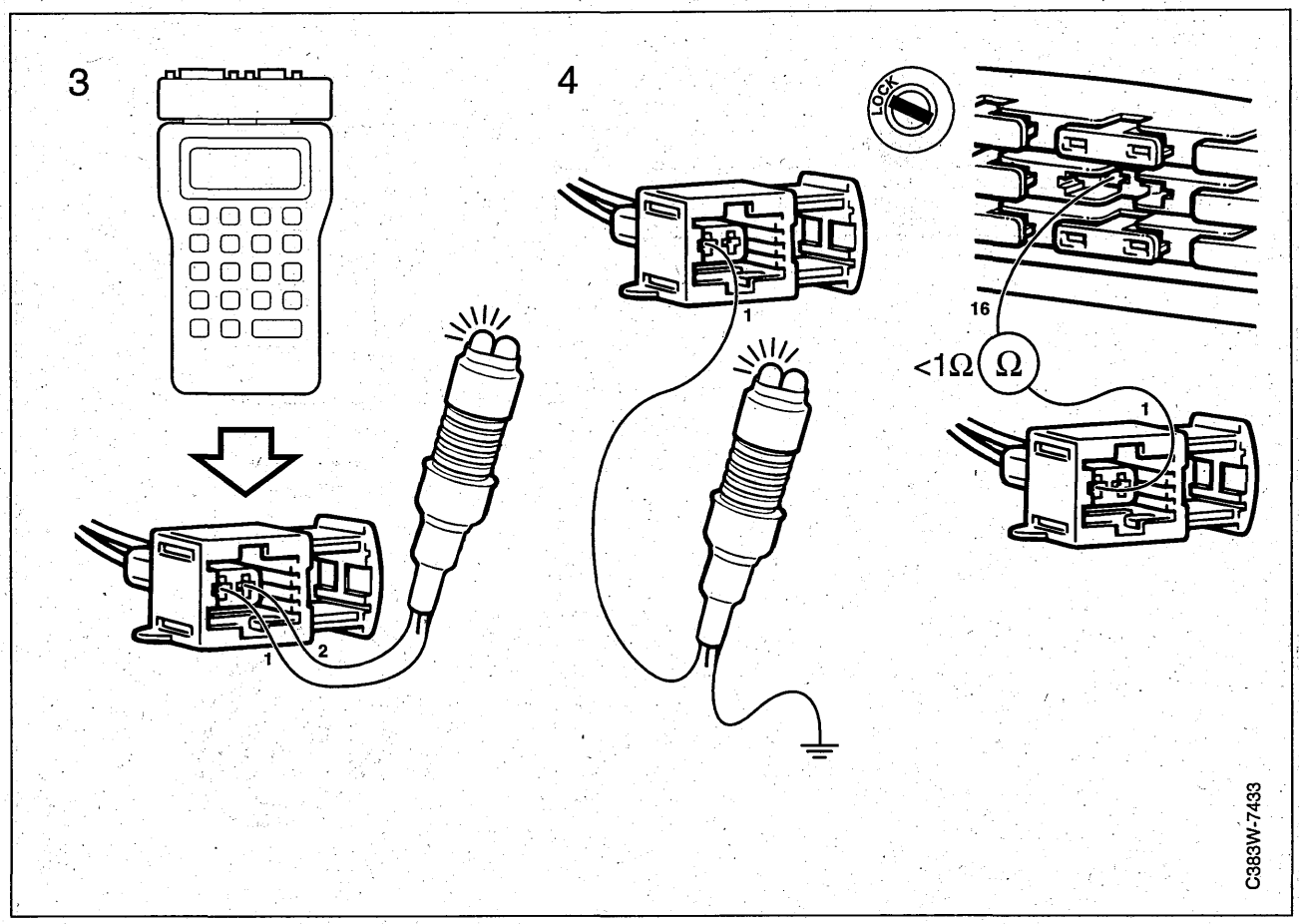
The horn should sound.

Does the horn work properly?

YES Proceed to point 6.

NO Continue with point 3.

Diagnostic trouble code B1193 (contd.)



3 **Check the horn's power supply**

- Disconnect the horn.
- Connect the test lamp to the horn's 2-pin connector.
- Select "HORN" with the ISAT scan tool.

When "ON" is selected, the test lamp should light up.

Does it light up?

YES Change the horn.

NO Continue with point 4.

4 **Check the horn's power supply (+30 circuit)**
Connect the test lamp to pin 1 of the horn's 2-pin connector and a good grounding point.

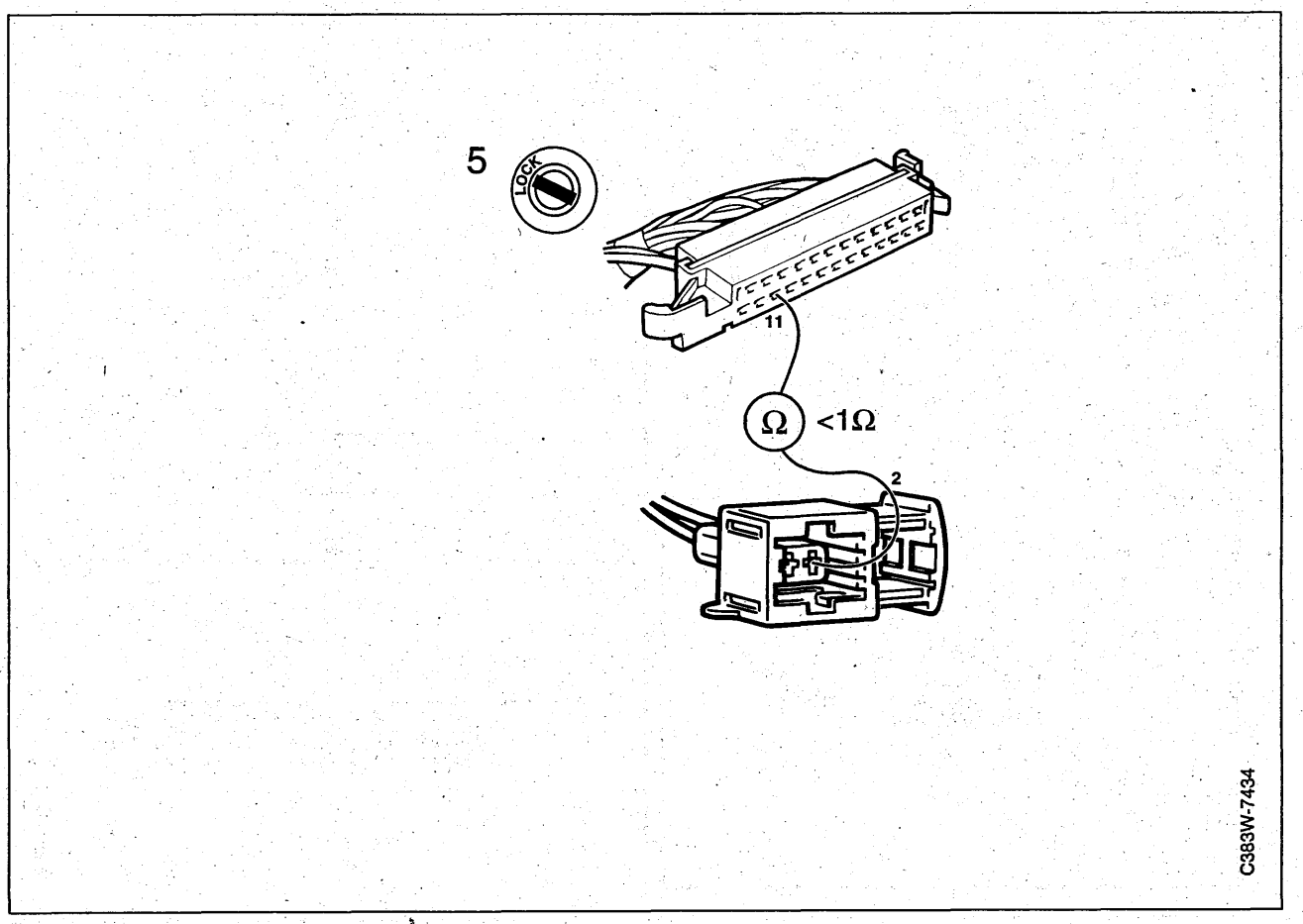
The test lamp should light up.

Does it light up?

YES Continue with point 5.

NO Check circuit continuity and, if necessary, repair or replace the wiring between pin 1 of the connector and fuse 16.

Diagnostic trouble code B1193 (contd.)



5 **Check the horn's ground connection**

- Pin 11 of the electronic control module grounds the horn when it is activated.
- Check the continuity of the wiring between pin 2 of the connector and pin 11 of the electronic control module.

The resistance should be < 1 ohm.

Is the resistance reading correct?

YES Proceed to point 6.

NO Repair or replace the wiring harness.

6 **Check diagnostic trouble code generation**

- Clear the diagnostic trouble code.
- Drive the car at varying engine speeds and loads.
- Check whether the diagnostic trouble code is generated afresh.

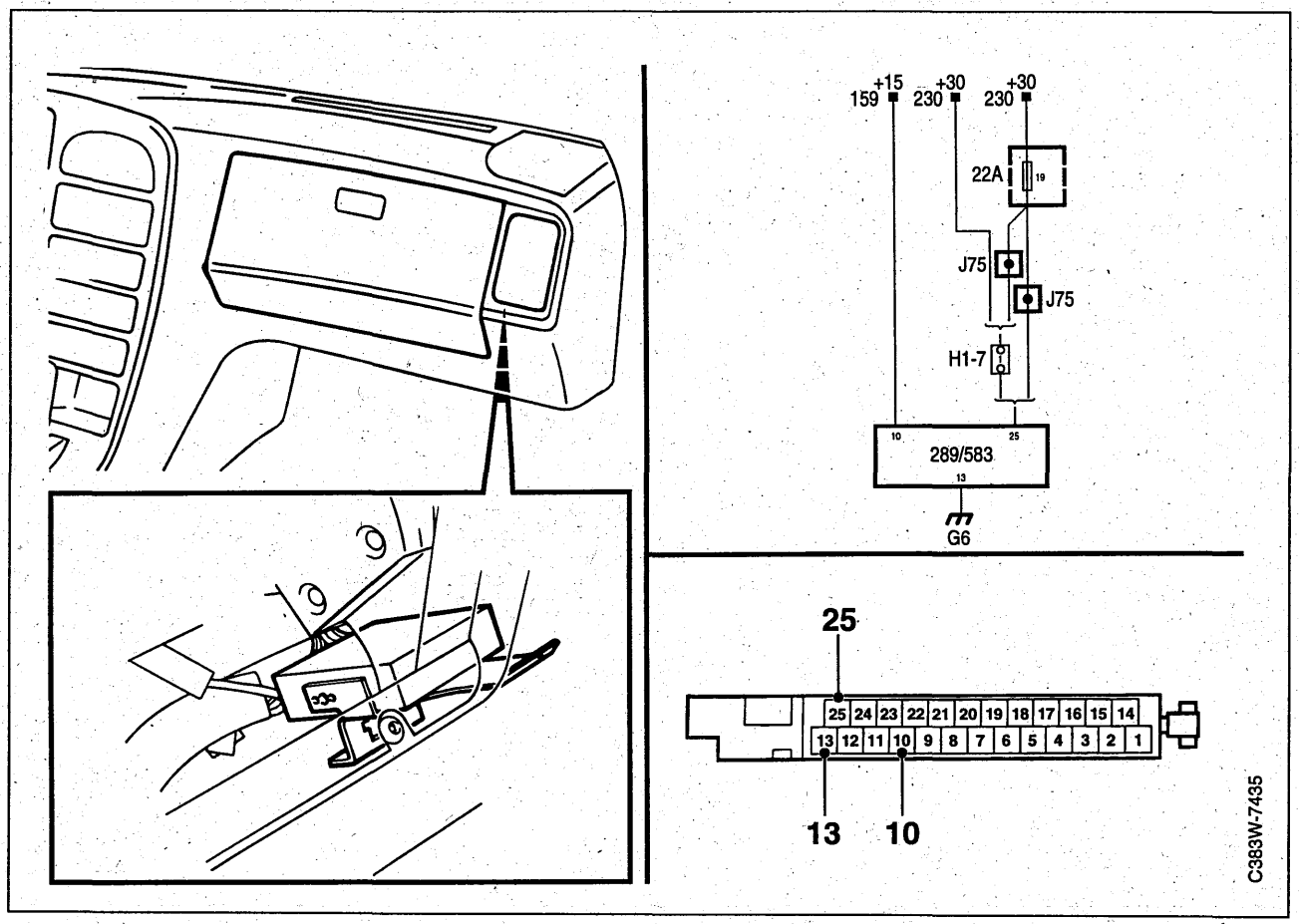
Is the DTC generated afresh?

YES Continue as described on page 158.

NO The remedial measure taken was correct or the fault is of intermittent nature.

Diagnostic trouble code B1605

Fault in the electronic control module



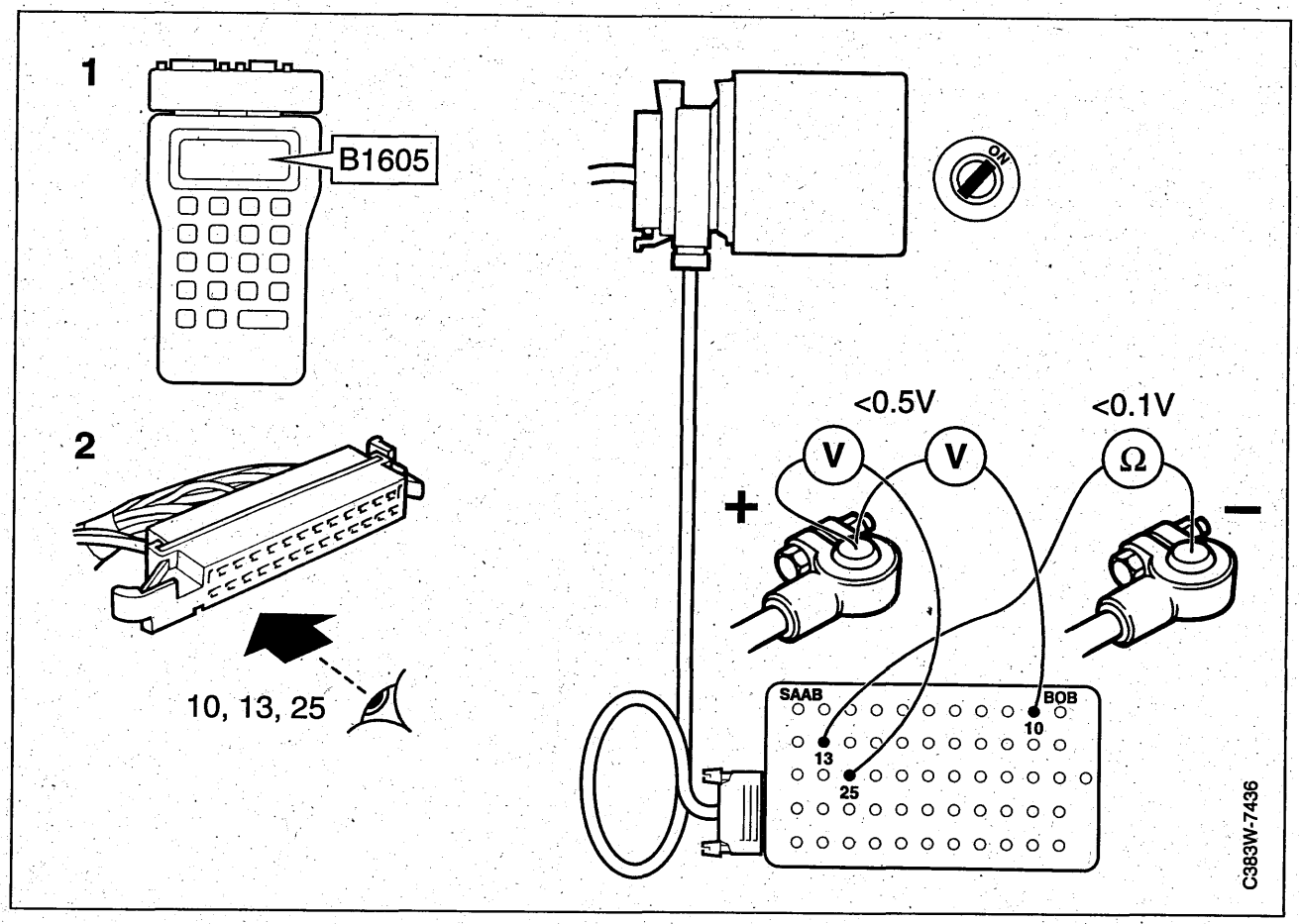
Fault symptom

Anti-theft alarm completely unserviceable.
Indefinable (different functions may be affected, due to an internal memory and/or programming fault).

Condition

Electronic control module fault (internal) generates diagnostic trouble code.

Diagnostic trouble code B1605 (contd.)



Diagnostic procedure

1 **Check diagnostic trouble code generation**

- Clear the diagnostic trouble code.
- Drive the car on test.
- Check whether the diagnostic trouble code is generated afresh.

Is the DTC generated afresh?

YES Continue with point 2.

NO The fault is intermittent.

2 **Check the anti-theft alarm's electronic control module connection**

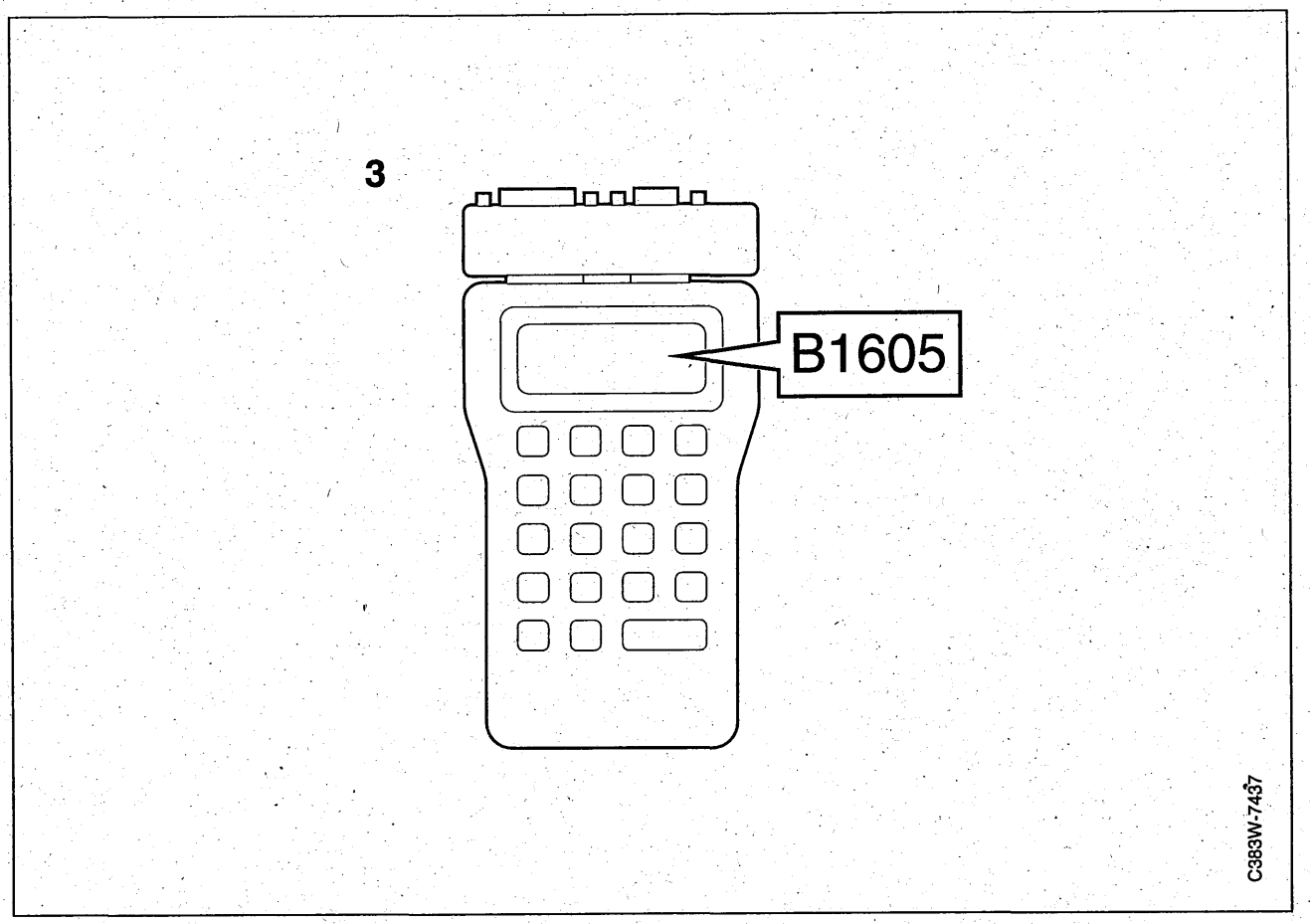
- Remove the electronic control module.
- Inspect the connector for slide-out of the contact sockets.
- Check the electronic control module's ground and power supply connections:
  - pin 25 (+30)
  - pin 10 (+15)
  - pin 13 (GND)

Everything OK?

YES Refit the electronic control module and continue with point 3.

NO Take remedial action.

Diagnostic trouble code B1605 (contd.)



3 **Check diagnostic trouble code generation**

- Clear the diagnostic trouble code.
- Arm/disarm the anti-theft alarm 5 times.
- Check whether the diagnostic trouble code is generated afresh.

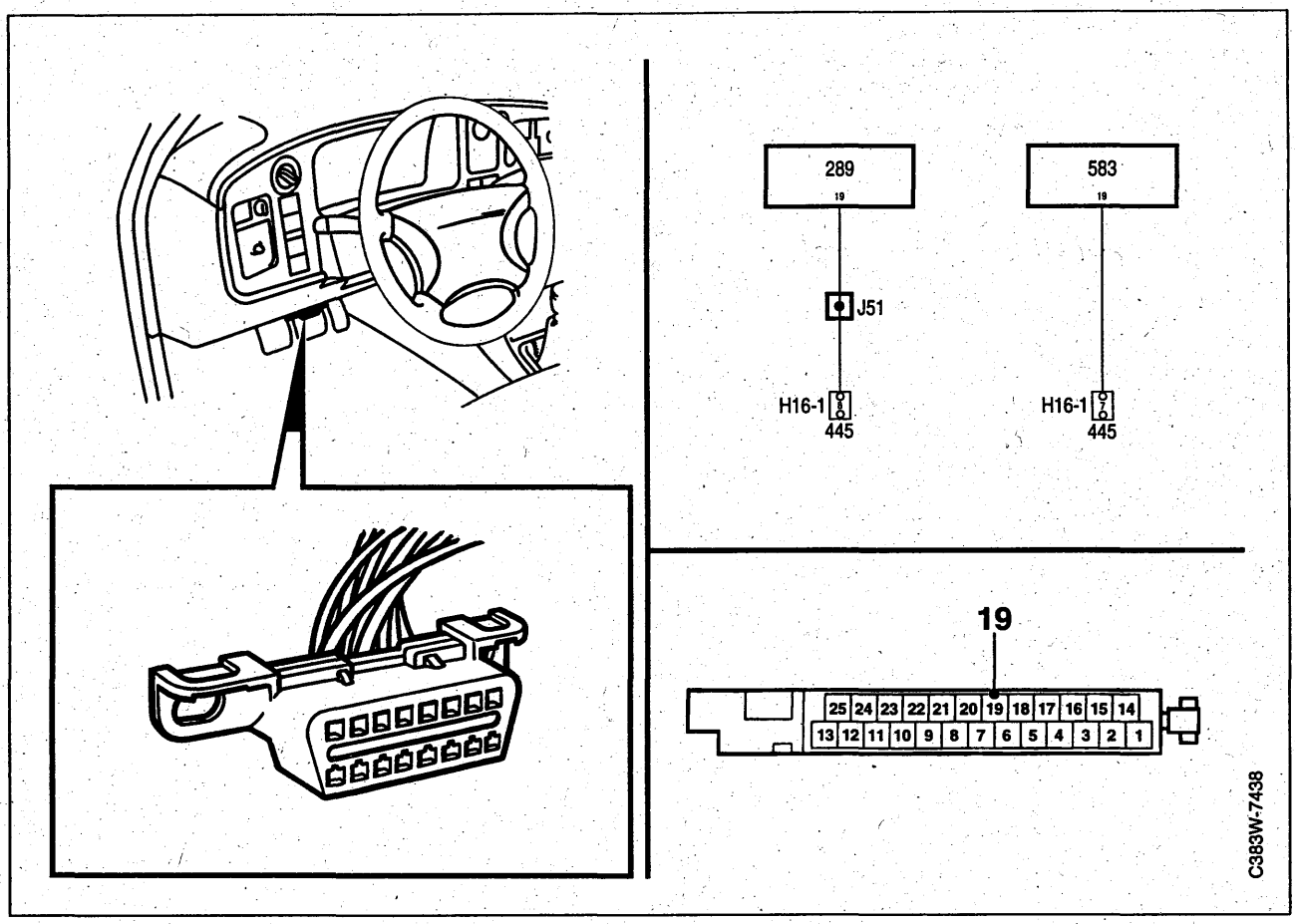
Is the DTC generated afresh?

YES — Continue as described on page 158.

NO — The remedial measure taken was correct or the fault is of intermittent nature.

Fault diagnosis with fault symptoms, Anti-theft alarm

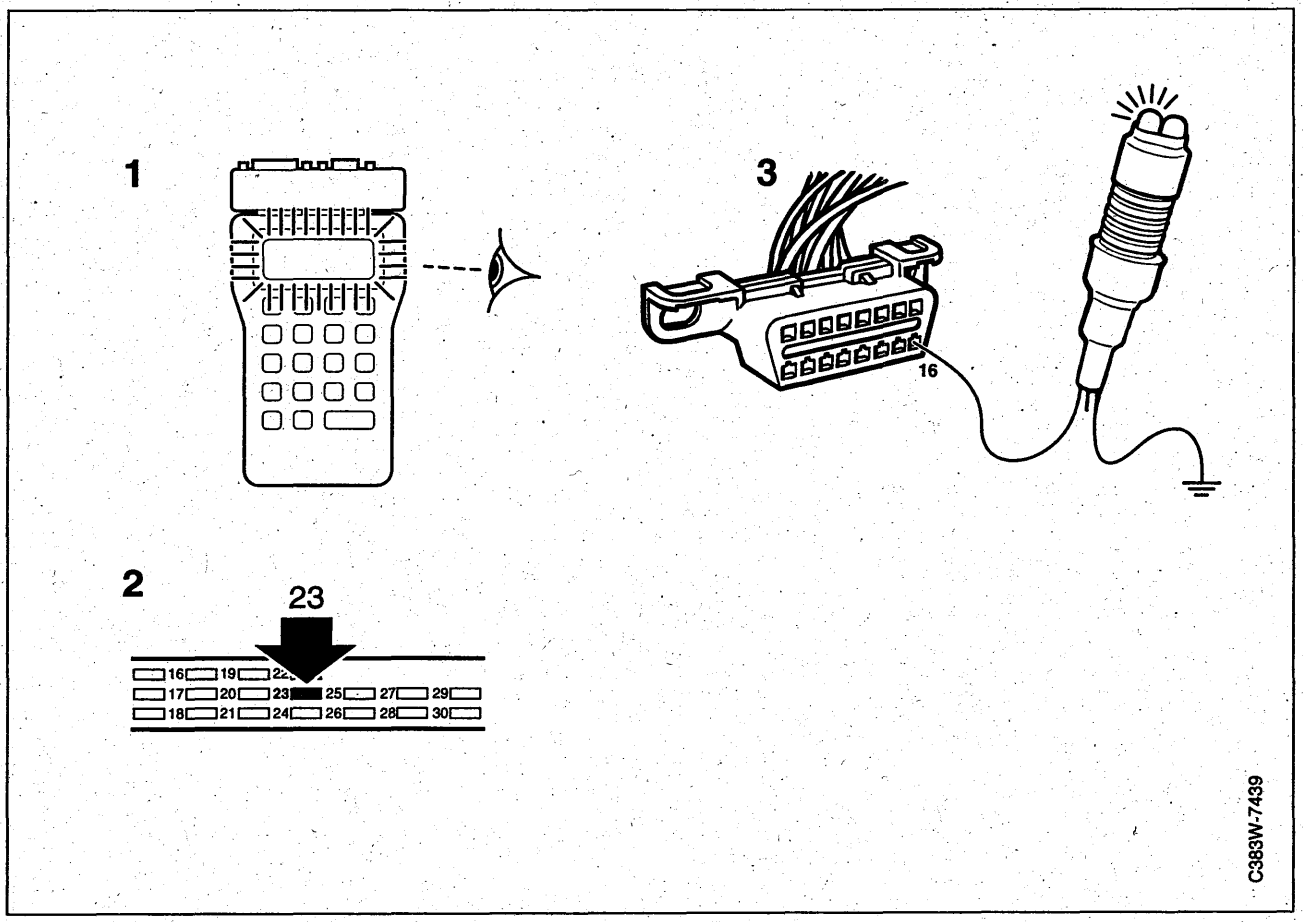
Fault diagnosis, data link connector



Fault symptom

No ISAT scan tool communication.

Fault diagnosis, data link connector (contd.)



Diagnostic procedure

1 **Check the ISAT scan tool connector**
Connect an ISAT scan tool.

The ISAT scan tool display should light up.

Does the display light up?

YES Continue with point 5.

NO Continue with point 2.

2 **Check fuse 23.**

3 **Check the power supply (+30 circuit) in the data link connector**
Connect the test lamp to pin 16 of the data link connector and a good grounding point.

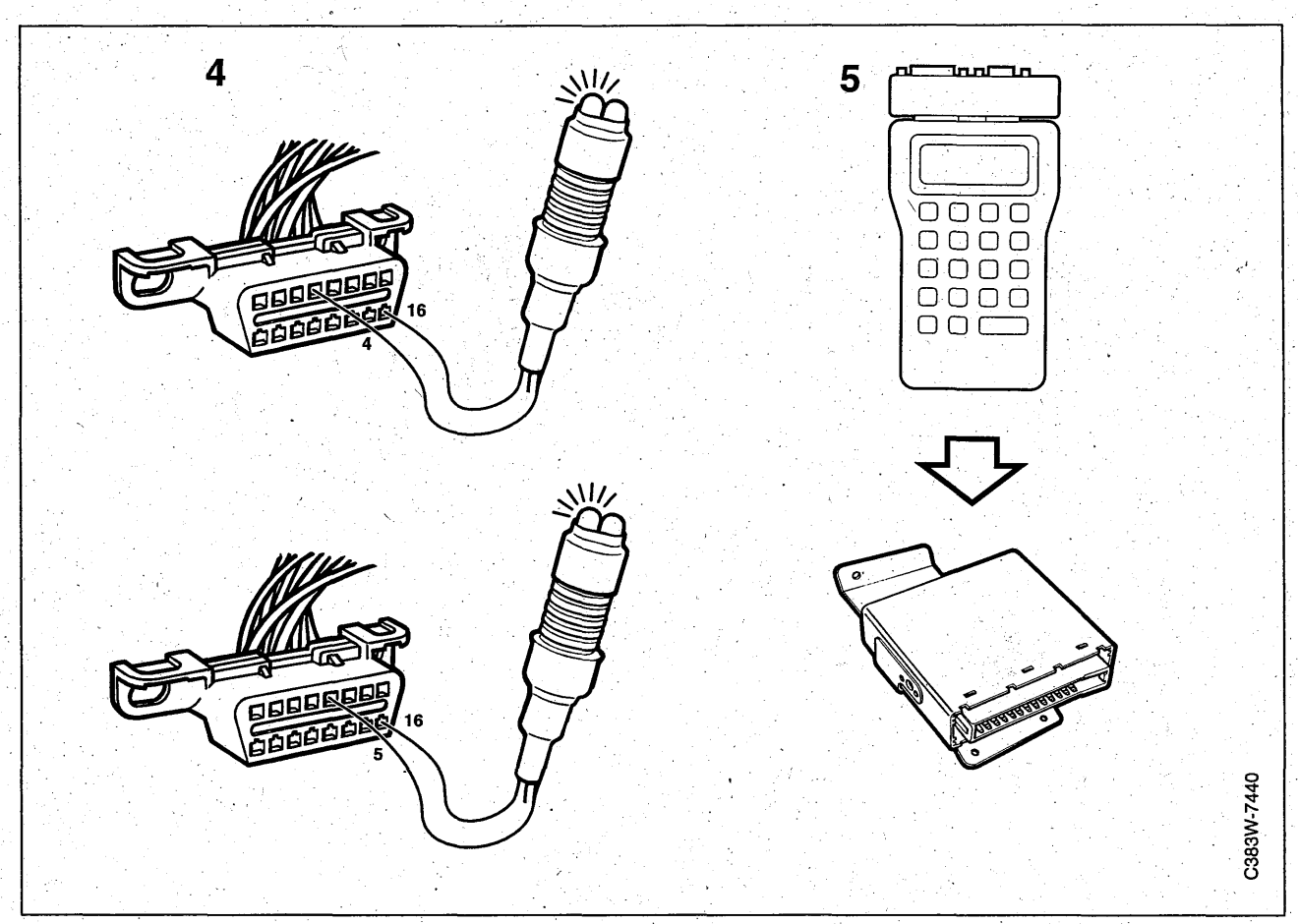
The test lamp should light up if a +30 power supply is present.

Does it light up?

YES Continue with point 4.

NO Check and, if necessary, repair or replace the wiring between pin 16 and fuse 23. If the wiring is OK, continue fault diagnosis as described in Service Manual 3:2 "Electrical system,
+30 power supply".

Fault diagnosis, data link connector (contd.)



4 **Check the data link connector's ground connection**

- Connect the test lamp to pins 4 and 16 of the data link connector.
- Connect the test lamp to pins 5 and 16 of the data link connector.

The test lamp should light up in both cases if connection to ground is OK.

Does it light up?

YES — Check the ISAT scan tool.

NO — Repair or replace the wiring between pin 4 and grounding point G8, or between pin 5 and grounding point G6.

5 **Check ISAT scan tool contact with anti-theft alarm**

- Note that the anti-theft alarm must not be armed.
- Select "THEFT ALARM".

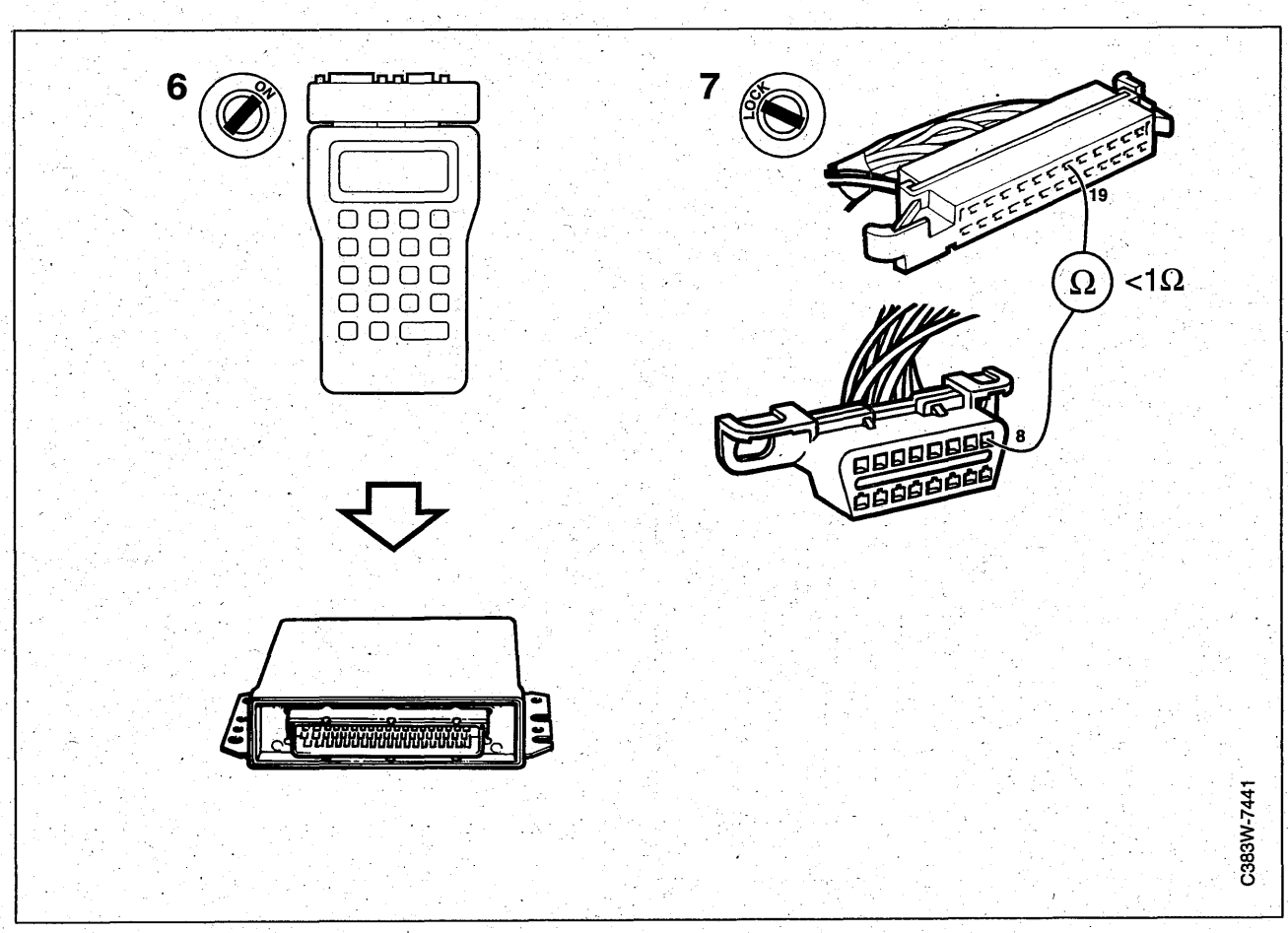
The ISAT scan tool should show the menu for the anti-theft alarm, see page 44.

Does it show the menu?

YES — The fault is of intermittent nature, proceed to point 8.

NO — Proceed to point 6.

Fault diagnosis, data link connector (contd.)



6 **Check ISAT scan tool contact with another system**
Select another system with which the car is equipped.

The ISAT scan tool should display the menu for the system selected.

Does it show the menu?

YES Continue with point 7.

NO Check the ISAT scan tool.

7 **Check the wiring**
Check the wiring harness for continuity between pin 8 of the data link connector and pin 19 of the anti-theft alarm's electronic control module.

The resistance should be < 1 ohm.

Is the resistance OK?

YES Continue with point 8.

NO Repair or replace the wiring harness.

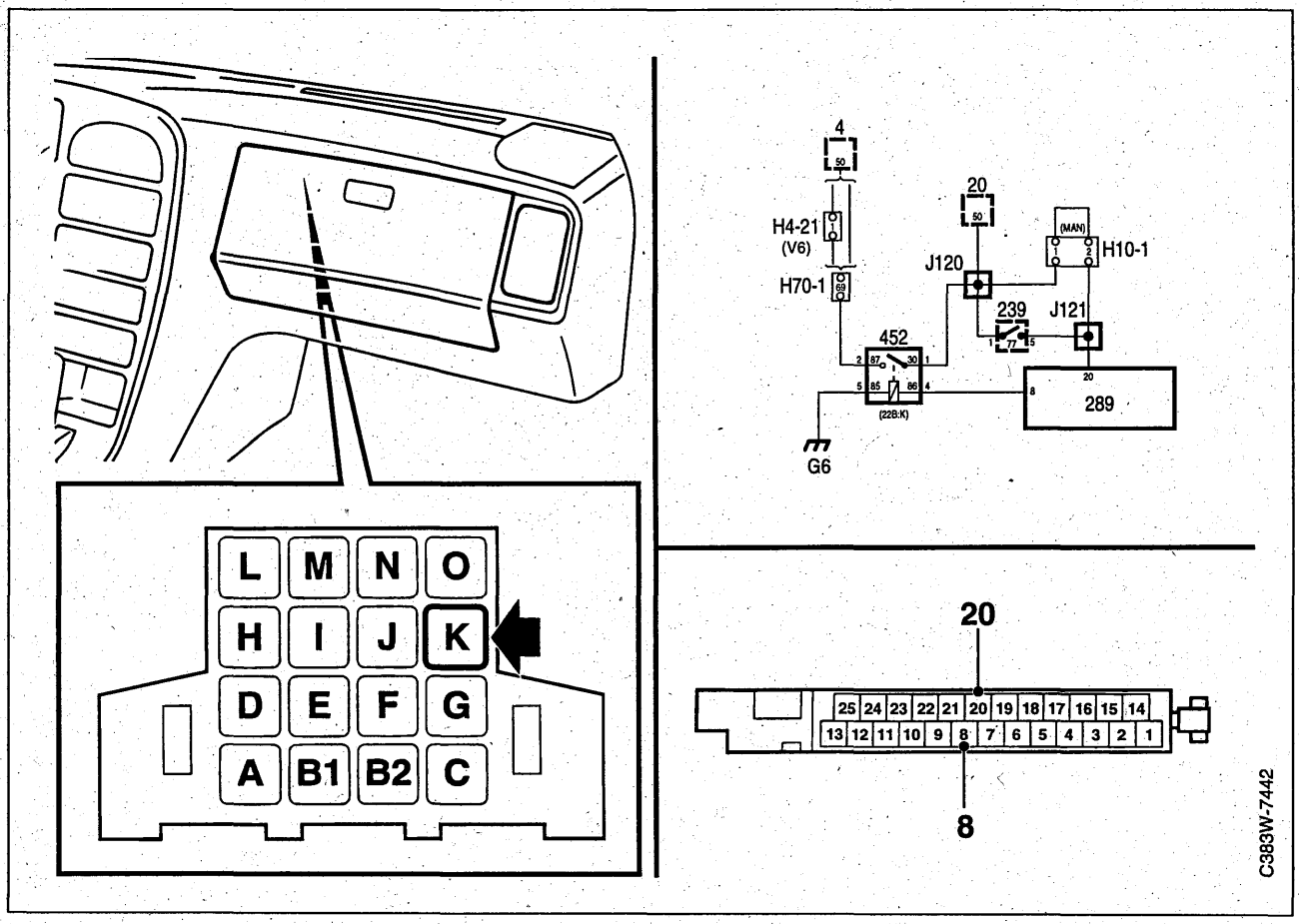
8 **Final test**
Check to see if the fault symptom persists.

Does the trouble persist?

YES Continue as described on page 158.

NO The remedial measure taken was correct or the fault is of intermittent nature.

Fault diagnosis, starter motor interlock (+50)



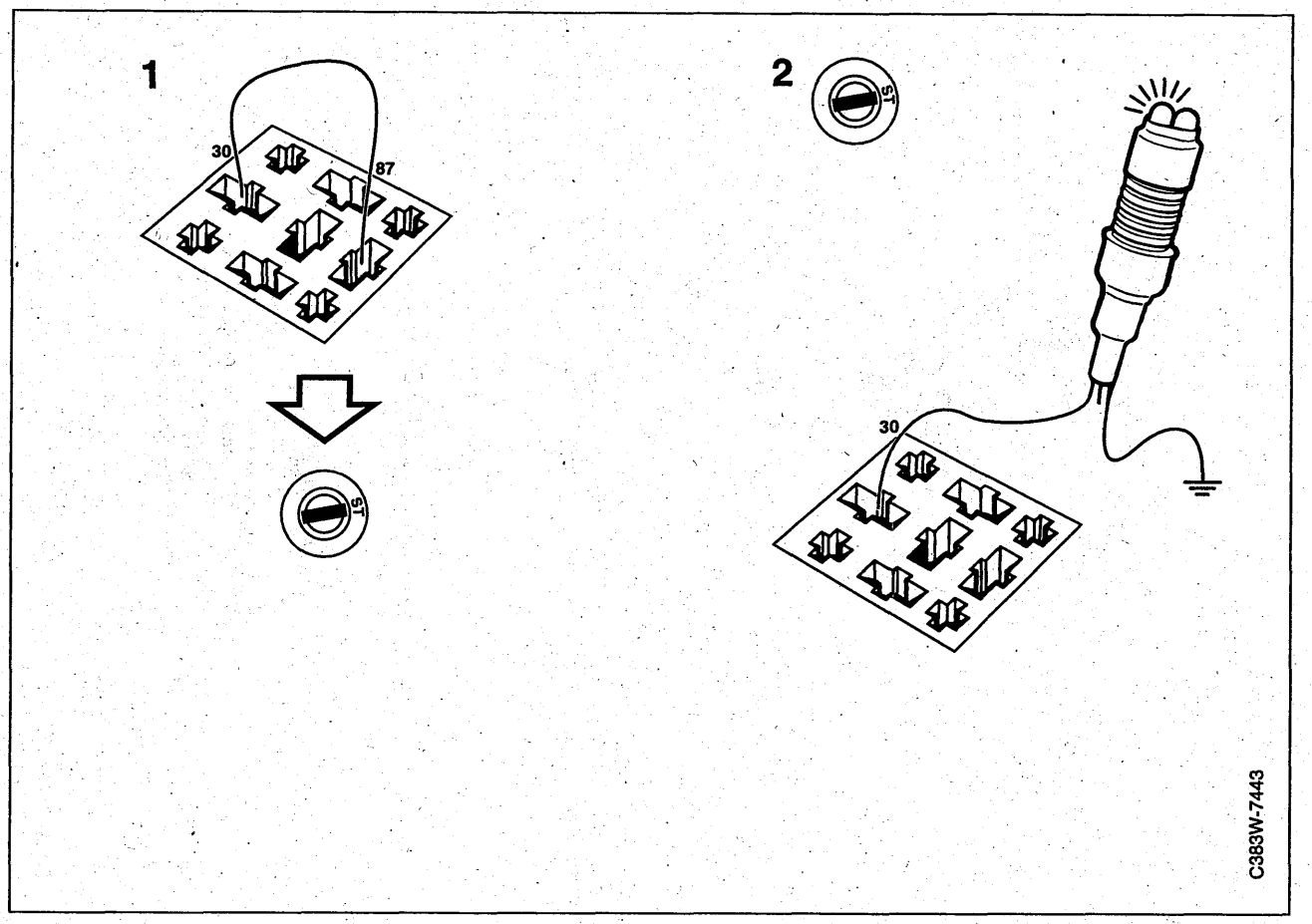
Fault symptom

The starter motor does not work.
The alarm is not activated in the start position with the alarm armed.
The starter motor runs at different ignition switch positions.

Important

If the LED flashes, the car may be self-immobilized.

Fault diagnosis, starter motor interlock (+50) (contd.)



Diagnostic procedure

1 **Check the starter motor's power supply (+50 circuit)**

- Unplug the starter relay.
- Connect a jumper lead between pins 30 and 87 in the relay socket.
- Turn the ignition switch to the "ST" position (+50).

The start motor should start cranking.

Does the starter motor work?

YES Continue with point 4.

NO Continue with point 2.

2 **Check the starter relay's power supply (+50 circuit)**

- Connect the test lamp to pin 30 of the relay socket and a good ground.
- Turn the ignition switch to the "ST" position (+50).

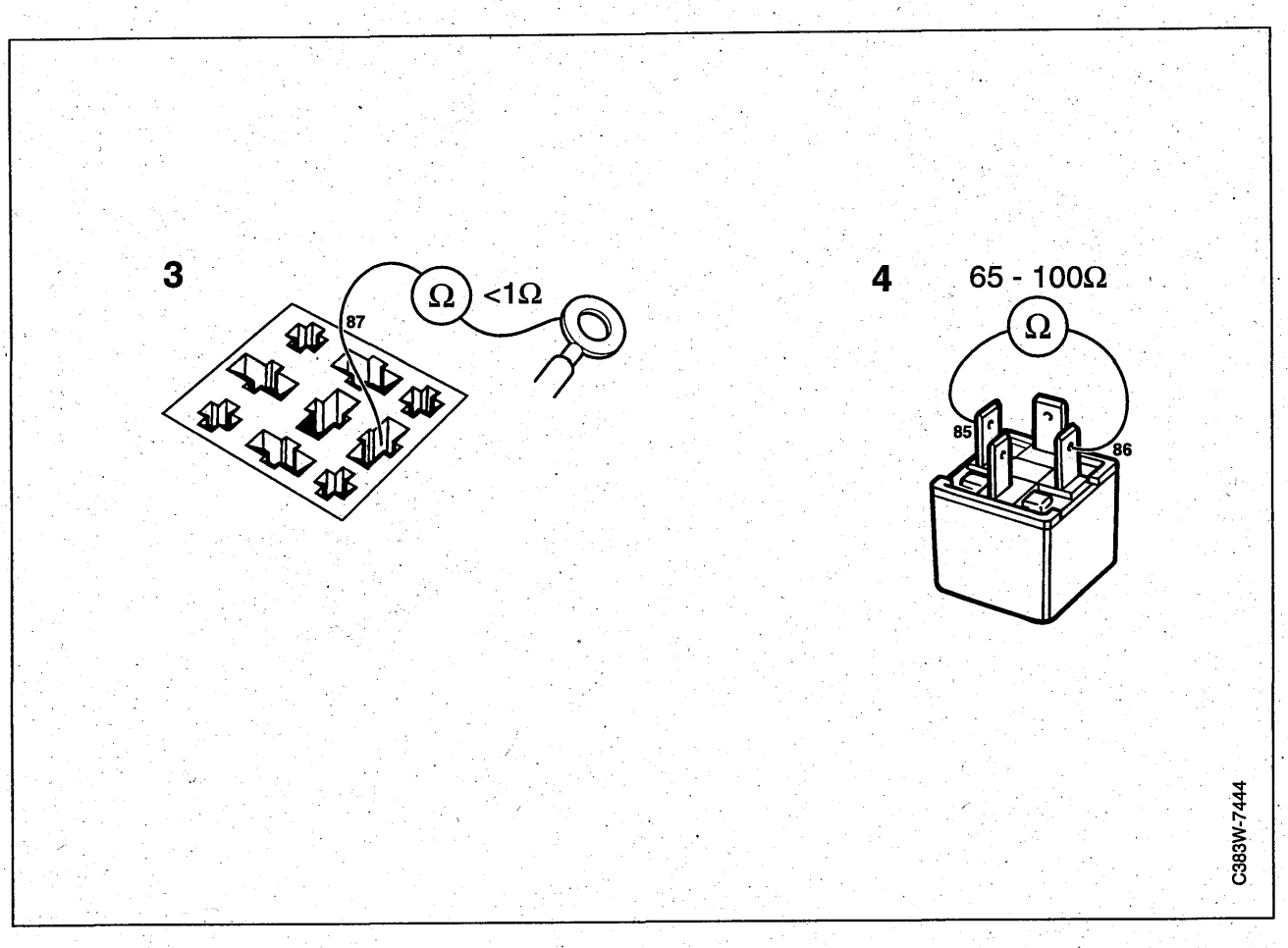
The test lamp should light up.

Does it light up?

YES Continue with point 3.

NO Check the continuity of the wiring between pin 30 of the starter relay's connector and the ignition switch.

Fault diagnosis, starter motor interlock (+50) (contd.)



3 **Check the wiring connected to the starter motor**

Check the continuity of the wiring between pin 87 of the starter relay connector and terminal 50 of the starter motor.

The resistance should be < 1 ohm.

Is the resistance OK?

YES Check the starting system. See Service Manual 3:2 "Electrical system, starting and charging systems".

NO Check and, if necessary, repair or replace the wiring, including connectors.

4 **Check the starter relay**

- Check the resistance of the relay's winding.
- Take a resistance reading across pins 85 and 86.

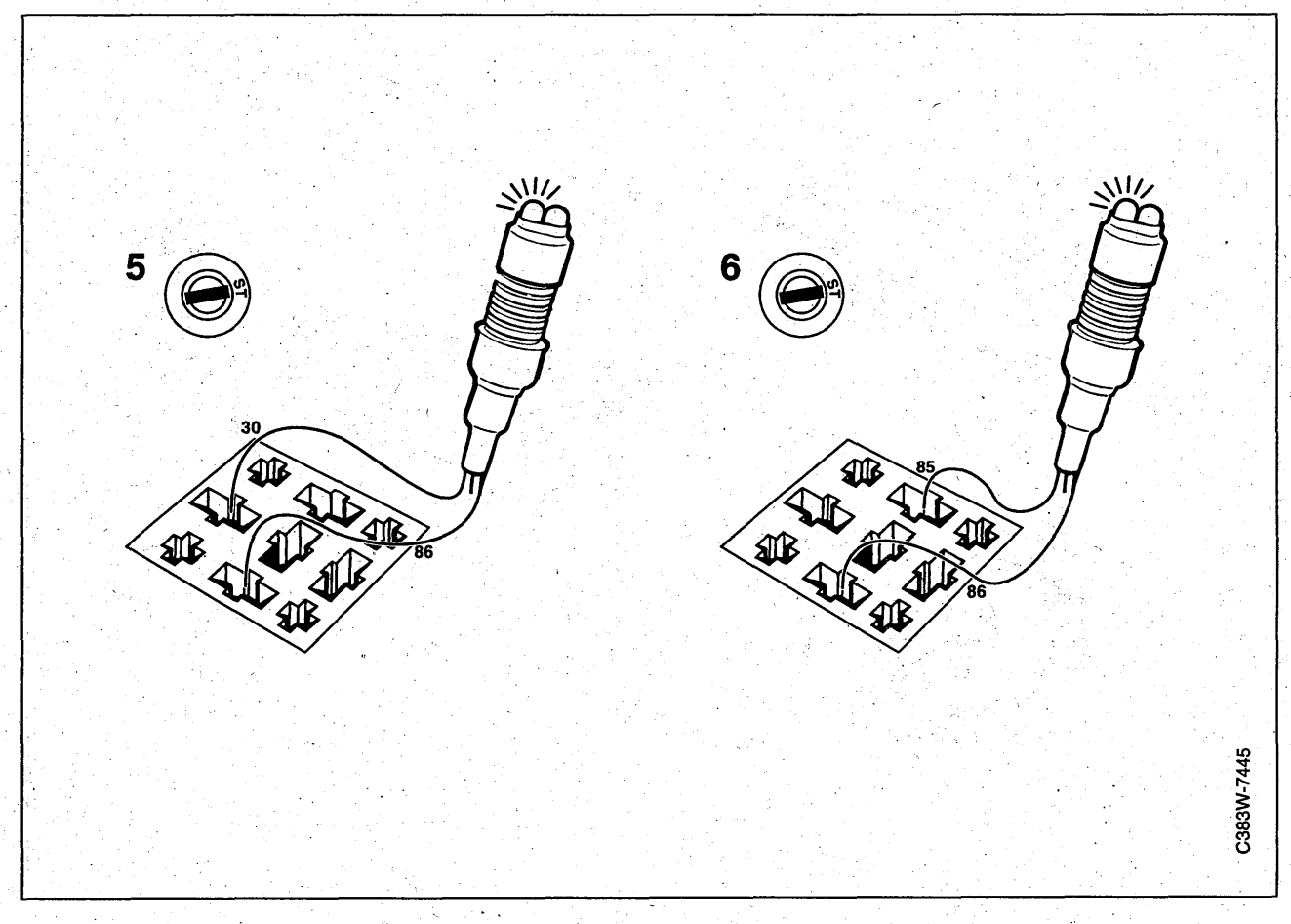
The resistance should be 65 — 100 ohms.

Is the resistance OK?

YES Continue with point 5.

NO Change the relay.

Fault diagnosis, starter motor interlock (+50) (contd.)



5 **Check the starter relay's connection to ground**

- Connect the test lamp to pins 30 and 86 of the relay socket.
- Turn the ignition switch to the "ST" position.

Does the test lamp light up?

YES Proceed to point 6.

NO Check and repair or replace the wiring, including grounding point G6.

6 **Check the starter relay's power supply**

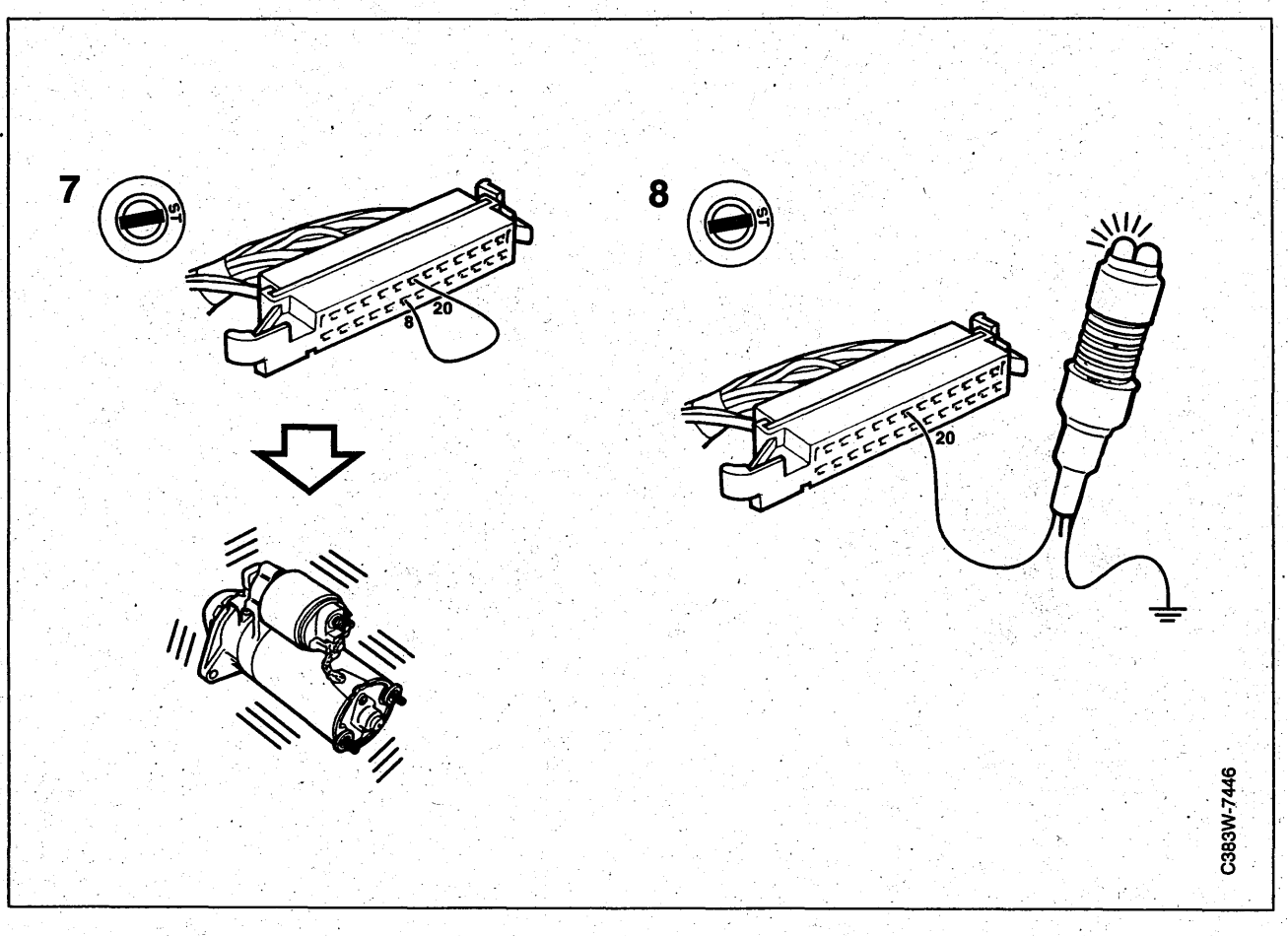
- Connect the test lamp to pins 86 and 85 of the relay socket.
- Turn the ignition switch to the "ST" position.

Does the test lamp light up?

YES Change the starter relay.

NO Continue with point 7.

Fault diagnosis, starter motor interlock (+50) (contd.)



7 **Check the operation of the electronic control module**

- Refit the starter relay.
- Remove the electronic control module.
- Connect a jumper lead between pins 20 and 8 of the electronic control module's connector.
- Turn the ignition switch to the "ST" position (+50).

Does the starter motor work?

YES Continue with point 10.

NO Continue with point 8.

8 **Check the electronic control module's power supply (+50 circuit)**

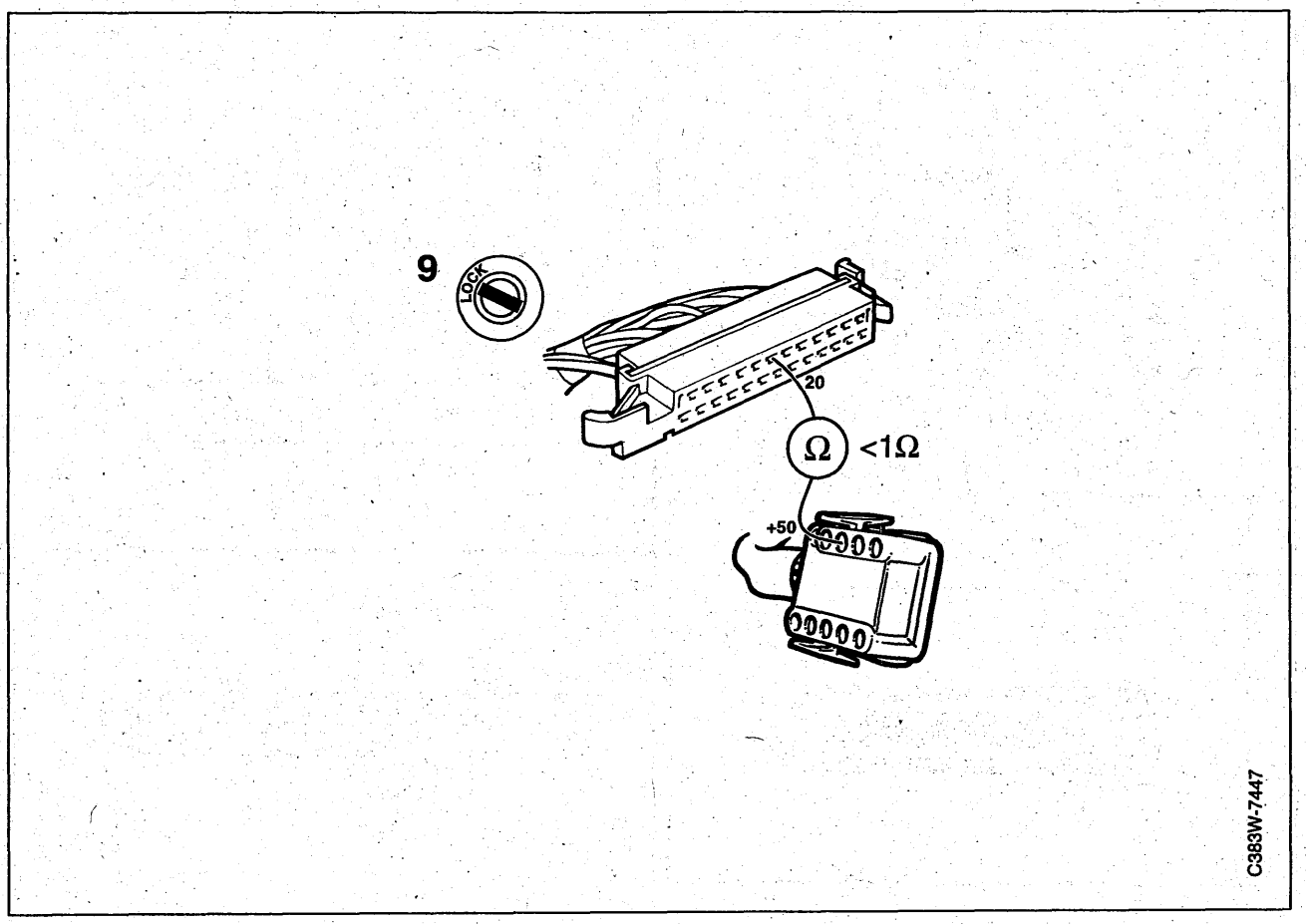
- Connect the test lamp to a good grounding point and pin 20 of the electronic control module's connector.
- Turn the ignition switch to the "ST" position (+50).

Does the test lamp light up?

YES Check and repair or replace the wiring between pin 8 of the electronic control module's connector and pin 85 of the starter relay.

NO Continue with point 9.

Fault diagnosis, starter motor interlock (+50) (contd.)



9 **Check the wiring**
(Cars with a manual gearbox)
Check for continuity (and repair or replace the wiring, if necessary) between pin 20 of the electronic control module's connector and the ignition switch (+50), including any intermediate connectors.

(cars with automatic transmission)
Check for continuity (and repair or replace the wiring, if necessary) between pin 20 of the electronic control module's connector and the ignition switch (+50), including the starting interlock switch.

Important
The starting interlock switch is closed in selector lever positions P and N, and open in all other selector lever positions.

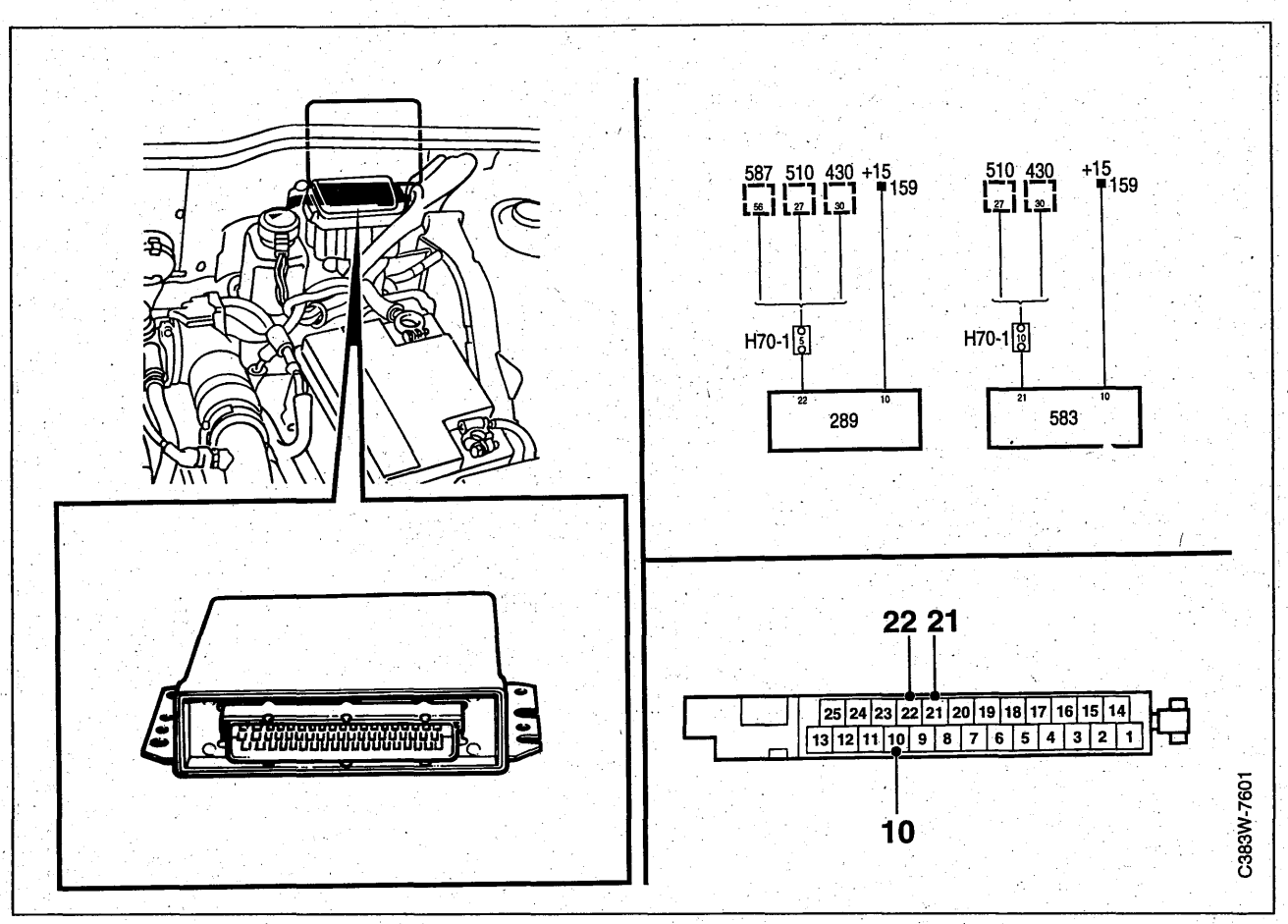
10 **Final test**
- Start the car.
- Check to see if the fault symptom persists.

Does the trouble persist?

YES — Continue as described on page 158.

NO — The remedial measure taken was correct or the fault is of intermittent nature.

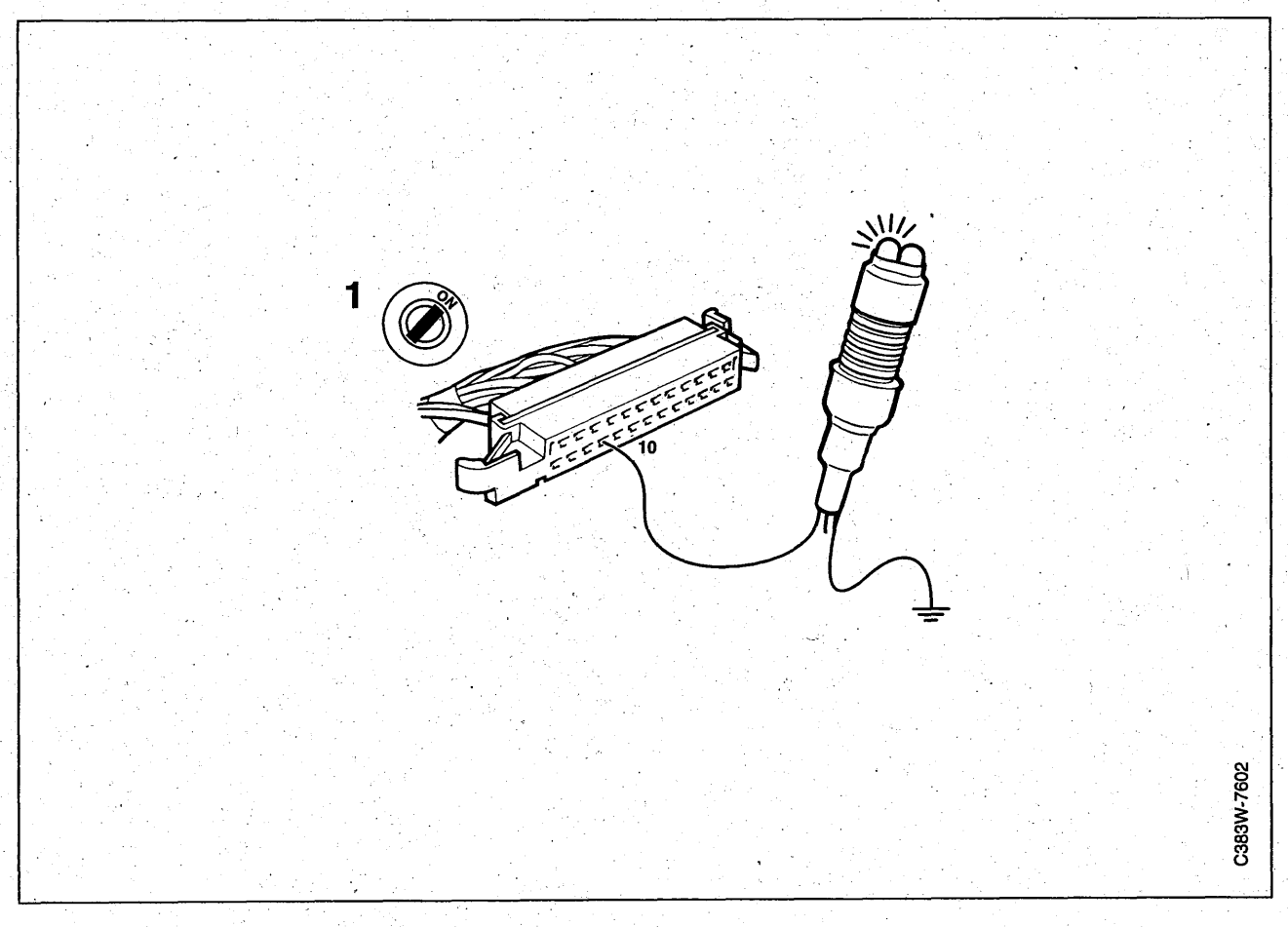
Fault diagnosis, +15 power supply circuit



Fault symptom

The alarm is not set off when the ignition is switched on and the alarm is armed.
The car will not start.

Fault diagnosis, +15 power supply circuit (contd.)



Diagnostic procedure

1 **Check the anti-theft alarm control module's power supply (+15 circuit).**

- Remove the anti-theft alarm's control module.
- Connect the test lamp to pin 10 of the control module's connector and a good grounding point.
- Ignition switch in the "ON" position.

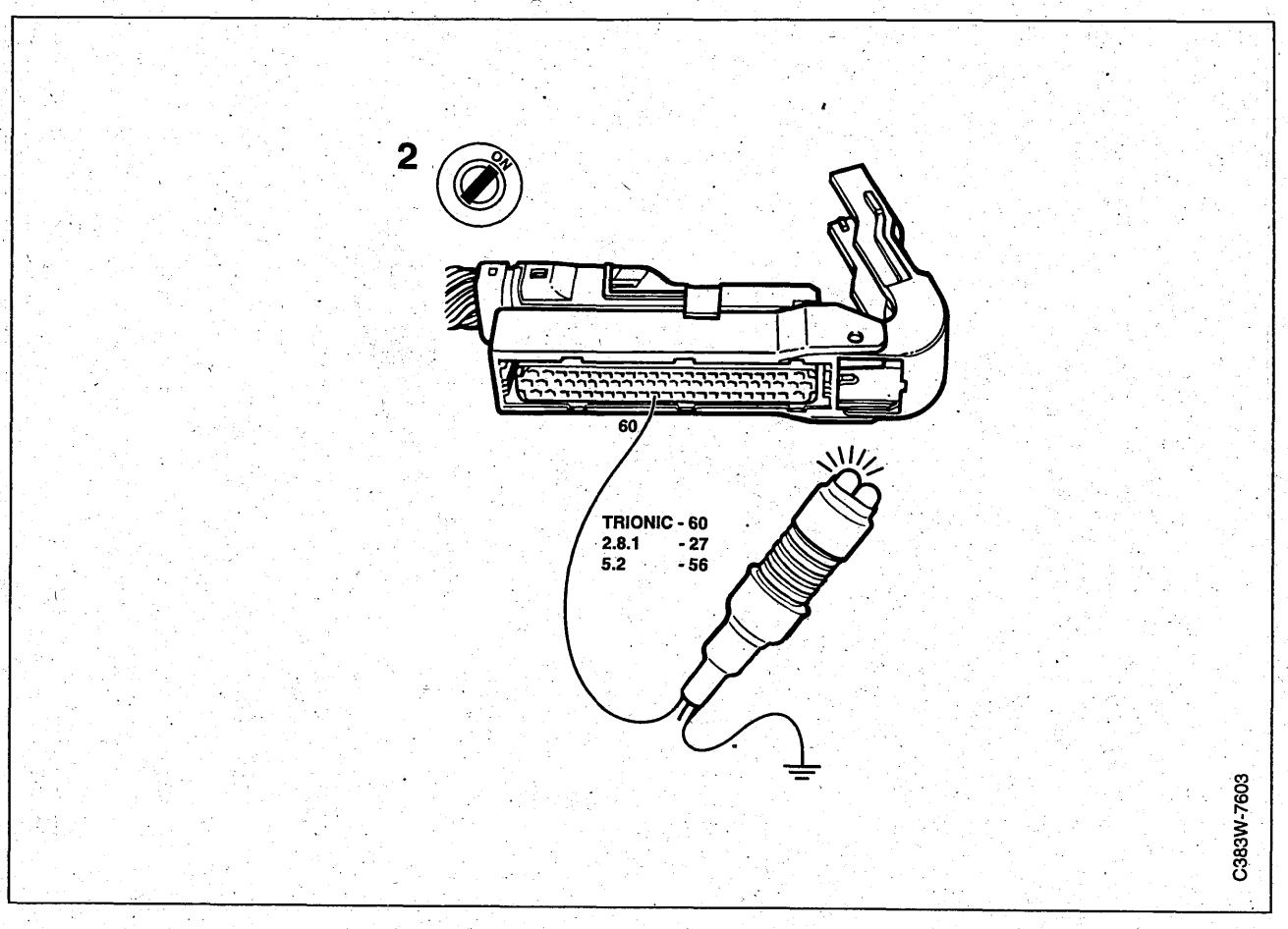
The test lamp should light up.

Does it light up?

YES Continue with point 2.

NO Check and rectify the wiring between pin 10 of the control module and distribution terminal 159. See Service Manual 3:2 "Electrical system, +15 power supply".

Fault diagnosis, +15 power supply circuit (contd.)



2 **Check the engine management system's power supply (+15 circuit)**

- Fit the anti-theft alarm's control module.
- Remove the engine control module in question.
- Connect the test lamp to:
  - Trionic pin 60 and a good grounding point (4-cyl.).
  - Motronic 2.8.1 pin 27 and a good grounding point (6-cyl.).
  - Motronic 5.2 pin 56 and a good grounding point (6-cyl. US).
- Ignition switch in the "ON" position.

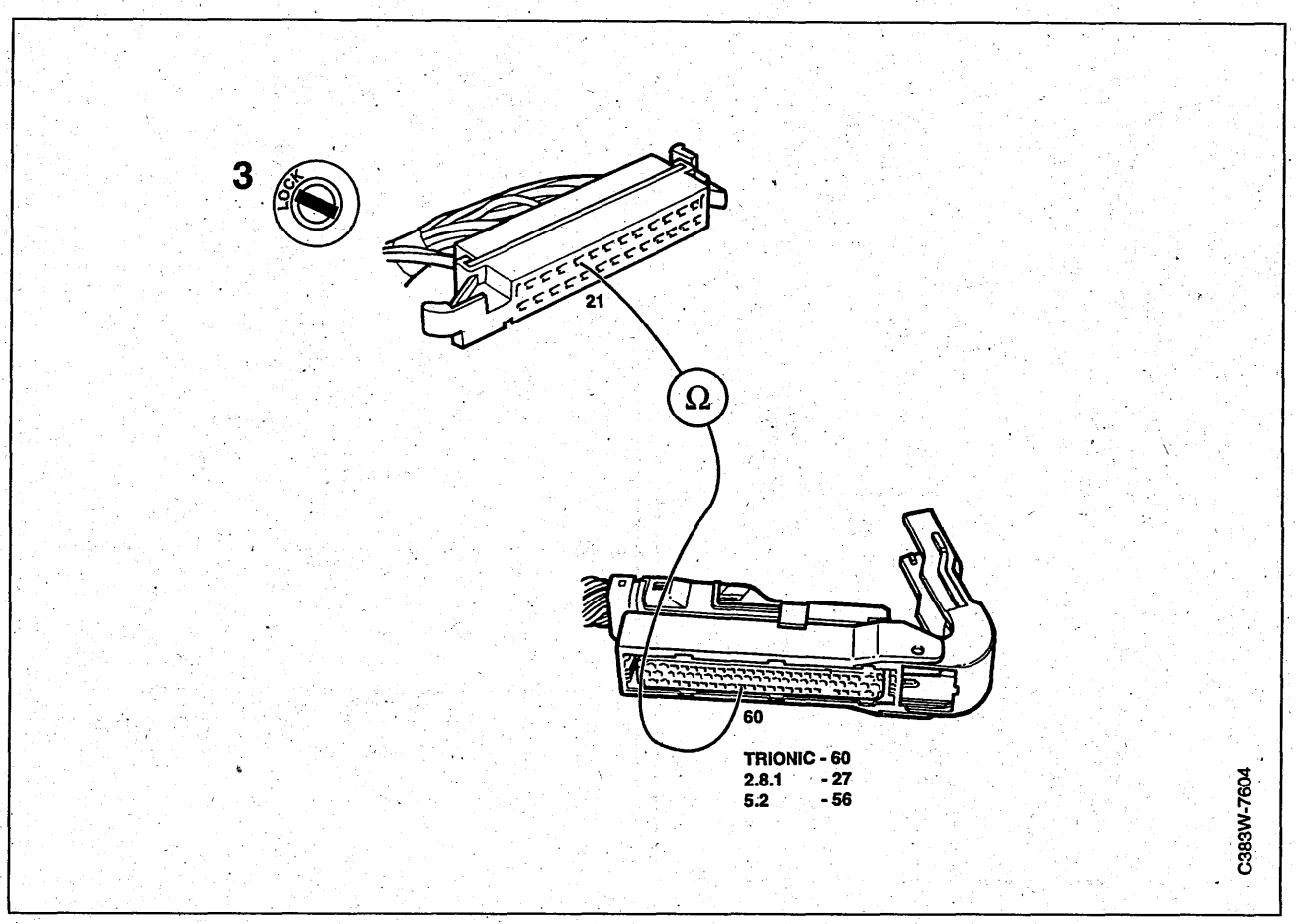
The test lamp should light up.

Does it light up?

YES — Continue fault diagnosis as described in Service Manual 2:7 "Engine management system".

NO — Continue with point 3.

Fault diagnosis, +15 power supply circuit (contd.)



3 **Check the wiring harness**
Check the continuity of the wiring harness between pin 21 of the anti-theft alarm's control module and
- Trionic control module pin 60 (4-cyl.)
- Motronic 2.8.1 control module pin 27 (6-cyl.)
- Motronic 5.2 control module pin 56 (6-cyl. US).

Is the wiring OK?

YES Continue with point 4.

NO Repair or replace the wiring harness.

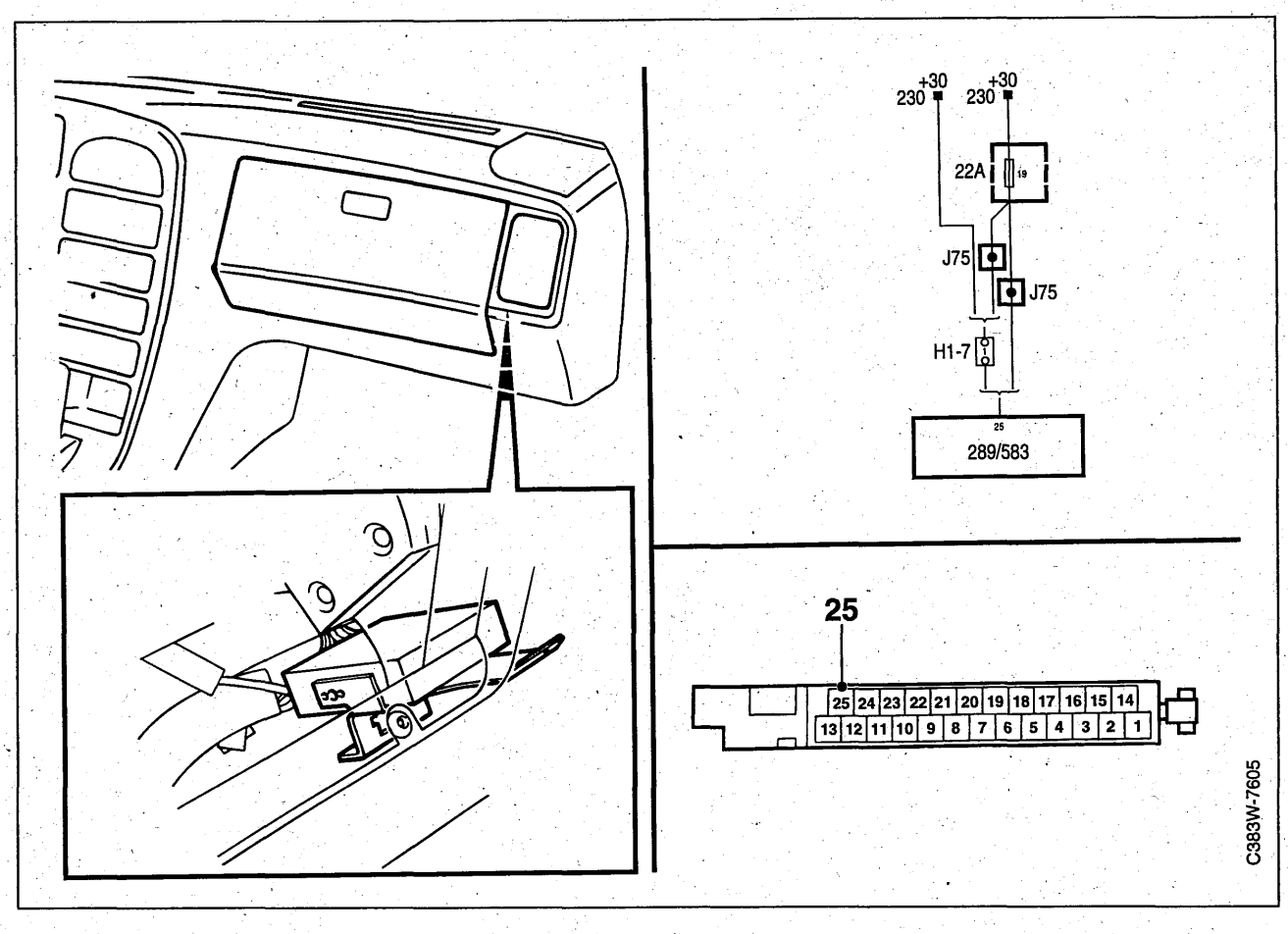
4 **Final test**
Start the car and check to see if the fault symptom persists.

Does the trouble persist?

YES The remedial measure taken was correct or the fault is of intermittent nature.

NO Continue as described on page 158.

Fault diagnosis, +30 power supply circuit



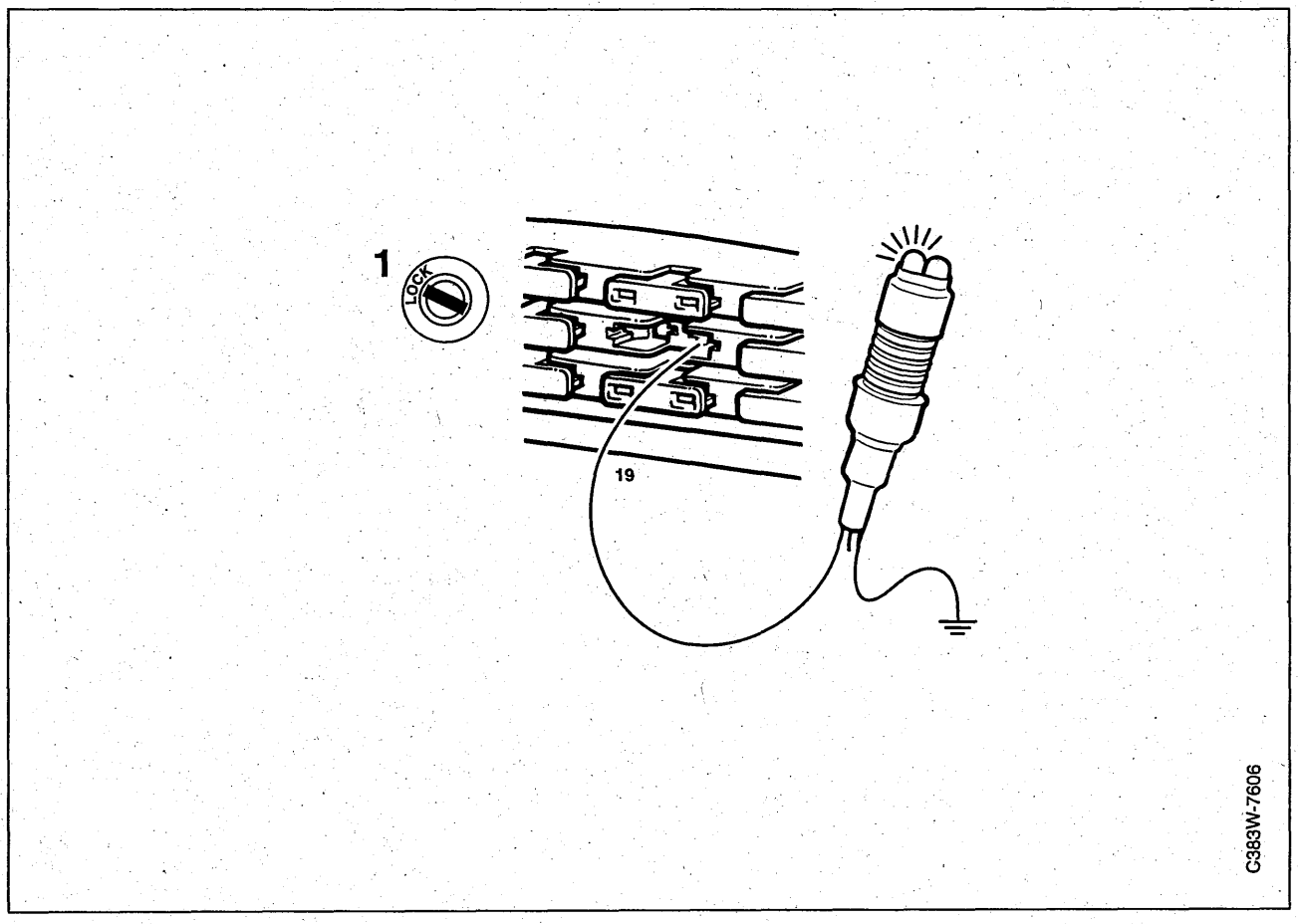
Fault symptom

The anti-theft alarm does not work.

Important

Failure of the power supply (+30 circuit) for the electronic control module will result in total loss of alarm functions.
Check the +30 power supply circuit by arming and disarming the anti-theft alarm.

Fault diagnosis, +30 power supply circuit (contd.)



Diagnostic procedure

1 **Check fuse 19.**

- Check that fuse 19 is intact and live.
- Connect the test lamp to the fuse and a good grounding point.

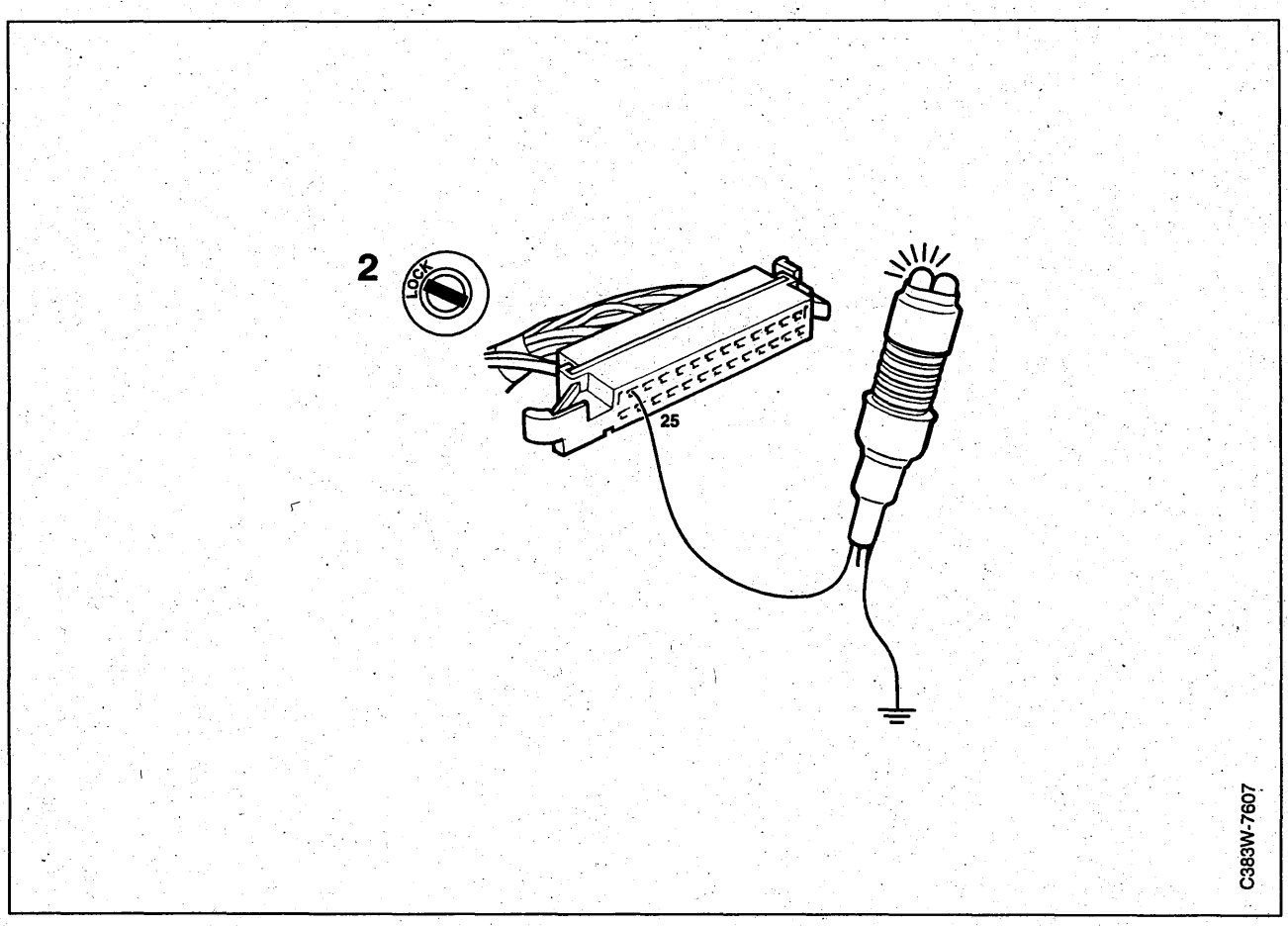
The test lamp should light up.

Does it light up?

YES Continue with point 2.

NO Continue fault diagnosis as described in Service Manual 3:2 "Electrical system, +30 power supply".

Fault diagnosis, +30 power supply circuit (contd.)



2 **Check the wiring connected to the control module.**

- Unplug the control module.
- Inspect the connector for socket slide-out.
- Check that the control module is supplied with power.
- Connect the test lamp to pin 25 of the connector and a good grounding point.

The test lamp should light up.

Does it light up?

YES — Continue with point 3.

NO — Check and rectify the wiring between pin 25 of the connector and fuse 19.

3 **Final test**

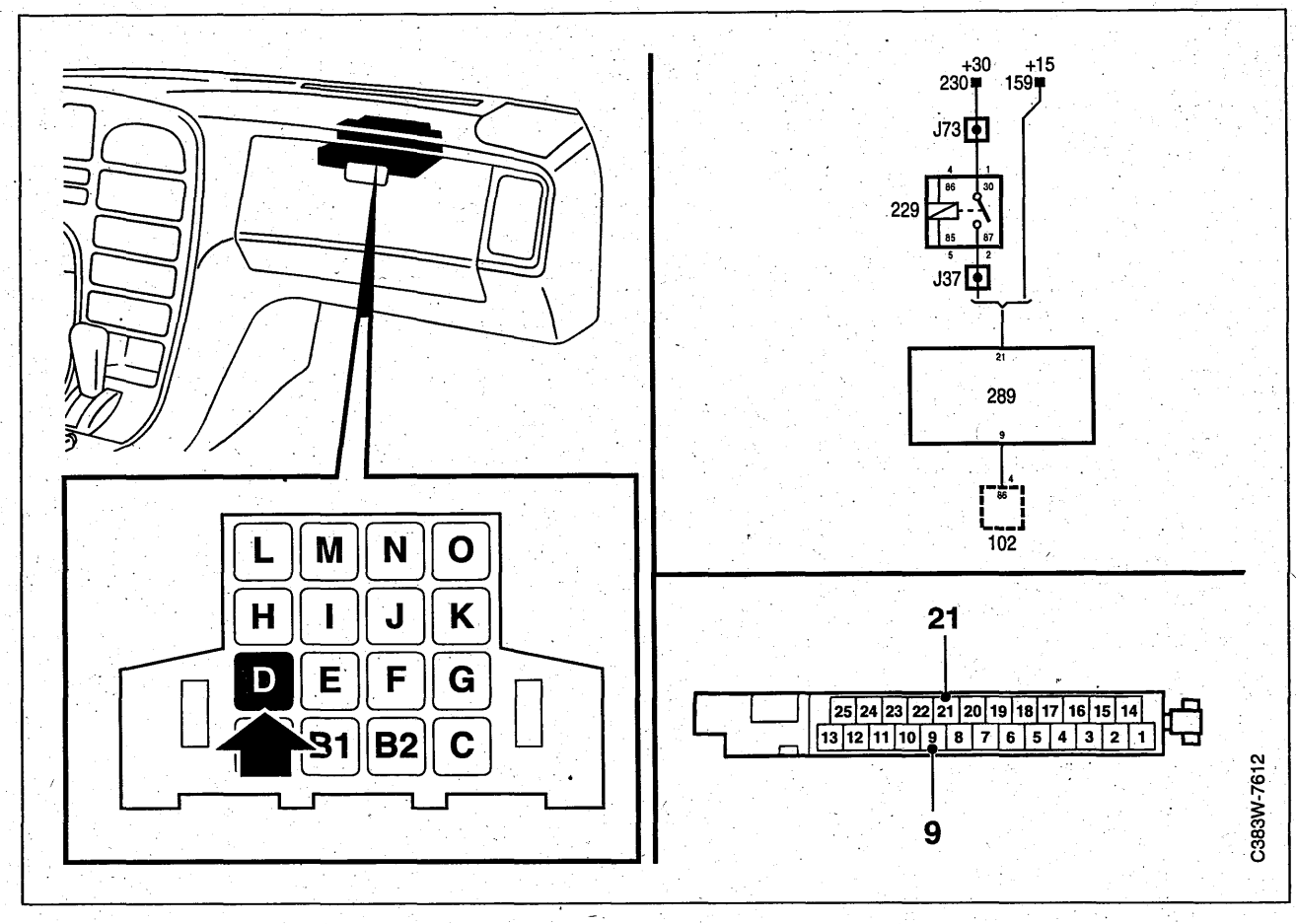
Check to see if the fault symptom persists.

Does the trouble persist?

YES — Continue as described on page 158.

NO — The remedial measure taken was correct or the fault is of intermittent nature.

Fault diagnosis, fuel pump relay



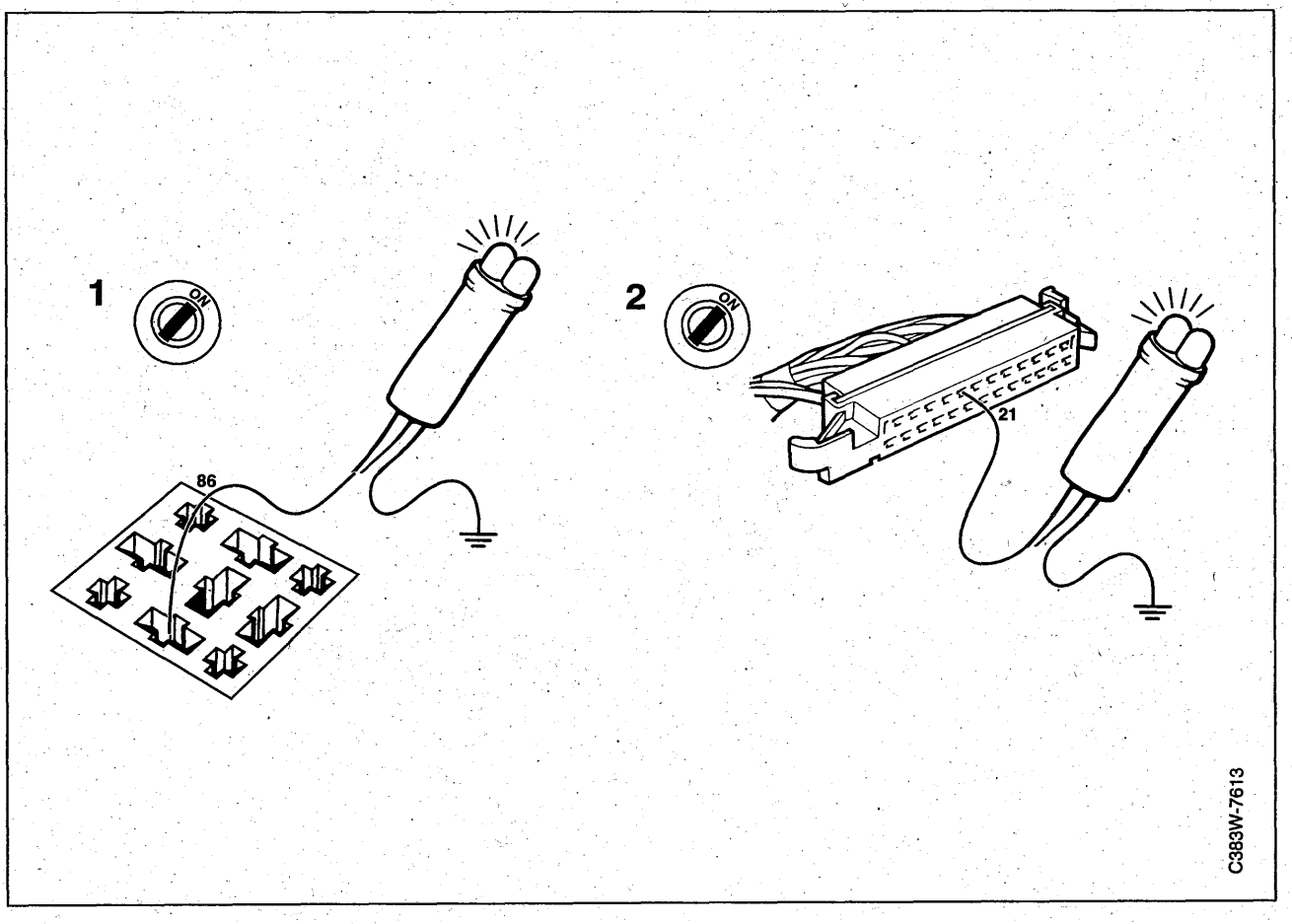
Fault symptom

The fuel pump relay does not work

Important

On 4-cyl. cars the fuel pump relay is supplied with current via the +15 circuit and
on 6-cyl. cars it is supplied with current via the +30 circuit.

Fault diagnosis, fuel pump relay (contd.)



Diagnostic procedure

1 **Check the fuel pump relay's power supply**

- Unplug the fuel pump relay.
- Connect the test lamp to pin 86 of the relay socket and a good grounding point.
- The alarm should be disarmed.
- Ignition switch "ON" (+15).

The test lamp should light up.

Does it light up?

YES Continue fault diagnosis as described in Service Manual 2:7 "Engine management system", Trionic (4-cyl. cars) or Motronic (6-cyl. cars).

NO Continue with point 2.

2 **Check the control module's power supply (+15/+30 circuits)**

- Remove the anti-theft alarm's control module.
- Connect the test lamp to pin 21 of the control module connector and a good grounding point.
- Ignition switch "ON" (+15).

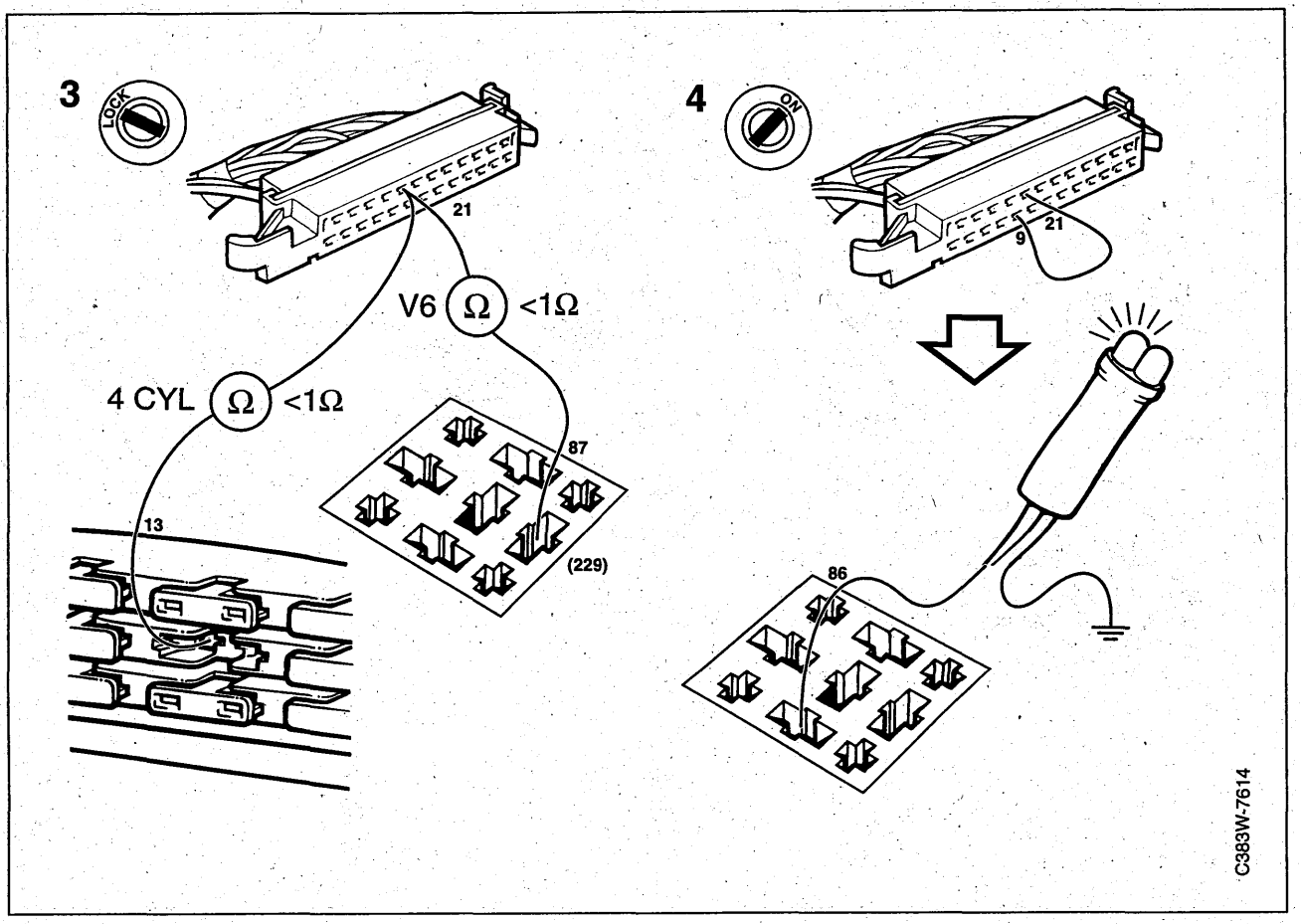
The test lamp should light up.

Does it light up?

YES Continue with point 4.

NO Continue with point 3.

Fault diagnosis, fuel pump relay (contd.)



3 **Check the wiring**
Check the continuity of the wiring between pin 21 of the control module's connector and:

- pin 87 of the main relay (6-cyl.)
- fuse 13 (4-cyl.)

The resistance should be < 1 ohm.

Is the resistance OK?

YES Continue with point 4.

NO Repair or replace the wiring harness.

4 **Check the operation of the electronic control module**

- Connect a jumper lead between pins 21 and 9 of the control module connector.
- Connect a test lamp to pin 86 of the connector and a good grounding point.
- Ignition switch "ON" (+15).

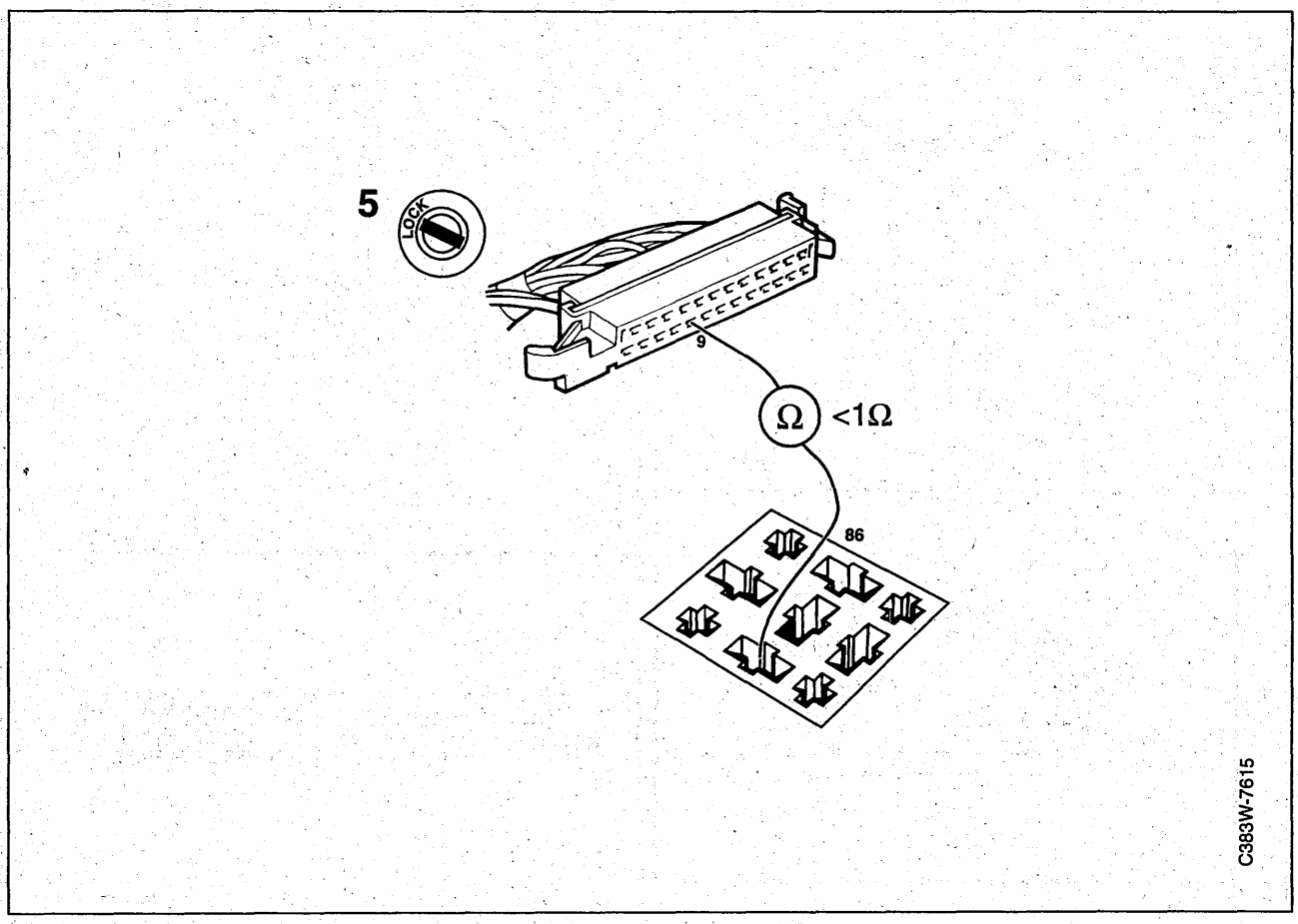
The test lamp should light up.

Does it light up?

YES Proceed to point 6.

NO Continue with point 5.

Fault diagnosis, fuel pump relay (contd.)



5 **Check the wiring**
Check the continuity of the wiring between pin 9 of the control module connector and pin 86 of the fuel pump relay.

The resistance should be < 1 ohm.

Is the resistance OK?

YES Proceed to point 6.

NO Repair or replace the wiring harness.

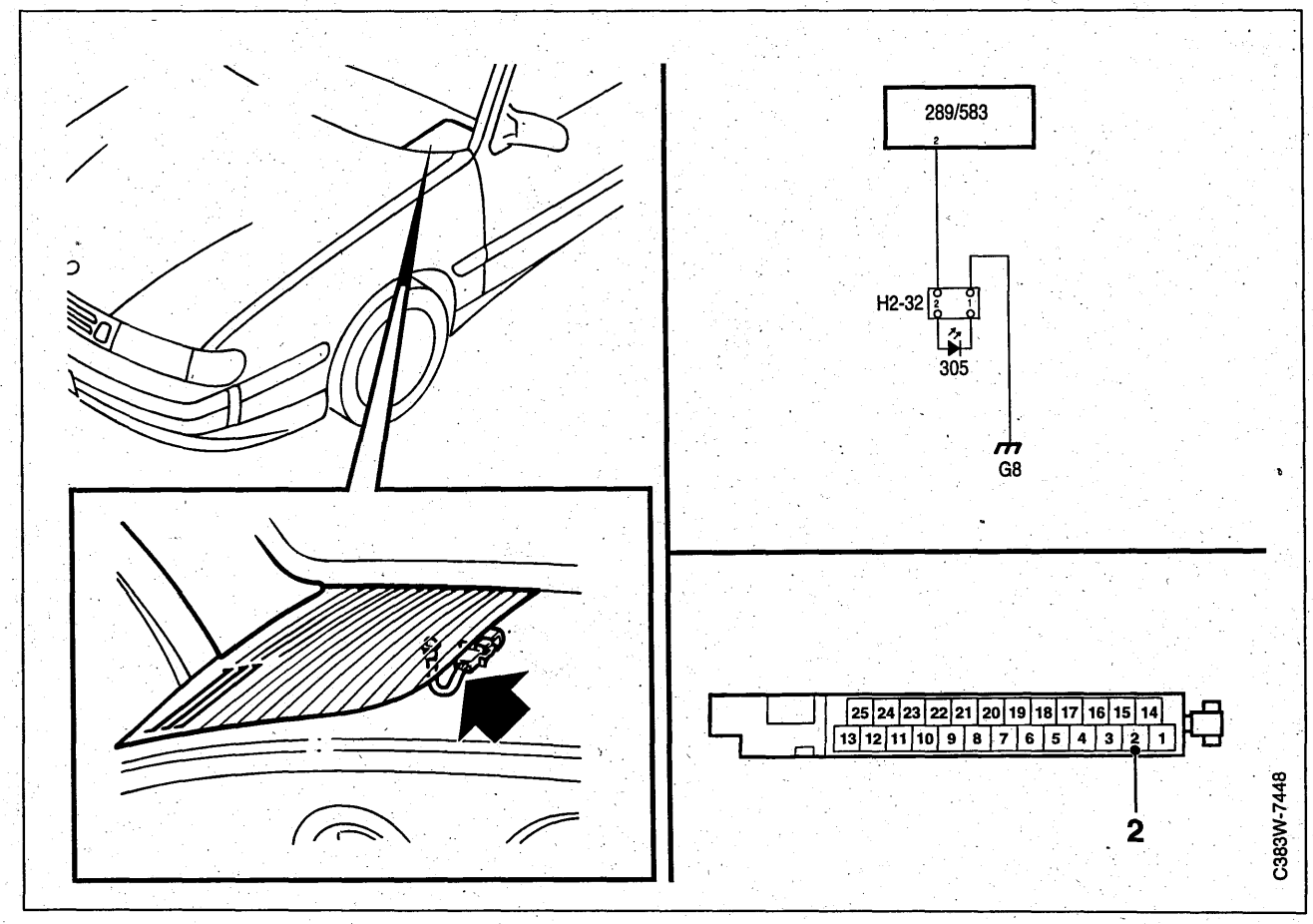
6 **Final test**
- Start the car.
- Check to see if the fault symptom persists.

Does the trouble persist?

YES Continue as described on page 158.

NO The remedial measure taken was correct or the fault is of intermittent nature.

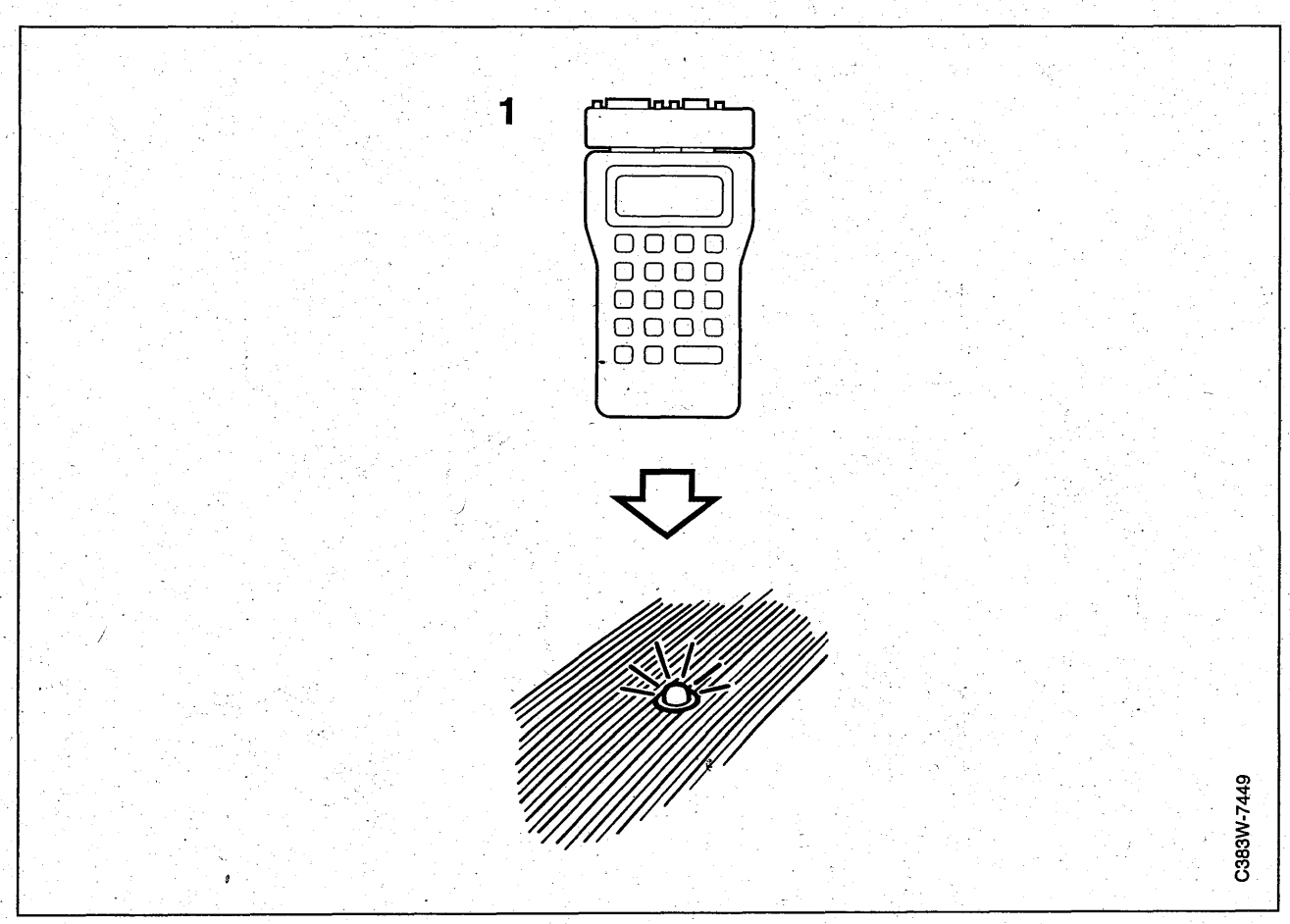
Fault diagnosis, LED



Fault symptom

The LED does not light up

Fault diagnosis, LED (contd.)



Diagnostic procedure

1 **Check the operation of the LED**

- Connect an ISAT scan tool.
- Select "ACTIVATE".
- Select "LED"
- Select "ON".

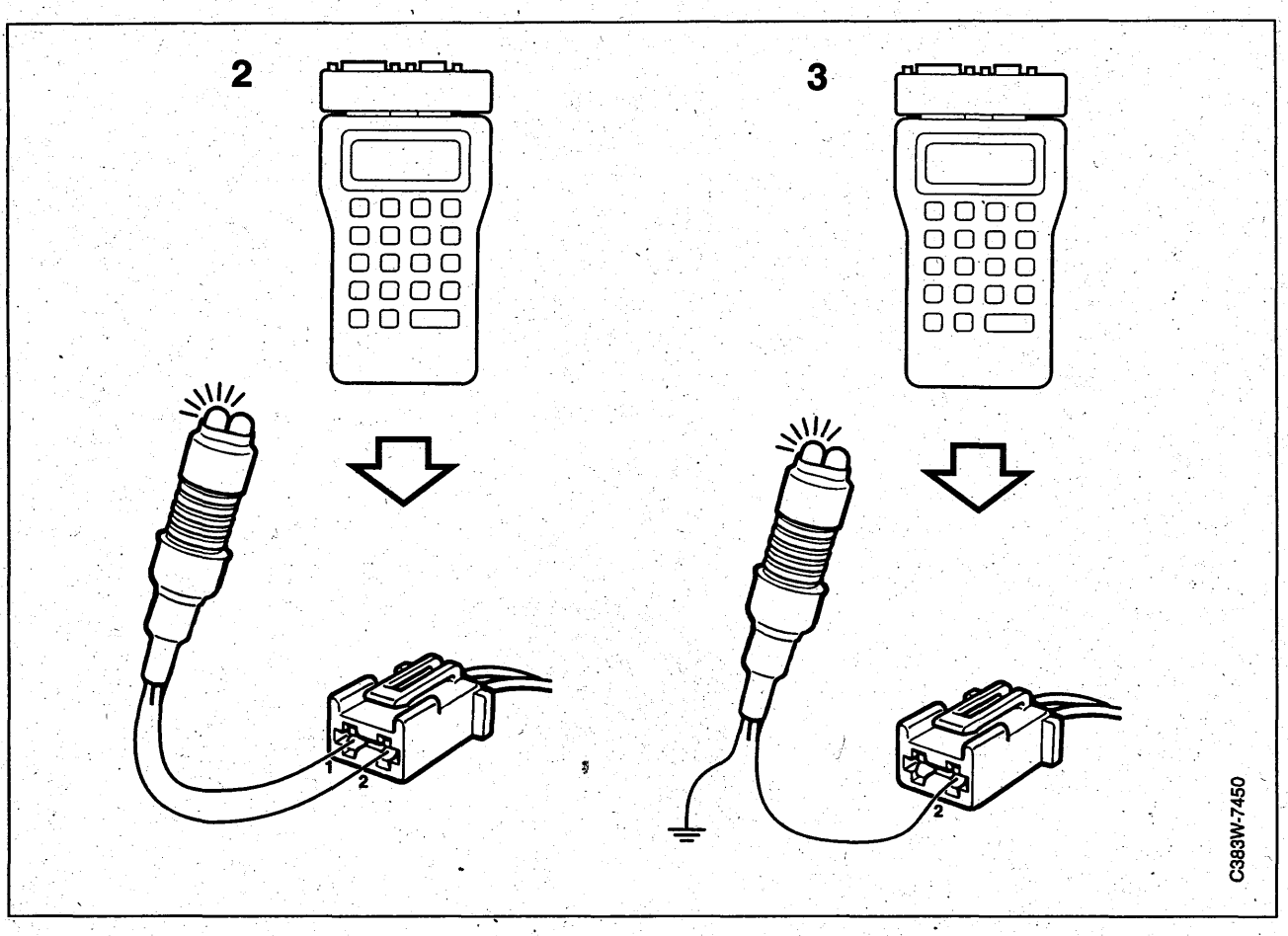
The LED should light up.

Does the LED light up?

YES — The fault is of intermittent nature, proceed to point 5.

NO — Continue with point 2.

Fault diagnosis, LED (contd.)



2 **Check the LED's power supply**

- Unplug the LED.
- Connect the test lamp to the LED's 2-pin connector.
- Activate "LED" with the ISAT scan tool.

The test lamp should light up.

Does it light up?

YES Change the LED.

NO Continue with point 3.

3 **Check the LED's power supply**

- Connect the test lamp to pin 2 of the LED's 2-pin connector and a good grounding point.
- Activate "LED" with the ISAT scan tool.

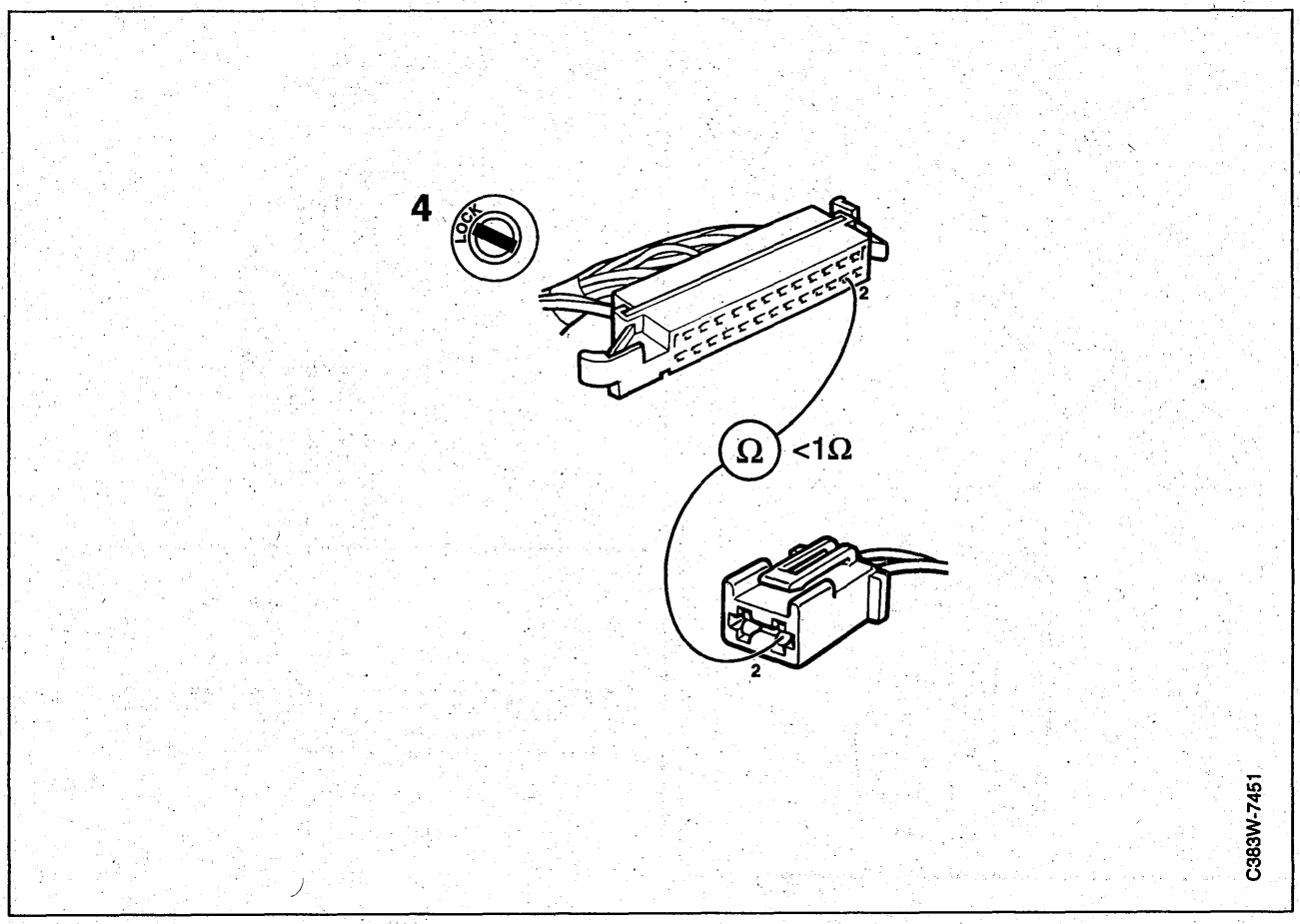
The test lamp should light up.

Does it light up?

YES Repair or replace the ground cable between pin 1 of the LED's 2-pin connector and grounding point G8.

NO Continue with point 4.

Fault diagnosis, LED (contd.)



4 Check the wiring
Check the continuity of the wiring between pin 2 of the LED's connector and pin 2 of the control module.

The resistance should be < 1 ohm.

Is the resistance OK?

YES Continue with point 5.

NO Repair or replace the wiring harness.

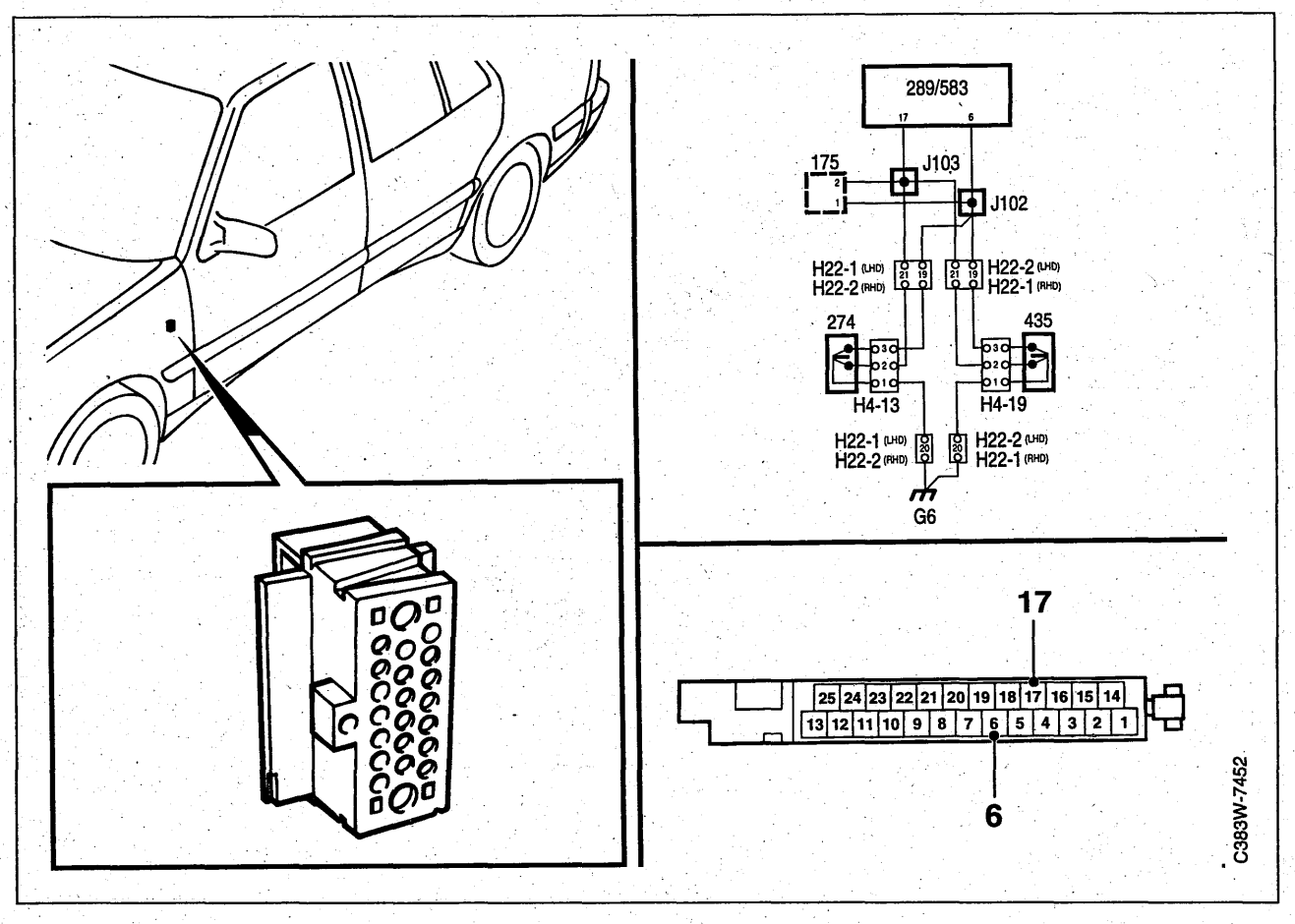
5 Final test
Check to see if the fault symptom persists.

Does the trouble persist?

YES Continue as described on page 158.

NO The remedial measure taken was correct or the fault is of intermittent nature.

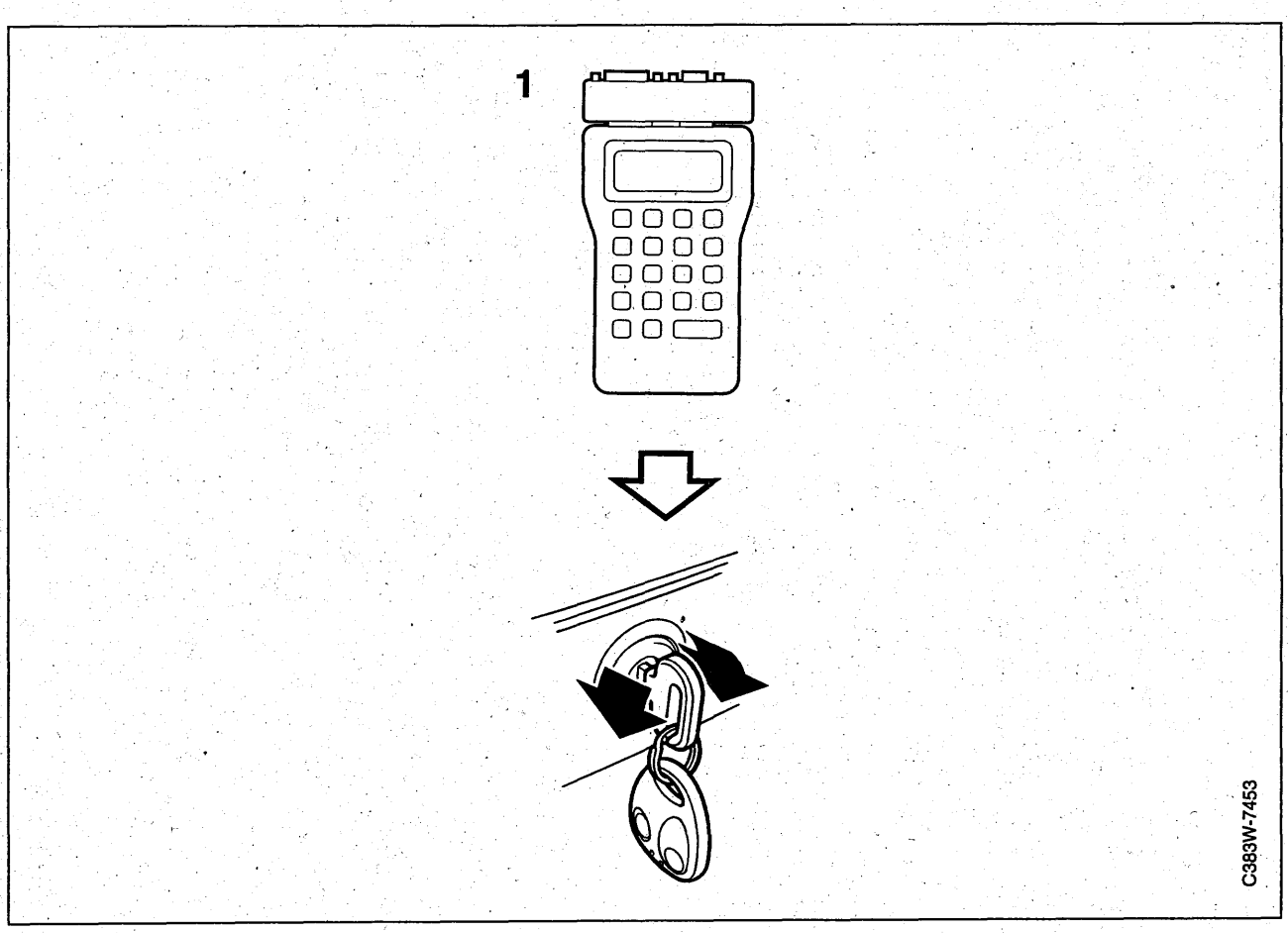
Fault diagnosis, door switches, central locking system



Fault symptom

The central locking system does not work.

Fault diagnosis, door switches in central locking system (contd.)



Diagnostic procedure

1 **Check the operation of the central locking system**

- Connect an ISAT scan tool.
- Select "READ VALUES".
- Select "LOCK SIGNAL" or "UNLOCK SIGNAL".
- Lock or unlock the central locking system using the door key lock.

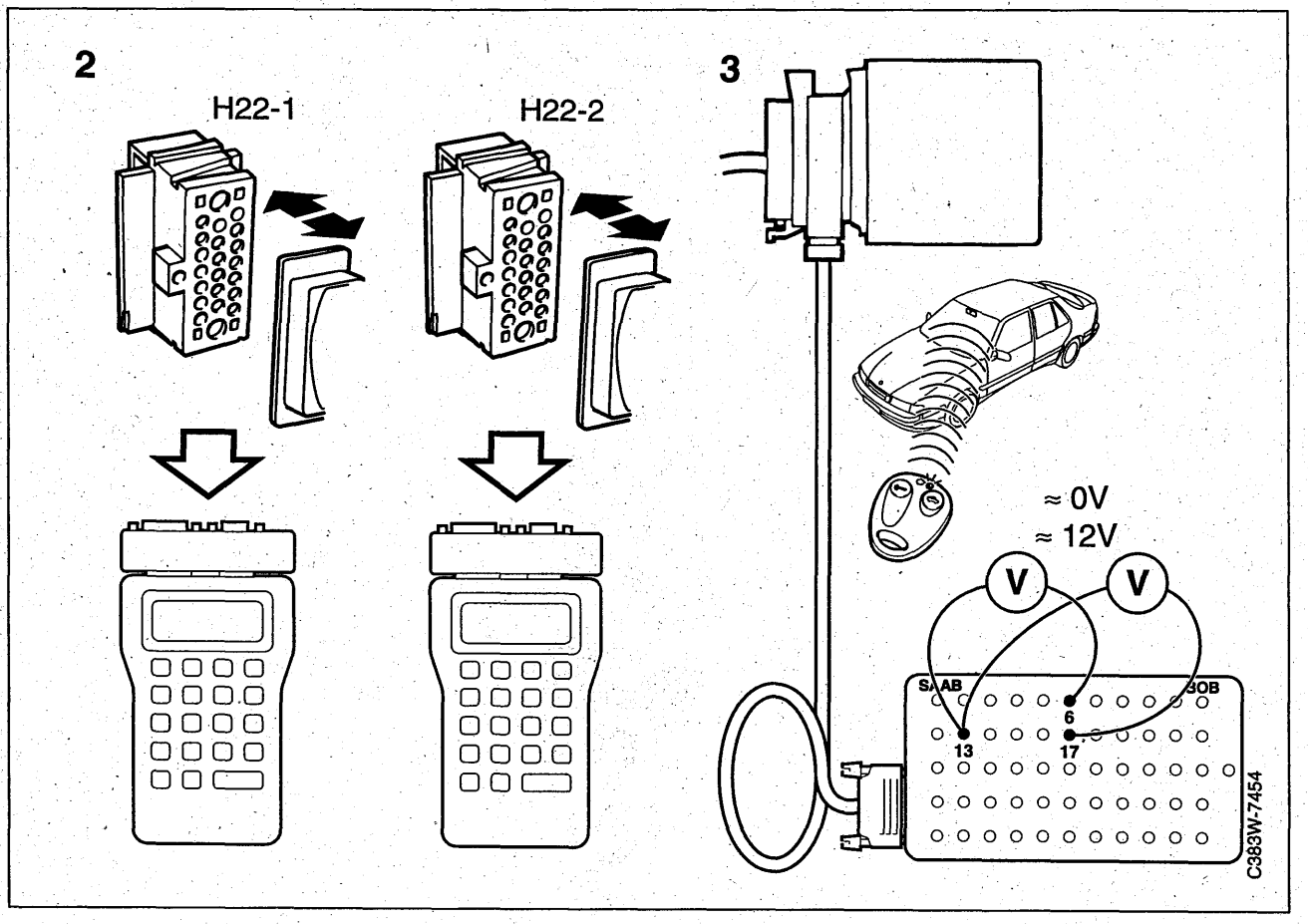
The ISAT scan tool should display "INACTIVE" when the key is in its normal position and "ACTIVE" when the key is turned.

Does it display correct readings for the locked and unlocked central locking system?

YES Continue with point 5.

NO Continue with point 2.

Fault diagnosis, door switches in central locking system (contd.)



2 **Check the operation of the central locking system (contd.)**

- Unplug connector H22-1.
- Select "LOCK SIGNAL" or "UNLOCK SIGNAL".

When the connector is unplugged the ISAT scan tool should show "INACTIVE".

Does the ISAT scan tool show "INACTIVE"?

YES — Continue with point 3.

NO — Unplug connector H22-2 and enter the same ISAT scan tool command again. When the connector is unplugged the ISAT scan tool should show "ACTIVE".

3 **Check the voltage levels**

- Connect a BOB.
- Check the voltage by taking readings across:
  - pins 17 and 13 of the control module when locking the central locking system.
  - pins 6 and 13 of the control module when unlocking the central locking system.

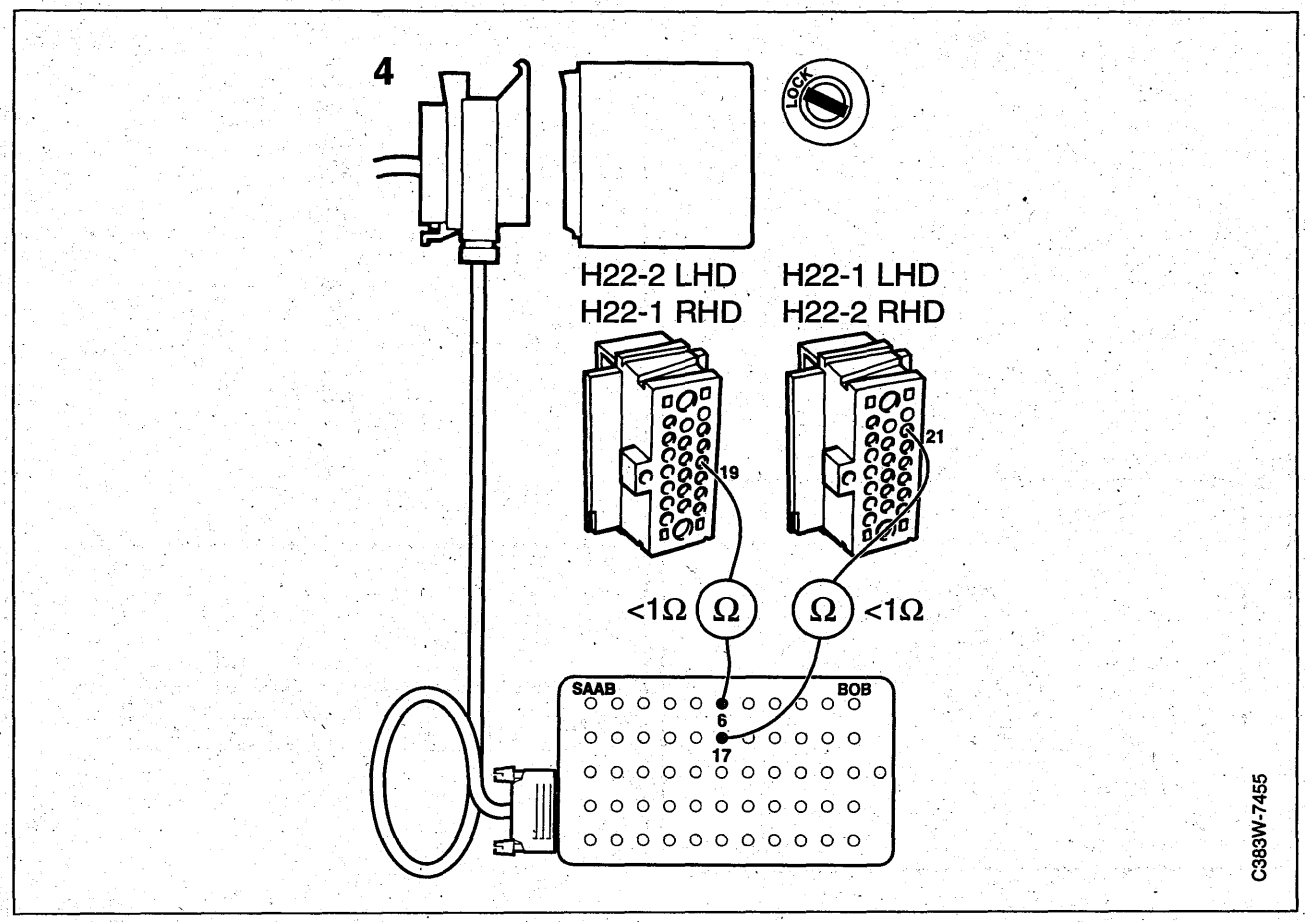
The voltage reading obtained should be about 7 V to battery positive (Batt+) and dip to about 0 V for 750 ms. See the test readings for pins 17 and 6 of the control module connectors.

Is the voltage reading OK?

YES — Continue with point 5.

NO — Continue with point 4.

Fault diagnosis, door switches in central locking system (contd.)



4 **Check the wiring**
Check the wiring harness for continuity between:

- pin 17 of the control module and
  - connector H22-1, pin 21 (LHD)
  - connector H22-2, pin 21 (RHD)
- pin 6 of the control module and
  - connector H22-2, pin 19 (LHD)
  - connector H22-1, pin 19 (RHD)

The resistance should be < 1 ohm.

Is the resistance OK?

YES Continue with point 5.

NO Repair or replace the wiring harness.

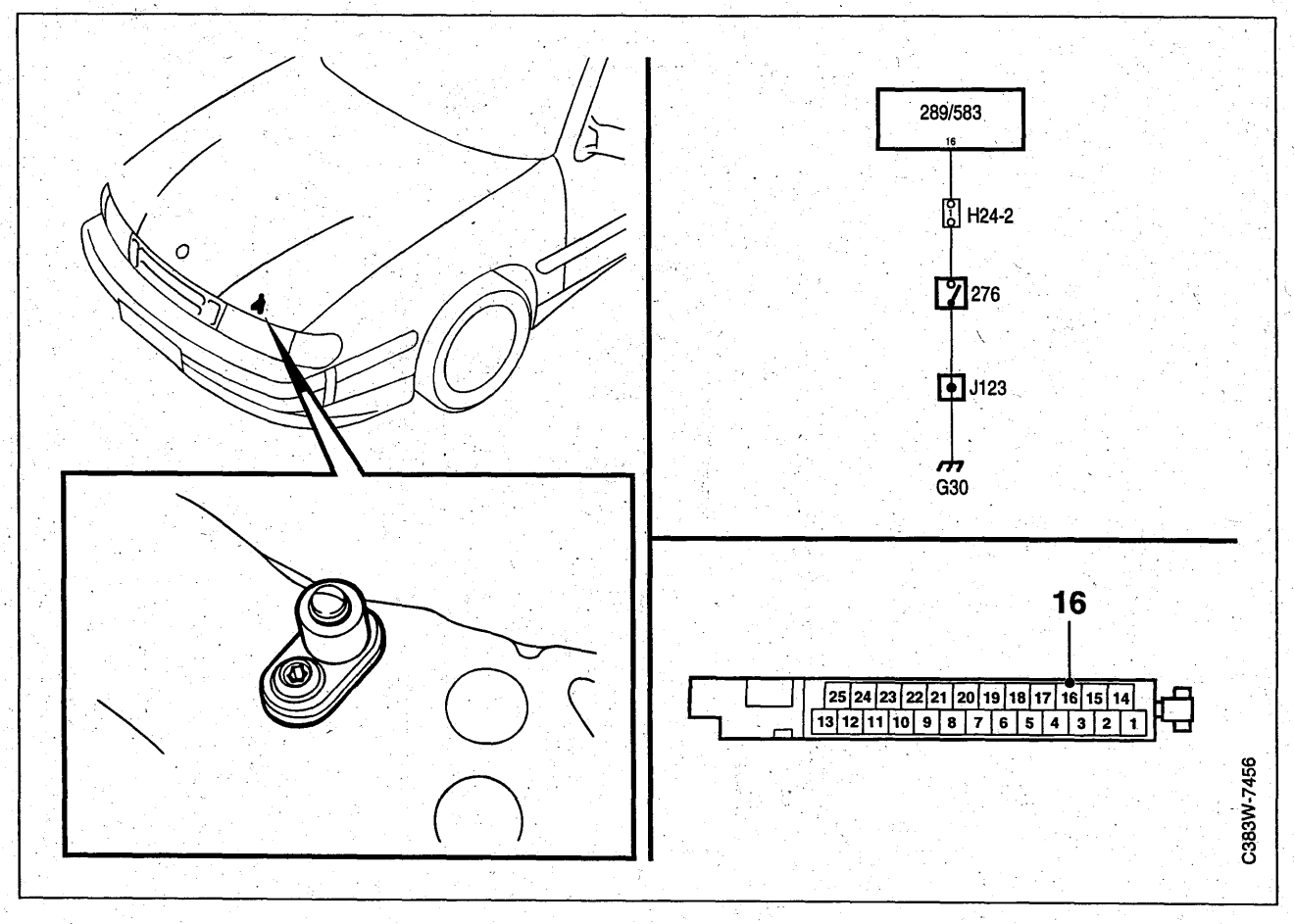
5 **Final test**
Check to see if the fault symptom persists.

Does the trouble persist?

YES Continue as described on page 158.

NO The remedial measure taken was correct or the fault is of intermittent nature.

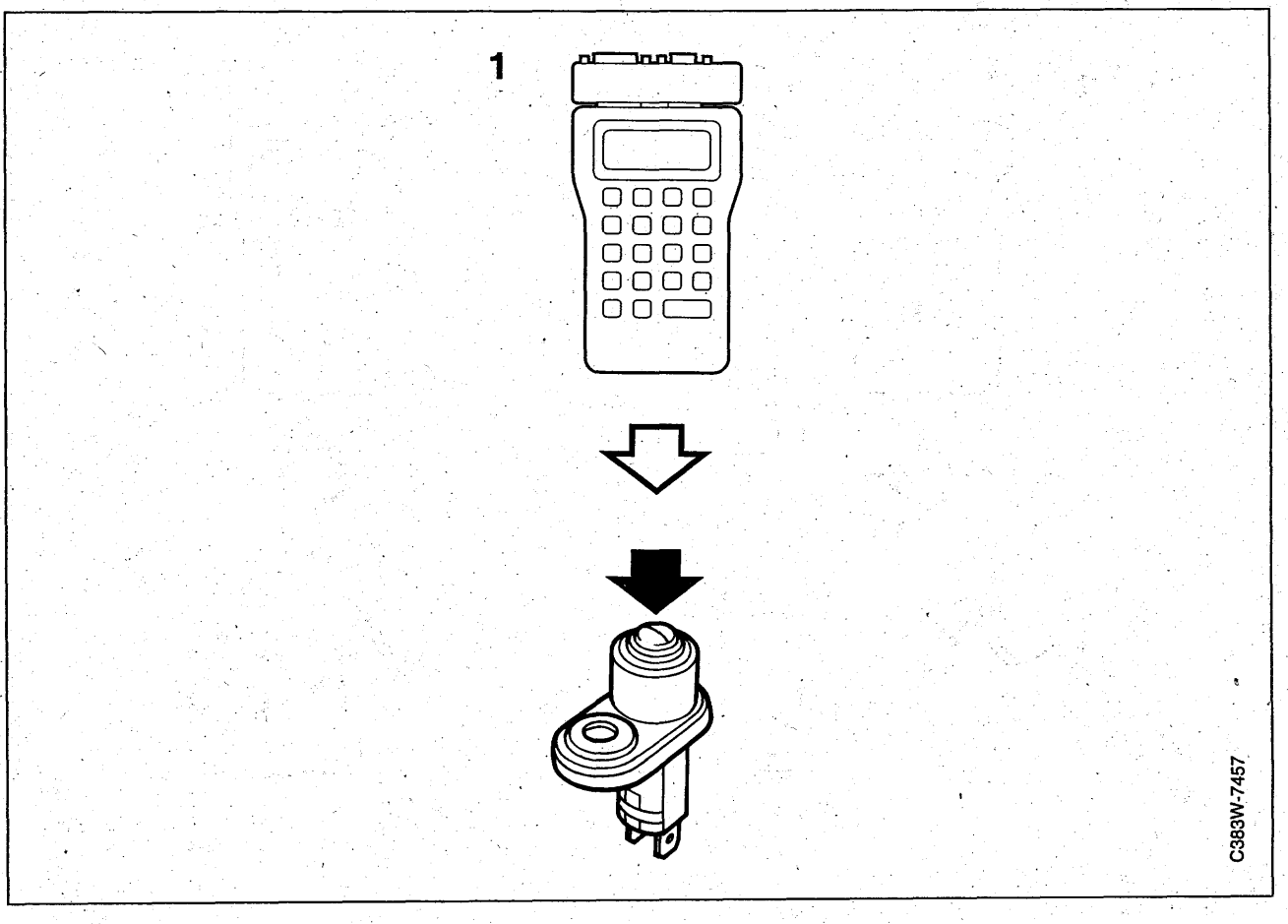
Fault diagnosis, bonnet switch



Fault symptom

The alarm does not sound when the bonnet is opened with the alarm armed.

Fault diagnosis, bonnet switch (contd.)



Diagnostic procedure

1 **Check the operation of the bonnet switch**

- Connect an ISAT scan tool.
- Select "READ VALUES".
- Select "BONNET".
- Open and close the bonnet, observing the ISAT scan tool display at the same time.

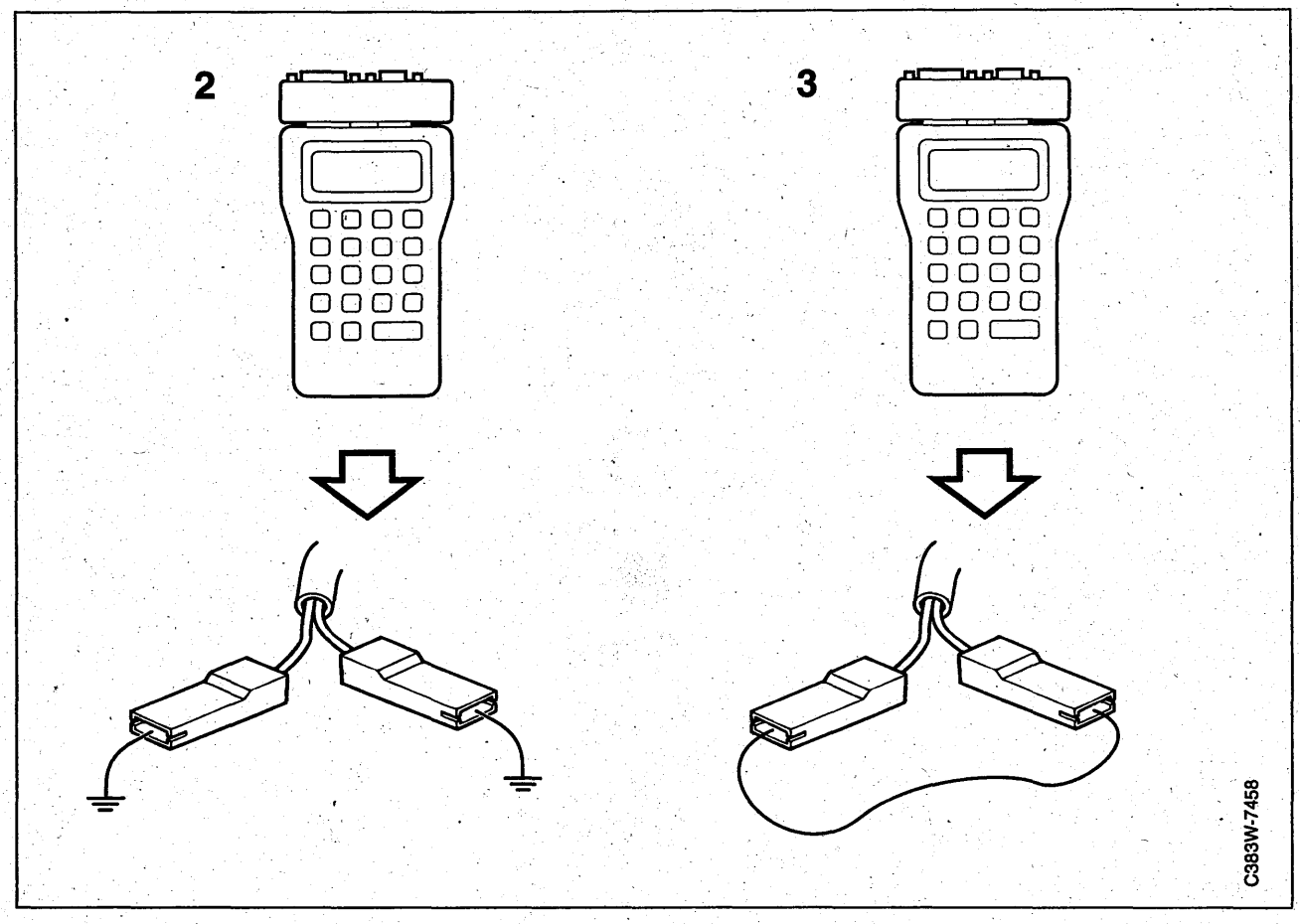
The ISAT scan tool display should read "OPEN" and "CLOSED" as appropriate.

Does it display the correct readings?

YES The fault is of intermittent nature, proceed to point 5.

NO Continue with point 2.

Fault diagnosis, bonnet switch (contd.)



2 **Check the current, bonnet open and closed**

- Unplug the connector from the bonnet switch.
- Ignition switch "ON" (+15).
- Select "BONNET" with the ISAT scan tool.

When the connector is unplugged, the ISAT scan tool should display "OPEN".
Connect a jumper lead between the relevant connector pin and a good grounding point.
The ISAT scan tool should display "CLOSED".

Does it display "CLOSED"?

YES Continue with point 3.

NO Continue with point 4.

3 **Check the bonnet switch**

- Select "BONNET".
- Connect jumper lead between the two connector pins.

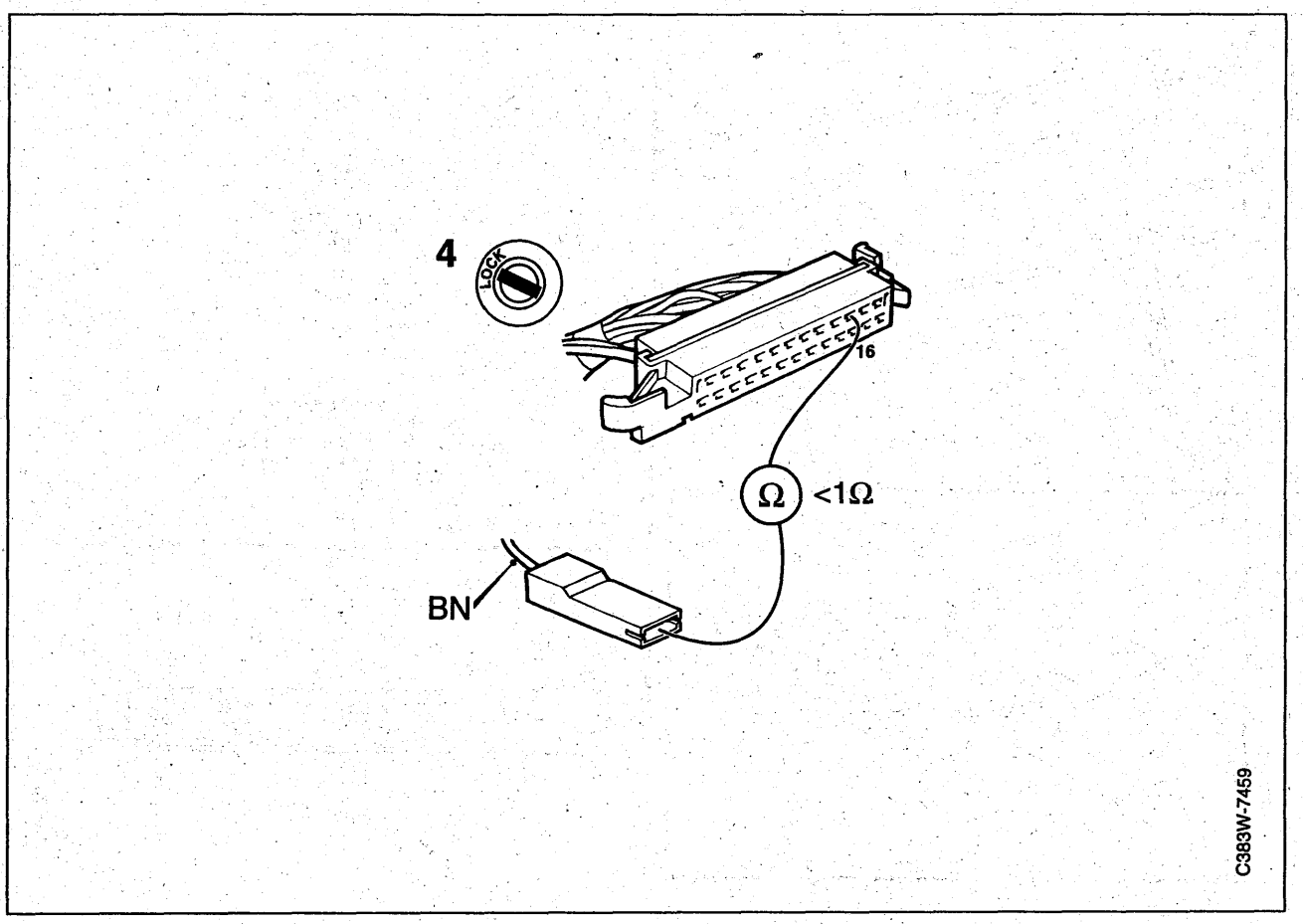
The ISAT scan tool should display "CLOSED".

Does the ISAT scan tool display "CLOSED"?

YES Change the bonnet switch.

NO Check for continuity, and take remedial action if necessary, between pin 2 of the bonnet switch and grounding point G30.

Fault diagnosis, bonnet switch (contd.)



4 **Check the wiring**
Check the wiring harness for continuity between pin 1 of the bonnet switch connector and pin 16 of the anti-theft alarm's control module.

The resistance should be < 1 ohm.

Is the resistance OK?

YES Continue with point 5.

NO Repair or replace the wiring harness.

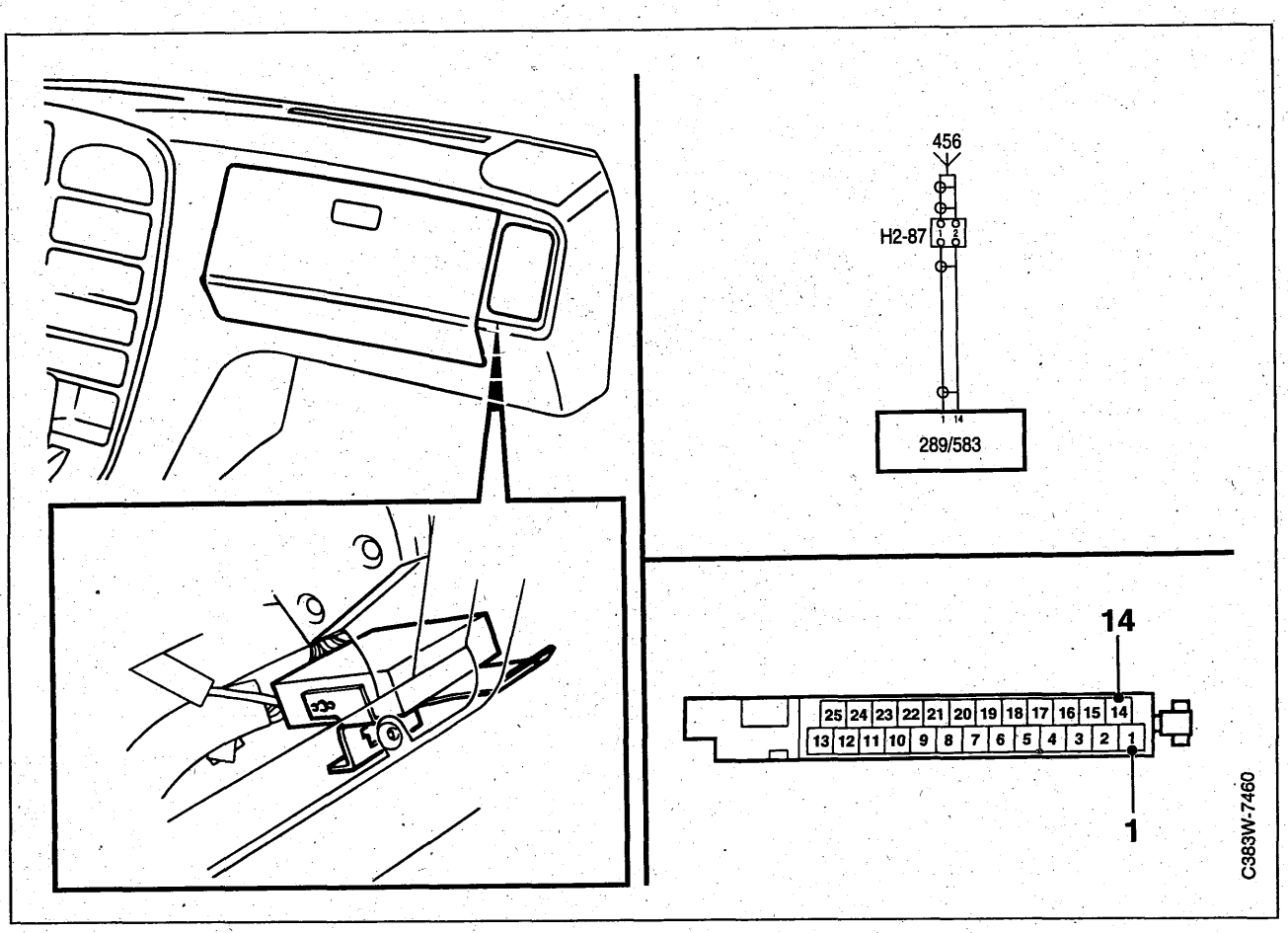
5 **Final test**
Check to see if the fault symptom persists.

Does the trouble persist?

YES Continue as described on page 158.

NO The remedial measure taken was correct or the fault is of intermittent nature.

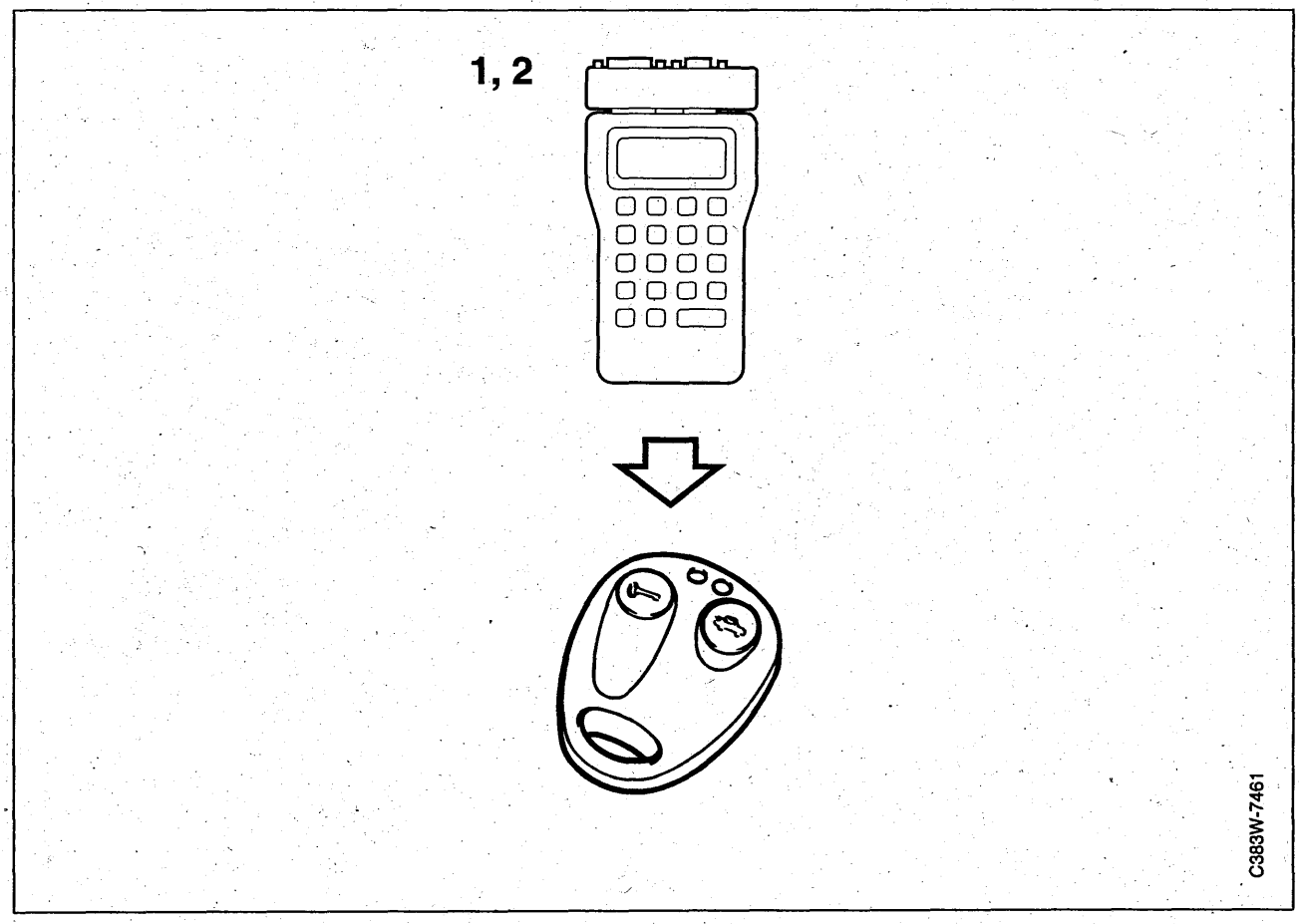
Fault diagnosis, remote control unit



Fault symptom

The remote control does not work.

Fault diagnosis, remote control (contd.)



Diagnostic procedure

1 **Check the operation of the remote control**

- The driver's door should be closed.
- Connect an ISAT scan tool.
- Select "READ VALUES".
- Select "REMOTE CONTROL".
- Press the left-hand/right-hand button, observing the ISAT scan tool's display at the same time.

The ISAT scan tool should display "LH BUTTON" or "RH BUTTON" as appropriate, and "NO BUTTON" in the normal position.

Does it show the correct reading?

YES Continue with point 5.

NO Continue with point 2.

2 **Try again using a new remote control unit.**

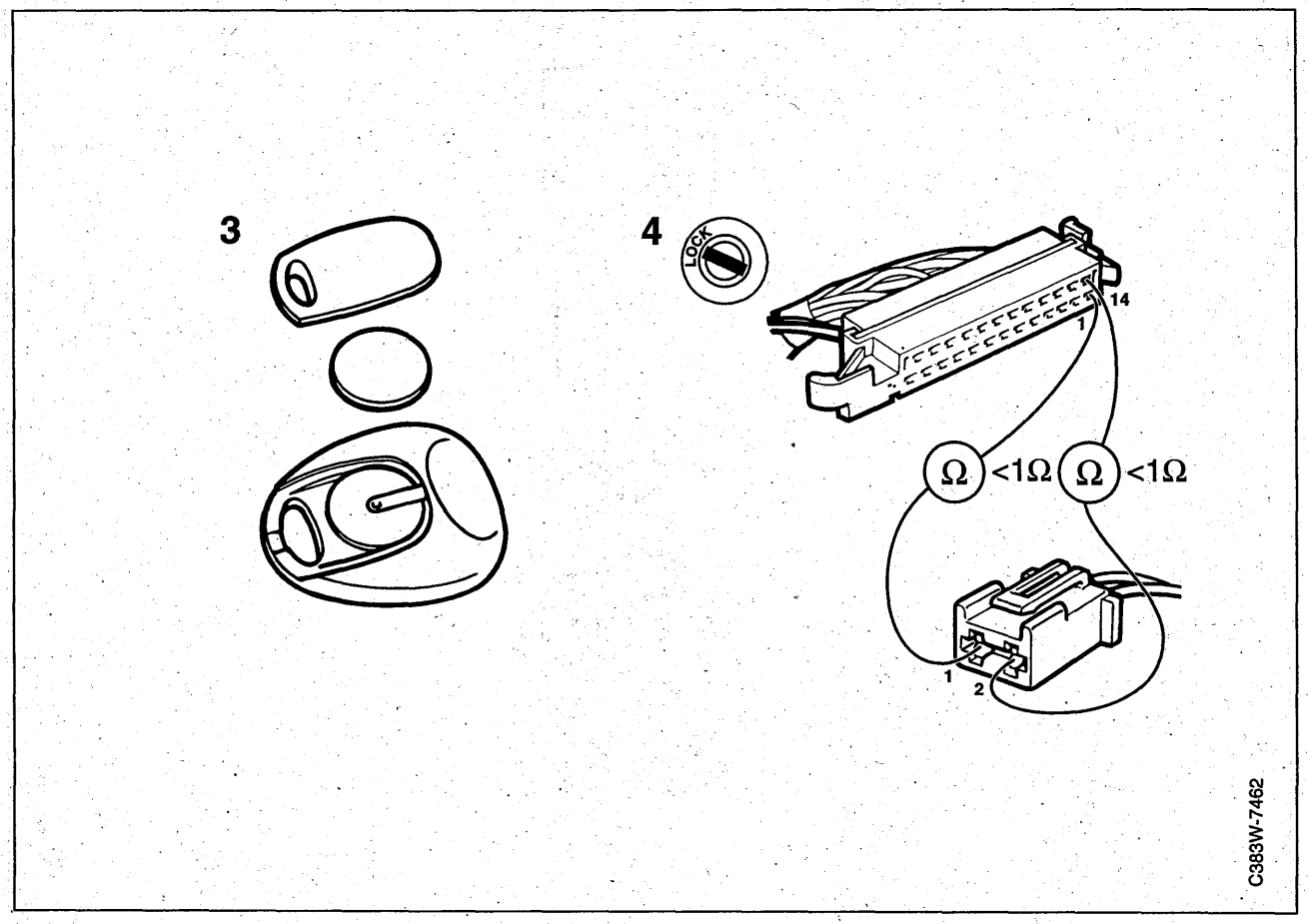
- Program the remote control.
- Repeat the ISAT scan tool commands as in point 1.

Does the remote control work?

YES Continue with point 3.

NO Continue with point 4.

Fault diagnosis, remote control (contd.)



3 **Check the old remote control unit**

- Change the batteries.
- Try the remote control to see whether it works.
- Repeat the ISAT scan tool commands as in point 1.

Does the remote control work?

YES The remedial measure taken was correct or the fault is of intermittent nature.

NO Change the remote control..

4 **Check the aerial cable**

Check the wiring harness for continuity between:

- connector H2-87, pin 1, and the alarm control module, pin 1.
- Connector H2-87, pin 2, and the alarm control module, pin 14.

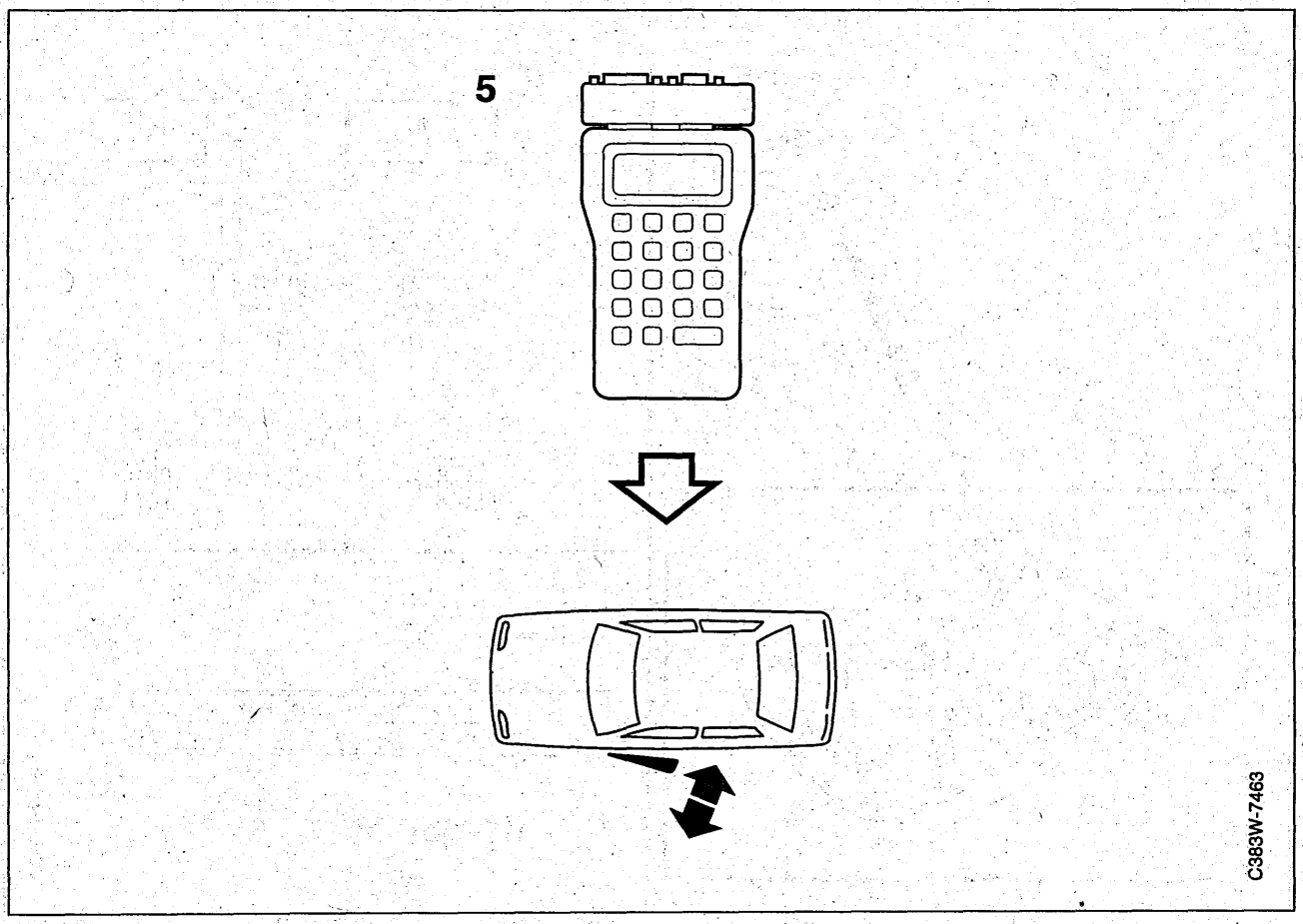
The resistance should be < 1 ohm.

Is the resistance OK?

YES Proceed to point 6.

NO Repair or replace the wiring harness.

Fault diagnosis, remote control (contd.)



5 **Check the driver's door switch**

- Select "PICTOGRAM SWITCH".
- Open and close the driver's door.

The ISAT scan tool display should read "OPEN" and "CLOSED" as appropriate.

Does it display the correct readings?

YES Proceed to point 6.

NO Proceed to "Fault diagnosis, door indication, driver's door".

6 **Final test**

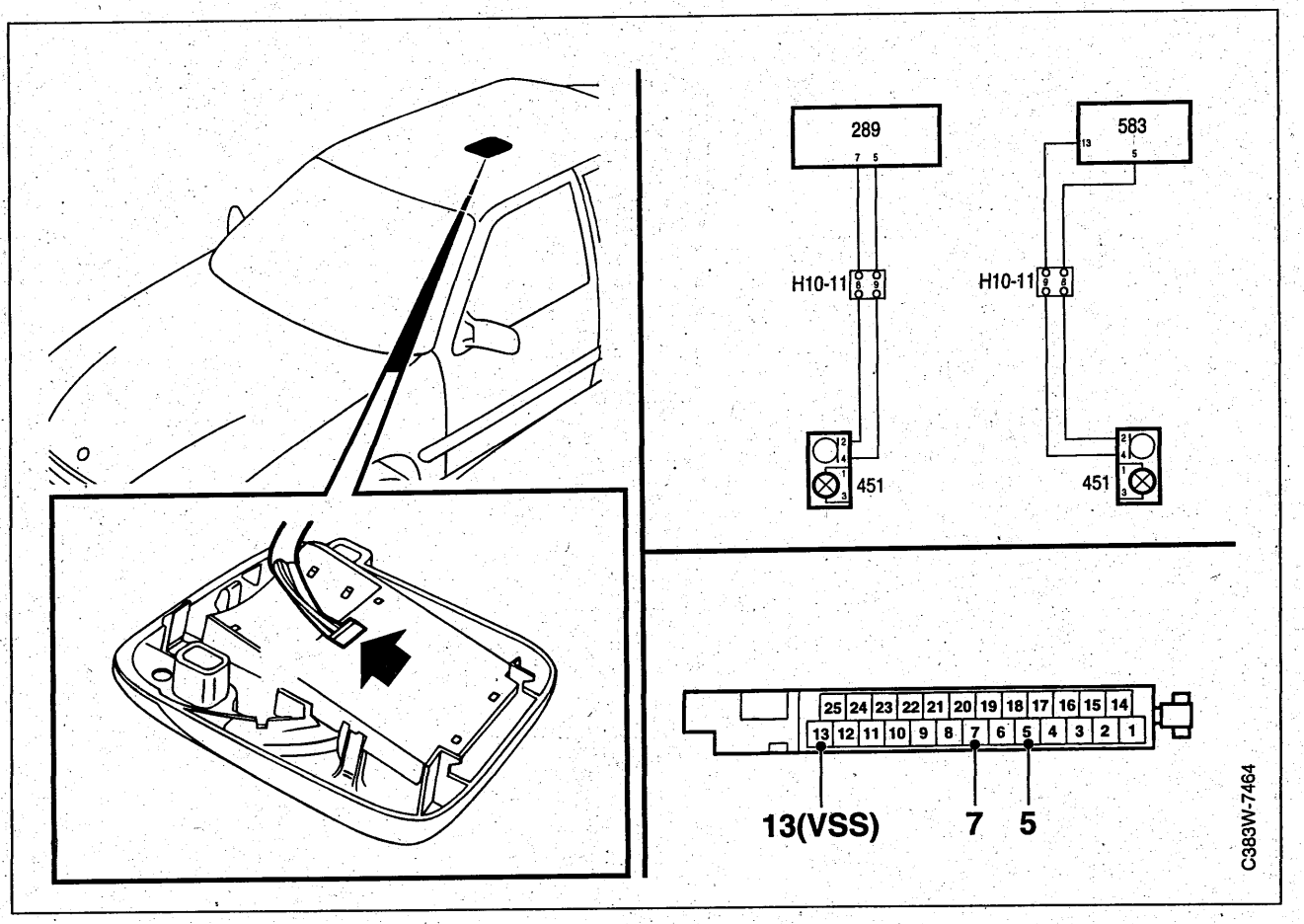
Check to see if the fault symptom persists.

Does the trouble persist?

YES Continue as described on page 158.

NO The remedial measure taken was correct or the fault is of intermittent nature.

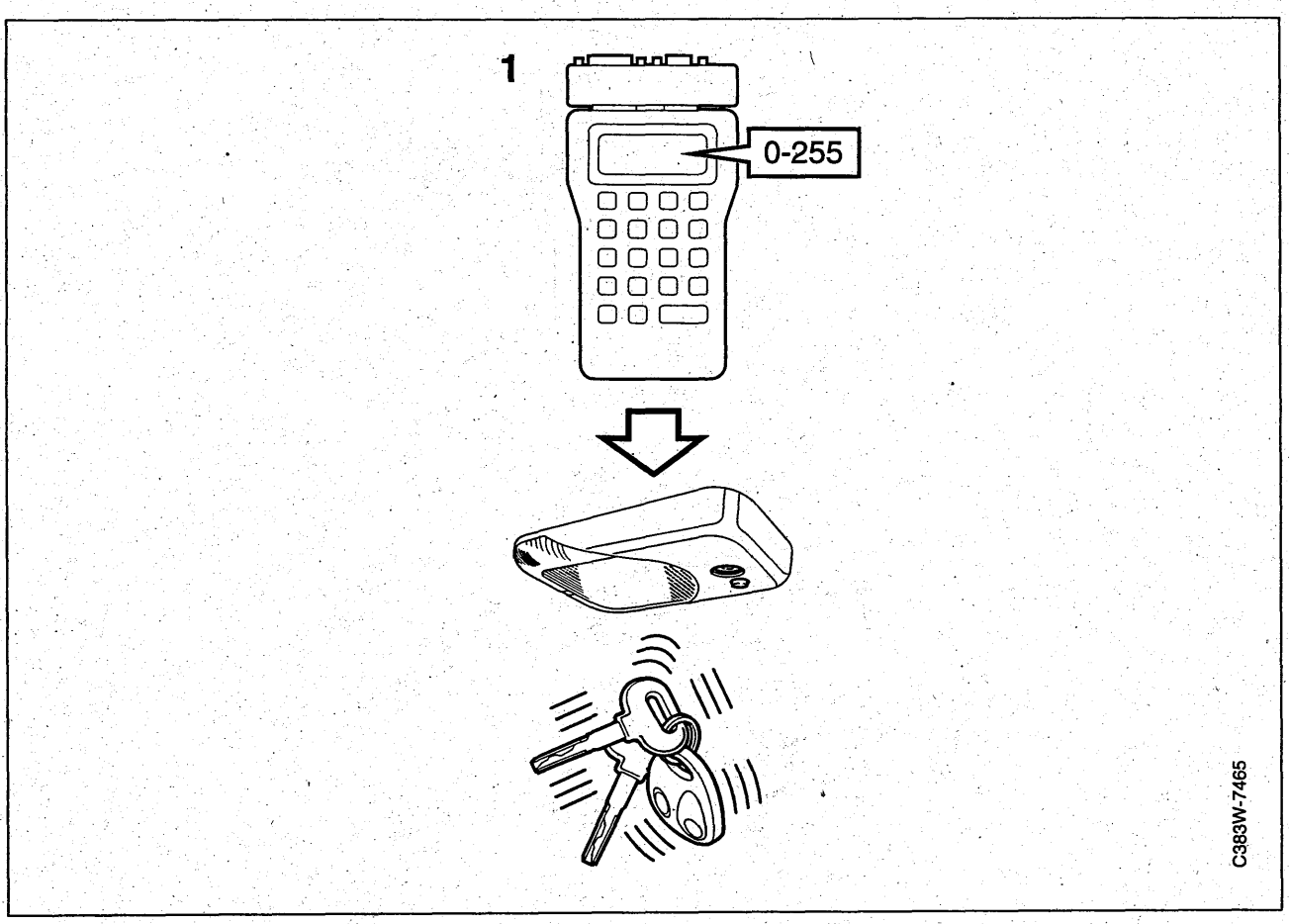
Fault diagnosis, glass breakage sensor



Fault symptom

The glass breakage sensor does not trigger the alarm.

Fault diagnosis, glass breakage sensor (contd.)



Diagnostic procedure

1 **Check the operation of the glass breakage sensor**

- Connect an ISAT scan tool.
- Select "READ VALUES".
- Select "GLASS BREAK SENSOR".
- Jingle a bunch of keys or the like near the sensor.

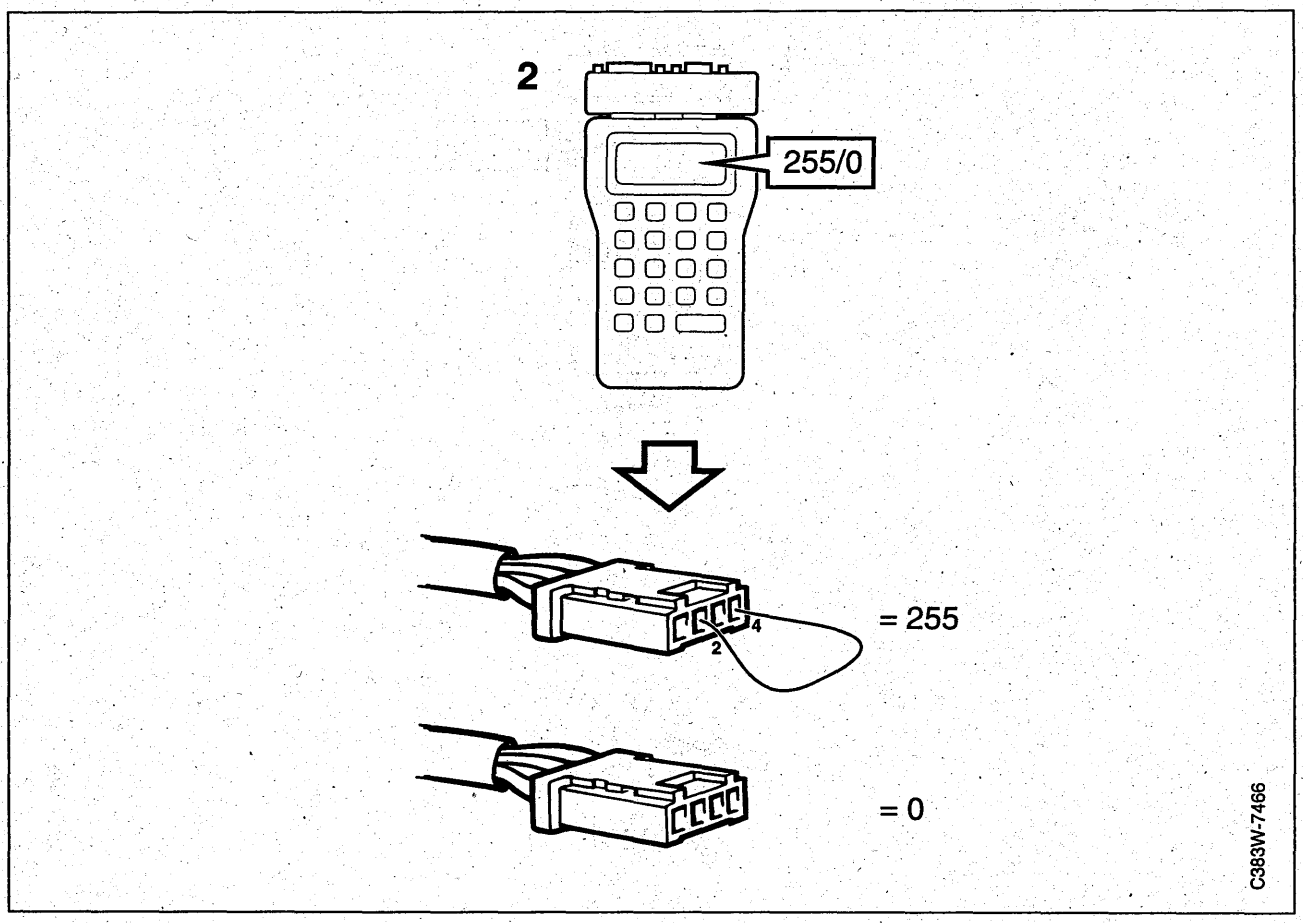
The ISAT scan tool display should show a reading of between 0 and 255.

Does it display a correct reading?

YES — Continue with point 5.

NO — If the reading is not OK or unchanged, continue with point 2.

Fault diagnosis, glass breakage sensor (contd.)



2 **Check the operation of the glass breakage sensor (contd.)**

- Disconnect the glass breakage sensor by unplugging the 4-pin connector.
- Select "READ VALUES".
- Select "GLASS BREAK SENSOR".

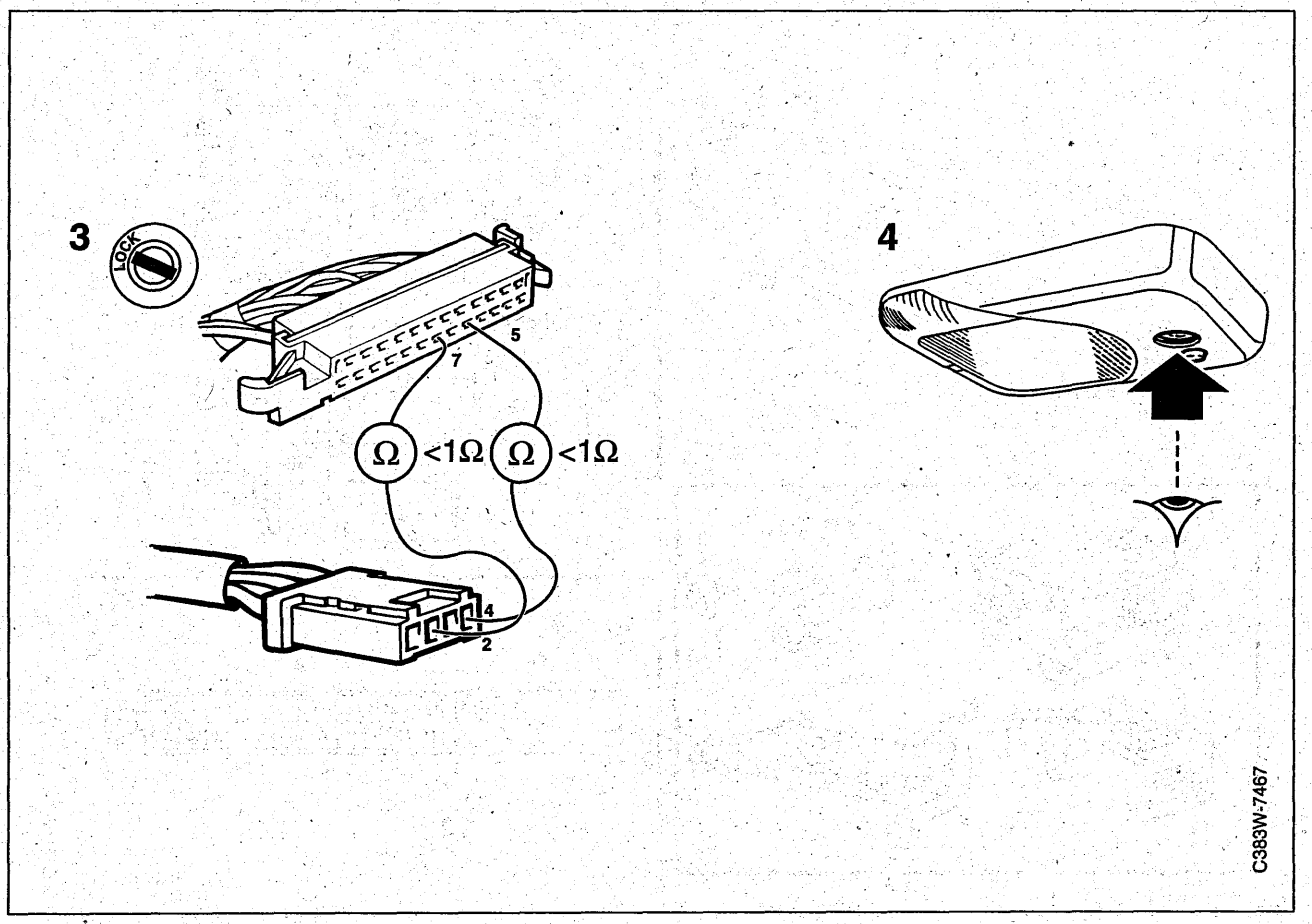
If the connector is still unplugged, the ISAT scan tool should show "0".
Connect a jumper lead between pins 2 and 4 of the connector and the ISAT scan tool should show 255.

Does it show a correct reading?

YES Continue with point 4.

NO Continue with point 3.

Fault diagnosis, glass breakage sensor (contd.)



3 **Check the wiring**
Check the wiring harness for continuity between:

- connector, pin 2, and alarm control module, pin 7.
- connector, pin 4, and alarm control module, pin 5.

The resistance should be < 1 ohm.

Is the resistance OK?

YES Continue with point 5.

NO Repair or replace the wiring harness.

4 **Check the glass breakage sensor**
Carry out a visual inspection of the sensor and connector. If nothing is found that can be rectified, change the glass breakage sensor.

5 **Final test**

- Disconnect the ISAT scan tool.
- Close all doors.
- Arm the alarm and wait until the LED flashes at the rate of 1 flash every 2 seconds.
- Jingle a bunch of keys close to the sensor.

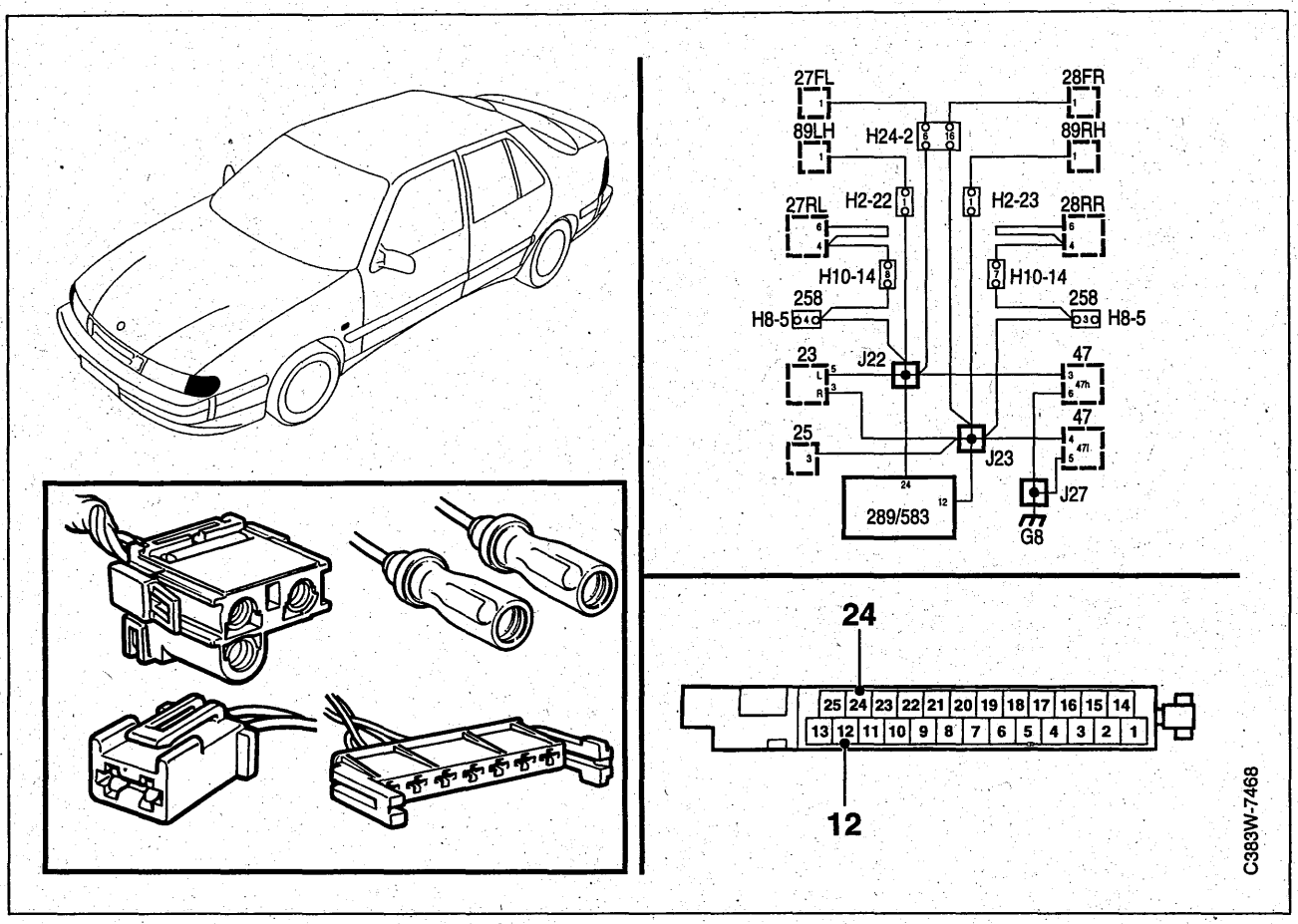
The alarm should go off.

Did the alarm go off?

YES The remedial measure taken was correct or the fault is of intermittent nature.

NO Continue as described on page 158.

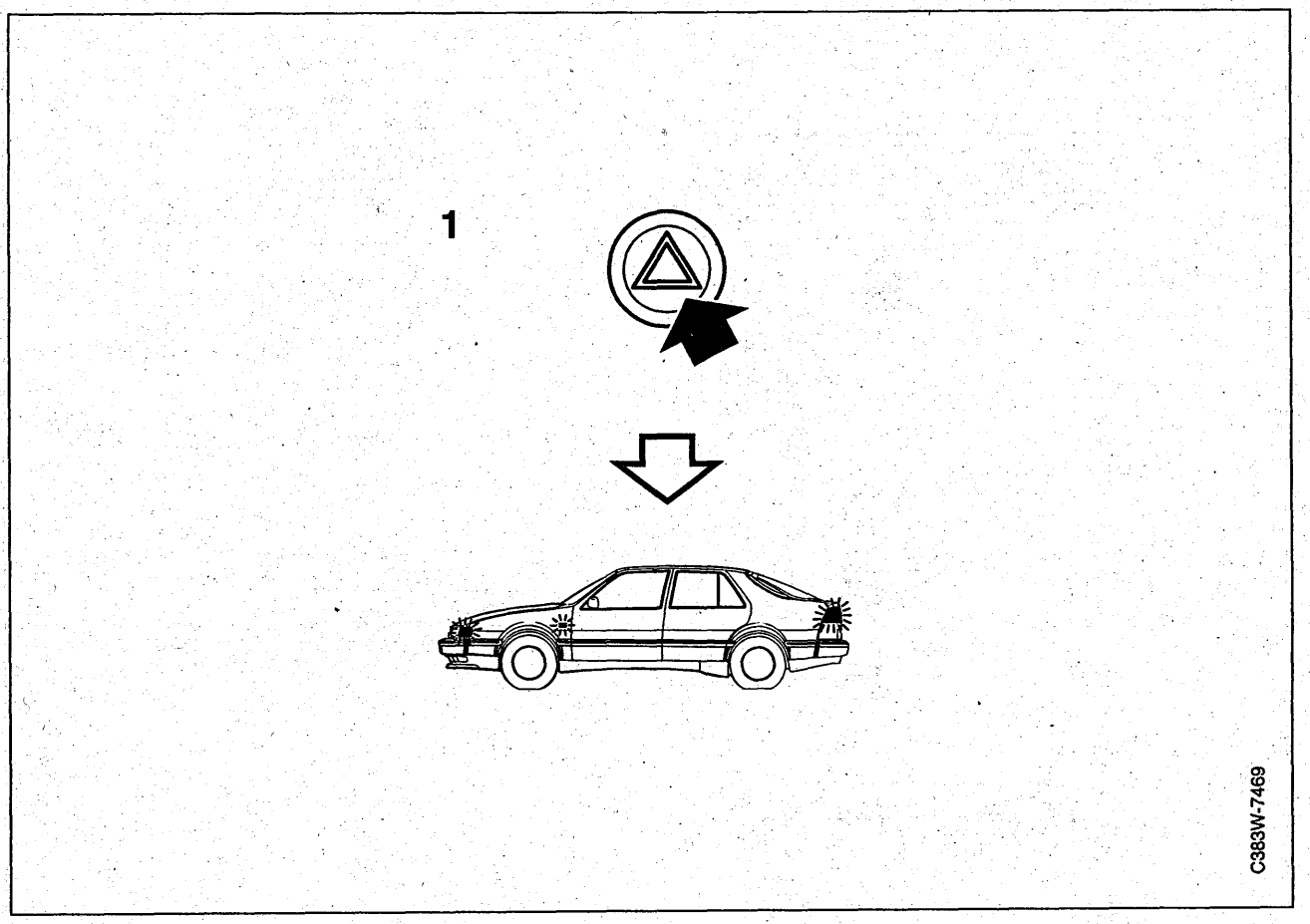
Fault diagnosis, direction indicators



Fault symptom

The direction indicators remain on constantly.
The direction indicators do not light up.

Fault diagnosis, direction indicators (contd.)



Diagnostic procedure

1 **Check the normal operation of the direction indicators**
Switch on the hazard flashers.

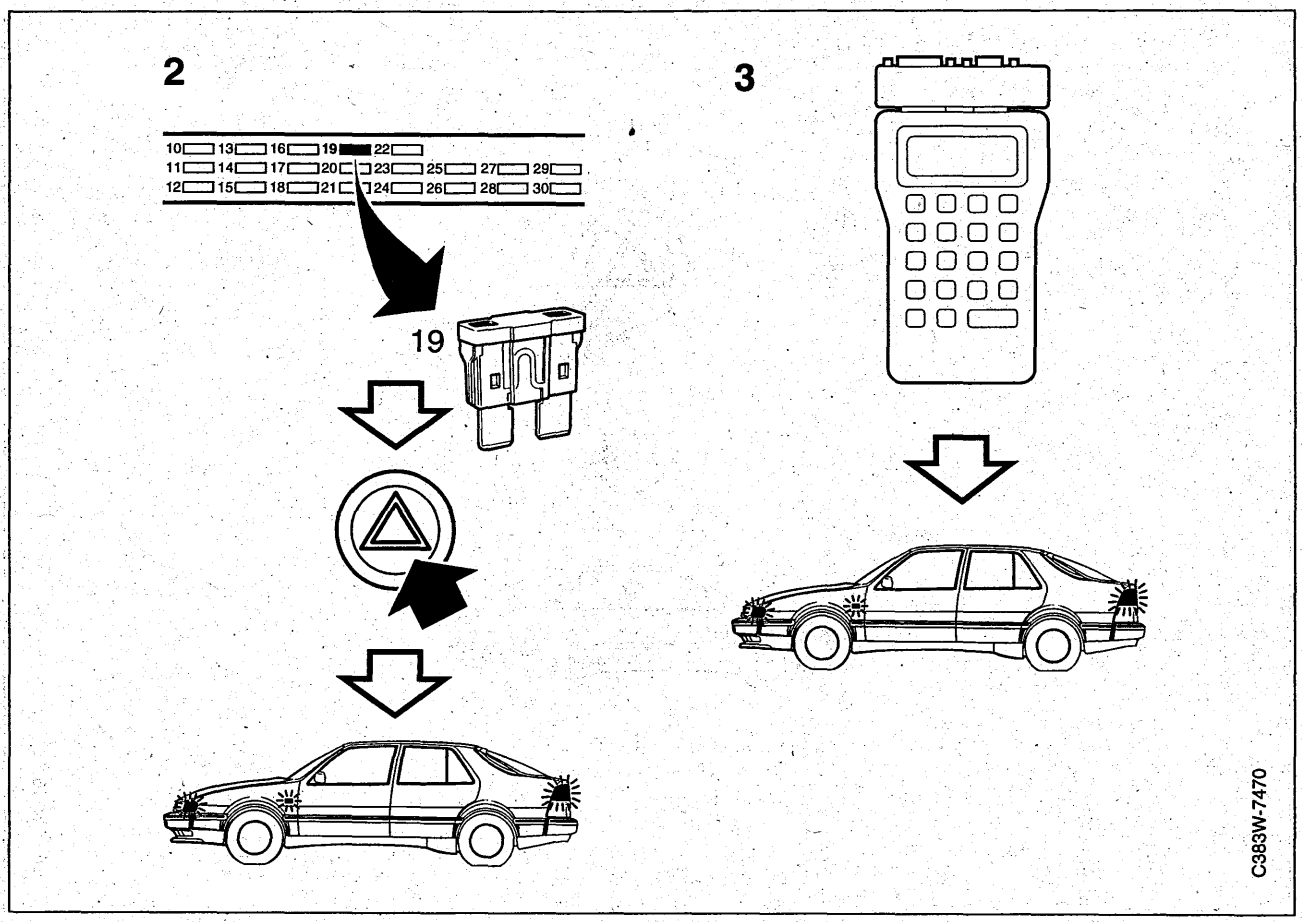
The hazard flashers should flash.

Do they work properly?

YES Continue with point 3.

NO Continue with point 2.

Fault diagnosis, direction indicators (contd.)



2 **Check the normal operation of the direction indicators (contd.)**

- Disconnect the anti-theft alarm.
- Remove fuse 19.
- Switch on the hazard flashers.

The hazard flashers should flash.

Do the hazard flashers work properly?

YES Continue with point 4.

NO Continue fault diagnosis as described in Service Manual 3:2 "Direction indicators".

3 **Check the operation of the direction indicators, using an ISAT scan tool.**

- Connect an ISAT scan tool.
- Select "ACTIVATE".
- Select "FLASHERS".
- Select "ON".

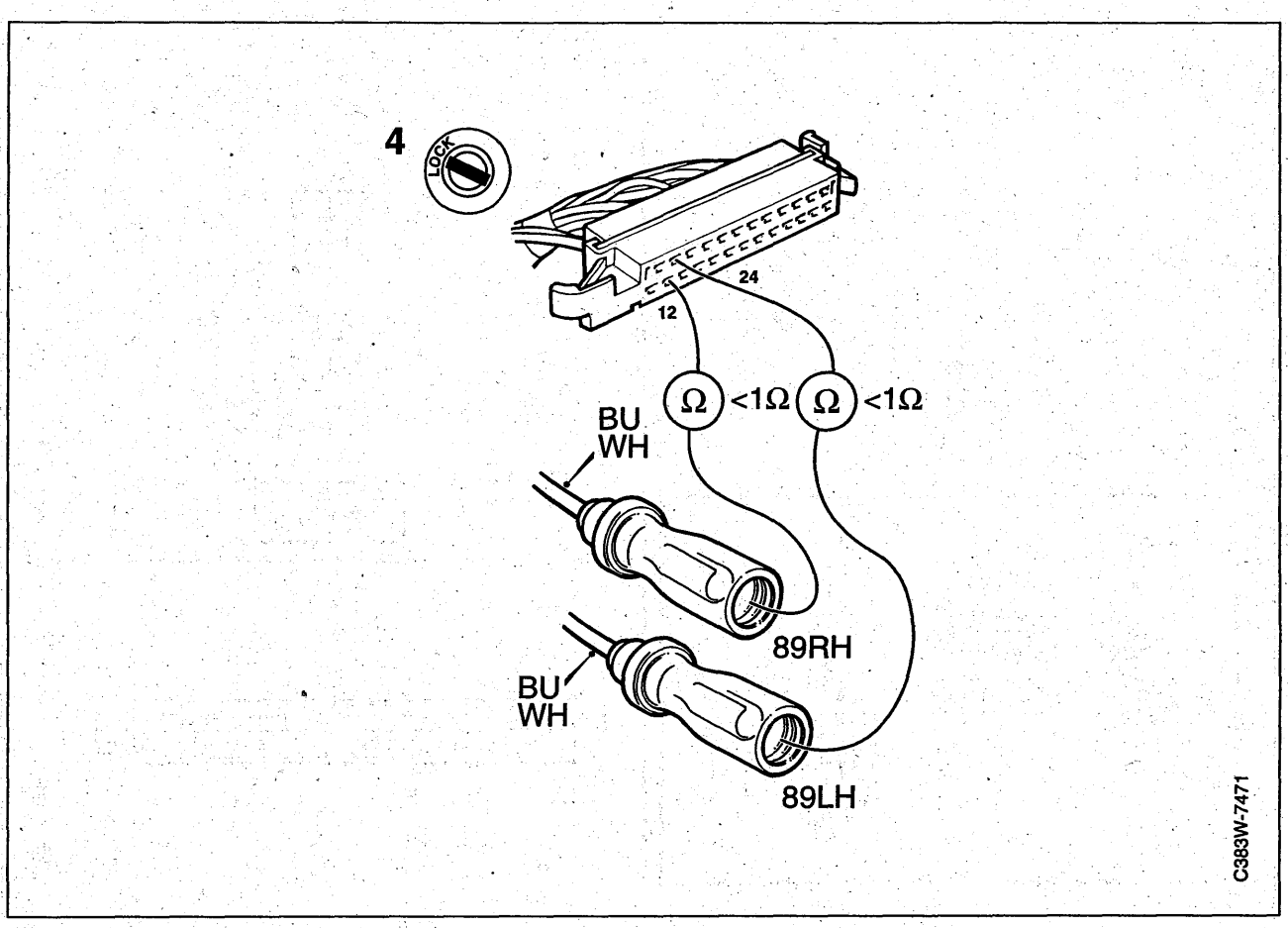
The direction indicators should remain on continuously.

Do they light up continuously?

YES The fault is of intermittent nature, proceed to point 5.

NO Continue with point 4.

Fault diagnosis, direction indicators (contd.)



4 **Check the wiring**

- Unplug the alarm's electronic control module.
- Check for continuity between:
  - the control module (pin 24) and the connector (LH side direction indicator.
  - the control module (pin 12) and the connector (RH side direction indicator.

The resistance should be < 1 ohm.

Is the resistance OK?

YES Continue with point 5.

NO Repair or replace the wiring harness.

5 **Final test**

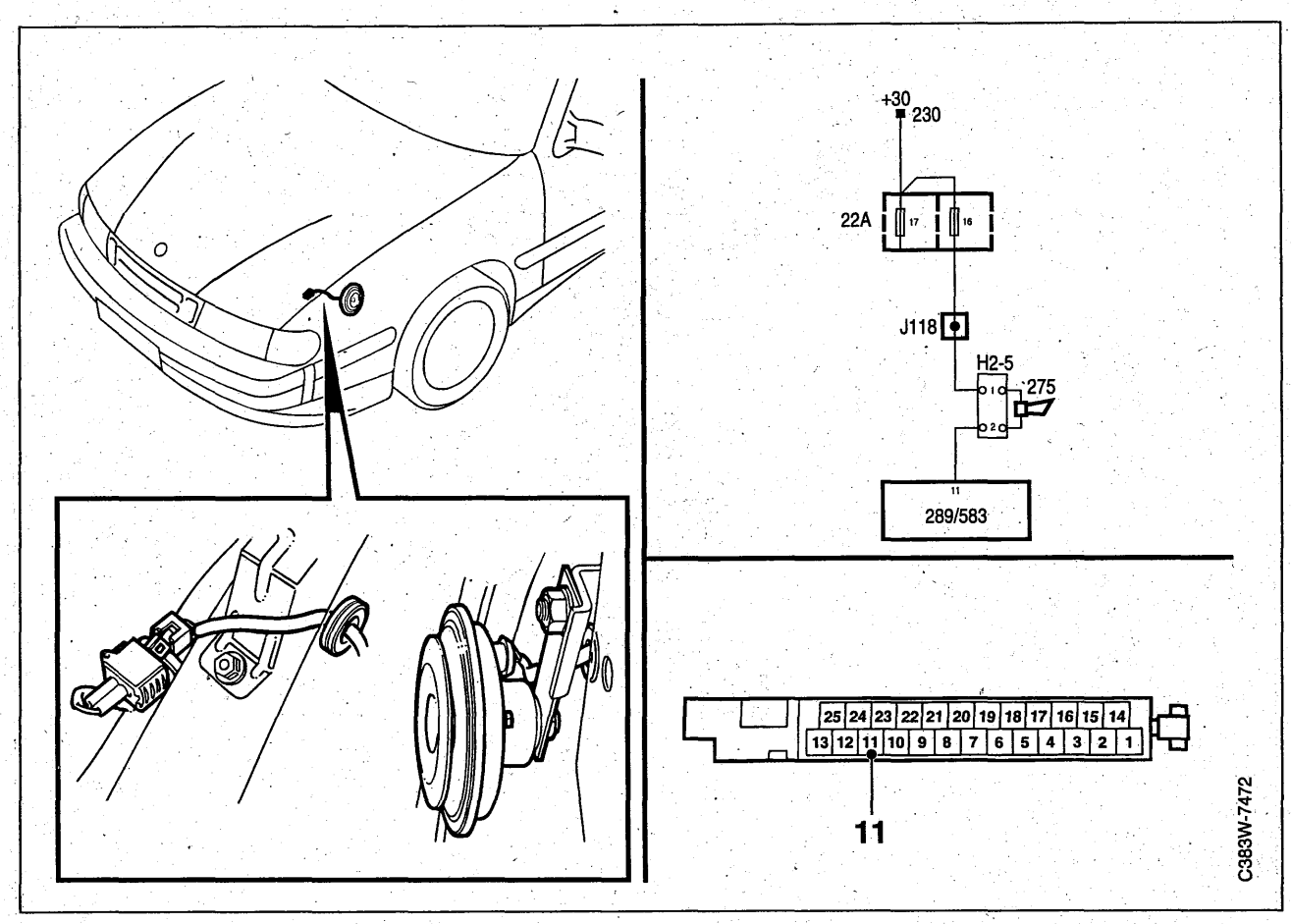
Check to see if the fault symptom persists.

Does the trouble persist?

YES Continue as described on page 158.

NO The remedial measure taken was correct or the fault is of intermittent nature.

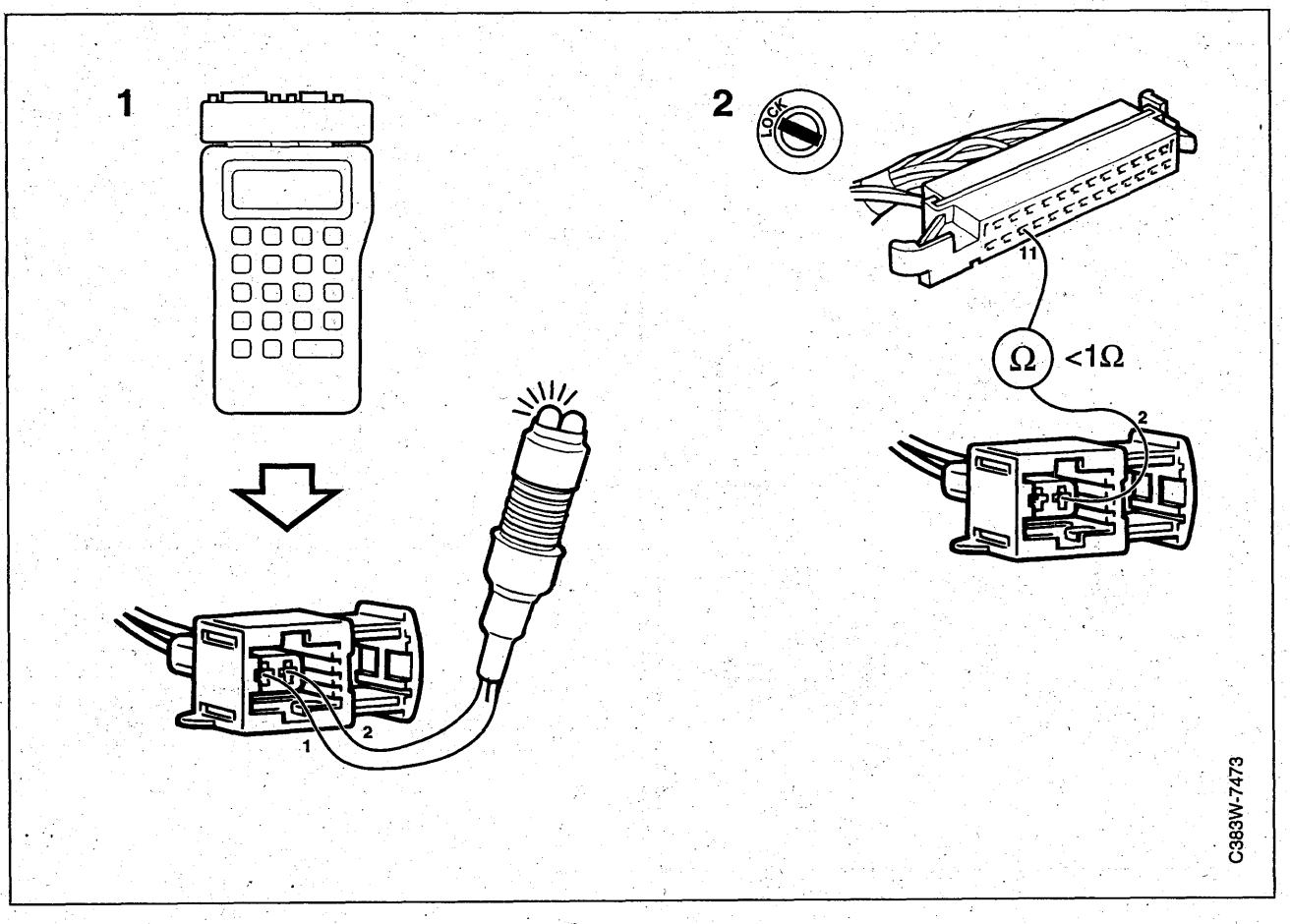
Fault diagnosis, horn



Fault symptom

The horn sounds continuously.

Fault diagnosis, horn (contd.)



Diagnostic procedure

1 **Check the horn**

- Disconnect the horn.
- Connect the test lamp to pin 2 of the horn's connector and battery positive (Batt+)

Does it light up?

YES Continue with point 2.

NO Change the horn.

2 **Check the horn's ground connection**
Check for continuity between pin 2 of the horn's connector and pin 11 of the alarm's control module.

The resistance should be < 1 ohm.

Is the resistance OK?

YES Continue with point 3.

NO Repair or replace the wiring harness.

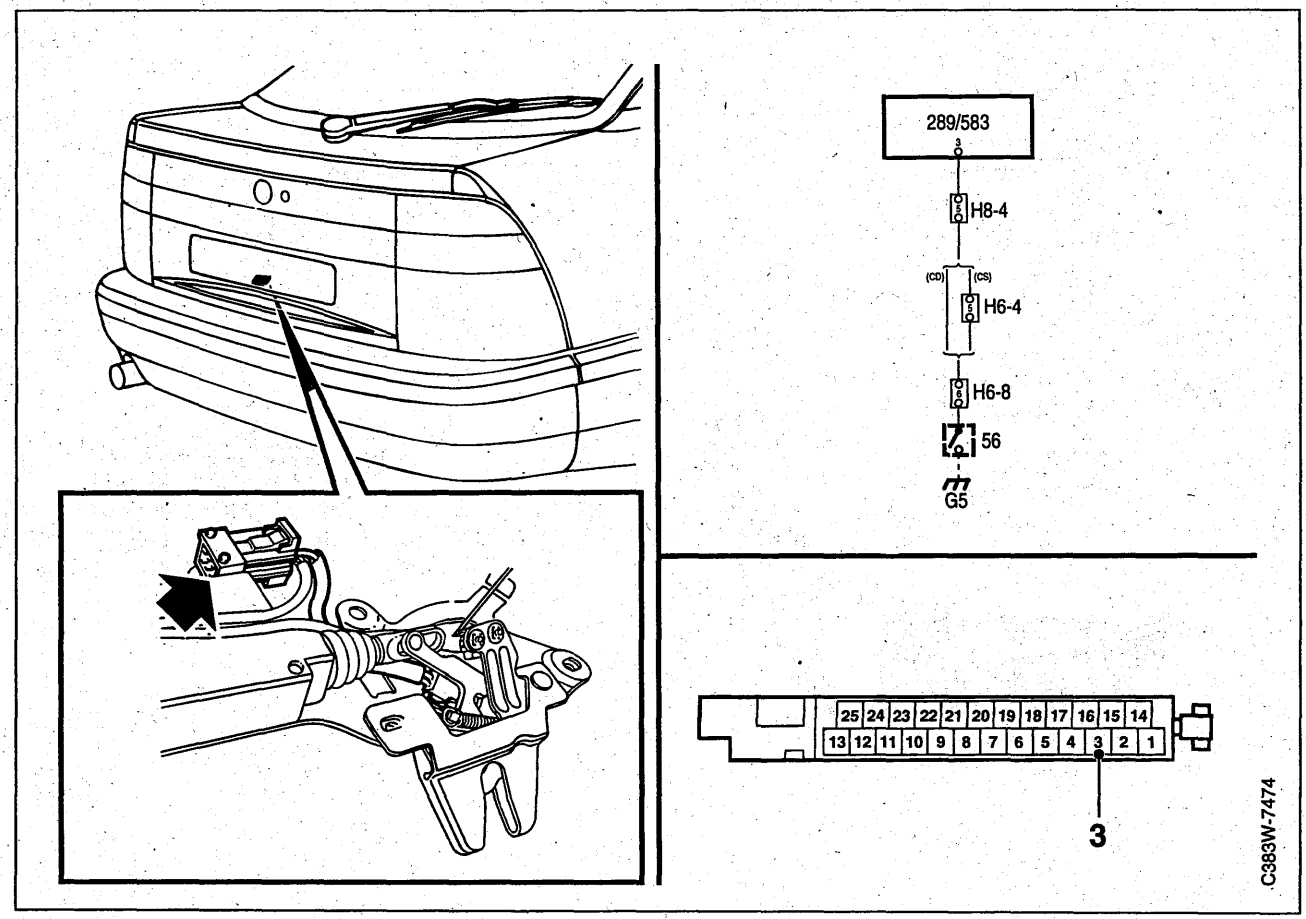
3 **Final test**
Check to see if the fault symptom persists.

Does the trouble persist?

YES Continue as described on page 158.

NO The remedial measure taken was correct or the fault is of intermittent nature.

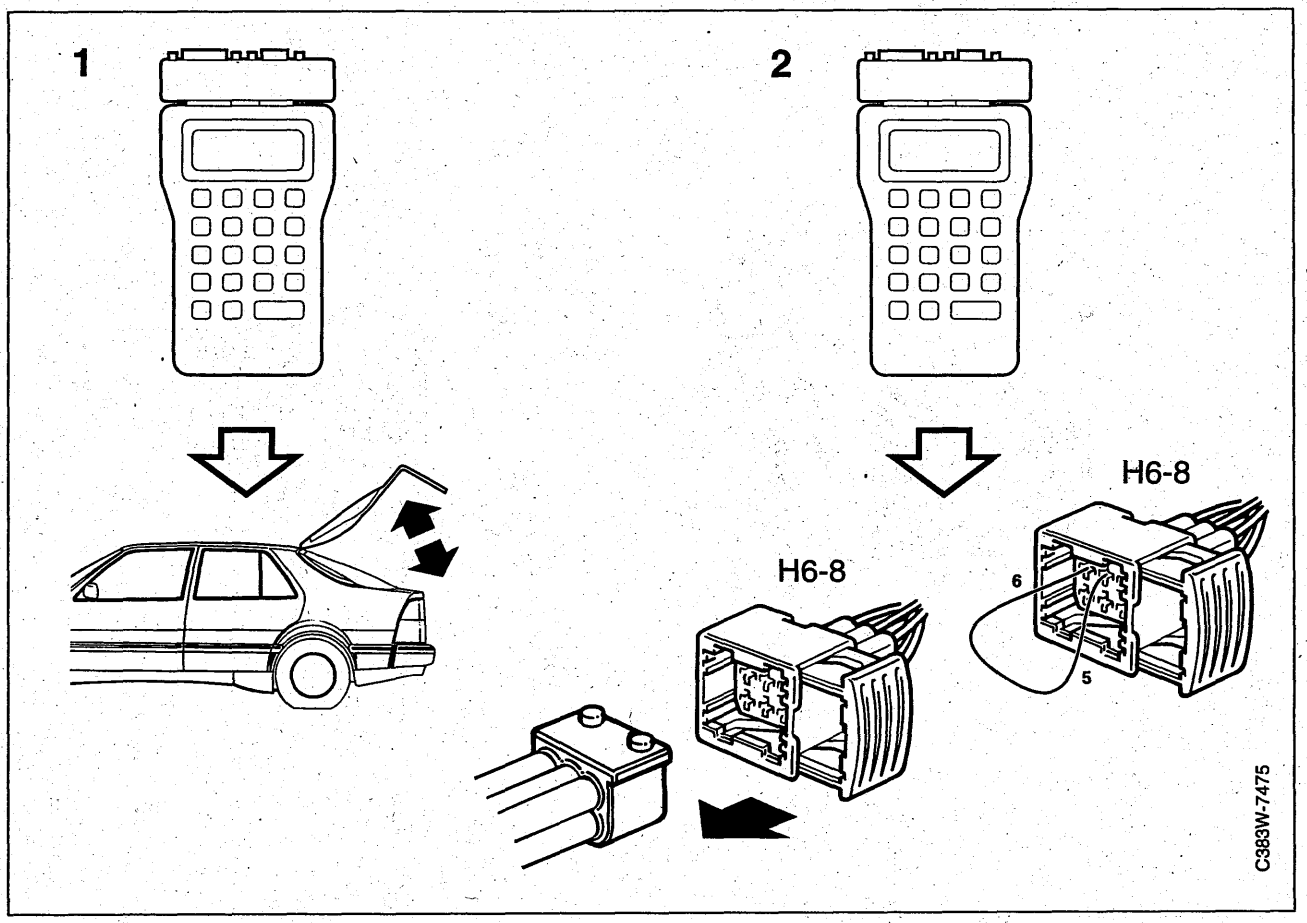
Fault diagnosis, luggage compartment lighting switch



Fault symptom

The tailgate is disconnected from the alarm system.
The LED flashes during the delay period.

Fault diagnosis, luggage compartment lighting switch (contd.)



Diagnostic procedure

1 **Check operation of the lamp, tailgate open/closed**

- Connect an ISAT scan tool.
- Select "READ VALUES".
- Select "TAILGATE SWITCH".
- Open and close the tailgate, observing the ISAT scan tool display at the same time.

The ISAT scan tool display should read "OPEN" and "CLOSED" as appropriate.

Does the display show a correct reading?

YES Proceed to point 6.

NO Continue with point 2.

2 **Check the microswitch**

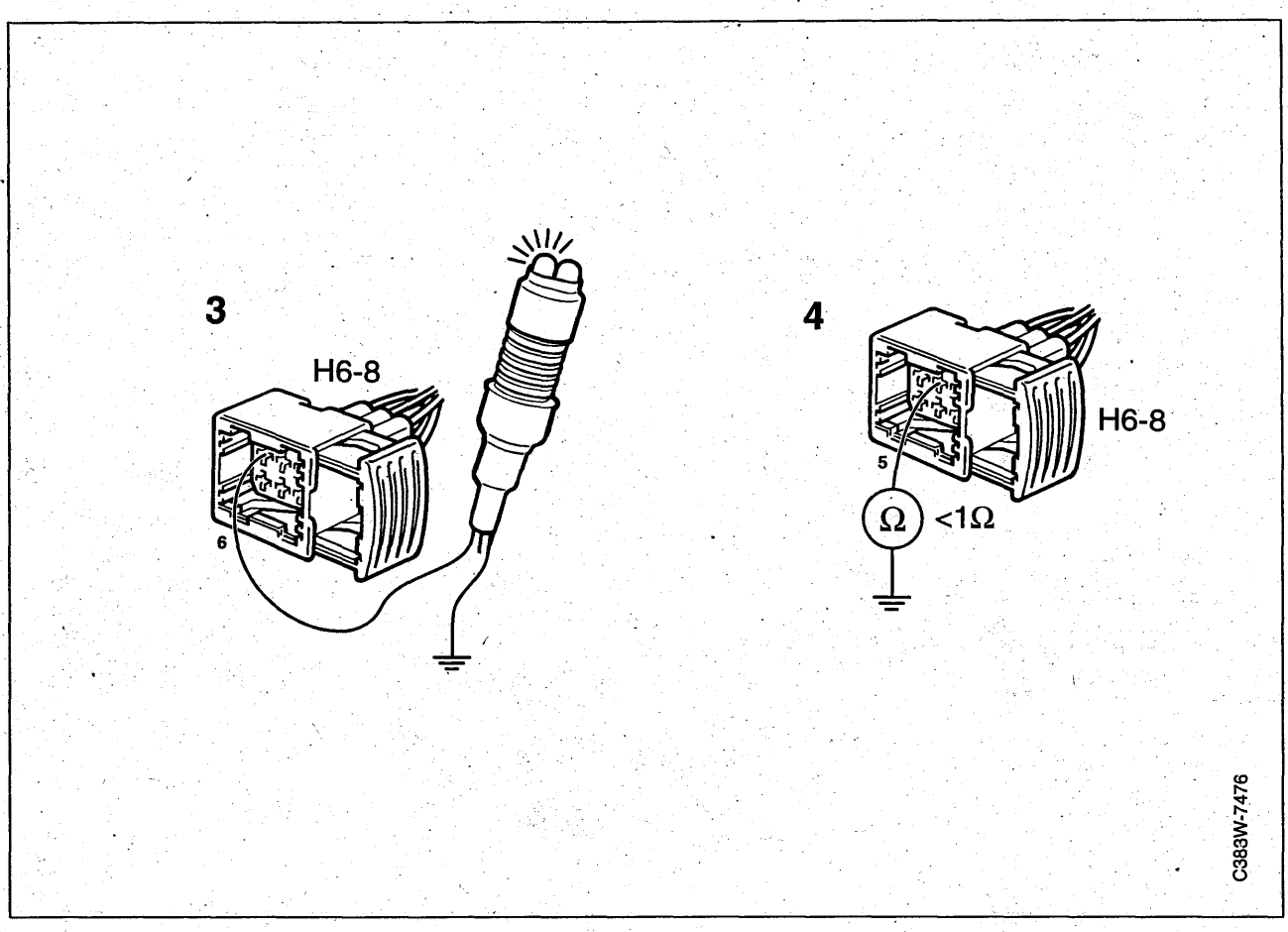
- Unplug the luggage compartment connector, H6-8.
- Select "TAILGATE SWITCH".
  The ISAT scan tool should display "OPEN".
- Connect a jumper lead between pins 5 and 6 of connector H6-8.
  The ISAT scan tool should display "CLOSED".

Does it display the correct readings?

YES Proceed to point 6.

NO Continue with point 3.

Fault diagnosis, luggage compartment lighting switch (contd.)



3 **Check the microswitch's power supply**
Connect the test lamp to pin 6 of connector H6-8 and a good grounding point.

Does it light up?

YES Continue with point 4.

NO Continue with point 5.

4 **Check the connection to ground**

- Check the lamp, connector and wiring.
- Check for continuity between pin 5 of the connector and a good grounding point.

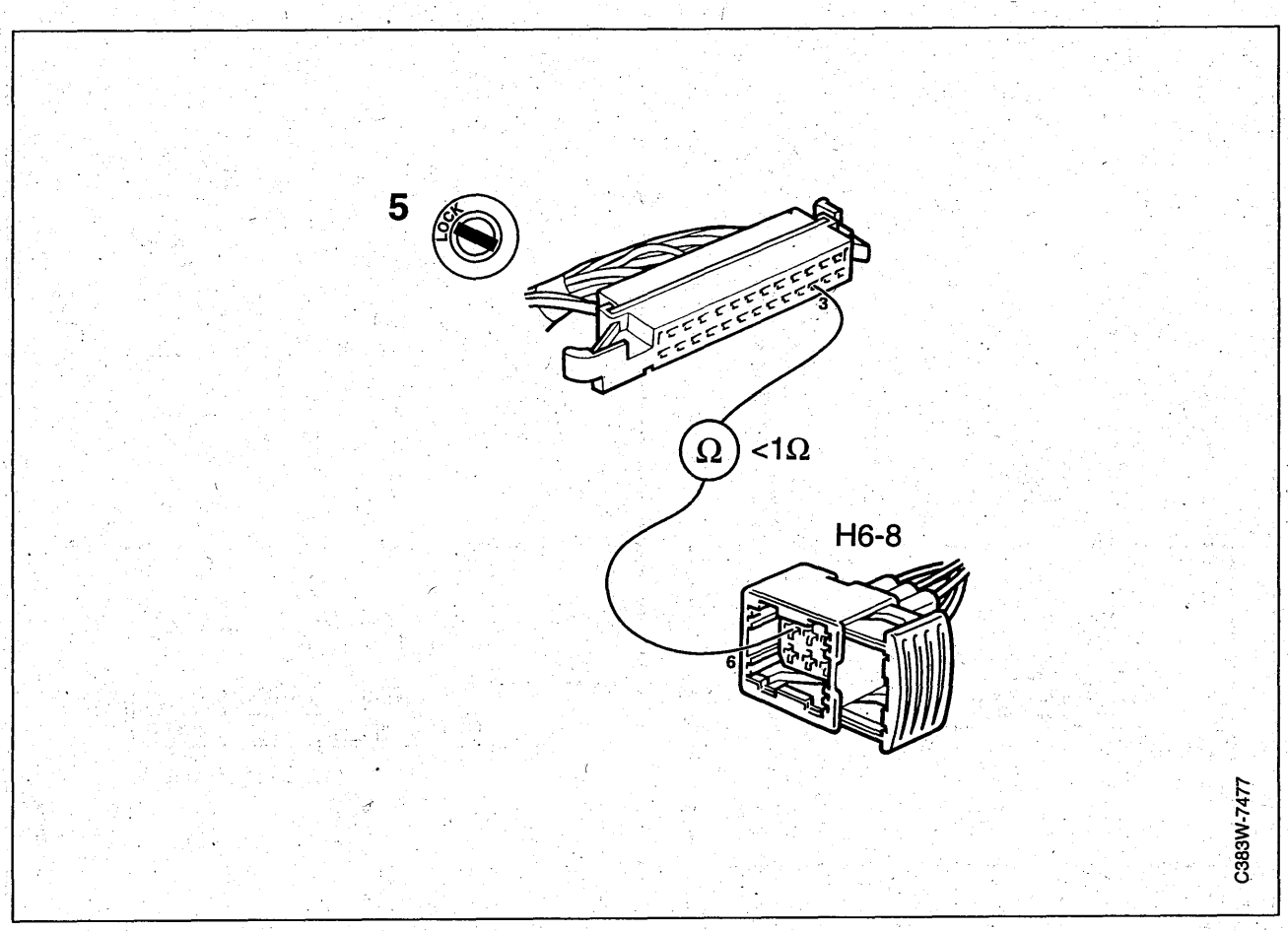
The resistance should be < 1 ohm.

Is the resistance OK?

YES Proceed to point 6.

NO Repair or replace the wiring harness.

Fault diagnosis, luggage compartment lighting switch (contd.)



5 **Check the wiring**
Check the wiring for continuity between pin 6 of the connector and pin 3 of the alarm control module.

The resistance should be < 1 ohm.

Is the resistance OK?

YES Proceed to point 6.

NO Repair or replace the wiring harness.

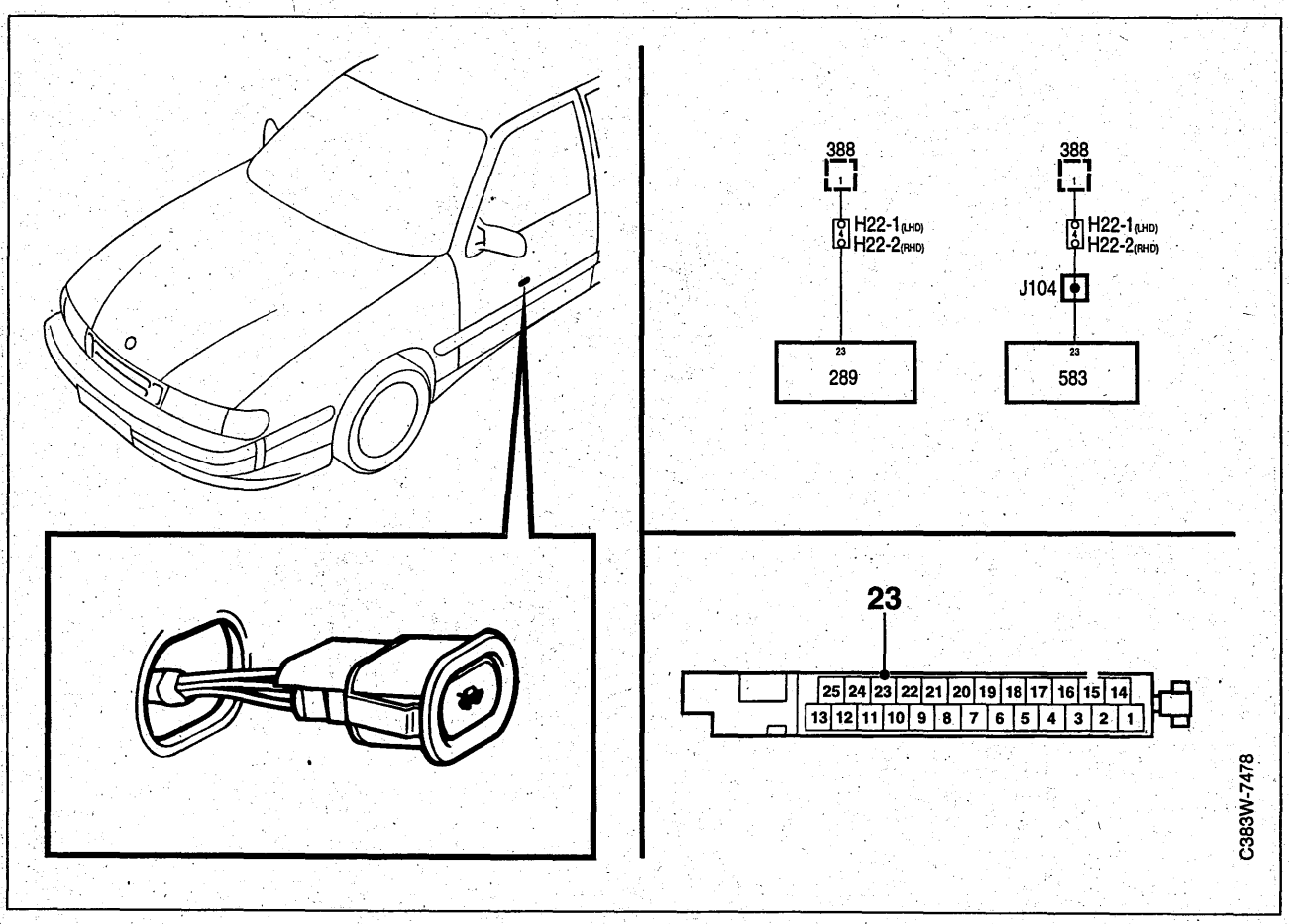
6 **Final test**
Check to see if the fault symptom persists.

Does the trouble persist?

YES Continue as described on page 158.

NO The remedial measure taken was correct or the fault is of intermittent nature.

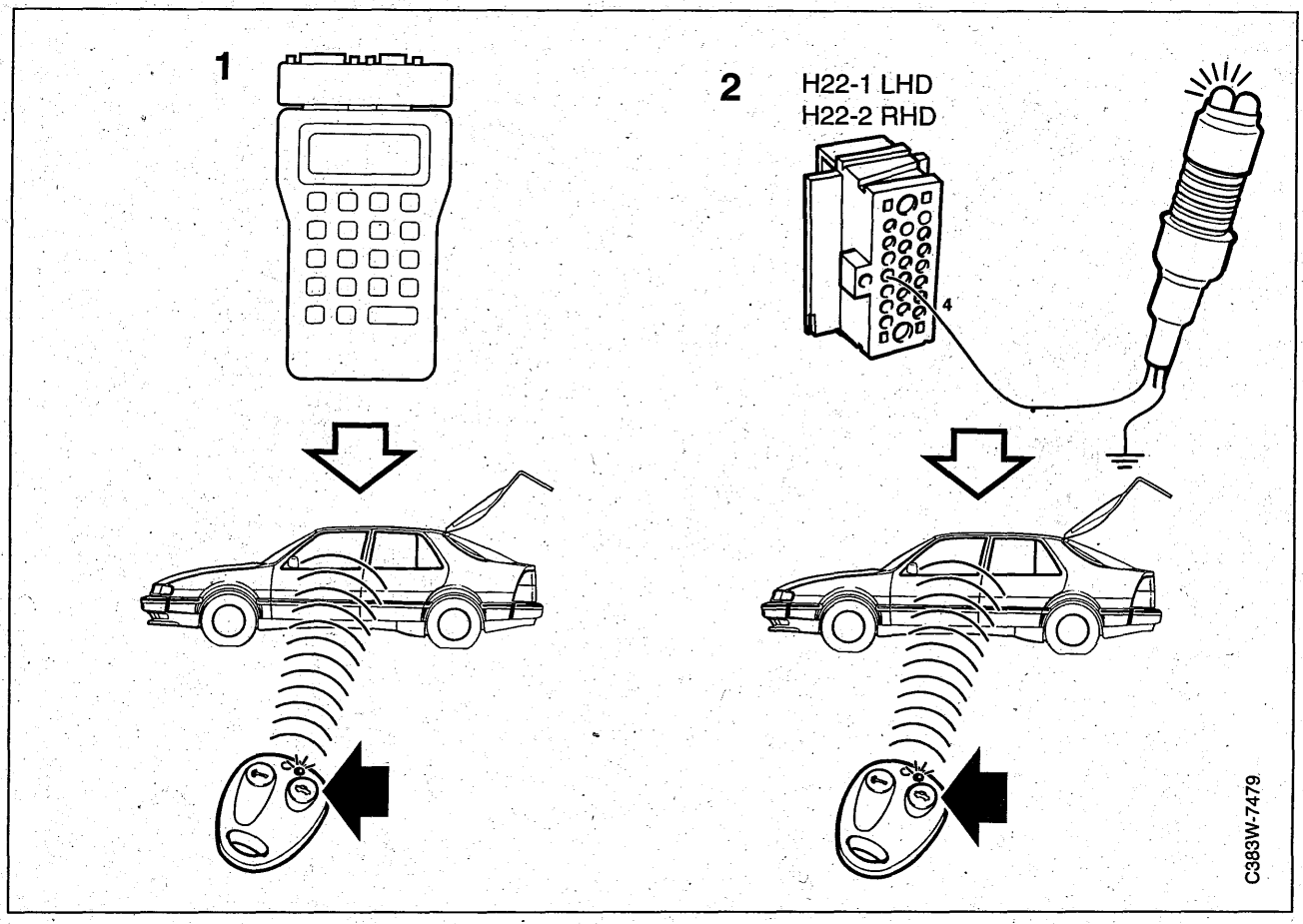
Fault diagnosis, remote control, tailgate release



Fault symptom

The tailgate cannot be disarmed or released.

Fault diagnosis, remote control, tailgate release (contd.)



Diagnostic procedure

1 **Check the operation of the tailgate release**

- Connect an ISAT scan tool.
- Select "READ VALUES".
- Select "TAILGATE LOCK".
- The ISAT scan tool should display "CLOSED".
- Press the right-hand button on the remote control.

The ISAT scan tool should show "OPEN" for about 3 seconds and the tailgate motor should be activated.

Does this happen?

YES — Continue with point 7.

NO — If the ISAT scan tool shows "OPEN" for about 3 seconds but the tailgate motor is not activated, continue with point 2.
If the ISAT scan tool displays "CLOSED", proceed to point 4.

2 **Check the unlock signal from the electronic control module**

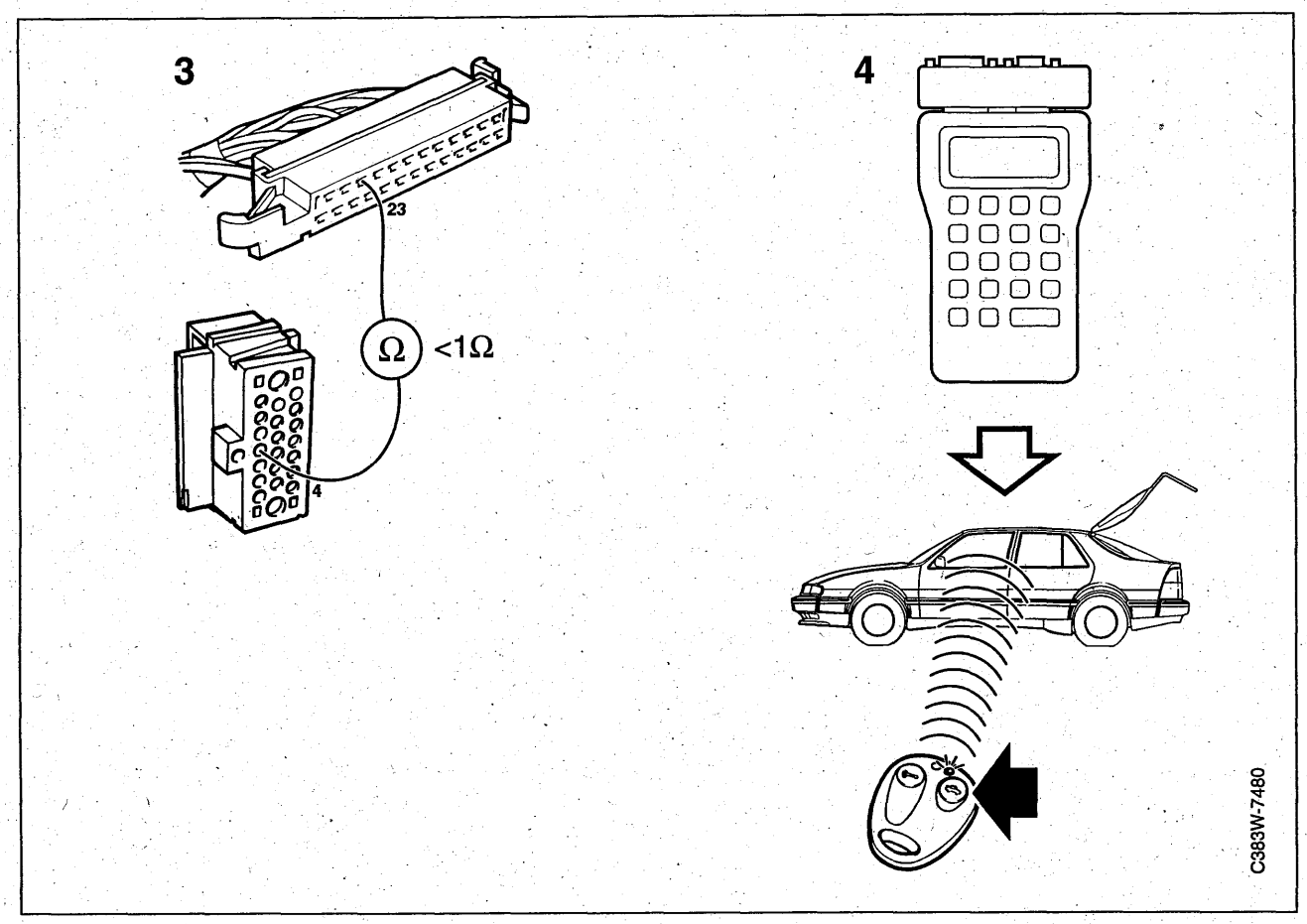
- Unplug connector H22-1.
- Connect the test lamp to connector H22-1, pin 4, and a good grounding point.
- Press the right-hand button on the remote control.

Does the test lamp light up?

YES — Continue fault diagnosis in Service Manual 3:2 "Central locking system, electrically operated tailgate release".

NO — Continue with point 3.

Fault diagnosis, remote control, tailgate release (contd.)



3 **Check the wiring**
Check the wiring for continuity between pin 23 of the alarm control module and pin 4 of connector H22-1.

The resistance should be < 1 ohm.

Is the resistance OK?

YES Continue with point 7.

NO Repair or replace the wiring harness.

4 **Check the operation of the tailgate release**
- Select "ACTIVATE".
- Select "TAILGATE".
- Select "ON".

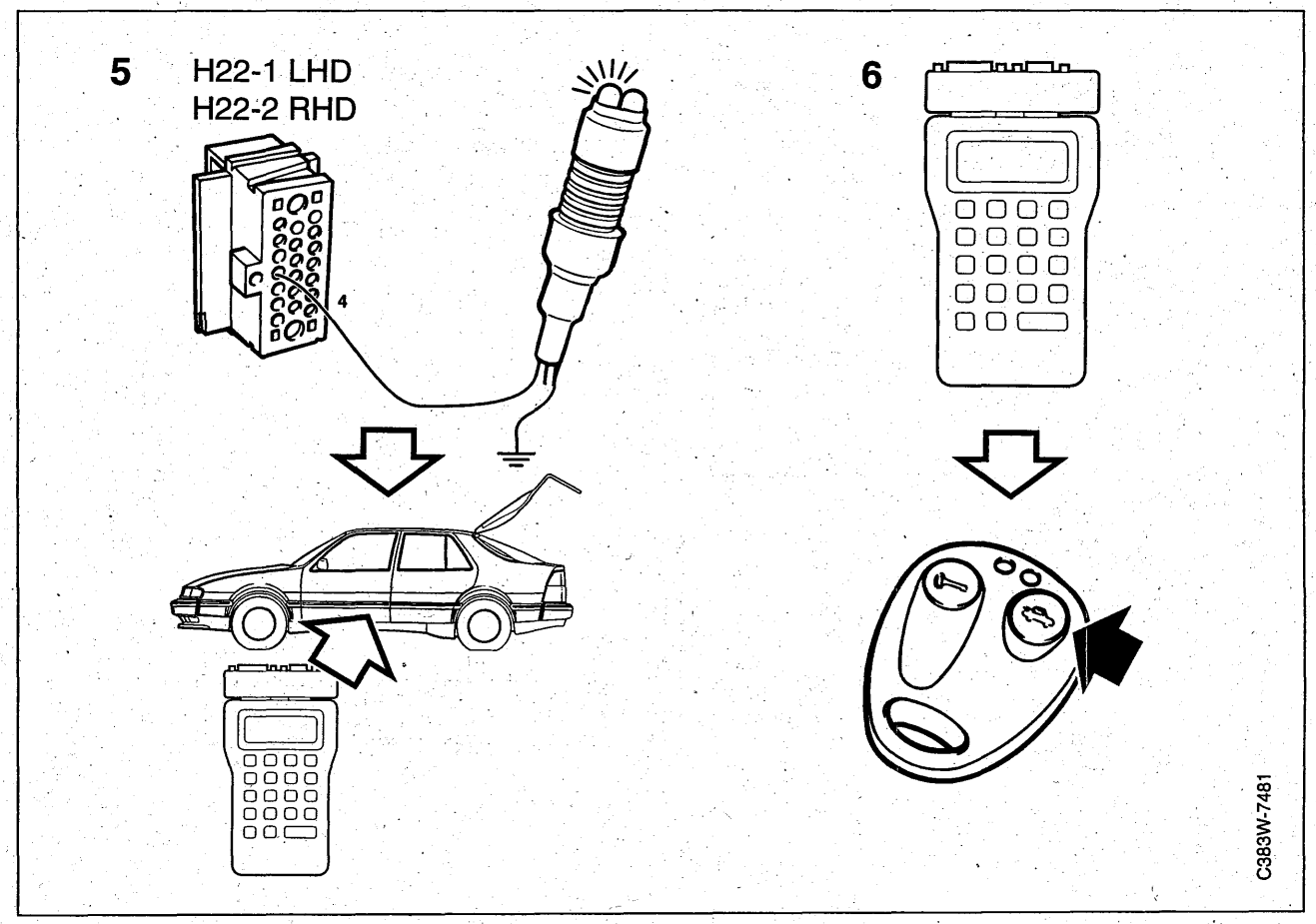
The tailgate motor should be activated.

Is the tailgate released?

YES Proceed to point 6.

NO Continue with point 5.

Fault diagnosis, remote control, tailgate release (contd.)



5 **Check the operation of the tailgate release**

- Unplug connector H22-1.
- Connect the test lamp to connector H22-1, pin 4, and a good grounding point.
- Select "ACTIVATE".
- Select "TAILGATE".
- Select "ON".

The test lamp should light up.

Does the test lamp light up?

YES Try changing the remote control.

NO Continue with point 7.

6 **Check the remote control**

- Select "READ VALUES".
- Select "REMOTE CONTROL".
- Press the right-hand button on the remote control.

The ISAT scan tool should display "RH BUTTON" when this button is pressed.

Does it display the correct text?

YES Continue with point 7.

NO Try changing the remote control.

7 **Final test**

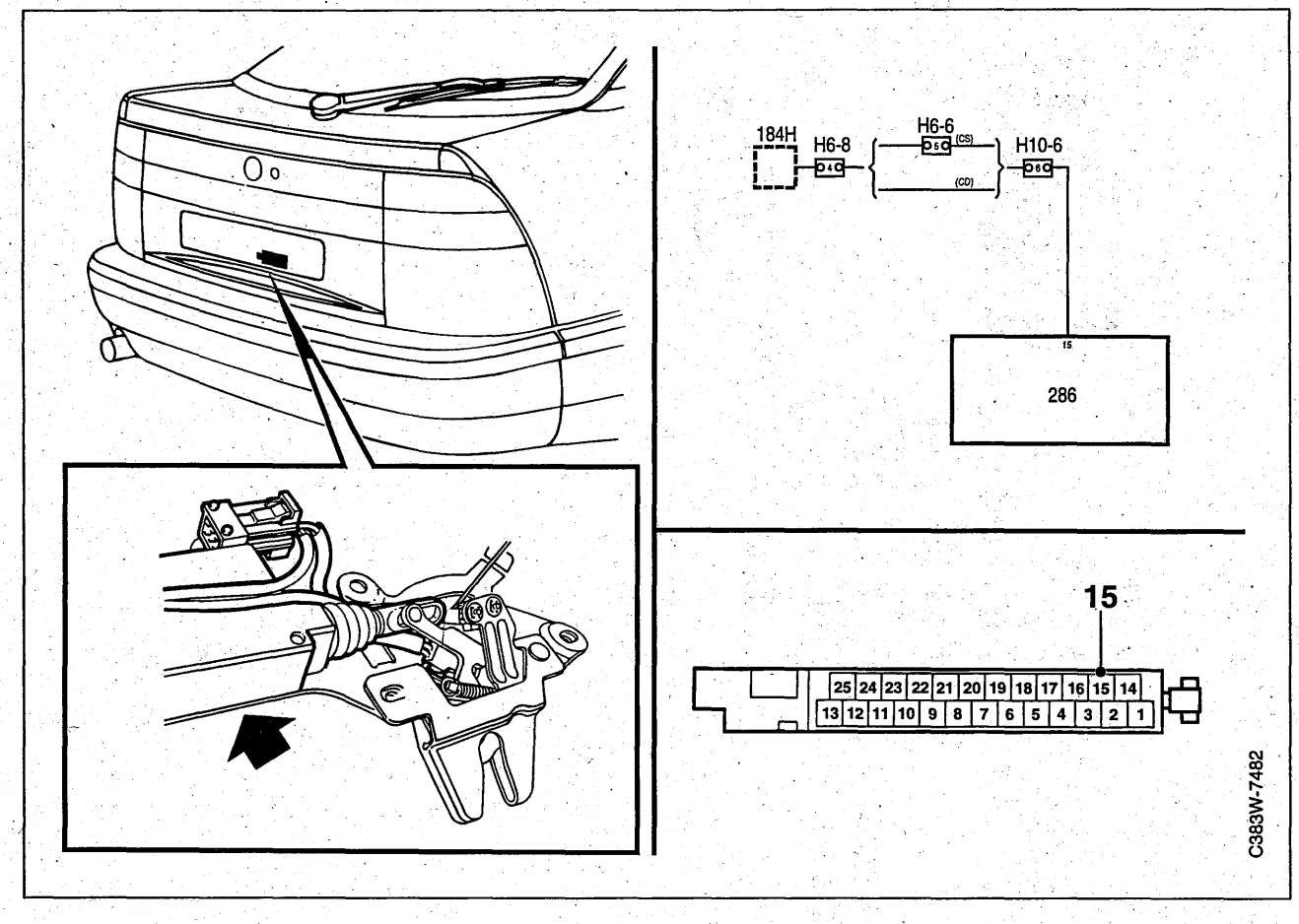
Check to see if the fault symptom persists.

Does the trouble persist?

YES Continue as described on page 158.

NO The remedial measure taken was correct or the fault is of intermittent nature.

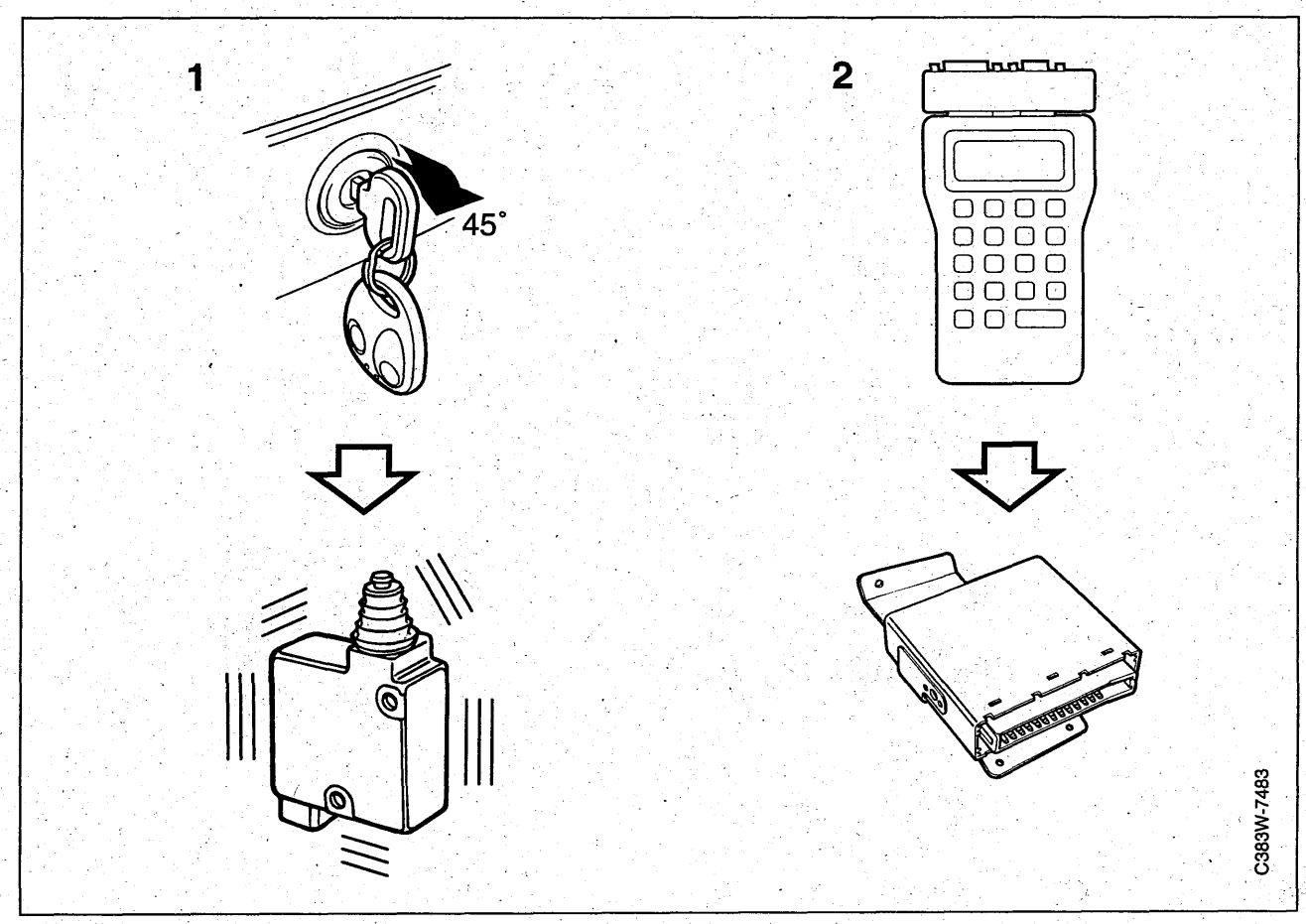
Fault diagnosis, microswitch in tailgate, key opening



Fault symptom

The alarm cannot be disarmed by using the car key in the tailgate.

Fault diagnosis, microswitch in tailgate, opening with key (contd.)



Diagnostic procedure

1 **Check the tailgate opening function, opening with key**
Insert the key in the tailgate lock and turn it through 45 degrees.

The tailgate motor should be activated when the key is turned through 45 degrees.

Is the motor activated?

YES Continue with point 2.

NO Check fuse 17. If the fuse is OK, continue with point 3.

2 **Check the programming**
- Connect an ISAT scan tool.
- Select "PROGRAMMING".
- Select "DISENGAGE BOOT".
- Check the programming of the control module. See the "PROGRAMMING" command menu, page 49.

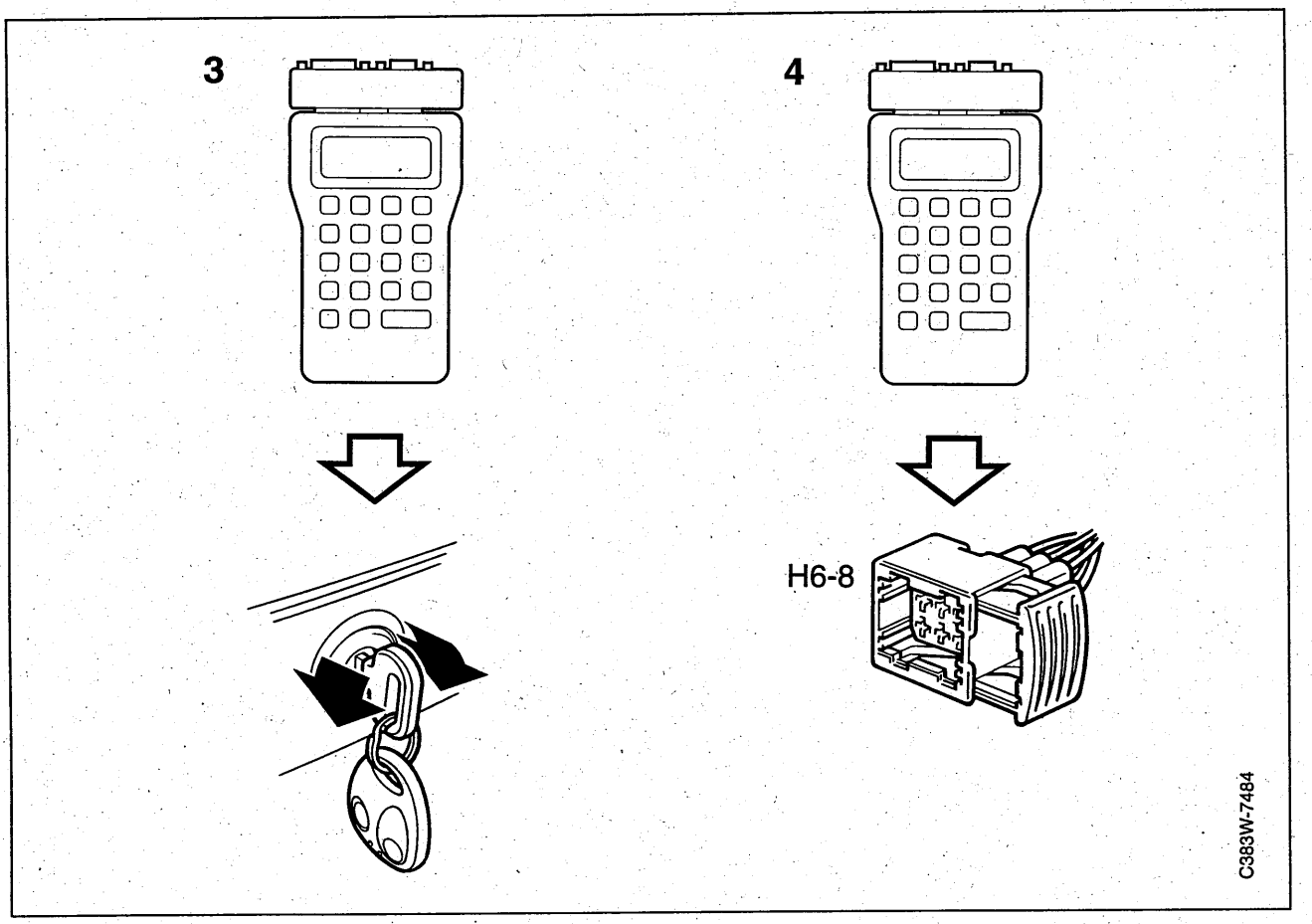
The programming should be "ON".

Is the programming OK?

YES Continue with point 7.

NO Change "OFF" to "ON".

Fault diagnosis, microswitch in tailgate, opening with key (contd.)



3 **Check the operation of the tailgate**

- Connect an ISAT scan tool.
- Select "READ VALUES".
- Select "TAILGATE LOCK".
- Lock and unlock the tailgate with the key.

The ISAT scan tool display should show "OPEN" and "CLOSED" as appropriate.

Does it display the correct text?

YES Continue with point 4.

NO Continue with point 7.

4 **Check the microswitch, tailgate release**

- Unplug connector H6-8 (in tailgate)
- Select "READ VALUES".
- Select "TAILGATE LOCK".

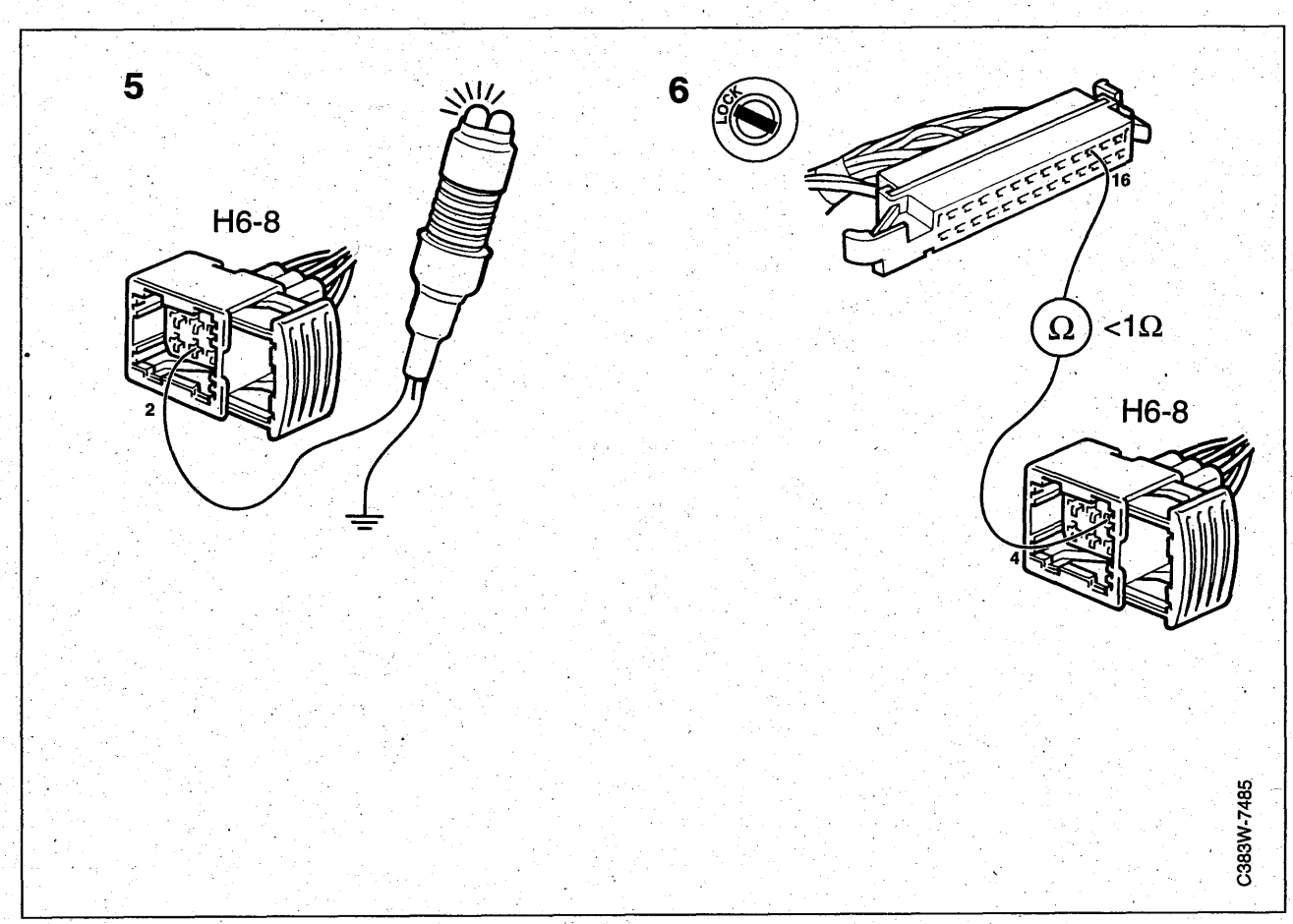
The ISAT scan tool should display "OPEN".

Does it display the correct text?

YES Change the microswitch.

NO Continue with point 5.

Fault diagnosis, microswitch in tailgate, opening with key (contd.)



5 **Check the microswitch's power supply (+30 circuit)**
Connect the test lamp to pin 2 of connector H6-8 and a good grounding point.

Does the test lamp light up?

YES Continue with point 6.

NO Continue fault diagnosis as described in Service Manual 3:2 "Central locking system, electrically operated tailgate release".

6 **Check the wiring**
Check the continuity of the wiring between pin 4 of the connector and pin 15 of the alarm's control module.

The resistance should be < 1 ohm.

Is the resistance OK?

YES Continue with point 7.

NO Repair or replace the wiring harness.

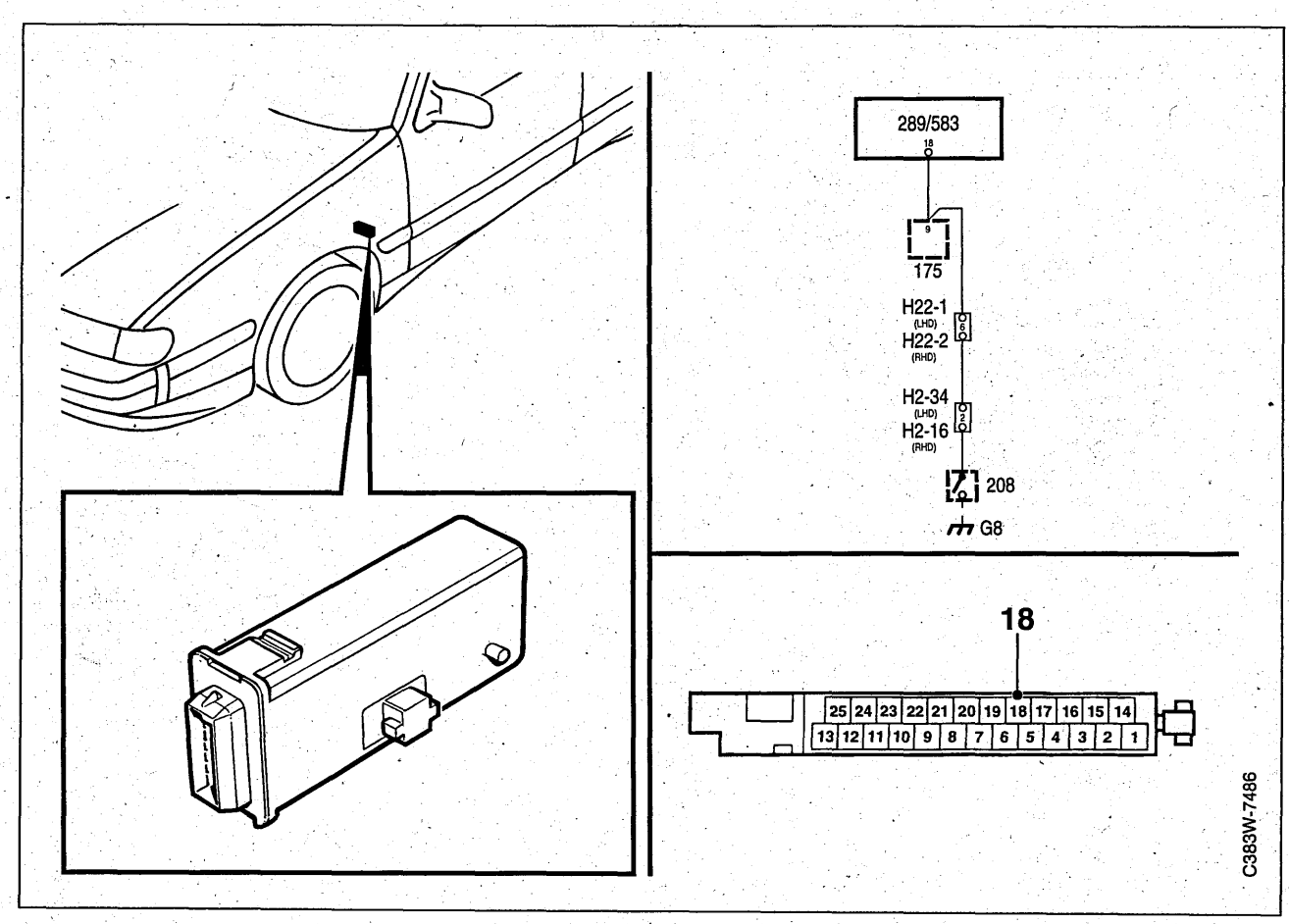
7 **Final test**
Check to see if the fault symptom persists.

Does the trouble persist?

YES Continue as described on page 158.

NO The remedial measure taken was correct or the fault is of intermittent nature.

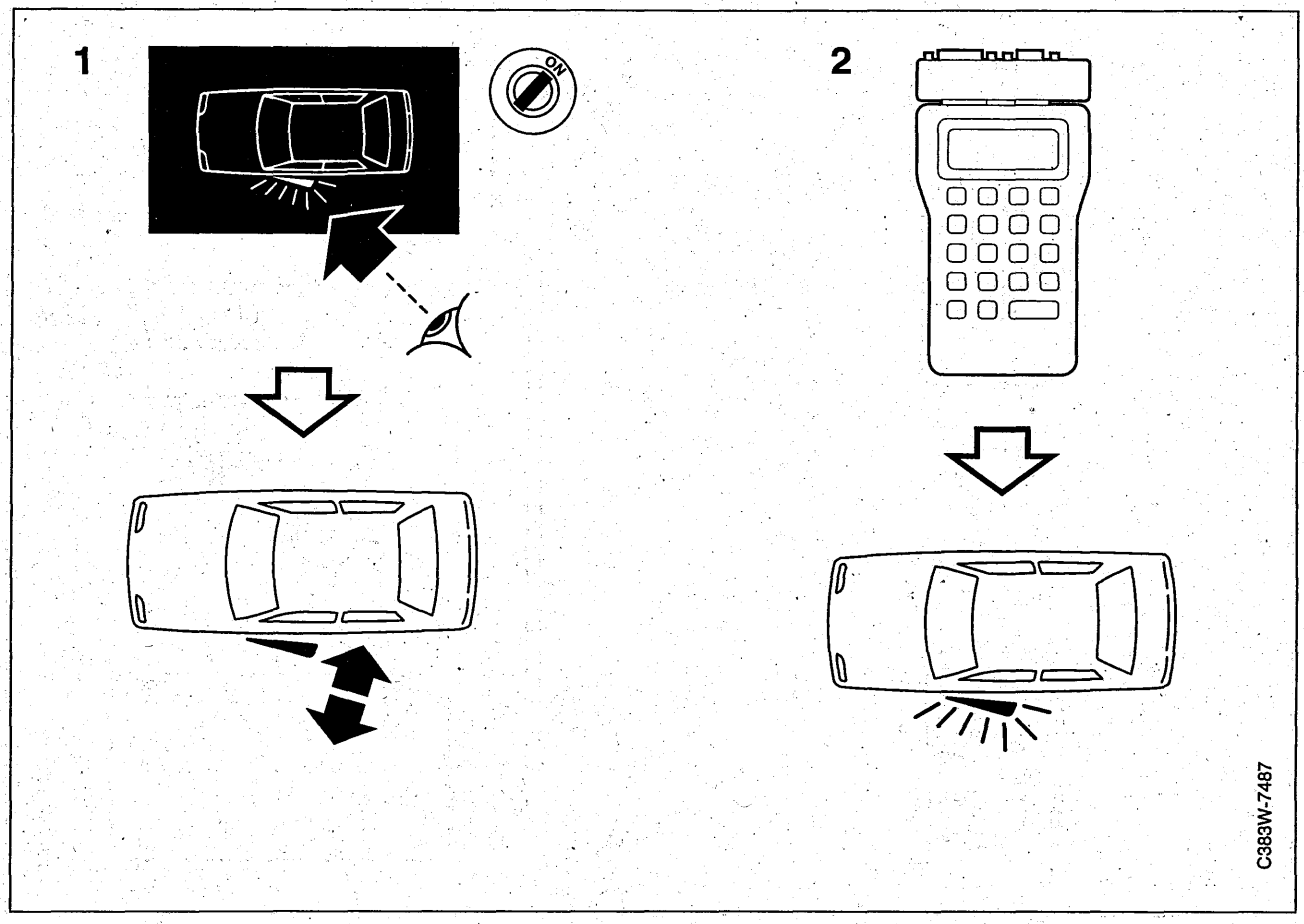
Fault diagnosis, door indication, driver's door



Fault symptom

No door indication.
Remote control out of order.

Fault diagnosis, door indication, driver's door (contd.)



Diagnostic procedure

1 **Check the pictogram**

- Open and close the driver's door and check the pictogram on the main instrument display panel.
- The other doors should be closed.

The pictogram should light up and go out, as appropriate.

Does the pictogram indicate correctly?

YES Continue with point 4.

NO Continue with point 2.

2 **Check door indication operation**

- Connect an ISAT scan tool.
- Select "READ VALUES".
- Select "PICTOGRAM SWITCH".
- Open and close the driver's door.

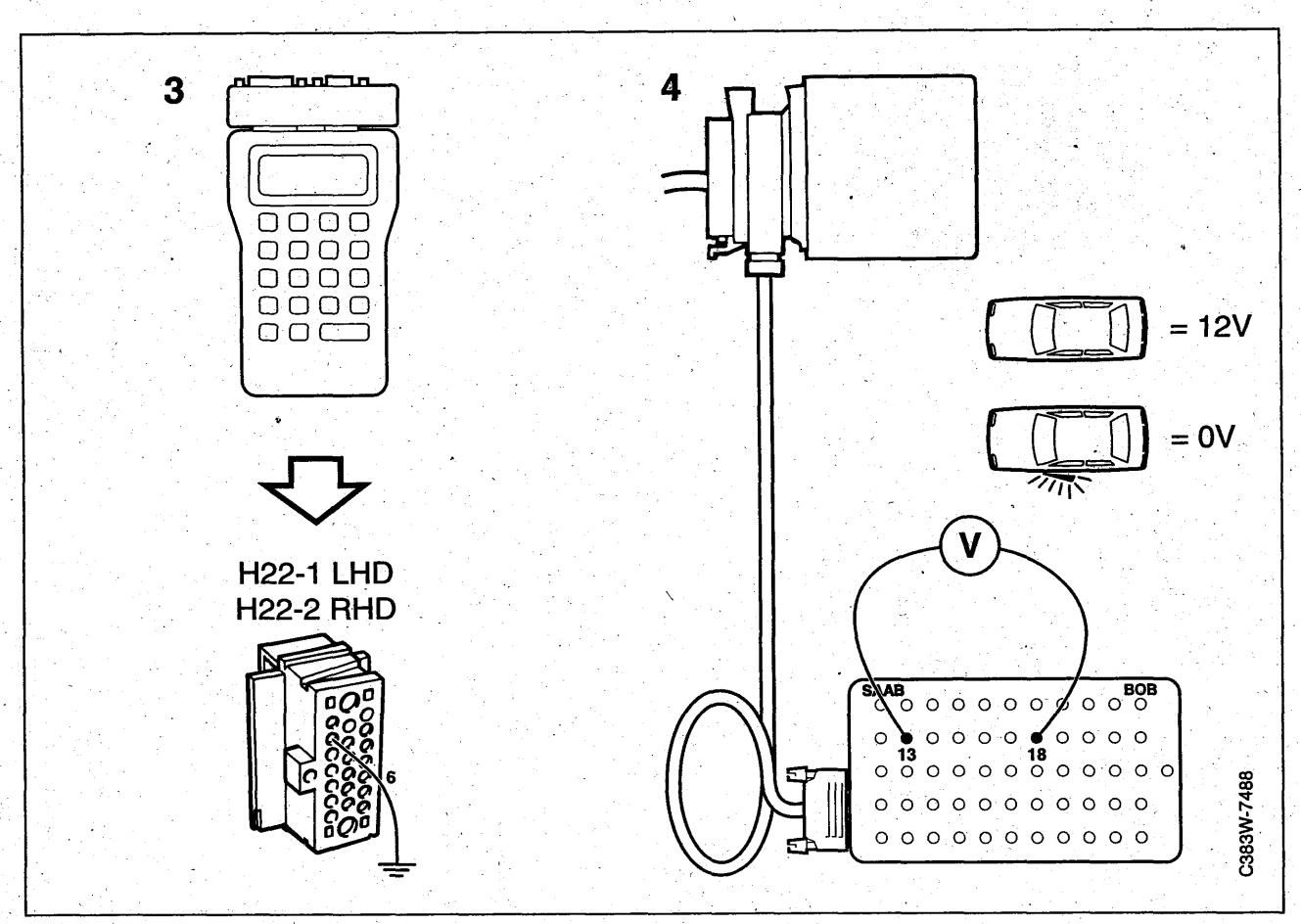
The ISAT scan tool display should read "OPEN" and "CLOSED" as appropriate.

Does it display the correct text?

YES The fault is of intermittent nature, proceed to point 6.

NO Continue with point 3.

Fault diagnosis, door indication, driver's door (contd.)



3 **Check door indication operation (contd.)**

- Unplug connector H22-1.
- Select "PICTOGRAM SWITCH".

The ISAT scan tool should display "CLOSED".
Connect a jumper lead between pin 6 of connector H22-1 and a good grounding point.
The ISAT scan tool display should read OPEN.

Does it display the correct text?

YES Continue with point 5.

NO Continue with point 4.

4 **Check the control module's voltage levels**

- Connect a BOB.
- Connect a voltmeter to pins 18 and 13.
- Open and close the driver's door. Check the voltage reading.

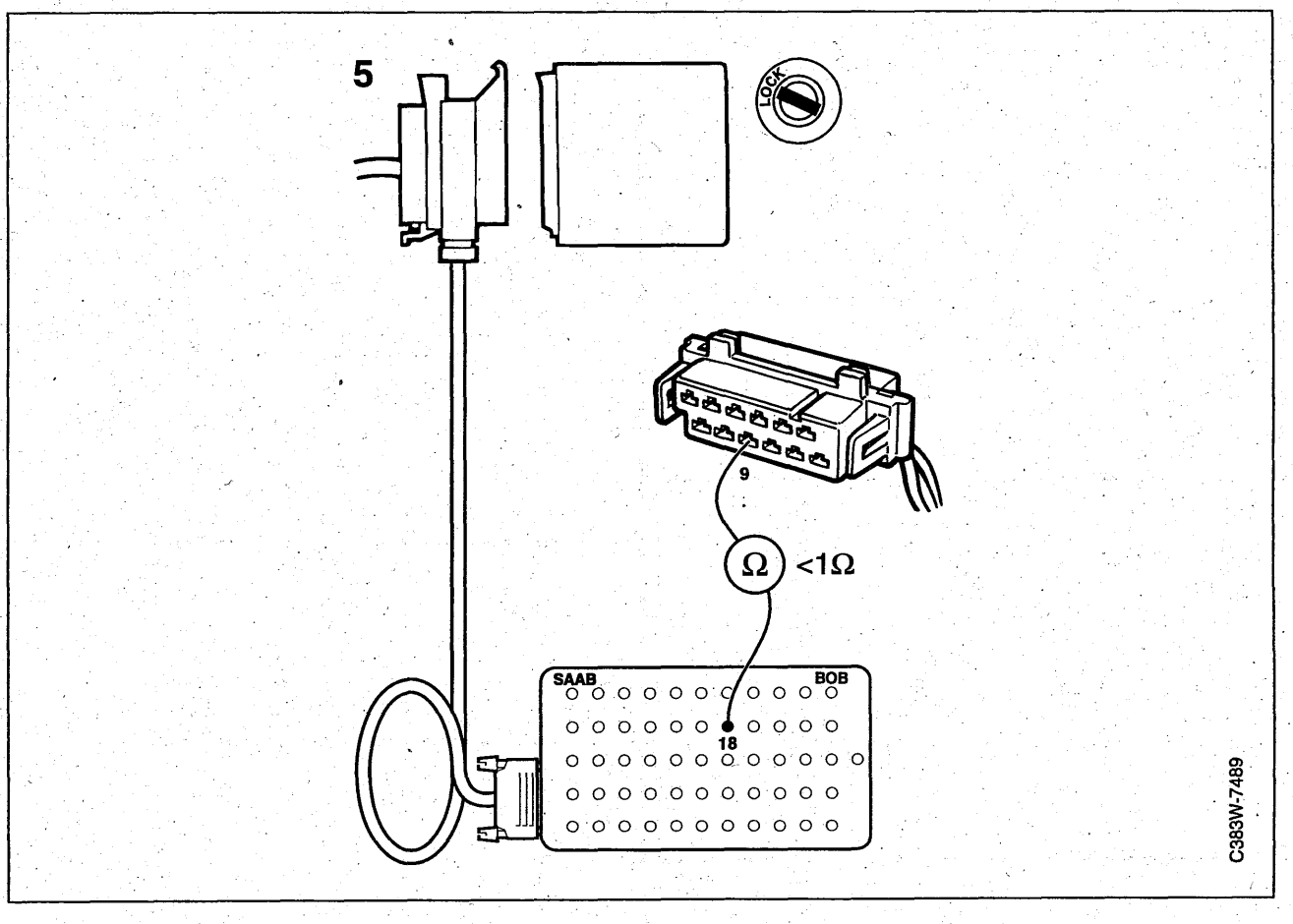
Closed = 12 V
Open = 0 V.

Is the voltage reading OK?

YES Proceed to point 6.

NO Continue with point 5.

Fault diagnosis, door indication, driver's door (contd.)



5 **Check the wiring**
Check the continuity of the wiring between pin 18 of the alarm's control module and pin 9 of the central locking system's control module.

The resistance should be < 1 ohm.

Is the resistance OK?

YES Continue fault diagnosis as described in Service Manual 3:2 "Central locking system, electrically operated tailgate release".

NO Repair or replace the wiring harness.

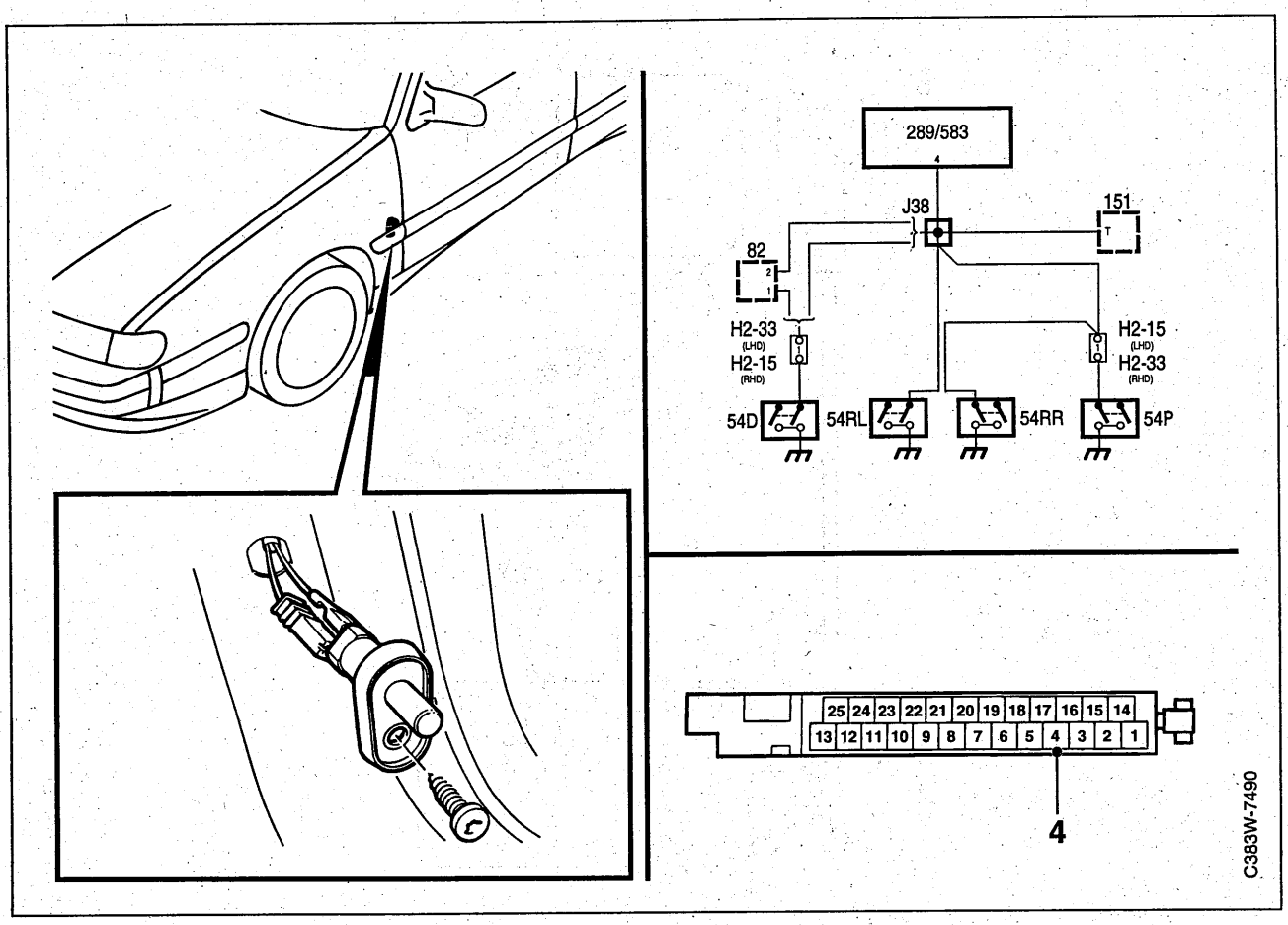
6 **Final test**
Check to see if the fault symptom persists.

Does the trouble persist?

YES Continue as described on page 158.

NO The remedial measure taken was correct or the fault is of intermittent nature.

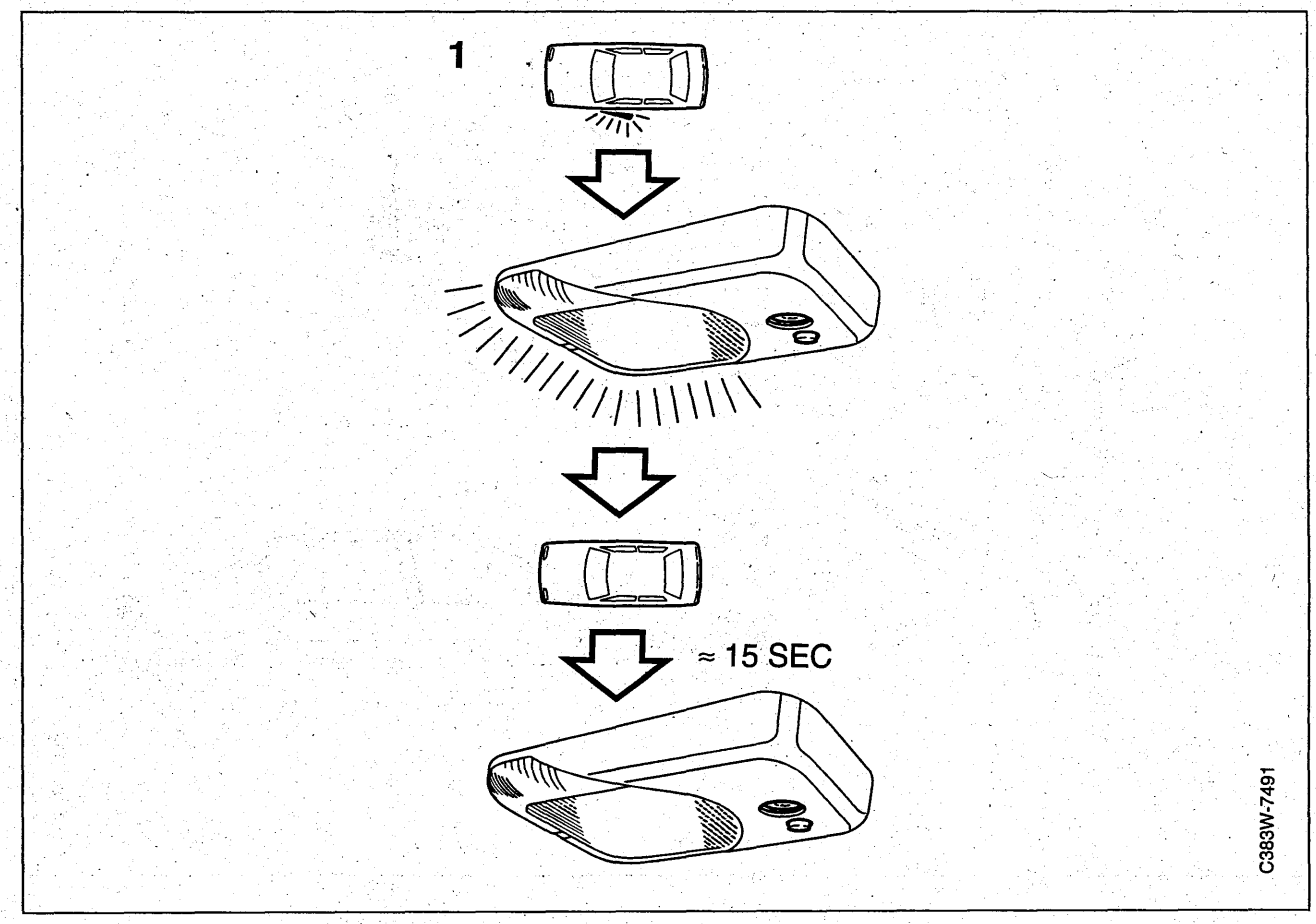
Fault diagnosis, delayed arming due to delayed interior lighting



Fault symptom

The alarm is not armed.

Fault diagnosis, delayed arming due to delayed interior lighting (contd.)



Diagnostic procedure

1 **Check interior lighting operation**
Close the door.

The interior lighting should go out after about 15 seconds.

Does the interior lighting go out?

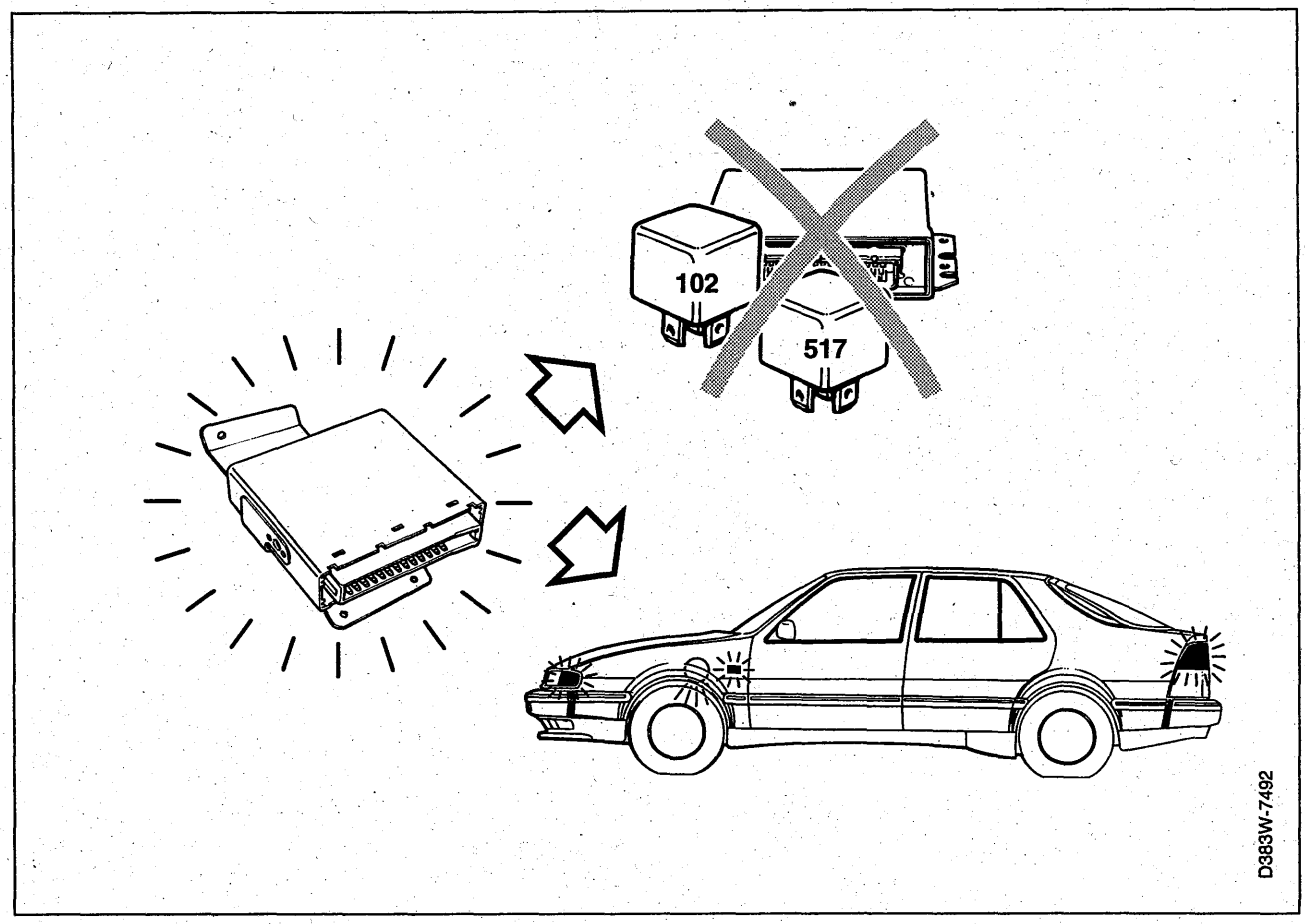
YES Continue as described on page 158.

NO Continue fault diagnosis as described in Service Manual 3:2 "Interior lighting".

Important

If there is no fault in the interior lighting electrical circuit, check for a short circuit to ground in the lead between pin 4 of the control module and pin 1 of the time-delay relay.

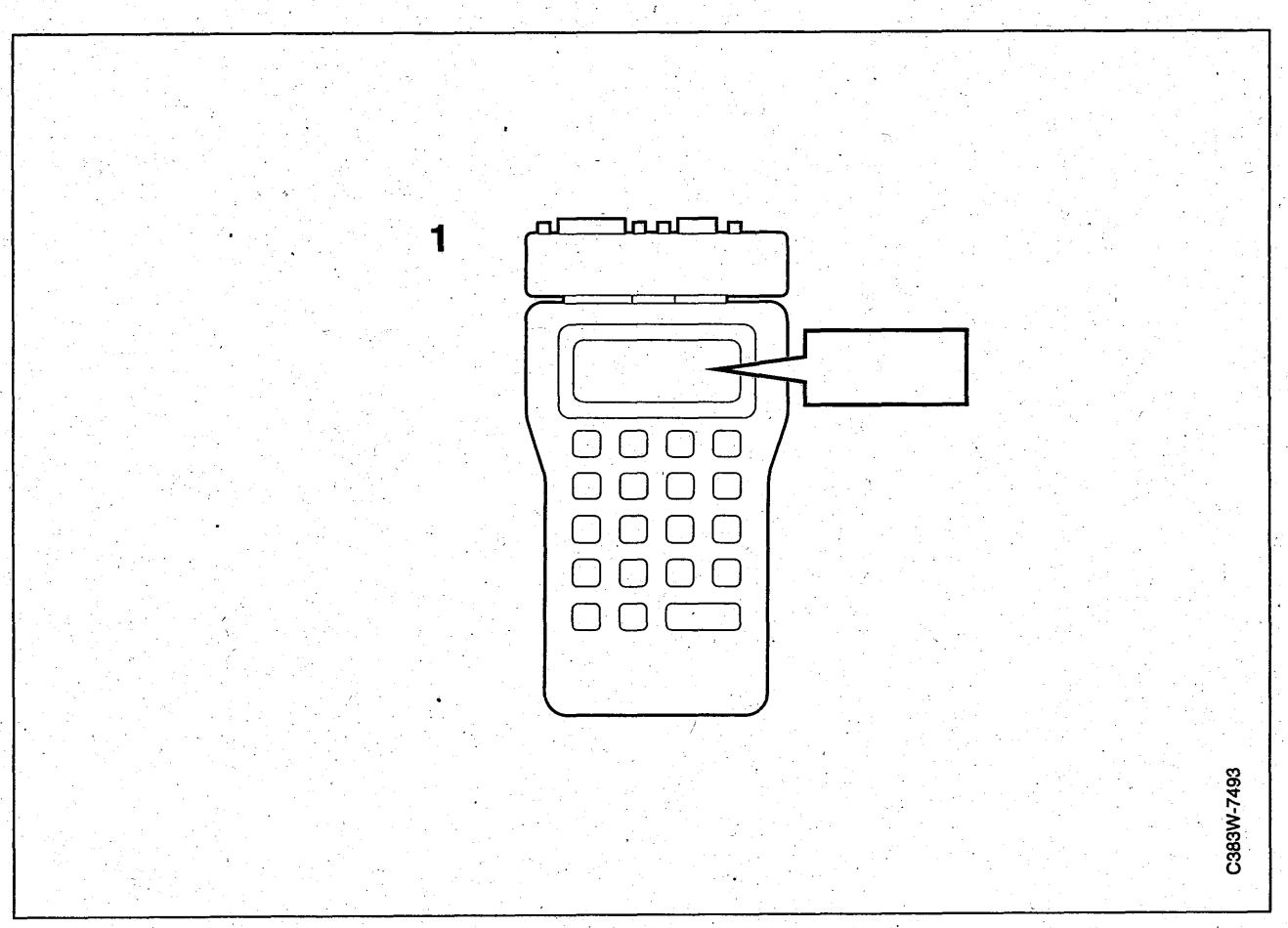
Fault diagnosis, false alarm



Fault symptom

The alarm sets off without cause
(no break-in attempt)

Fault diagnosis, false alarm (contd.)



Diagnostic procedure

1 **Check the cause of the alarm**

- Connect an ISAT scan tool.
- Select "READ VALUES".
- Select "LAST ALARM CAUSE".

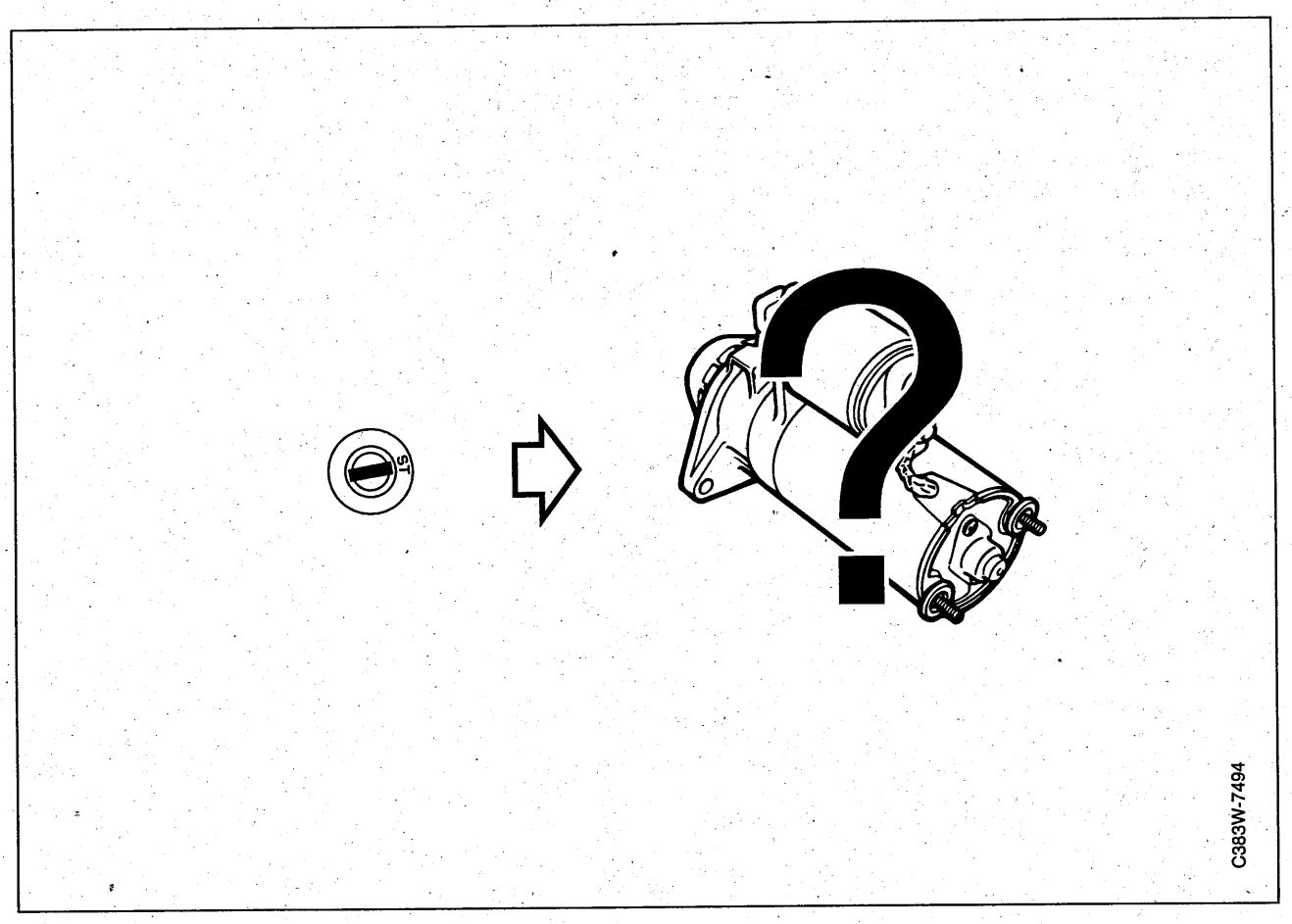
Is the cause of the alarm recorded?

YES Continue fault diagnosis of the indicated fault symptom.

NO Continue as described on page 158.

Fault diagnosis with fault symptoms, Anti-theft alarm with VSS

Fault diagnosis, engine management system, diagnostic trouble code P1640



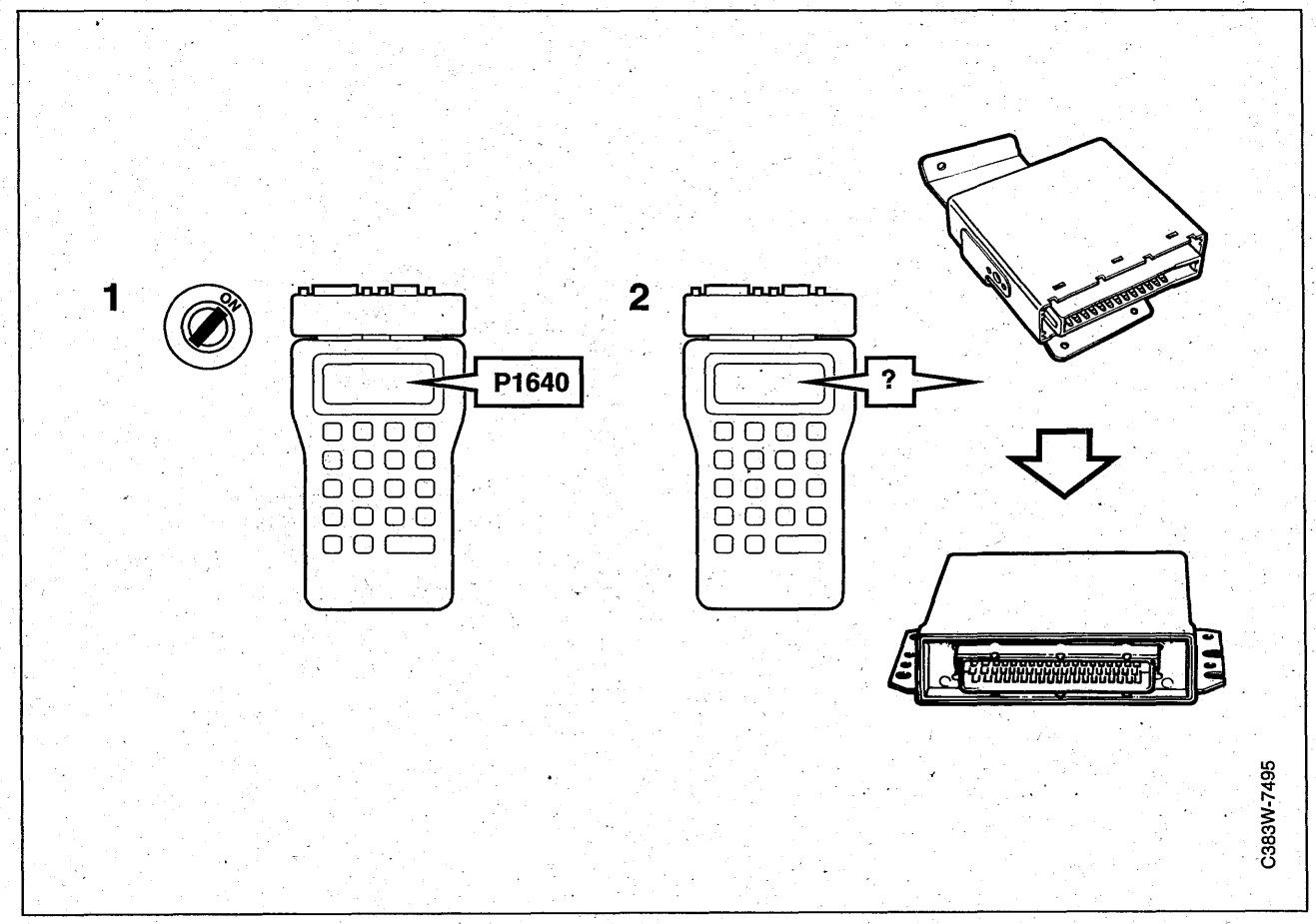
Fault symptom

Car fails to start.

Condition

Diagnostic trouble code (DTC) P1640 stored in the **engine management system** if alarm code absent.

Fault diagnosis, engine management system, diagnostic trouble code P1640 (contd.)



Diagnostic procedure

1 **Check the diagnostic trouble code (DTC) in the engine management system**

- Connect an ISAT scan tool.
- Ignition switch in the "ON" position.
- Select "TRIONIC" or "MOTRONIC 2.8.1", as appropriate.
- Select "READ FAULT CODES".

Is diagnostic trouble code (DTC) P1640 stored?

YES — Continue with point 2.

NO — Continue fault diagnosis of the engine management system as described in Service Manual 2:7.

2 **Check the alarm code status in VSS**

- Select "THEFT ALARM".
- Select "READ VALUES".
- Select "ALARM CODE".

Is the alarm code correct?

YES — Continue with point 3.

NO — The alarm code is incorrect or absent. Continue fault diagnosis of the engine management system as described in Service Manual 2:7.

3 **Final test**

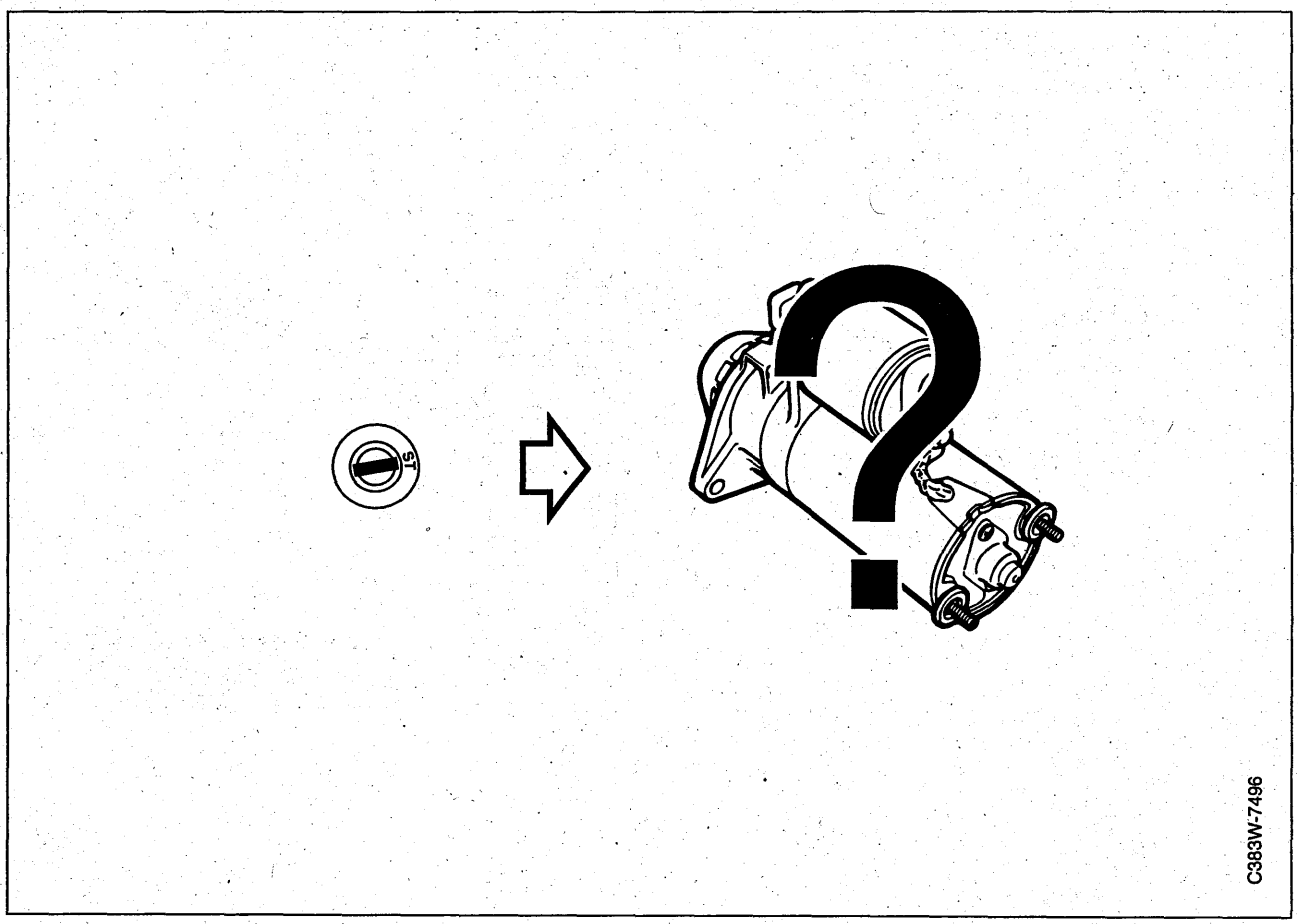
Start the car and check to see if the fault symptom persists.

Does the trouble persist?

YES — Continue as described on page 158.

NO — The remedial measure taken was correct or the fault is of intermittent nature.

Fault diagnosis, engine management system, diagnostic trouble code P1641



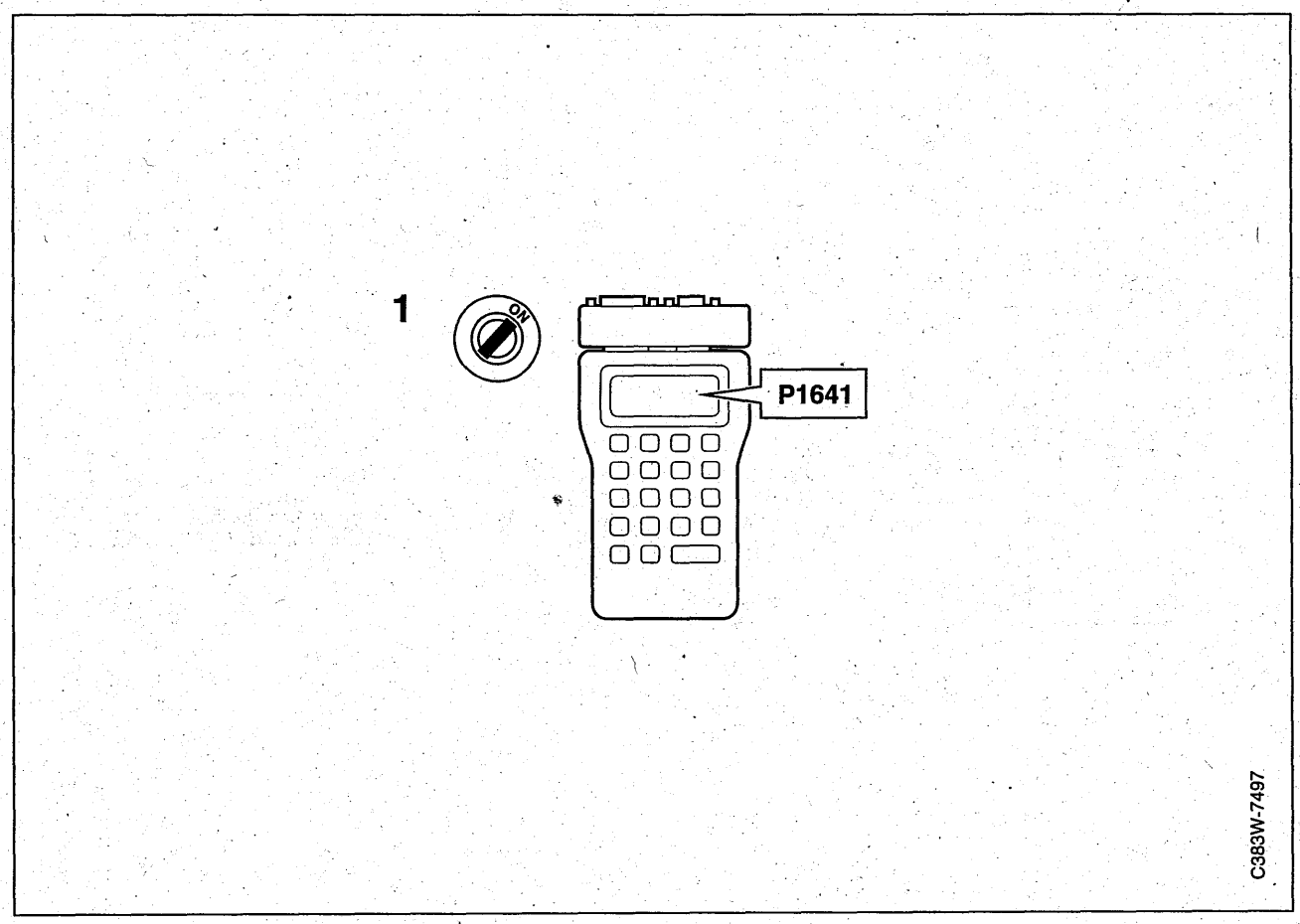
Fault symptom

Car fails to start.

Condition

Diagnostic trouble code (DTC) P1641 stored in the **engine management system** if alarm code is incorrect.

Fault diagnosis, engine management system, diagnostic trouble code P1641 (contd.)



Diagnostic procedure

1 **Check the diagnostic trouble code (DTC) in the engine management system**

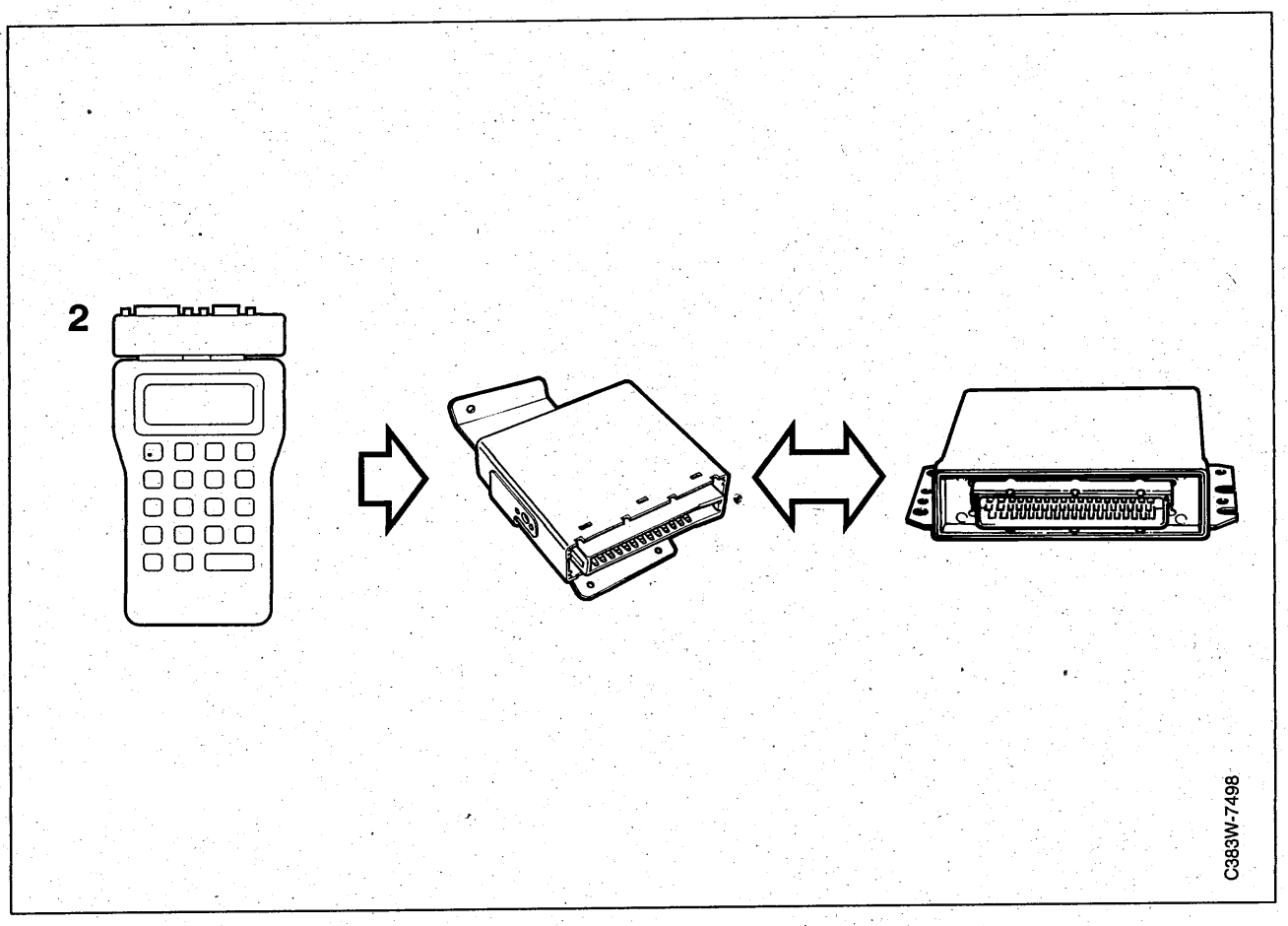
- Connect an ISAT scan tool.
- Ignition switch in the "ON" position.
- Select "TRIONIC" or "MOTRONIC 2.8.1", as appropriate.
- Select "READ FAULT CODES".

Is diagnostic trouble code (DTC) P1641 stored?

YES — Continue with point 2.

NO — Continue fault diagnosis of the engine management system as described in Service Manual 2:7.

Fault diagnosis, engine management system, diagnostic trouble code P1641 (contd.)



2 **Program the VSS alarm code**

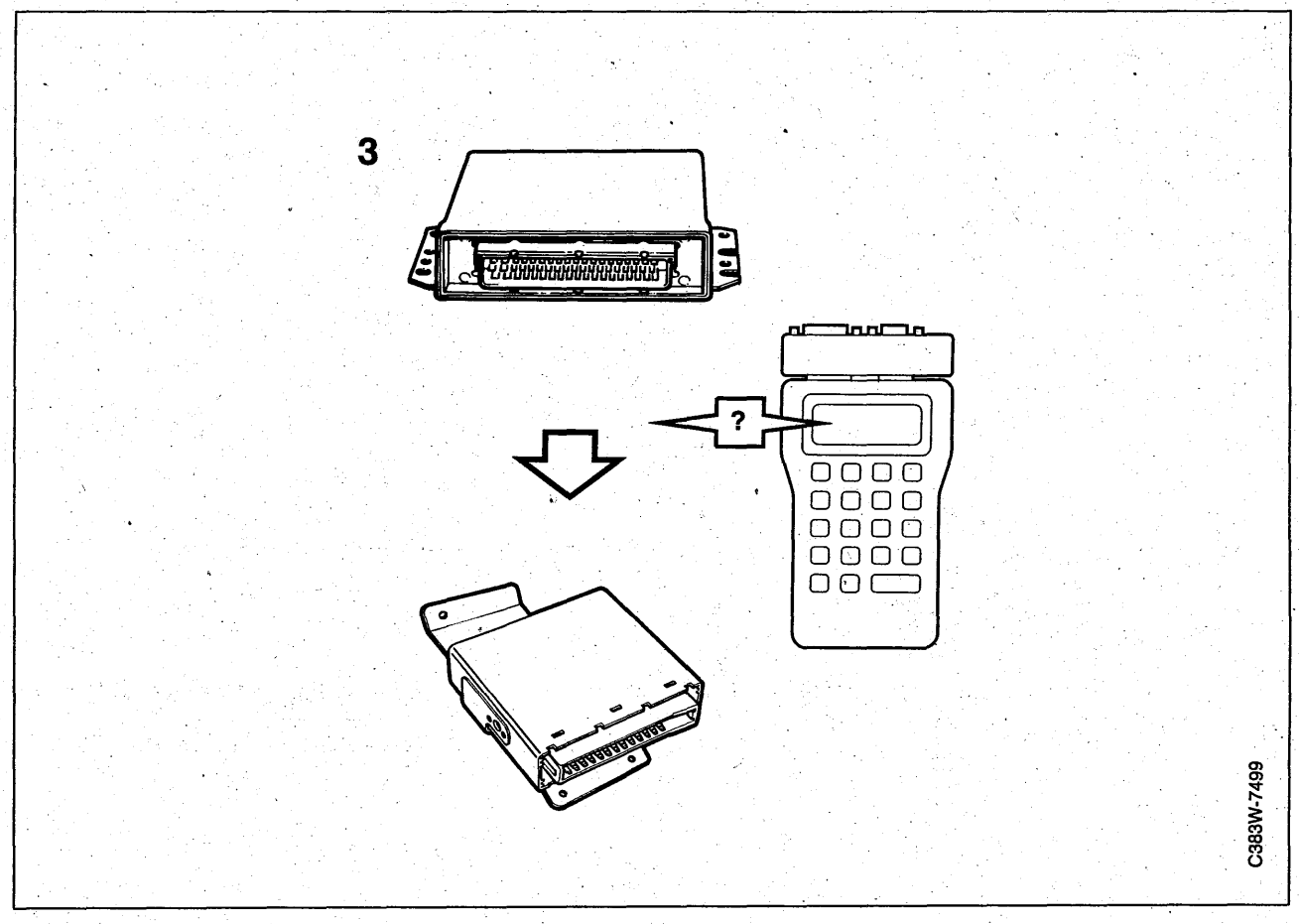
- Select "THEFT ALARM".
- Select "IMMOBILIZING".
- Program the correct alarm code in the VSS electronic control module.
- Select "TRIONIC" or "MOTRONIC 2.8.1", as appropriate.
- Select "CLEAR FAULT CODES".
- Try to start the car.

Has it started?

YES — The remedial measure taken was correct.

NO — The alarm code is incorrect or absent. Continue fault diagnosis of the engine management system as described in Service Manual 2:7.

Fault diagnosis, engine management system, diagnostic trouble code P1641 (contd.)



3 **Check the alarm code status in VSS**
- Select "THEFT ALARM".
- Select "READ VALUES".
- Select "ALARM CODE".

Is the alarm code correct?

YES Continue with point 4.

NO The alarm code is incorrect or absent. Continue fault diagnosis of the engine management system as described in Service Manual 2:7.

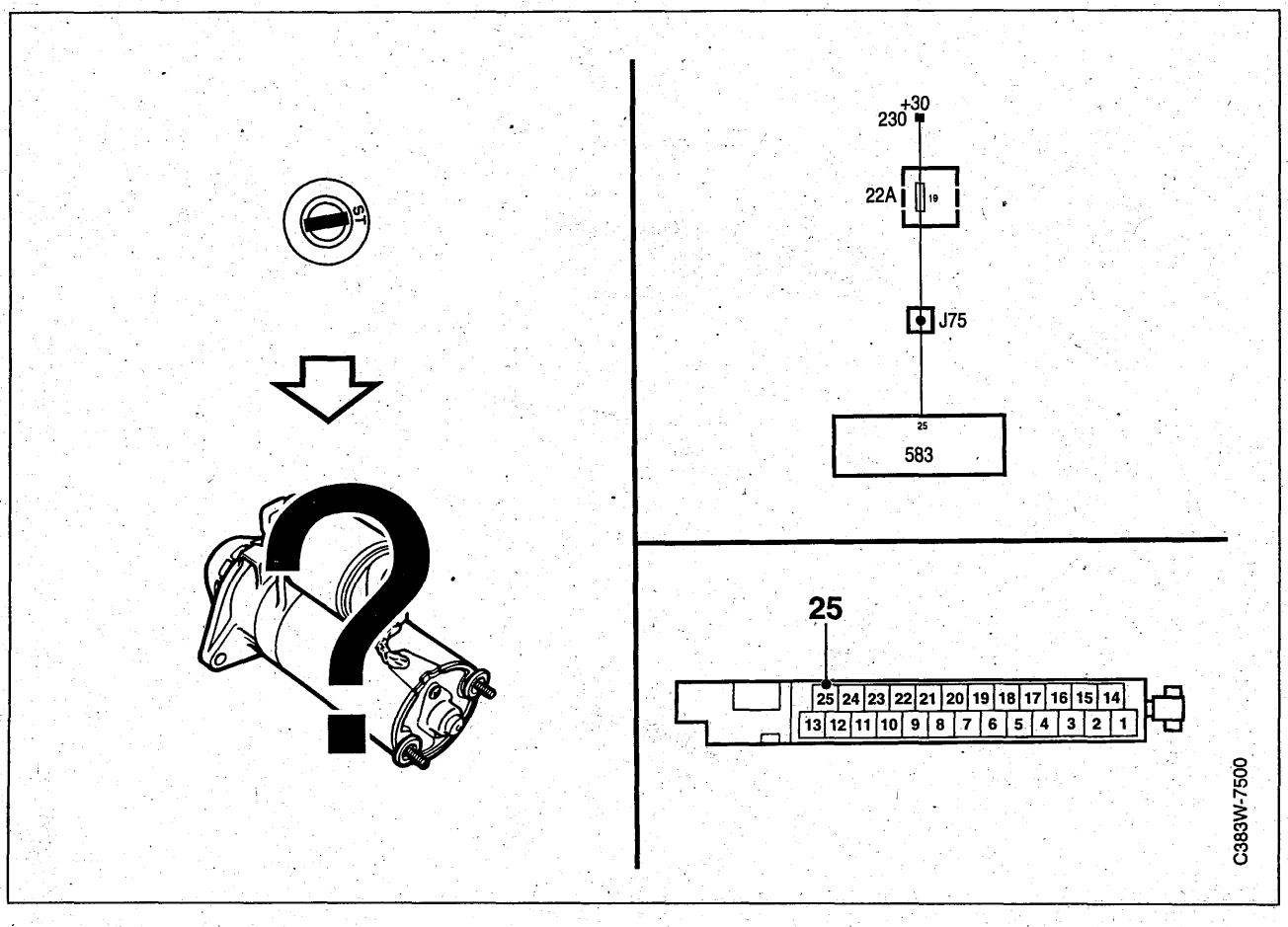
4 **Final test**
Start the car and check to see if the fault symptom persists.

Does the trouble persist?

YES Continue as described on page 158.

NO The remedial measure taken was correct or the fault is of intermittent nature.

Fault diagnosis, electronic control module, no power supply (+30 circuit)



Fault symptom

Car fails to start.
The LED flashes with the ignition switch in the "ST" position.

Condition

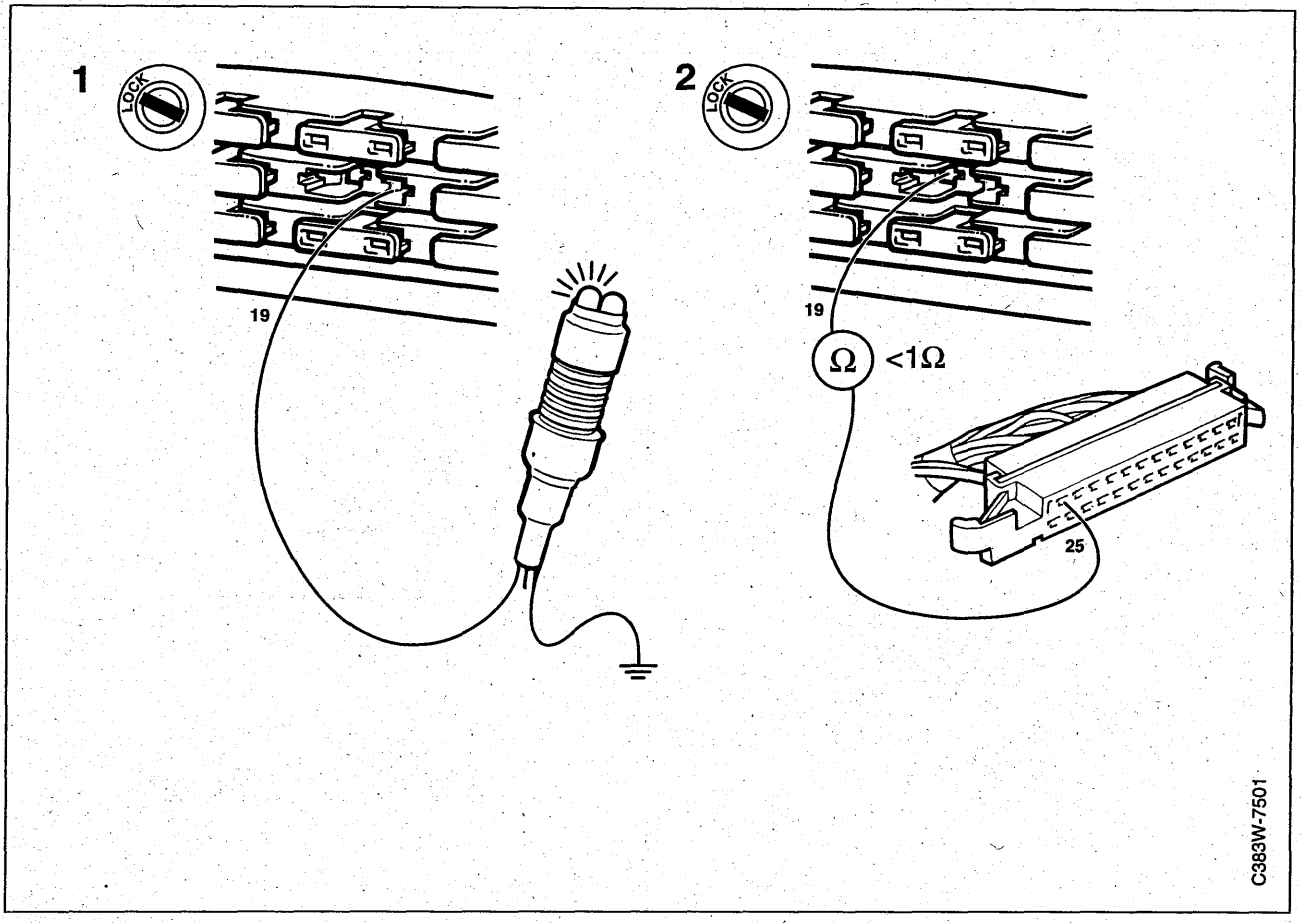
No power supply (+30 circuit).

Diagnostic help

- Ignition switch in the "ON" position.
- Press the left-hand button on the remote control five (5) times and the LED will go out.
- The car can be started.
- Ignition switch in the "OFF" position.
- Restart.

If the car starts, the control module has no power supply (+30 circuit).

Fault diagnosis, electronic control module, no power supply (+30 circuit) (contd.)



Diagnostic procedure

1 **Check the transport fuse**

- Check that fuse 19 is intact and live.
- Connect the test lamp to the fuse and a good grounding point.

If the output side of the fuse is live, the test lamp should light up.

Does the lamp light up?

YES — Continue with point 2.

NO — Change the fuse or continue fault diagnosis as described in Service Manual 3:2 "Electrical system, +30 power supply".

2 **Check the wiring connected to the VSS electronic control module**

Check the wiring for continuity between fuse 19 and pin 25 of the VSS control module.

Is the wiring OK?

YES — Continue with point 3.

NO — Repair or replace the wiring harness.

3 **Final test**

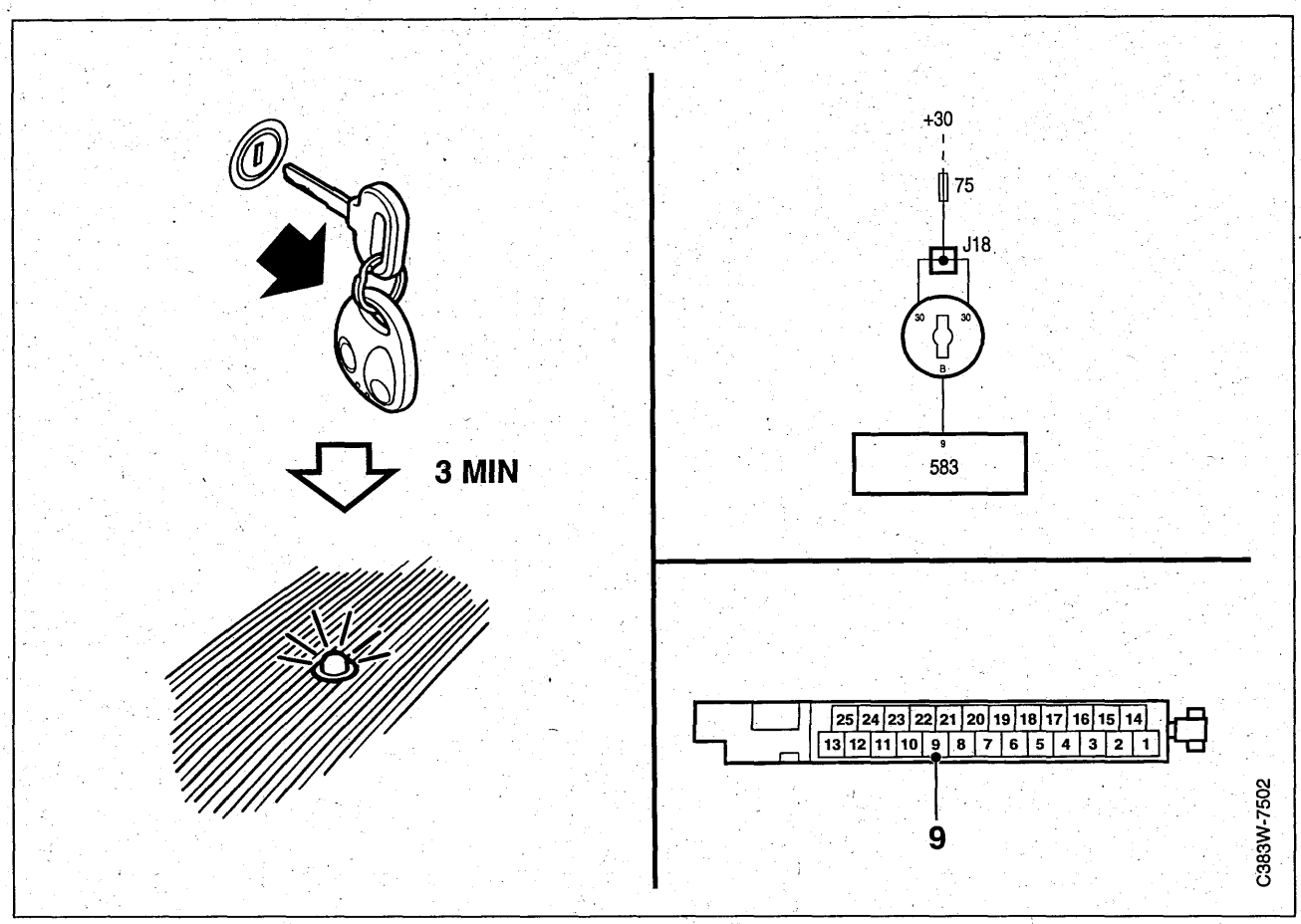
Start the car and check to see if the fault symptom persists.

Does the trouble persist?

YES — Continue as described on page 158.

NO — The remedial measure taken was correct or the fault is of intermittent nature.

Fault diagnosis, power supply (+B circuit), self-immobilizing does not work



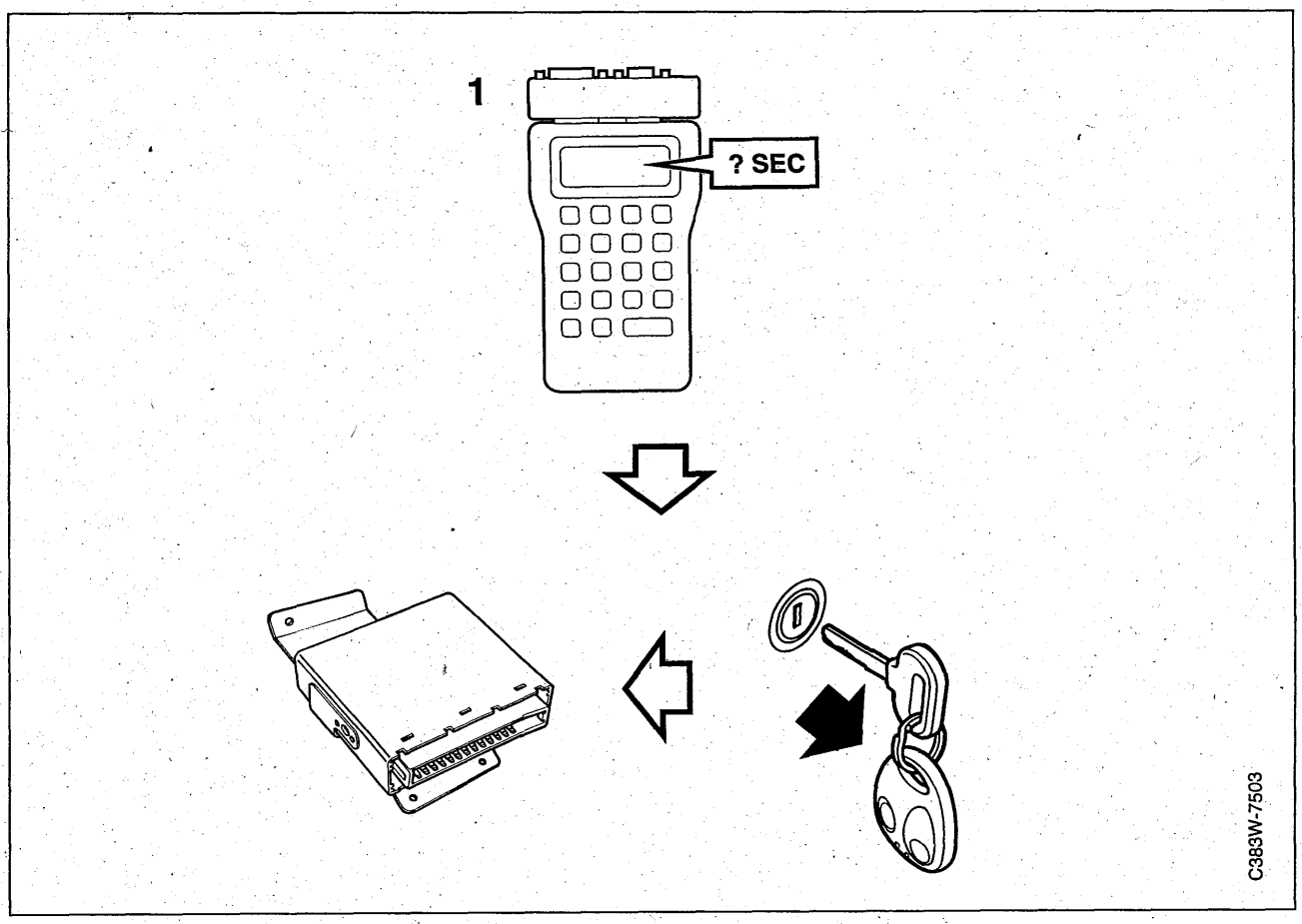
Fault symptom

No immobilizing 30 seconds after the ignition key has been removed.

Condition

No ground signal from the ignition switch.

Fault diagnosis, power supply (+B circuit), no self-immobilizing (contd.)



Diagnostic procedure

1 **Check the VSS programming**

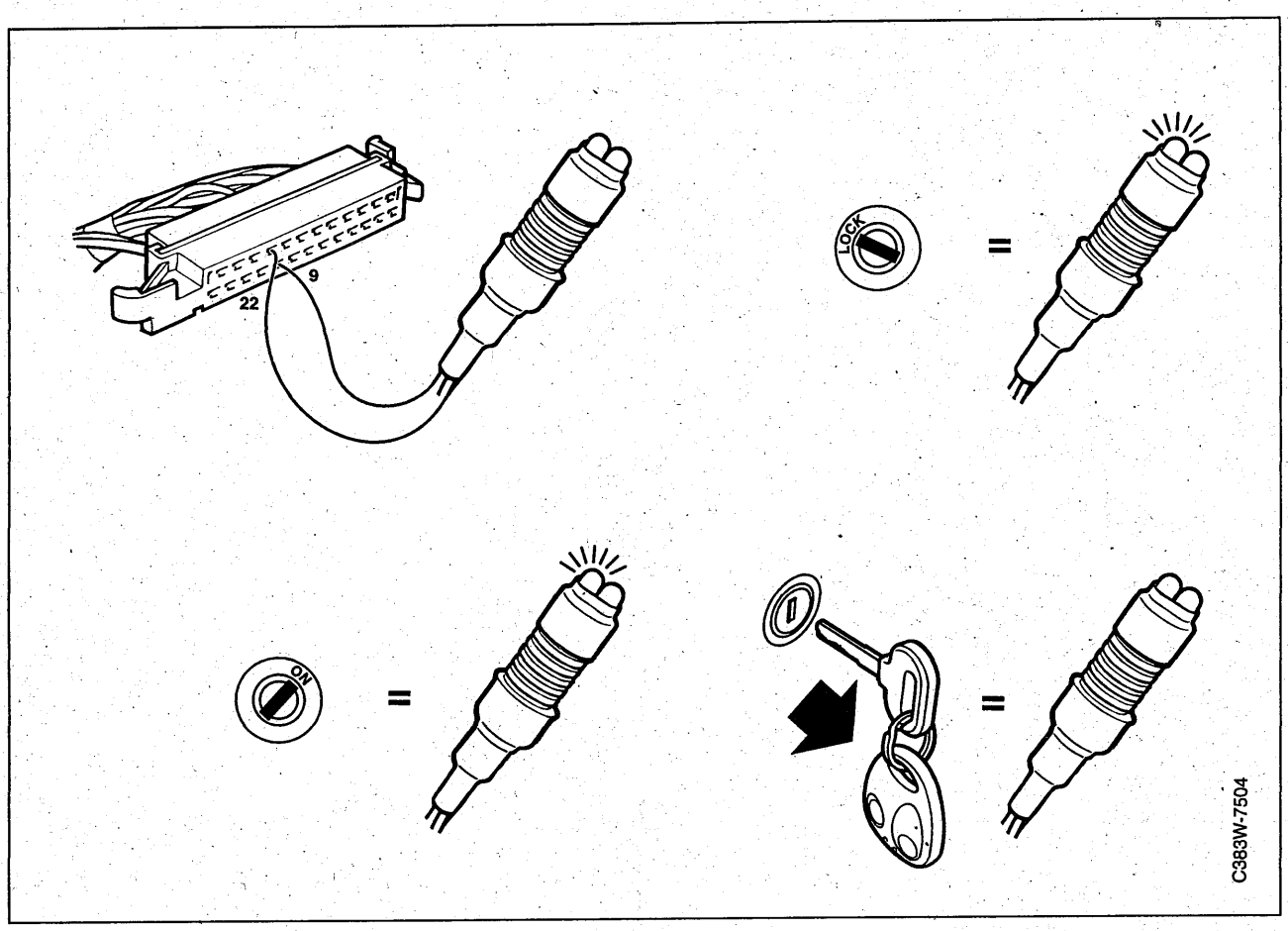
- Connect an ISAT scan tool.
- Select "THEFT ALARM".
- Select "PROGRAMMING".
- Select "SELF-IMMOBILIZING".
- Check "TIME BEFORE ACTIV".

Is the time displayed correct?

YES — Continue with point 2.

NO — Program the relevant time according to current market requirements.

Fault diagnosis, power supply (+B circuit), no self-immobilizing (contd.)



2 **Check the VSS control module's input**

- Remove the VSS control module.
- Connect the test lamp to pins 9 and 22 of the connector.
- Carry out the following test sequence:
  - Ignition switch in the ON position.
    The test lamp should not light up.
  - Ignition switch in the OFF position and ignition key **inserted**.
    The test lamp should not light up.
  - Ignition switch in the OFF position and the ignition key **removed**.
    The test lamp should light up.

Were the test sequence results OK?

YES — Continue with point 3.

NO — Check and repair or replace the wiring between pin 9 of the control module and the ignition switch.

3 **Final test**

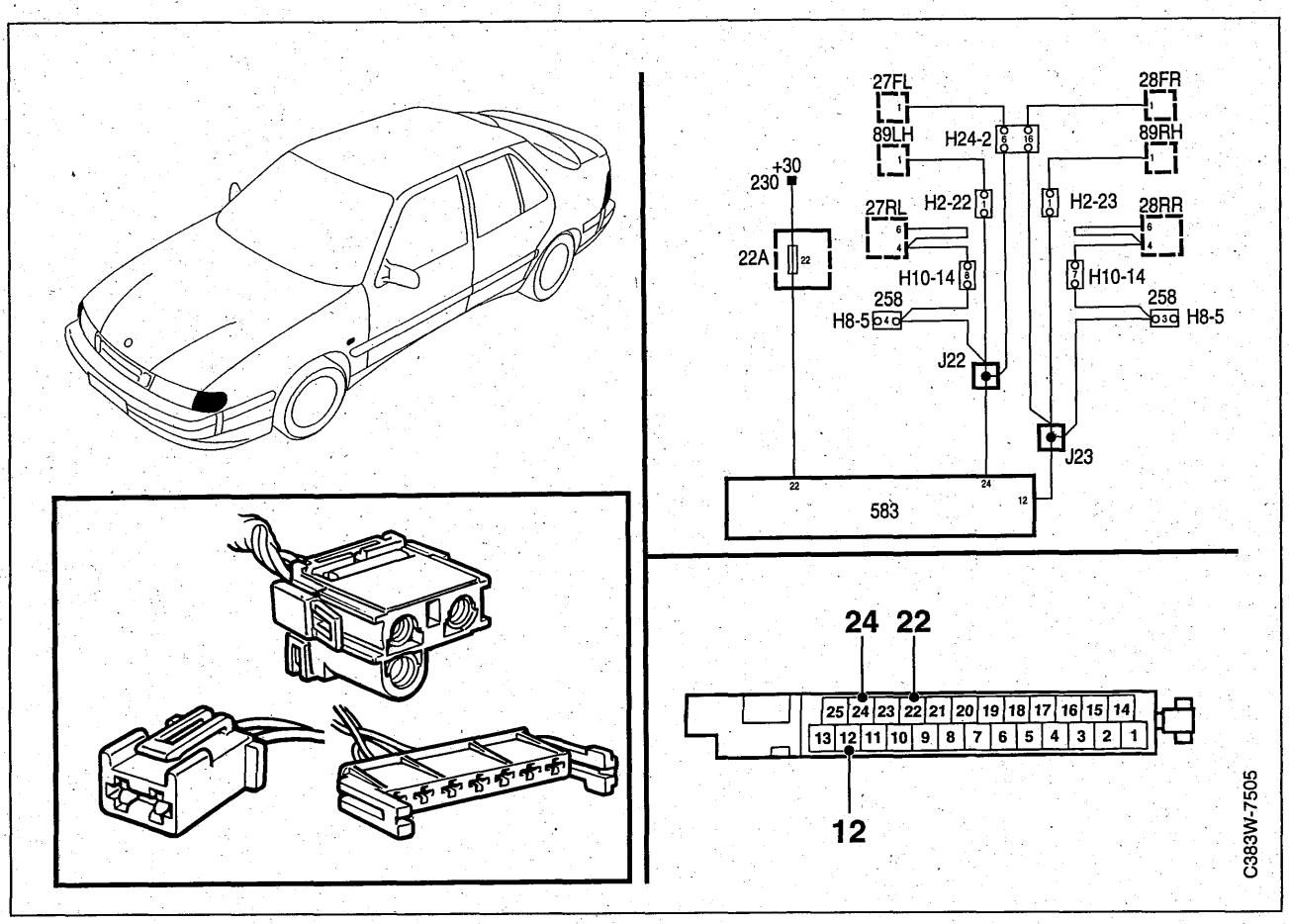
Start the car and check to see if the fault symptom persists.

Does the trouble persist?

YES — Continue as described on page 158.

NO — The remedial measure taken was correct or the fault is of intermittent nature.

Fault diagnosis, direction indicators, no power supply (+30 circuit)



Fault symptom

Direction indicators do not work.

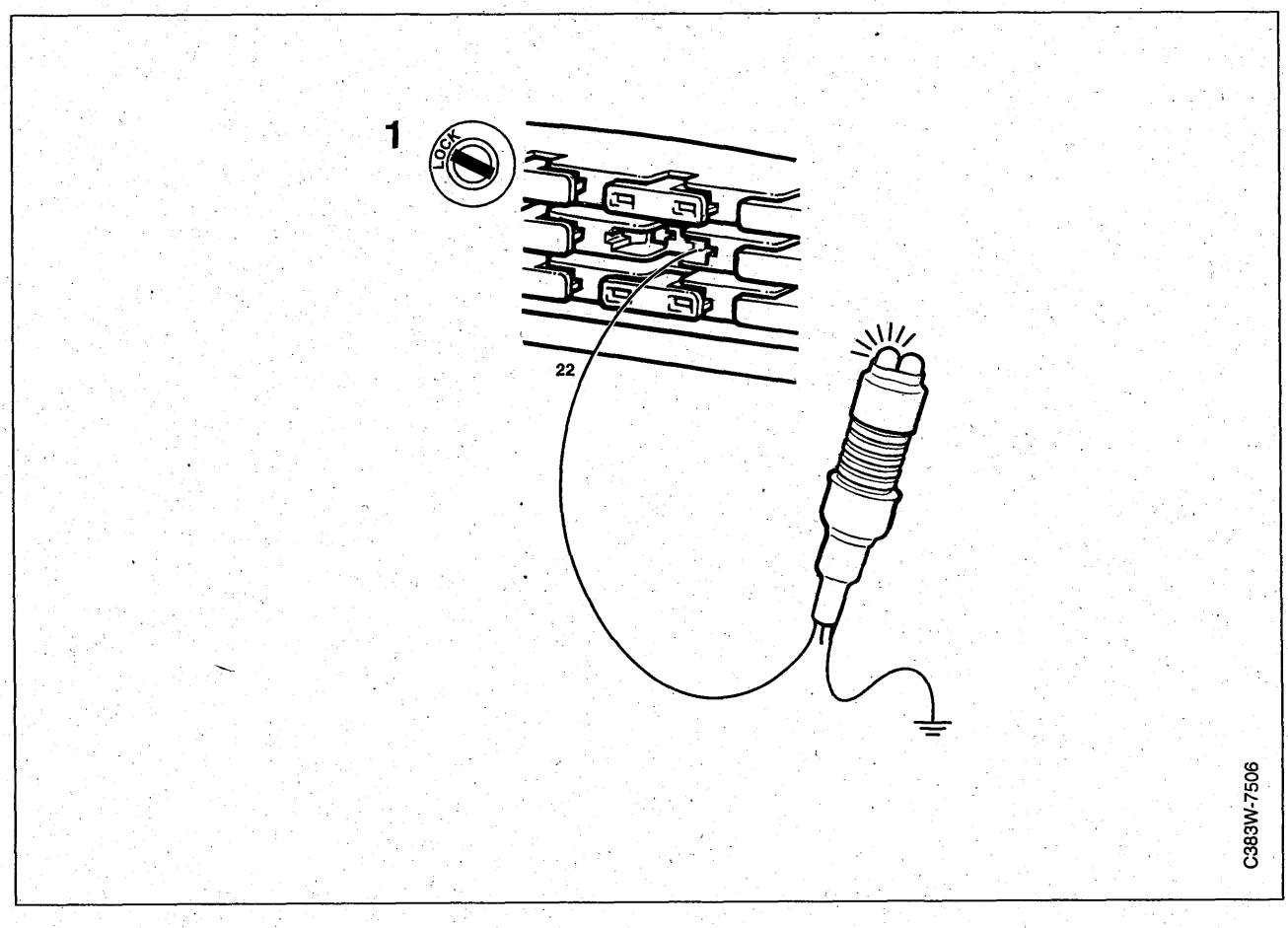
Condition

No power supply (+30 circuit).

Diagnostic help

Service Manual 3:2 "Electrical system" describes the procedures for fault diagnosis of direction indicators and hazard flashers.

Fault diagnosis, direction indicators, no power supply (+30 circuit) (contd.)



Diagnostic procedure

1 **Check fuse 22.**

- Check that fuse 22 is intact and live.
- Connect the test lamp to fuse 22 and a good grounding point.

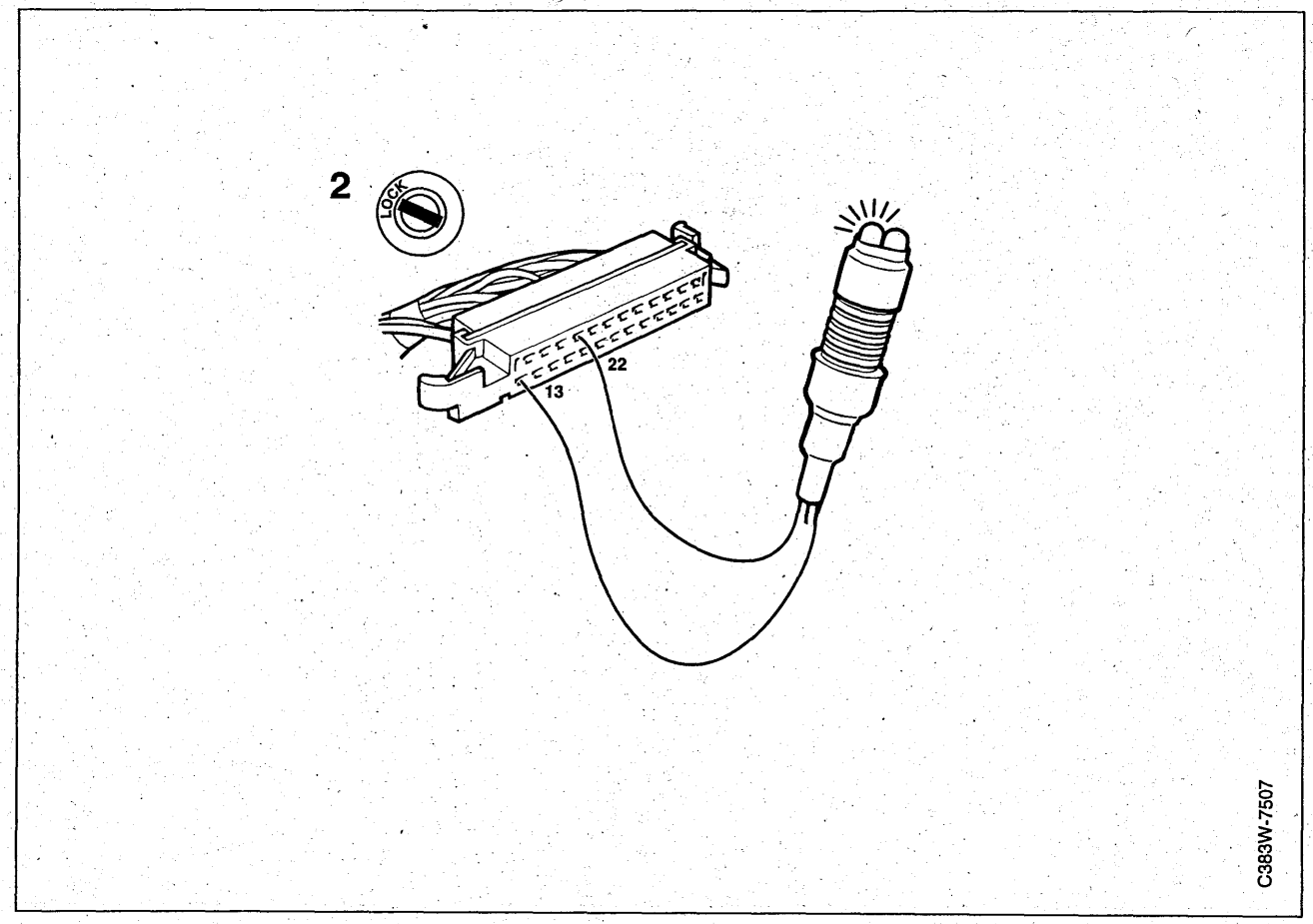
If the output side of the fuse is live, the test lamp should light up.

Does it light up?

YES — Continue with point 2.

NO — Change the fuse or continue fault diagnosis as described in Service Manual 3:2 "Electrical system, +30 power supply".

Fault diagnosis, direction indicators, no power supply (+30 circuit) (contd.)



2 **Check the wiring connected to the VSS electronic control module**

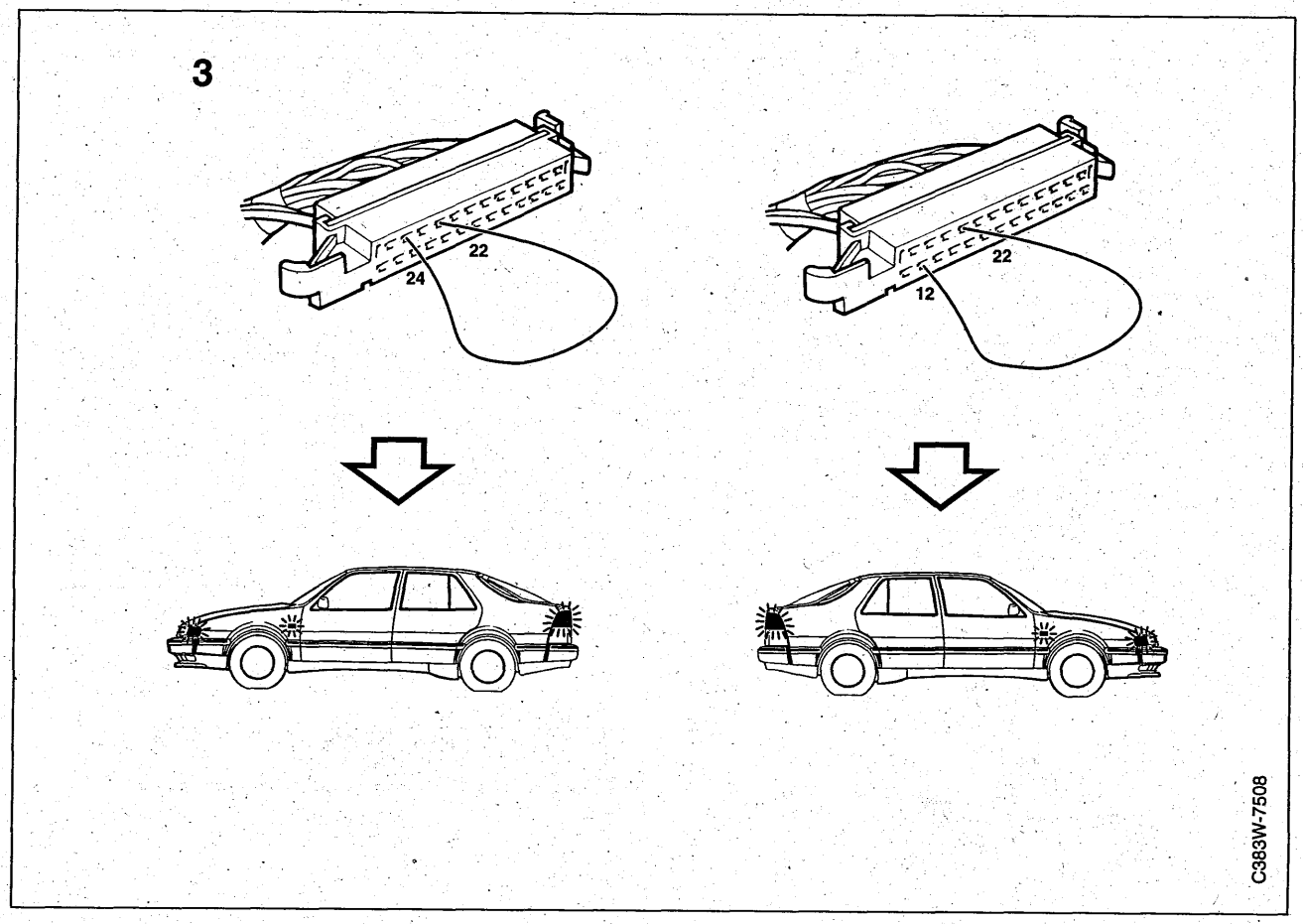
- Unplug the VSS electronic control module.
- Connect the test lamp to pins 22 and 13 of the electronic control module connector.

Does it light up?

YES Continue with point 3.

NO Check the wiring harness for continuity between pin 22 of the VSS electronic control module and fuse 22, including connectors. Rectify the fault.

Fault diagnosis, direction indicators, no power supply (+30 circuit) (contd.)



3 **Supply power directly to the direction indicators**

- Connect a jumper lead between pins 22 and 24 of the electronic control module connector.
- Connect a jumper lead between pins 22 and 12 of the electronic control module connector.

The left-hand and right-hand direction indicators respectively should light up.

Do the direction indicators light up?

YES Continue with point 4.

NO Check the wiring harness for continuity between:
- pin 24 of the VSS control module and the connector, left-hand side direction indicator.
- pin 12 of the VSS control module and the connector, right-hand side direction indicator.

See fault diagnosis in Service Manual 3:2 "Electrical system, Direction indicators, Hazard flashers". Rectify the fault.

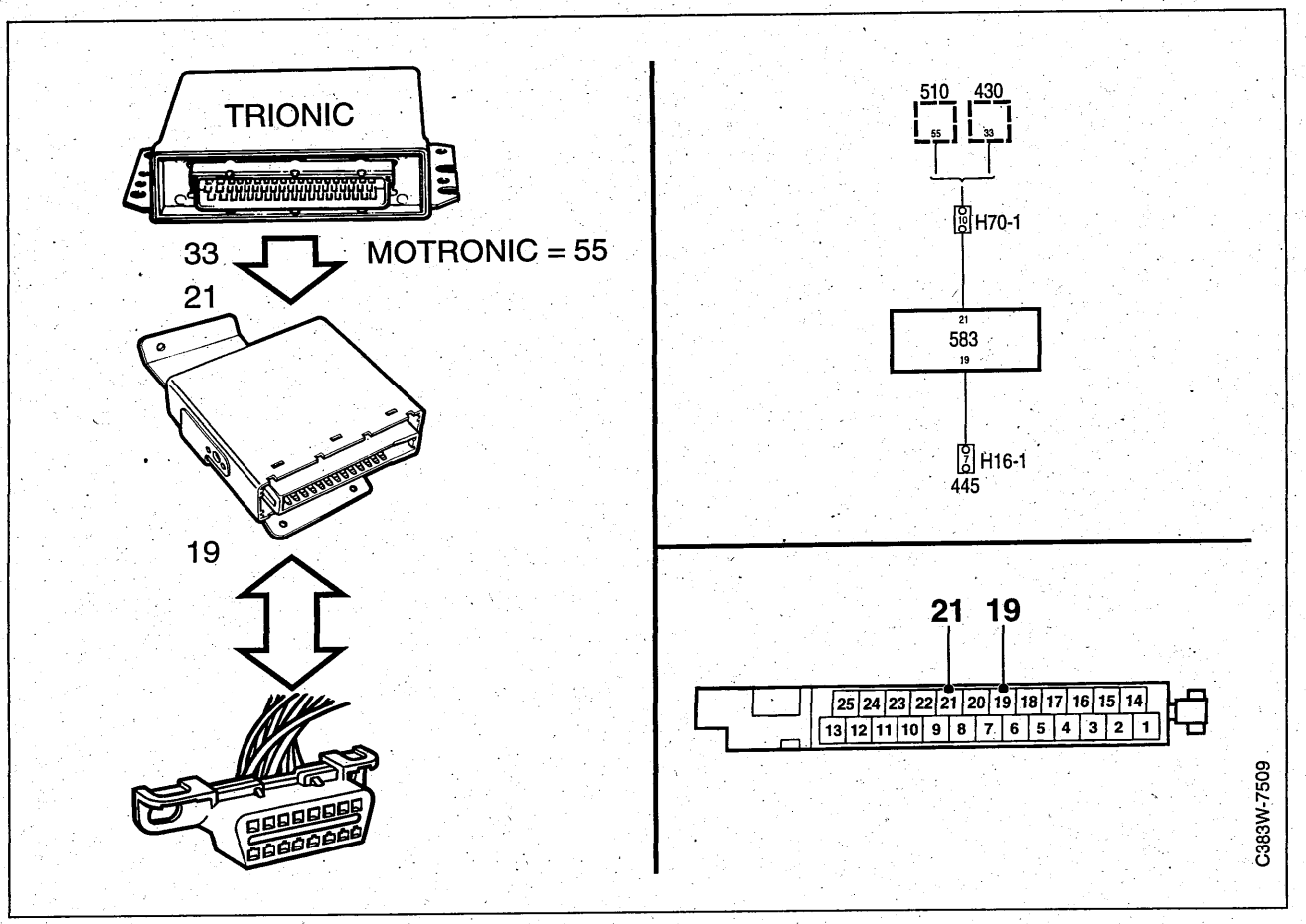
4 **Final test**
Activate the hazard flashers and check whether they work.

Do the hazard flashers work?

YES The remedial measure taken was correct or the fault is of intermittent nature.

NO Continue as described on page 158.

Fault diagnosis, data link, no communication with engine management system



Fault symptom

Car fails to start and
no ISAT scan tool communication with VSS.

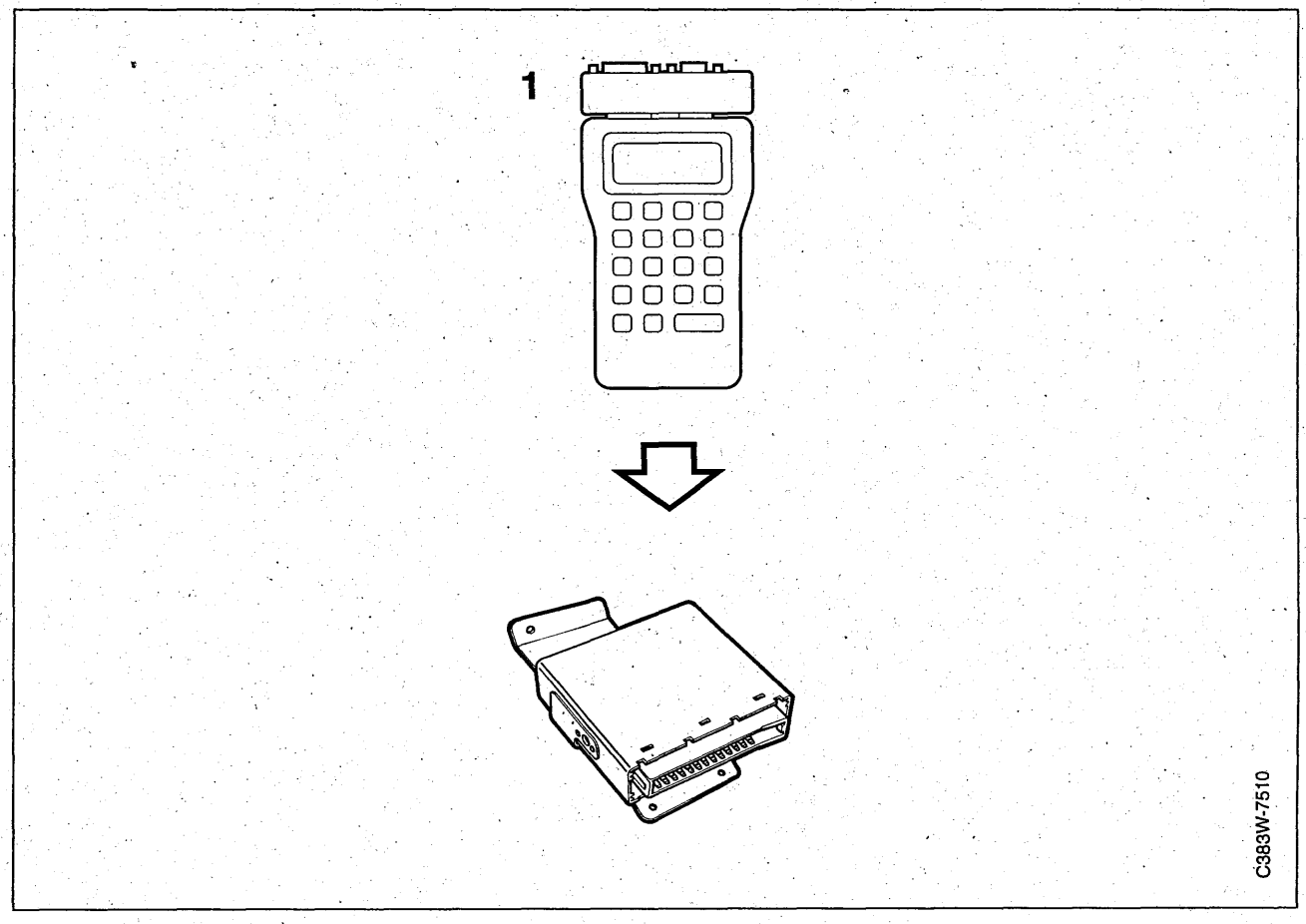
Condition

Communication between VSS and the engine management system absent or faulty.

Diagnostic help

- If diagnostic trouble codes P1640 or P1641 are stored in the engine management system they cannot be read because there may be a short circuit to ground/B+ or an open circuit in the data link (K lead).
- On starting, when VSS and the engine management system exchange alarm codes, communication takes place between pin 21 of the VSS electronic control module and pin 33 of the Trionic electronic control module or pin 55 of the Motronic electronic control module.

Fault diagnosis, data link, no communication with the engine management system (contd.)



Diagnostic procedure

1 **Check ISAT scan tool communication with VSS**

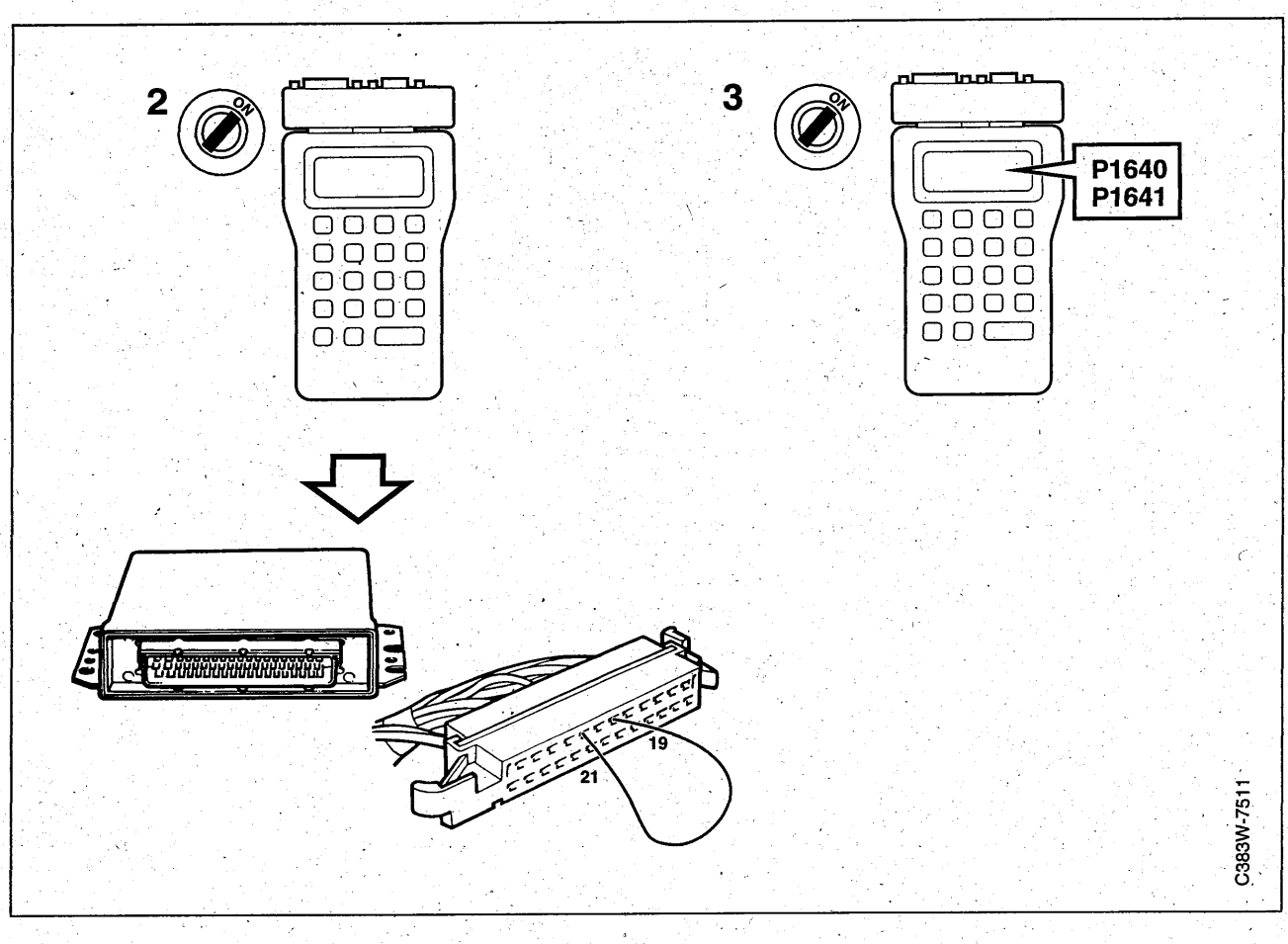
- Connect an ISAT scan tool.
- Select "THEFT ALARM".

Does the ISAT scan tool display a THEFT ALARM submenu?

YES — Continue with point 2.

NO — Check via the LED that the alarm is not immobilized. If the LED flashes twice, disarm and repeat "Check VSS communication". Otherwise, continue as described in the "fault diagnosis, data link connector" section under "Anti-theft alarm, fault diagnosis without diagnostic trouble codes".

Fault diagnosis, data link, no communication with the engine management system (contd.)



2 **Check ISAT scan tool communication with the engine management system**

- Unplug the VSS electronic control module.
- Ignition switch in the ON position.
- Connect a jumper lead between pins 19 and 21 of the VSS electronic control module connector.
- Select "TRIONIC" or "MOTRONIC 2.8.1", as appropriate.

Does the ISAT scan tool show the submenu for the selected engine management system?

YES — The K lead is OK. Continue with point 3.

NO — Continue with point 4.

3 **Check for diagnostic trouble codes in the engine management system**

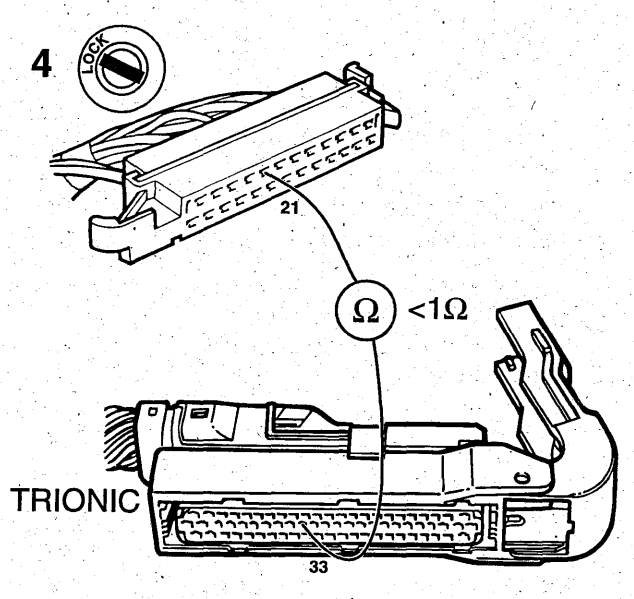
- Select "READ FAULT CODES".

Is diagnostic trouble code P1640 or P1641 stored?

YES — Continue fault diagnosis as described for the stored diagnostic trouble code.

NO — Continue with point 5.

Fault diagnosis, data link, no communication with the engine management system (contd.)



4 **Check the K lead**
Check the wiring harness for continuity between pin 21 of the VSS electronic control module and pin 33 of the Trionic electronic control module or pin 55 of the Motronic electronic control module.

Is the wiring OK?

YES Continue fault diagnosis of the engine management system as described in Service Manual 2:7.

NO Rectify or replace the wiring (including connectors).

5 **Final test**
Start the car and check to see if the fault symptom persists.

Does the trouble persist?

YES Continue as described on page 158.

NO The remedial measure taken was correct or the fault is of intermittent nature.

Test readings, electronic control module connections, Anti-theft alarm

Pin	Component/ function	In/Out	Test conditions	Between	Test reading	Function/fault diagnosis
1	Aerial remote transmitter, signal	IN	Not measurable with conventional instruments			29/98
2	LED	OUT	Activate with ISAT scan tool Select "LED" "OFF" "ON"	 2-13 2-13	 <0.5 V 2 V	27/86
3	Tailgate switch	IN	Tailgate closed Tailgate open	3-13 3-13	12 V 0 V	18/112
4	Door switches	IN	Door closed Door open	4-13 4-13	12 V 0 V	18/90
5	Glass breakage sensor, ground	IN	Ignition "OFF"	5-13	<5 ohms	19/102
6	Central locking system, unlocking	OUT	Disarm the alarm with the remote control (or key, if programmed) - normal position - key position, unlock Multimeter with min/max facility required. If min phase selected = 0 V. A conventional voltmeter drops from about 7 V to about 1.5-3 V.	 6-13	 Batt+ 0 V for 0.75 sec	34/90
7	Glass breakage sensor, input	IN	Central locking system unlocking (car key)	7-5	0.3 V	19/102
8	Starter relay, +50 supply	OUT	Starter motor cranking Ignition "ON" (+15)	13-8	12 V 0 V	25/68
9	Fuel pump relay	OUT	Ignition "ON" (+15) Alarm armed (when idling)	13-9	12 V 0 V	25/82
10	+15	IN	Ignition "ON" (+15)	10-13	12 V	21/74
11	Horn	OUT	Activate using ISAT scan tool Select "HORN" "OFF" "ON"	 11-13 11-13	 12 V 0 V	23/110
12	Direction indicators	OUT	Activate using ISAT scan tool Select "FLASHERS" "OFF" "ON"	 12-13 12-13	 0 V Batt+	24/106

Test readings, electronic control module connections, Anti-theft alarm (contd.)

Pin	Component/ function	In/Out	Test conditions	Between	Test reading	Function/fault diagnosis
13	Power ground	IN		13-Batt-	<0.1 V	14/--
14	Aerial, ground	IN	Ignition "OFF"	14-13	<5 ohms	29/98
15	Not used.					
16	Switch, bonnet	IN	Bonnet open Bonnet closed	16-13	0 V 12 V	18/94
17	Central locking system, locking	OUT	Arm the alarm with the remote control (or key, if programmed) - normal position - key position, lock Multimeter with min/max facility required. If min phase selected = 0 V. A conventional voltmeter drops from about 7 V to about 1.5-3 V.	17-13	Batt+ 0 V for 0.75 sec	34/90
18	Pictogram switch	IN	Door open Door closed	18-13	0 V 12 V	18/124
19	Diagnostics, K lead	IN/ OUT	ISAT scan tool connected ISAT scan tool not connected	19-13	12 V 0 V	39/64
20	+50	IN	Starter motor cranking Ignition "ON" (+15)	20-13	12 V 0 V	21/68
21	Fuel pump relay (4-cyl) +30 (6-cyl)	IN	Ignition "ON" (+15)	Batt+ -21	<0.5 V	21/74
22	+15 (4-cyl) +30 (6-cyl) Power supply, Trionic/Motronic	OUT	Ignition "ON" (+15)	Batt+ -22	<0.5 V	21/74
23	Unlocking tailgate using remote control	OUT	Activate using ISAT scan tool Select "TAILGATE" "ON" "OFF" or remote control	23-13	12 V 0 V	33/116
24	Direction indicators	OUT	Activate using ISAT scan tool Select "FLASHERS" "OFF" "ON"	24-13 24-13	0 V Batt+	24/106
25	+30	IN		Batt+ -25	<0.5 V	14/78

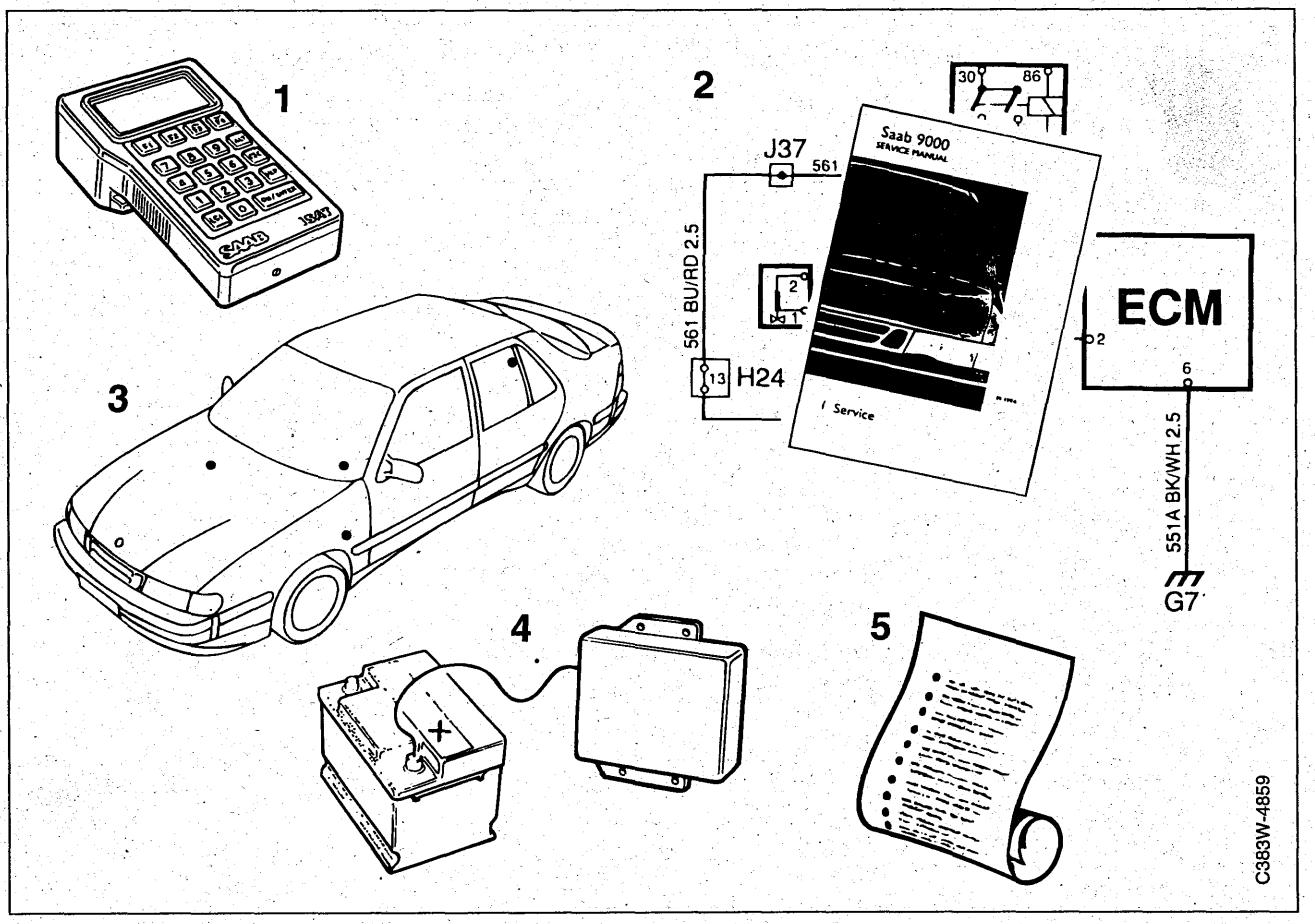
Test readings, electronic control module connections, Anti-theft alarm with VSS

Pin	Component/ function	In/Out	Test conditions	Between	Test reading	Function/fault diagnosis
1	Aerial remote transmitter, signal	IN	Not measurable with conventional instruments			29/98
2	LED	OUT	Activate with ISAT scan tool Select "LED" "OFF" "ON"	 2-13 2-13	 <0.5 V 2 V	27/86
3	Tailgate switch	IN	Tailgate closed Tailgate open	3-13 3-13	Batt+ 0 V	18/112
4	Door switches	IN	Door closed (switch open) Door open (switch closed)	4-13 4-13	Batt+ 0 V	18/90
5	Not used.					
6	Central locking system, unlocking	OUT	Disarm the alarm using remote control - normal position - unlock position Multimeter with min/max facility required. If min phase selected = 0 V. A conventional voltmeter drops from about 7 V to about 1.5-3 V.	6-13	7 V 0 V for 0.75 sec	32/98
7	Glass breakage sensor, input	IN	- normal position - tap/jingle with bunch of keys	7-13	0 V 2-4 V	19/102
8	Not used.					
9	Immobilizing input	IN	Ignition "ON" Ignition "OFF" Ignition "OFF", key removed	9-13	+B voltage +B voltage 0 V	26/150
10	+15	IN	Ignition "ON"	10-13	Batt+	22/--
11	Horn	OUT	Activate using ISAT scan tool Select "HORN" "OFF" "ON"	 11-13 11-13	 Batt+ 0 V	23/110
12	Direction indicators	OUT	Activate using ISAT scan tool Select "FLASHERS" "OFF" "ON"	 12-13 12-13	 0 V Batt+	24/106

Test readings, electronic control module connections, Anti-theft alarm with VSS (contd.)

Pin	Component/ function	In/Out	Test conditions	Between	Test reading	Function/fault diagnosis
13	Power ground	IN		13-Batt-	<0.1 V	15/--
14	Aerial, ground	IN	Ignition "OFF"	14-13	<5 ohms	29/98
15	Not used					
16	Switch, bonnet	IN	Bonnet open Bonnet closed	16-13	0 V Batt+	18/94
17	Central locking system, locking	OUT	Arm the alarm using remote control - normal position - lock position Multimeter with min/max facility required. If min phase selected = 0 V. A conventional voltmeter drops from about 7 V to about 1.5-3 V.	17-13	Batt+ 0 V for 0.75 sec	31/98
18	Pictogram switch	IN	Door open (switch closed) Door closed (switch open)	18-13	0 V Batt+	18/124
19	Diagnostics, K lead	IN/ OUT	ISAT scan tool connected ISAT scan tool not connected	19-13	Batt+ 0 V	39/150
20	Not used.					
21	Communication, VSS and engine management system (4-cyl) +30 (6-cyl)	IN	Ignition "ON" (+15) - ISAT scan tool connected - ISAT scan tool not connected	21-13	11 V 4 V	22/--
22	+30 supply direction indicators	IN		Batt+ -22	<0.5 V	15/146
23	Unlocking tailgate using remote control	OUT	Activate using ISAT scan tool Select "TAILGATE" "ON" "OFF" or remote control	23-13	Batt+ 0 V	33/116
24	Direction indicators	OUT	Activate using ISAT scan tool Select "FLASHERS" "OFF" "ON"	24-13 24-13	0 V Batt+	24/106
25	+30 supply electronic control module	IN		Batt+ -25	<0.5 V	15/140

Before changing the electronic control module



When all tests have been carried out as described in the diagnostic procedure under the relevant diagnostic trouble code, or by manual fault diagnosis, without any faults having been detected, it is natural to assume that the control module is at fault.

For this reason, check through the following points very carefully before definitely settling on the anti-theft alarm's electronic control module as the cause of the fault.

1 Check once again that all the points in the fault diagnosis schedule for the relevant diagnostic trouble code or fault symptom have been covered.

2 Study the wiring diagram of the circuit in question and make sure that you understand it. If necessary, refer to appropriate parts of the technical description and the electrical descriptions of operation in Service Manual 3:2 "Wiring diagrams".

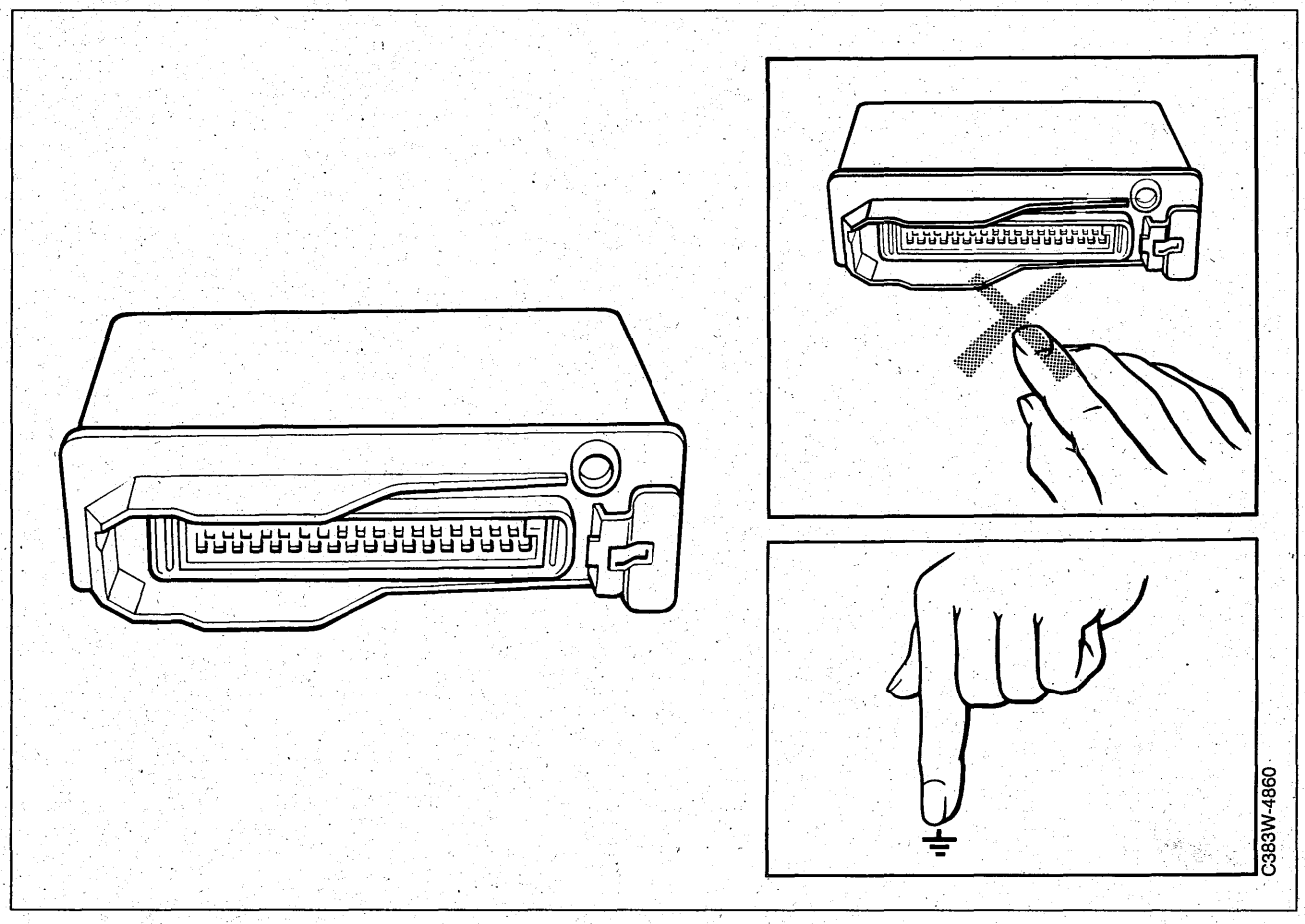
3 Check all grounding points. If you have already done so, do it once again. Check that power ground and sensors are mechanically and electrically isolated from each other.

4 Check the control module's power supply.

5 Experience from M93 shows that most of the control modules returned in connection with warranty repairs were not faulty.
Be restrictive with control module replacement. Unnecessary replacement of control modules constitutes a major expense for Saab Automobile and Saab dealers. Give careful thought to possible causes of the fault before changing the control module.

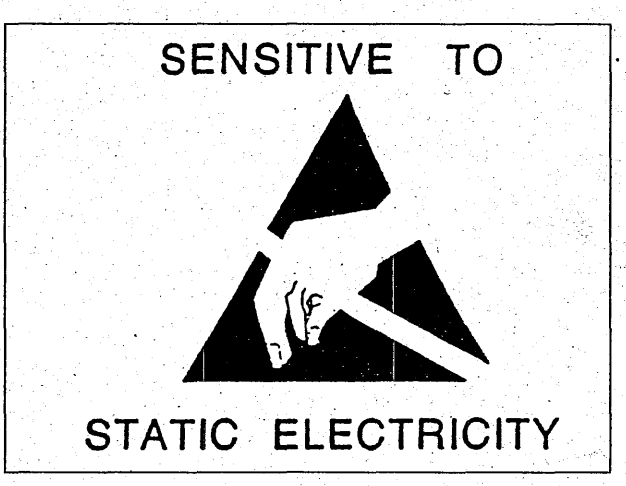
6 If the original fault persists in spite of this, then the anti-theft alarm control module will have to be changed.

Handling electronic control modules



All electronic control modules are more or less sensitive to static electricity and can, if they are handled incorrectly, be so seriously damaged as to be rendered unserviceable. It is therefore important that the following rules are always followed when an electronic control module is to be removed or changed for any reason.

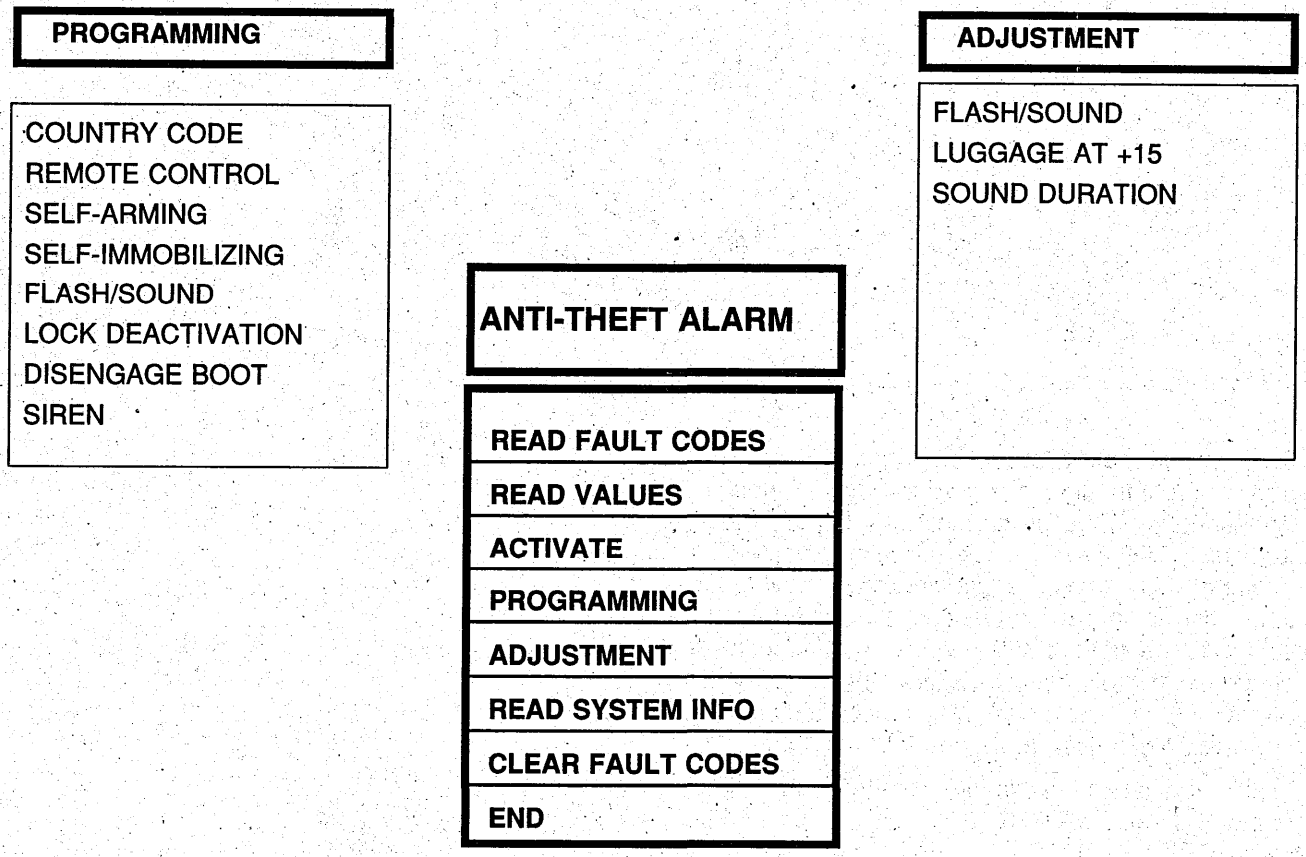
- Avoid unplugging or removing a control module unless absolutely necessary.
- Never touch the connector pins and never place the control module in such a way that the connector pins may come into contact with foreign objects.
- Before unpacking a new electronic control module, ground the packaging to the car body. Open the packaging as shortly as possible before fitting the control module in the car.
- When handling or working on control modules, it is important to ground yourself from time to time. This is especially important when you have been sitting in the car, when changing your position, or when moving round the car. It is even more important in climatic conditions with extremely dry air (such as in the winter in cold-climate markets).
- Avoid wearing clothes made of synthetic (man-made) fibres.



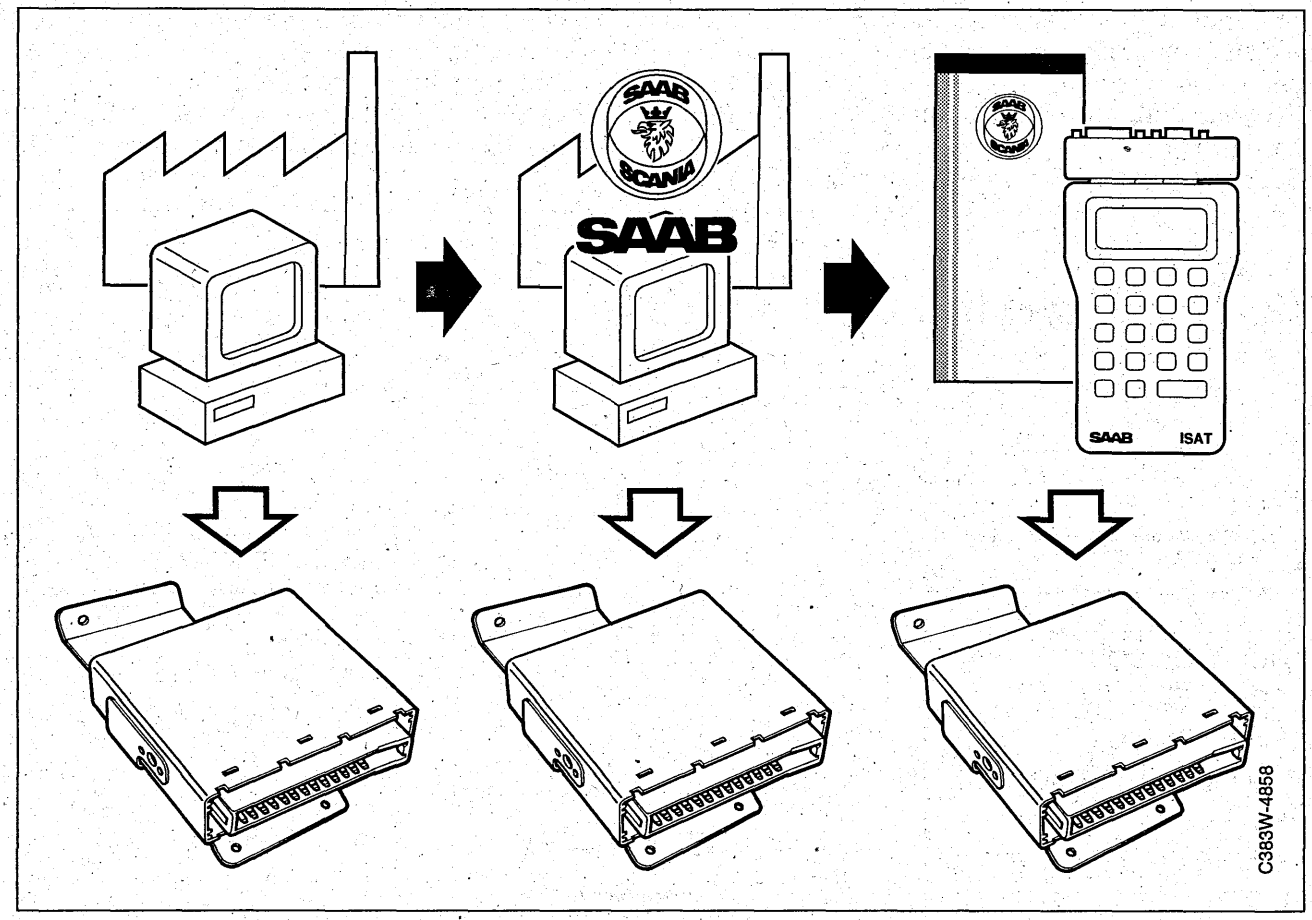
- Avoid wearing shoes with insulating rubber soles.
- Furthermore, always handle electronic control modules which are suspected of being defective in the same way. This will significantly increase the possibility of determining the cause of the fault.

Programming and adjusting, anti-theft alarm

ISAT scan tool menu structure



Anti-theft alarm basic programming



Basic programming of the anti-theft alarm's electronic control module is carried out by the supplier. Subsequently, EOL programming is carried out at the factory. However, since this cannot meet the needs of all countries, additional programming has to be carried out in connection with **pre-delivery service**, see table on next page. In the event of electronic control module replacement, the anti-theft alarm must be programmed in accordance with **spare part programming**, see table on page 164.

Instructions and a description of the functions will be found on pages 165-176.

Important

If new values are programmed at the request of a customer or for any other reason, it is up to the mechanic to make sure that these do not break any laws or insurance stipulations that might be applicable.

Anti-theft alarm basic programming (contd.)

Programming in connection with pre-delivery service

ISAT scan tool command			Market						
PROGRAMMING			**US**	**PA**	**JA**				
	Horn	Direction indicators							
COUNTRY CODE, select:									
GERMANY	30 s pulses	5 min flashing	O	O	O				
GREAT BRITAIN	30 s pulses	no flashing							
SWITZERLAND	30 s continuous	no flashing							
OWN ALTERNATIVE									
HOLLAND	30 s continuous	5 min flashing							
SIREN (always selected if included)									
REMOTE CONTROL, select:									
PROGRAMMING			O	O	O				
SELF-ARMING, select:									
OFF			O	O	O				
SELF-IMMOBILIZING, select:									
OFF			O	O	O				
ON									
TIME BEFORE ACTIV.									
ACTIVATION TIME									
FLASH/SOUND, select:									
ORIGINAL VALUE (Direction indicators)	Arm Disarm	1 flash 3 flashes	O	O	O				
(Horn)	Arm	1 chirp	O	O	O				
	Disarm	2 chirps	O	O	O				
	Unlock tailgate	2 s flashing 3 chirps		O O	O O				
LOCK DEACTIVATION, select:									
OFF									
ON									
DISENGAGE BOOT, select:									
OFF									
ON									
SIREN, select:									
OFF			O	O	O				
ON (selected if siren fitted)									

O = function programmed at factory.
X = reprogramming to be carried out in connection with pre-delivery service.

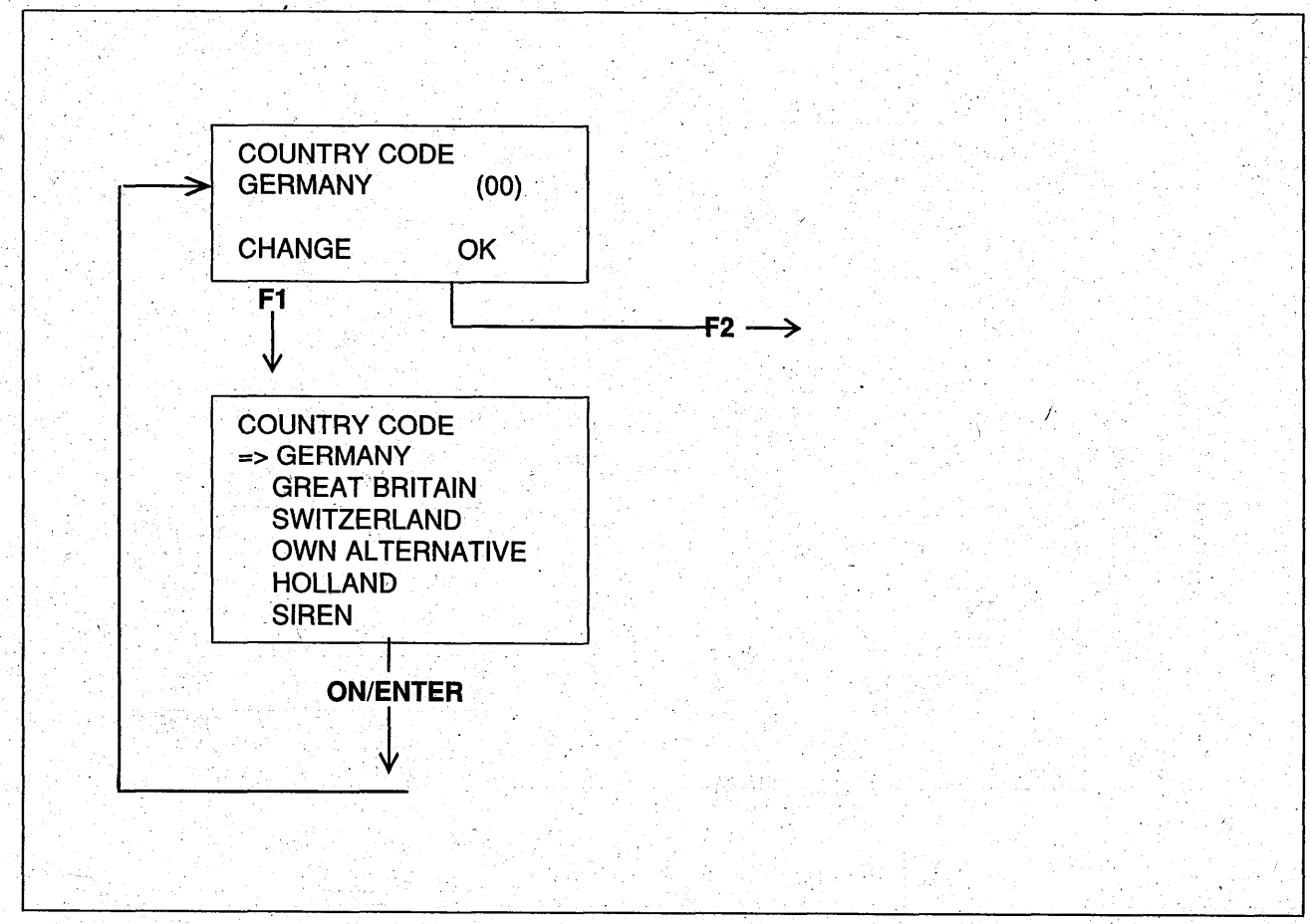
Anti-theft alarm basic programming (contd.)

Programming, spare part

ISAT scan tool command			Market						
PROGRAMMING			US	PA	JA				
	Horn	Direction indicators							
COUNTRY CODE, select:									
GERMANY	30 s pulses	5 min flashing	O	O	O				
GREAT BRITAIN	30 s pulses	no flashing							
SWITZERLAND	30 s continuous	no flashing							
OWN ALTERNATIVE									
HOLLAND	30 s continuous	5 min flashing							
SIREN (always selected if included)									
REMOTE CONTROL, select:									
PROGRAMMING			X	X	X				
SELF-ARMING, select:									
OFF			O	O	O				
SELF-IMMOBILIZING, select:									
OFF			O	O	O				
ON									
TIME BEFORE ACTIV.									
ACTIVATION TIME									
FLASH/SOUND, select:									
ORIGINAL VALUE (Direction indicators)	Arm	1 flash	X	X	X				
	Disarm	3 flashes							
(Horn)	Arm	1 chirp	X	X	X				
	Disarm	2 chirps	X	X	X				
	Unlock	2 s flashing		X	X				
	tailgate	3 chirps		X	X				
LOCK DEACTIVATION, select:									
OFF									
ON									
DISENGAGE BOOT, select:									
OFF									
ON									
SIREN, select:									
OFF			O	O	O				
ON (selected if siren fitted)									

O = function programmed at factory.
X = reprogramming to be carried out for spare part.

Alarm signal, country-specific/own alternative/siren



The anti-theft alarm is pre-programmed for the requirements of 4 different countries on how an alarm is to be given. The operation of the alarm thus complies with the laws and insurance requirements that apply in these countries. For countries with other requirements, and for different customer preferences, individual programming is possible under "OWN ALTERNATIVE" in the menu.

Programming

Country-specific

1 Connect an ISAT scan tool.
Select "PROGRAMMING".

2 Select "COUNTRY CODE".

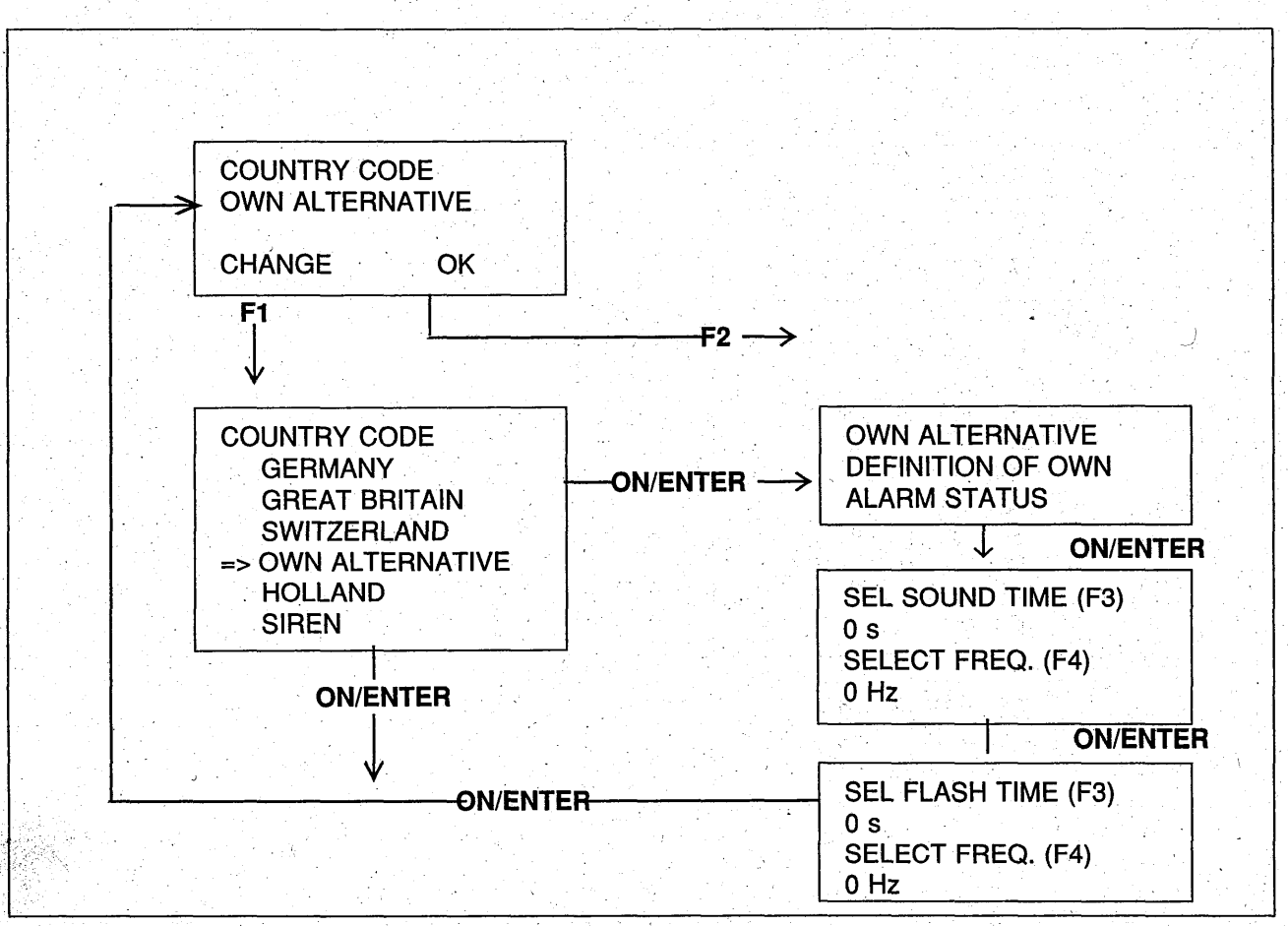
3 Select country.

The values that apply for each country are given in the table on the right. For "OWN ALTERNATIVE" or "SIREN", see the description on the next page.

Country	Sound duration	Flashing period
Germany	30 sec(*	5 min
Great Britain	30 sec(*	no flashing
Switzerland	30 sec(**	no flashing
Own alternative		
Holland	30 sec(**	5 min
Siren		

*) The sound is produced in pulses
**) The sound is produced continuously.

Alarm signal: country-specific/own alternative/siren (contd.)



Own alternative

1 Select "COUNTRY CODE".
Select "OWN ALTERNATIVE".

2 Select the desired values for the alarm signal (sound and/or flash) from the table below.

Sound duration: 0-30-60-90-120-180-240-300 sec
Sound frequency: 0-0.5-1-2 signals/sec
Flashing period: 0-60-120-180-240-300 sec
Flash frequency: 0-0.5-1-2-4 signals/sec

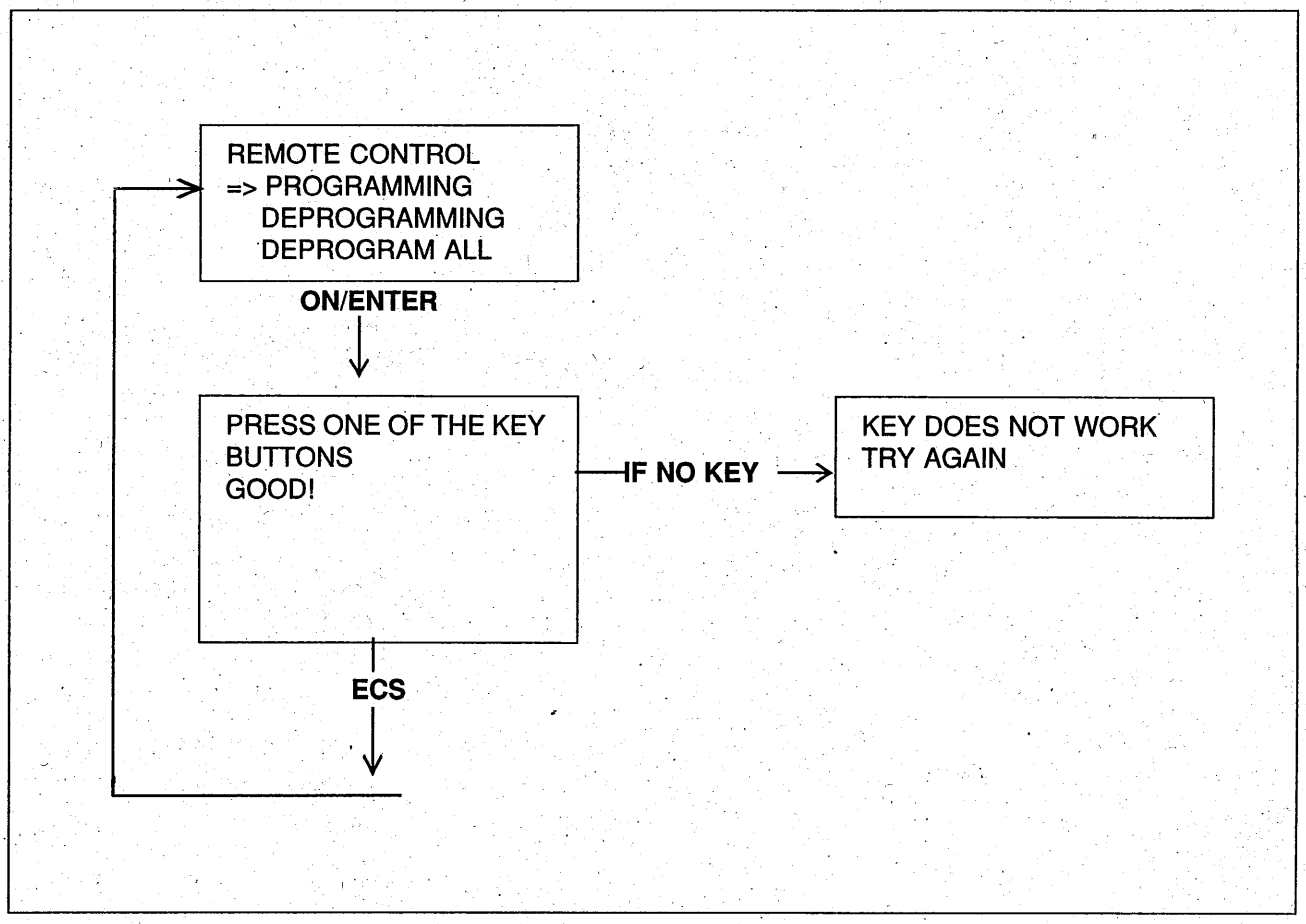
Siren

If a siren with battery back-up is fitted, this must be selected in the country code menu. The "SIREN" command, last in the programming menu, must also be selected "ON". Continue on page 174.

Important

The alarm's horn must be disconnected when a siren with battery back-up is fitted.

Programming for remote control



The remote control that is used for the car's anti-theft alarm must be programmed (coded) for that particular car. When the car is delivered, 2 pre-programmed remote control units are supplied. It is also possible to program 2 additional remote control units (a total of 4 remote control units can be programmed) for the car.

Programming

One remote control unit

1 Connect an ISAT scan tool.
Select "PROGRAMMING".

2 Select "REMOTE CONTROL".
Select "PROGRAMMING".

3 Point the remote control at the aerial and press one of the buttons within 5 seconds of selecting the ISAT scan tool command.

Deprogramming one remote control unit

1 Select "REMOTE CONTROL".
Select "DEPROGRAMMING".

2 Point the remote control at the aerial and press one of the buttons within 5 seconds of selecting the ISAT scan tool command.

Deprogramming all remote control units

1 Select "REMOTE CONTROL".
Select "DEPROGRAM ALL".

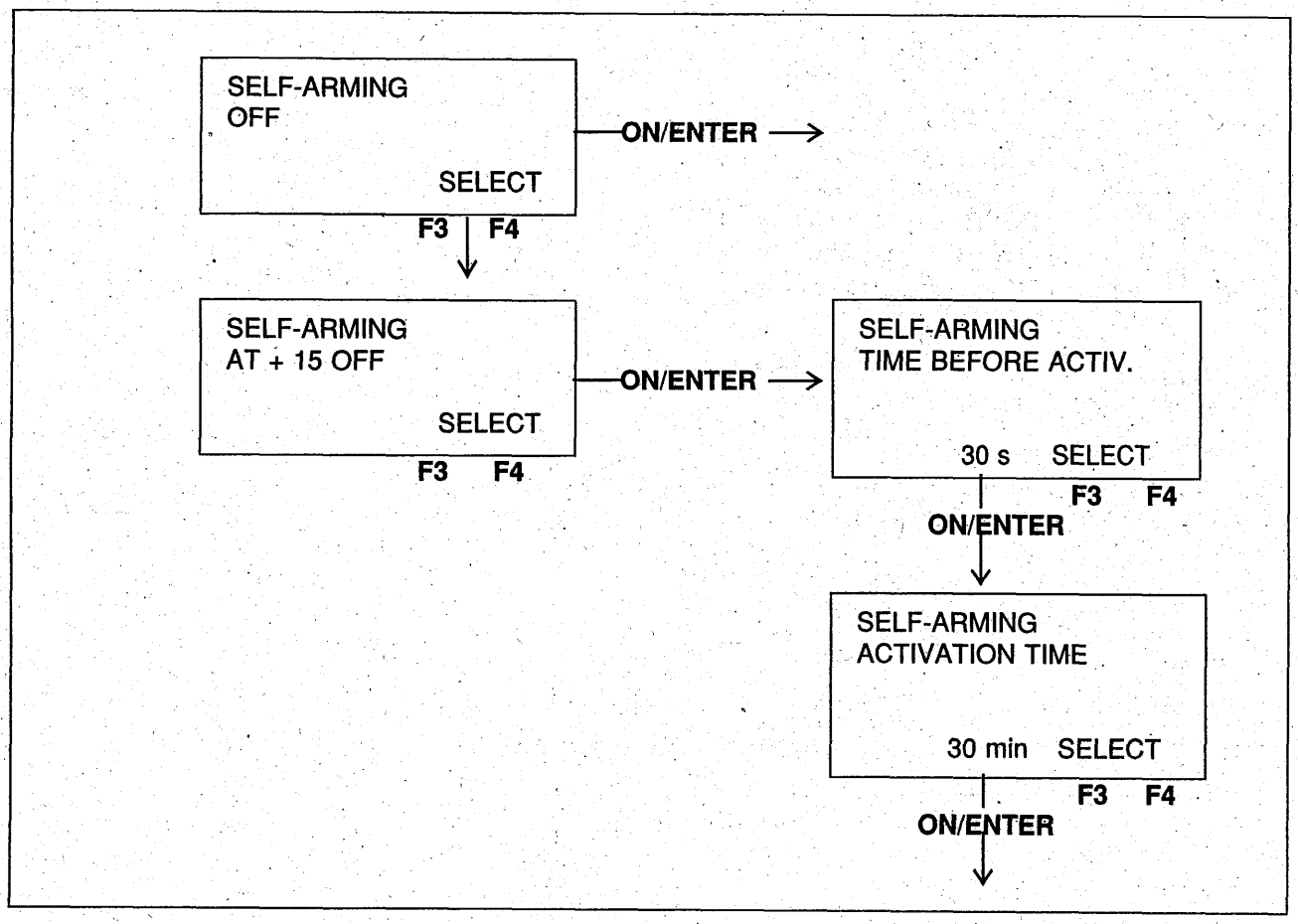
2 All programmed remote control units will then be deprogrammed.

Important

Make a habit of always having the ignition switch in the Drive position when deprogramming all remote control units. This is to avoid deprogramming while the car is armed.

If a remote control unit is lost, all remote control units can be deprogrammed. This means that the customer must bring in all the remote control units for reprogramming.

Self-arming



The anti-theft alarm can be programmed for self-arming. This means that the alarm automatically starts monitoring without the remote control being used. There are two types of self-arming and for both of them the time before the function becomes active should be specified. The activation time should also be selected. The activation time is the time the 3-circuit breaking function is active when the alarm has been triggered.

When the alarm has been triggered, the selected country code will apply. The LED will start its delay period according to the specified "TIME BEFORE ACTIV." and then go over to indicating that the alarm is armed.

Programming

Self-arming

Connect an ISAT scan tool.
Select "PROGRAMMING".
Select "SELF-ARMING" and then:

1 "OFF" in order to deselect self-arming.

2 "AT +15 OFF" for connection of the self-arming function when the ignition is "OFF".

3 "+15 OFF DOOR CLOSED" for connection of the self-arming function when the ignition is "OFF" and the driver's door closed.

Time before self-arming

1 Select "TIME BEFORE ACTIV.".

2 Select the time: 30, 60, 120, 180, 300 or 600 seconds until the alarm should self-arm.

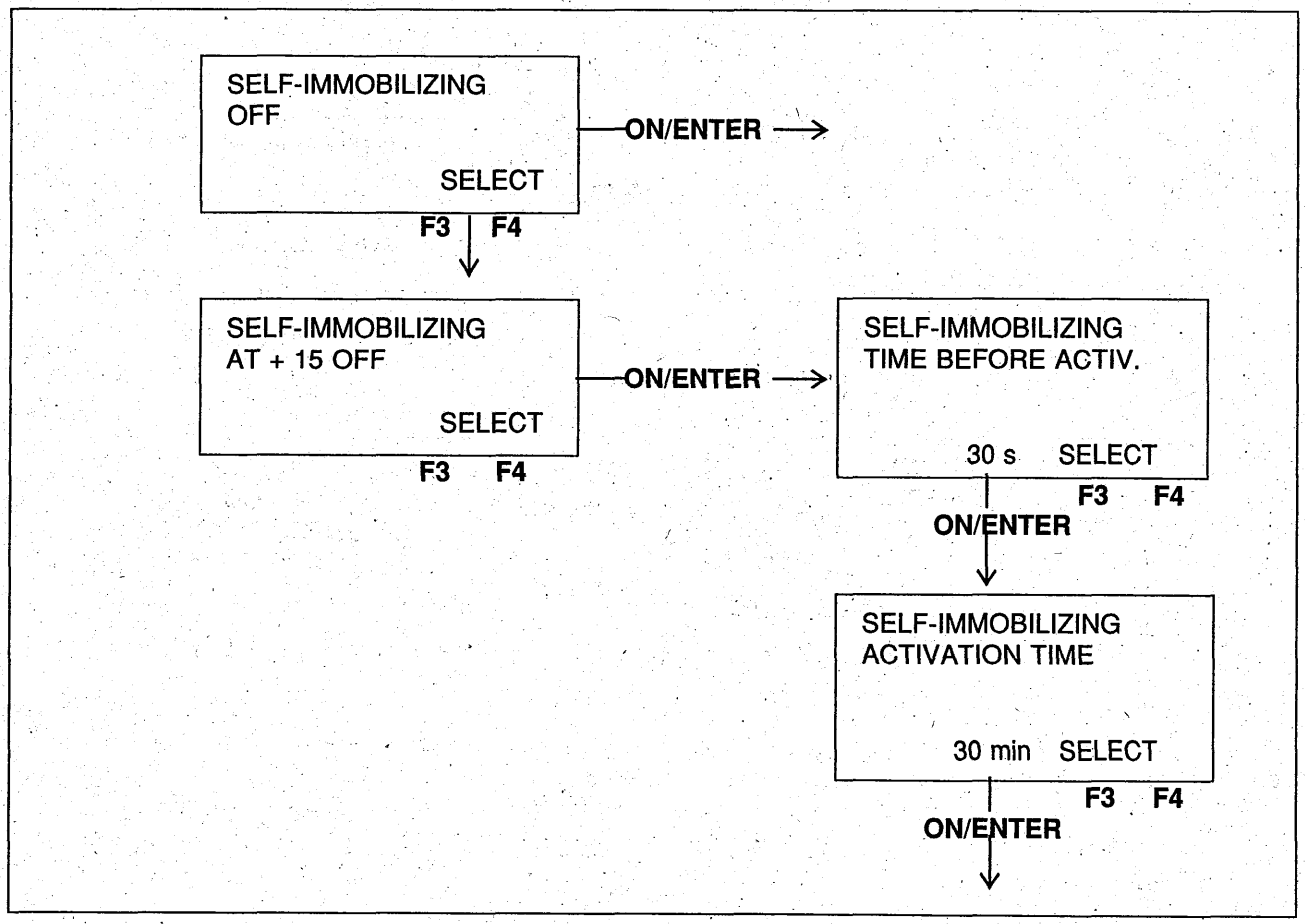
Arming time

Select "ACTIVATION TIME": 30, 45 or 60 minutes.

Important

When self-arming has been selected, "Self-immobilizing" or 3-circuit breaking will also be automatically included in the arming function.

Self-immobilizing (3-circuit breaking)



The anti-theft alarm can be programmed for self-immobilizing alone, that is to say only the alarm's 3-circuit breaking function is activated. This takes place automatically without the use of the remote control.

This function is only used when self-arming has been disabled. When self-arming is selected, the function is automatically included. Only two choices are possible and if the "ON" function is selected it will be connected in accordance with the latest self-arming alternative selected. If no self-arming alternative is selected, the function will be connected when the ignition is off and the door closed.
When the function is active, this is indicated by the LED flashing twice. This takes place after "TIME BEFORE ACTIV.".

Programming

Self-immobilizing

Connect an ISAT scan tool.
Select "PROGRAMMING".
Select "SELF-IMMOBILIZING" and then:

1 "ON" to select self-immobilizing.

2 "OFF" to deselect self-immobilizing.

Time until self-immobilizing

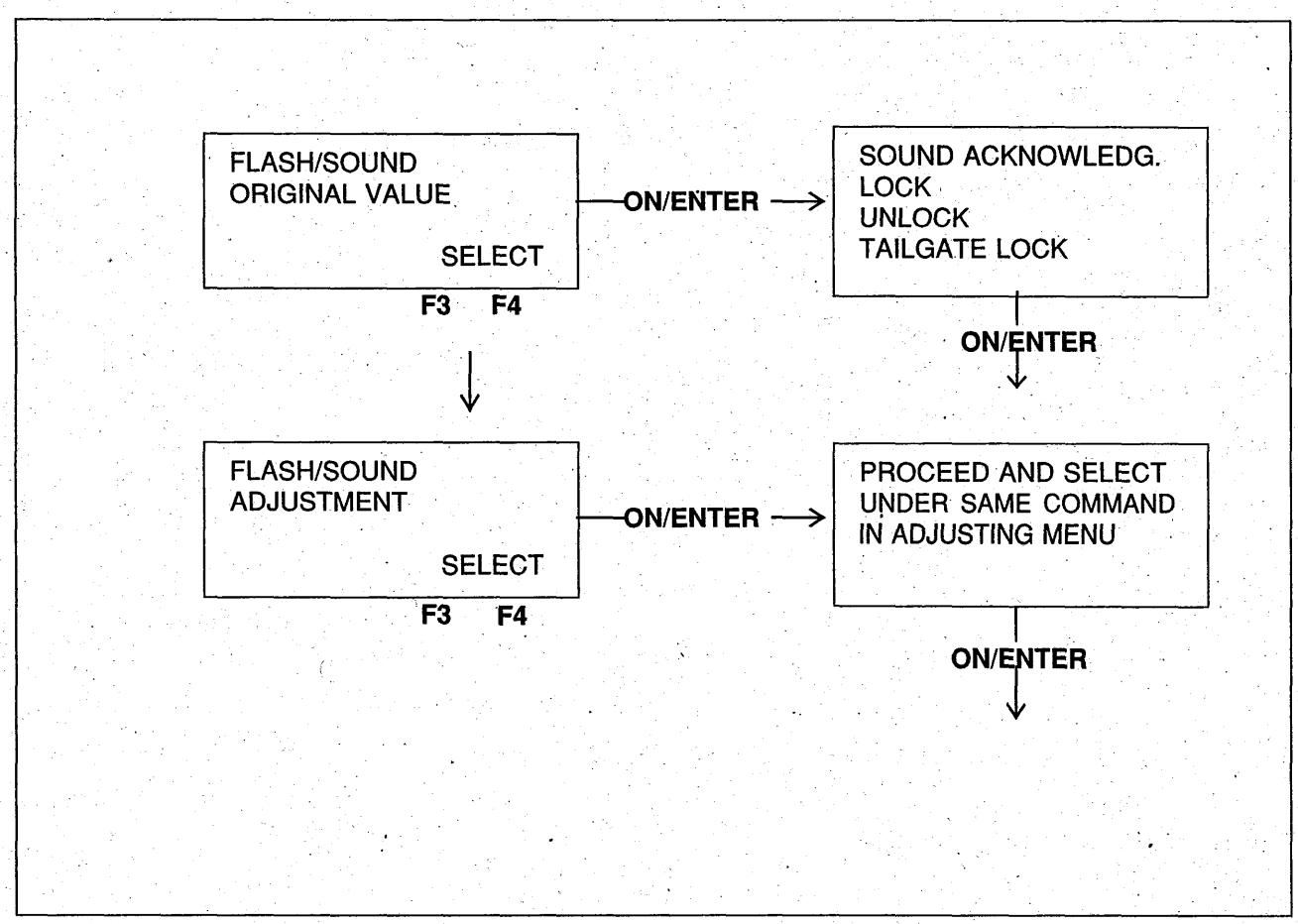
1 Select "TIME BEFORE ACTIV." if "ON" was selected above.

2 Select the time: 30, 60, 120, 180, 300 or 600 seconds until self-immobilizing is armed.

Immobilizing time

Select "ACTIVATION TIME": 30, 45 or 60 minutes.

Remote control: flash/sound confirmation



On arming/disarming/unlocking the tailgate using the remote control, a flash/sound acknowledgement can be obtained. Such acknowledgement is programmable and the pattern can be chosen within certain limits.

As delivered, the following is the case:

- if the **LH button** is pressed to arm the car, the car's direction indicators will flash once for 0.5 seconds. If the LH button is used for unlocking/ disarming, this is indicated by the car's direction indicators flashing 3 times. If the car alarm has been set off, this is shown by 5 flashes when disarming.
- if the **RH button** is pressed to unlock the tailgate, this is not indicated. On the other hand, it is possible to program a flash/sound acknowledgement for this function.

Programming

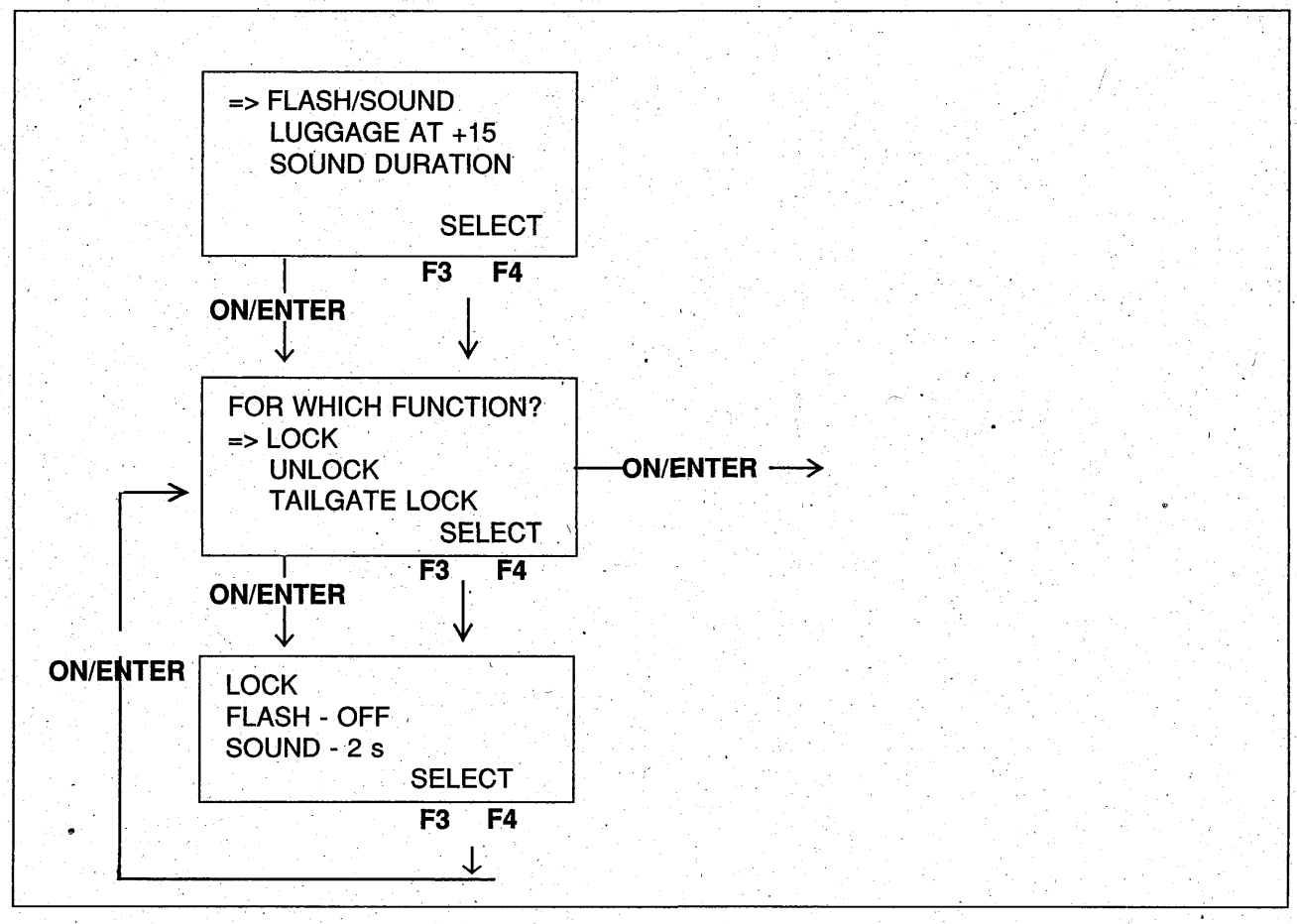
LH button

Connect an ISAT scan tool.
Select "PROGRAMMING".
Select "FLASH/SOUND" and then:

1 "ORIGINAL VALUE" to select the same programming as carried out at the factory (see above). It is also possible to select sound acknowledgement for the 3 functions.

2 "ADJUSTMENT" to select a different type of programming to that selected at the factory. See next page.

Remote control: adjusting flash/sound acknowledgement



If "ADJUSTMENT" was selected in the programming menu on the previous page, new settings can be entered as described below. These settings will then apply.

Programming

Arming (lock)

1 Select "ADJUSTMENT".
Select "FLASH/SOUND".
Select "LOCK".

2 Select the setting for the direction indicators:

OFF — no flashing
0.5 s — direction indicators on for 0.5 sec.
2 s — direction indicators on for 2 sec
5 s — direction indicators on for 5 sec

3 Select the setting for sound (horn):

OFF — no sound
1 — sounds once
2 — sounds twice
3 — sounds three times

Disarming (unlock)

1 Select "ADJUSTMENT"
Select "FLASH/SOUND".
Select "UNLOCK".

2 Select direction indicator setting as previously.

3 Select sound setting (horn) as previously.

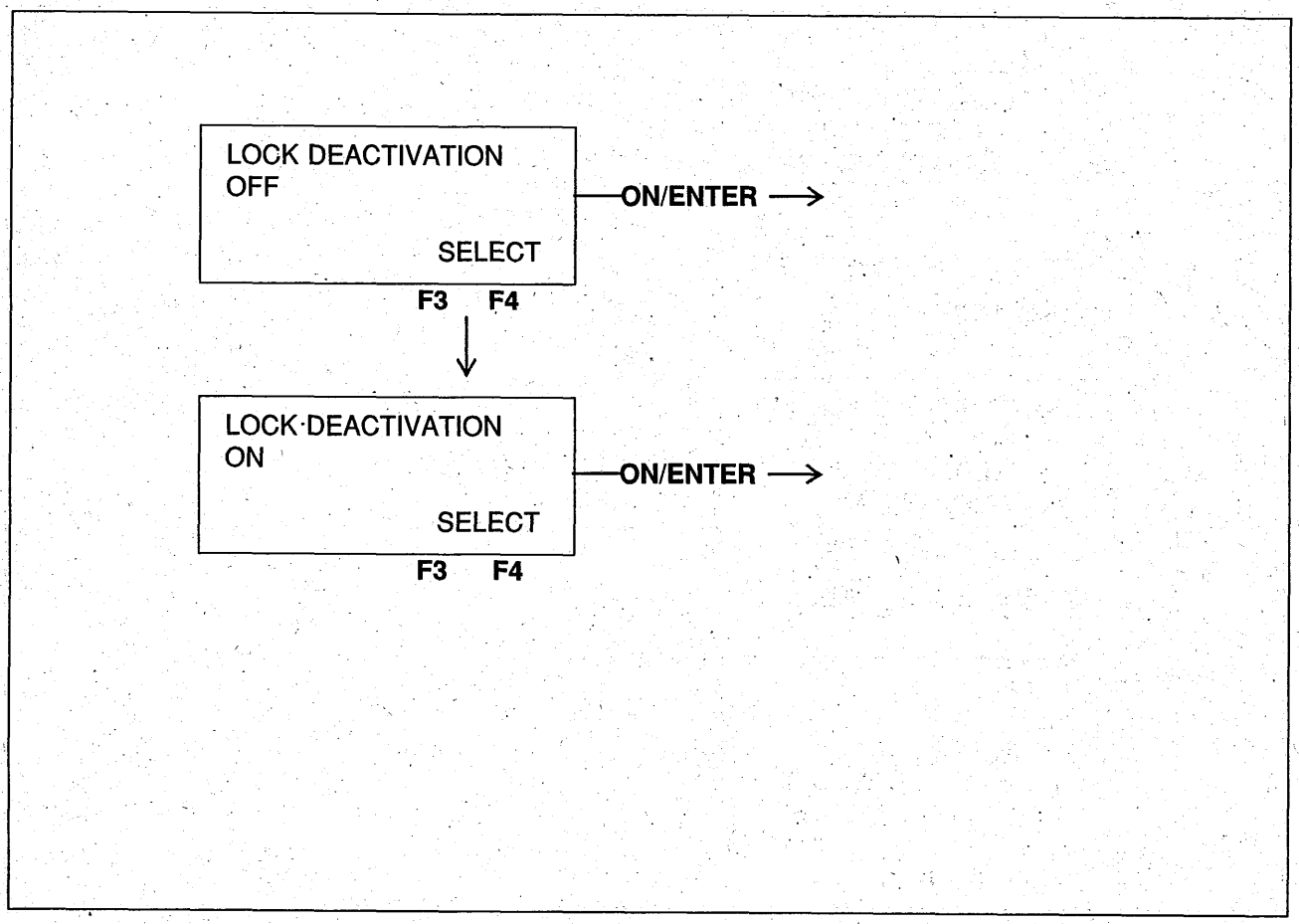
Unlocking tailgate

1 Select "ADJUSTMENT".
Select "FLASH/SOUND".
Select "TAILGATE LOCK".

2 Select direction indicator setting as previously.

3 Select sound setting (horn) as previously.

Programming for car key



In the basic version, the anti-theft alarm can be armed and disarmed with the remote control unit and car key. Arming/disarming with the car key can be deprogrammed for countries requiring this function to be inoperative.

Programming

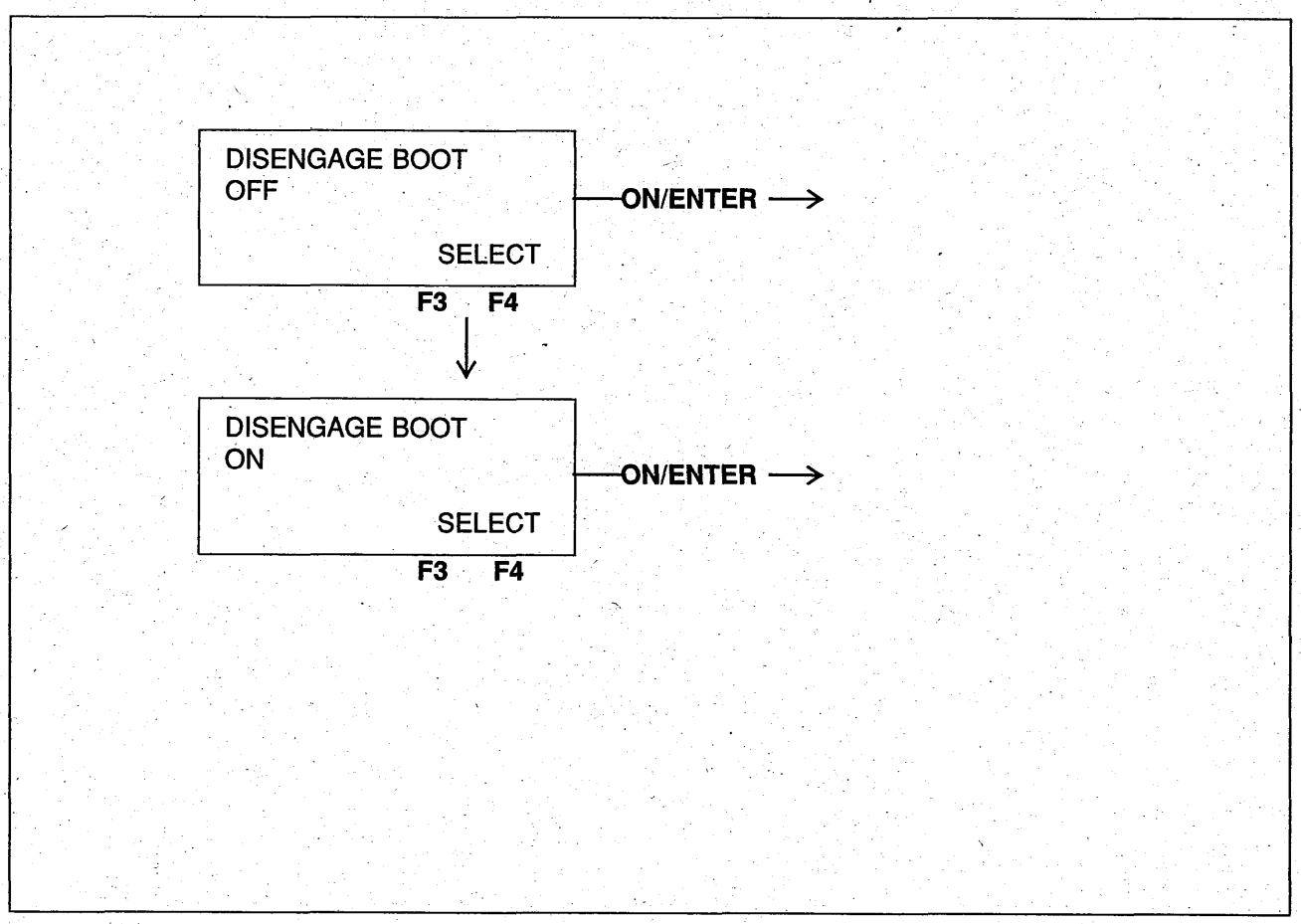
Car key for arming and disarming the alarm

Connect an ISAT scan tool.
Select "PROGRAMMING".
Select "LOCK DEACTIVATION" and then:

1 "OFF" if arming and disarming the alarm should be possible only with the remote control unit.

2 "ON" if arming and disarming the alarm should be possible with both the car key and the remote control unit.

Programming for car key (contd.)



Car key for disarming/unlocking tailgate

Select "PROGRAMMING".
Select "DISENGAGE BOOT" and then:

1 "OFF" if it should only be possible to use the remote control unit.

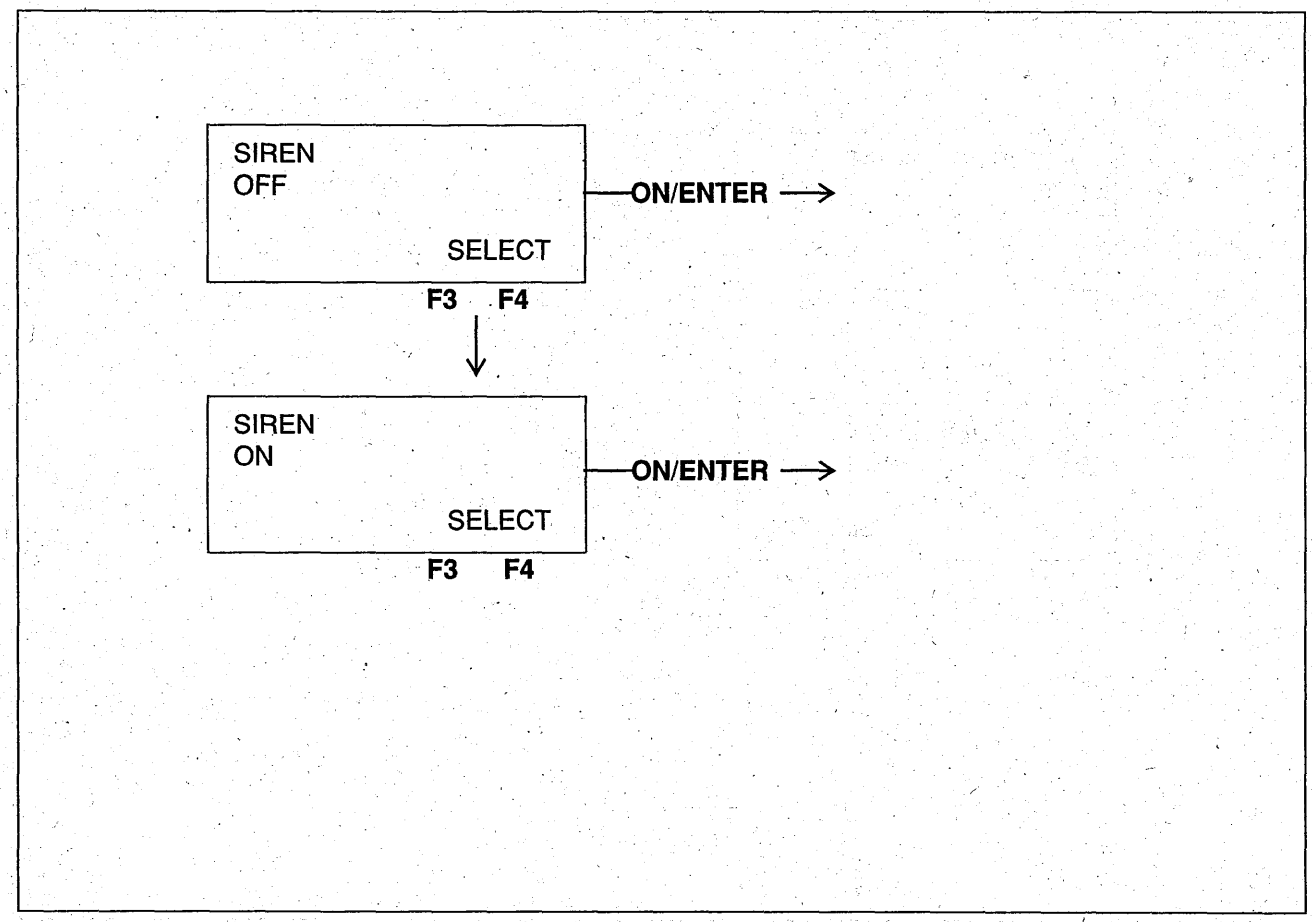
2 "ON" if it should be possible to use both the car key and the remote control unit to open the tailgate when the car is armed.

When the tailgate is opened it is excluded from alarm monitoring. When closed it will be included in alarm monitoring after the delay period.

Important

If this function is selected "OFF", the alarm will be set off if an attempt is made to open the tailgate with the key.

Programming for siren



In the basic version, only the alarm's special horn is used for the acoustic alarm. However, in certain markets the fitting of a siren with battery back-up is required. The alarm's **horn** is activated via a relay output in the electronic control module, that is to say the horn is activated by being grounded. The **siren** must be supplied continuously with +12 V and if this 12 V supply is interrupted, the siren will start. To accomplish this, the alarm must be programmed for the siren. For it to work correctly, the siren must be selected in the "COUNTRY CODE" menu. See "COUNTRY CODE" programming.

Programming

Connect an ISAT scan tool.
Select "PROGRAMMING".
Select "SIREN" and then:

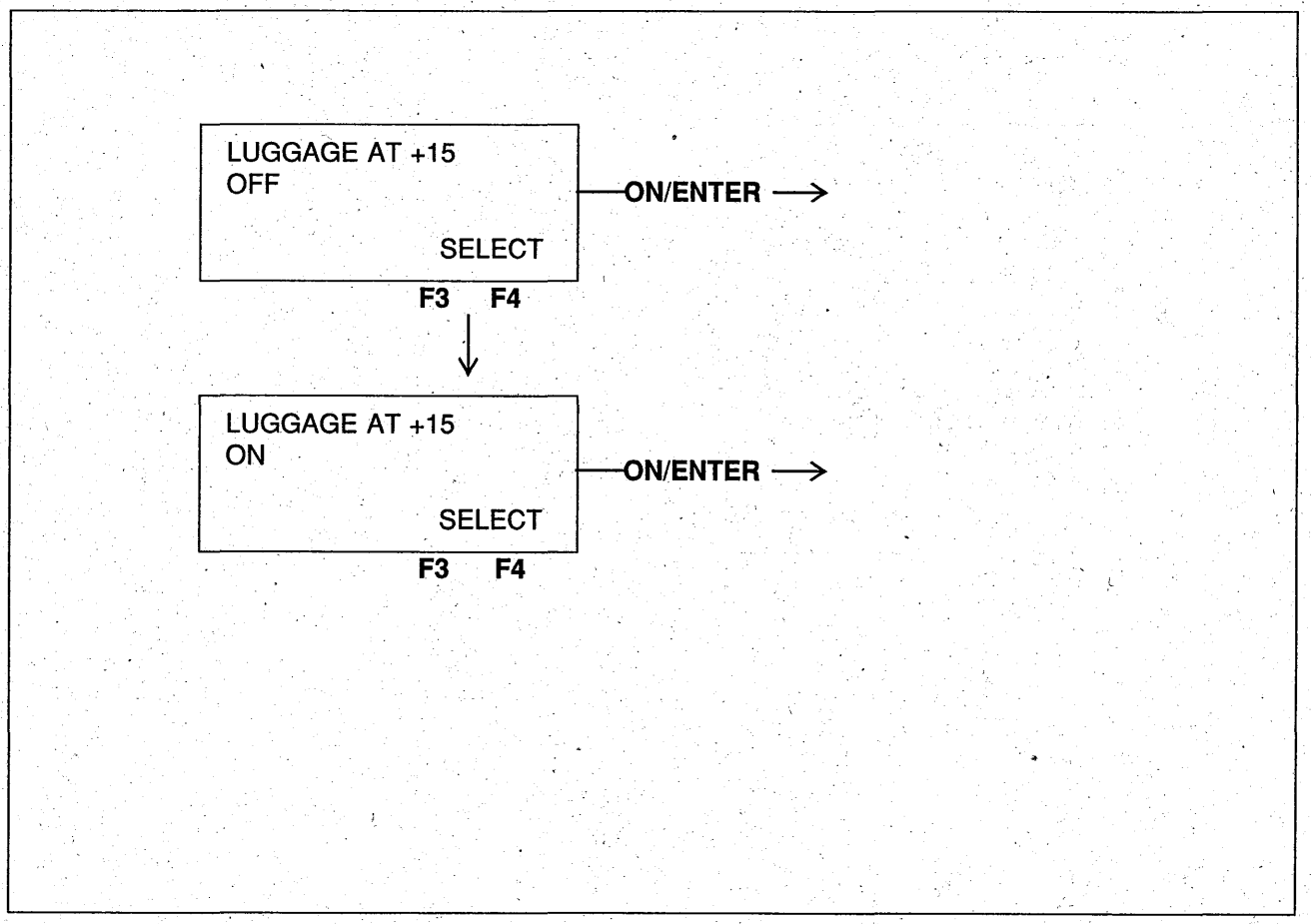
1 "ON" if the siren is to be included.

2 "OFF" if the siren is not to be included.

Important

IF "ON" is selected, sound confirmation will not be obtained.

Tailgate opening with ignition (+15) on



The tailgate cannot normally be opened by means of the remote control if the ignition is switched on. It is possible, however, with the following programming.

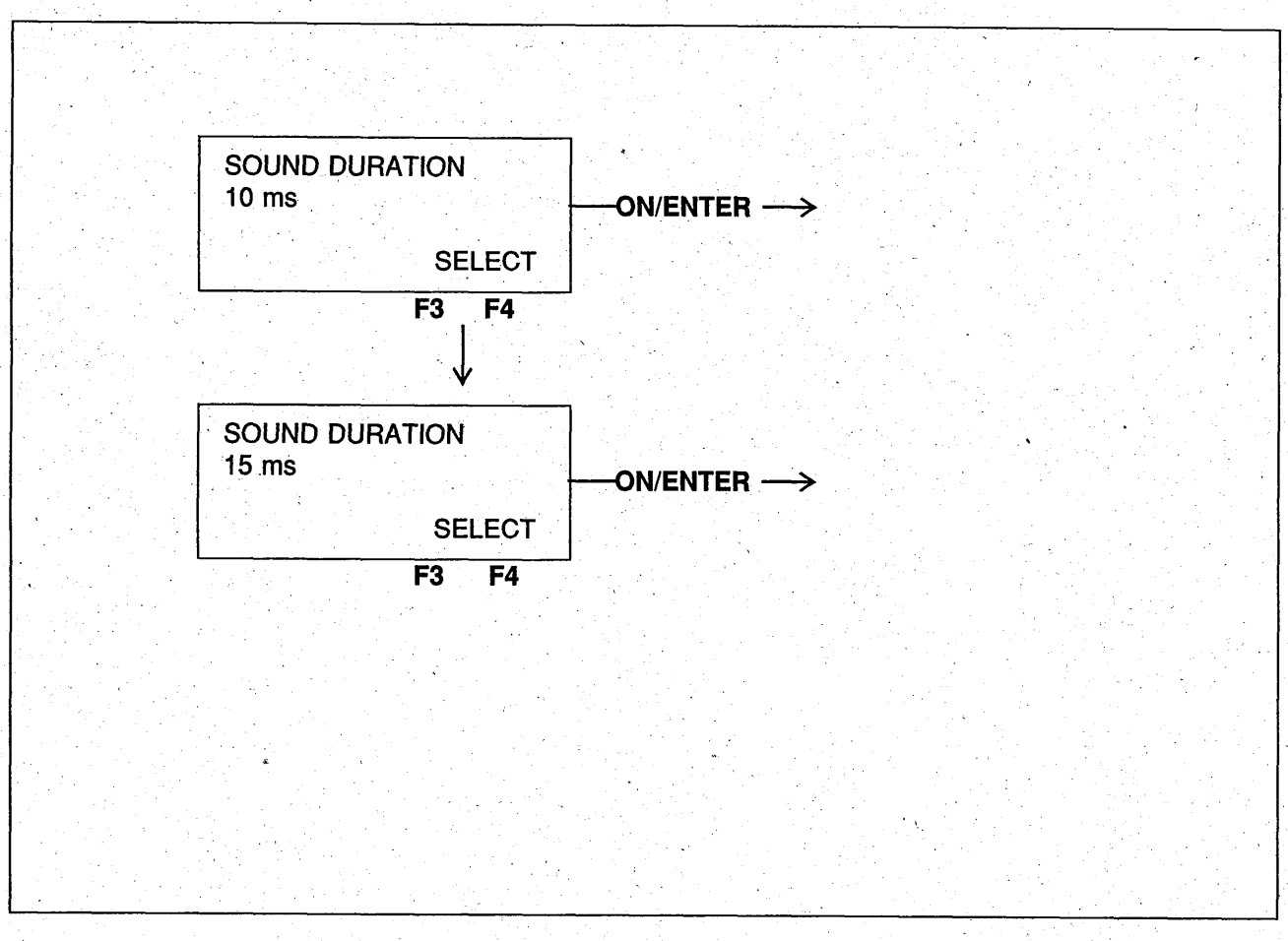
Programming

Connect an ISAT scan tool.
Select "ADJUSTMENT".
Select "LUGGAGE AT +15" and then:

1 "OFF" if it should not be possible to open the tailgate with the ignition switch in the ON position (+15).

2 "ON" if it should be possible to open the tailgate with the ignition switch in the ON position (+15).

Sound adjustment (Sound characteristics)



In the "FLASH/SOUND" setting menu, only the number of times the acoustic signal is to chirp can be changed. With this function, the character of the sound can be altered by changing its duration (the length of each acoustic signal).

Programming

Connect an ISAT scan tool.
Select "ADJUSTMENT".
Select "SOUND DURATION".
Select time:

5-10-15-20-25-30 msec.

A short time will be a perceived as a low volume sound and a longer time as a high volume sound.

Programming and adjustment, anti-theft alarm with VSS

ISAT scan tool menu structure

PROGRAMMING

COUNTRY CODE
REMOTE CONTROL
SELF-ARMING
SELF-IMMOBILIZING
FLASH/SOUND
SIREN

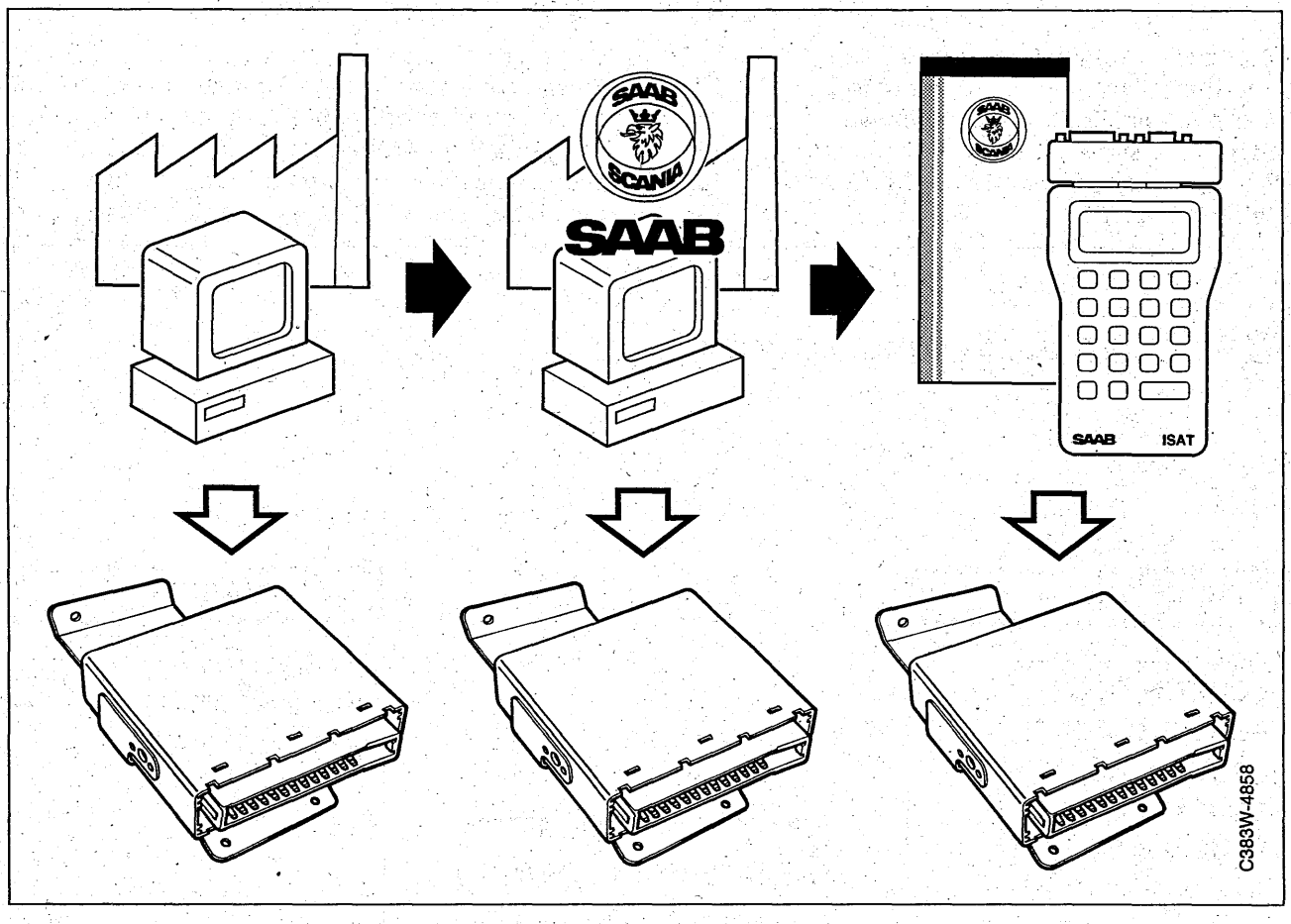
ANTI-THEFT ALARM

READ FAULT CODES
READ VALUES
ACTIVATE
PROGRAMMING
ADJUSTMENT
READ SYSTEM INFO
IMMOBILIZING
CLEAR FAULT CODES
END

ADJUSTMENT

FLASH/SOUND
LUGGAGE AT +15
SOUND DURATION

Anti-theft alarm basic programming



Basic programming of the anti-theft alarm's electronic control module is carried out by the supplier. Subsequently, EOL programming is carried out at the factory. However, since this cannot meet the needs of all countries, additional programming has to be carried out in connection with **pre-delivery service**, see table on next page. In the event of electronic control module replacement, the anti-theft alarm must be programmed in accordance with **spare part programming**, see table on page 180.

Instructions and descriptions of the functions will be found on pages 181-191.

Important

If new values are programmed at the request of a customer or for any other reason, it is up to the mechanic to make sure that these do not break any laws or insurance stipulations that might be applicable.

Anti-theft alarm basic programming (contd.)

Programming in connection with pre-delivery service

ISAT scan tool command			Market							
PROGRAMMING			**D**	**GB**	**NL**	**CH**	**BE**	**FR**	**SE**	**Other**
	Horn	Direction indicators								
COUNTRY CODE, select:										
GERMANY	30 s pulses	5 min flashing	O	O	O	O	O	O	O	O
GREAT BRITAIN	30 s pulses	no flashing		X						
SWITZERLAND	30 s continuous	no flashing				X				
OWN ALTERNATIVE										
HOLLAND	30 s continuous	5 min flashing			X					
SIREN (always selected if included)										
REMOTE CONTROL, select:										
PROGRAMMING			O	O	O	O	O	O	O	O
SELF-ARMING, select:										
OFF			O	O	O	O	O	O	O	O
AT + 15 OFF										
+15 OFF, DOOR CLOSED										
TIME BEFORE ACTIV.	(s = sec)									
SELF-IMMOBILIZING, select:										
TIME BEFORE ACTIV.	(s = sec)		30	30	30	30	30	30	30	30
FLASH/SOUND, select:										
ORIGINAL VALUE	Arm	1 flash	O	O	O	O	O	O	O	O
(Direction indicators)	Disarm	3 flashes								
(Horn)	Arm	1 chirp		O						O
	Disarm	2 chirps		O						O
	Unlock	2 s flashing	O	O	O	O	O	O	O	O
	tailgate	3 chirps	O	O	O	O	O	O		O
SIREN, select:										
OFF			O	O	O	O	O	O	O	O
ON (selected if siren fitted)										
PROGRAMMING			**D**	**GB**	**NL**	**CH**	**BE**	**FR**	**SE**	**Other**

O = function programmed at factory.
X = reprogramming to be carried out in connection with pre-delivery service.

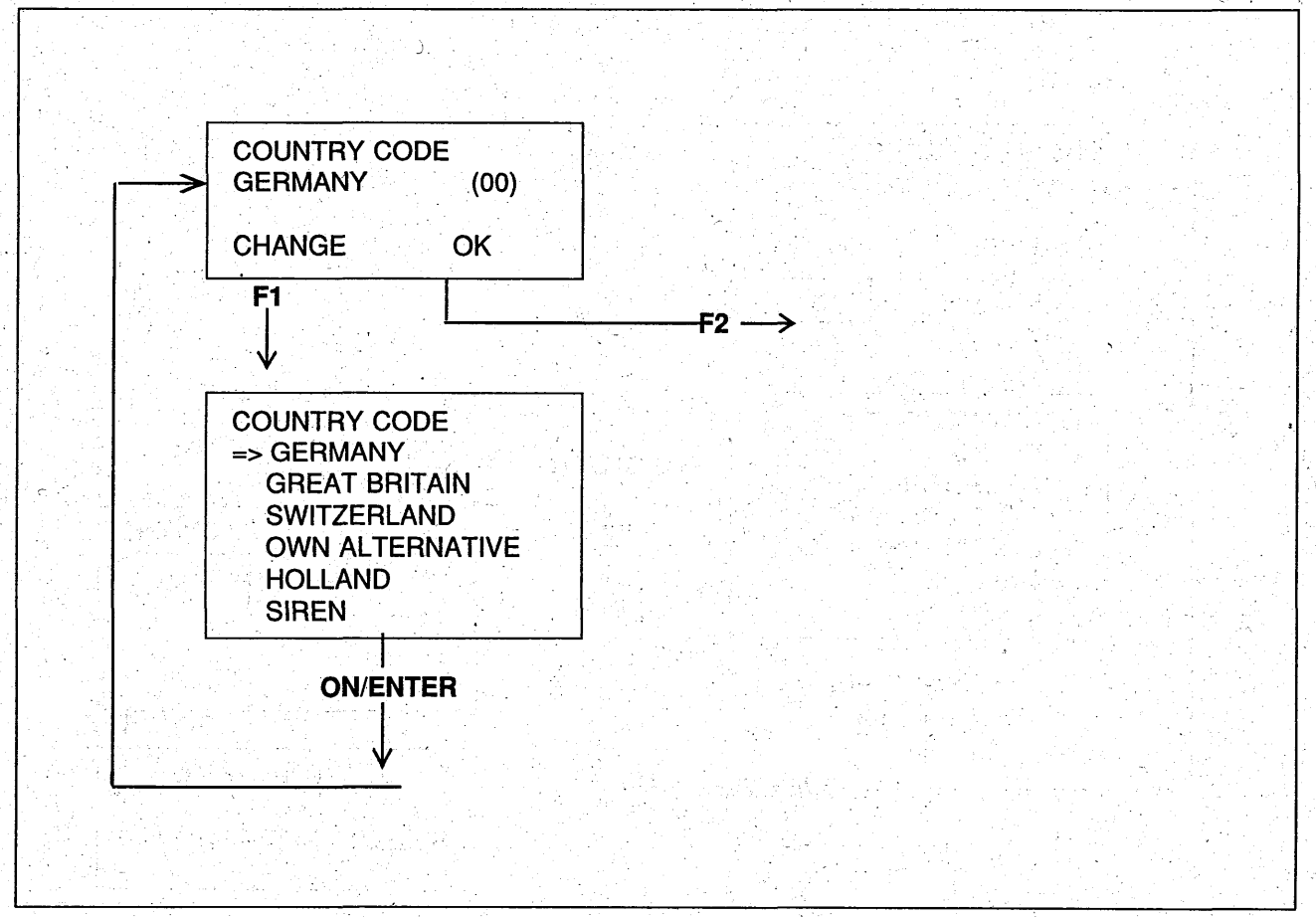
Anti-theft alarm basic programming (contd.)

Programming, spare part

ISAT scan tool command			Market							
PROGRAMMING			**D**	**GB**	**NL**	**CH**	**BE**	**FR**	**SE**	**Other**
	Horn	Direction indicators								
COUNTRY CODE, select:										
GERMANY	30 s pulses	5 min flashing	O	O	O	O	O	O	O	O
GREAT BRITAIN	30 s pulses	no flashing		X						
SWITZERLAND	30 s continuous	no flashing				X				
OWN ALTERNATIVE										
HOLLAND	30 s continuous	5 min flashing			X					
SIREN (always selected if included)										
REMOTE CONTROL, select:										
PROGRAMMING			X	X	X	X	X	X	X	X
SELF-ARMING, select:										
OFF										
AT + 15 OFF										
+15 OFF, DOOR CLOSED										
TIME BEFORE ACTIV.	(s = sec)									
SELF-IMMOBILIZING, select:										
TIME BEFORE ACTIV.	(s = sec)		30	30	30	30	30	30	30	30
FLASH/SOUND, select:										
ORIGINAL VALUE	Arm	1 flash	X	X	X	X	X	X	X	X
(Direction indicators)	Disarm	3 flashes								
(Horn)	Arm	1 chirp		X						X
	Disarm	2 chirps		X						X
	Unlock	2 s flashing	X	X	X	X	X	X	X	X
	tailgate	3 chirps	X	X	X	X	X	X		X
SIREN, select:										
OFF			O	O	O	O	O	O	O	O
ON (selected if siren fitted)										
PROGRAMMING			**D**	**GB**	**NL**	**CH**	**BE**	**FR**	**SE**	**Other**

O = function programmed at factory.
X = reprogramming to be carried out for spare part.

Alarm signal, country-specific/own alternative/siren



The anti-theft alarm is pre-programmed for the requirements of 4 different countries on how an alarm is to be given. The operation of the alarm thus complies with the laws and insurance requirements that apply in these countries. For countries with other requirements, and for different customer preferences, individual programming is possible under "OWN ALTERNATIVE" in the menu.

Programming

Country-specific

1 Connect an ISAT scan tool.
Select "PROGRAMMING".

2 Select "COUNTRY CODE".

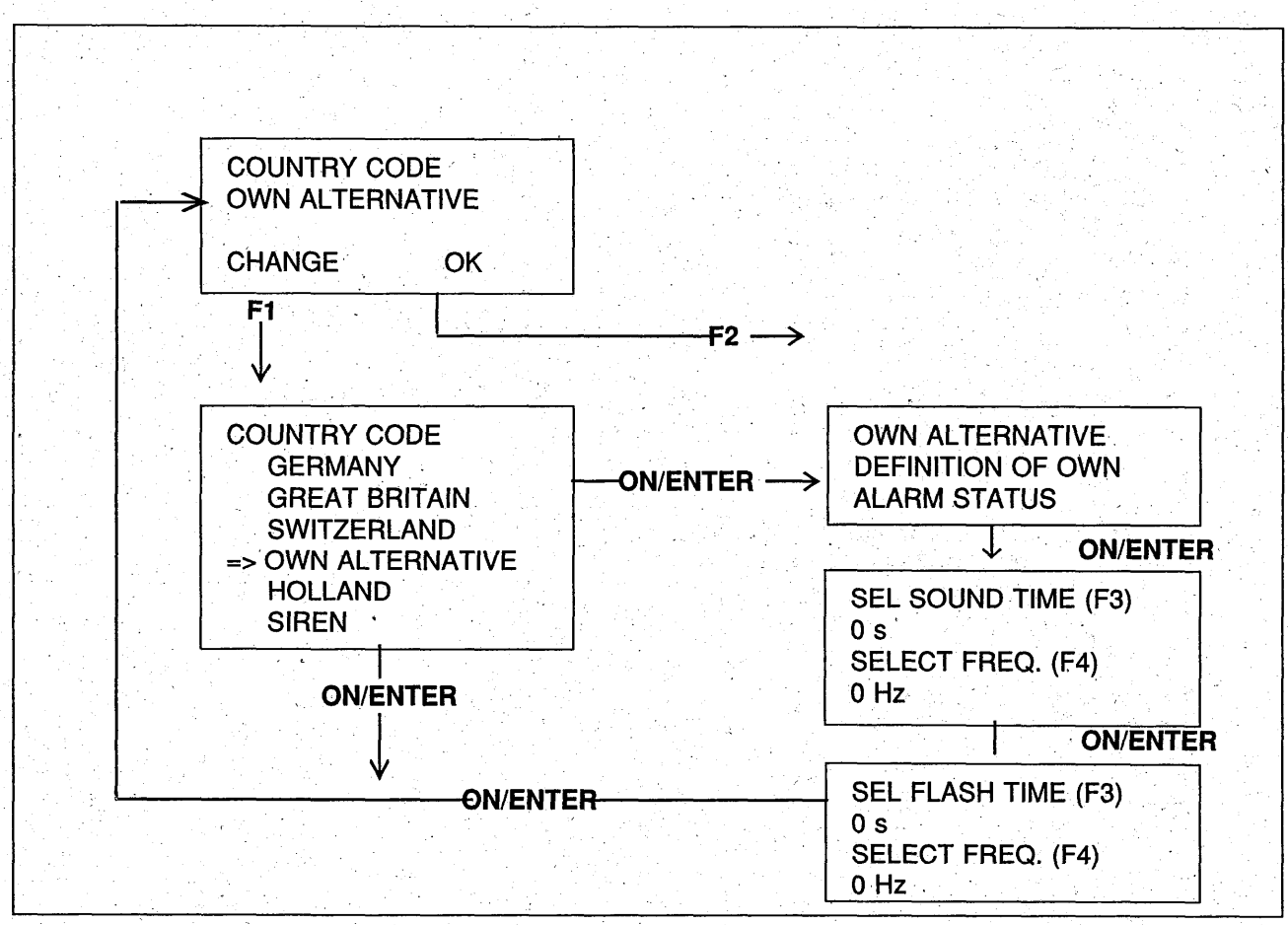
3 Select country.

The values that apply for each country are given in the table on the right. For "OWN ALTERNATIVE" or "SIREN", see the description on the next page.

Country	Sound duration	Flashing period
Germany	30 sec(*	5 min
Great Britain	30 sec(*	no flashing
Switzerland	30 sec(**	no flashing
Own alternative		
Holland	30 sec(**	5 min
Siren		

*) The sound is produced in pulses.
**) The sound is produced continuously.

Alarm signal: country-specific/own alternative/siren (contd.)



Programming (contd.)

Own alternative

1 Select "COUNTRY CODE".
Select "OWN ALTERNATIVE".

2 Select the desired values for the alarm signal (sound and/or flash) from the table below.

Sound duration: 0-30-60-90-120-180-240-300 sec
Sound frequency: 0-0.5-1-2 signals/sec
Flashing period: 0-60-120-180-240-300 sec
Flash frequency: 0-0.5-1-2-4 signals/sec

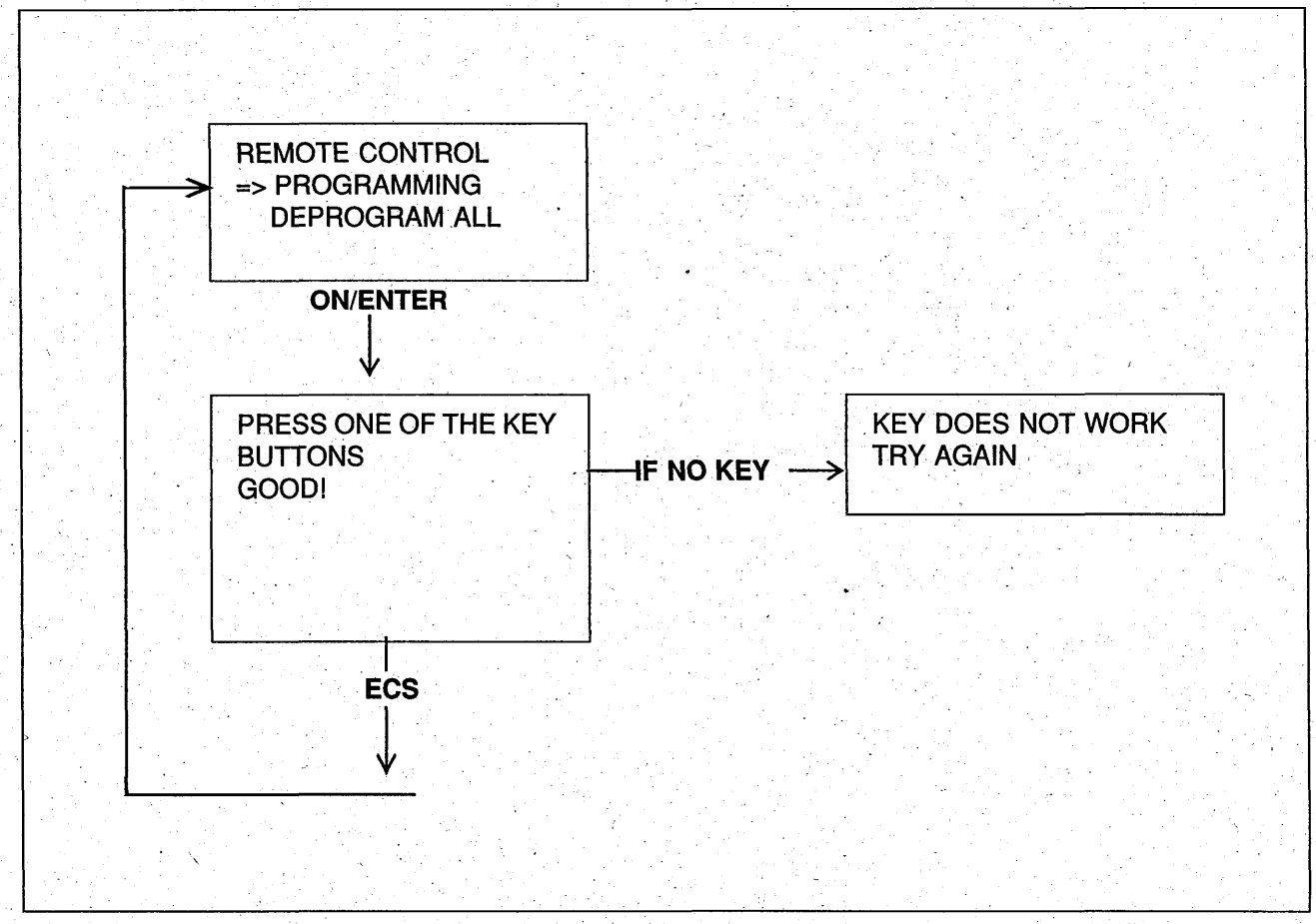
Siren

If a siren with battery back-up is fitted, this must be selected in the country code menu. The "SIREN" command, last in the programming menu, must also be selected "ON". Continue on page 189.

Important

The alarm's horn must be disconnected when a siren with battery back-up is fitted.

Programming for remote control



The remote control that is used for the car's anti-theft alarm must be programmed (coded) for that particular car. When the car is delivered, 2 preprogrammed remote control units are supplied. It is possible to obtain 2 additional remote control units (a total of 4 remote control units can be programmed for the car).

Programming

Remote control units

1 Connect an ISAT scan tool.
Select "PROGRAMMING".

2 Select "REMOTE CONTROL".
Select "PROGRAMMING".

3 Point the remote control unit at the aerial and press one of its buttons within 5 seconds of selecting the ISAT scan tool command. If between 1 and 3 additional remote control units are needed, program these in the same way as described here in point 3.

Important

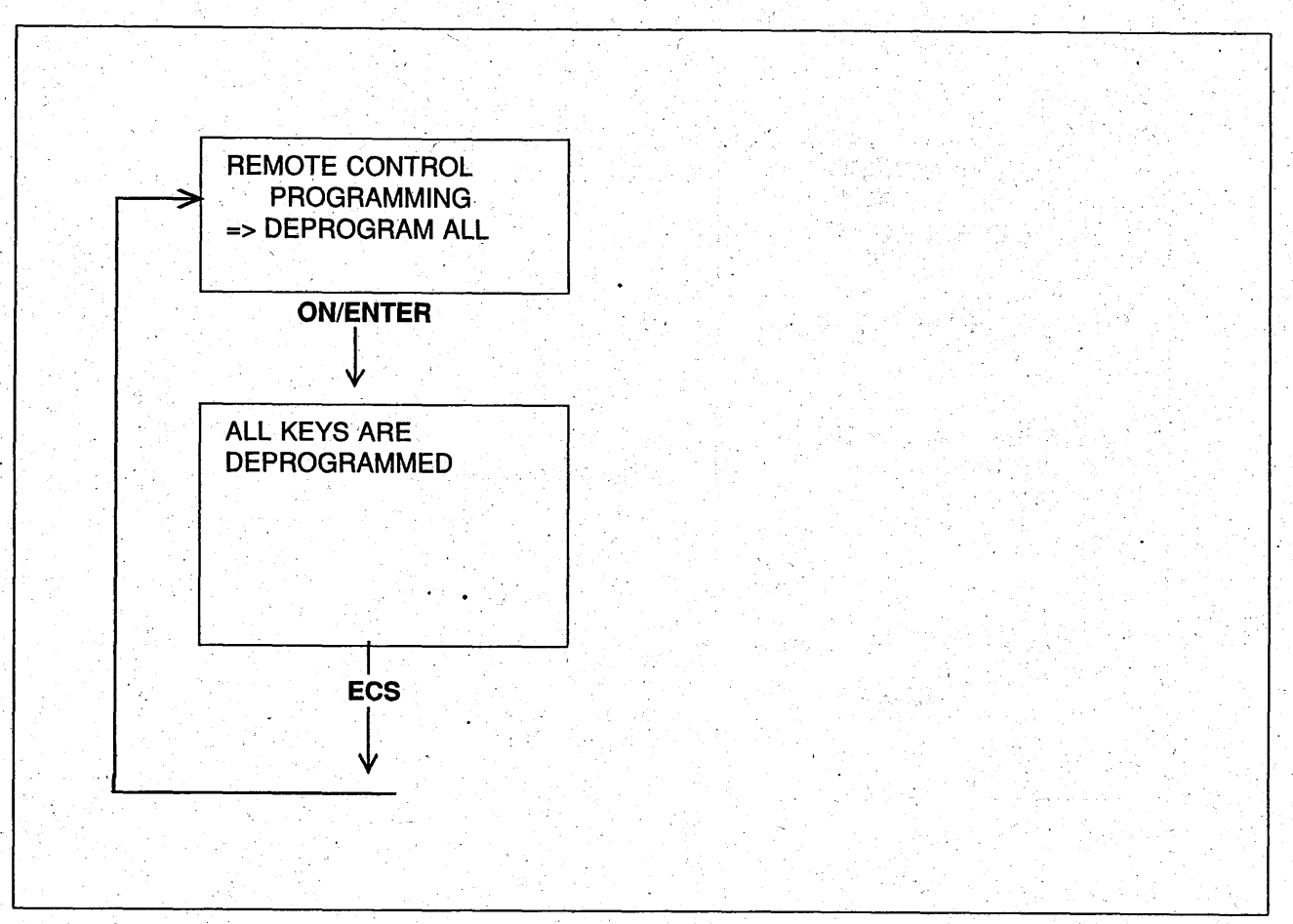
All remote control units that are to be used must be programmed consecutively without leaving the ISAT scan tool programming mode for remote control units.

Check the number of programmed remote control units

Always check the number of remote control units that have been programmed.

- Ignition on (ignition switch in "ON" position).
- Press the RH button on the remote control unit (tailgate).
- The LED flashes once for each programmed remote control unit.

Programming for remote control (contd.)



Deprogramming all remote control units

1 Select "REMOTE CONTROL".
Select "DEPROGRAM ALL".

2 All programmed remote control units will now be deprogrammed.

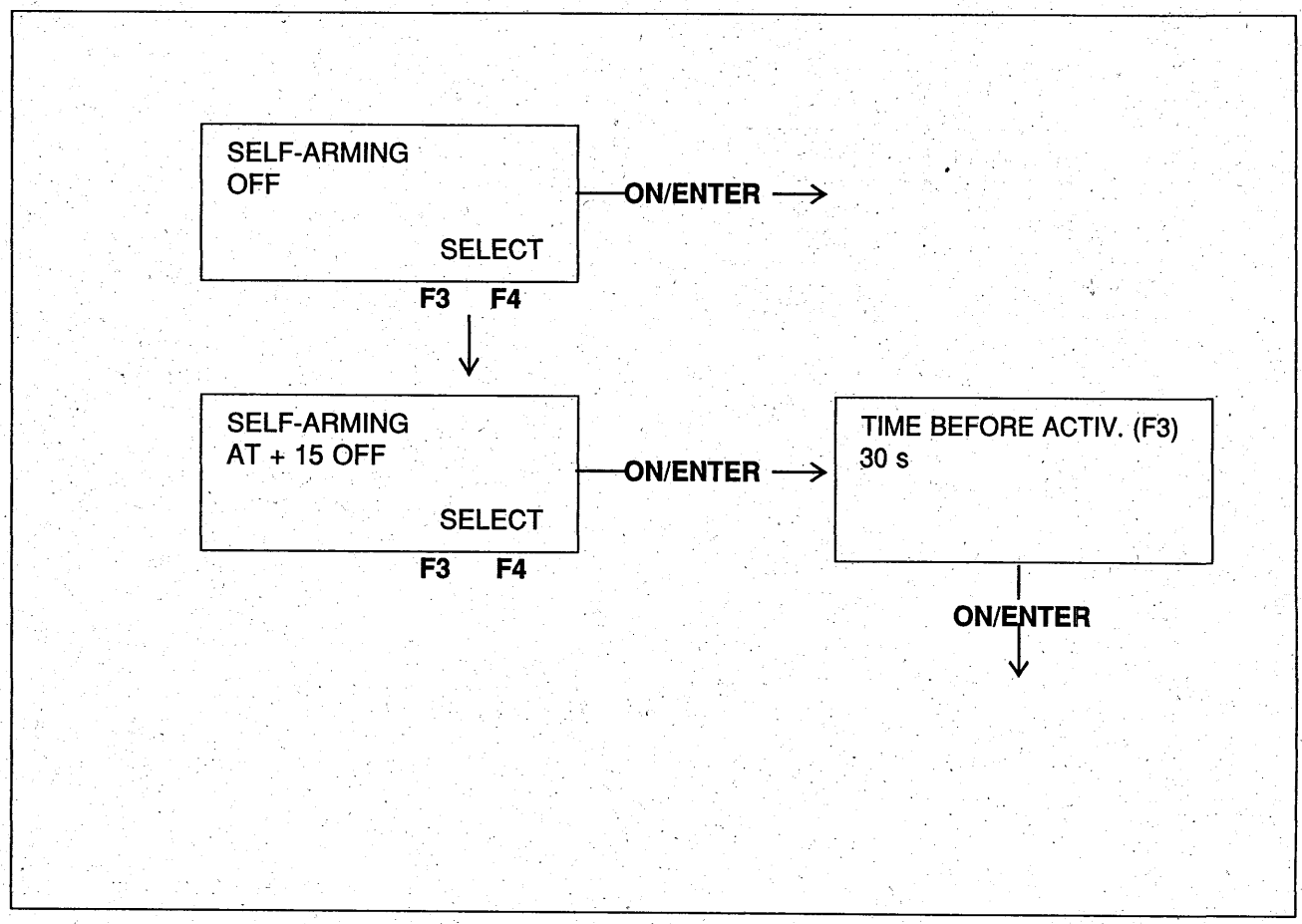
Important

Unless 4 remote control units are used, none of them can be programmed until all programmed remote controls have been deprogrammed as described in "Deprogramming all remote controls" above. Programming can then be carried out as described in "Remote controls" on the previous page.

Make a habit of always having the ignition switch in the Drive position when deprogramming all remote control units. This is to avoid deprogramming while the car is armed.

If all remote controls are deprogrammed and the car is self-immobilized, it is still possible to program anti-theft alarm remote controls.

Self-arming



The anti-theft alarm can be programmed for self-arming. This means that the alarm automatically starts monitoring without the remote control being used. How the function is to become active and the time elapsing before it becomes active are specified.

When the alarm has been triggered, the selected country code will apply. The LED will start its delay period according to the specified "TIME BEFORE ACTIV." and then go over to indicating that the alarm is armed.

Programming

Self-arming

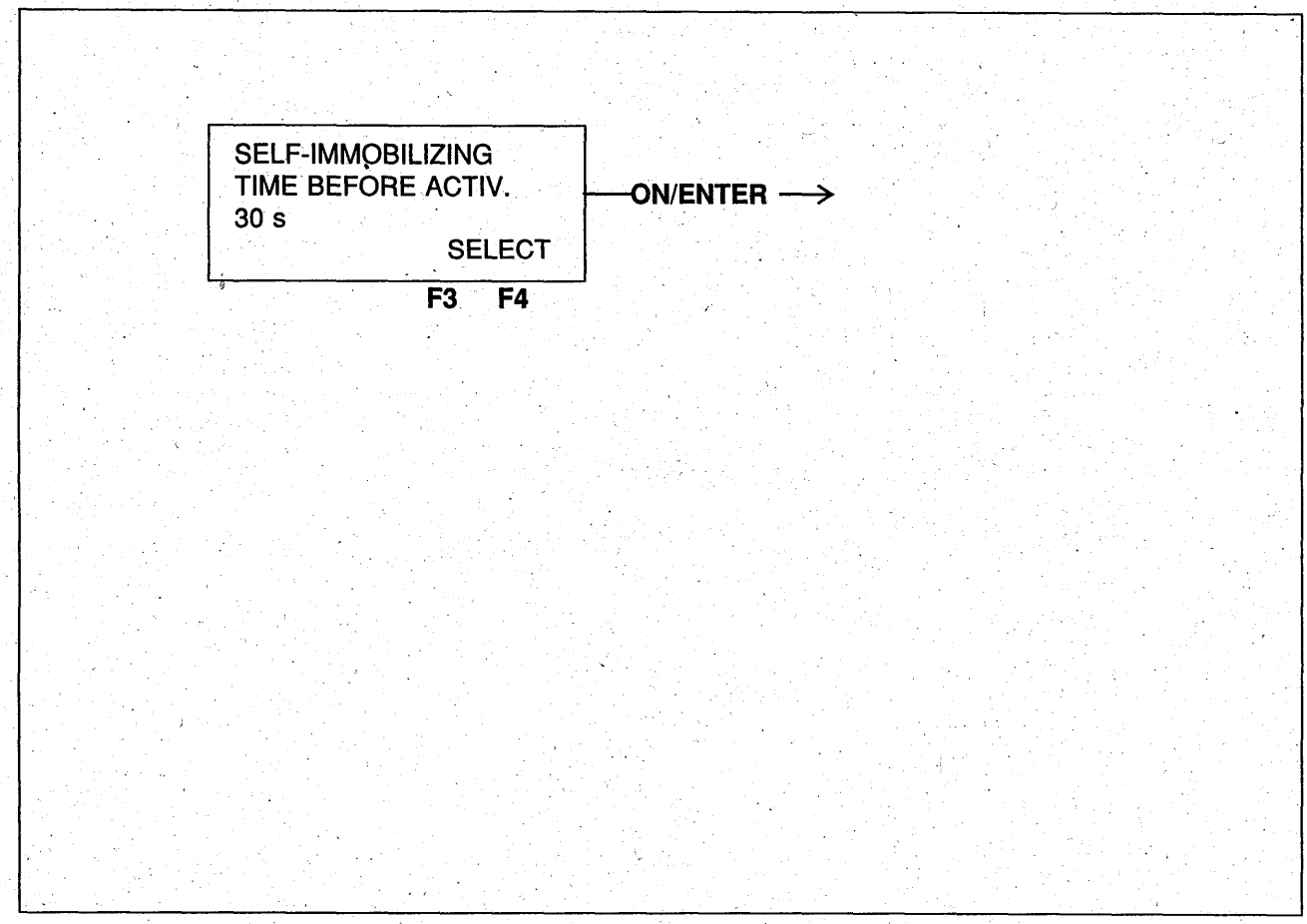
Connect an ISAT scan tool.
Select "PROGRAMMING".
Select "SELF-ARMING" and then:

1 "OFF" in order to deselect self-arming.
2 "AT +15 OFF" for connection of the self-arming function when the ignition is "OFF".
3 "+15 OFF DOOR CLOSED" for connection of the self-arming function when the ignition is "OFF" and the driver's door closed.

Time before self-arming

1 Select "TIME BEFORE ACTIV.".
2 Select the time: 30, 60, 90, 120, 150, 180, 210, 240, 270 or 300 seconds as the time before the alarm should self-arm.

Self-immobilizing



The anti-theft alarm's self-immobilizing function is always engaged when the ignition key is removed from the ignition switch. This takes place automatically after a certain time without the remote control unit having to be used.

The time before the function becomes active is preset but can be programmed. The LED flashes at a rate of 2 flashes per second to indicate that the function is active.

Programming

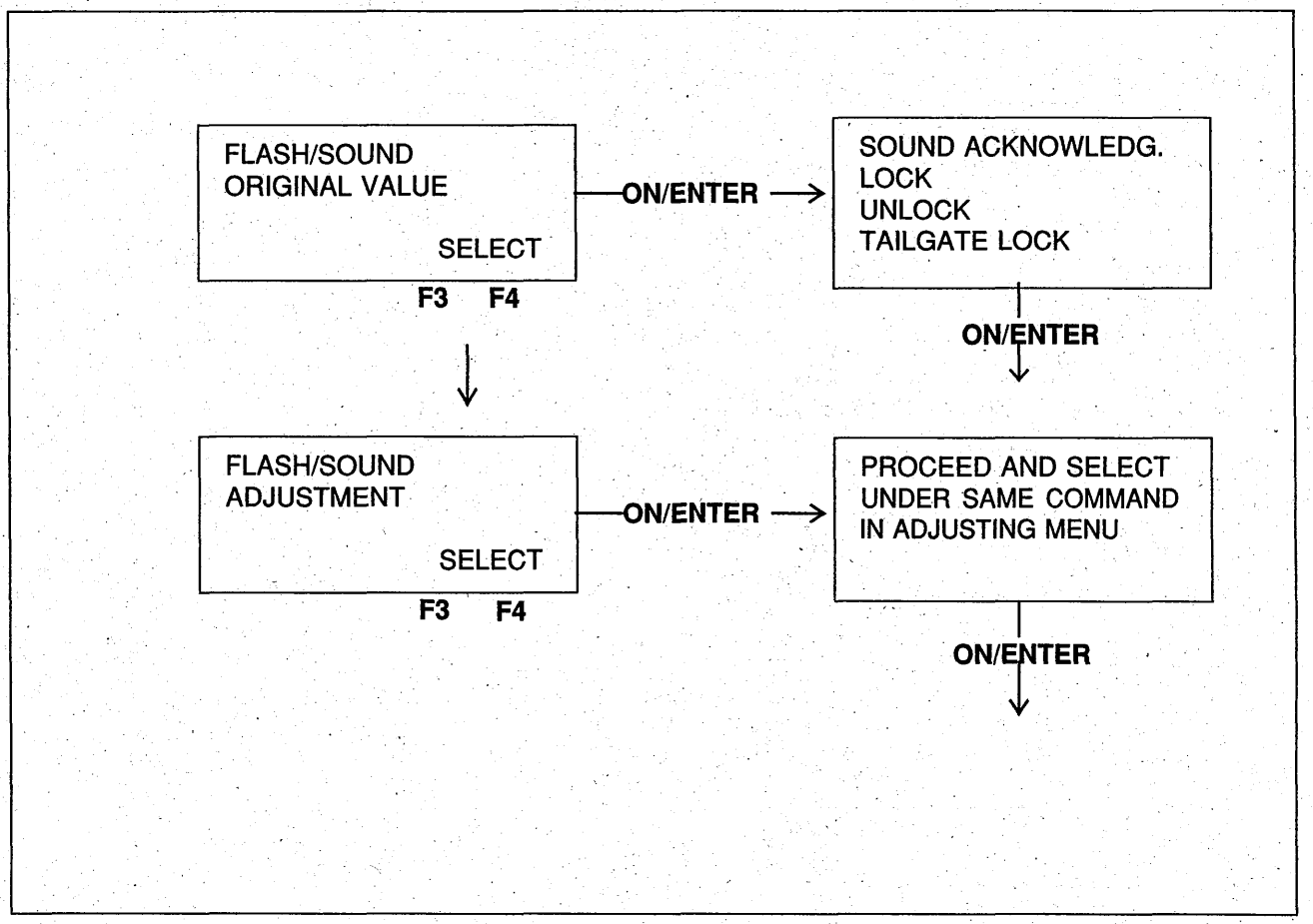
Self-immobilizing, time

Connect an ISAT scan tool.
Select "PROGRAMMING".
Select "SELF-IMMOBILIZING".
Select "TIME BEFORE ACTIV.": 30, 60, 90, 120, 150, 180, 210, 240, 270 or 300 seconds as the time elapsing before the car is self-immobilized.

Important

If the ignition key is not inserted in the ignition switch after the car has been disarmed/unlocked, the car will be automatically self-immobilized after 3 minutes.

Remote control: flash/sound confirmation



On arming/disarming/unlocking the tailgate using the remote control, a flash/sound acknowledgement can be obtained. Such acknowledgement is programmable and the pattern can be chosen within certain limits.

As delivered, the following is the case:

- if the **LH button** is pressed to arm the car, the car's direction indicators will flash once for 0.5 seconds. If the LH button is used for unlocking/ disarming, this is indicated by the car's direction indicators flashing 3 times. If the car alarm has been set off, this is shown by 5 flashes when disarming.
- if the **RH button** is pressed to unlock the tailgate, this is not indicated. On the other hand, it is possible to program a flash/sound acknowledgement for this function.

Programming

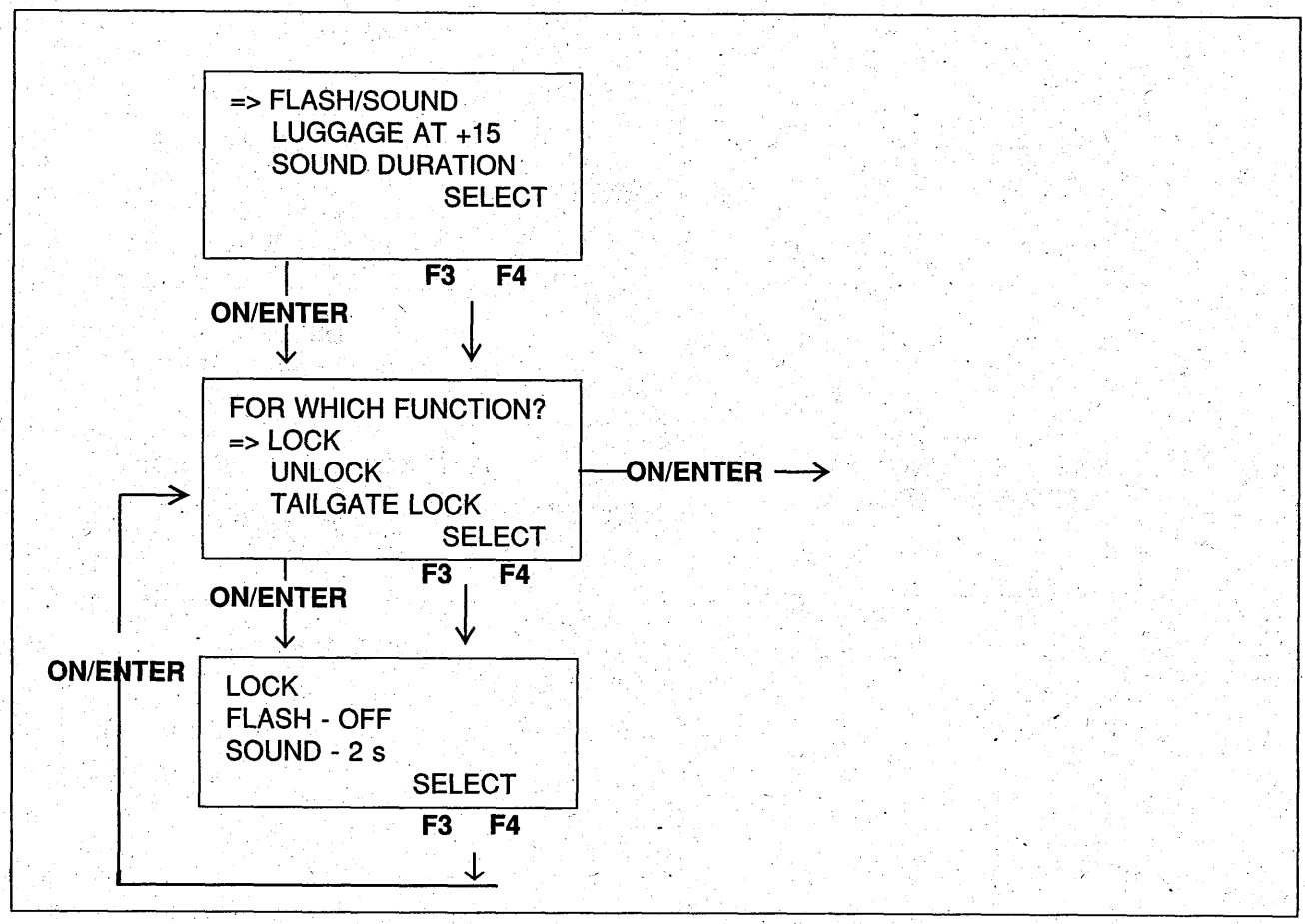
LH button

Connect an ISAT scan tool.
Select "PROGRAMMING".
Select "FLASH/SOUND" and then:

1 "ORIGINAL VALUE" to select the same programming as carried out at the factory (see above). It is also possible to select sound acknowledgement for the 3 functions.

2 "ADJUSTMENT" to select a different type of programming to that selected at the factory. See next page.

Remote control: adjusting flash/sound acknowledgement



If "ADJUSTMENT" was selected in the programming menu on the previous page, new settings can be entered as described below. These settings will then apply.

Programming

Arming (lock)

1 Select "ADJUSTMENT".
Select "FLASH/SOUND".
Select "LOCK".

2 Select the setting for the direction indicators:

OFF — no flashing
0.5 s — direction indicators on for 0.5 sec.
2 s — direction indicators on for 2 sec
5 s — direction indicators on for 5 sec

3 Select the setting for sound (horn):

OFF — no sound
1 — sounds once
2 — sounds twice
3 — sounds three times

Disarming (unlock)

1 Select "ADJUSTMENT"
Select "FLASH/SOUND".
Select "UNLOCK".

2 Select direction indicator setting as previously.

3 Select sound setting (horn) as previously.

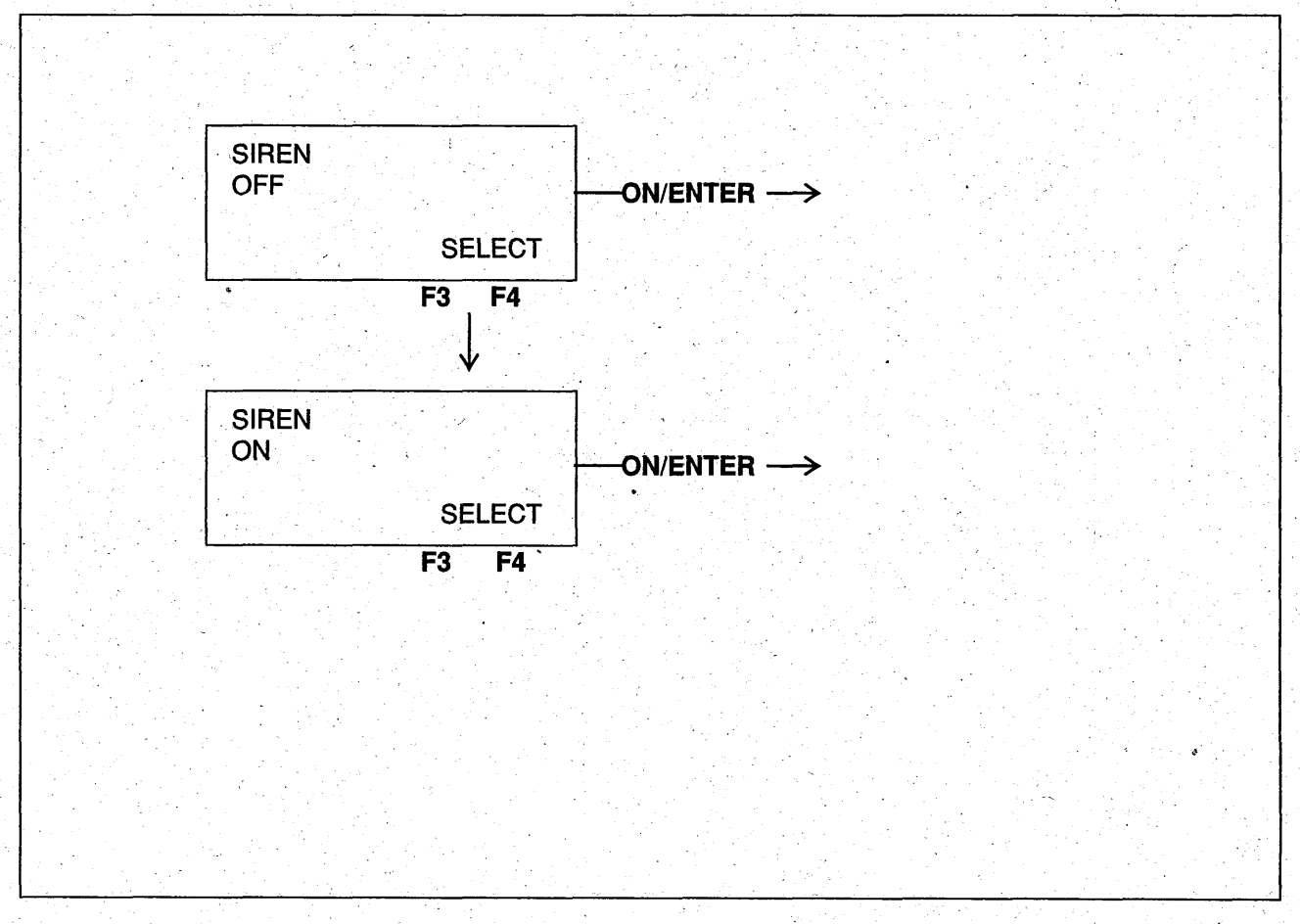
Unlocking tailgate

1 Select "ADJUSTMENT".
Select "FLASH/SOUND".
Select "TAILGATE LOCK".

2 Select direction indicator setting as previously.

3 Select sound setting (horn) as previously.

Programming for siren



In the basic version, only the alarm's special horn is used for the acoustic alarm. However, in certain markets the fitting of a siren with battery back-up is required. The alarm's **horn** is activated via a relay output in the electronic control module, that is to say the horn is activated by being grounded. The **siren** must be supplied continuously with +12 V and if this 12 V supply is interrupted, the siren will start. To accomplish this, the alarm must be programmed for the siren. For it to work correctly, the siren must be selected in the "COUNTRY CODE" menu. See "COUNTRY CODE" programming.

Programming

Connect an ISAT scan tool.
Select "PROGRAMMING".
Select "SIREN" and then:

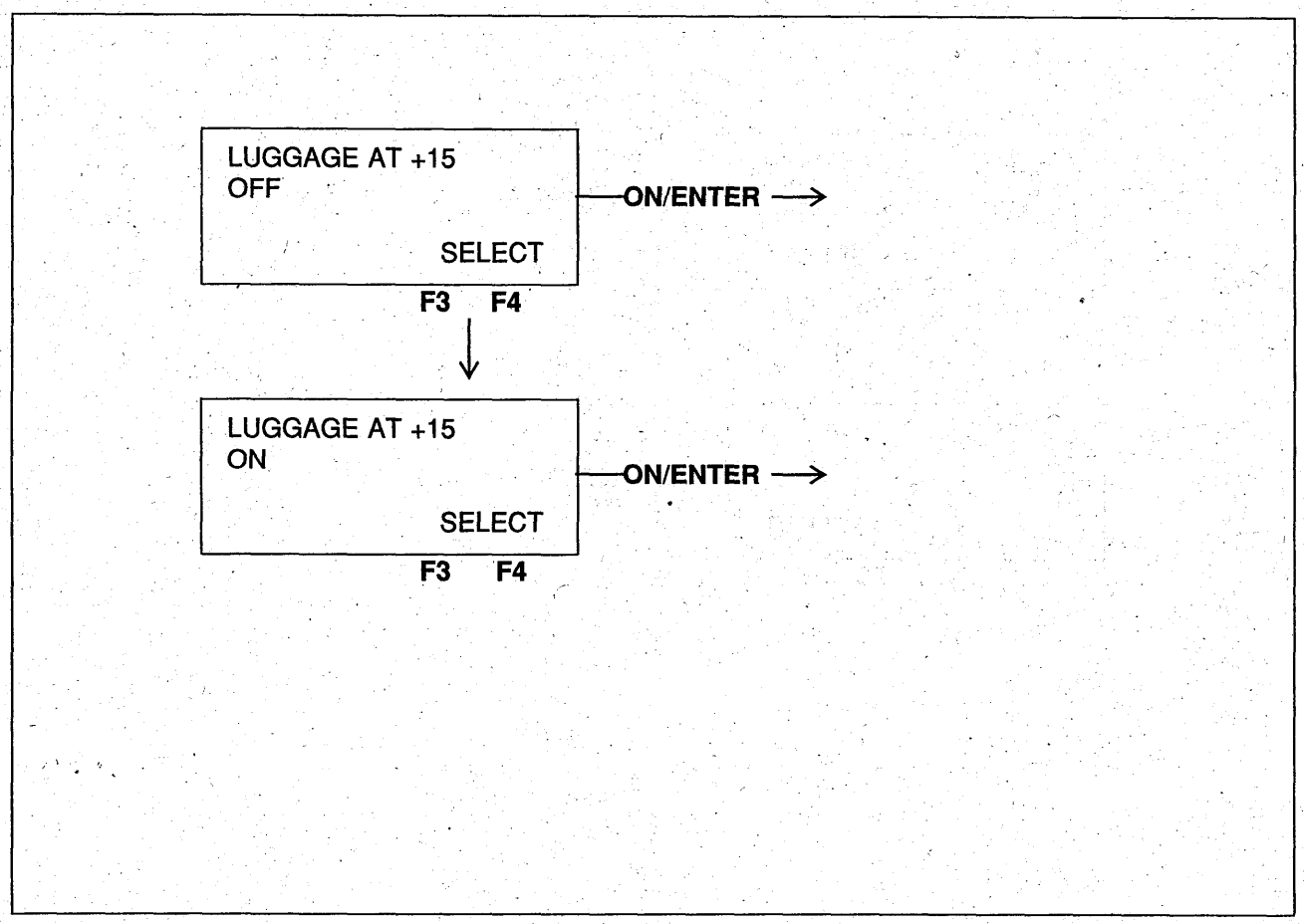
1 "ON" if the siren is to be included.

2 "OFF" if the siren is not to be included.

Important

IF "ON" is selected, sound confirmation will not be obtained.

Tailgate opening with ignition (+15) on



The tailgate cannot normally be opened by means of the remote control if the ignition is switched on. It is possible, however, with the following programming.

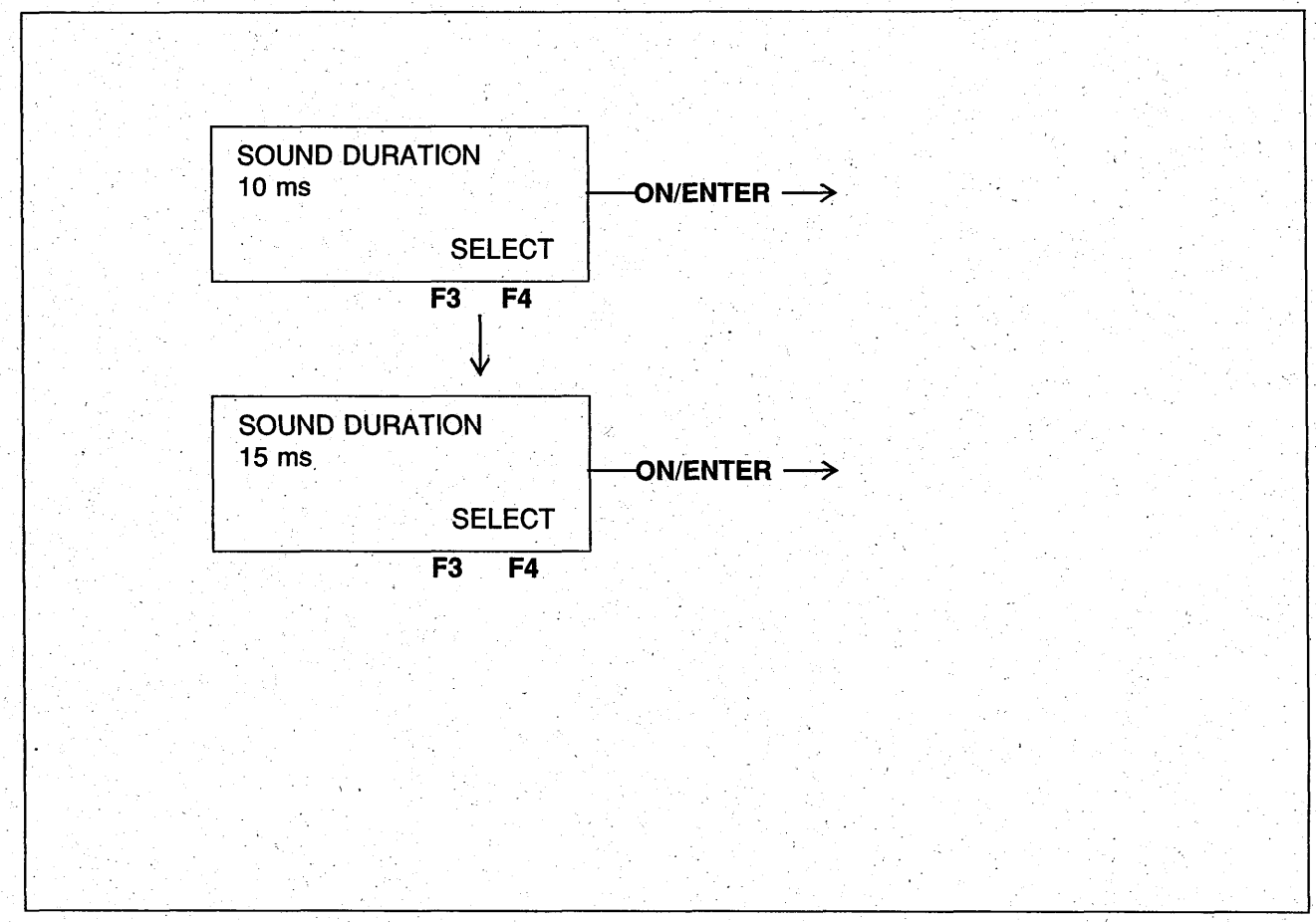
Programming

Connect an ISAT scan tool.
Select "ADJUSTMENT".
Select "LUGGAGE AT +15" and then:

1 "OFF" if it should not be possible to open the tailgate with the ignition switch in the ON position (+15).

2 "ON" if it should be possible to open the tailgate with the ignition switch in the ON position (+15).

Sound adjustment (Sound characteristics)



In the "FLASH/SOUND" setting menu, only the number of times the acoustic signal is to chirp can be changed. With this function, the character of the sound can be altered by changing its duration (the length of each acoustic signal).

Programming

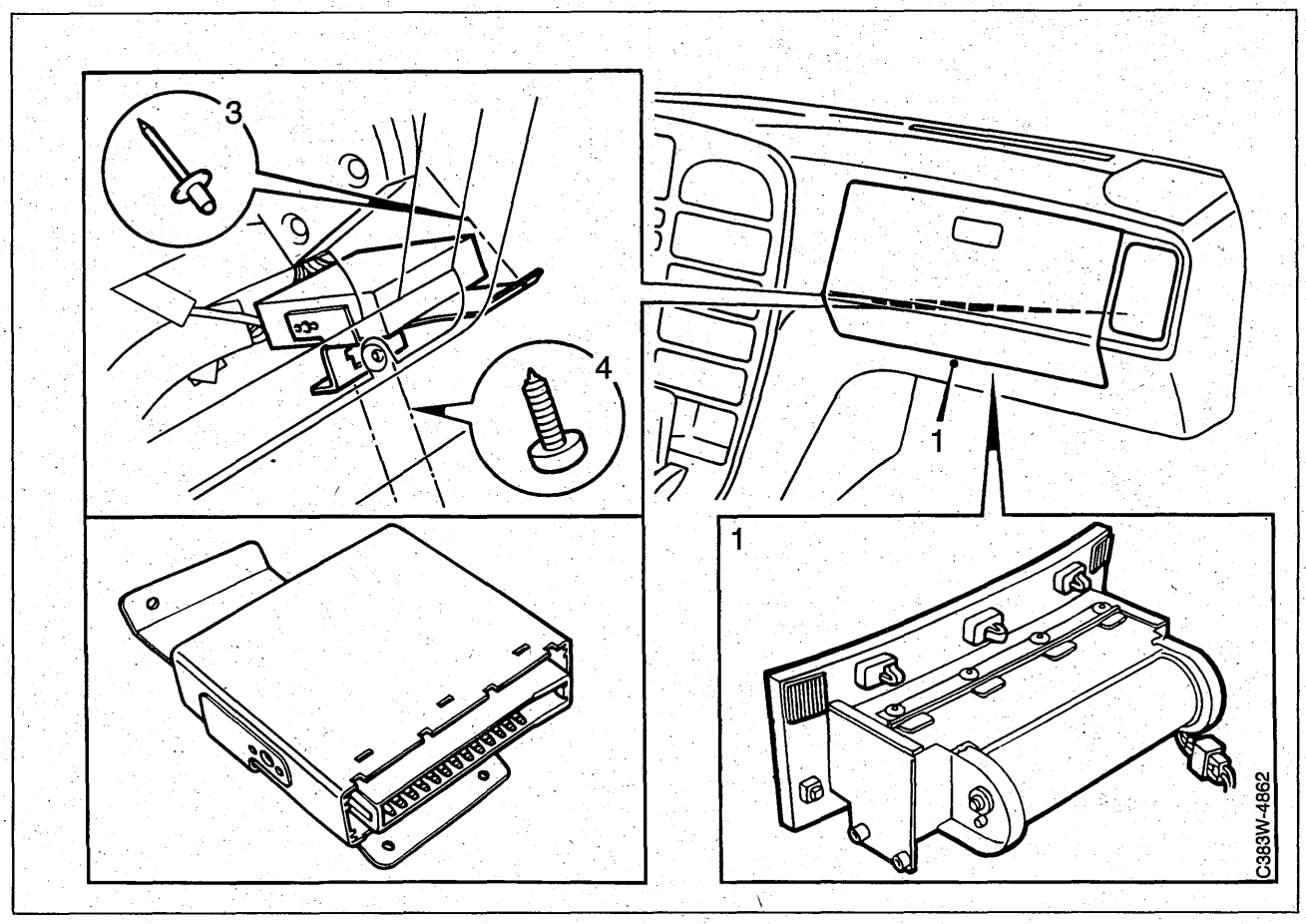
Connect an ISAT scan tool.
Select "ADJUSTMENT".
Select "SOUND DURATION".
Select time:

5-10-15-20-25-30 msec.

A short time will be a perceived as a low volume sound and a longer time as a high volume sound.

Component replacement

Electronic control module



1 **Car without passenger airbag**
Remove the glove box and air distribution flap.

Car with passenger airbag
Remove the complete airbag, including bracket and air distribution flap.

2 Carefully press the air duct upwards on the passenger's side.

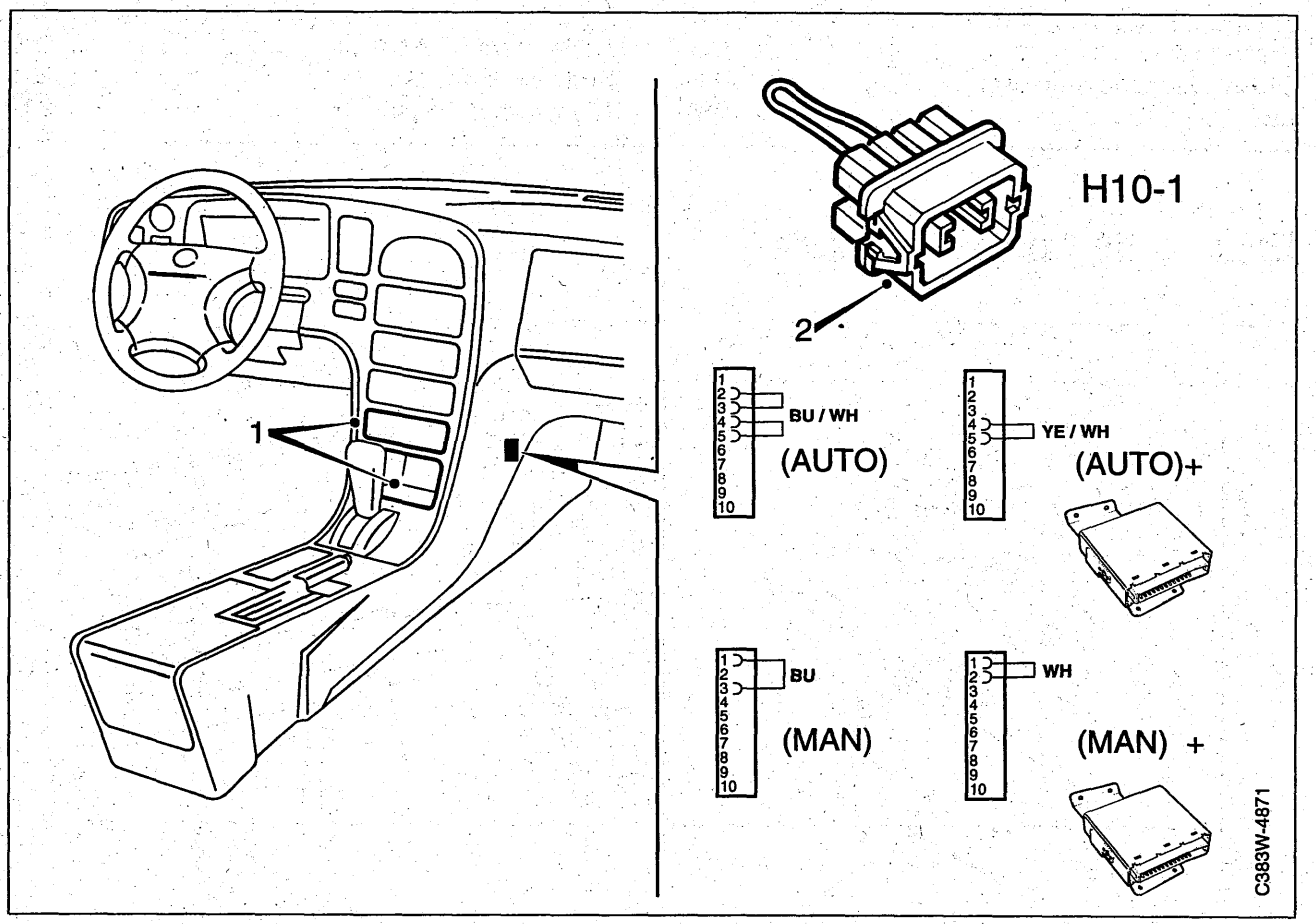
3 Drill out the pop rivet securing the control module. Use a drill with a bit stop.

4 Remove the two control module retaining screws (from below). Lift out the control module.

5 Unplug the electronic control module connector.

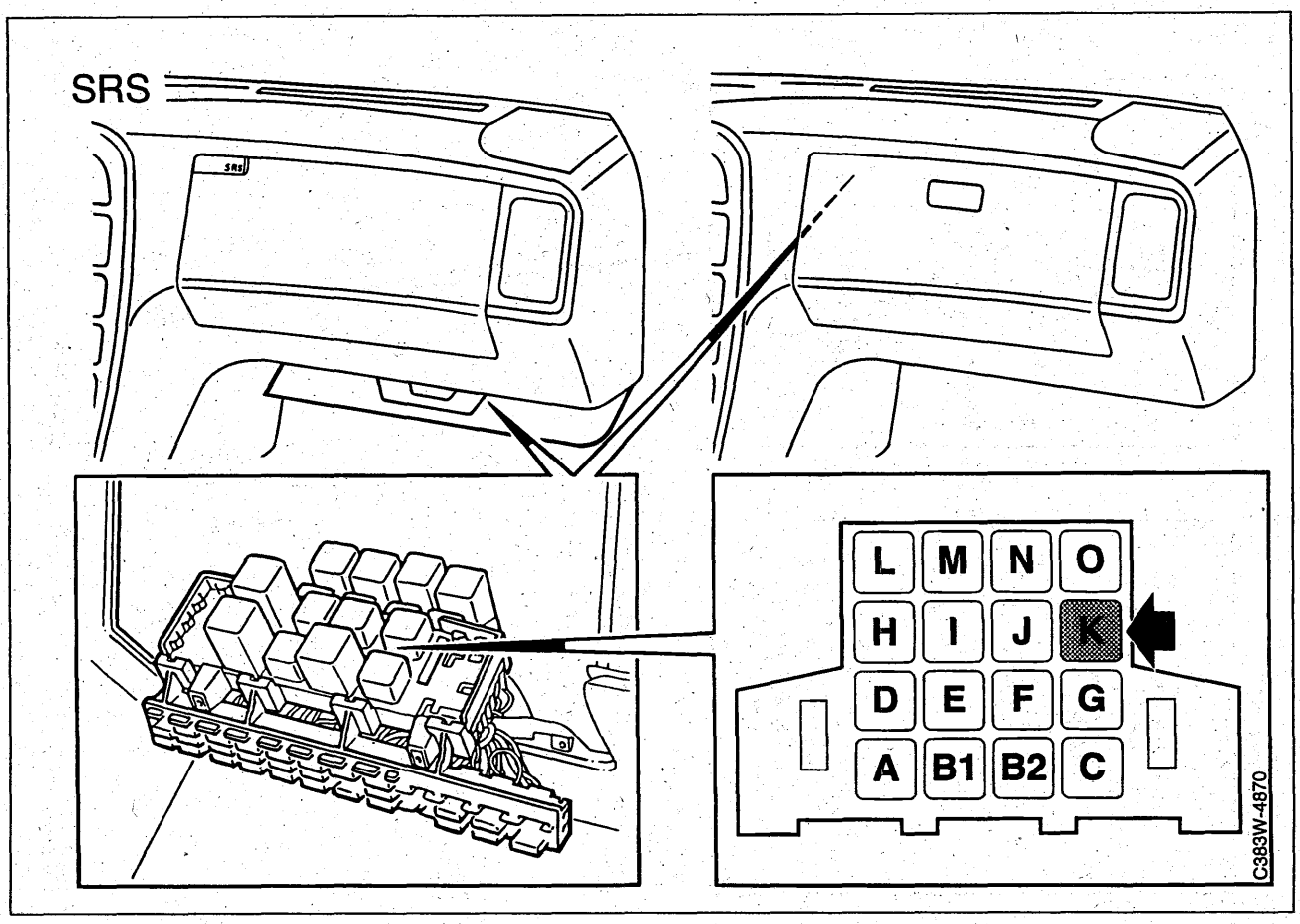
6 Fit in reverse order.

Jumper plug



1 Remove the two lower storage compartments in the centre console.
2 Remove the jumper plug.
3 Fit in reverse order.

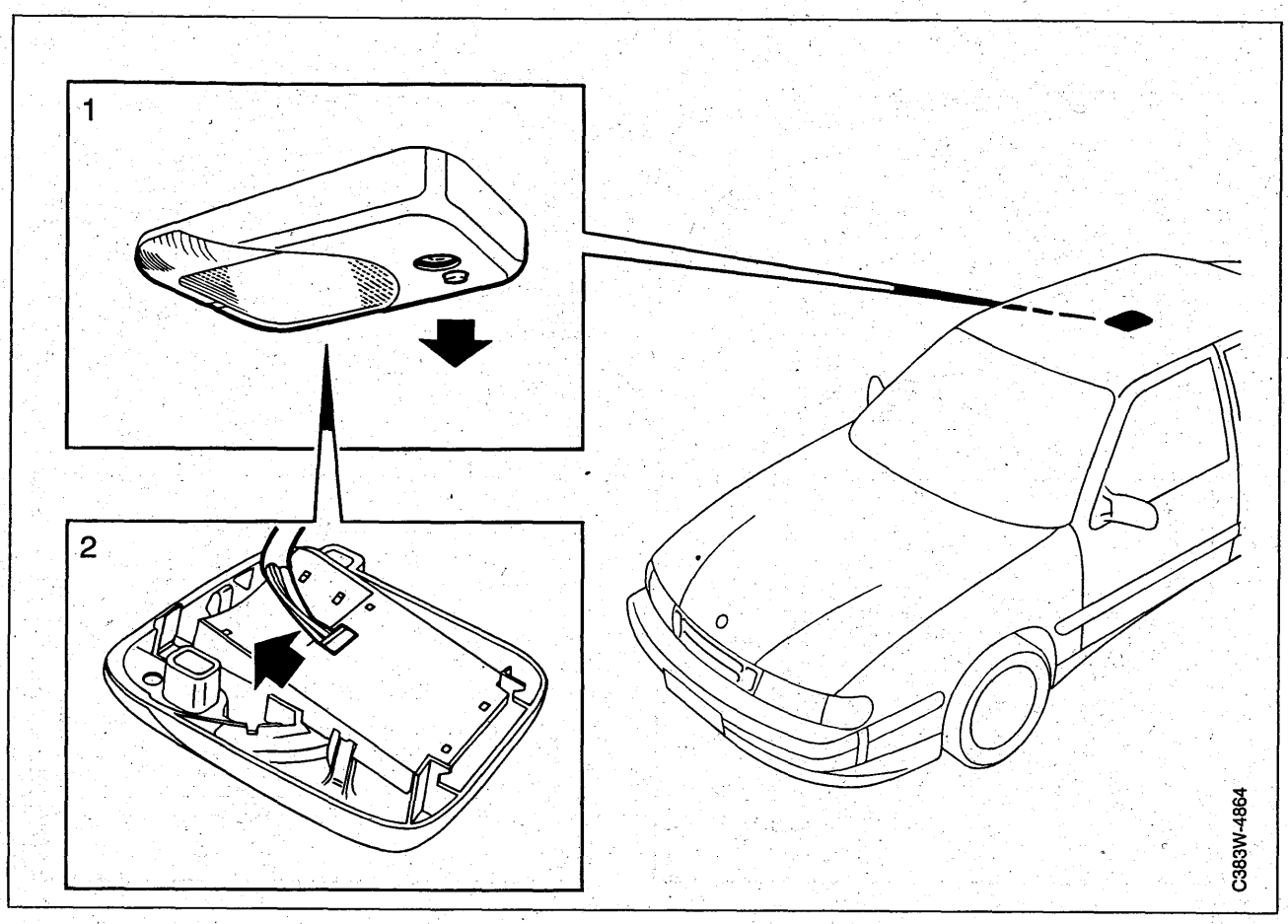
Starter relay



Car without passenger airbag
The main relay board is located behind the glove box.

Car with passenger airbag
The main relay board is located below the airbag module.

Glass breakage sensor

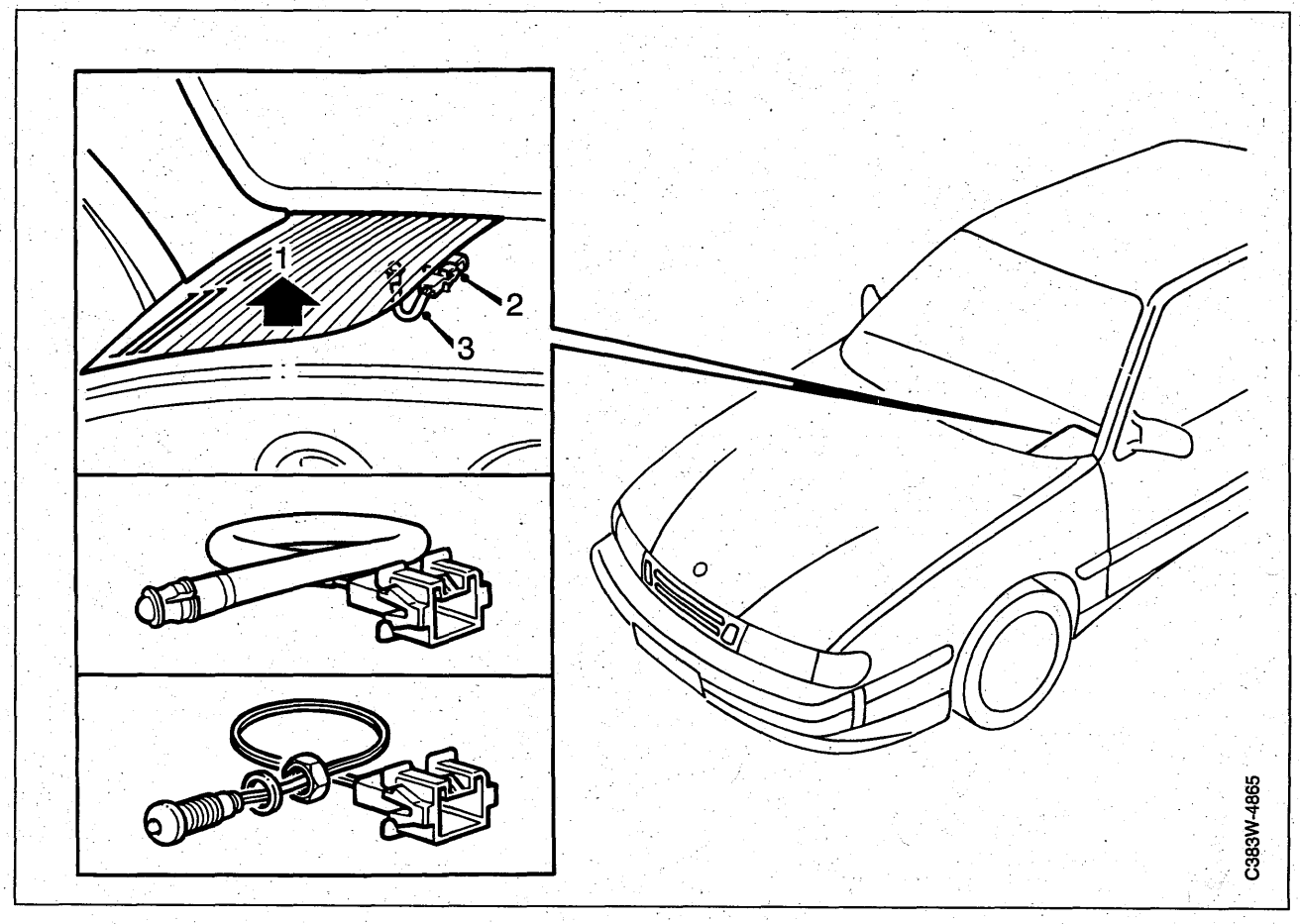


1 Remove the roof-mounted dome lamp.

2 Unplug its connector.

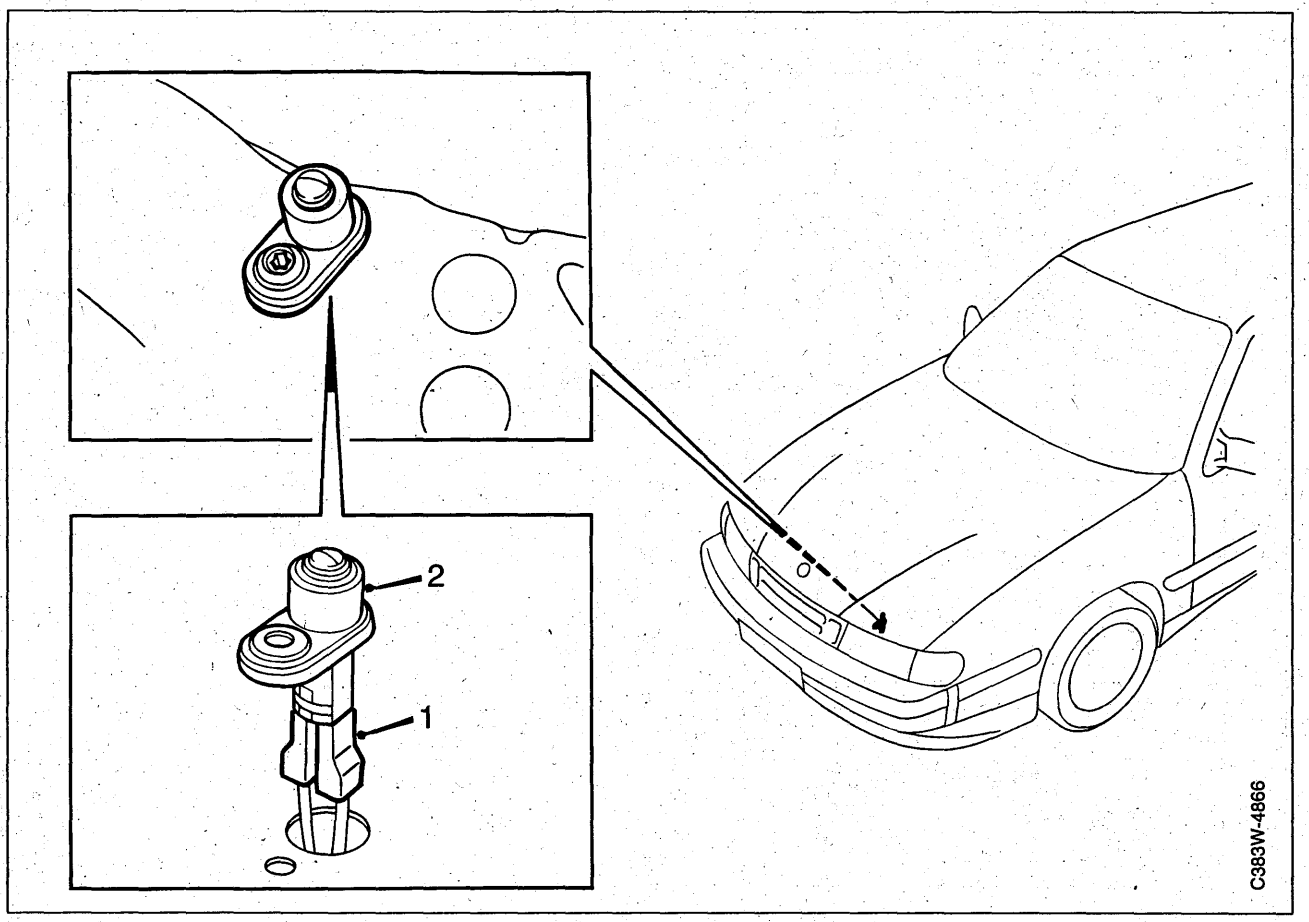
3 Fit in reverse order.

LED



1 Remove the loudspeaker grille from the dashboard on the driver's side.
2 Unplug the LED's connector.
3 Remove the LED.
4 Fit in reverse order.

Bonnet switch

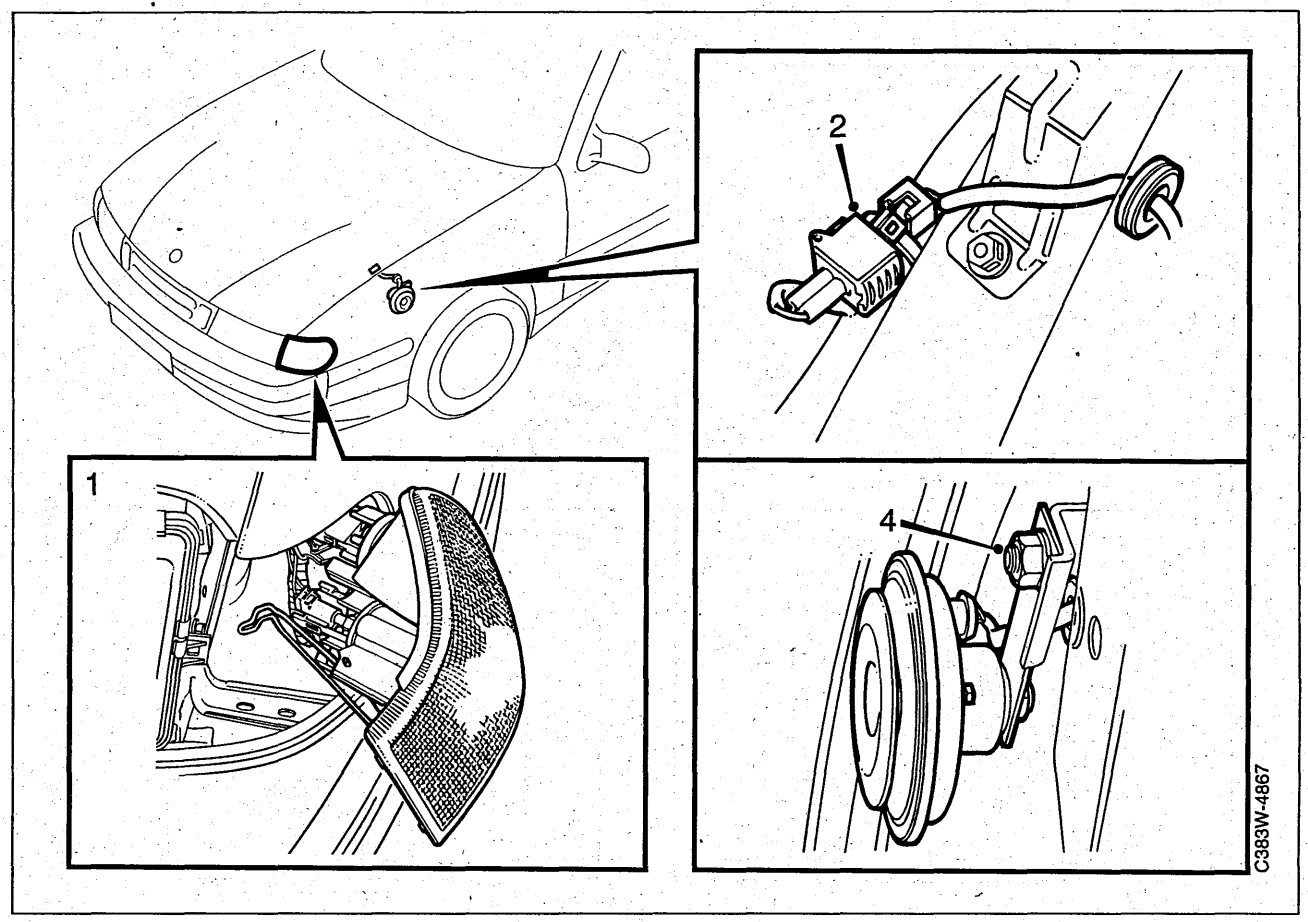


1 Unplug the bonnet switch connector.
2 Remove the bonnet switch.
3 Fit in reverse order.

Important

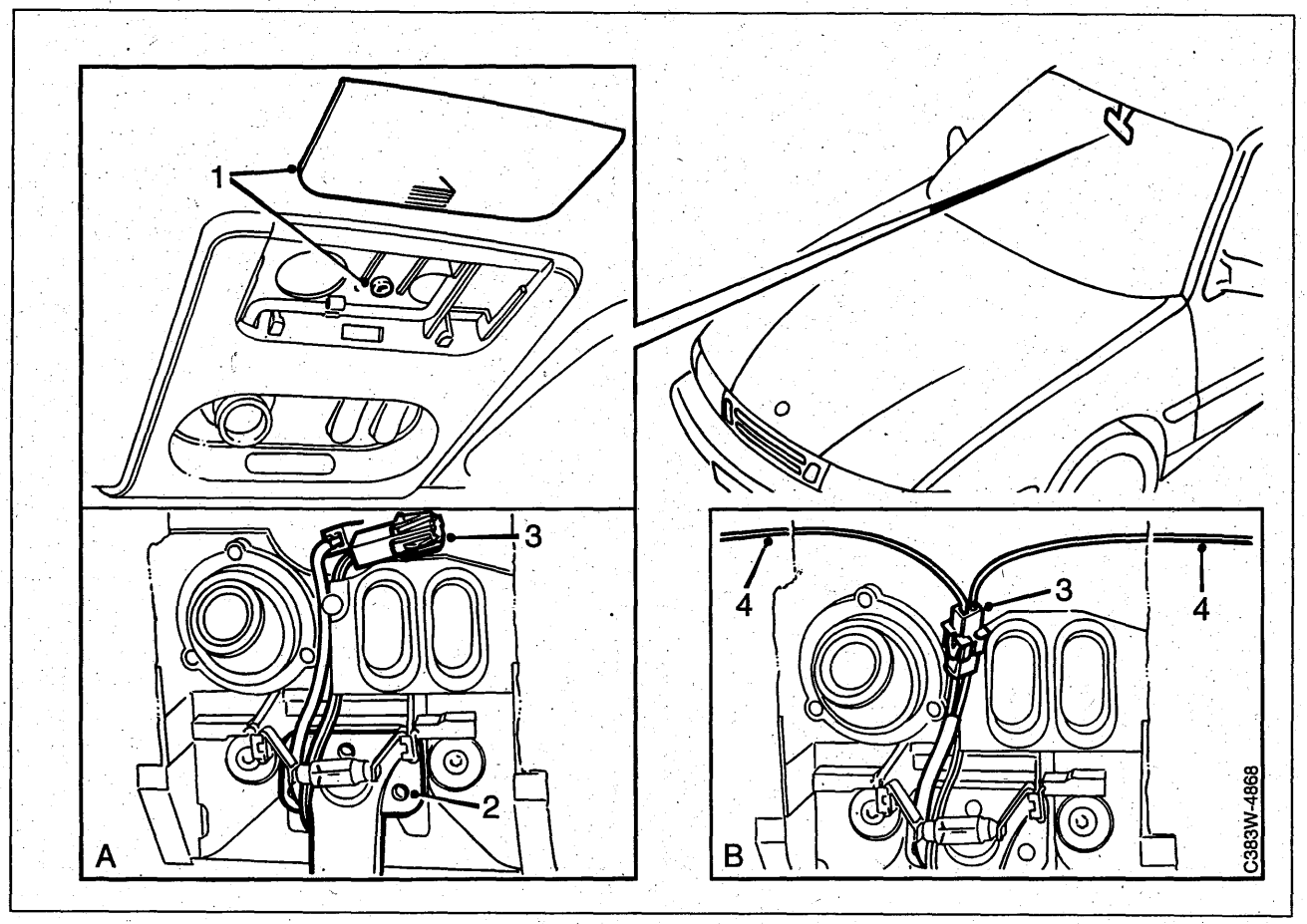
Make sure that the protective rubber sleeve (under the radiator member) is fitted over the cable terminals.

Horn



1 Remove the front left-hand direction indicator.
2 Unplug the horn's connector (in the engine bay).
3 Carefully press the air cleaner intake pipe down (secure with screwdriver).
4 Undo the nut securing the horn and lift out the horn.
5 Fit in reverse order.

Aerial for remote control



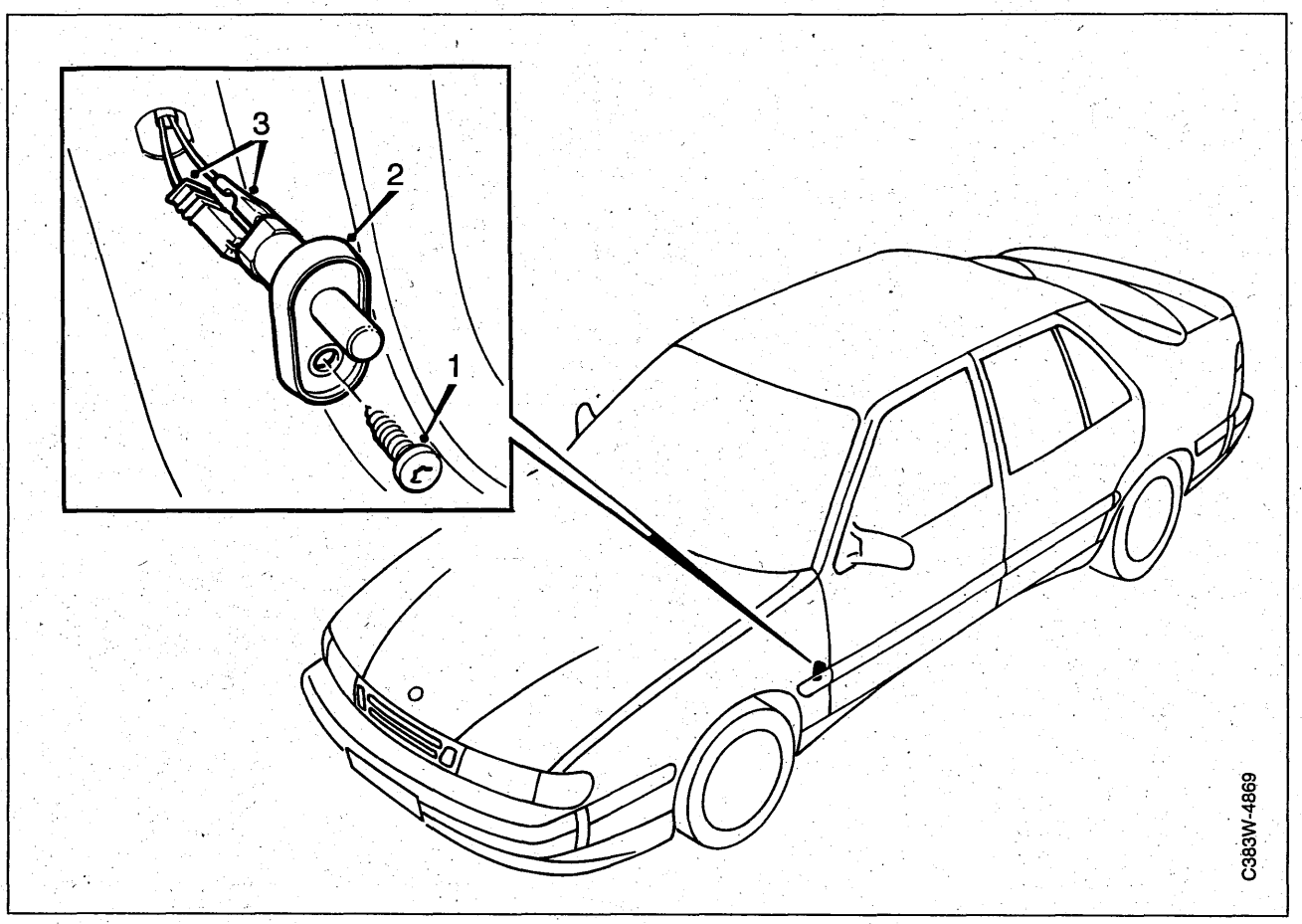
A Aerial built into interior rearview mirror (JP)

1 Remove the roof console's cover panel.
2 Remove the rearview mirror as shown.
3 Unplug the connectors.
4 Fit in reverse order.

B Dipole aerial

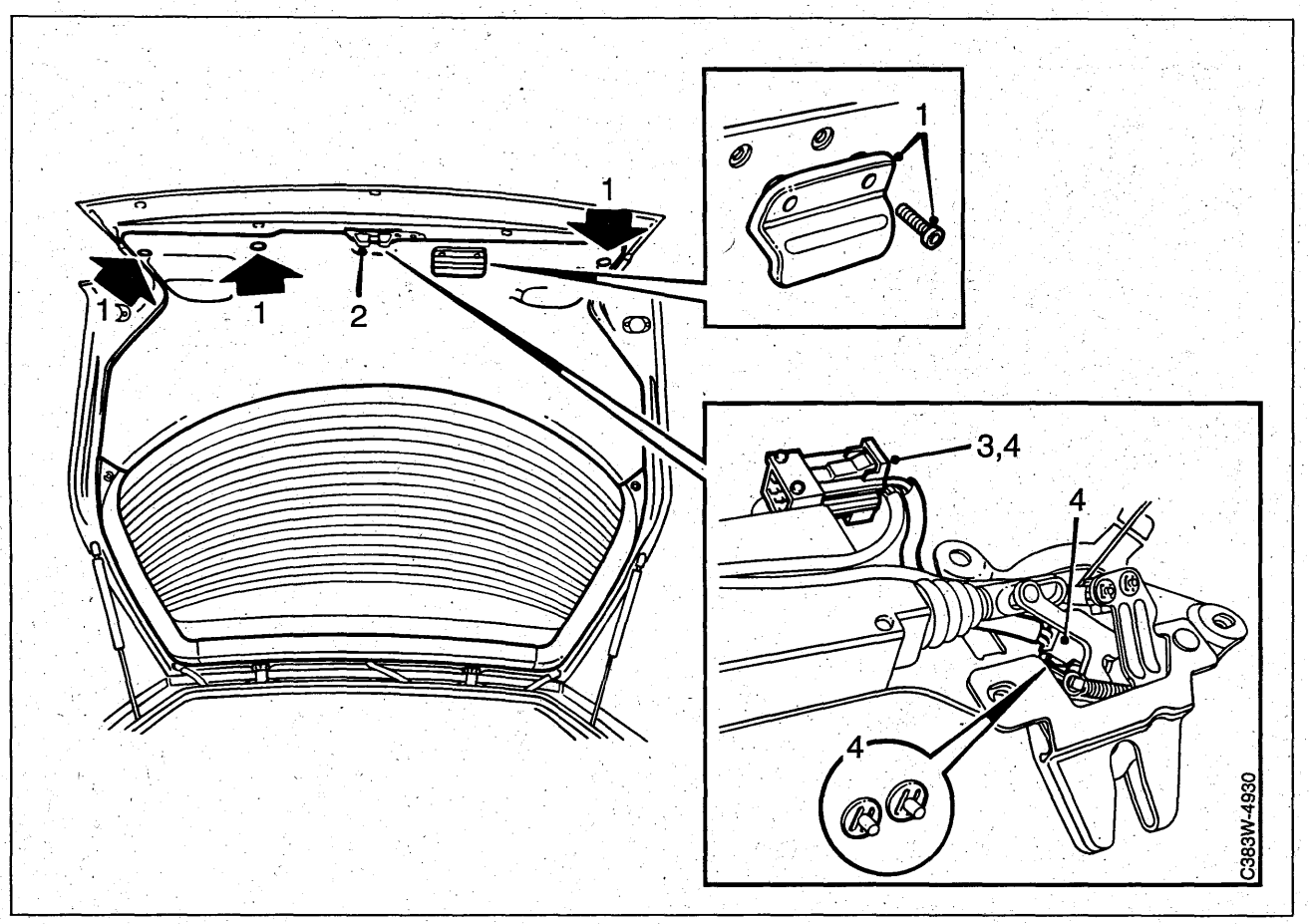
1 Remove the roof console's cover panel.
2 Remove the sun visor retaining clips.
3 Unplug the connector.
4 Remove the aerial (remember that the new aerial is fitted in the same way).
5 Fit in reverse order.

Door switches



1 Remove the door switch retaining screw.
2 Extract the door switch from the hole in the body.
3 Unplug the connector.
4 Fit in reverse order.

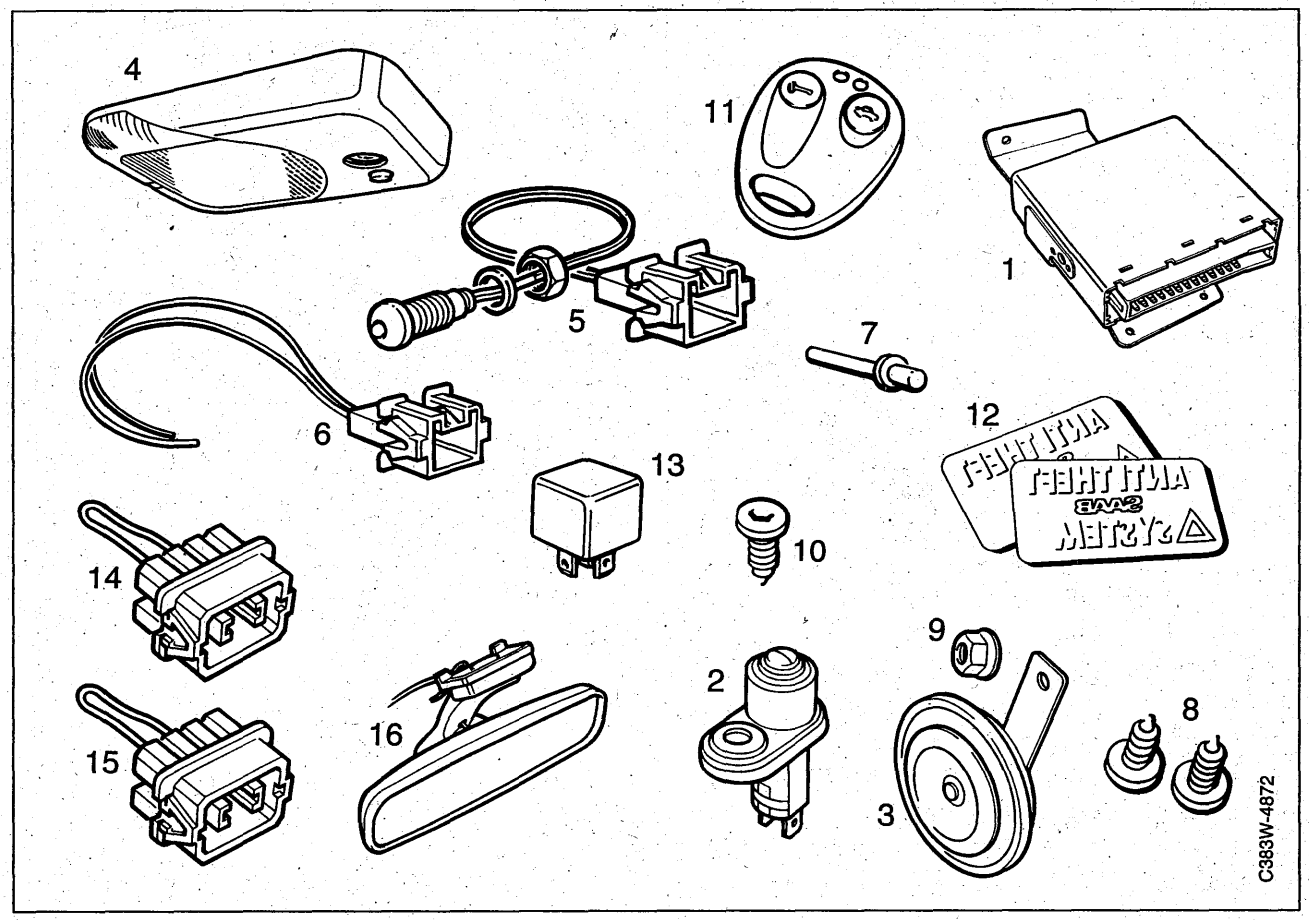
Microswitch in tailgate



1 Remove the tailgate handle and trim.
2 Remove the plastic cover over the lock.
3 Unplug the 6-pin connector.
4 Remove the 2 pins for the microswitch from the connector. Remove the microswitch (first remove the plastic buttons holding the microswitch).
5 Fit in reverse order.

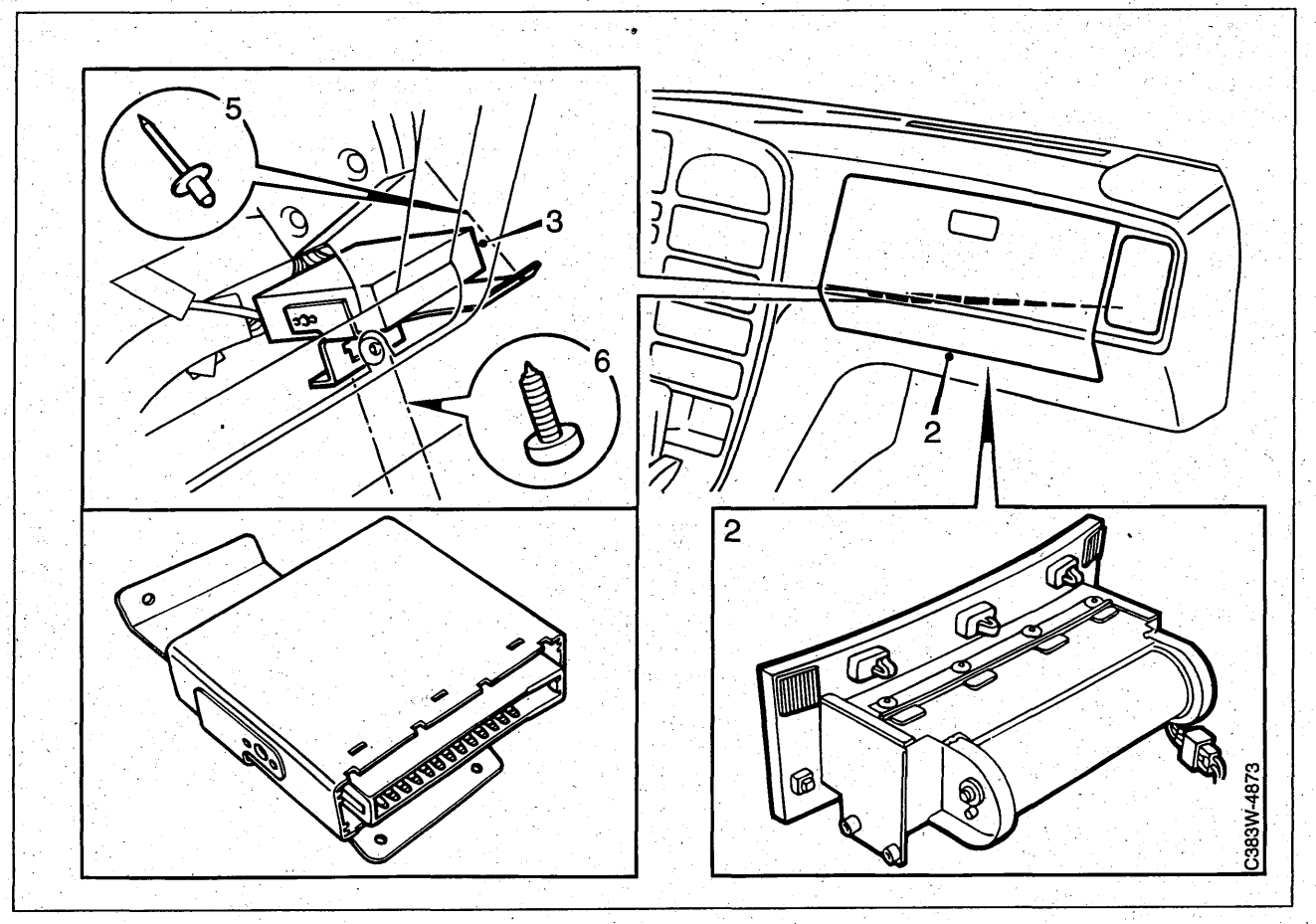
Fitting kit

Constituent components



1 Electronic control module
2 Bonnet switch
3 Horn
4 Glass breakage sensor
5 LED
6 Dipole aerial
7 Pop rivet
8 Screws (2)
9 Nut, horn
10 Screw, bonnet switch
11 Remote control
12 Labels
13 Starter relay
14 Jumper plug, MAN
15 Jumper plug, AUT
16 Interior rearview mirror with built-in aerial, JA

Electronic control module



1 Disconnect the negative (-) cable from the battery.

2 **Car without passenger airbag**
Remove the glove box and air distribution flap.

Car with passenger airbag
Remove the complete airbag, including bracket and
air distribution flap.

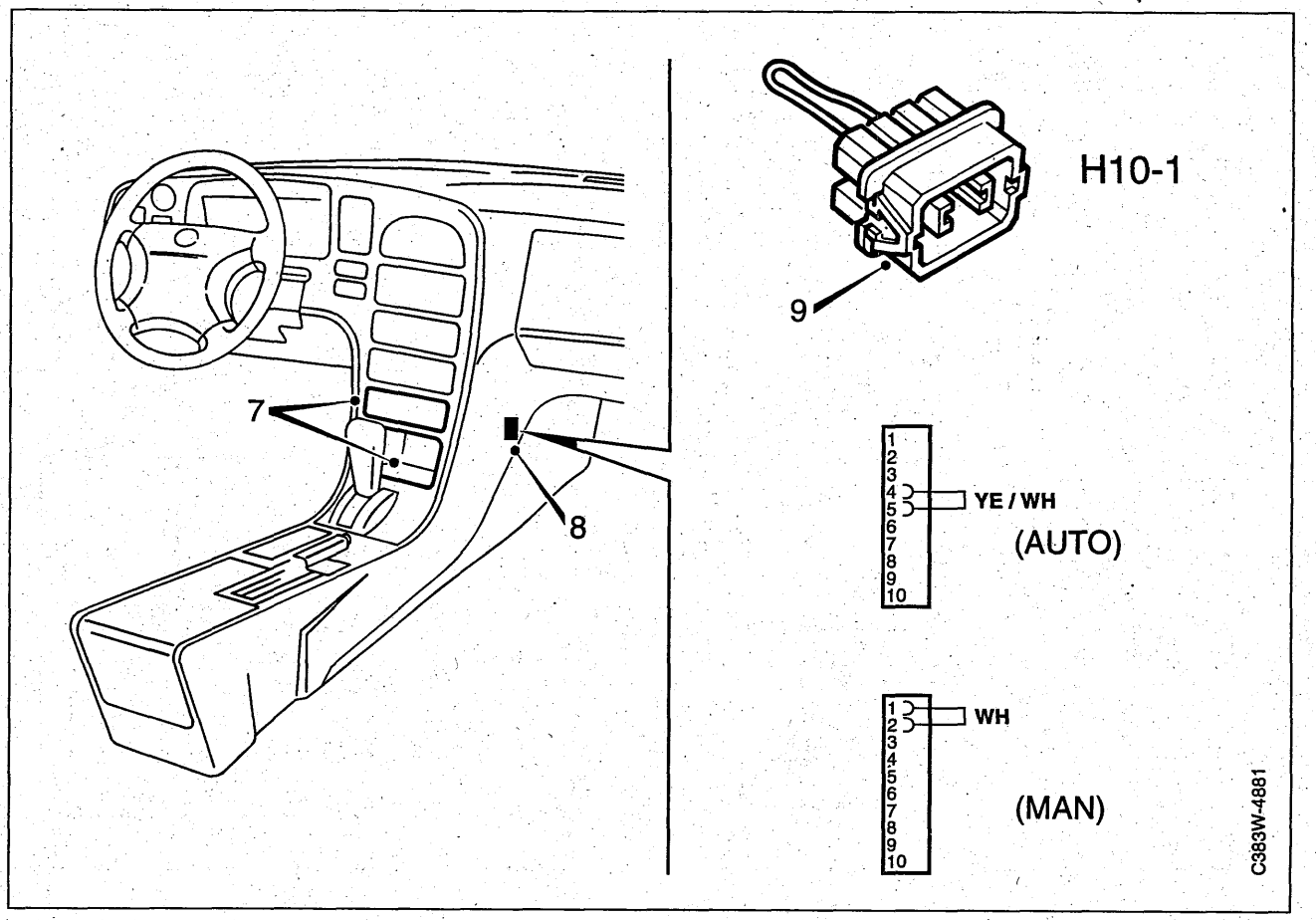
3 Remove the control module from below.

4 Plug in the 25-pin control module connector.

5 Fit the pop rivet.

6 Secure the control module in place by means of the two screws.

Jumper plug

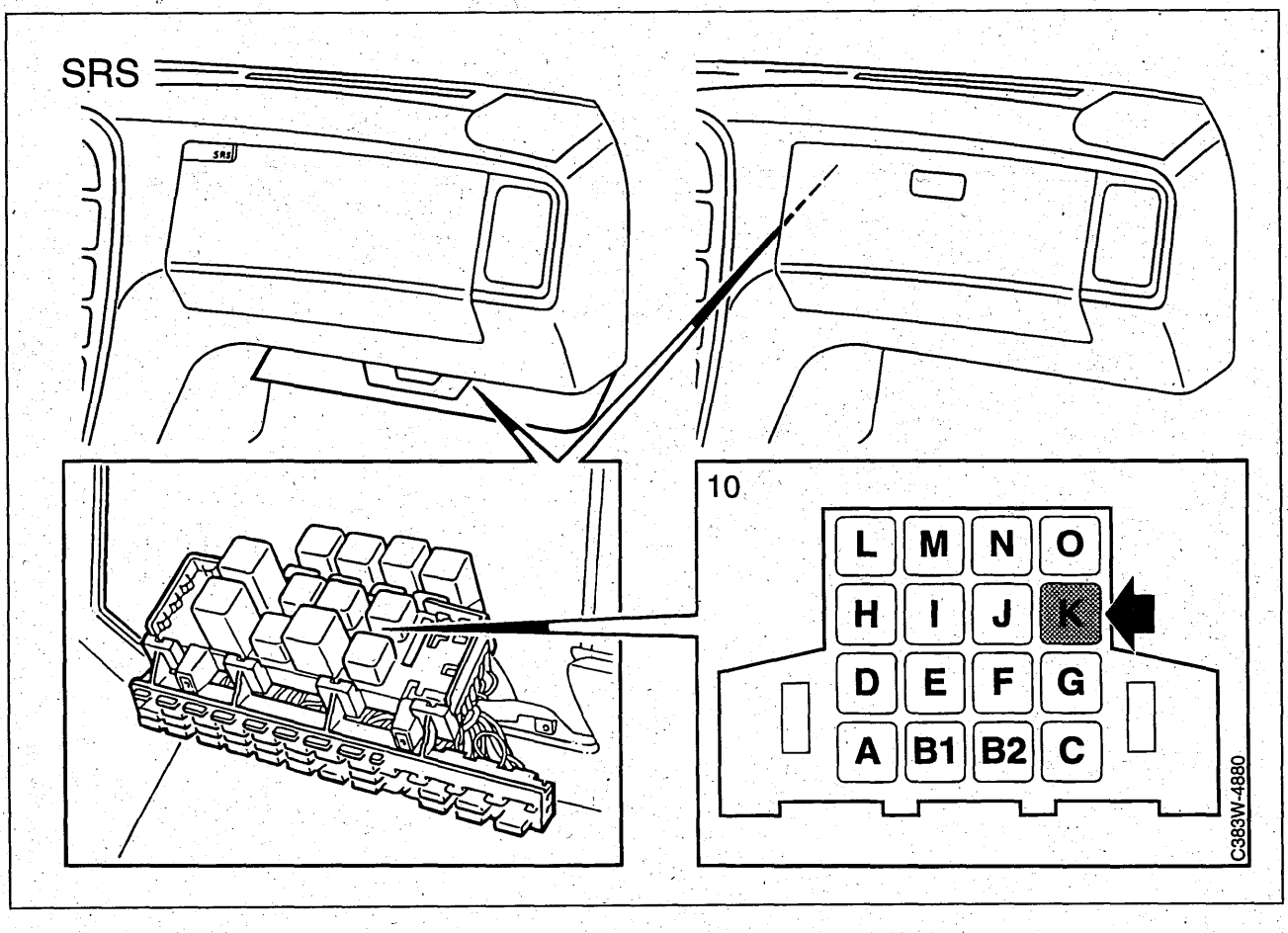


7 Remove the two lower storage compartments in the centre console.

8 Remove the 10-pin jumper connector.

9 Plug in the jumper plug at the appropriate place.

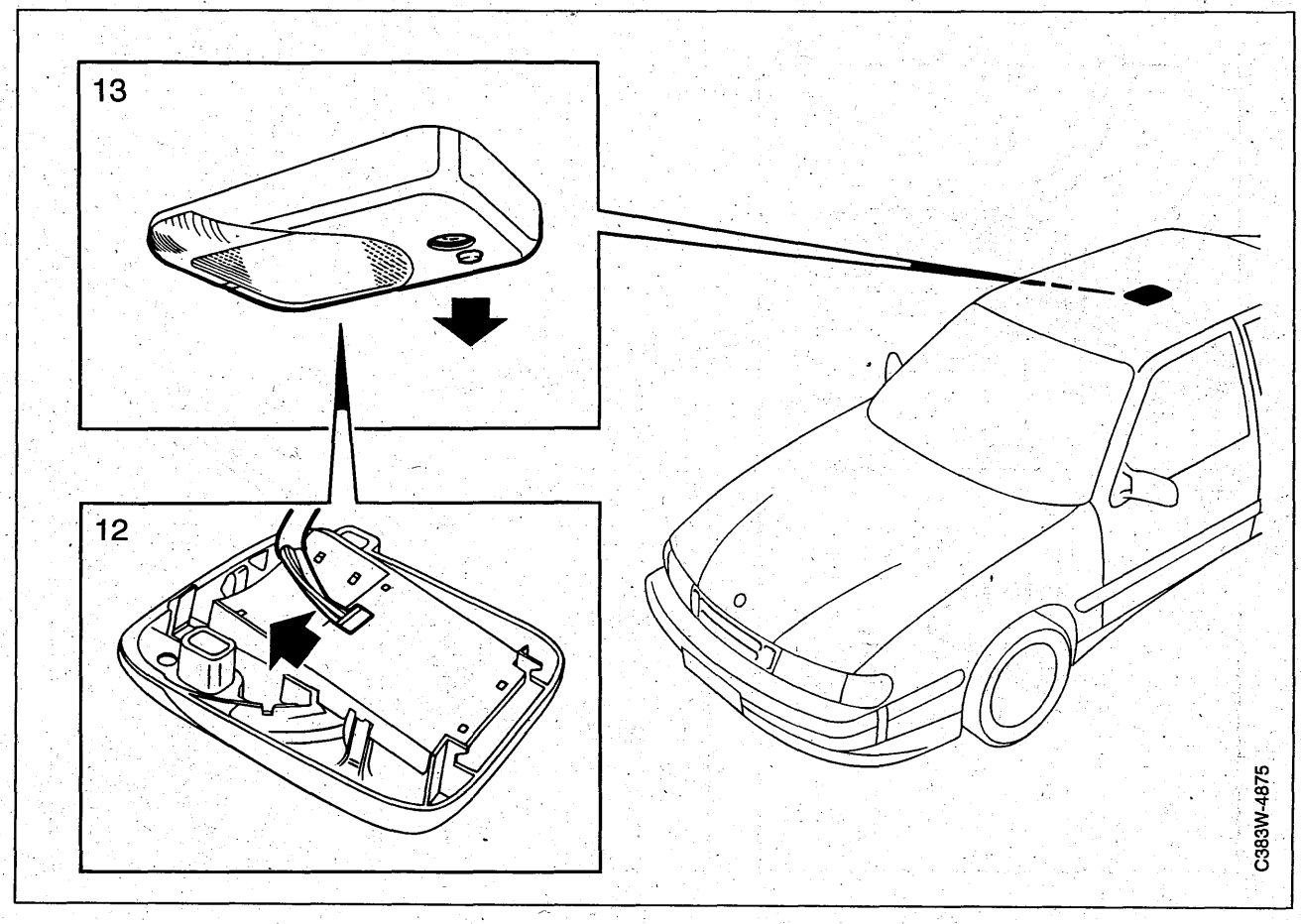
Starter relay



10 **Car without passenger airbag**
Fit the starter relay.
The main relay board is located behind the glove box.

Car with passenger airbag
Fit the starter relay.
The main relay board is located below the air-bag module.

Glass breakage sensor

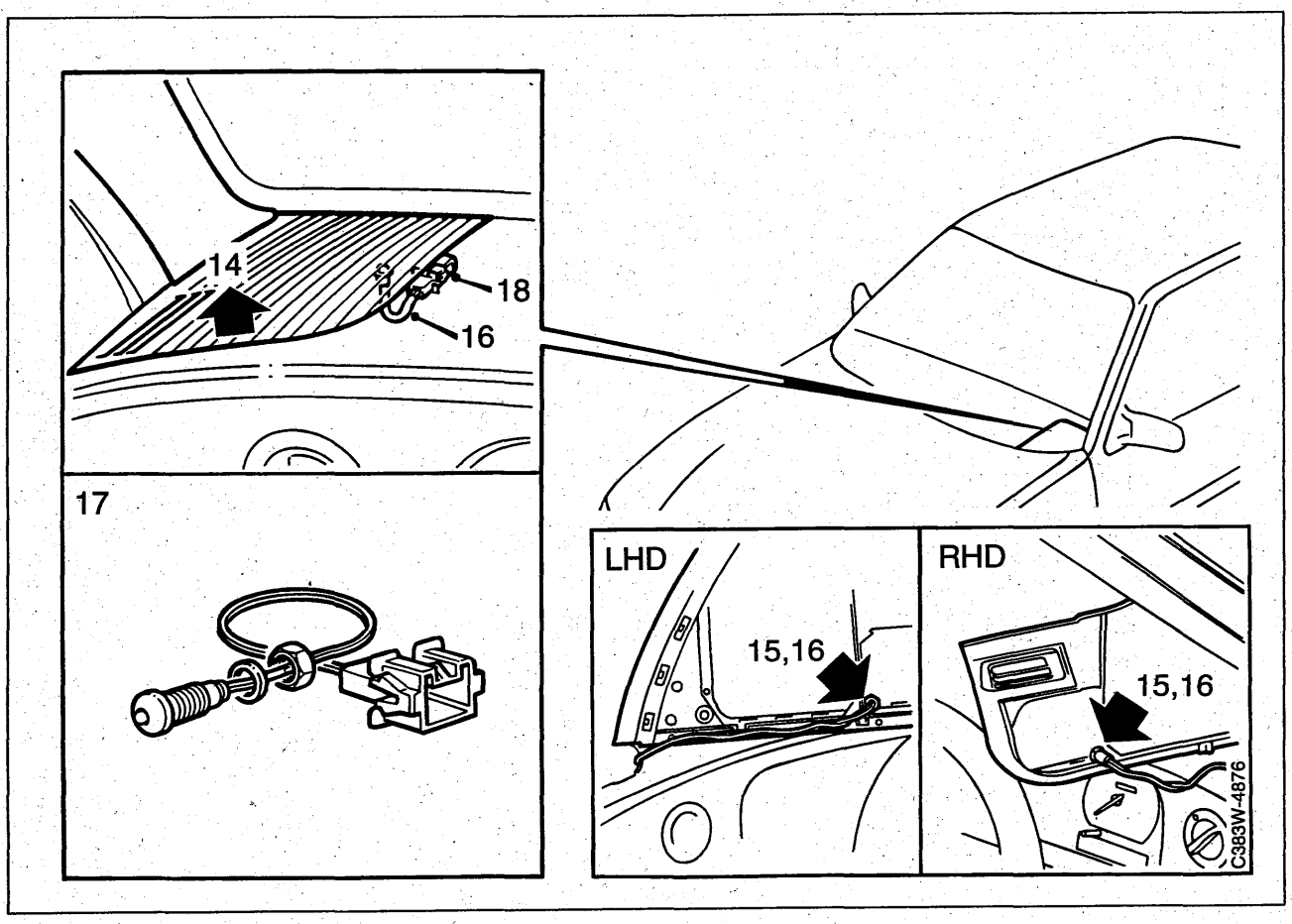


11 Remove the existing roof-mounted dome lamp and unplug its connector.

12 Plug the connector into the new dome lamp.

13 Press the roof-mounted dome lamp into place.

LED



14 Remove the loudspeaker grille and loudspeaker on the driver's side.

15 Drill a hole (8 mm diam.) in the loudspeaker grille as shown.

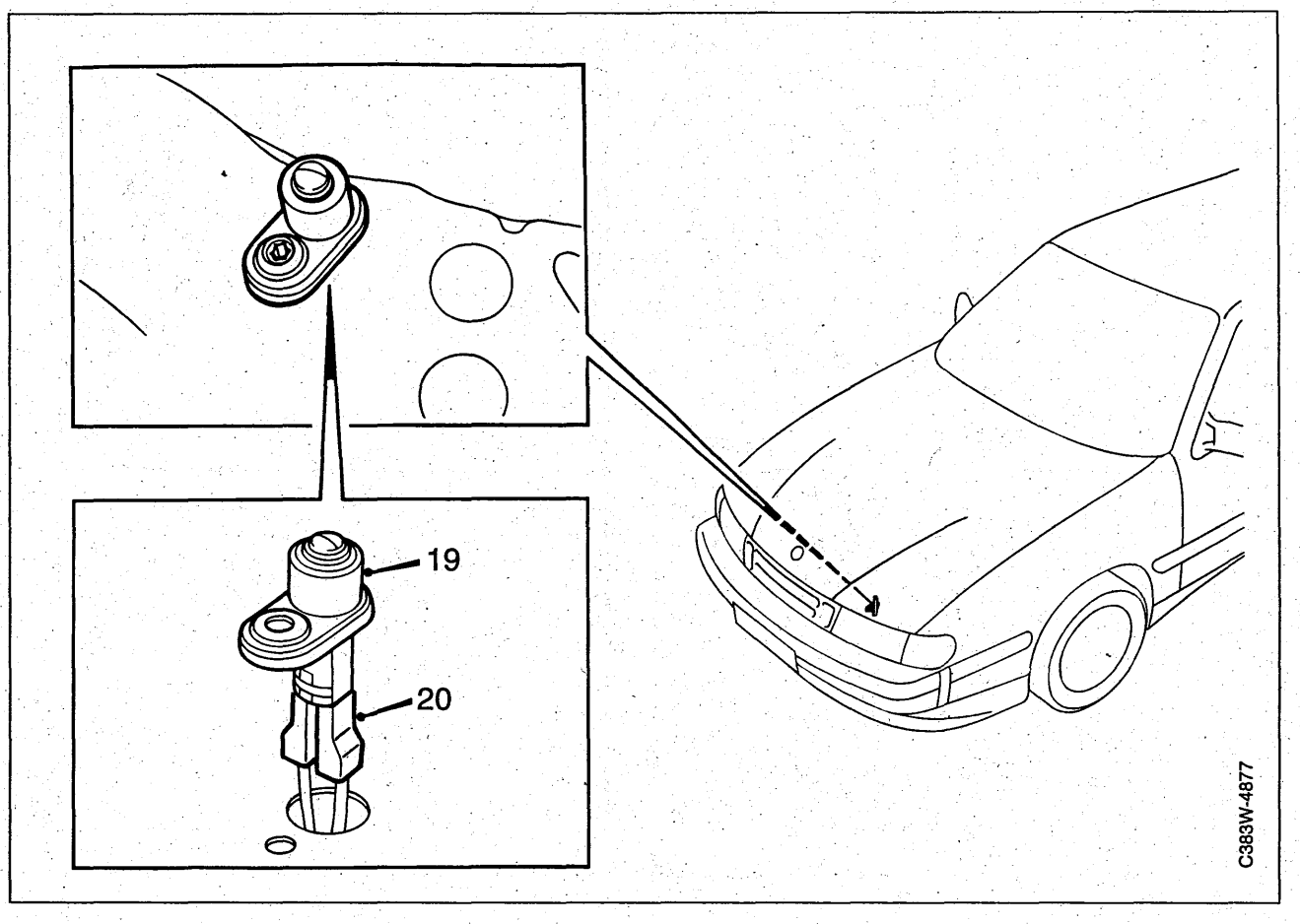
16 Fit the LED by inserting the leads through the hole (from above). Secure with washer and nut.

17 Fit the supplied cable terminals to the ends of the leads. Connect the leads (with cable terminals) to the connector as follows:

Blue - pin 2
Black - pin 1

18 Plug in the connector. Refit the loudspeaker grille.

Bonnet switch



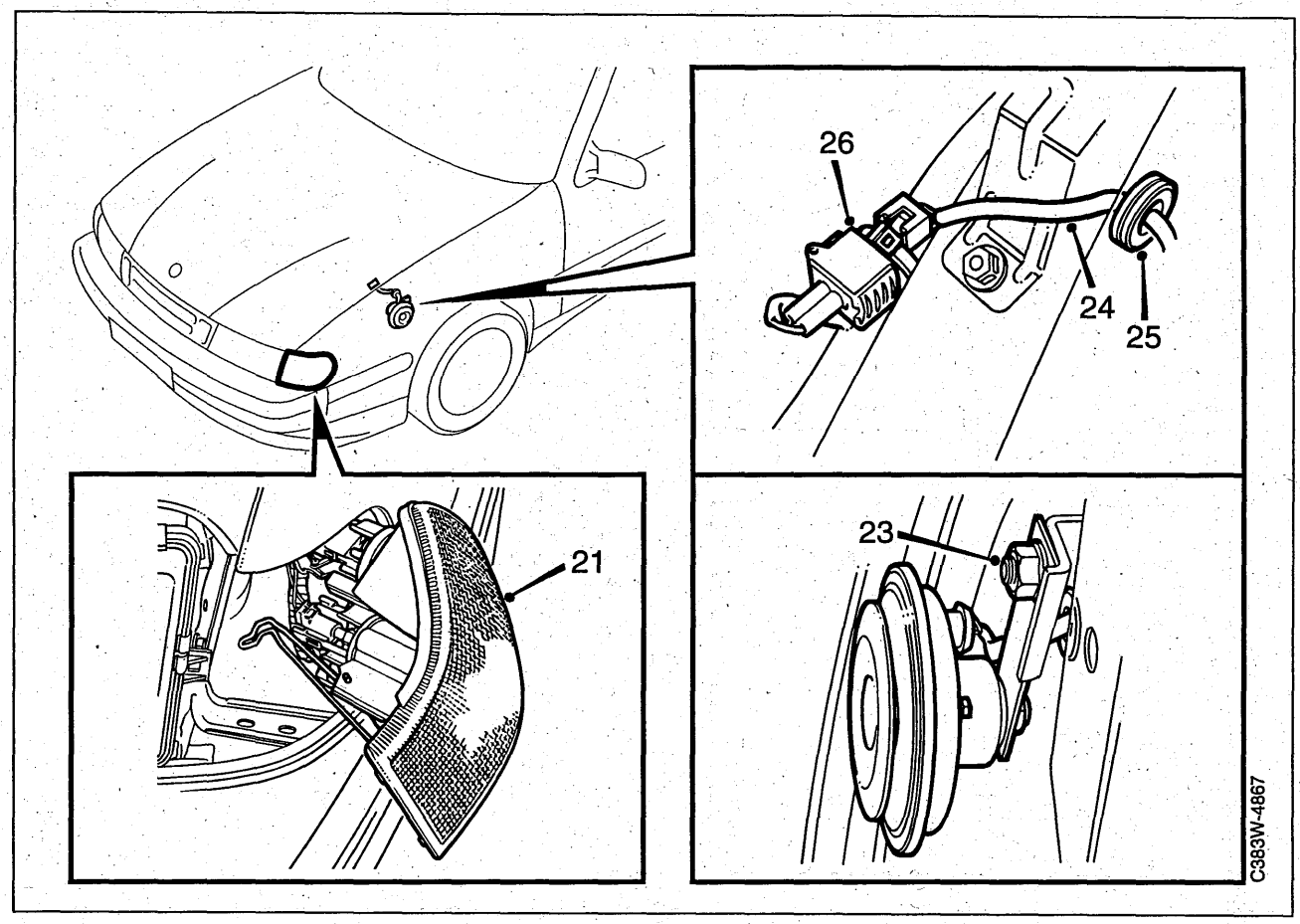
19 Fit the bonnet switch.

20 Plug in the connector.

Important

Make sure that the protective rubber sleeve (under the radiator member) is fitted over the cable terminals.

Horn



21 Remove the front left-hand direction indicator.

22 Carefully press the air cleaner intake pipe down (secure with screwdriver).

23 Fit the horn with nut.

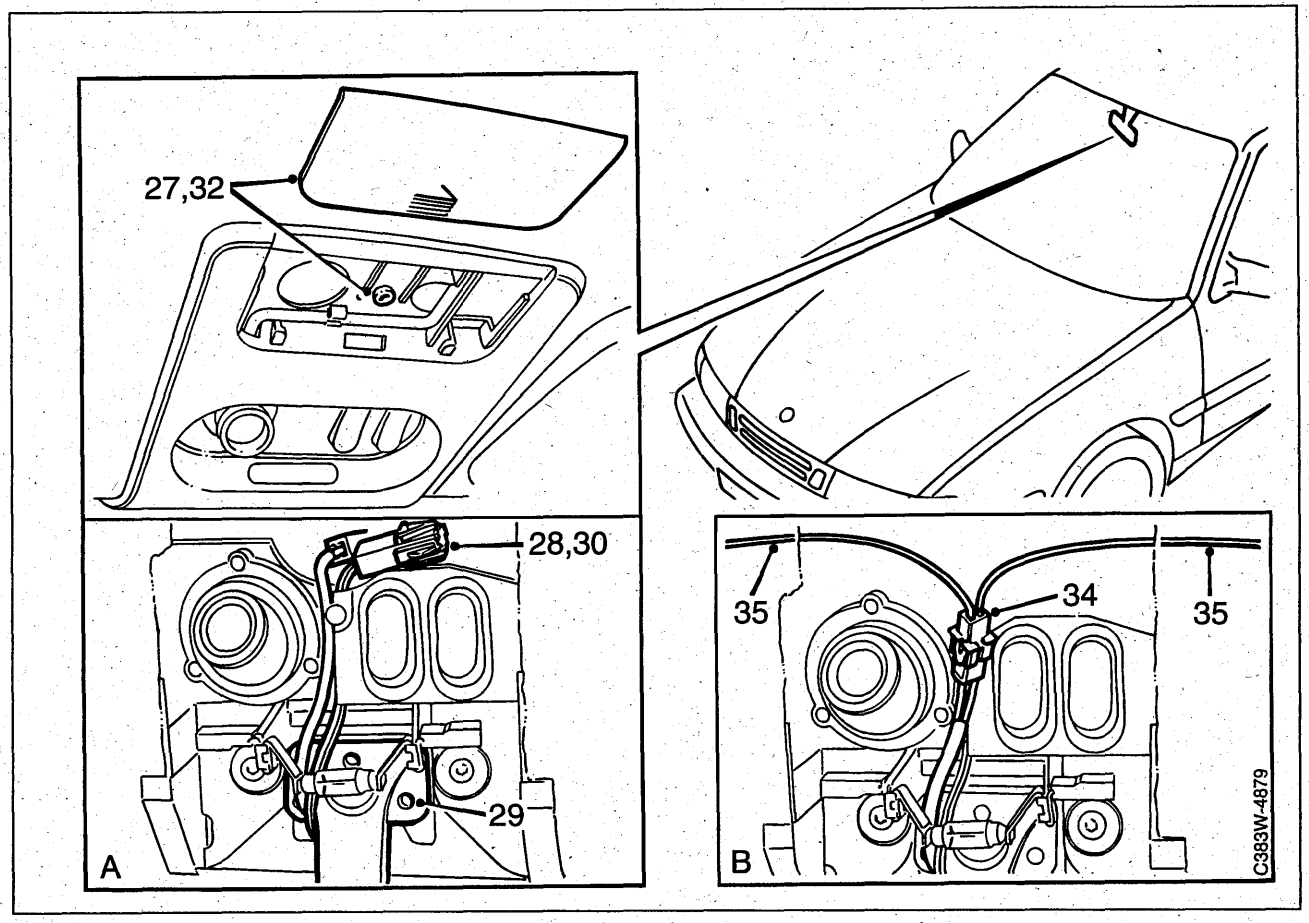
24 Run the cable into the engine bay.

25 Fit the rubber grommet in the cable lead-through hole.

26 Lift up the relay box. Locate the connector for the horn and plug in the horn.

Refit the direction indicator.

Aerial



A Interior rearview mirror with built-in aerial (JA)

27 Remove the roof console's cover panel.

28 Unplug the rearview mirror connectors.

29 Remove the existing rearview mirror and fit the mirror supplied in the fitting kit.

30 Plug in the rearview mirror connectors.

31 Refit the cover panel.

B Dipole aerial

32 Remove the roof console's cover panel.

33 Remove the sun visor retaining clips.

34 Plug in the aerial.

35 Fix the aerial leads as shown by means of adhesive tape. Note that the aerial should be fitted between the body metal and the headlining.

36 Refit the cover panel.

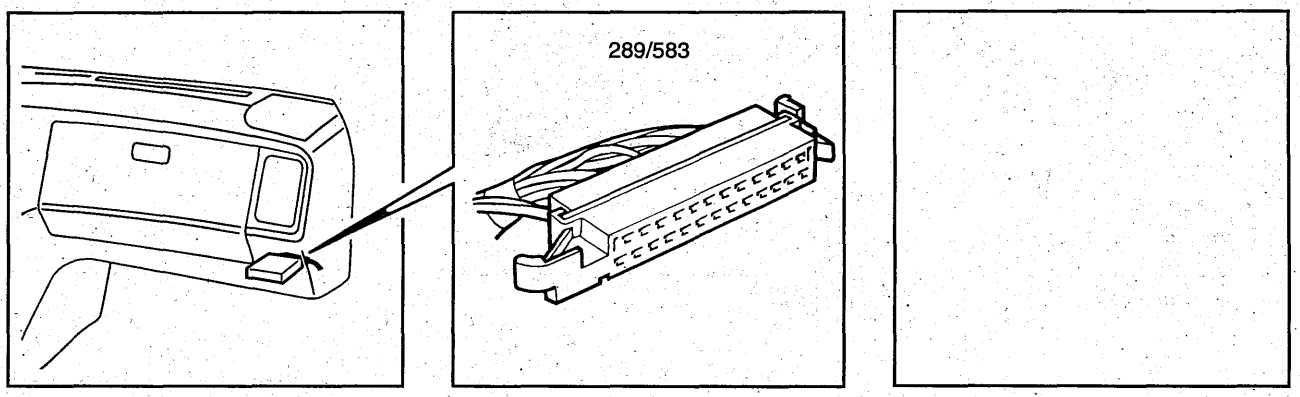
37 Wipe the area clean and affix labels.

38 Program the alarm as described in this service manual.

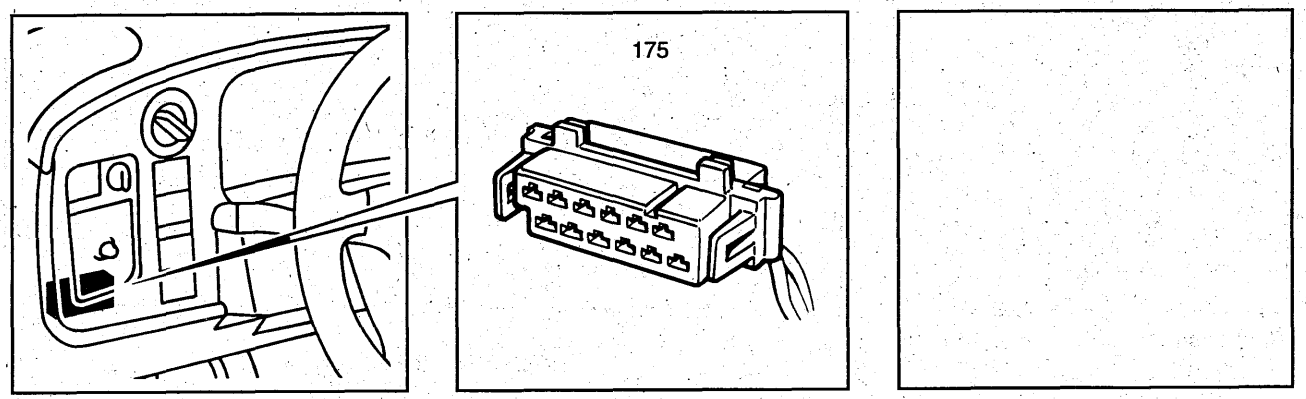
39 Check that it works properly by activating it as described in the Owner's Manual.

40 Refit all parts that have been removed.

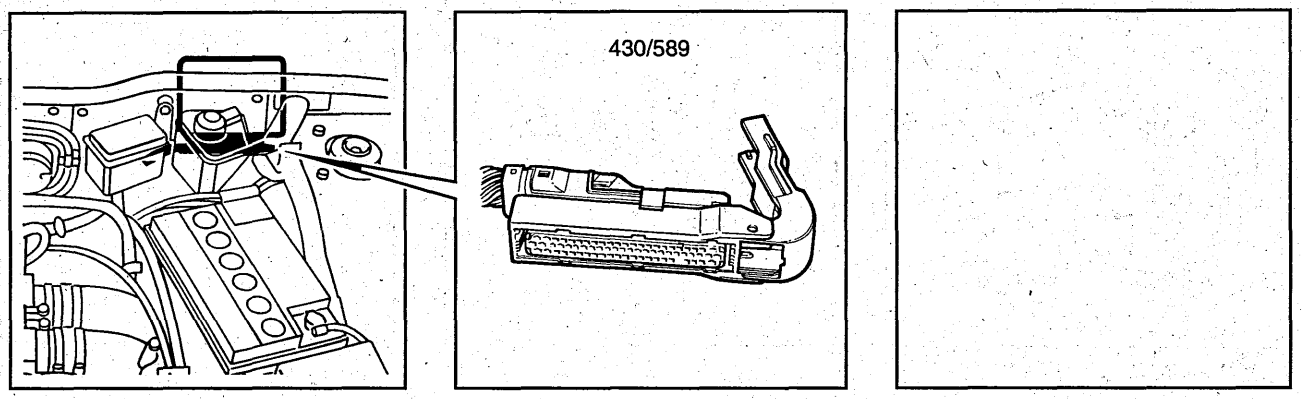
Connectors and grounding points



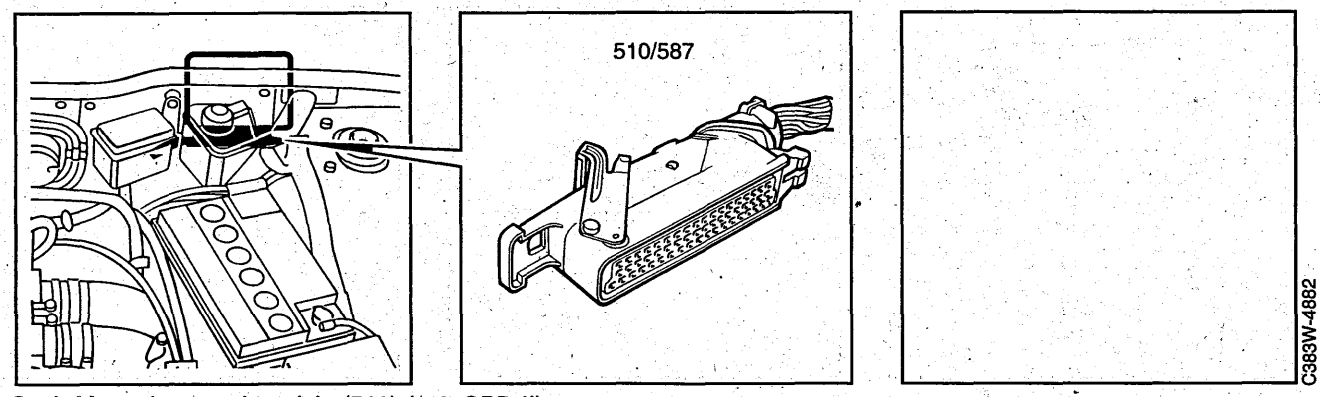
Saab Anti-theft alarm electronic control module (289) (583 VSS)



Central locking system electronic control module (175)

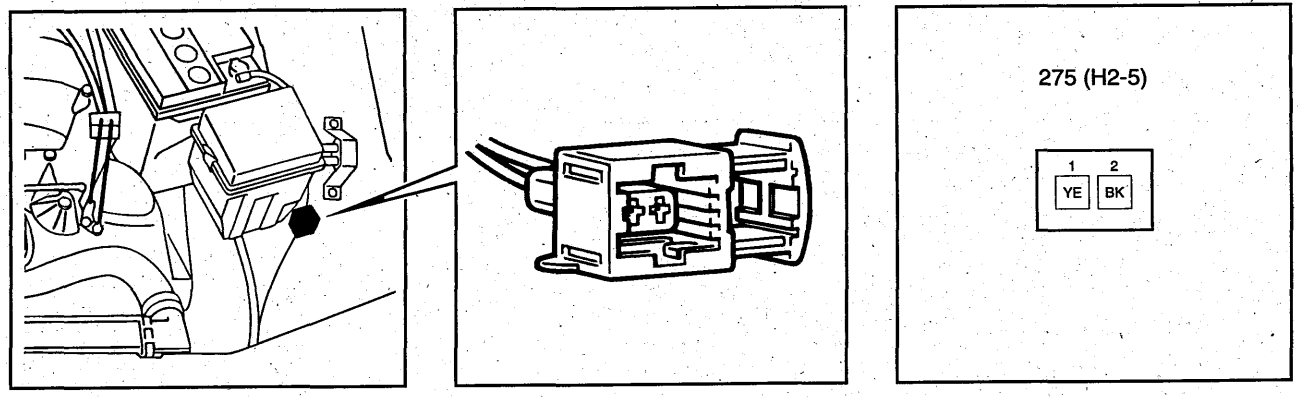


Saab Trionic control module (430) (589 OBD II)

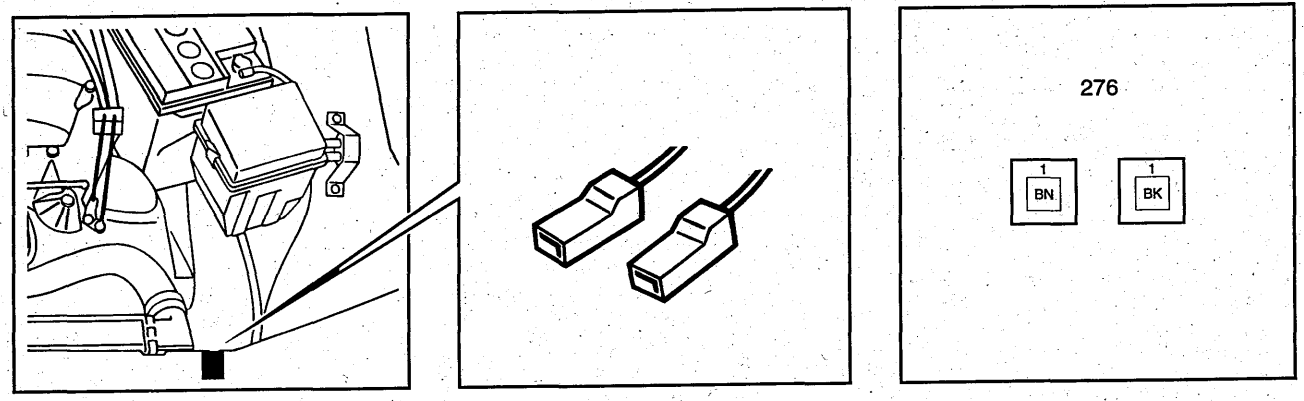


Saab Motronic control module (510) (587 OBD II)

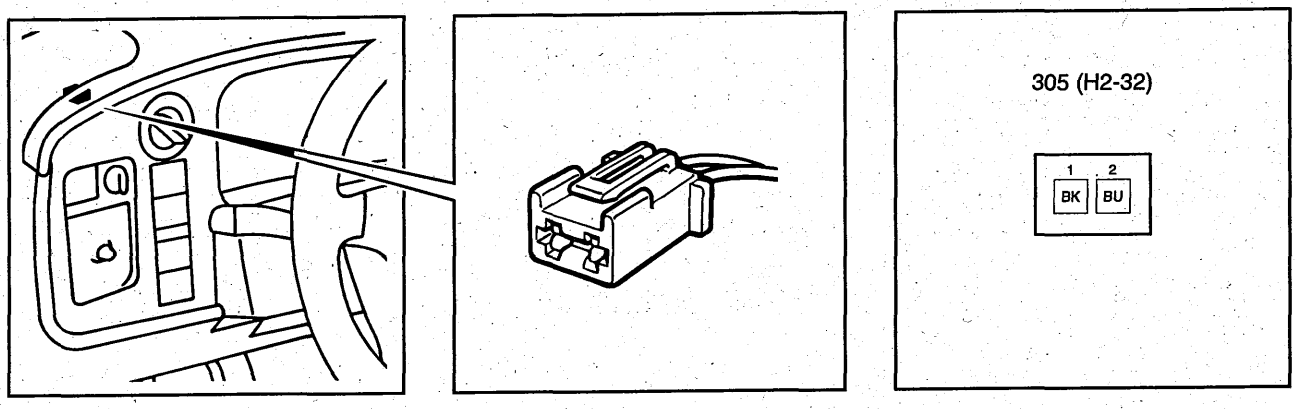
C383W-4882



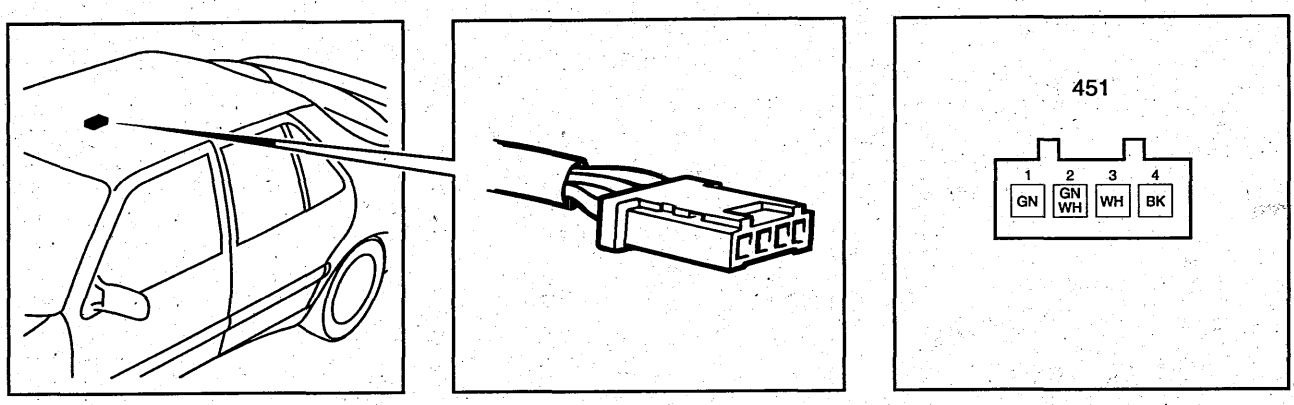
Horn, anti-theft alarm (275)



Bonnet switch, anti-theft alarm (276)

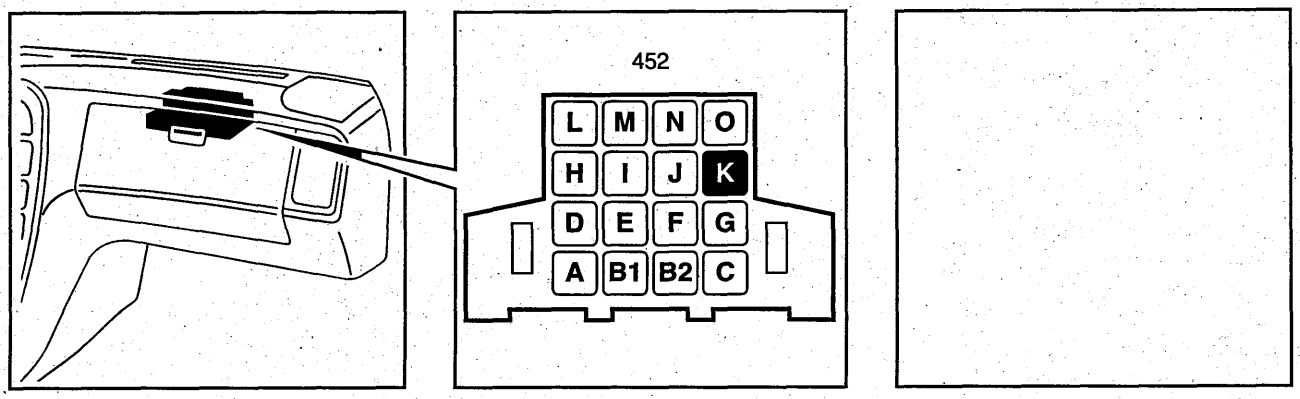


LED, anti-theft alarm (305)

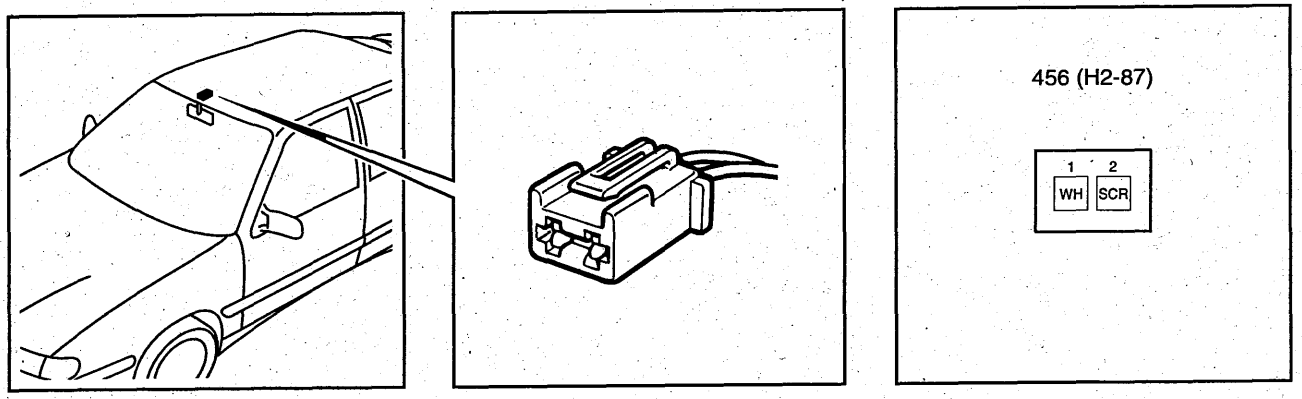


Glass breakage sensor, anti-theft alarm (451)

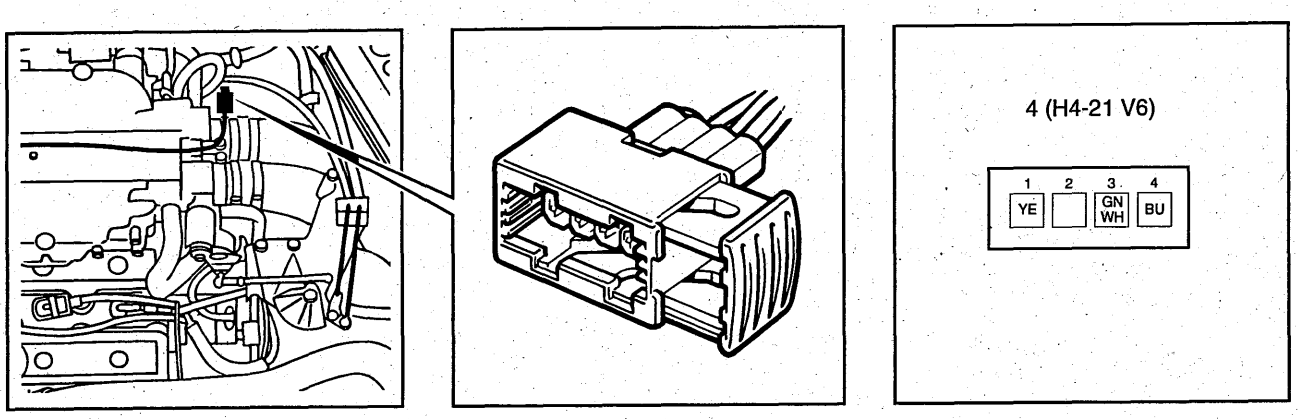
C383W-4883



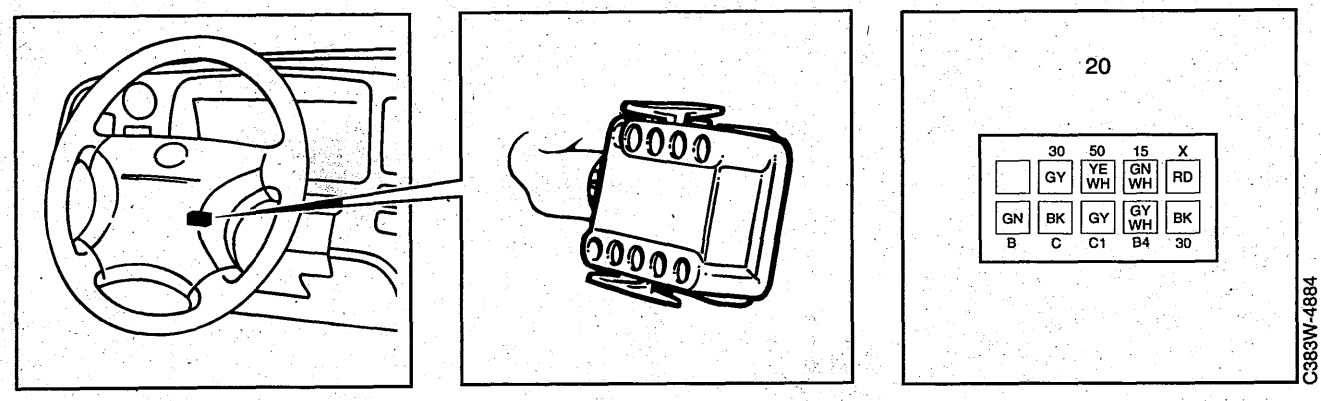
Relay, starter motor interlock, anti-theft alarm (452)



Aerial, remote control, anti-theft alarm (456)

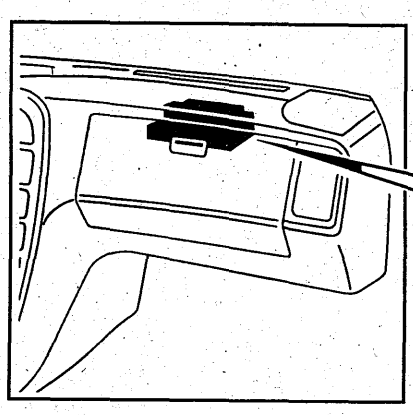


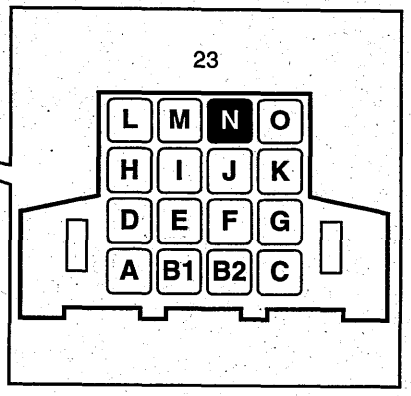
Starter motor (4)



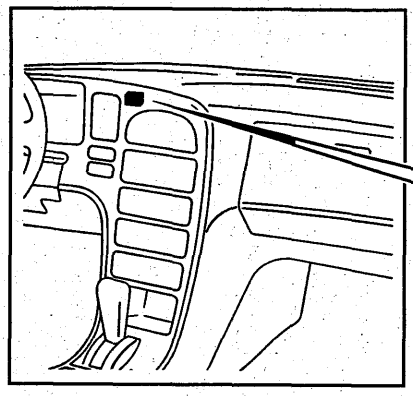
C383W-4884

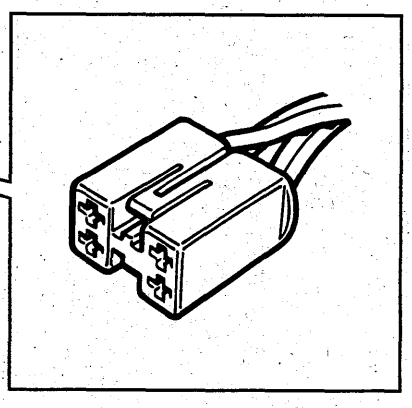
Ignition switch (20)

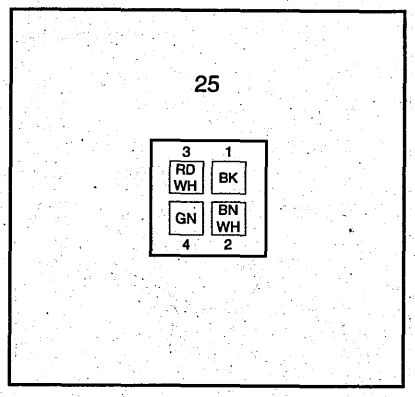




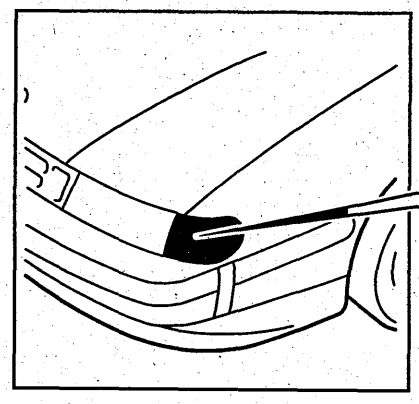
Relay, direction indicators (23)

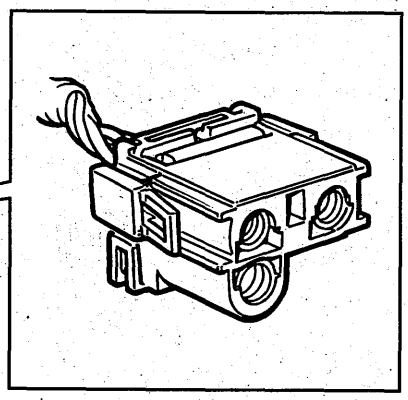


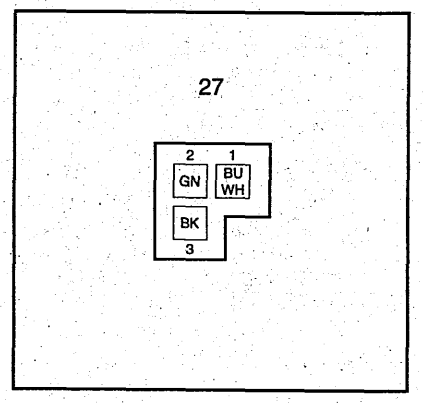




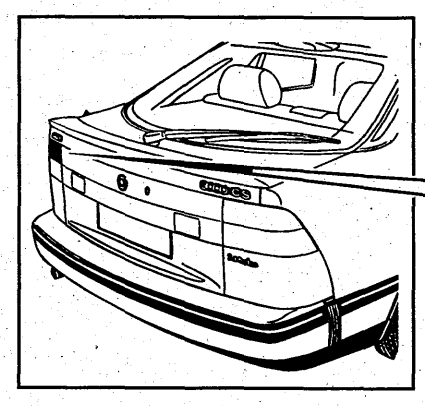
Switch, hazard flashers (25)

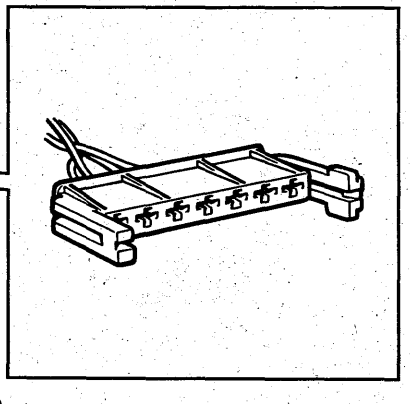


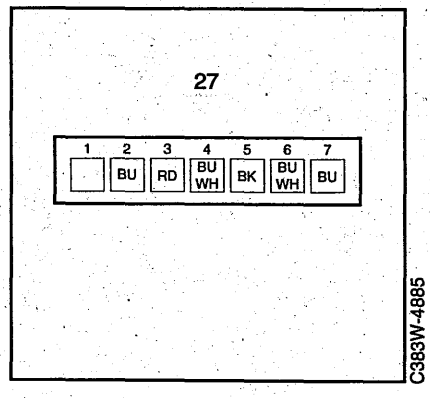




Front direction indicators, LH side (27FL)

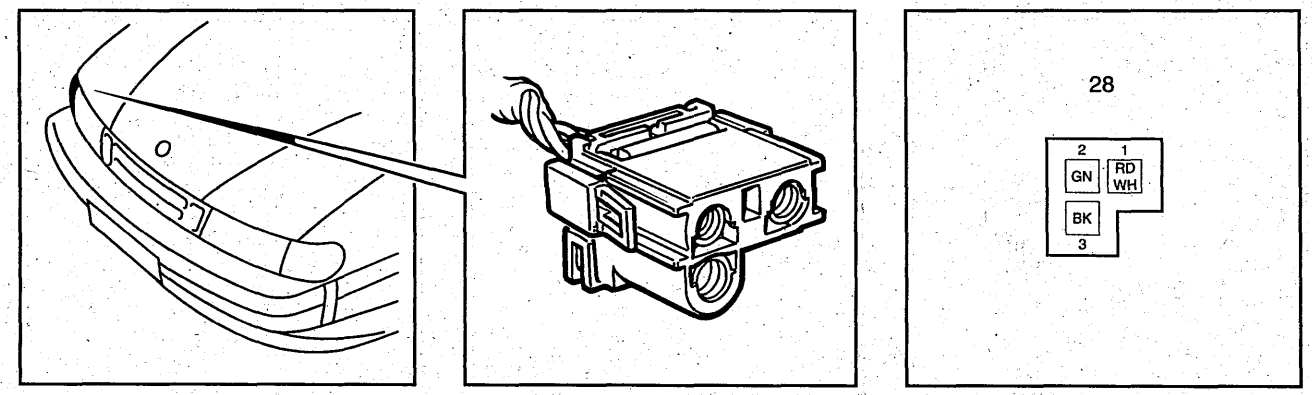




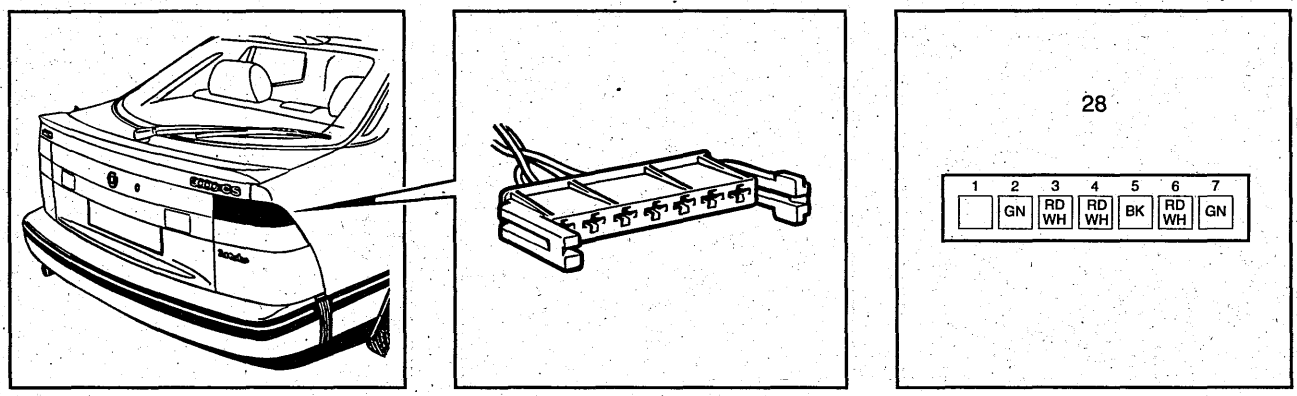


Rear direction indicators, LH side (27RL)

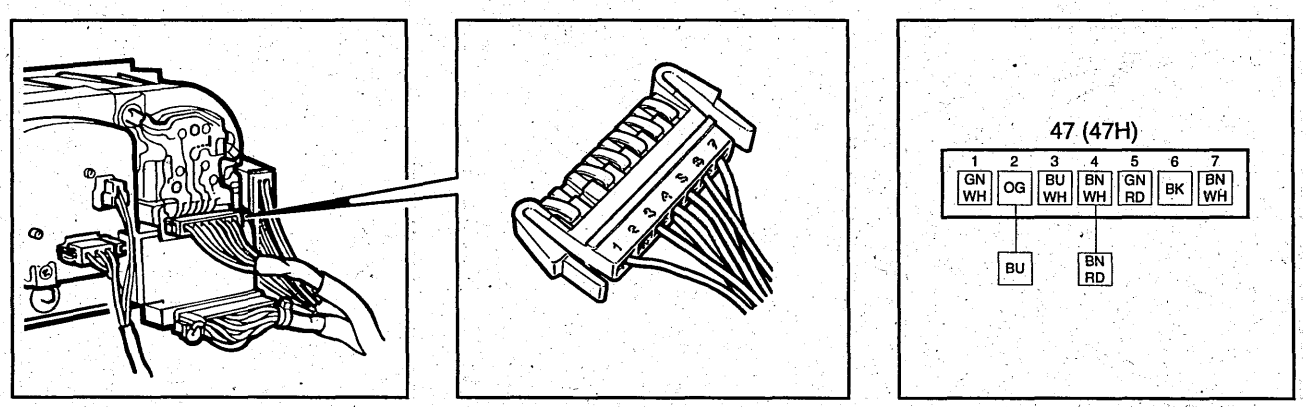
C383W-4885



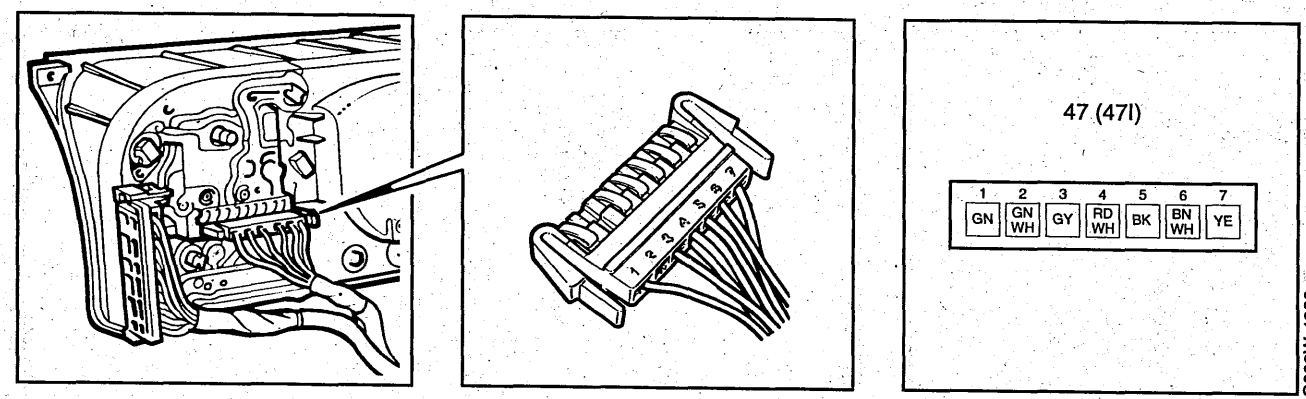
Front direction indicators, RH side (28FR)



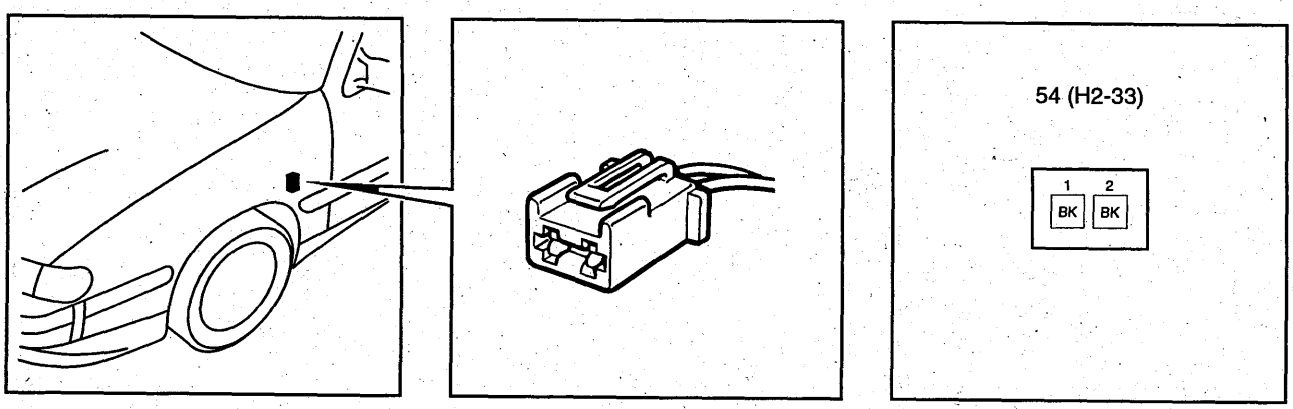
Rear direction indicators, RH side (28RR)



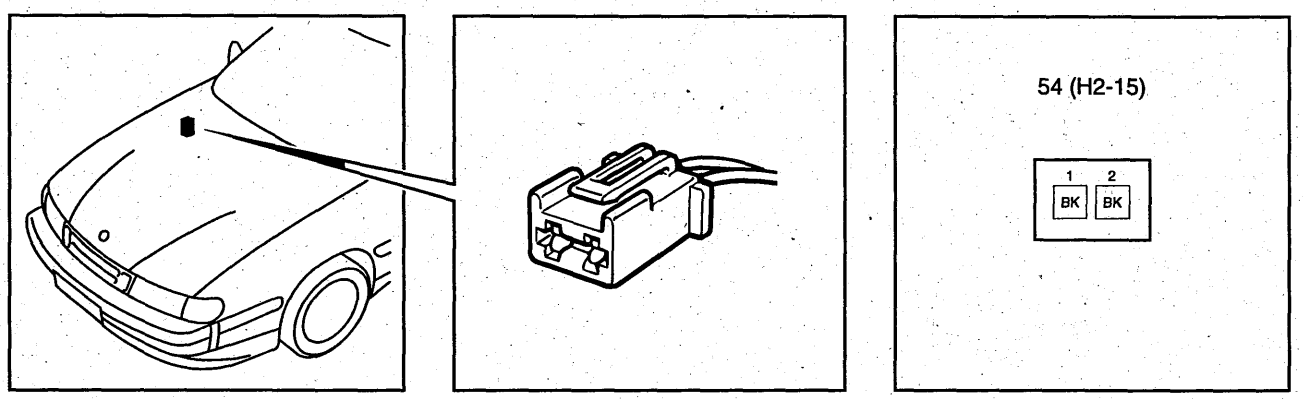
Indicator lamp, direction indicators, RH side (47h)



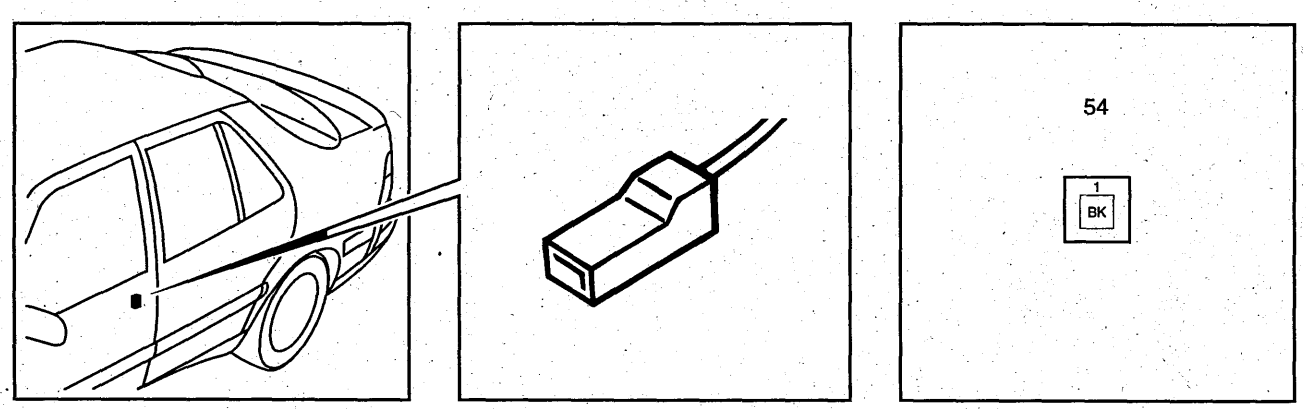
Indicator lamp, direction indicators, LH side (47i)



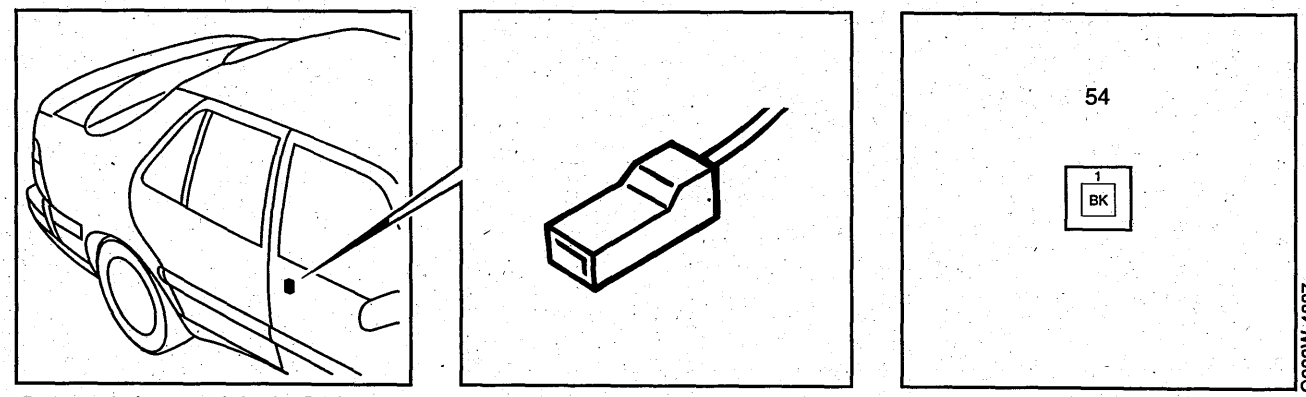
Door switch, driver's door (54D)



Door switch, front right (54P)

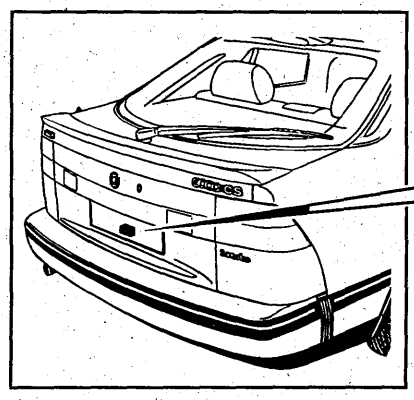


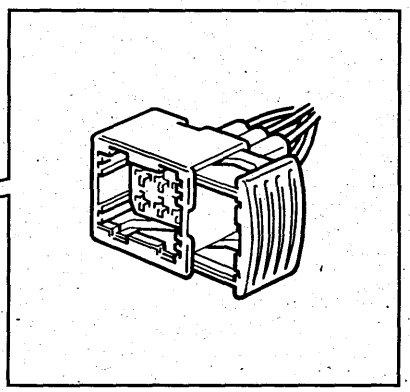
Door switch, rear left (54RL)



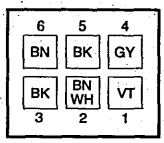
Door switch, rear right (54RR)

C383W-4887

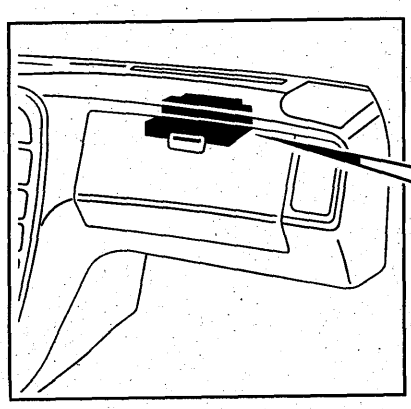


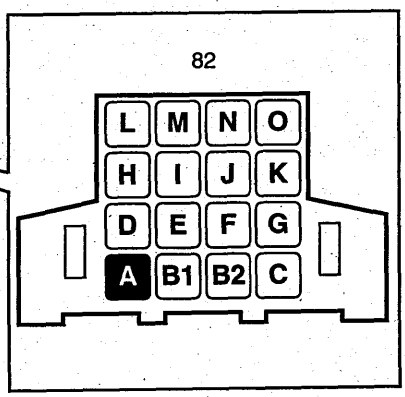


56 (H6-8)

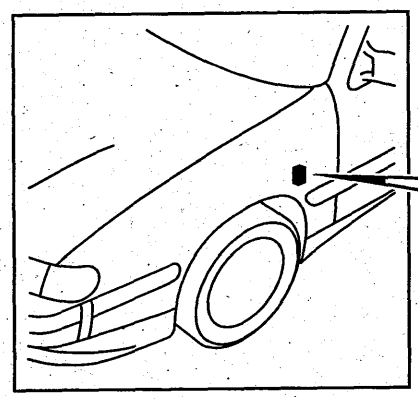


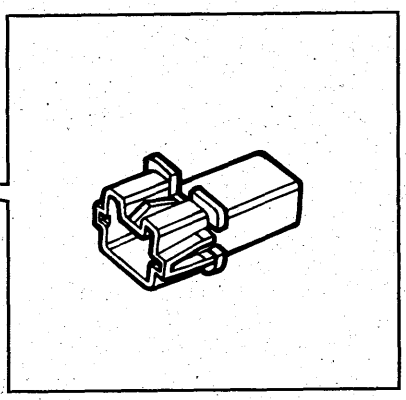
Luggage compartment switch (56)



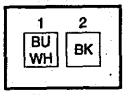


Relay, seat belt/key reminder (82)

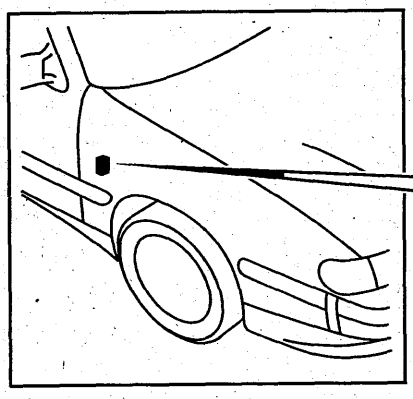


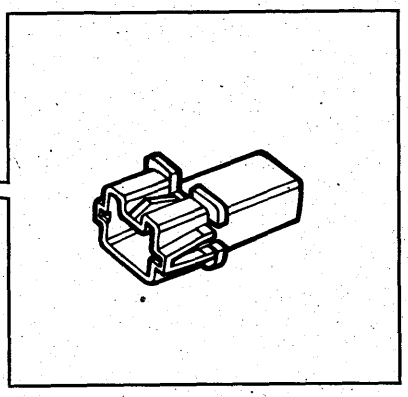


89 LH (H2-22)

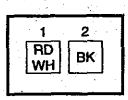


Side direction indicator, left (89LH)



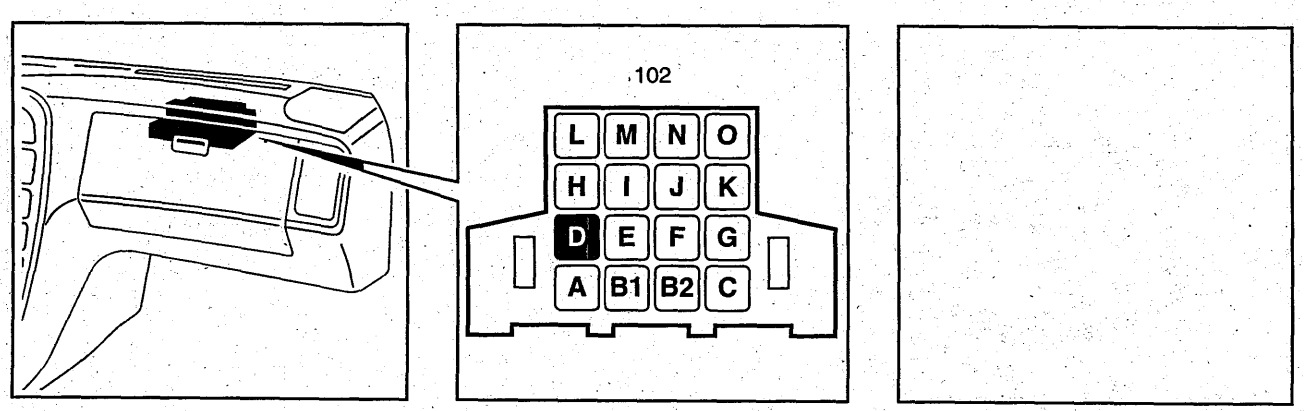


89 RH (H2-23)

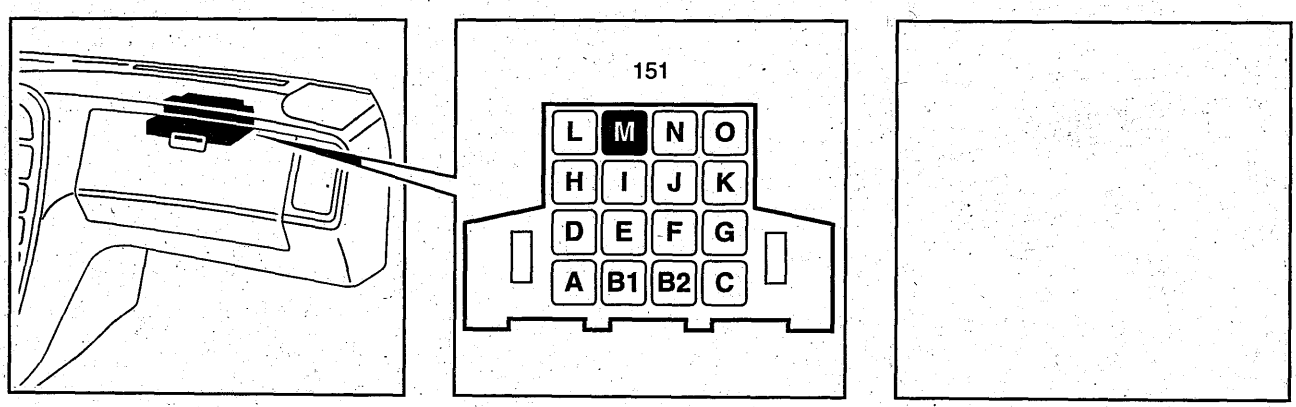


Side direction indicator, right (89RH)

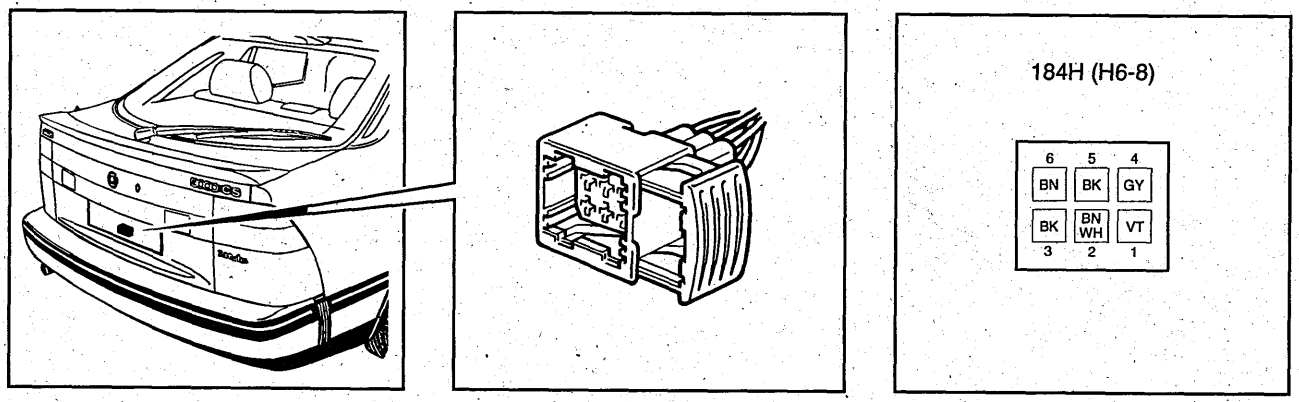
C383W-4888



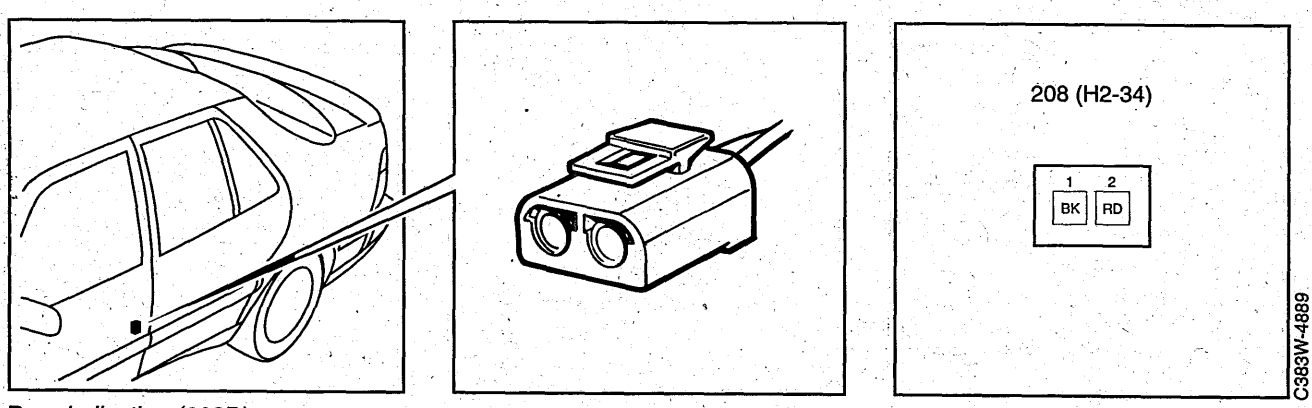
Fuel pump relay (102)



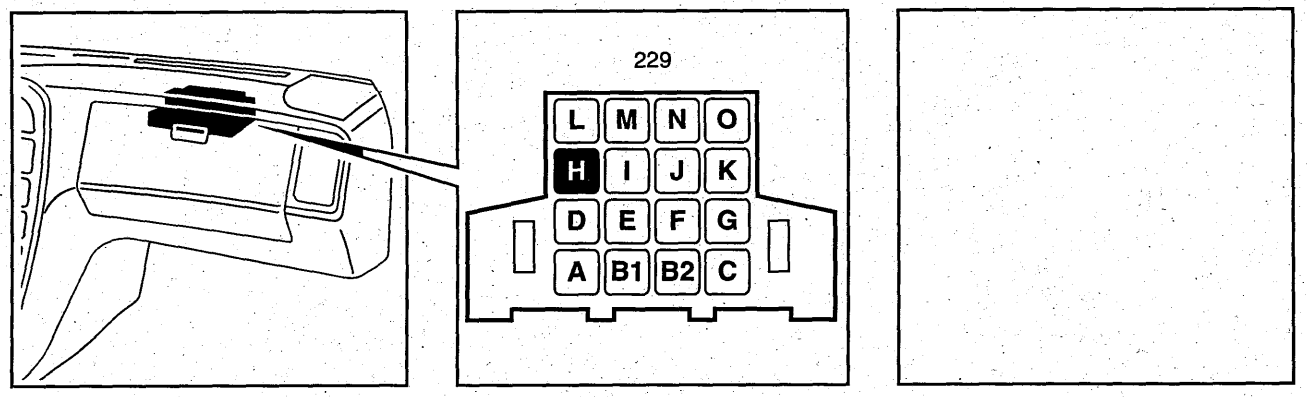
Time-delay relay, delayed interior lighting (151)



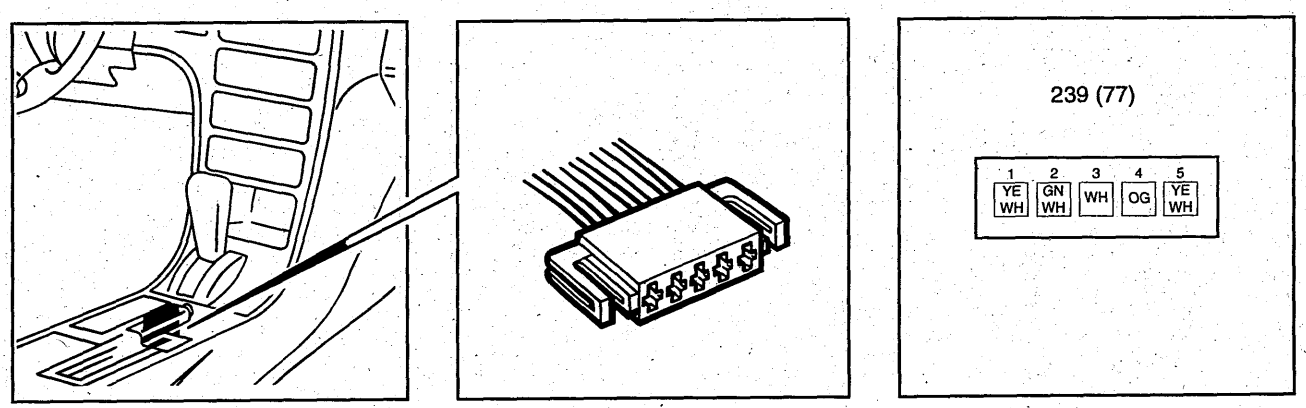
Motor, central locking, tailgate (184H)



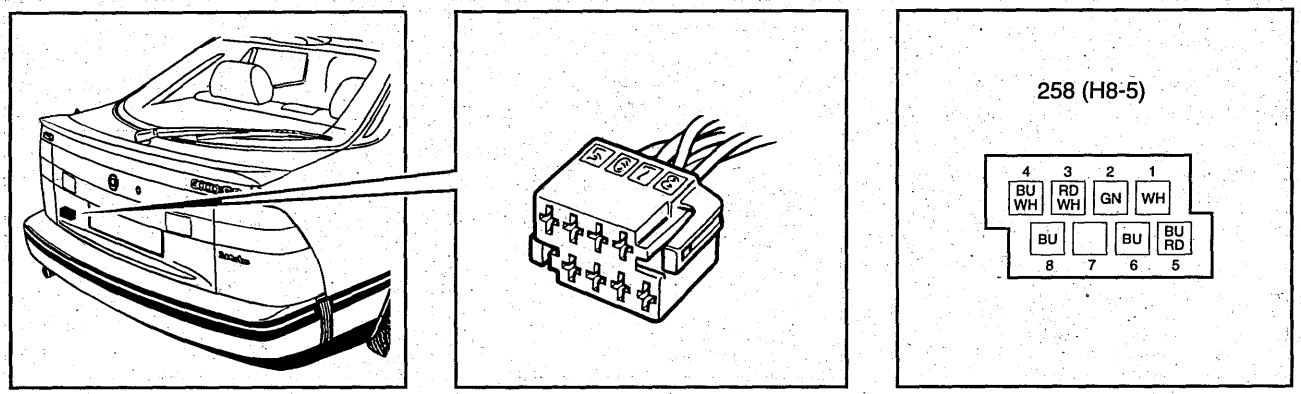
Door indication (208D)



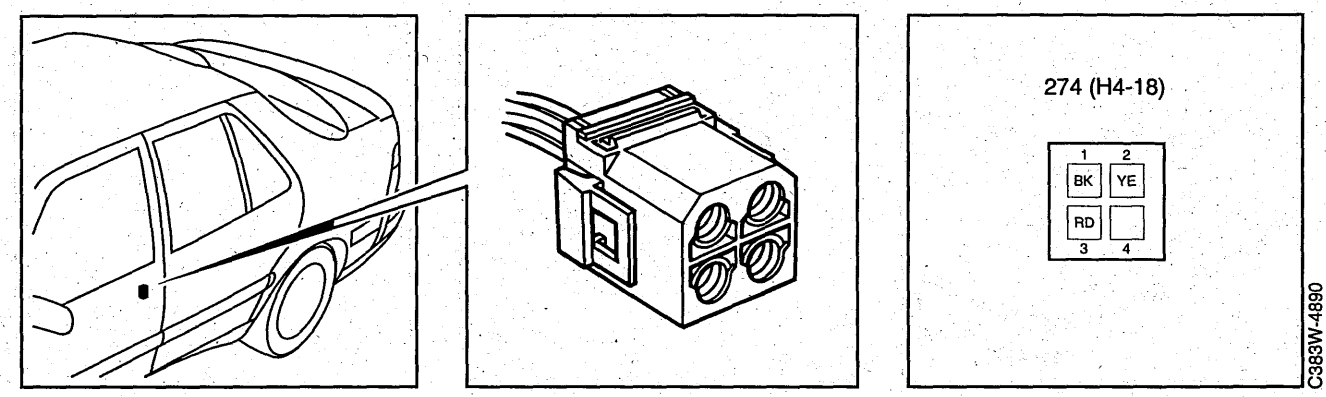
Main relay, engine management system (229)



Gear selector position switch, automatic transmission (239)

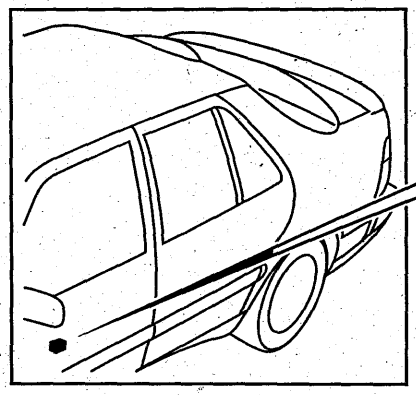


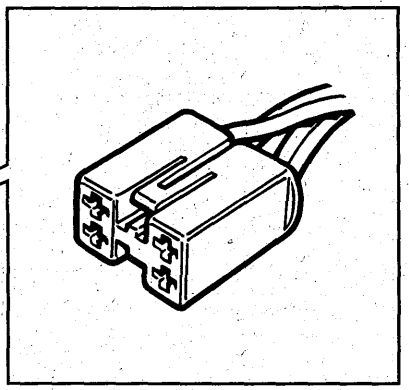
Connector, trailer electrics (258)



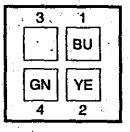
Microswitch, central locking, driver's door (274)

C383W-4890

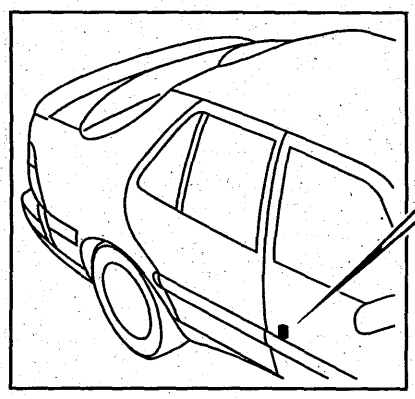


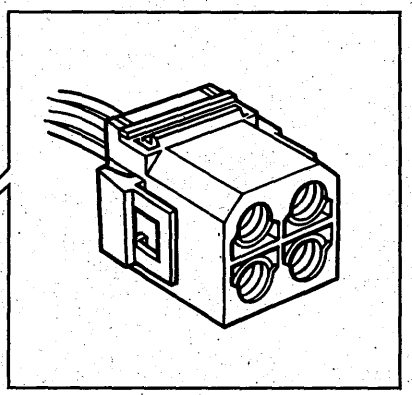


388

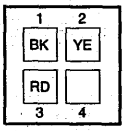


Switch, tailgate release (388)

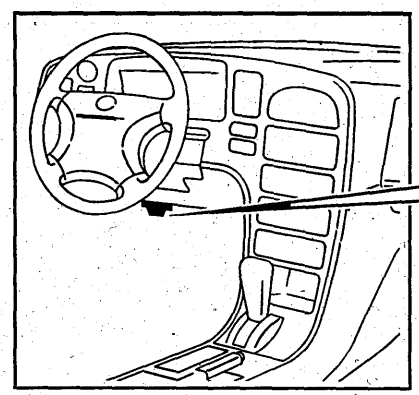


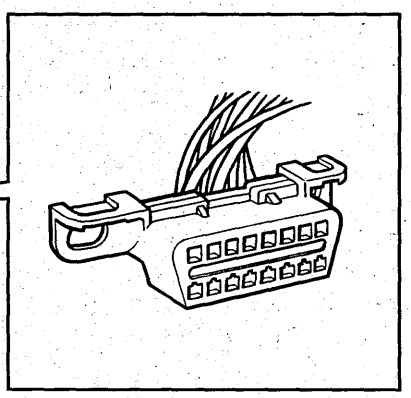


435 (H4-19)

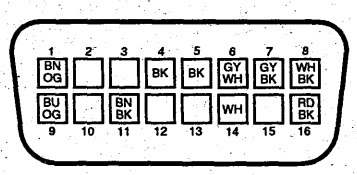


Microswitch, passenger's door (435)

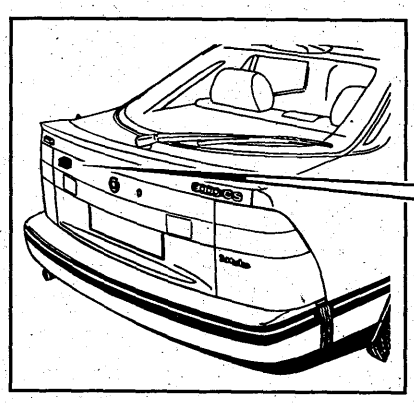


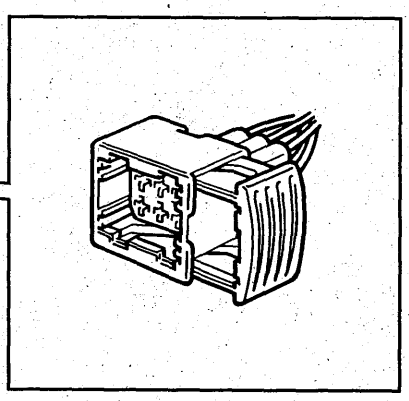


H16-1

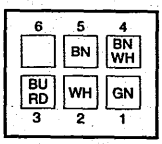


Data link connector (445)



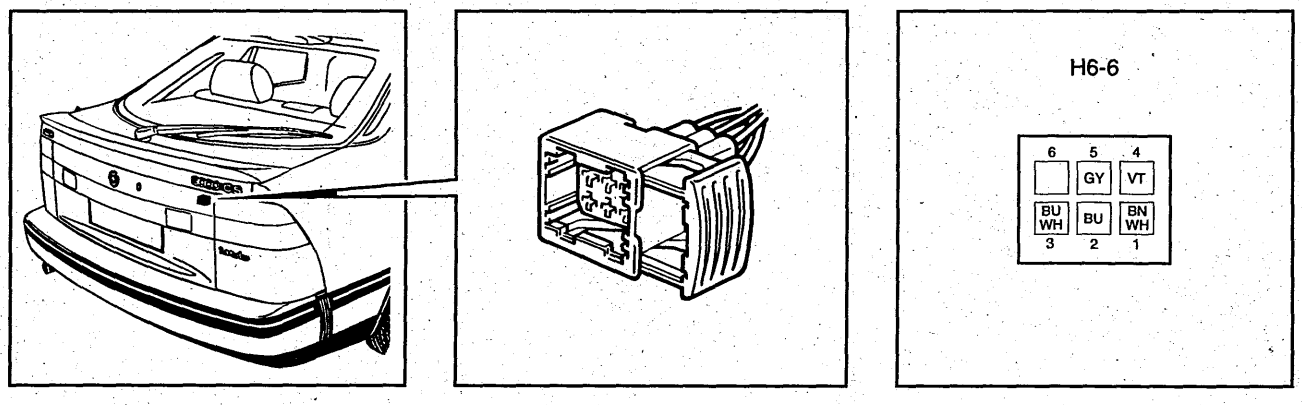


H6-4

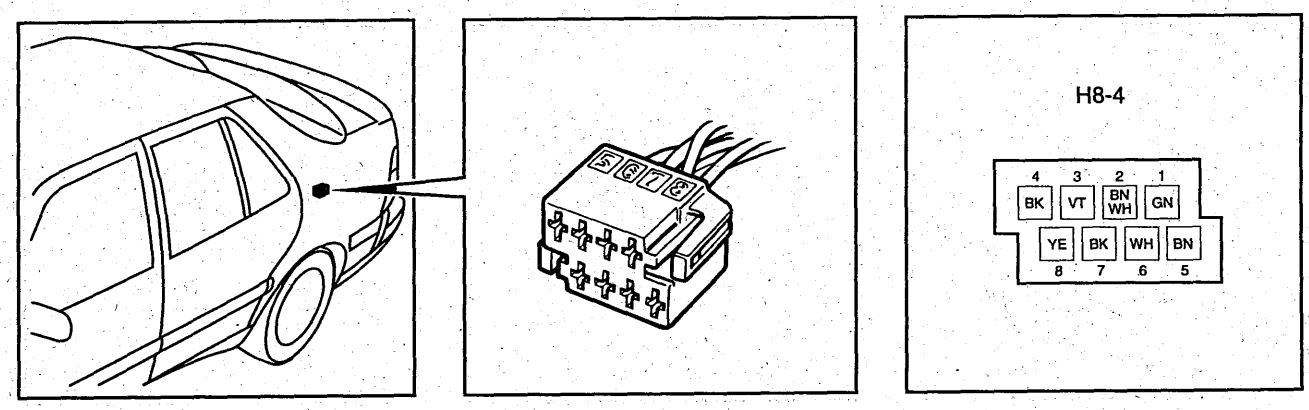


C383W-4891

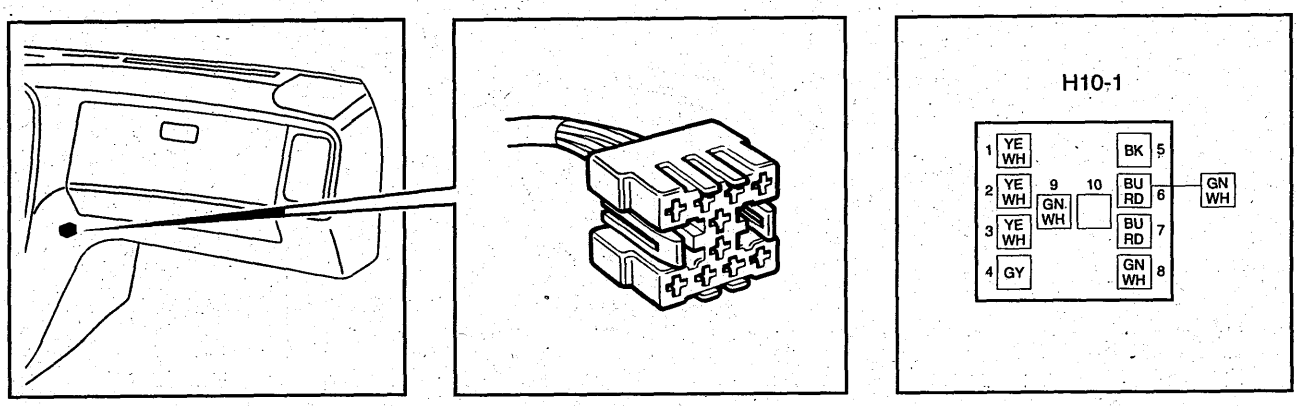
H6-4



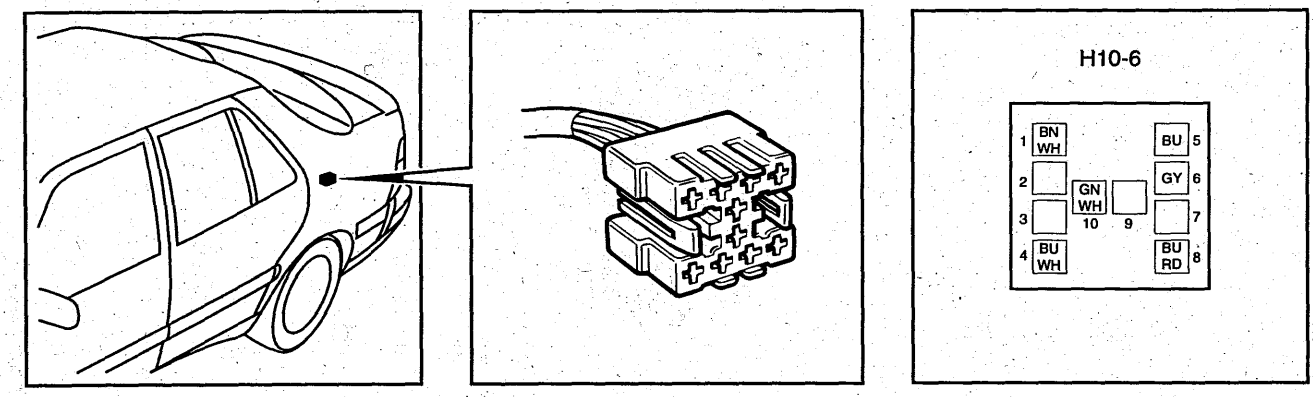
H6-6



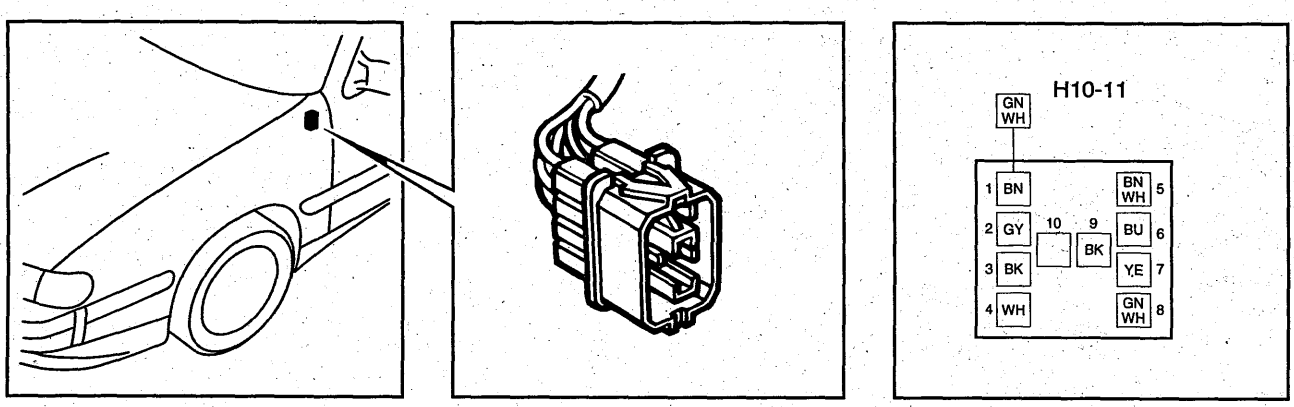
H8-4



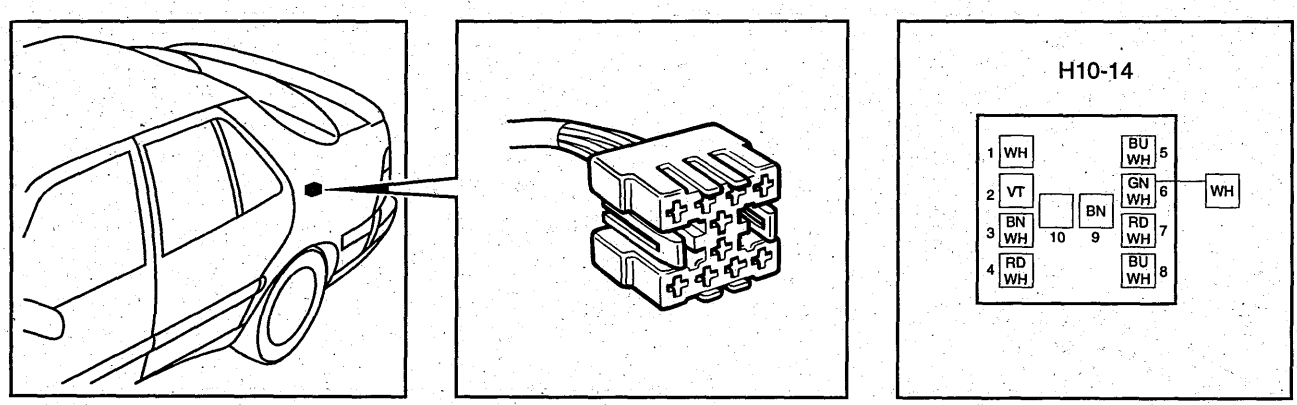
H10-1



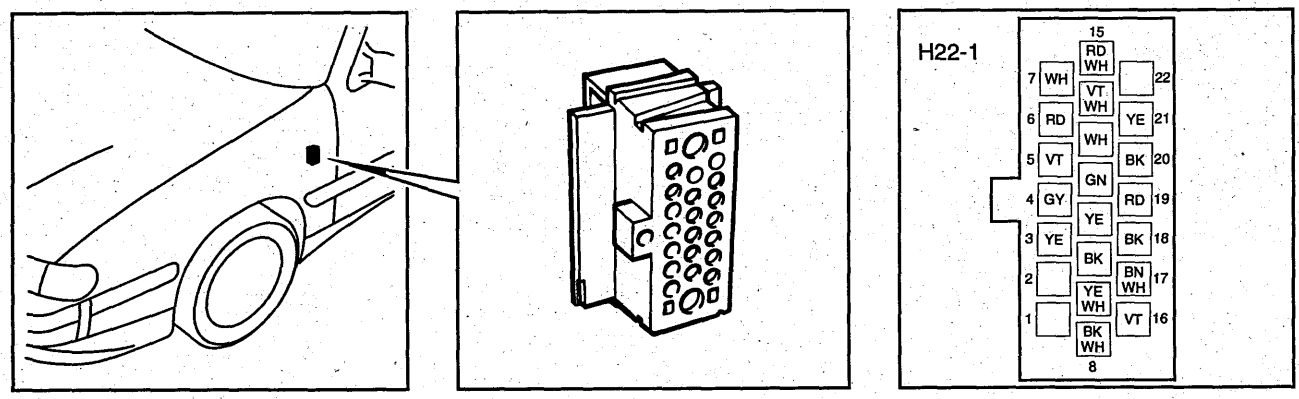
H10-6



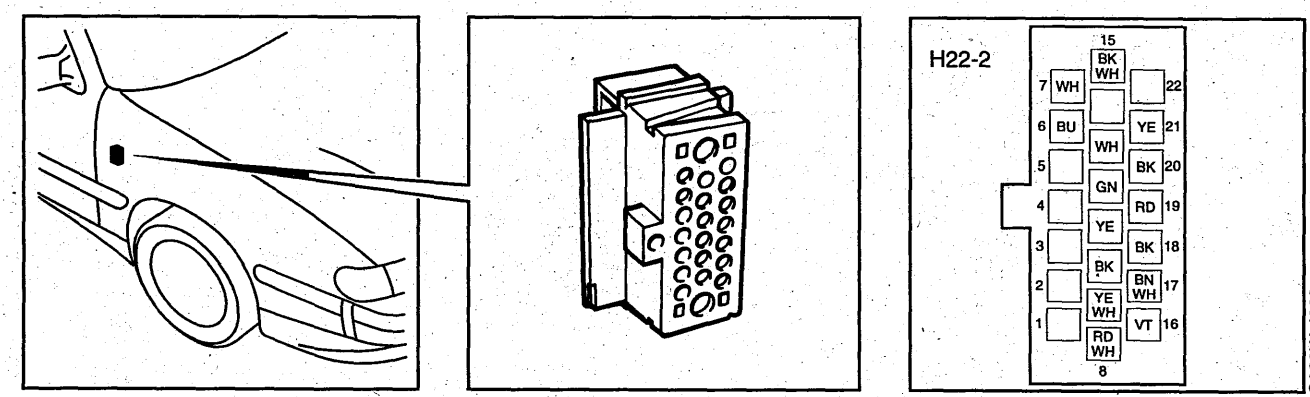
H10-11



H10-14

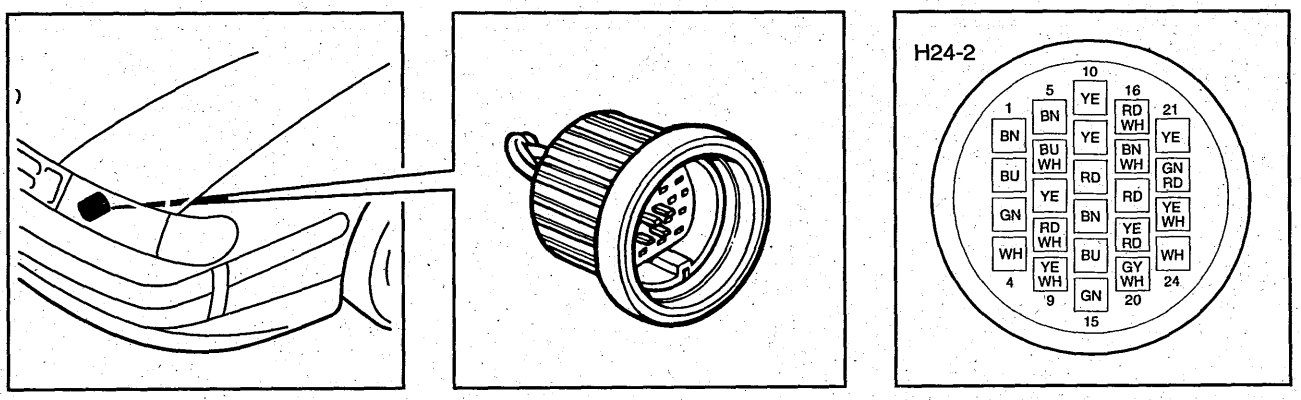


H22-1

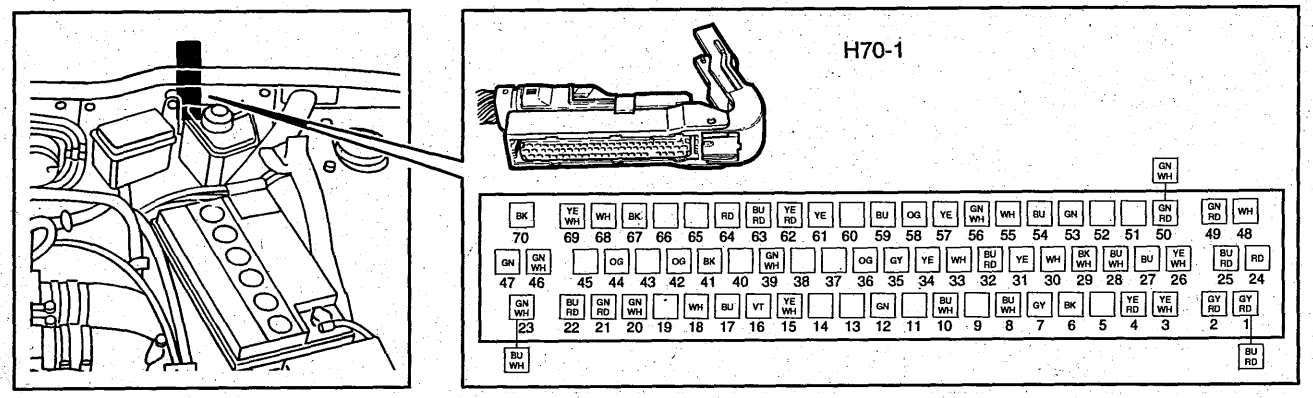


H22-2

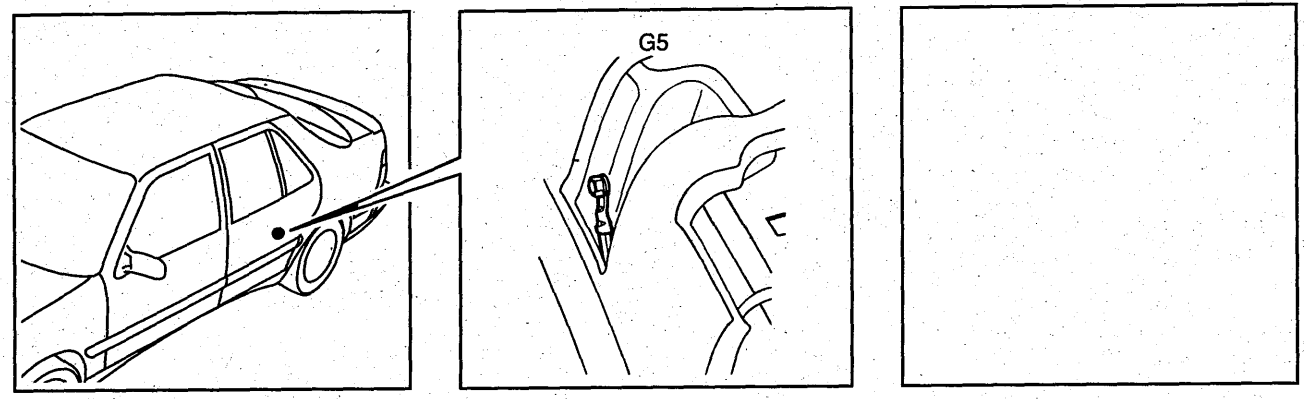
C383W-4893



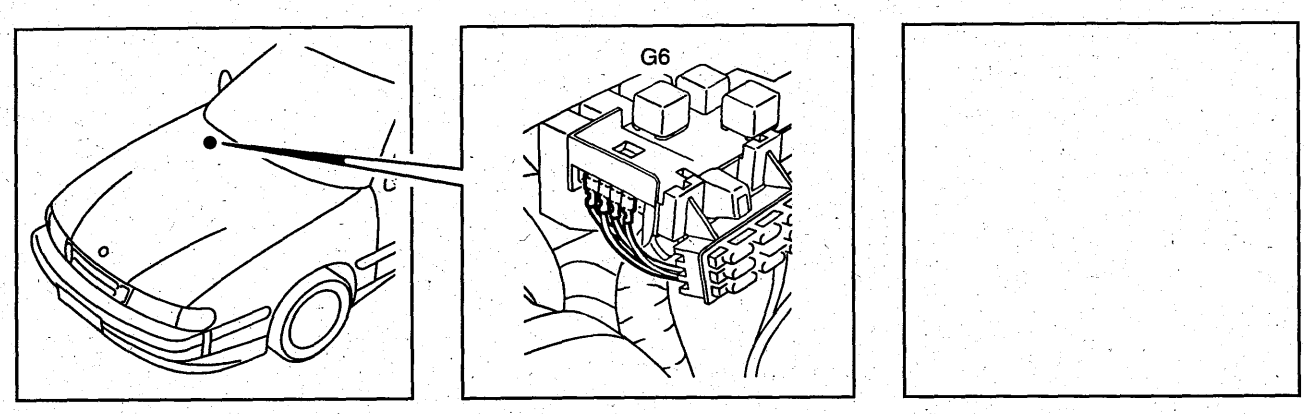
H24-2



H70-1

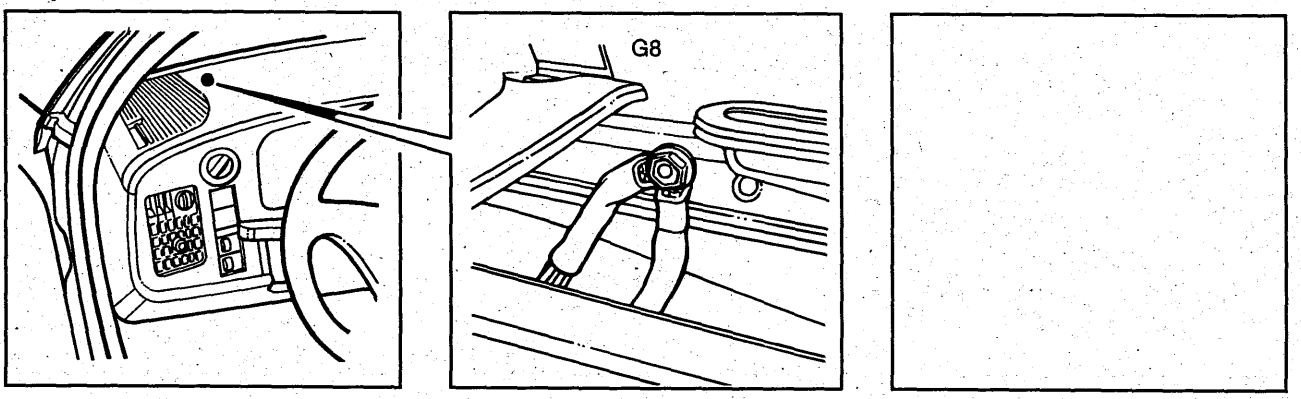


G5

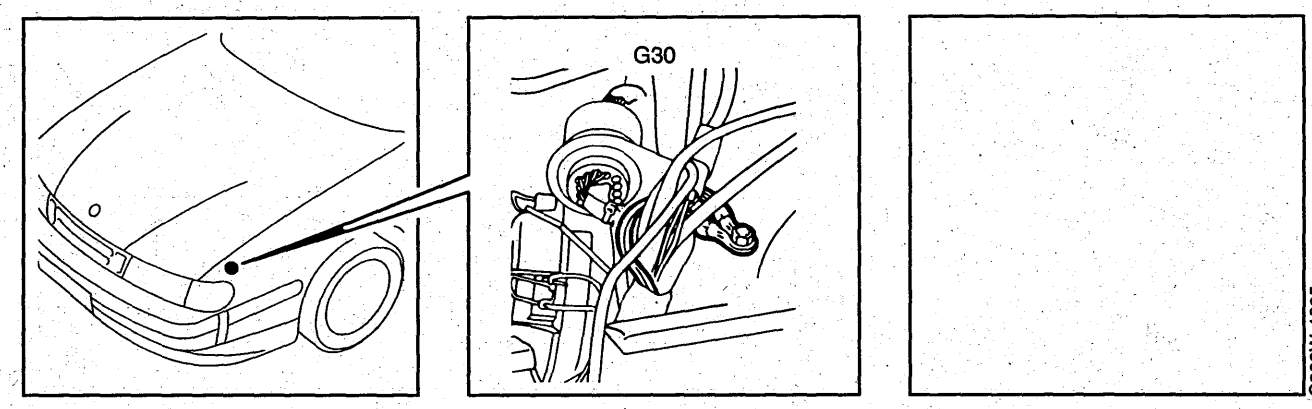


G6

C383W-4894



G8



G30

Wiring diagram

List of components

4 Starter motor, on the rear of the engine.
20 Ignition switch, on the right of the steering column
22A Fuse holder, dashboard
23 Relay, direction indicators
25 Switch, hazard flashers
27FL Direction indicator lamp, front left
27RL Direction indicator lamp, rear left
28FR Direction indicator lamp, front right
28RR Direction indicator lamp, rear right
47h Indicator lamp, direction indicators, left
47i Indicator lamp, direction indicators, right
54D Switch, driver's door
54P Switch, passenger's door
54RL Door switch, rear left
54RR Door switch, rear right
56 Switch, luggage compartment lighting
75 Distribution block, battery pulse
82 Relay, seat belt/key reminder
89LH Side direction indicator, left
89RH Side direction indicator, right
102 Relay, fuel pump
151 Relay, delayed interior lighting
159 Distribution terminal, +15 circuit
175 Electronic control module, central locking
184H Motor, central locking, tailgate
208D Door indication
229 Main relay, engine management system
230 Distribution terminal, +30 circuit
239 Gear selector position switch 2, automatic transmission
258 Connector, trailer electrics
274 Microswitch, central locking, driver's door
275 Horn, anti-theft alarm
276 Bonnet switch, anti-theft alarm
289 Electronic control module, anti-theft alarm, behind glove box
305 LED, anti-theft alarm
388 Switch, tailgate
430 Electronic control module, Saab TRIONIC
435 Microswitch, central locking, passenger's door
445 Data link connector
451 Glass breakage sensor, in the interior lighting panel
452 Relay, starter motor interlock, anti-theft alarm
456 Aerial, remote control, anti-theft alarm
510 Electronic control module, Motronic 2.8.1.
583 Electronic control module, anti-theft alarm with VSS
587 Electronic control module, Motronic 5.2
589 Electronic control module, Saab Trionic OBD II

Grounding points
G5 Under rear seat, on left
G6 Distribution terminal, negative, in main fuse box 22B behind the glove box
G8 Grounding point in the dashboard, beside left-hand front loudspeaker socket
G30 Grounding point, left-hand structural member, behind left-hand headlamp

1-pin connector
H1-7 At wiring harness branch for anti-theft alarm control module.

2-pin connectors
H2-5 Front left corner in engine bay under main fuse box 342
H2-15 In right-hand A pillar
H2-16 Beside lock mechanism inside right-hand front door
H2-22 Adjacent to left-hand side direction indicator (green switch)
H2-23 Adjacent to right-hand side direction indicator (green switch)
H2-32 Adjacent to LED by left-hand loudspeaker grille
H2-33 By left-hand A pillar
H2-34 Adjacent to lock mechanism inside left-hand front door
H2-87 Under roof console adjacent to interior rearview mirror

4-pin connectors
H4-13 In driver's door (adjacent to microswitch 274)
H4-19 Beside lock mechanism in passenger's door
H4-21 Adjacent to the generator, V6 engine

6-pin connectors
H6-4 In tailgate on left-hand side adjacent to rear window
H6-6 To the right of the rear window wiper motor
H6-8 In the boot lid beside motor 188 (4D, CS)

8-pin connectors
H8-4 By the left-hand rear wheel housing.
H8-5 By the left-hand rear light cluster

10-pin connectors

H10-1 Under the anti-theft alarm control module adjacent to the glove box

H10-6 By the left-hand rear wheel housing.

H10-11 At far left under the dashboard (behind the knee shield)

H10-14 In the luggage compartment on the left-hand side by the filament monitor

16-pin connector

H16-1 Data link connector

22-pin connectors

H22-1 Behind the cable lead-through in left-hand A pillar

H22-2 Behind the cable lead-through in right-hand A pillar

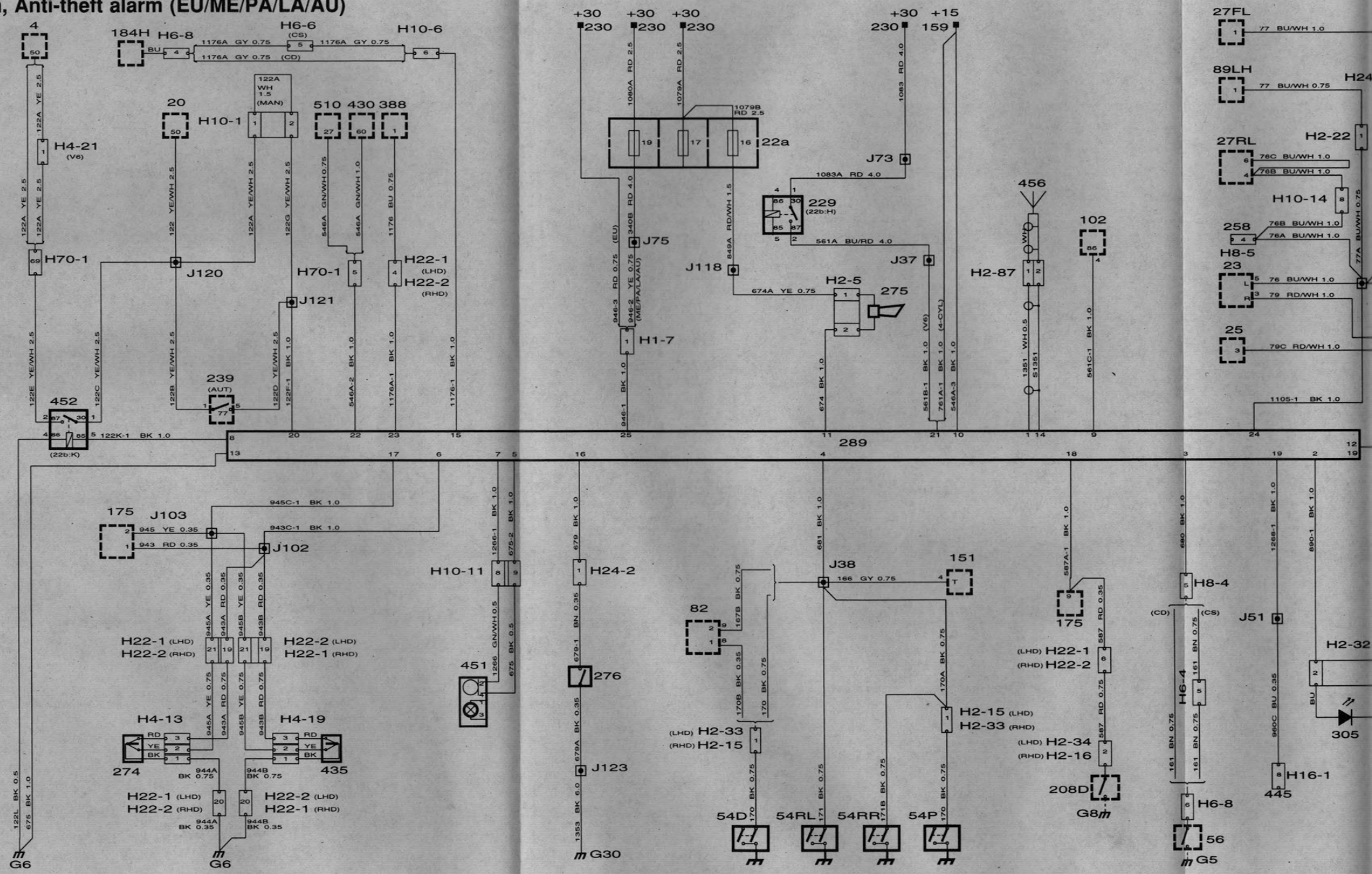
24-pin connector

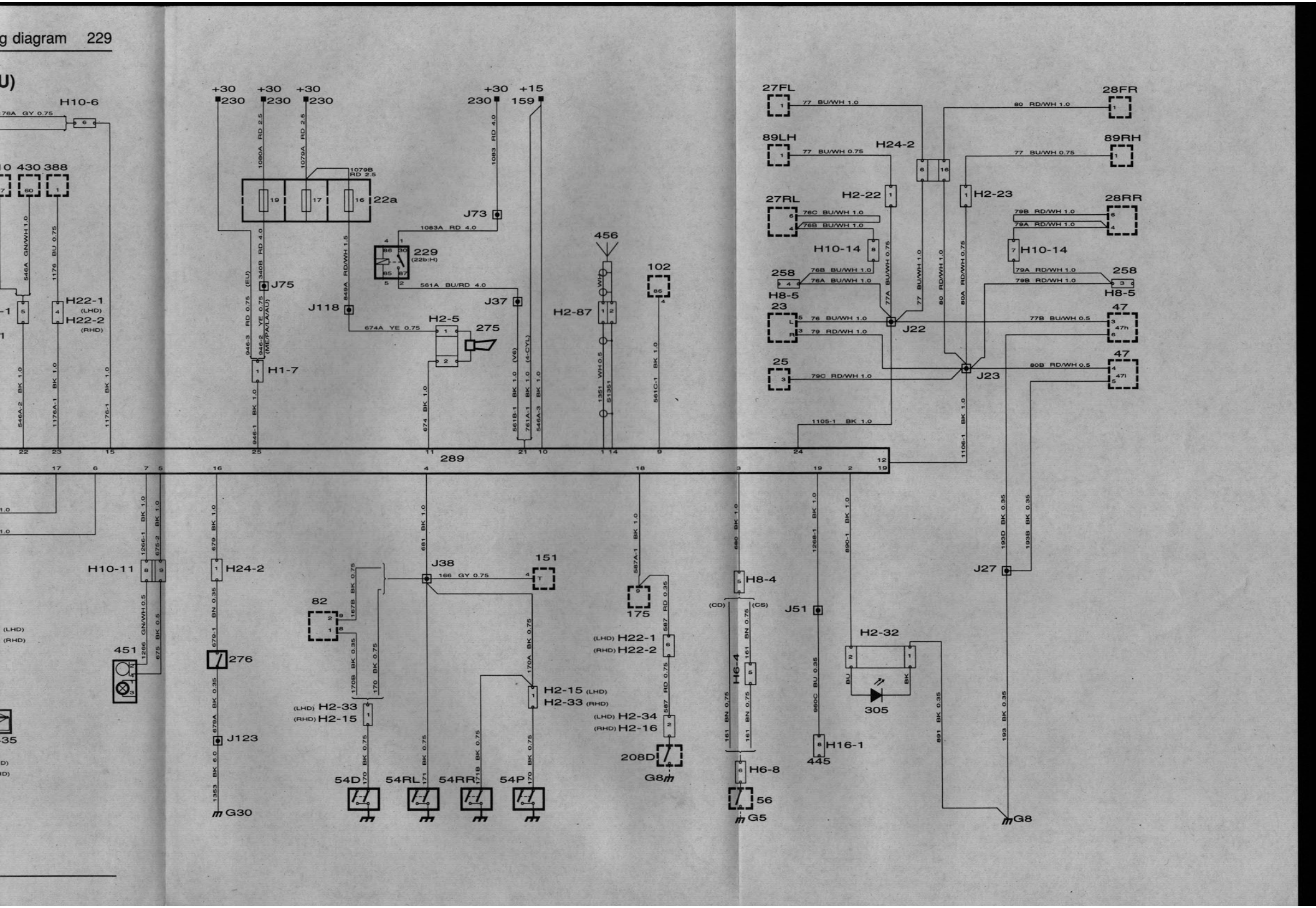
H24-2 Behind the left-hand headlamp

70-pin connector

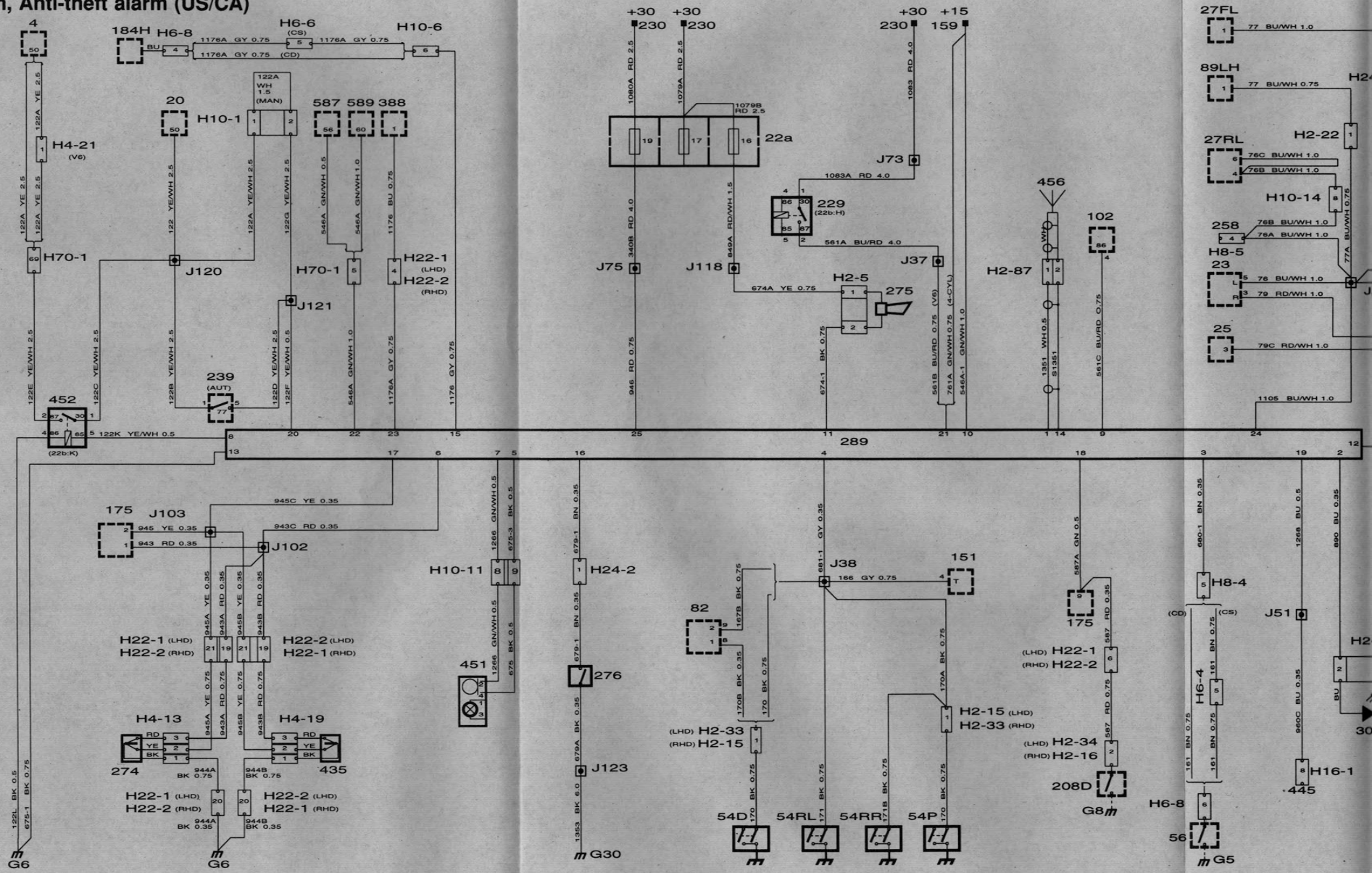
H70-1 In the engine bay behind the bulkhead partition.

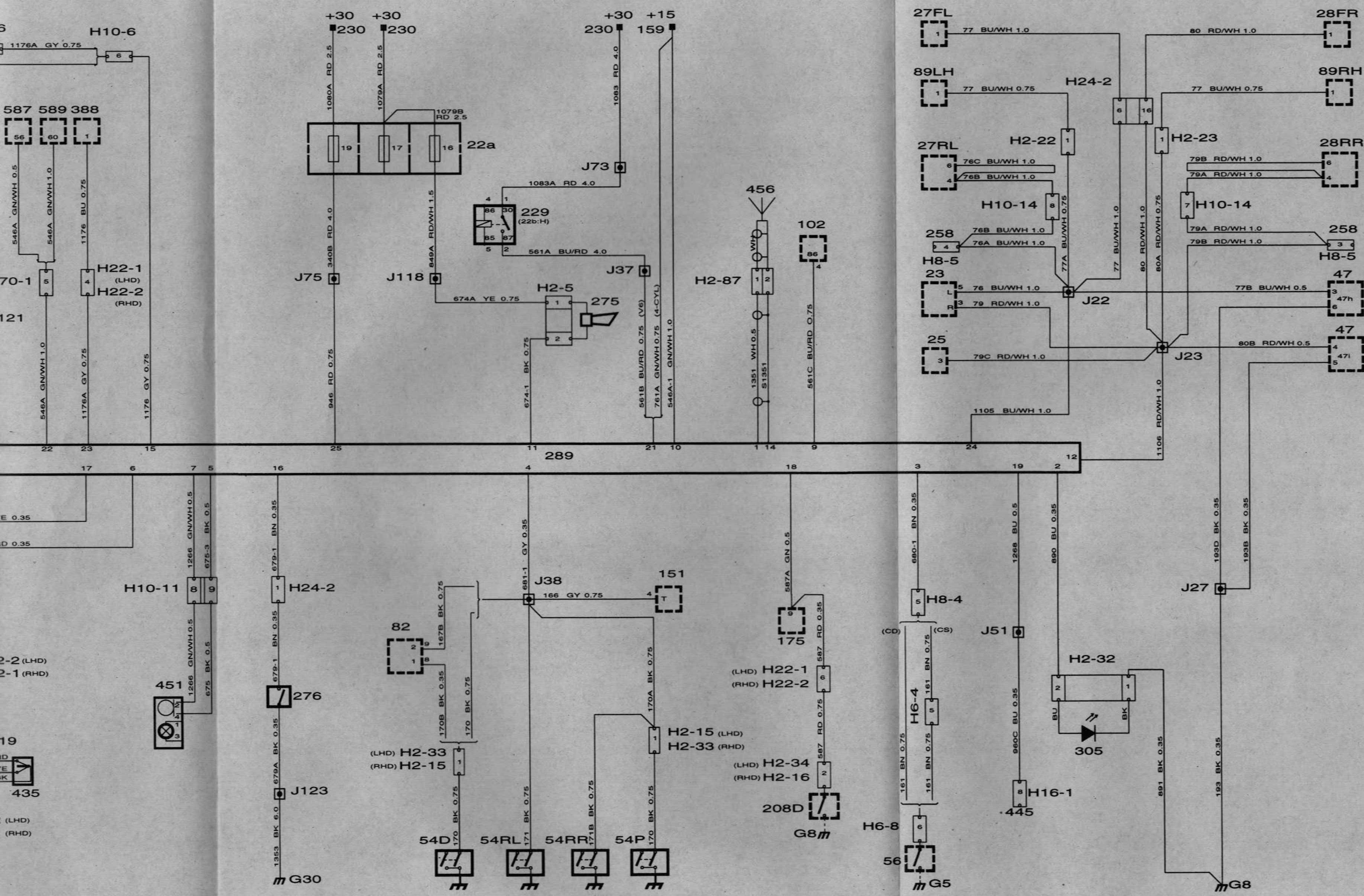
Wiring diagram, Anti-theft alarm (EU/ME/PA/LA/AU)



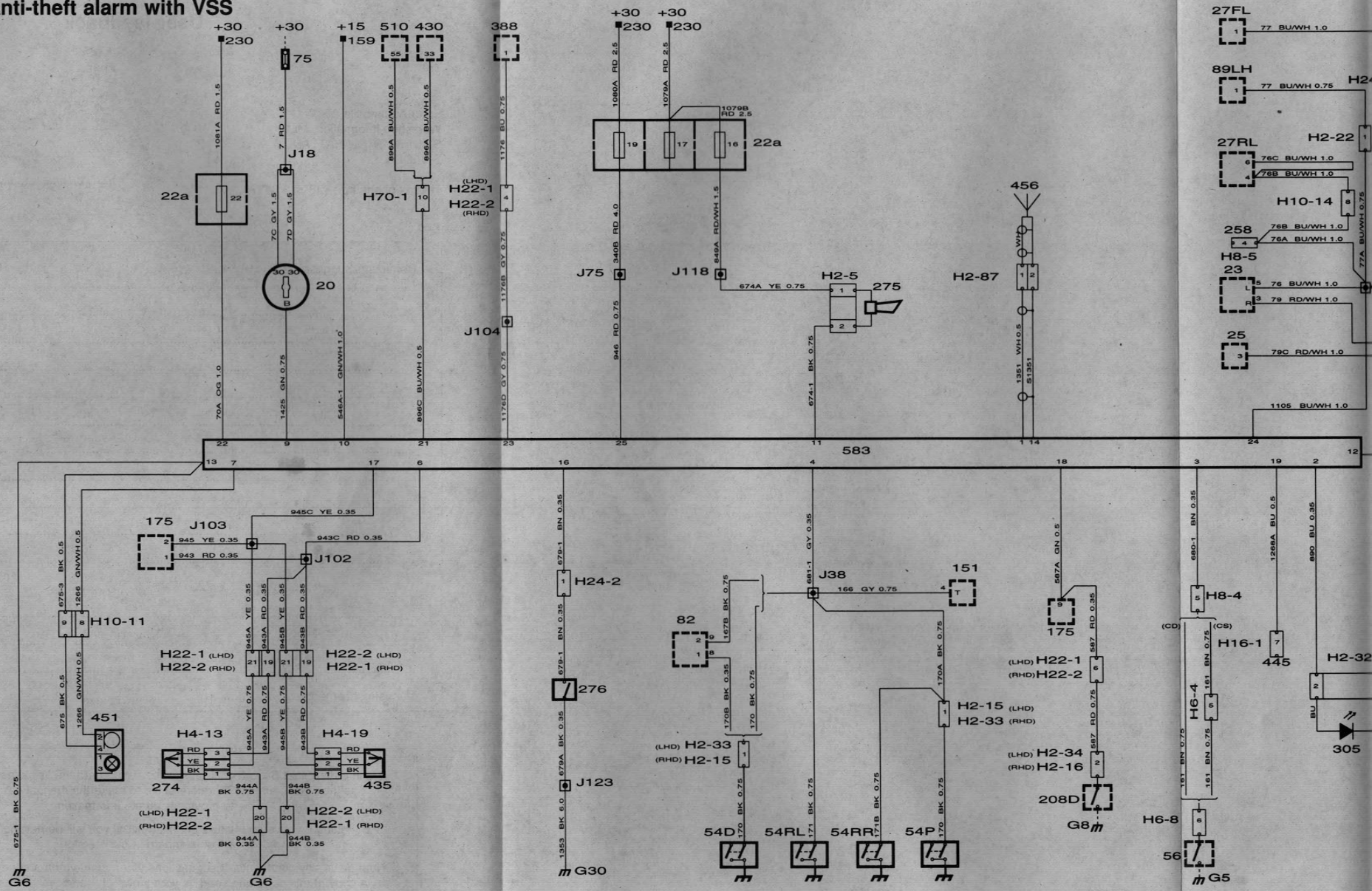

U)
H10-6
76A GY 0.75
10 430 388
546A GN/WH 1.0
1176 BU 0.75
H22-1 (LHD)
H22-2 (RHD)
546A-2 BK 1.0
1176A-1 BK 1.0
1176-1 BK 1.0
22 23 15
+30 230
+30 230
+30 230
+30 230
+15 159
1080A RD 2.5
1079A RD 2.5
1079B RD 2.5
1083 RD 4.0
19 17 16 22a
J73
1083A RD 4.0
229 (22b:H)
346B RD 4.0
J75
946-3 RD 0.75 (EU)
946-2 YE 0.75 (ME/PA/LA/AU)
H1-7
946-1 BK 1.0
J118
849A RD/WH 1.5
561A BU/RD 4.0
J37
674A YE 0.75
H2-5
275
674 BK 1.0
561B-1 BK 1.0 (V6)
761A-1 BK 1.0 (4-CYL)
546A-3 BK 1.0
25 11 21 10
289
456
H2-87
1351 WH 0.5
51351
102
561C-1 BK 1.0
1 14 9
27FL
77 BU/WH 1.0
28FR
80 RD/WH 1.0
89LH
77 BU/WH 0.75
H24-2
89RH
77 BU/WH 0.75
27RL
76C BU/WH 1.0
76B BU/WH 1.0
H2-22
H2-23
28RR
79B RD/WH 1.0
79A RD/WH 1.0
H10-14
258
76B BU/WH 1.0
76A BU/WH 1.0
H8-5
23
76 BU/WH 1.0
79 RD/WH 1.0
J22
77A BU/WH 0.75
77 BU/WH 1.0
80 RD/WH 1.0
80A RD/WH 0.75
77B BU/WH 0.5
47
47h
25
79C RD/WH 1.0
J23
80B RD/WH 0.5
47l
1105-1 BK 1.0
1106-1 BK 1.0
24
12 19
17 6 7 5
16 4 18 3 19 2
1266-1 BK 1.0
675-2 BK 1.0
H10-11
679 BK 1.0
H24-2
681 BK 1.0
J38
166 GY 0.75
151
680 BK 1.0
H8-4
(CD) (CS)
1266-1 BK 1.0
890-1 BK 1.0
J27
193D BK 0.35
193B BK 0.35
1266 GN/WH 0.5
675 BK 0.5
451
679-1 BN 0.35
276
82
167B BK 0.75
170B BK 0.35
170 BK 0.75
170A BK 0.75
H2-15 (LHD)
H2-33 (RHD)
(LHD) H2-33
(RHD) H2-15
587A-1 BK 1.0
175
(LHD) H22-1
(RHD) H22-2
587 RD 0.35
RD 0.75
(LHD) H2-34
(RHD) H2-16
208D
G8
H6-4
161 BN 0.75
J51
H2-32
305
660C BU 0.35
H16-1
445
691 BK 0.35
193 BK 0.35
679A BK 0.35
J123
1353 BK 6.0
G30
54D 54RL 54RR 54P
170 BK 0.75
171 BK 0.75
171B BK 0.75
H6-8
56
G5
G8

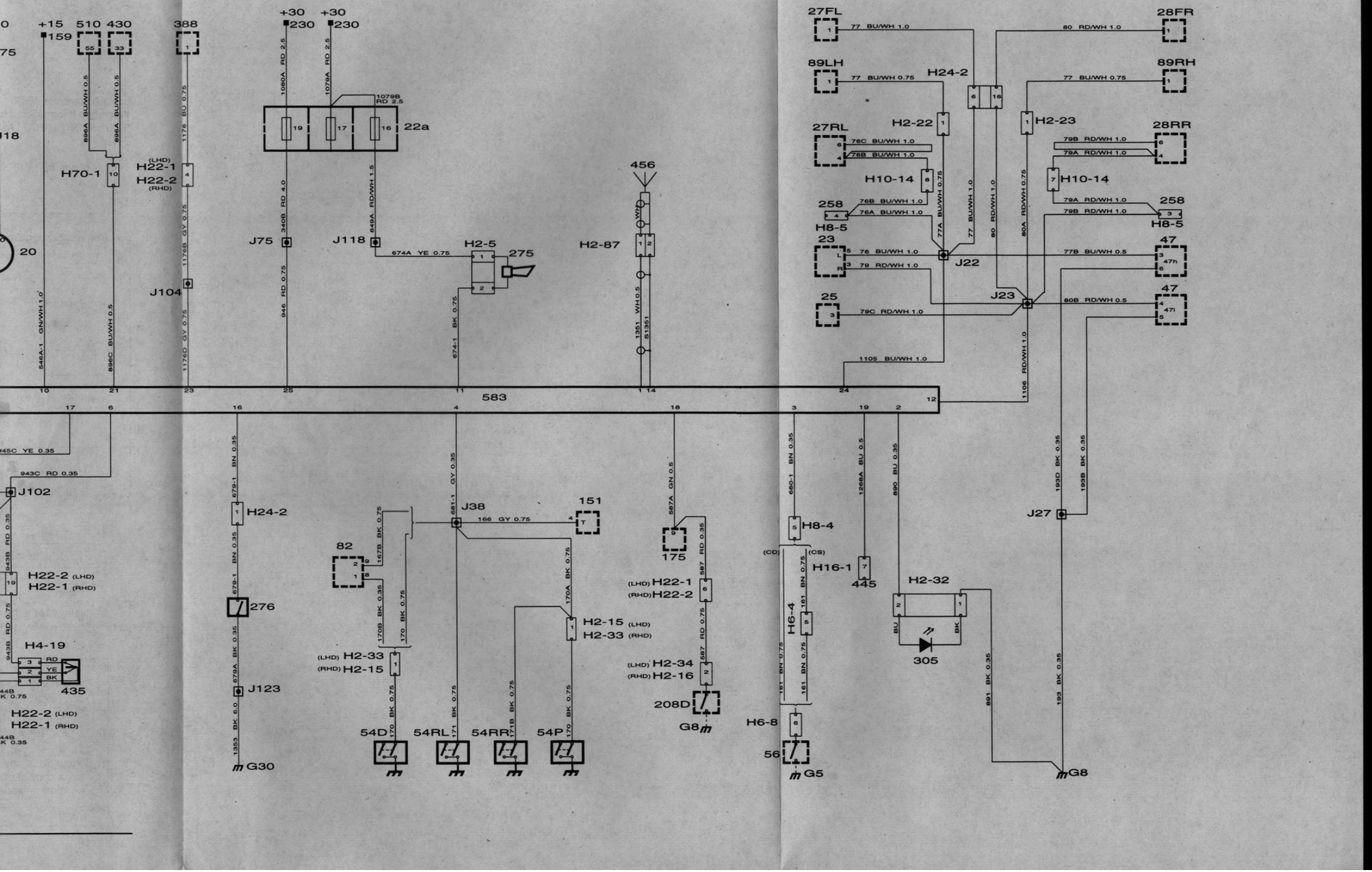
Wiring diagram, Anti-theft alarm (US/CA)




+30
230
+15
159
H10-6
587
589
388
22a
229
J73
J75
J118
J37
H2-5
275
H2-87
456
102
289
H10-11
H24-2
J38
151
82
451
276
J123
G30
H2-33
H2-15
54D
54RL
54RR
54P
175
H22-1
H22-2
H2-34
H2-16
208D
G8
H8-4
H6-4
H6-8
56
G5
J51
H16-1
445
H2-32
305
J27
27FL
28FR
89LH
89RH
H24-2
27RL
28RR
H2-22
H2-23
H10-14
258
H8-5
23
47
J22
25
J23
435
(LHD)
(RHD)

Wiring diagram, Anti-theft alarm with VSS




+15
510
430
388
+30
230
+30
230
159
55
33
1
1080A RD 2.5
1079A RD 2.5
1079B RD 2.5
19
17
16
22a
896A BU/WH 0.5
896A BU/WH 0.5
1176 BU 0.75
H70-1
10
(LHD) H22-1
H22-2 (RHD)
4
J75
340B RD 4.0
J118
649A RD/WH 1.5
456
WH
H2-5
275
674A YE 0.75
H2-87
1
2
1351 WH 0.5
S1351
946 RD 0.75
674-1 BK 0.75
1176B GY 0.75
J104
1176D GY 0.75
546A-1 GN/WH 1.0
896C BU/WH 0.5
10
21
23
25
11
583
1
14
24
12
27FL
77 BU/WH 1.0
28FR
80 RD/WH 1.0
89LH
77 BU/WH 0.75
H24-2
89RH
77 BU/WH 0.75
H2-22
H2-23
27RL
76C BU/WH 1.0
76B BU/WH 1.0
28RR
79B RD/WH 1.0
79A RD/WH 1.0
H10-14
H10-14
258
76B BU/WH 1.0
76A BU/WH 1.0
79A RD/WH 1.0
79B RD/WH 1.0
258
H8-5
H8-5
77A BU/WH 0.75
77 BU/WH 1.0
80 RD/WH 1.0
80A RD/WH 0.75
23
76 BU/WH 1.0
79 RD/WH 1.0
J22
77B BU/WH 0.5
47
47h
J23
25
79C RD/WH 1.0
80B RD/WH 0.5
47
47i
1105 BU/WH 1.0
1106 RD/WH 1.0
17
6
16
4
18
3
19
2
945C YE 0.35
943C RD 0.35
J102
679-1 BN 0.35
681-1 GY 0.35
J38
166 GY 0.75
151
T
H24-2
82
167B BK 0.75
567A GN 0.6
680-1 BN 0.35
1268A BU 0.5
890 BU 0.35
193D BK 0.35
193B BK 0.35
J27
H8-4
175
(CD)
(CS)
H16-1
445
H22-2 (LHD)
H22-1 (RHD)
943B RD 0.35
276
679-1 BN 0.35
170B BK 0.35
170 BK 0.75
170A BK 0.75
H2-15 (LHD)
H2-33 (RHD)
(LHD) H22-1
(RHD) H22-2
587 RD 0.35
H6-4
161 BN 0.75
H2-32
943B RD 0.75
H4-19
RD
YE
BK
435
679A BK 0.35
J123
(LHD) H2-33
(RHD) H2-15
(LHD) H2-34
(RHD) H2-16
587 RD 0.75
208D
G8
305
891 BK 0.35
193 BK 0.35
944B BK 0.75
H22-2 (LHD)
H22-1 (RHD)
944B BK 0.35
1353 BK 6.0
G30
54D
54RL
54RR
54P
170 BK 0.75
171 BK 0.75
171B BK 0.75
170 BK 0.75
H6-8
56
G5
G8

Ordering No. 362400 English edition. Printed in Sweden.

ENG

SAAB

Saab Automobile AB
Trollhättan, Sweden

Printed in Sweden, Graphic Systems AB, Gbg 1995.26079