There is nothing particularly noteworthy about removing and refitting the battery.

However, the following checks and precautions are to be carried out to ensure that it operates efficiently.

A - CHECKS

Check that :

- the battery casing and cover are neither cracked nor broken,
- that the top of the battery is clean,
- the battery posts are in good condition,

  It is essential to :

  - ensure that no salts (sulphating) have formed on the posts or the terminal clamps,
  - clean and grease these parts if necessary,
  - check that the terminal clamps are fully tightened on the posts. Poor contact can give rise to starting or charging defects or sparking that could cause the battery to explode.
- Electrolyte level.

On batteries equipped with removable cover plates :

- remove the plate either by hand or with an appropriate tool (rigid spatula),
- check that the electrolyte level in all the cells is well above the plates,
- if necessary, top up the levels with distilled water.

***NOTE** : certain types of battery have translucent casings through which the electrolyte level can be seen.*

Never add already mixed electrolyte or any other form of product.

B - PRECAUTIONS

We should like to remind you that a battery :

- contains sulphuric acid which is a dangerous product,
- gives off, during charging, oxygen and hydrogen. These two gases form an explosive mixture, hence the risk of explosion.

1) - DANGER = ACID

A sulphuric acid solution is a very aggressive, toxic and corrosive substance. It attacks the skin, clothing and concrete and corrodes most metals.

It is therefore very important, when handling a battery, to take the following precautions :

- wear goggles to protect the eyes,
- wear gloves and acid-proof clothing.

> If the acid does splash onto the skin or clothing, rinse off the contaminated area with copious quantities of water and if it splashes in the eyes, consult a doctor.

2) - DANGER = RISK OF EXPLOSION

When a battery is being charged (whether on a vehicle of off it) oxygen and hydrogen are formed. The formation of this gas is at its maximum when the battery is fully charged and the quantity of gas produced is proportional to the strength of the charging current.

Oxygen and hydrogen when mixed in a free space, on the surfaces of the plates, form a highly explosive mixture.

The slightest spark, a cigarette, or a match which is not quite extinguished, is enough to cause an explosion. The explosion is so powerful that the battery can disintegrate into fragments and the acid can be dispersed into the surrounding atmosphere. Anybody near such an explosion is in danger from flying fragments and splashed acid. This splashed acid is very dangerous to the eyes, face and hands and it also attacks clothing.

> This warning of the danger of a badly treated battery exploding must therefore be taken very seriously. Avoid any risks of sparking.

- Ensure that the current consuming accessories are switched off before disconnecting or reconnecting a battery.
- When charging a battery within a confined space, switch off the charger before connecting or disconnecting the battery.
- Never lay a metal object on the battery as this could cause a short circuit across the battery posts.
- Never bring a battery near a naked flame, a welding torch or a lighted cigarette or match.

REMOVING

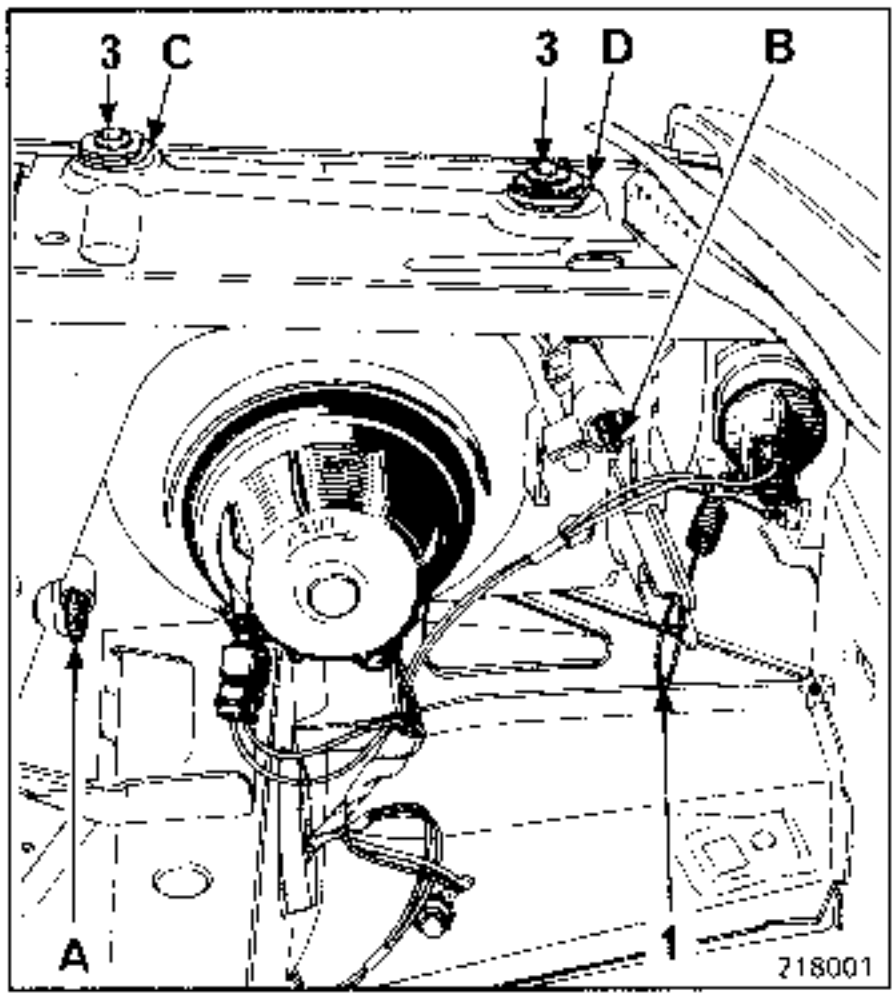
Disconnect :
- the battery,
- the direction indicator connector.

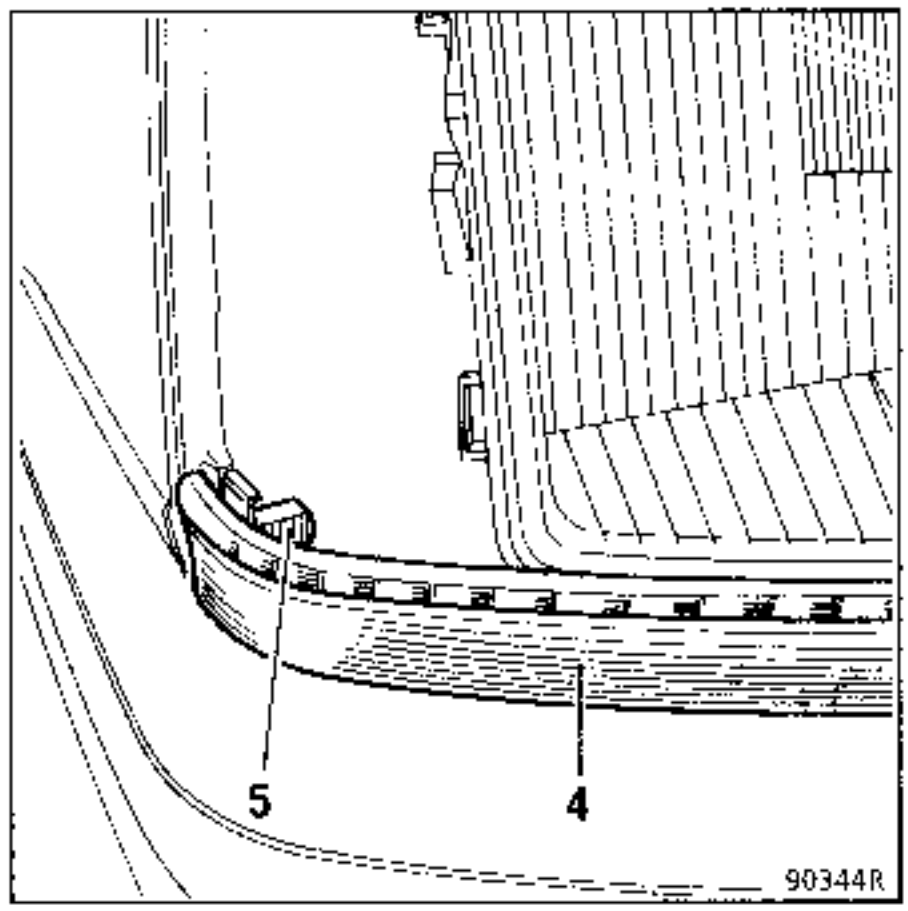
Remove :
- the direction indicator by releasing spring (1),
- the radiator grille lower bar (4) by releasing screw (5).

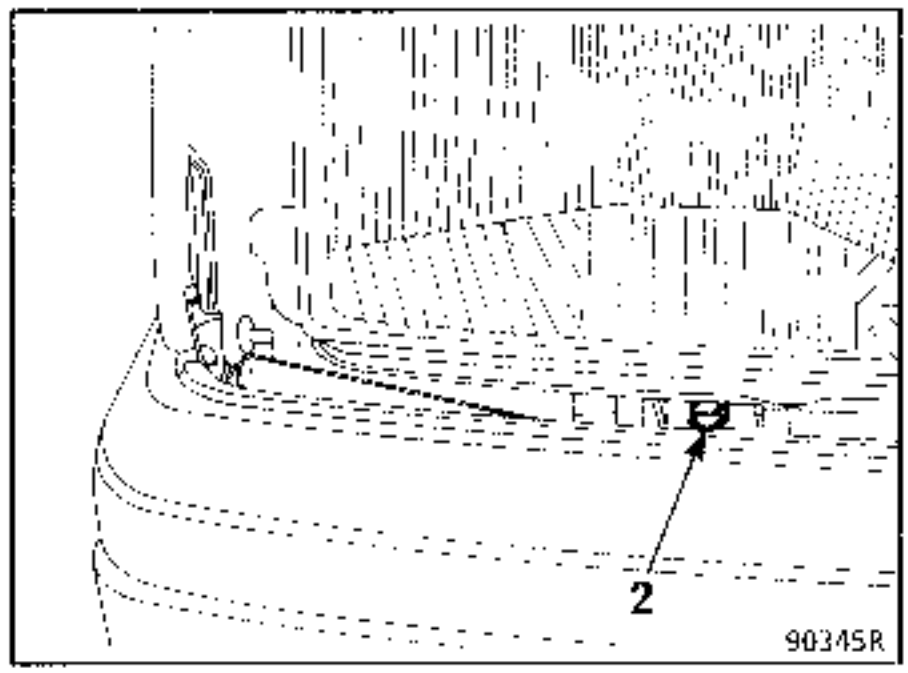
Disconnect the beam unit connectors.

Remove the lower screw (2) and the two upper screws (3).

Remove the headlight from the front.







REFITTING (Special points)

After refitting, adjust the headlight at screws (A) and (B).

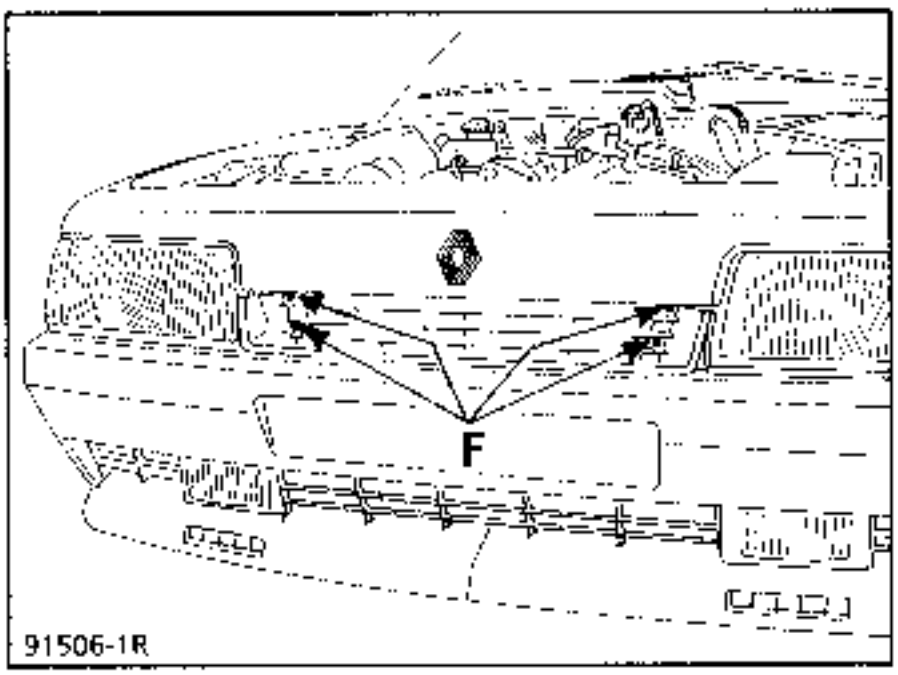
NOTE : Screws (C) and (D) are used to adjust the clearance between the bonnet and the radiator grille lower bar.

WARNING: These screws are pre-adjusted. If their adjustment has to be altered, consult section 42 of the Bodywork Workshop Manual.

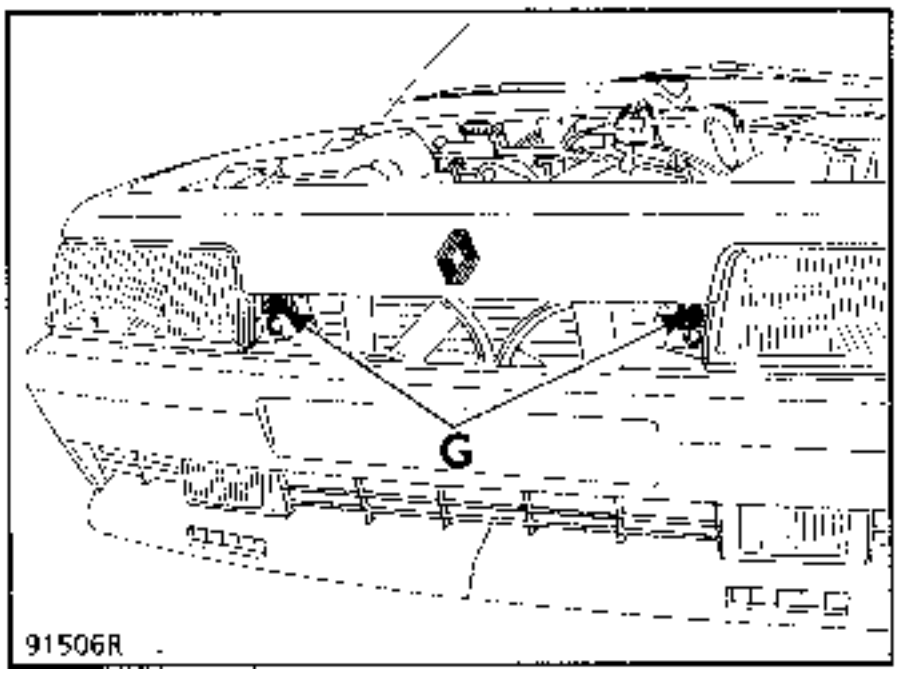
REMOVING

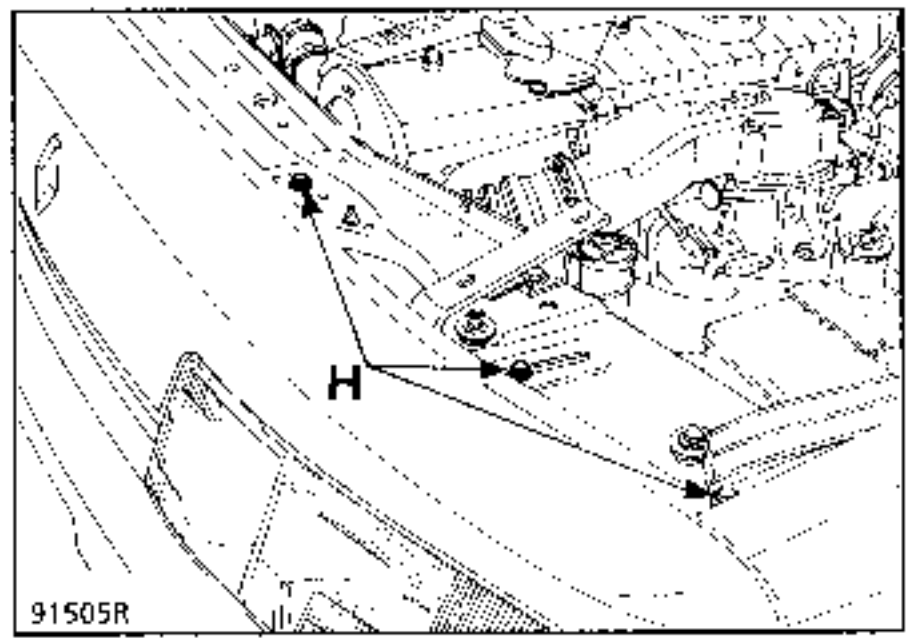
Disconnect the battery.

Remove :
– the radiator grill at 4 screws (F),



– the radiator grille upper panel at screws (G) and (H).

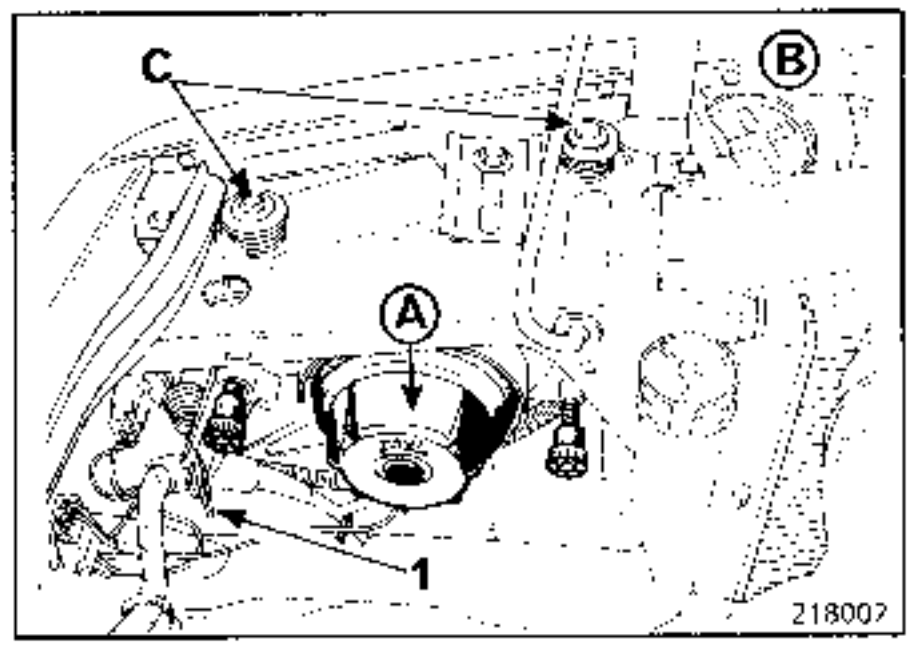




Disconnect the direction indicator connector.

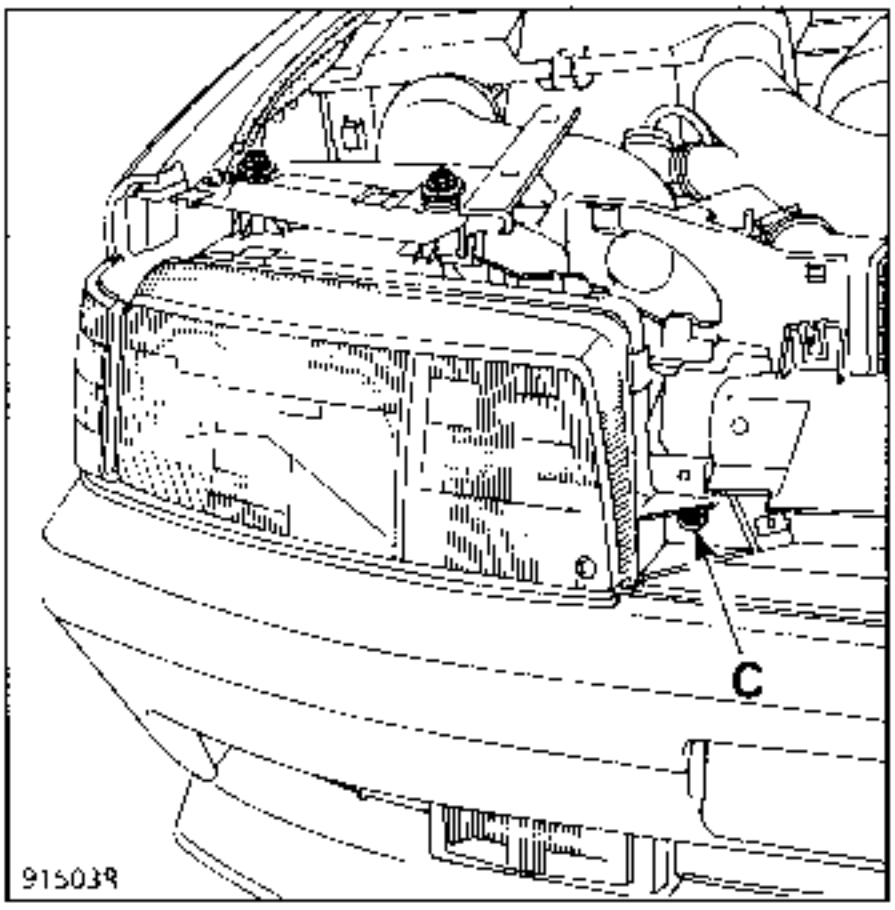
Remove :
– the direction indicator by releasing spring (1),
– the plastic covers by turning then through a quarter turn (A) (B).

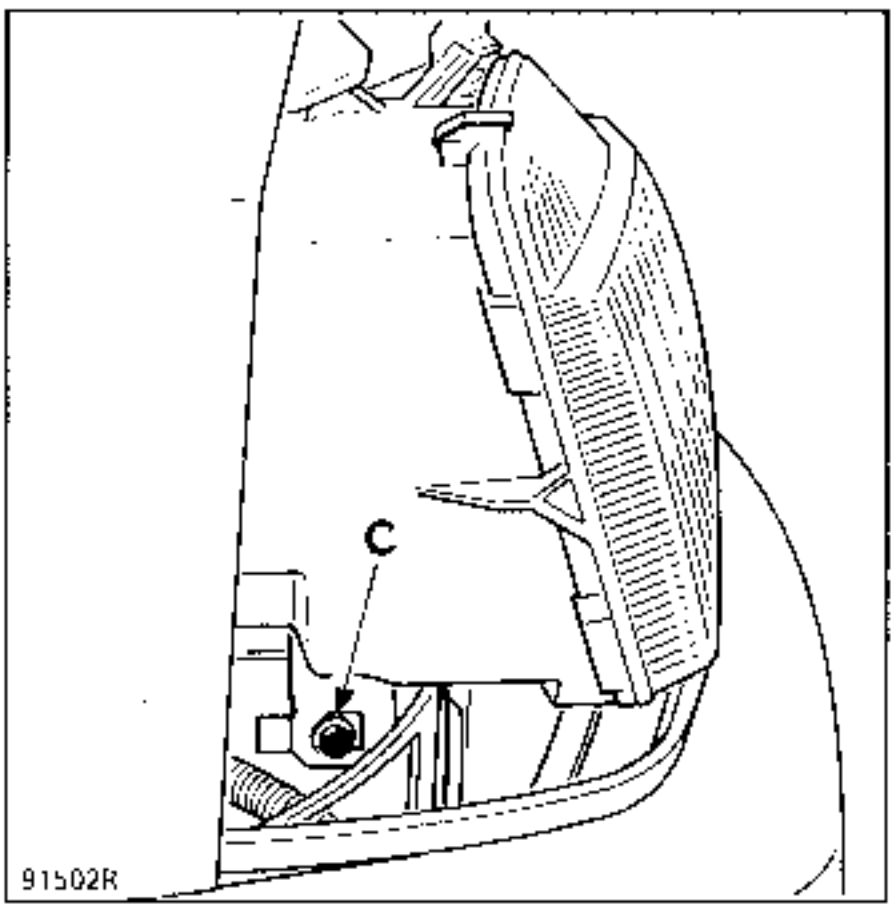
Disconnect the beam unit connectors.



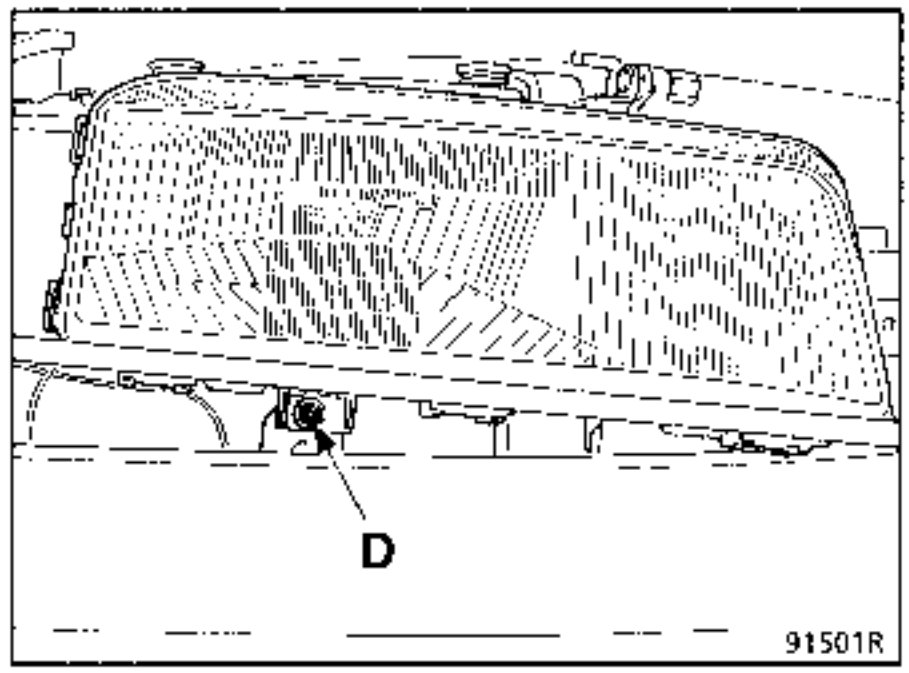
REMOVING (continued)

Remove the 4 screws (C).





Lift the headlight and remove screw (D).

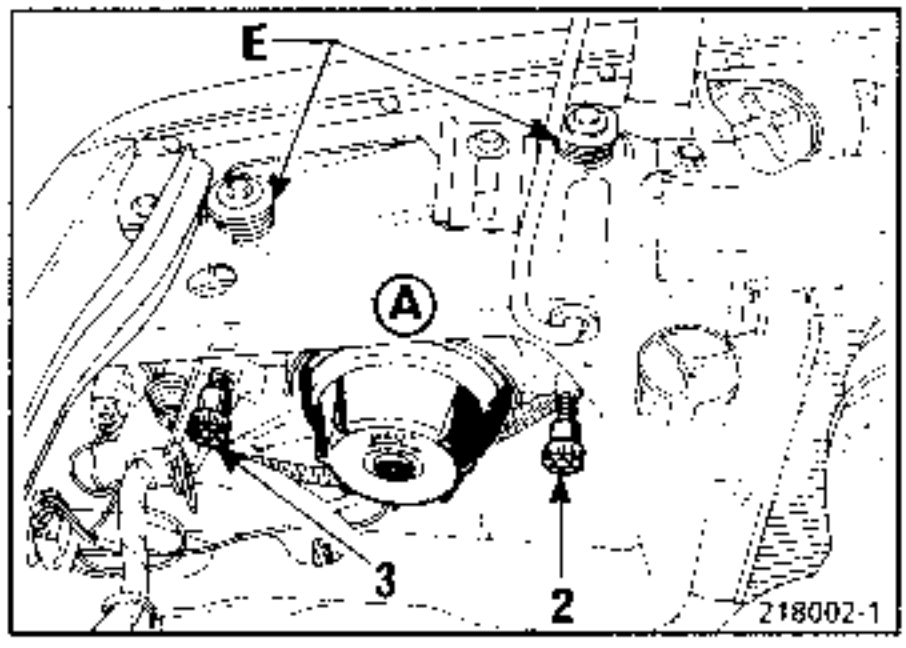


Remove the headlight from the front.

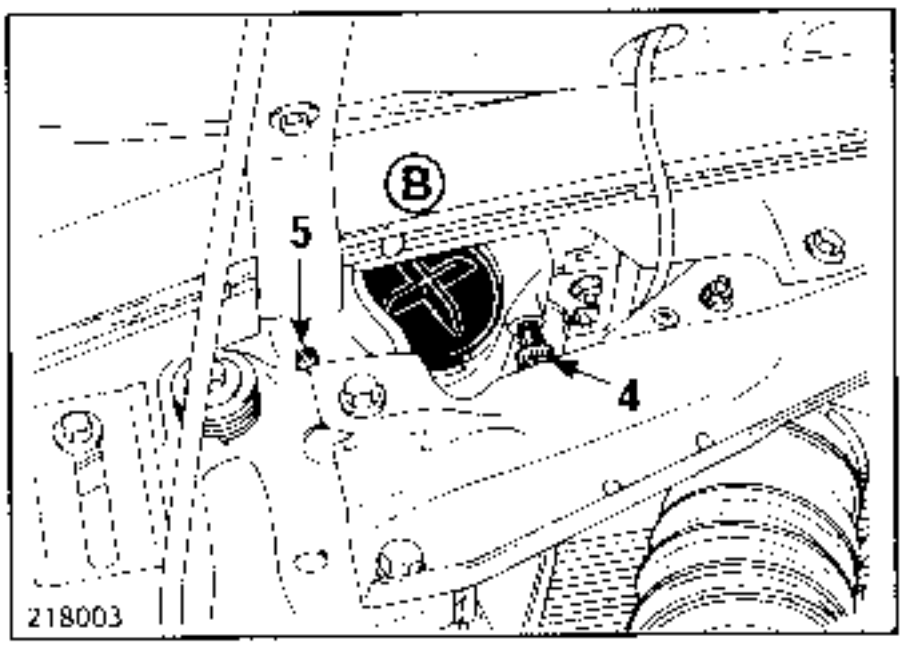
REFITTING (Special points)

Twin headlight radiator grille

After refitting, adjust the headlights at screws (2) and (3) in the case of the dipped/main beam light (A) and the screws (4) and (5) for the main beam only light (B).



REFITTING (continued)

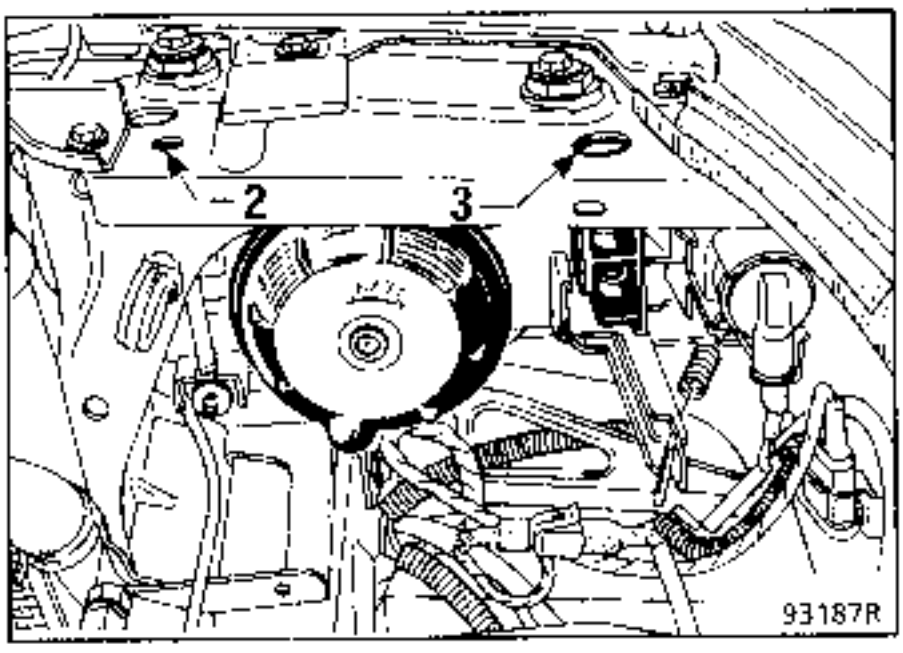


NOTE : Screws (E) are used to adjust the clearance between the upper part of the radiator grille and the front bumper.

WARNING : These screws are pre-adjusted. If their adjustment has to be altered, consult section 42 of the Bodywork Workshop Manual.

Special feature on single headlight type radiator grille

After refitting, adjust the headlight at screws (2) and (3).



NOTE : Screws (E) are used to adjust the clearance between the upper part of the radiator grille and the front bumper.

WARNING : These screws are pre-adjusted. If their adjustment has to be altered, consult section 42 of the Bodywork Workshop Manual.

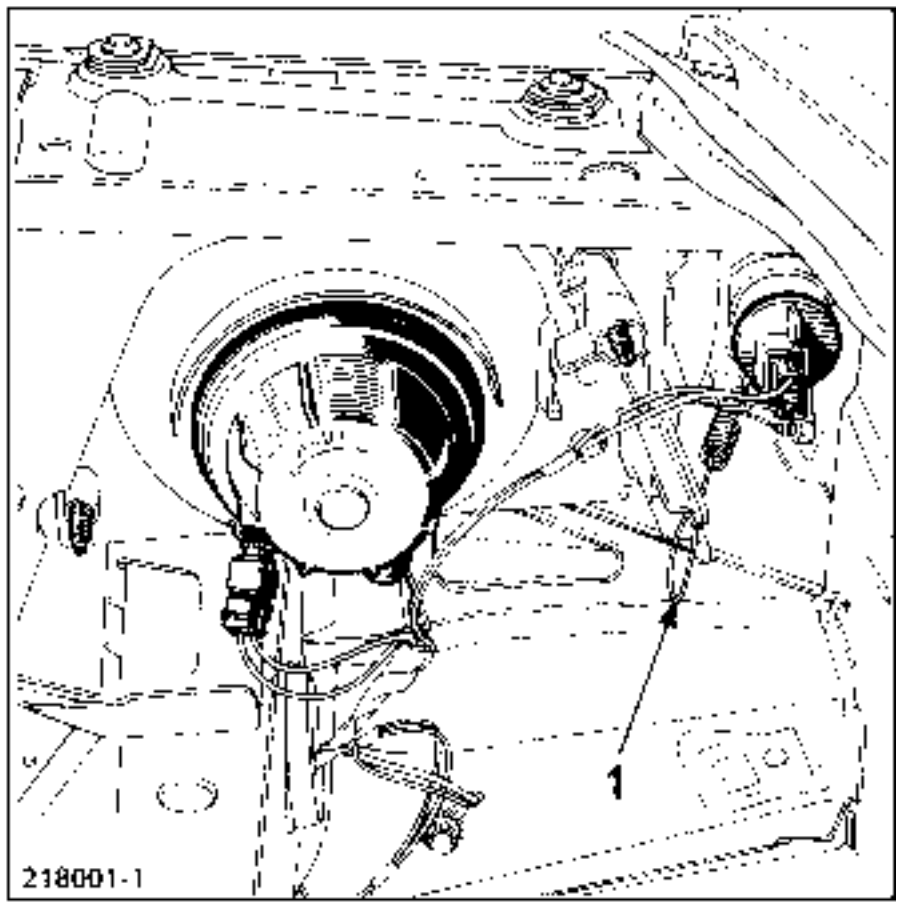
REMOVING

Disconnect the battery.

Unhook the spring (1).

Take out the bulb holder by twisting it.

Remove the light by pulling it towards the front.



REFITTING

Carry out these operations in reverse.

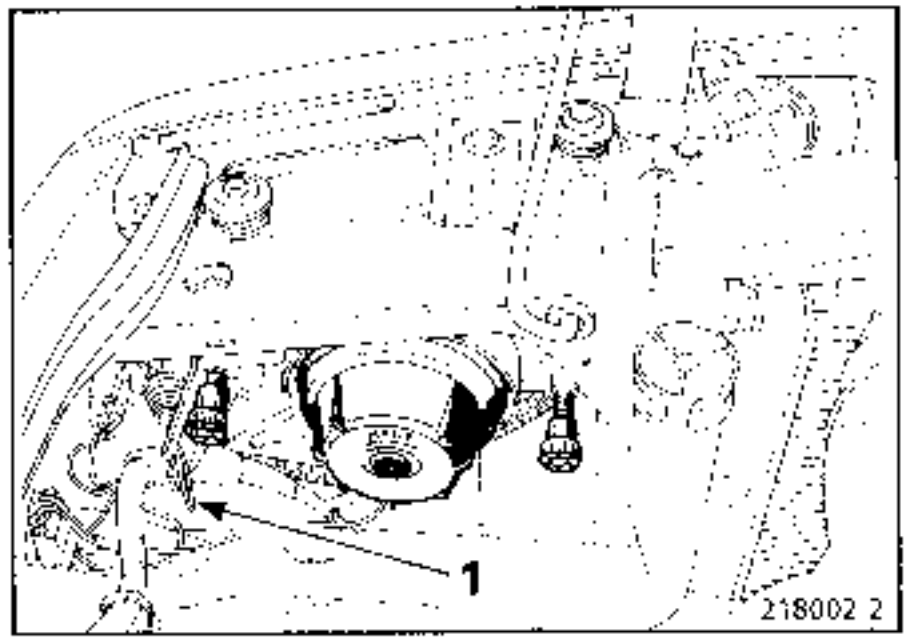
REMOVING

Disconnect the battery.

Unhook the spring (1).

Take out the bulb holder by twisting it.

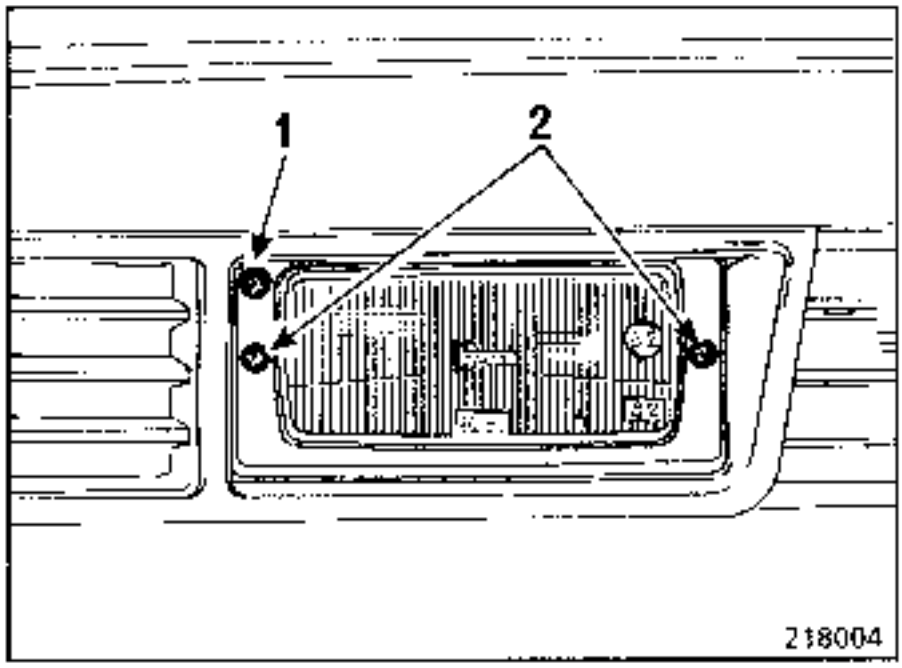
Remove the light by pulling it towards the front.

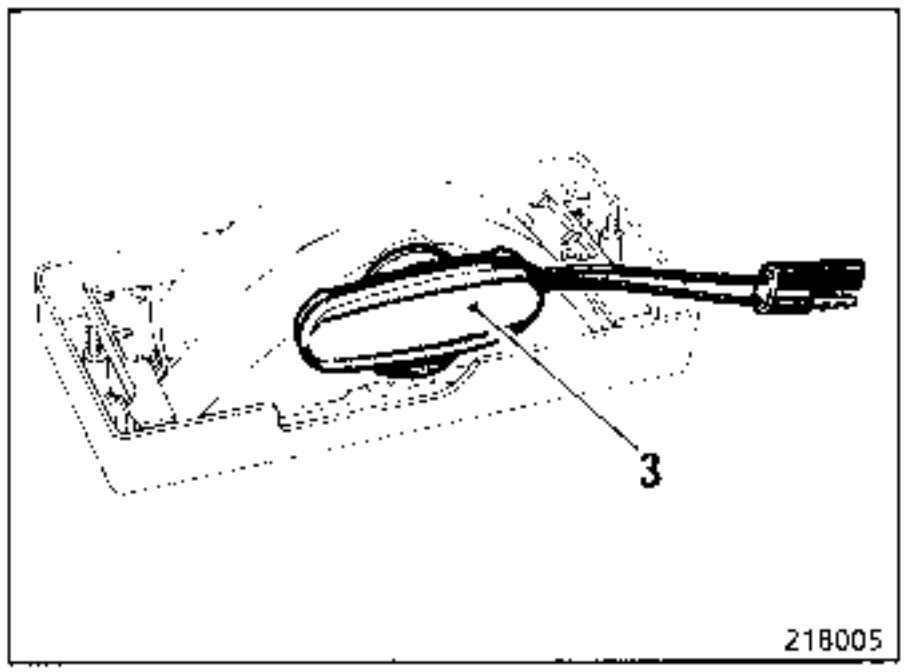


REFITTING

Carry out these operations in reverse.

For versions equipped with fog lights.





REMOVING

Unscrew securing screws (2).

Take out the beam unit in a forwards direction.

Disconnect the two wires.

REPLACING THE BULB
Turn the bulb holder through a quarter of a turn (3) and remove it.

Take out the bulb.

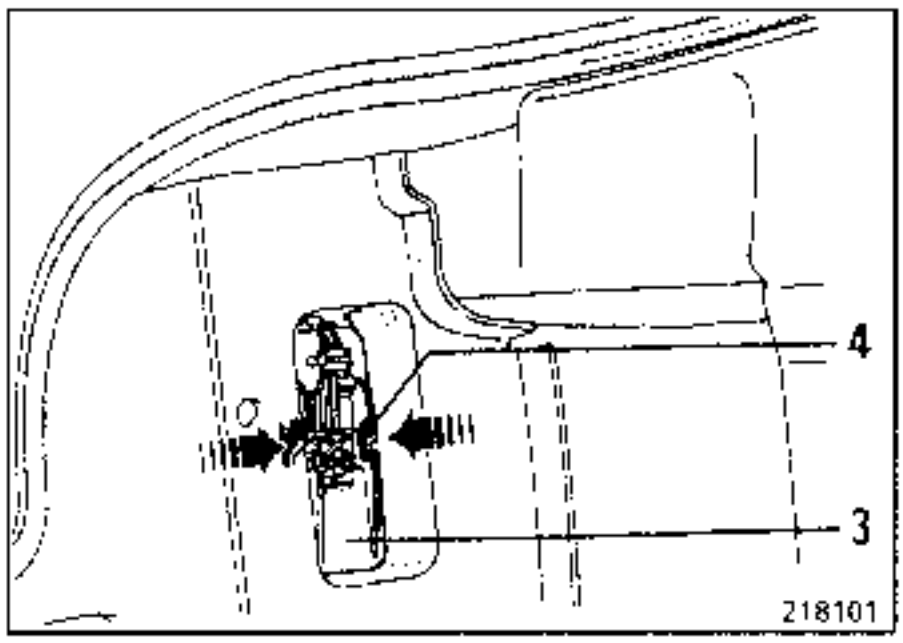
Hold the new bulb in a cloth or piece of paper and slide it into its support.

Adjust the height of the beam : screw (1).

REMOVING

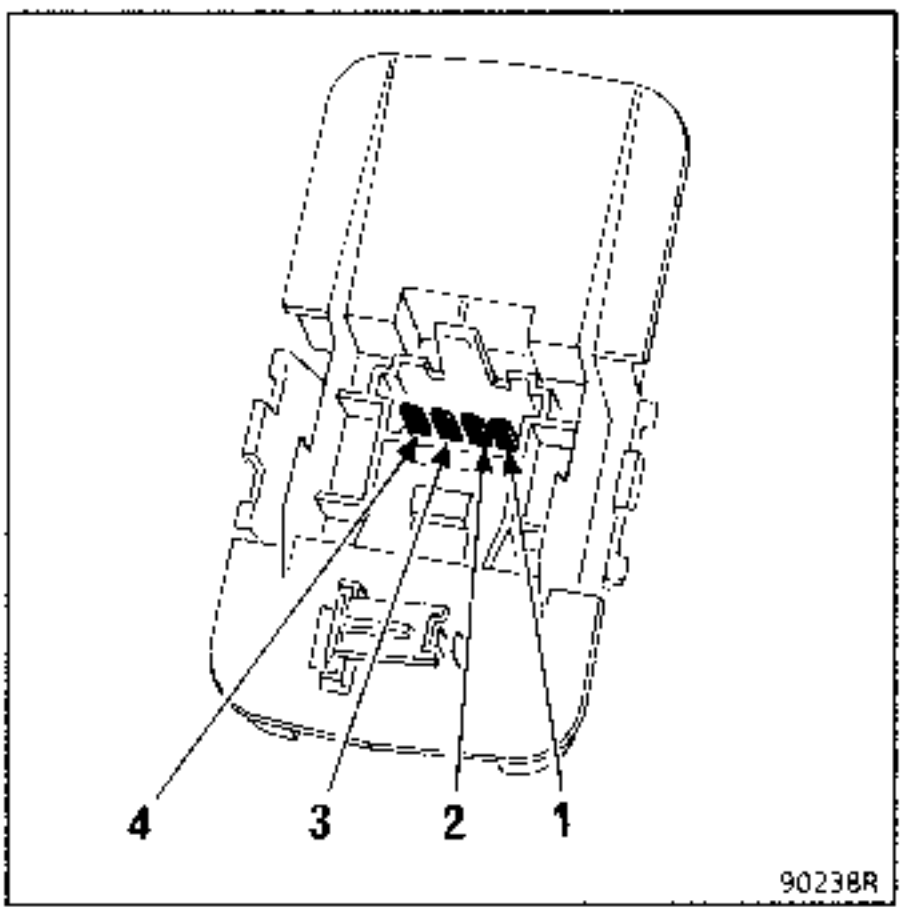
Disconnect :
- the battery,
- the connector.

To gain access to the bulbs, release the 2 lugs (4).



Remove:
- the trim (8 screws) from inside the boot,
- the rear lights (4 screws),
- the light, outwards.

CONNECTIONS

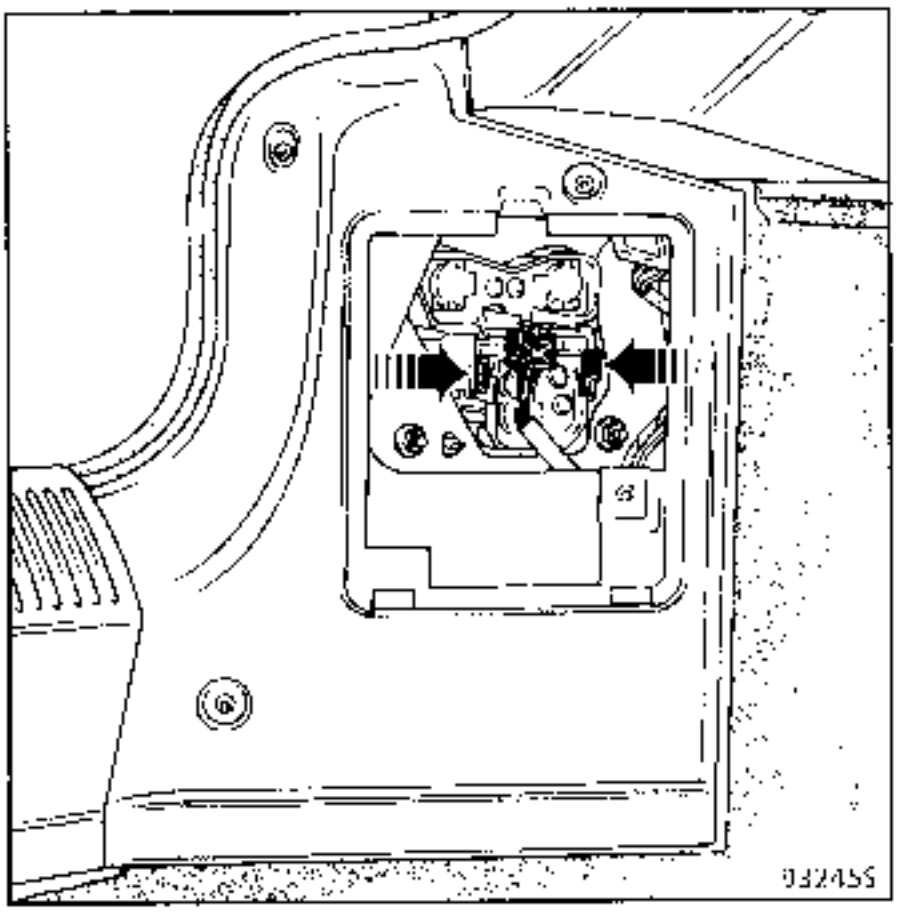


1 Direction indicator
2 Stop light
3 Rear sidelight
4 Earth

REMOVING

Disconnect:
- the battery,
- the connector.

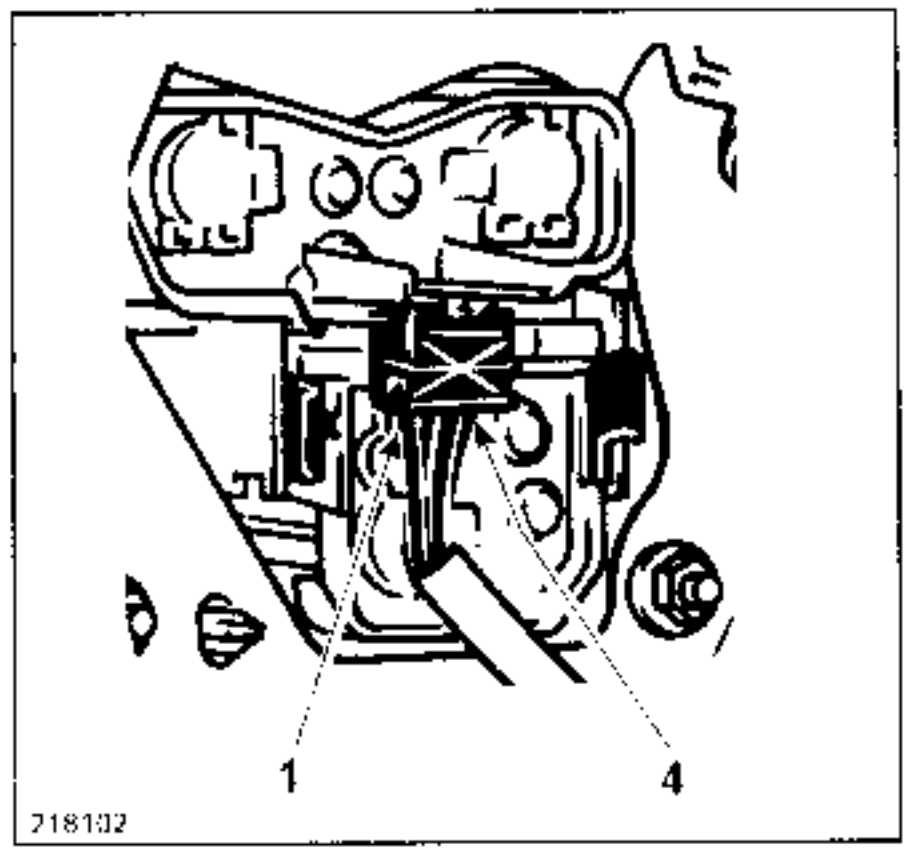
To gain access to the bulbs, free the retaining lugs.



Remove the 3 securing screws.

Pull the light outwards.

CONNECTIONS



1 Earth
2 Direction indicator
3 Stop light
4 Rear sidelight

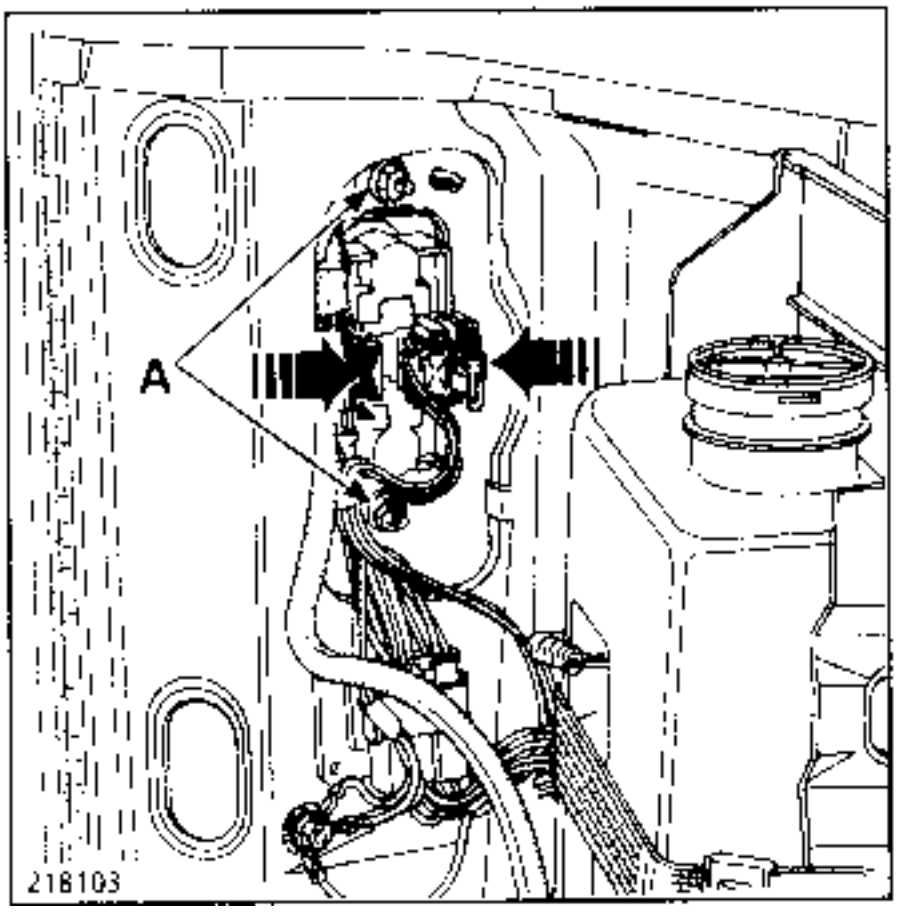
REMOVING

Remove the rear light access panel which is inside the wing.

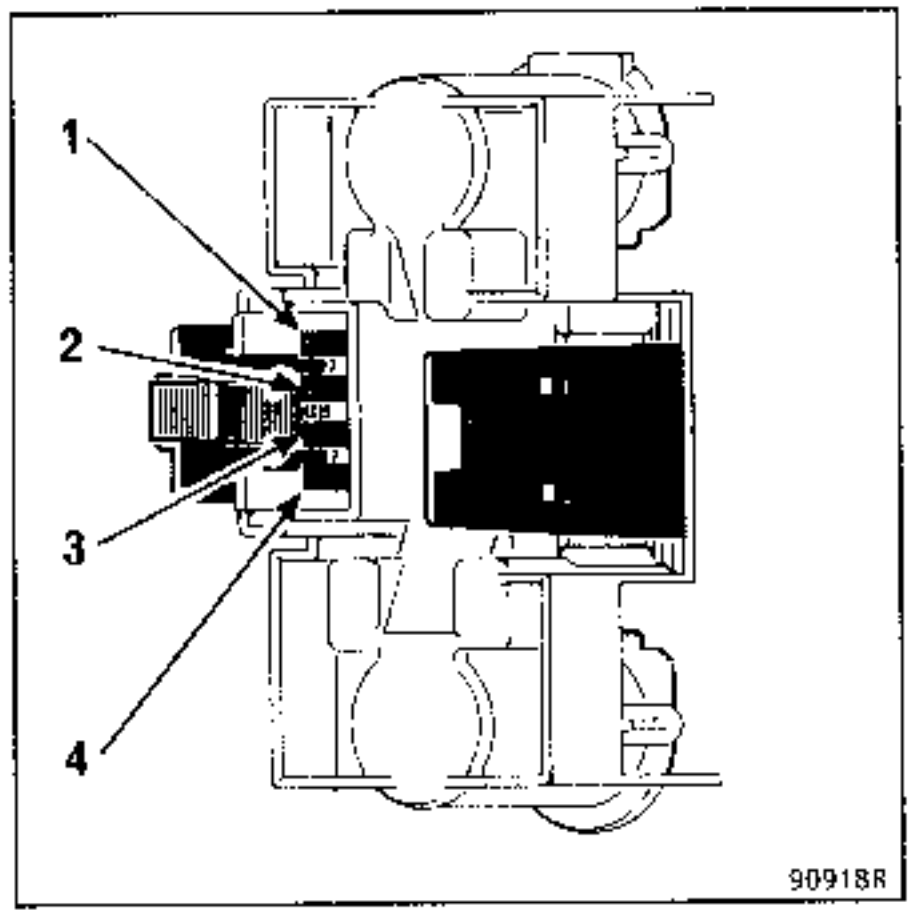
Disconnect :
- the battery,
- the connector.

Unscrew the 2 securing screws (A).

Take out the light.



CONNECTIONS

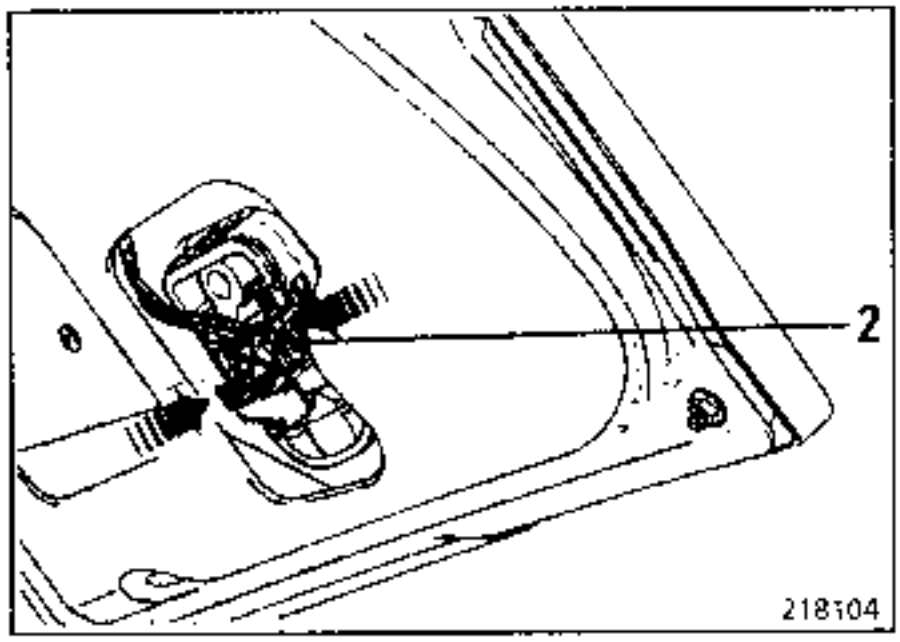


1 Earth
2 Direction indicator
3 Rear sidelight
4 Stop light

REMOVING

Disconnect:
- the battery,
- the connector.

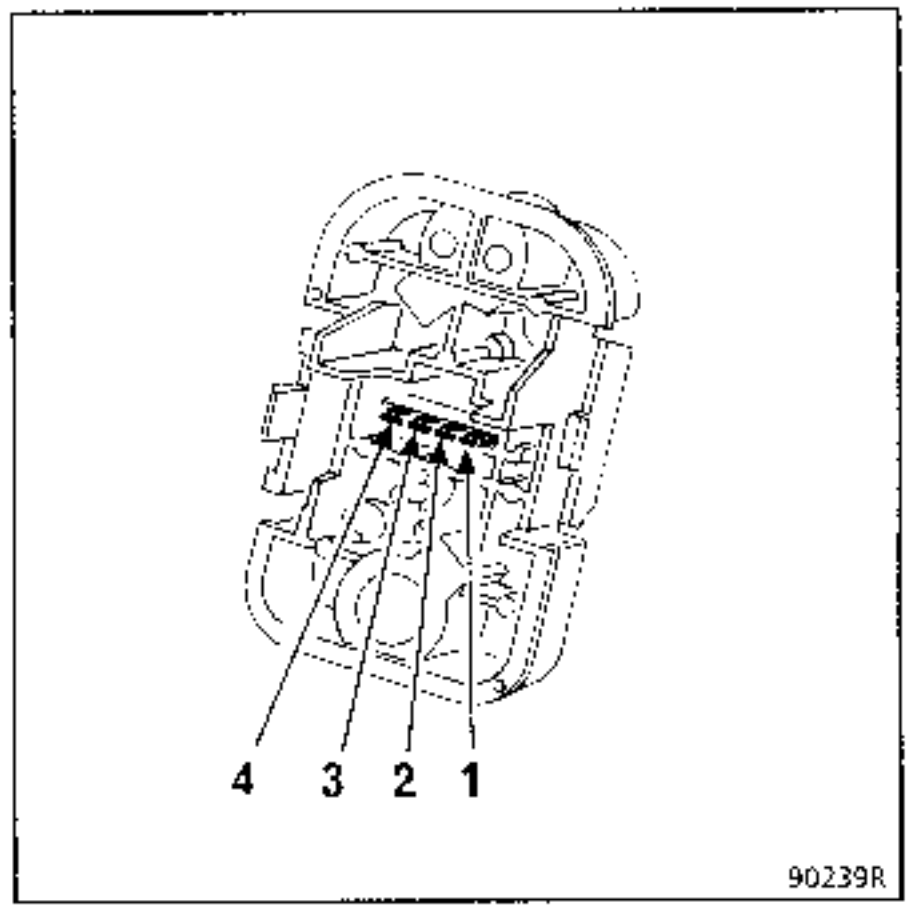
To gain access to the bulbs, free the 2 retaining lugs (2).



Remove:
- the trim piece that secures the number plate (6 screws and one nut behind the number plate on early vehicles).
- the rear light (4 screws).

Pull the rear light outwards.

CONNECTION



1 Rear fog light
2 Earth
3 Reversing light
4 Not used

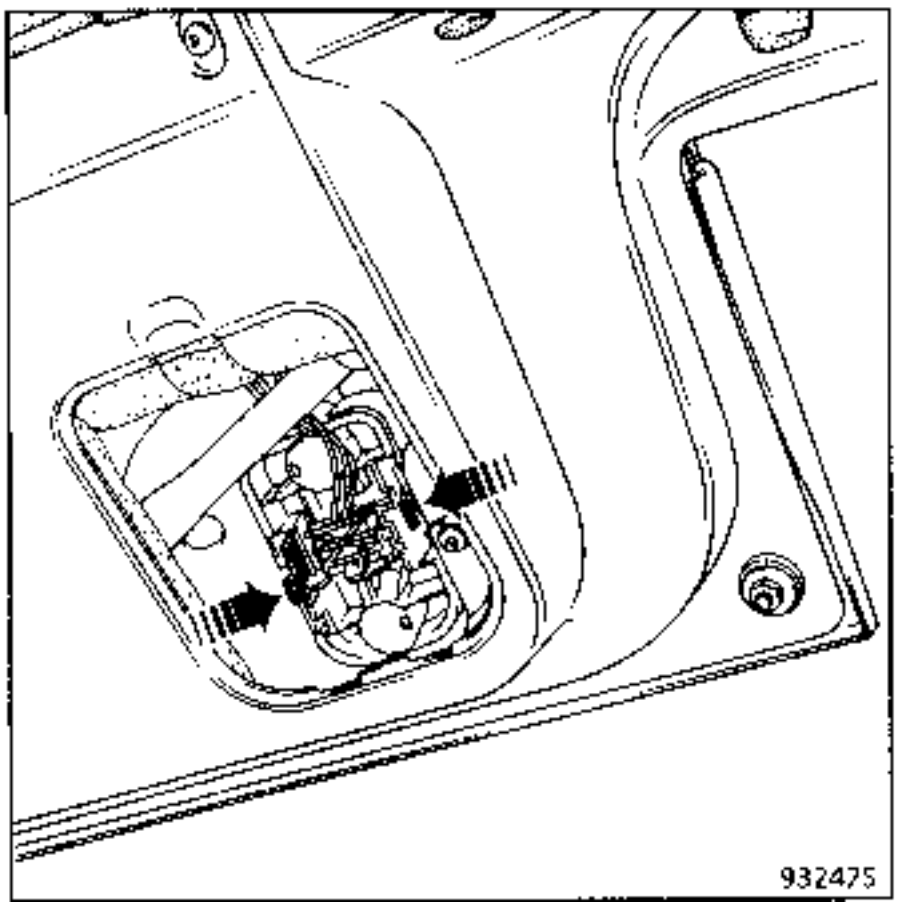
The rear lights mounted on the boot form one single assembly.

REMOVING

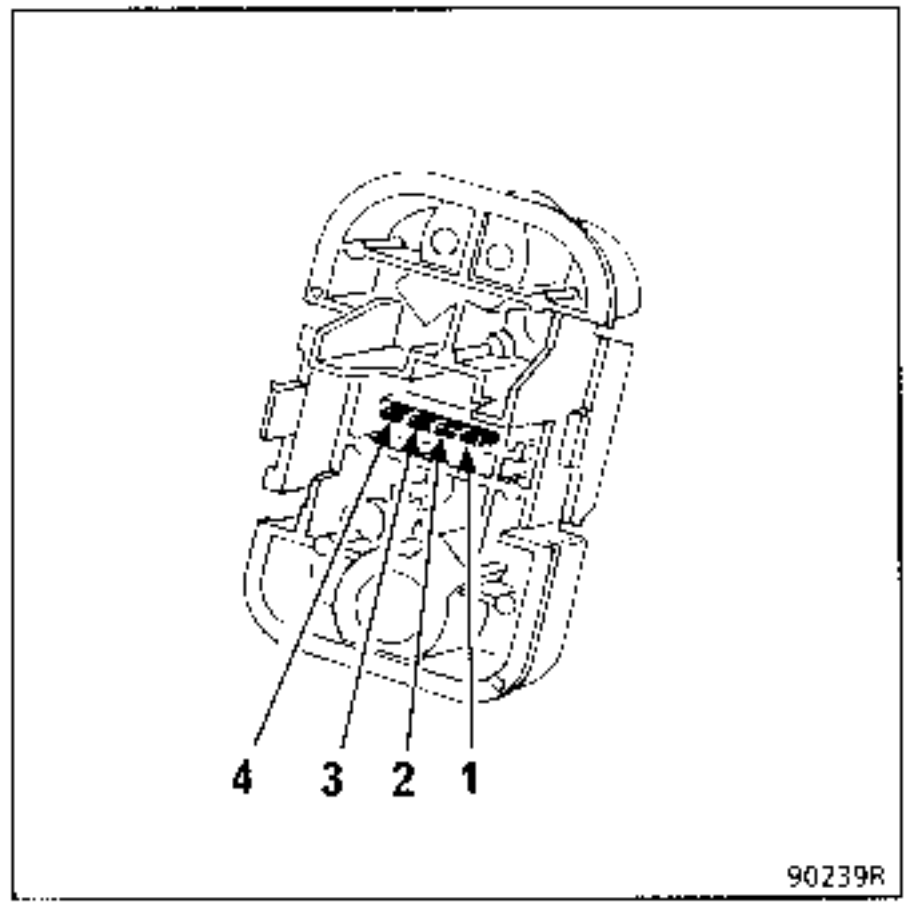
Disconnect the right and lefthand rear light connectors and the number plate light connectors.

Remove the 4 screws from the righthand rear light, the 4 screws from the lefthand rear light and the nut behind the number plate.

To gain access to the bulbs, free the 2 retaining lugs.



CONNECTION



1 Reversing light
2 Earth
3 Fog light
4 Not used

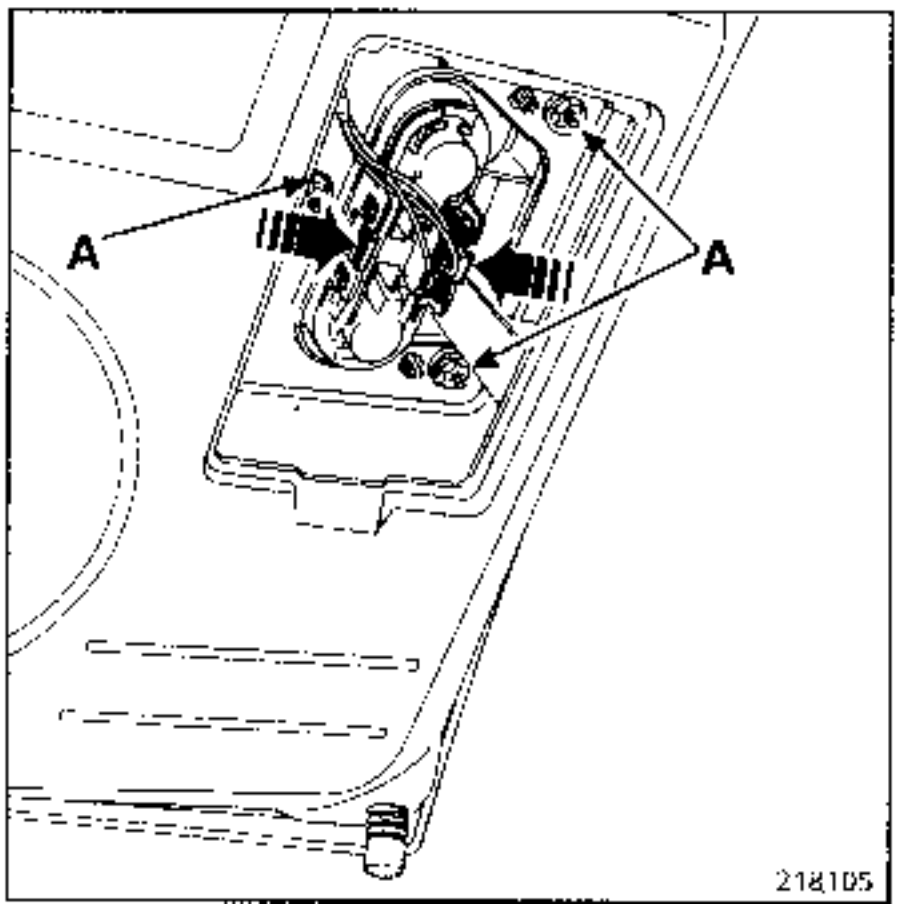
REMOVING

Remove the rear light access panel from the tailgate.

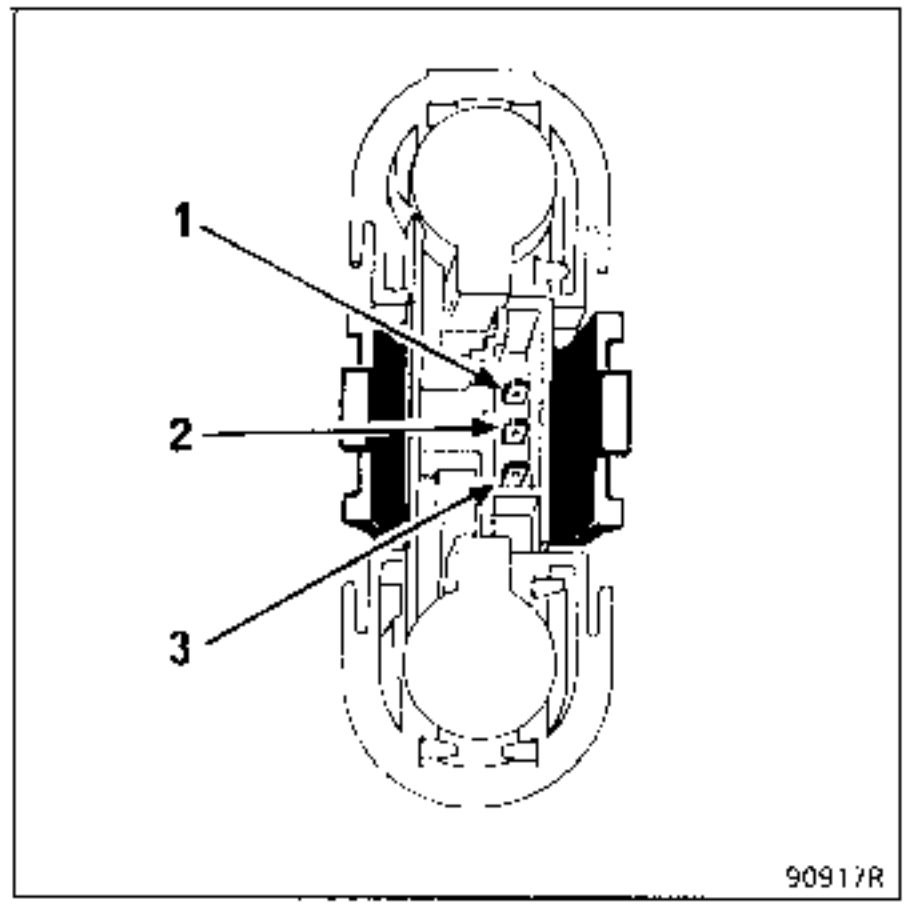
Disconnect :
- the battery,
- the connector.

Unscrew the 3 securing screws (A).

Remove the light.



CONNECTIONS



1 Rear fog light
2 Earth
3 Reversing light

SPECIAL POINT CONCERNING OPERATION

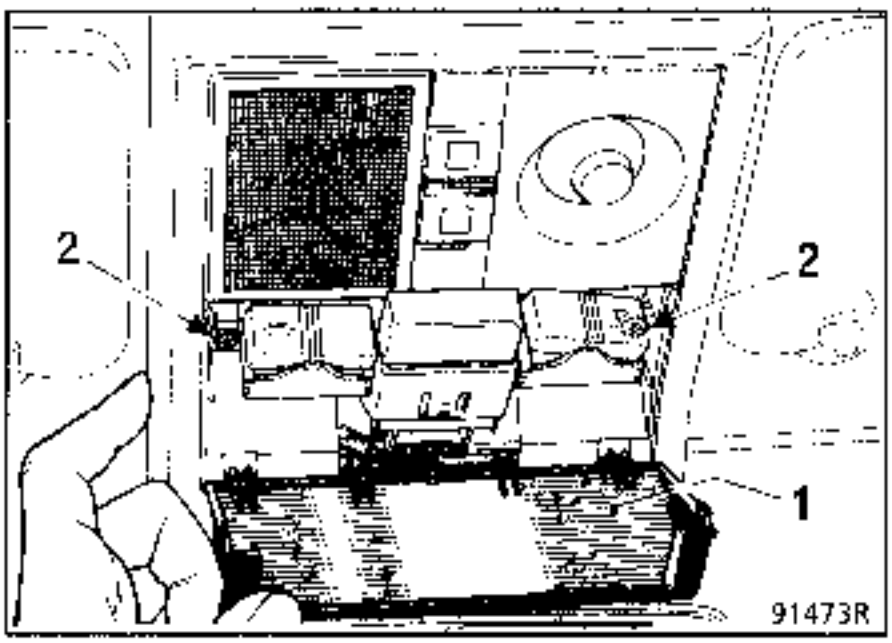
On some vehicles, the operation of the interior courtesy light is on a timer relating to the operation of unlocking the doors using the infra-red remote control (plip). (See pages 87-2 and 87-3).

To change the spot light and interior light bulbs, the interior light assembly must be removed first.

REMOVING

Remove:
- the plastic cover (1),
- the two securing screws (2).

Pull the assembly out towards the front of the vehicle.



REMOVING THE INTERIOR LIGHT OR SPOT LIGHT

In either case, the infra-red receiver unit must be removed first (if the vehicle is equipped with one).

Disconnect the connectors.

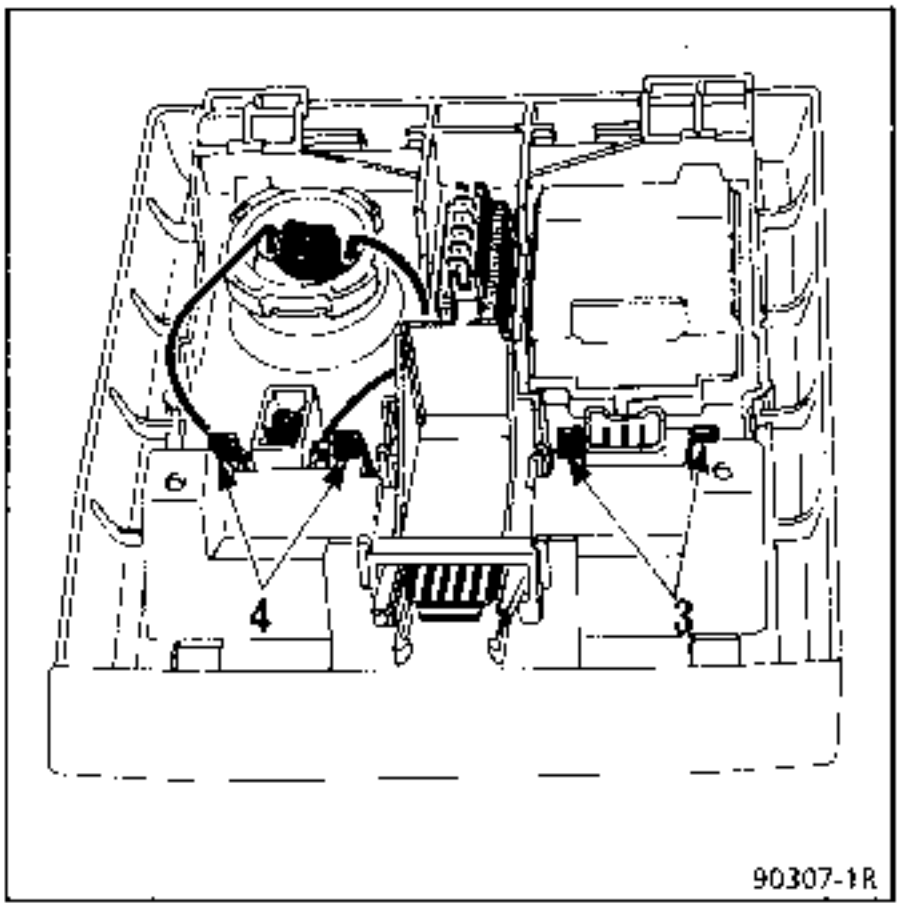
INTERIOR LIGHT

Carefully free the retaining lugs (3) and take out the switch and light assembly.

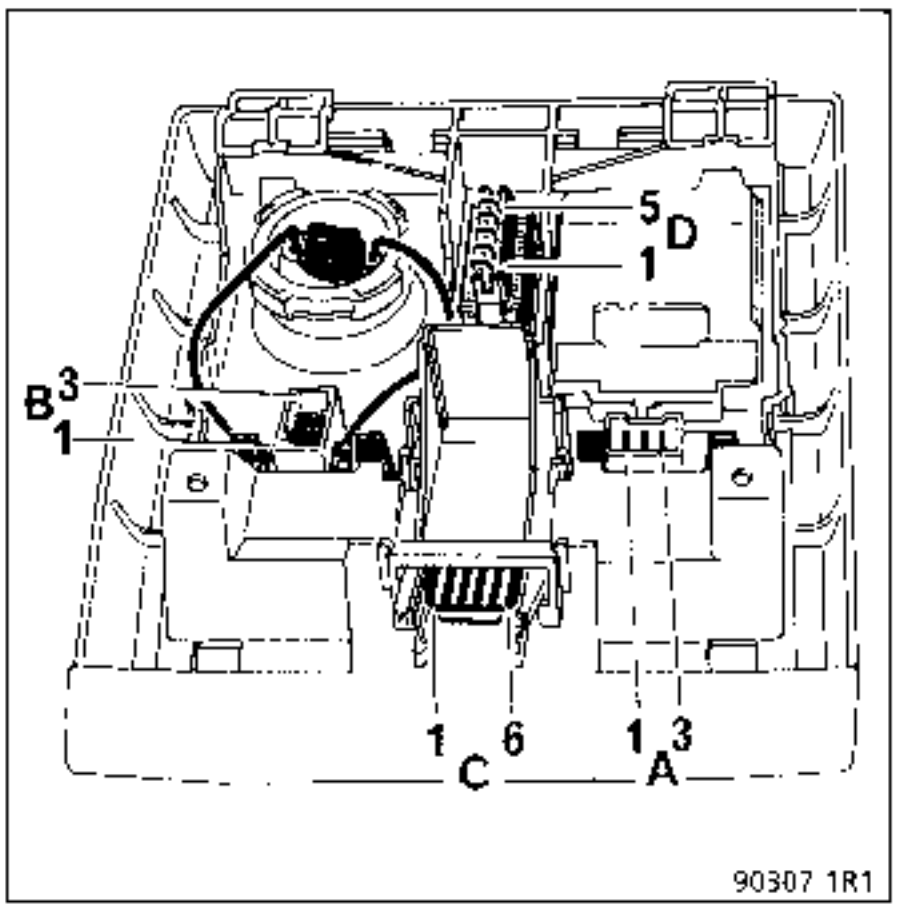
NOTE : The switch cannot be removed.

Carefully free the retaining lugs (4) and remove the spot light and switch assembly.

NOTE : The switch cannot be removed.



CONNECTIONS



CONNECTORS

INTERIOR LIGHTING (A)

1 + before ignition switch
2 Earth
3 Earth via door switch

MAP READING SPOT LIGHT (B)

1 + before ignition switch
2 Earth
3 Not used

INFRA-RED REMOTE CONTROL RECEIVER (C)
(vehicle without engine immobiliser)

1 Earth
2 Door unlock signal
3 Door unlock information
4 Door locking signal
5 Door locking information
6 + before ignition switch

INFRA-RED REMOTE CONTROL RECEIVER (C)
(vehicle with engine immobiliser)

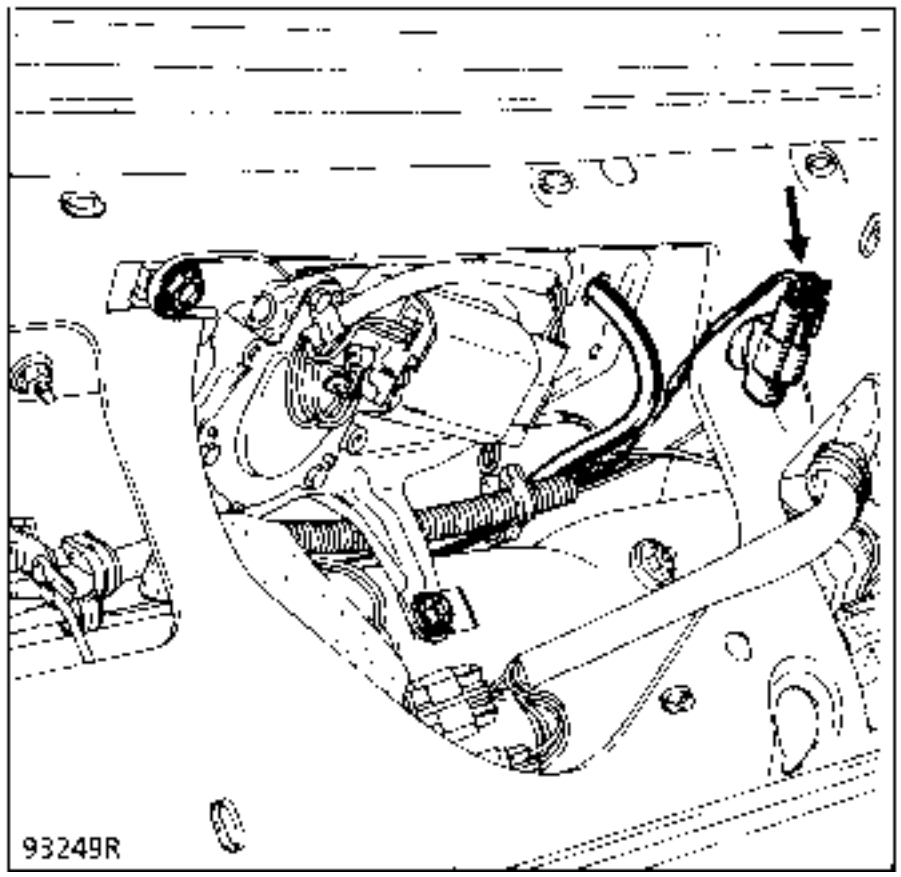
1 Earth
2 Not used
3 Infra-red receiver supply
4 Not used
5 Infra-red receiver outlet
6 Not used

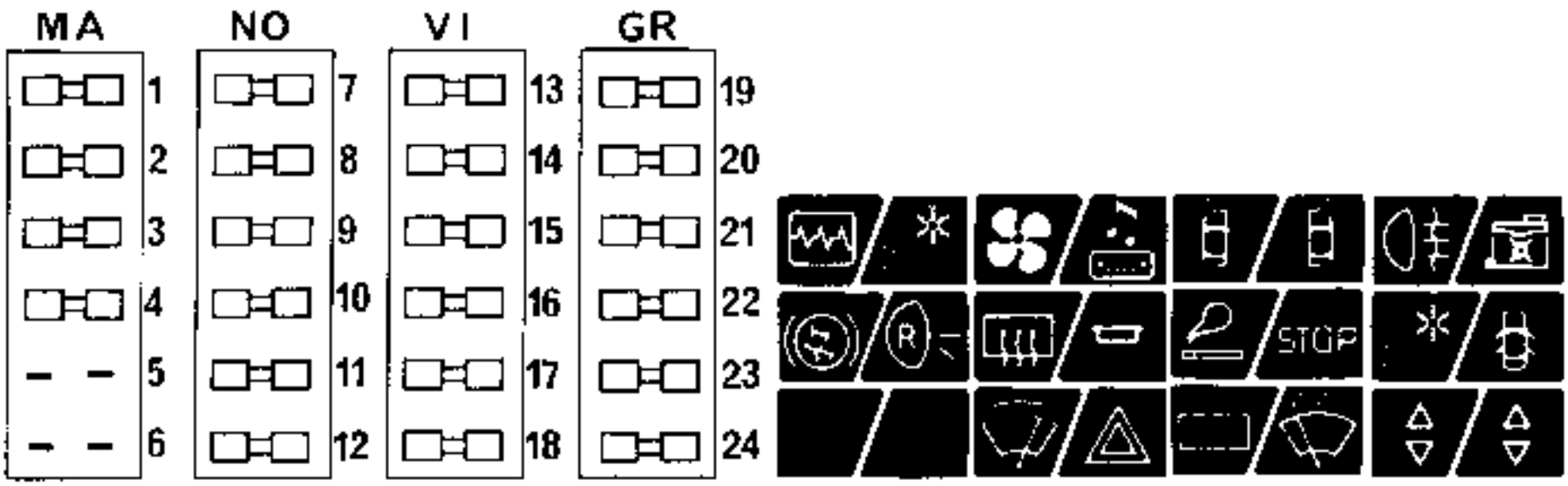
SUNROOF SWITCH (D)

1 Motor
2 Earth
3 + after ignition switch
4 Not used
5 Motor

BOOT LIGHT SWITCHES

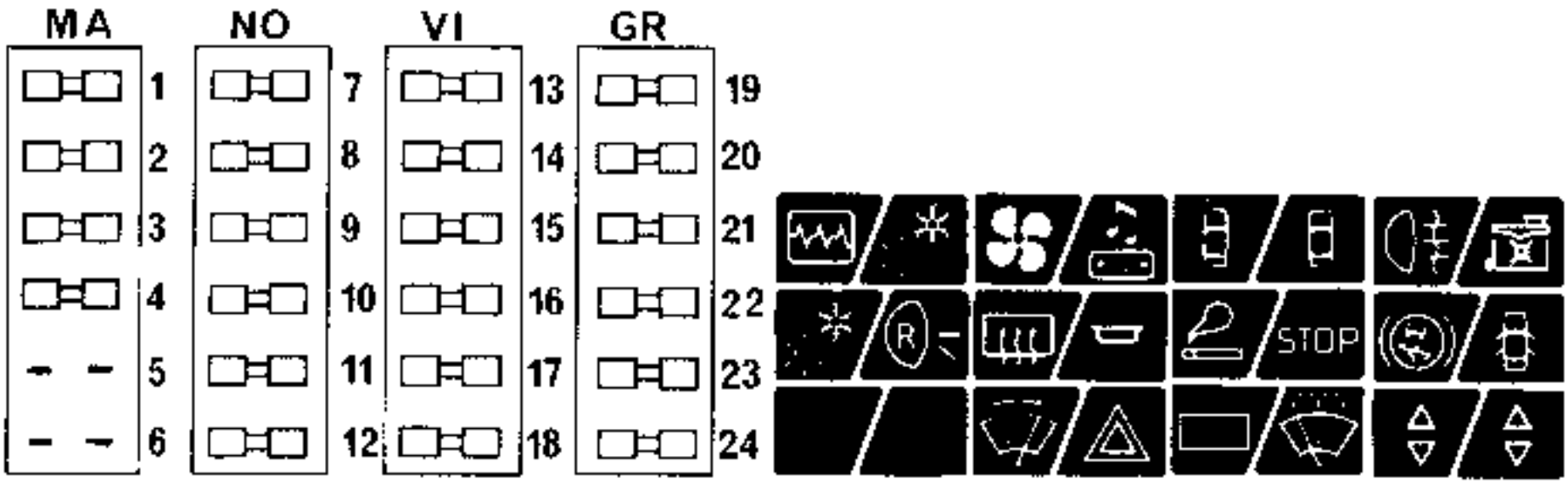
On type B48 vehicles, the boot light switch is a ball type switch mounted on the tailgate.





218106

N°	Amps	Allocation
1	5	Automatic transmission
2	30	Air conditioning
3	3	A.B.S.
4	5	Reversing light/Automatic transmission
5	-	Not used
6	-	Not used
7	20	Heater
8	10	Radio
9	20	Heated rear screen/rear wash/wipe
10	5	Clock/Interior lights Radio (before ignition)/Instrument panel (before ignition)
11	10	Windscreen wiper park/timer
12	10	Flasher unit Hazard warning lights
13	5	LH side/rear lights
14	5	RH side/rear lights
15	0	Cigar lighter
16	10	Stop lights
17	10	Inst. panel/Reversing lights
18	15	Windscreen wipers
19	7,5	Rear fog lights
20	20	Engine cooling fan
21	30	Air conditioning
22	25	Electric door locks/Electric rear view mirrors
23	30	LH window winder
24	30	RH window winder/ Sunroof



218107

N°	Amps	Allocation
1	5	Automatic transmission
2	30	Air conditioning
3	30	Air conditioning
4	-	Not used
5	-	Not used
6	-	Not used
7	20	Heater/Rear screen wash/wipe
8	10	Radio/Alarm (after ignition)
9	20	Heated rear screen
10	5	Clock/Interior lights Radio ((before ignition) / Instrument panel (before ignition)
11	10	Windscreen wiper park/timer
12	10	Flasher unit Hazard warning lights
13	5	LH side/rear lights Front fog lights
14	5	RH side/rear lights
15	10	Cigar lighter/Rear screen wash/wipe (park)
16	10	Stop lights/cruise control
17	10	Inst. panel/Reversing lights/Alarm
18	15	Windscreen wipers
19	7,5	Rear fog light
20	20	Engine cooling fan
21	3	A.B.S.
22	25	Electric door locks/Alarm (+ before ignition)/ Electric rear view mirrors
23	30	LH window winder
24	30	RH window winder/Sunroof

DESCRIPTION

The burglar alarm comprises:
- 1 alarm computer for processing and managing information,
- 1 volumetric detection unit (ultrasound), plus warning light,
- 1 self-fed siren (option) with on/off key switch,
- 1 alarm suppression key switch.

LOCATION OF THE COMPONENTS

Alarm computer

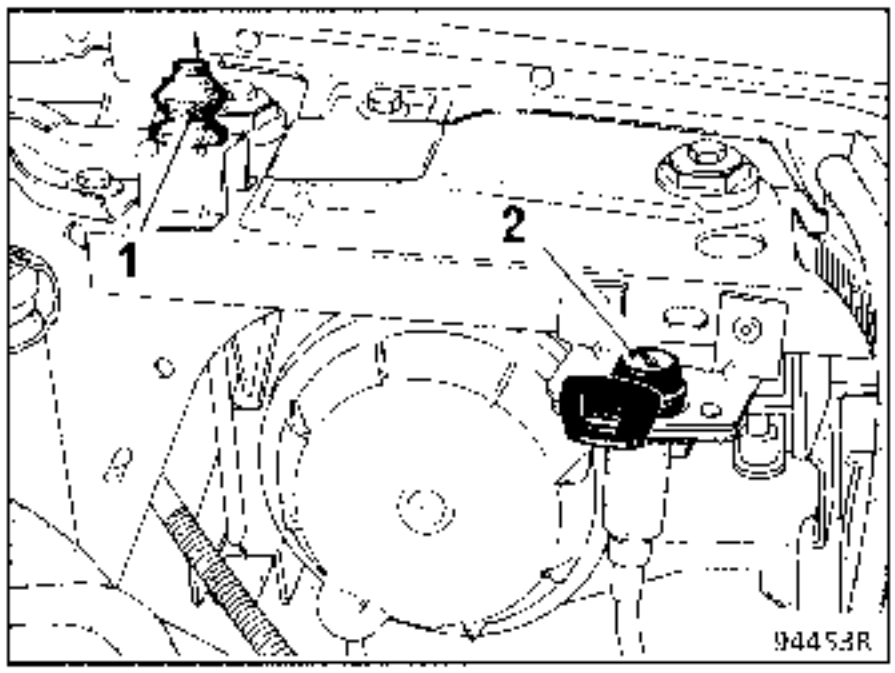
Strapped to a mounting on the floor, on the left hand side of the clutch pedal.

Volumetric detection unit

On the roof console with the PLIP receiver and the alarm standby warning light.

Self-fed siren

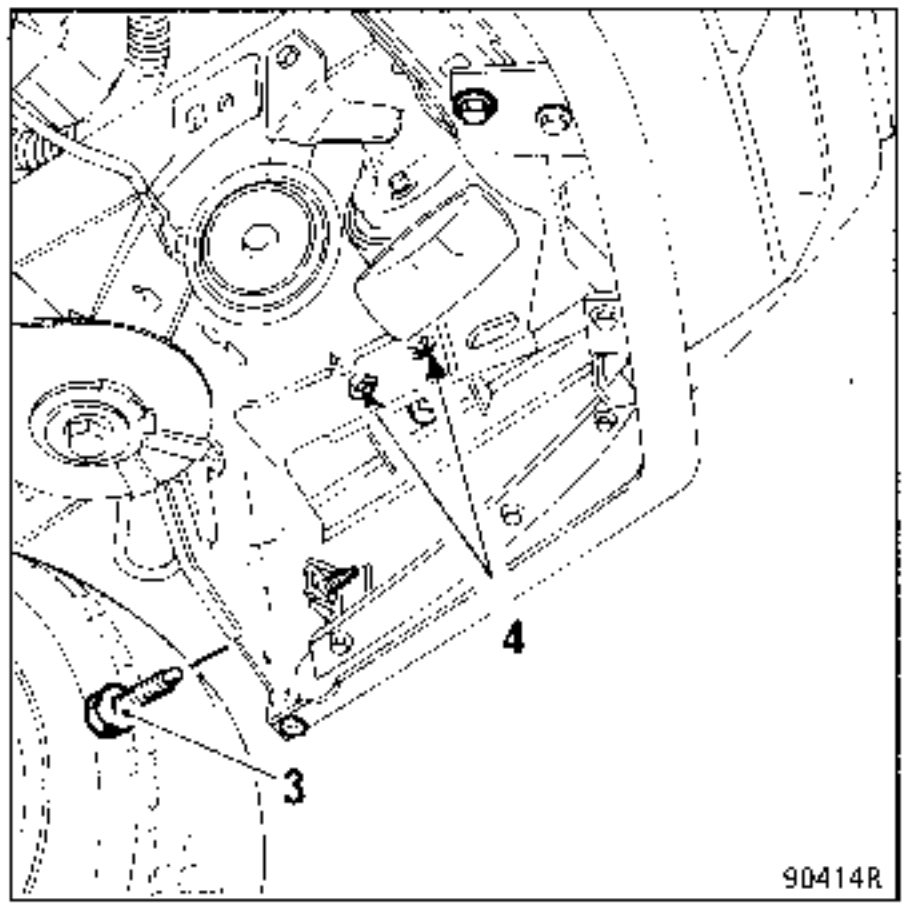
Located in the bumper, under the front right hand headlight unit, this is fitted with a remote key switch, mounted vertically on the front right hand headlight carrier panel. Check that the sealed cover is correctly refitted to prevent the ingress of water and dust.



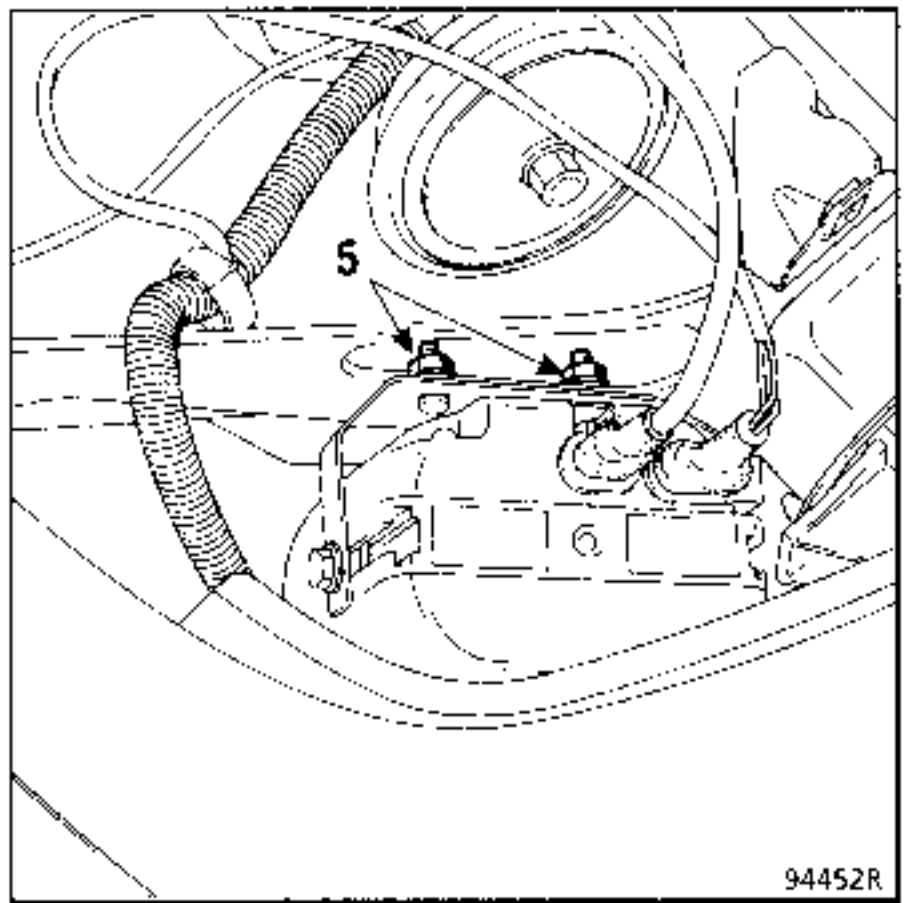
1 Bonnet switch
2 Key switch - remote from siren

REMOVING THE SIREN

Remove:
- the front right hand headlight unit (see method on page 81-),
- bolt (3) then the two bolts (4) via the engine compartment,



- passing your left arm under the washer fluid bottle, the lower siren mounting bolt (located vertically).
- the two siren mounting nuts (5) and their pressure bar.



Holding the bumper at the ends, pull it outwards to separate it from the wing and lift it, **while removing the siren with its mounting.**

Disconnect the two siren connectors.

Unclip the fog lights connector (depending on equipment).

Separate the siren from the mounting.

Alarm suppression key switch

This switch is located in the glovebox, at the top near to the light.

When working on the vehicle, it is advisable to have the key to turn the alarm off. Remember to switch the siren off too (if the vehicle has this option) using its special key. Remember to turn back on both the alarm and the siren (if fitted) after the operation.

NOTE : if the vehicle is fitted with the alarm and the self-fed siren as an option, the one key is used for both key switches.

ADVICE : ensure that the keys for the alarm and the siren are not separated from the vehicle keys.

OPERATION

This alarm ensures:

- volumetric protection of the passenger compartment by an ultrasound field. Any modification to the interior volume (disruption of the emission and receiving of the ultrasounds) will trigger the alarm,

- perimetric protection; the alarm unit is connected to all the vehicle opening elements (front and rear doors, bonnet, boot), so if one of them is opened, the alarm will be triggered immediately.

ALARM SIGNALS - VISIBLE AND AUDIBLE

In accordance with current legislation, once the alarm has been triggered, the dipped headlights*, hazard warning lights, original vehicle horn or the siren, if fitted, will operate alternately for 25 seconds (± 5 s) . After 25 seconds (± 5 s) of silence, the alarm will rearm itself automatically to monitor the vehicle once more.

NOTE : after being triggered 3 times in succession, the alarm will become inactive, but the warning light will continue to flash to simulate stand by.

(*) depending on country

SETTING THE ALARM

The alarm is set when the doors are locked by the remote control (using the key will not set the alarm).

"Close" information is sent on track 5 of the PLIP unit to track 6 of the alarm unit (MTIS 15 track black connector) (see diagram).

This pulse sets the perimetric and volumetric detection systems. This is shown by the hazard warning lights flashing twice and the roof console warning light illuminating. This warning light remains illuminated for about 20 seconds, then flashes. This period is used by the sensors to analyse the volume of the passenger compartment. They reset each time the alarm is set, to take into account any change in volume (luggage, packages , etc...)

Any change in the volume after the alarm has been set (examples : window broken or a foreign body enters the passenger compartment or any movement inside the passenger compartment) will disrupt the ultrasound field and immediately trigger the alarm.

The same applies to the vehicle's opening elements, which, when opened, send an earth to the alarm unit via the switches on the doors, bonnet and boot (see diagram).

The alarm may therefore only operate normally if all the doors, bonnet and boot, as well as the windows and sunroof (depending on equipment), are correctly closed.

IMPORTANT: an animal, if left in the vehicle, may trigger the alarm when it moves.

If the alarm is being triggered incorrectly, check that the user has not hung any **objects from the rear view mirror, which may swing about.**

When the system is set, ensure the hazard warning lights flash. If they do not, the boot, bonnet or one of the doors is still open. Perimetric protection will no longer be assured.

When the opening element is closed, the hazard warning lights will flash to show that protection is active once more.

TURNING THE ALARM OFF

The alarm is turned off when the PLIP is used to unlock the doors. "Open" information is sent on track 3 of the PLIP unit to track 5 on the alarm unit. This pulse turns off the perimetric and volumetric protection systems (this is also the case if the alarm has been triggered).

This is shown by the hazard warning lights flashing and the warning light on the roof console extinguishing.

IMPORTANT: opening the doors using the key will not turn the alarm off and will not stop it if it has been triggered. The key switch, hidden in the glovebox, may be used to allow or prevent the last status of the alarm system as set by the PLIP.

DURATION OF OPERATION

After 5 weeks on continuous standby the battery may not have enough power to ensure the vehicle operates correctly.

SIREN

When the siren is fitted, 2 1/2 hours driving is required to ensure the internal battery has enough power for the siren to operate correctly.

TESTING THE ALARM

Set the alarm using the PLIP.

Check that the hazard warning lights flash twice and the warning light illuminates; otherwise turn the key in the key switch in the glovebox.

TESTING PERIMETRIC PROTECTION

Set the alarm using the PLIP.

Unlock a door using the key and open it; the alarm should be triggered (dipped headlights*, hazard warning lights, original horn or siren operate alternately).

Stop the alarm using the PLIP.

(*) depending on country.

TESTING VOLUMETRIC PROTECTION

Half open a front or rear window.

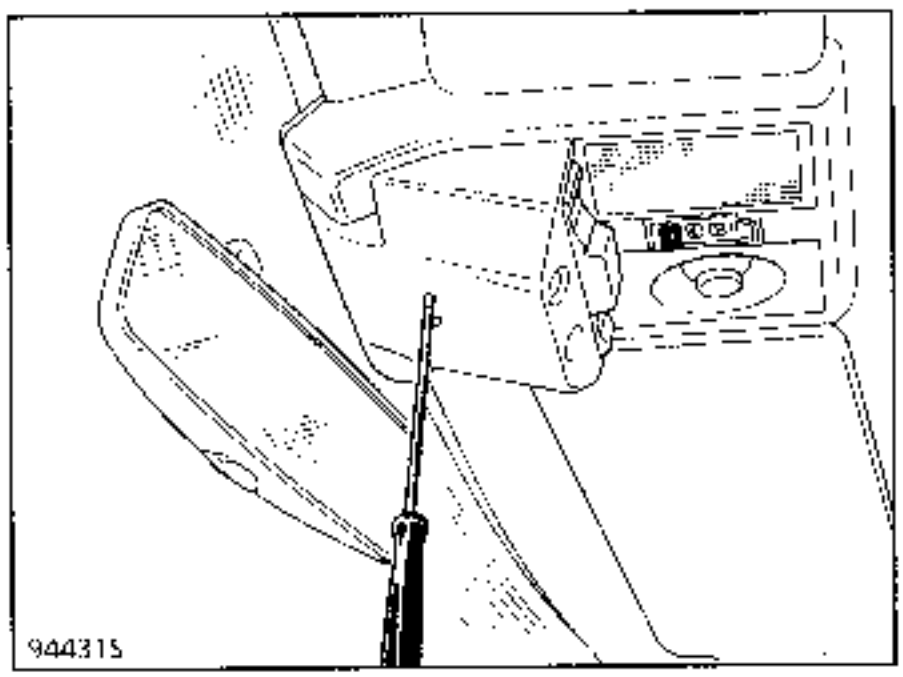
Set the alarm using the PLIP and wait for the warning light to flash.

Put your arm through the half open window and move it around in the passenger compartment; the alarm should be triggered, otherwise the sensitivity of the ultrasound module requires adjusting.

ADJUSTING THE ULTRASOUND SENSITIVITY

Put the ignition key in the accessories position (first notch) ; the warning light illuminates each time a movement is detected, but the alarm will not be triggered.

Remove the rubber plug from next to the warning light.
Using a small screwdriver, turn the potentiometer clockwise to increase the sensitivity or anti-clockwise to decrease the level.



SENSITIVITY ADJUSTMENT TABLE

Adjust using the potentiometer.

Reduce the value to reduce the sensitivity and vice versa.

The value is measured between tracks 2 and 4 on the detection unit electronic circuit.

TRIM		
Cloth	Leather	Baccara Leather
80 kΩ	60 kΩ	55 kΩ

CHECKING

Open a window, leave the vehicle and pass your arm through the open window; the warning light should illuminate when the arm is moved.

Continue to adjust until the required sensitivity is obtained.

Refit the plug.

IMPORTANT: do not set the ultrasound to too sensitive a level - the alarm may be triggered incorrectly.

ALLOCATION OF ALARM UNIT CONNECTOR TRACKS

(A) 15 tracks

1 Self-fed siren control
2 + 12 V after ignition
3 + 12 V accessories (1st notch ignition switch)
4 Earth
5 PLIP open information
6 PLIP close information
7 Front right hand door 1st notch switch
8 Front left hand door 1st notch switch
9 Rear right hand door 1st notch switch
10 Boot switch
11 Bonnet switch
12 Rear left hand door 1st notch switch
13 Ultrasound activation
14 Ultrasound detection
15 Warning light control

(B) 5 tracks

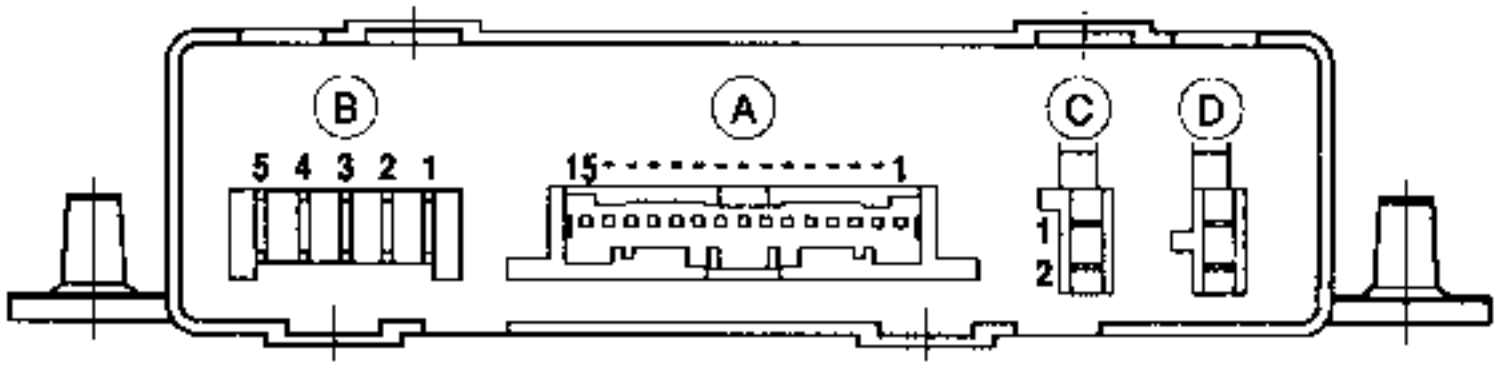
1 Right hand hazard warning lights
2 Left hand hazard warning lights
3 Dipped headlights*
4 Horn
5 + 12 V before ignition

(C) 2 tracks

1 Key switch (glovebox)
2 Key switch (glovebox)

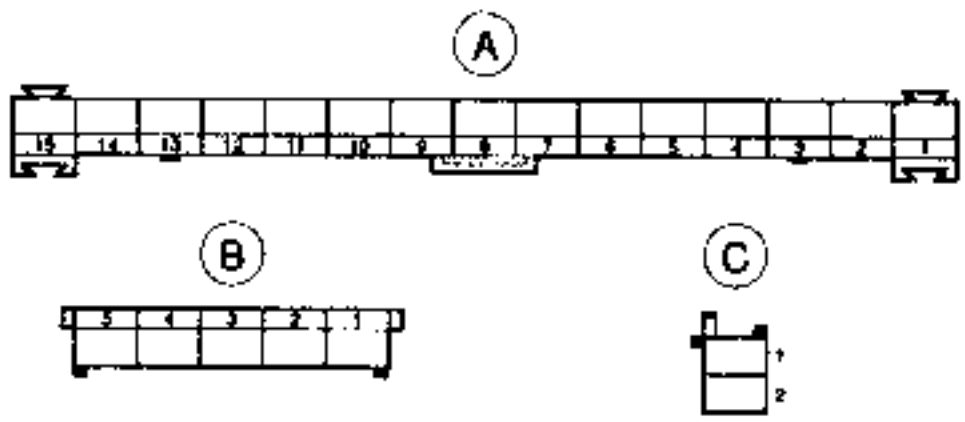
(D) Not used

(*) depending on country.



DG1004

Alarm unit

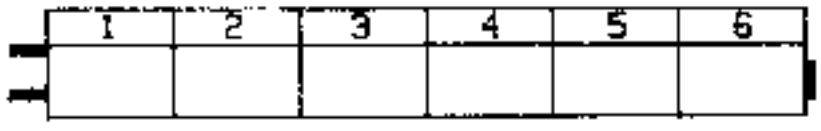


218201

Connectors at wiring end

NOTE : Connectors for the wiring are shown at wiring end.

ALLOCATION OF INFRARED RECEIVER CONNECTOR TRACKS (on roof console)

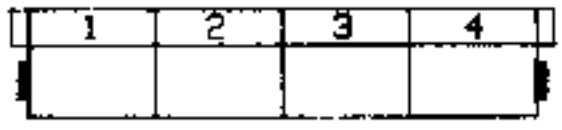


DG1005

1 PLIP earth
2 CPE* open command
3 Alarm open information
4 CPE* close command
5 Alarm close information
6 + before ignition PLIP

* CPE : central door locking

ALLOCATION OF DETECTION UNIT CONNECTOR TRACKS (on roof console)



DG1006

1 Ultrasound activation
2 Ultrasound detection
3 Alarm standby warning light
4 Detection unit earth

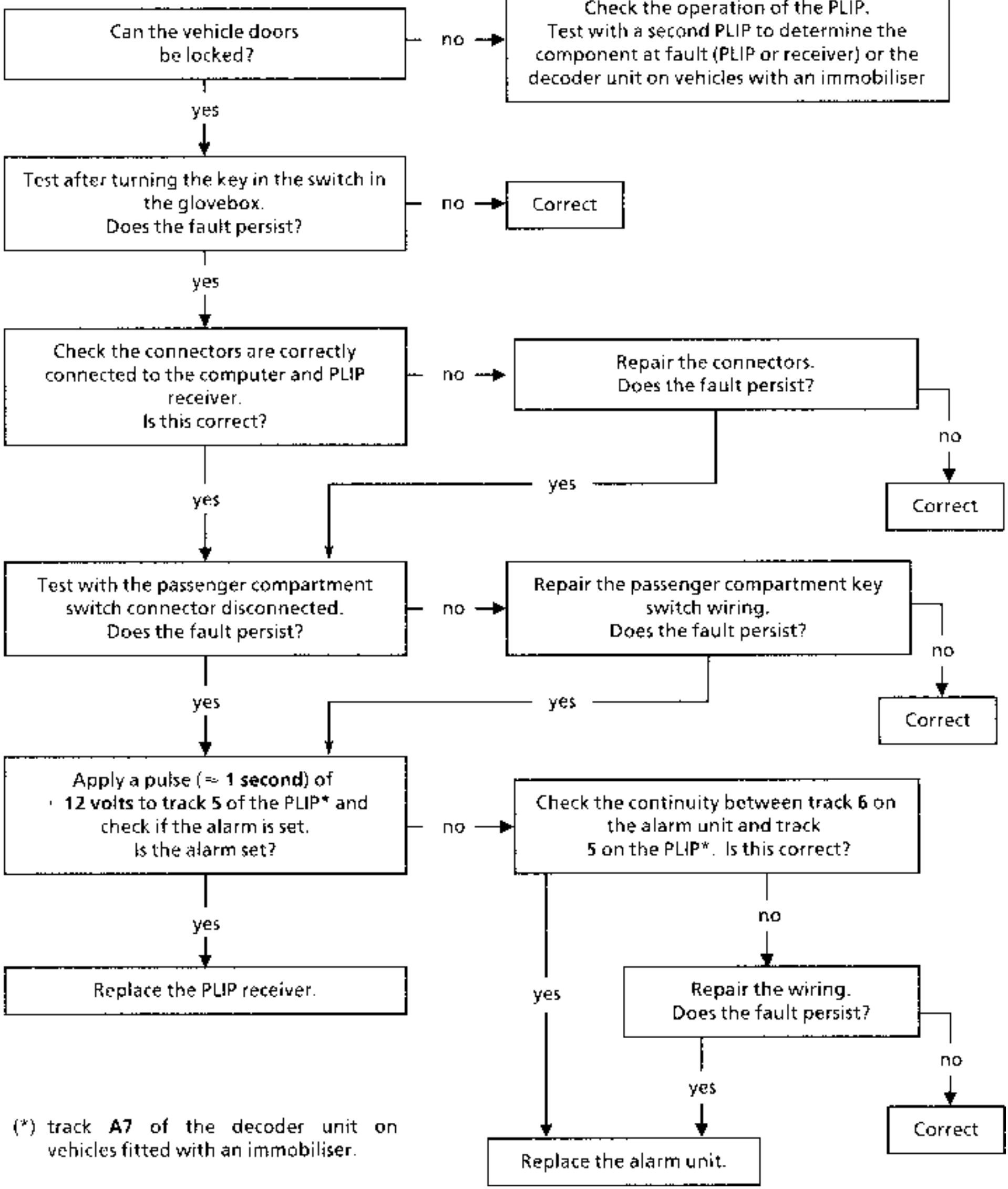
NOTE : Connectors for the wiring are shown at wiring end.

FAULT FINDING

CUSTOMER COMPLAINTS

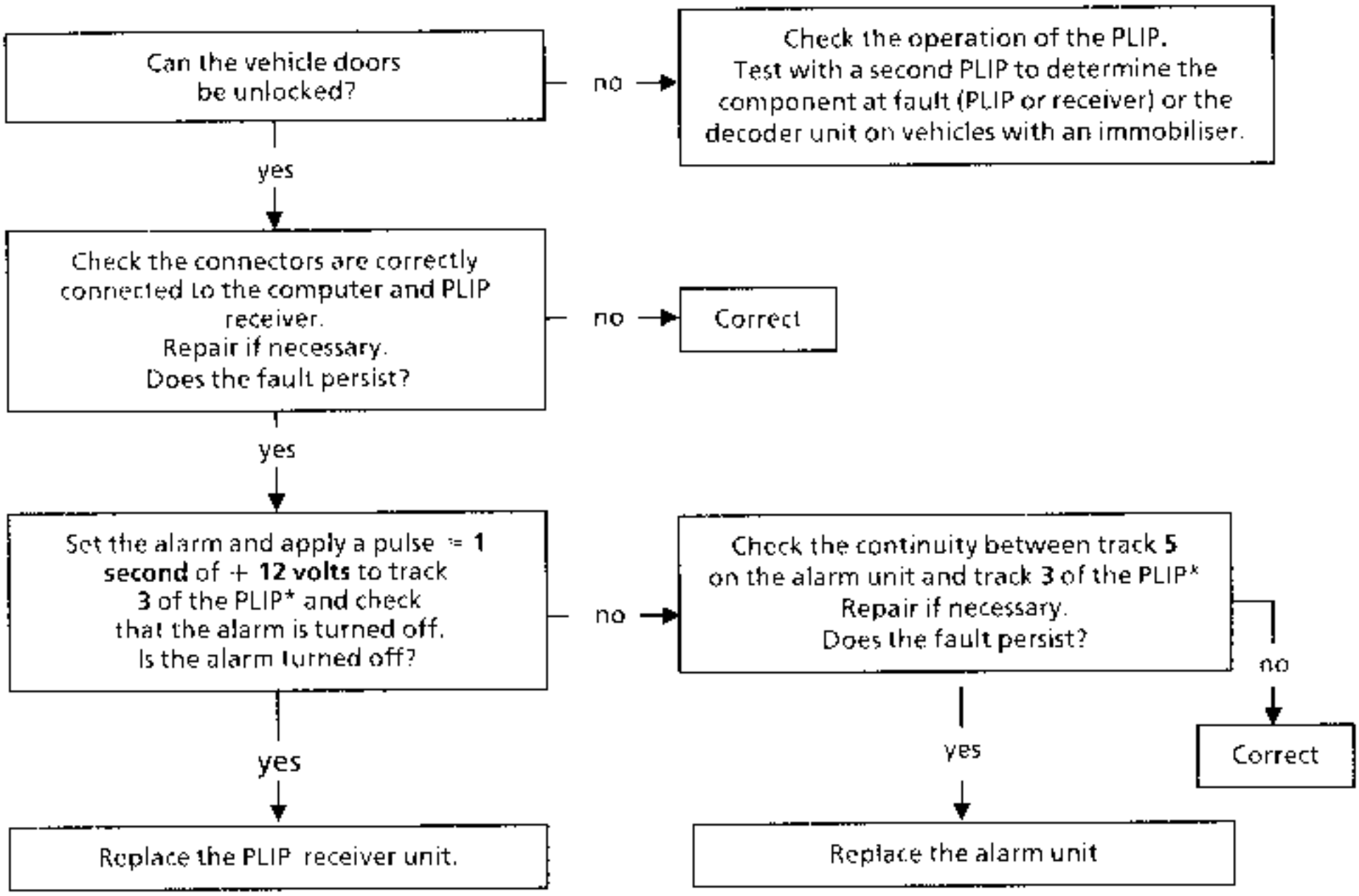
- PLIP cannot be used to set alarm — Chart 1
- Alarm cannot be turned off
  - By the PLIP — Chart 2
  - By the passenger compartment key switch — Chart 3
- Alarm triggered incorrectly when on stand by — Chart 4
- Incorrect operation
  - Siren sounds when driving — Chart 5
  - Hazard warning lights do not flash when alarm is set — Chart 6
  - Dipped headlights do not illuminate when alarm triggered — Chart 7
  - Audible warning does not sound
    - with siren — Chart 8
    - without siren — Chart 9

Chart 1 : PLIP cannot be used to set alarm



(*) track **A7** of the decoder unit on vehicles fitted with an immobiliser.

Chart 2 : Alarm cannot be turned off by the PLIP



(*) track **A6** on the decoder unit for vehicles fitted with an immobiliser

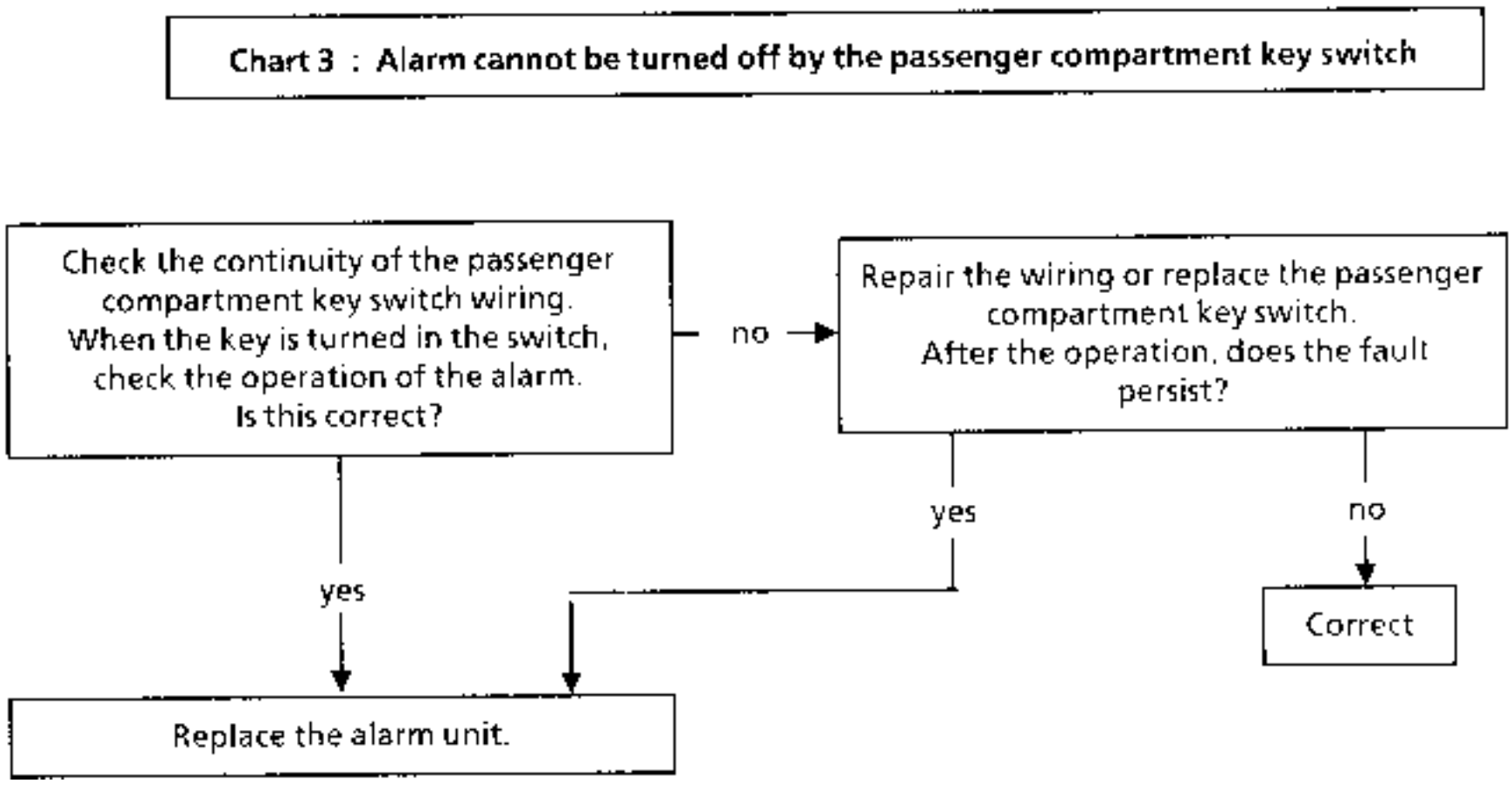


Chart 3 : Alarm cannot be turned off by the passenger compartment key switch
Check the continuity of the passenger compartment key switch wiring.
When the key is turned in the switch, check the operation of the alarm.
Is this correct?
no
Repair the wiring or replace the passenger compartment key switch.
After the operation, does the fault persist?
yes
no
yes
Correct
Replace the alarm unit.

Chart 4 : Alarm triggered incorrectly when on stand by

Set the alarm then check by pressing on the opening elements (doors, bonnet, boot) that the alarm is not triggered.
Is the alarm triggered?

yes → Check the adjustment and condition of the switch or the opening element at fault. Adjust or repair.
Does the fault persist?

yes → Leave the bonnet open to cancel perimetric protection and reset the alarm.
NOTE : the hazard warning lights will not flash - this is normal.
Tap sharply on one of the vehicle windows using the flat of your hand.
Is the alarm triggered?

no → See Chart 5 siren sounds when driving.

no → Correct

no

yes → Check the ultrasound sensitivity setting at terminals 4 (earth) and 2 on the detection unit (see adjustment values table p. 82-).
Is the setting correct?

no → Adjust to suit the interior trim.
Does the fault persist?

yes

no → Correct

yes → Check the continuity of the wires between the detection unit and the alarm unit.

Detection unit		Alarm unit
1	and 13	
2	and 14	
3	and 15	
4	and vehicle earth	

Between track 4 on the alarm unit and vehicle earth.
Repair if necessary.
Does the fault persist?

no → Correct

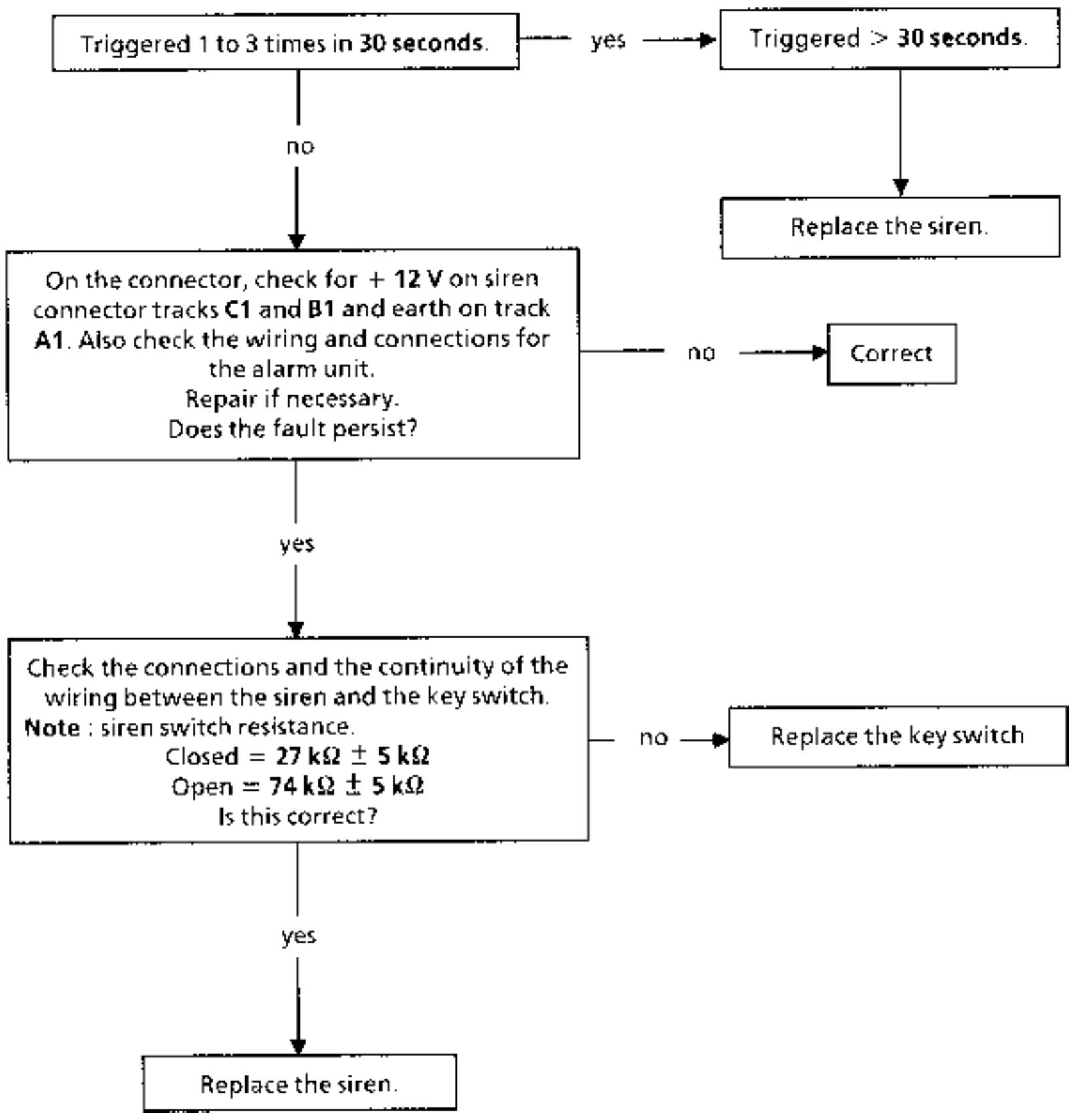
yes → Replace the detection unit.
Does the fault persist?

no → Correct

yes → Replace the alarm unit.

INCORRECT OPERATION

Chart 5 : Siren sounds when driving



INCORRECT OPERATION

Chart 6 : Hazard warning lights do not flash when alarm is set

Check by pressing the hazard warning lights switch that the lights operate correctly.
Do they operate correctly?

- no → Check the hazard warning lights
- yes ↓

Check the feed fuse on track **5** (**5** track connector on the alarm unit).
Repair if necessary.
Does the fault persist?

- no → Correct
- yes ↓

Test after turning the key in the switch in the glovebox.
Does the fault persist?

- yes → Stop
- no ↓

Check that the opening elements (doors - bonnet - boot) close correctly.
Adjust if necessary.
Does the fault persist?

- no → Correct
- yes ↓

On the **15** track alarm unit connector, check if the continuity is infinity on the wires corresponding to the opening elements: tracks 7 to 12. Is this correct?

- no → Note the opening element at fault, check the wiring for the faulty switch. After repair, does the fault persist?
  - no → Correct
  - yes → Replace the faulty lock.
- yes ↓

Sit in the vehicle, close the opening elements and check that when the alarm is set, there is + 12 volts (2 pulses) on track **1** of the alarm unit, reset the alarm and repeat the operation on track **2**
(black **5** track connector).
Is this correct?

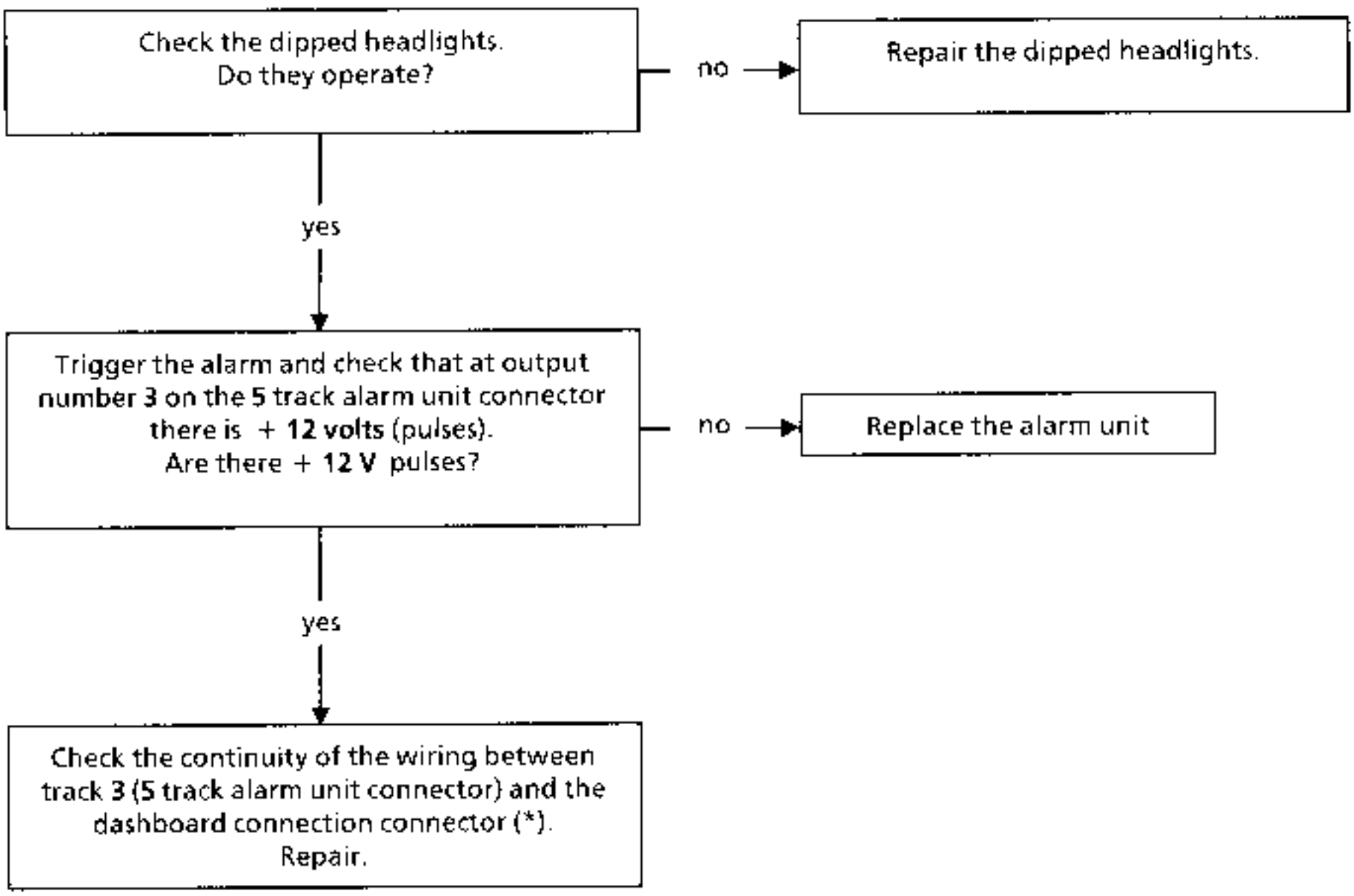
- no → Replace the alarm unit
- yes ↓

Check the continuity of the wiring on tracks **1** and **2** (**5** track connector on the alarm unit) and the dashboard connection connector (*).
Repair.

(*) see vehicle wiring diagram

INCORRECT OPERATION

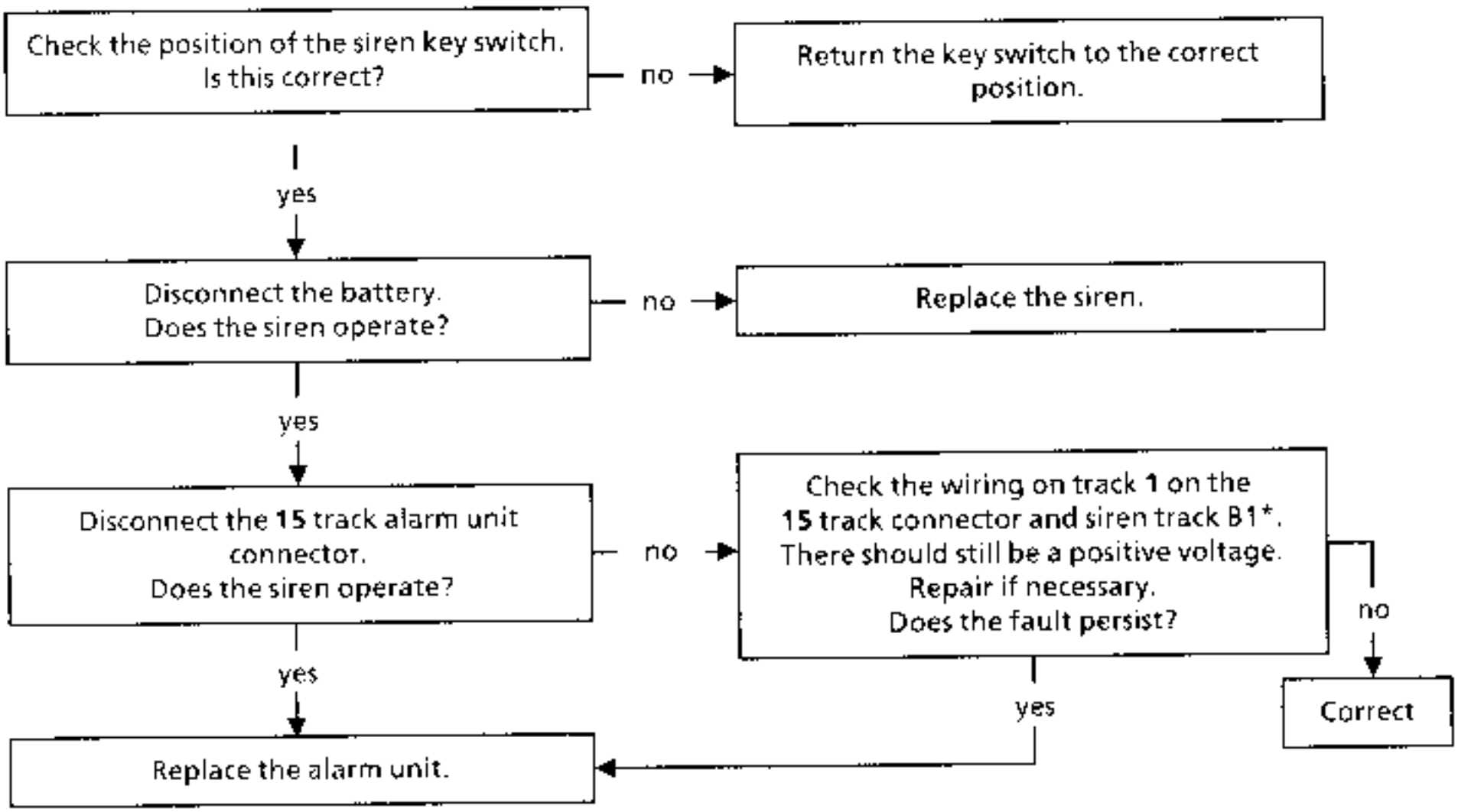
Chart 7 : Dipped headlights do not illuminate when alarm triggered



(*) see vehicle wiring diagram

INCORRECT OPERATION

Chart 8 : Audible warning does not sound (with siren)



(*) see vehicle wiring diagram

INCORRECT OPERATION

Chart 9 : Audible warning does not sound (without siren)

Check the operation of the vehicle horn.
Does it operate?

— no → Repair the vehicle horn.

yes ↓

Trigger the alarm and check on output number **4** of the **5** track alarm unit connector for
+ **12 volts** (pulses).
Are there ı **12 V** pulses?

— no → Replace the alarm unit.

yes ↓

Check the continuity of the wiring between track :
- **4** on the **5** track alarm unit connector and the dashboard connection connector*.

Repair

(*) see vehicle wiring diagram

DESCRIPTION

The immobiliser system is linked to the alarm system.

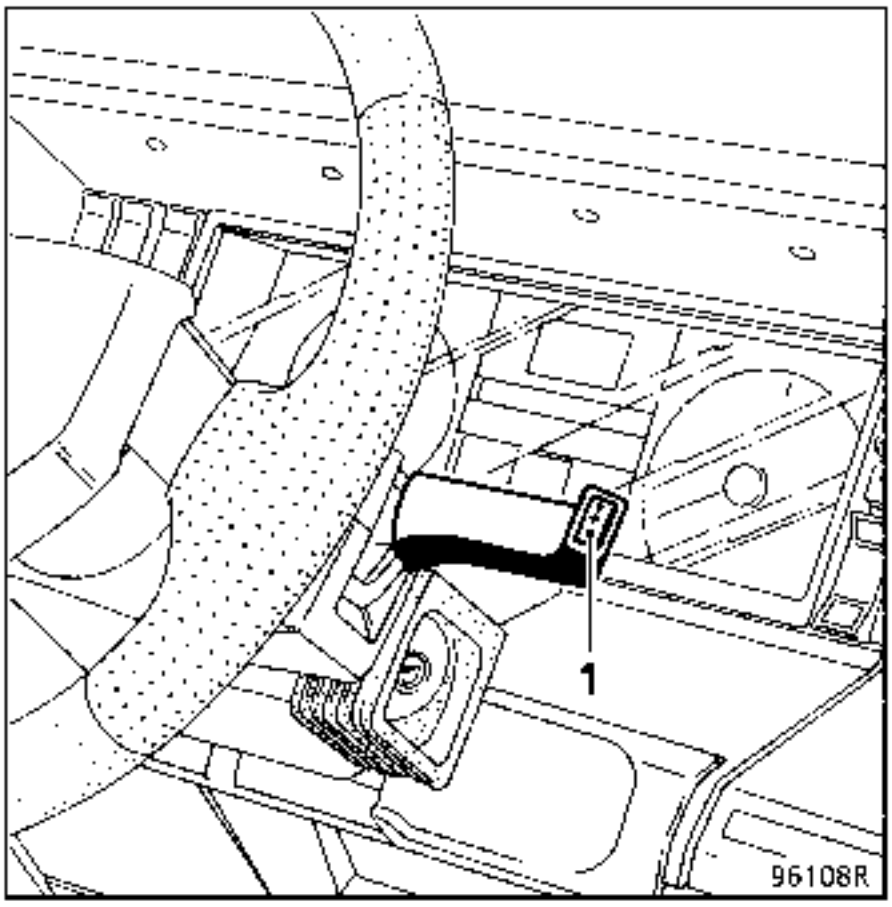
It is controlled by the PLIP.

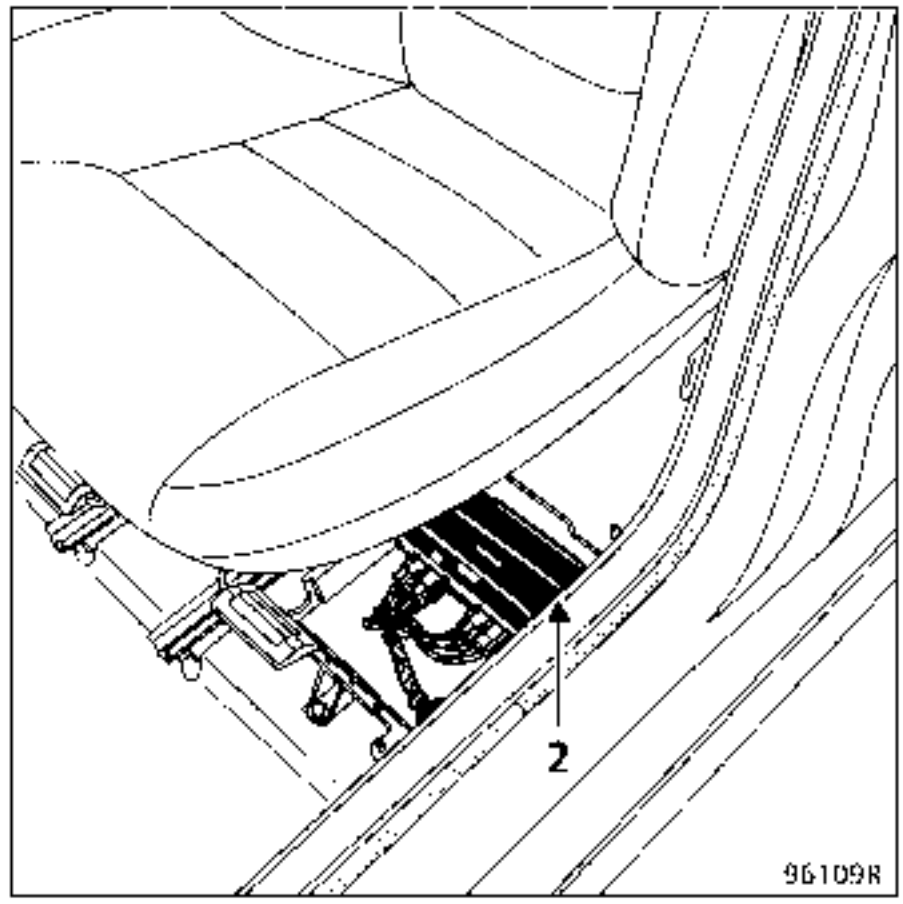
Unlocking the doors using the PLIP **turns the alarm off and permits the vehicle to be started**.

Locking the doors using the PLIP **turns the alarm on and prevents the vehicle from being started**.

The system comprises:

- the conventional alarm system,
- a special injection computer,
- an ADAC sequence display(1),
- a decoder unit (2).





This has the following functions:

- decoding of the infrared signal from the PLIP,
- the immobiliser function :
  In the presence of + after ignition feed, this generates a code on the coded line to the injection computer to authorise the vehicle to be started,
- locking / unlocking of the opening elements (doors, bonnet, etc.),
- setting / turning off of the alarm,
- management of the courtesy light which controls:
  - illumination of the courtesy light when one of the doors is opened (with or without the presence of + after ignition feed),
  - illumination of the courtesy light after the doors have been unlocked using the PLIP for a timed period of 15 seconds which starts again each time the PLIP is used (lock/open),
  - extinguishing of the courtesy light when + after ignition feed appears, when all doors are closed, even if a timed period has not yet expired.

OPERATION

When the doors are unlocked using the PLIP, a code is sent to the decoder unit via the infrared receiver unit.

If the decoder unit recognises the code, it turns the alarm off and after the ignition has been turned on, it sends a code to the injection computer on the coded line.

At this precise moment, one of several situations may arise:

- The injection computer has no reference code in its memory :
  - the code sent to it is stored in its memory
- The injection computer has a reference code in its memory :
  - the code sent to it is compared with the code in its memory.
  - if the two codes match, the injection computer unlocks the injection system, which allows the engine to be started.
    When the ignition is turned on, the injection warning light on the instrument panel flashes for a few seconds then remains illuminated, showing that the system is operating correctly.
    The injection warning light extinguishes when the engine is started, returning to its initial function (engine monitoring).
  - if the two codes do not match (different codes), the computer leaves the injection system locked to prevent the engine from being started (in this case the injection warning lights continues to flash).

When the doors are locked using the PLIP, the decoder unit sets the alarm and prevents a code being sent to the injection computer.

In this case, if the ignition is turned on, the injection warning light will remain flashing and the vehicle will not be able to be started.

NOTE : all actions on the PLIP will remain without effect if + after ignition feed is present.

EMERGENCY PROCEDURE

If the PLIP is faulty (example : batteries dead) the customer has two options:

- Use the second PLIP.
- Render the immobiliser function temporarily inoperational.

The method consists of entering a 4 figure code by hand using the ADAC sequence display key.

This code is on the card given to the customer when the vehicle was delivered and is covered by a protective film.

NOTE : when the customer takes delivery of his vehicle, the handover agent should ask him to take note of the code (by scratching off the protective film) and to test the procedure by entering the code himself, using the Driver's Handbook.

IMPORTANT: only the customer should carry out this operation. If the system is worked on in the workshop, the customer should enter the code himself (confidentiality).

PROCEDURE FOR ENTERING THE CODE

The PLIP does not work:

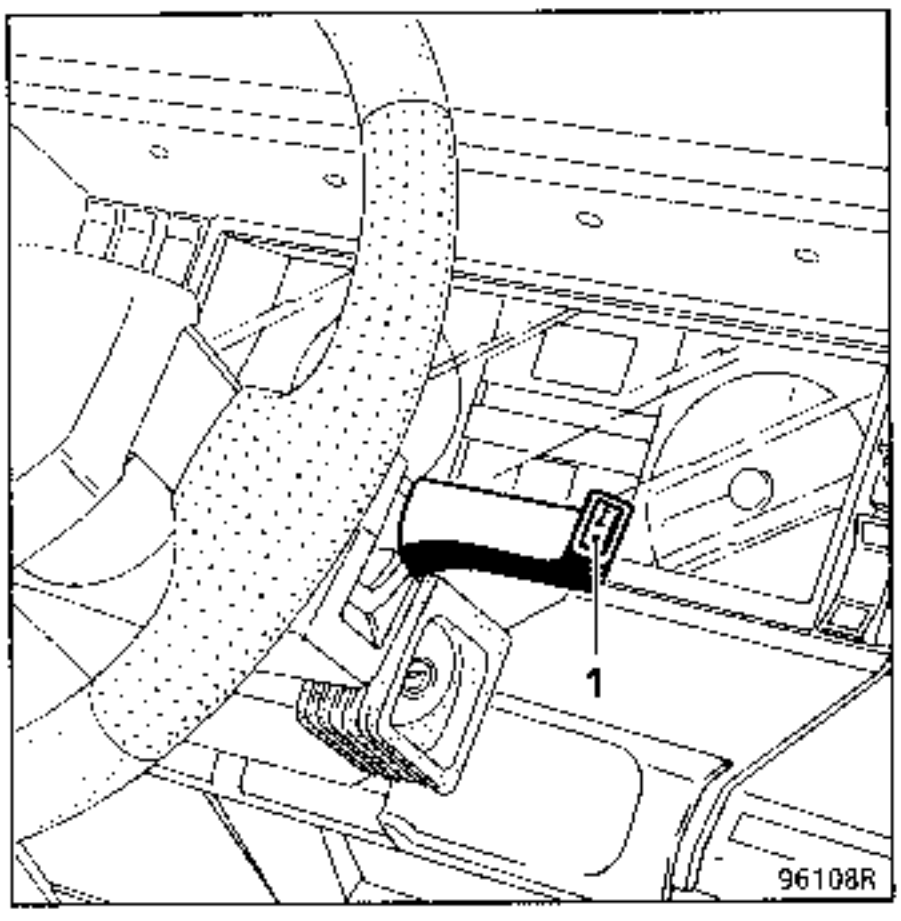
- Unlock the vehicle doors using the key, the alarm will be triggered.
  Turn the alarm off using the key switch in the glovebox.

- Turn the ignition on, the injection warning light will flash on the instrument panel.

  After taking note of the code number:

  1. Press the accelerator pedal down fully and hold it down. The injection warning light will extinguish.

  2. Press the ADAC sequence display key (1) the same number of times as the first figure of the code, checking that the injection warning light illuminates each time the key is pressed.



  3. Release the accelerator pedal - the injection warning light will flash.

Repeat operations 1, 2 and 3 to enter the three other figures of the code in turn.

After the code has been entered, the injection warning light should be permanently illuminated.If it is still flashing, the code is incorrect. Turn the ignition off then repeat the procedure for entering the code.

IMPORTANT: three attempts may be made to enter the code. If, after the third attempt, the code remains invalid, the battery must be disconnected for a few seconds.

When the injection computer memory has been erased, the code may be entered by hand once more.

Once the code has been validated (injection warning light is permanently illuminated) the vehicle is no longer protected by the immobiliser function and is used as a conventional vehicle.

RESETTING THE IMMOBILISER SYSTEM

The vehicle will only be protected again once the following operations have been carried out:

- Unlock the doors using the PLIP.

- Turn the ignition on for a few seconds to allow the injection computer to be programmed with the code once more.

- Lock then unlock the doors using the PLIP.

- Turn the ignition on, the injection warning light will flash for a few seconds then remain permanently illuminated.

The immobiliser function is now operational again.

Remember to turn the alarm back on using the key switch (in the glovebox).

IMPORTANT

Always check that the immobiliser has been reset correctly.

Turn the ignition off.

Lock the doors using the PLIP (from inside the vehicle).

Turn the ignition back on.

The injection warning light should flash to show that the engine cannot be started.

Also check that the alarm function has been activated by checking the warning light on the roof console.

NOTE : if the injection computer notes a fault in the system, when the engine is running, the injection warning light will flash during deceleration and at idle speed. In this case, after repair, erase the memory in the injection computer before resetting the immobiliser system using the PLIP.

REPLACING THE DECODER UNIT

Replace the complete kit (decoder unit, PLIP, card with new code number).

In this case the code memorised in the injection computer must be erased (code of the decoder unit to be replaced).

After removing the faulty decoder unit, use the customer emergency code (enter the 4 figure code number for the decoder unit to be replaced), then fit the new unit.

To programme the new code in the injection computer:

- Lock and unlock the doors using the PLIP.
- Turn the ignition on then off again.
- Lock and unlock the doors using the PLIP.
- Turn the ignition on, the injection warning light flashes for a few seconds then remains permanently illuminated.

The immobiliser function is operational again.

IMPORTANT

Always check that the immobiliser has been reset correctly.

Turn the ignition off.

Lock the doors using the PLIP (from inside the vehicle).

Turn the ignition back on.

The injection warning light should flash to show that the engine cannot be started.

Also check that the alarm function has been activated by checking the warning light on the roof console.

REPLACING THE INJECTION COMPUTER

The injection computer is supplied uncoded. The immobiliser code must therefore be programmed in when the injection computer is fitted.

Carry out the following operations:

Unlock the doors using the PLIP.

Turn the ignition on for a few seconds.

Lock and unlock the doors using the PLIP.

Turn the ignition on, the injection warning light should flash for a few seconds then remain permanently illuminated.

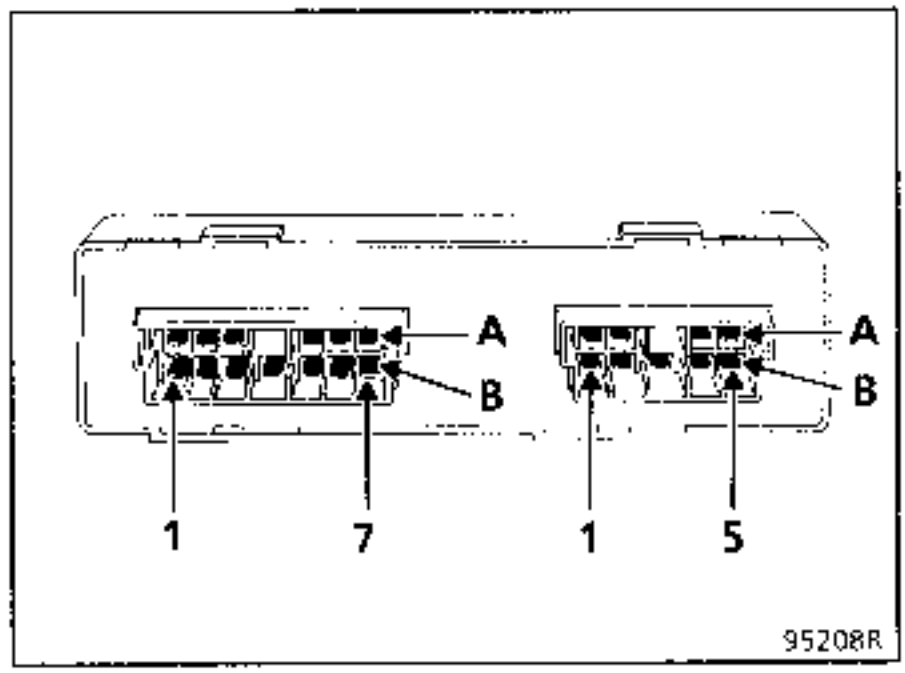
The immobiliser function is operational again.

IMPORTANT: if an uncoded injection computer from stock or from another vehicle (test part) is being tested, the doors MUST be locked by the PLIP when the part is fitted (do not use the PLIP during the test).

If the doors are unlocked, turning the ignition on sends a coded signal from the decoder unit to the injection computer (which will then be coded).

To prevent a code being memorised which could render the injection computer unusable after the test, the doors must be locked by the PLIP. The coded signal is then not sent when the ignition is turned on (the computer remains uncoded).

DECODER UNIT CONNECTIONS



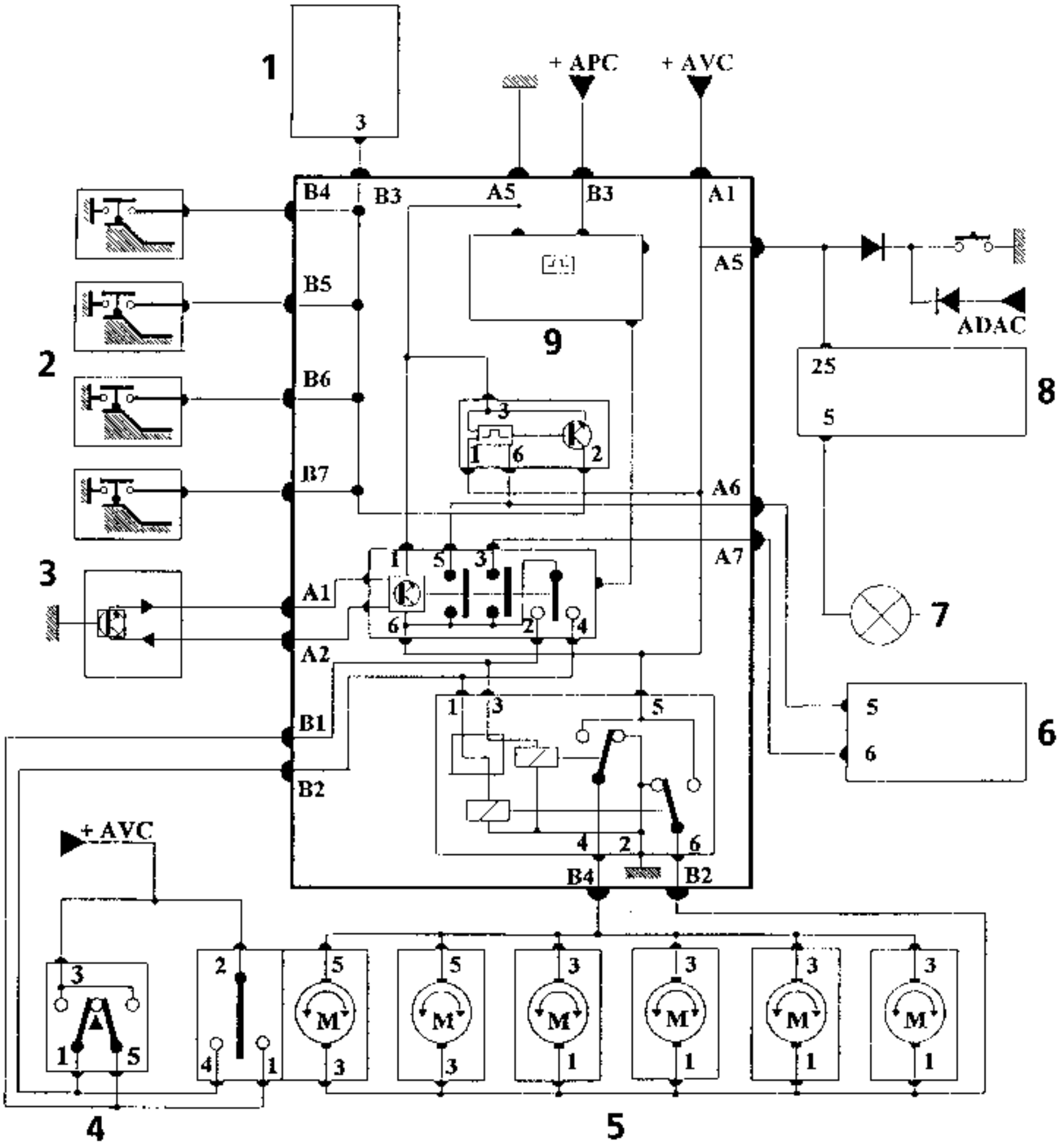
13 track connector

Track	Allocation
A1	Infrared input
A2	Infrared receiver feed
A3	Not used
A5	Coded information to injection computer
A6	Open information to alarm
A7	Close information to alarm
B1	Door open information
B2	Door close information
B3	+ after ignition
B4	Front left hand door switch
B5	Front right hand door switch
B6	Rear left hand door switch
B7	Rear right hand door switch

9 track connector

Track	Allocation
A1	- before ignition
A2	Diagnostic line K (not used)
A4	Diagnostic line L (not used)
A5	Earth
B1	Not used
B2	Doors close
B3	Courtesy light timer
B4	Doors open
B5	+ after ignition

DECODER UNIT DIAGRAM



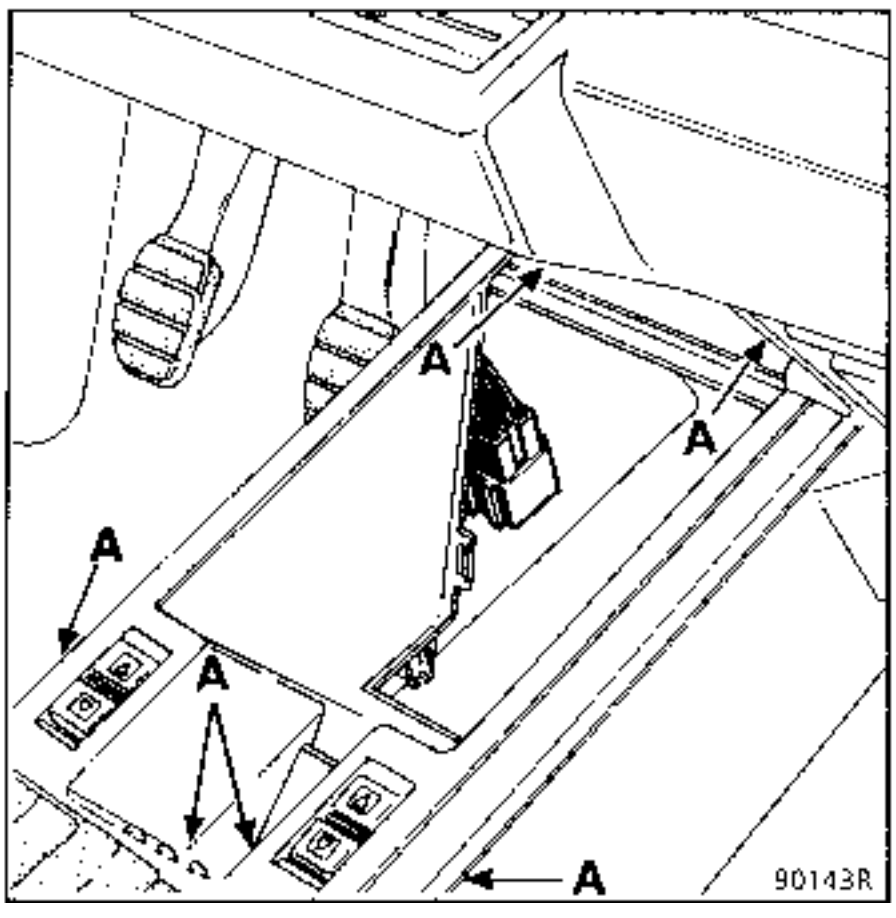
PRJ82003

1 Courtesy light
2 Door switches
3 Infrared receiver
4 Door locking switch
5 Door locking motors
6 Alarm unit
7 Injection warning light
8 Injection computer
9 Injection coding

Disconnect :
- the connectors in the front and lefthand door pillars and the earth wires,
- the choke connector,
- the connectors from the steering column mounted controls and the anti-theft switch,
- the connectors on the console, the heater assembly and its controls,
- the speedometer drive cable.

Remove :
- the steering column,
- the heater controls (see section 6),
- the choke control (apply soft soap to the cable to remove the anti-rattle sleeves),
- the instrument panel

Pull back the central console (screw A for equipment levels E1-E2) - (screw B for equipment level E3).



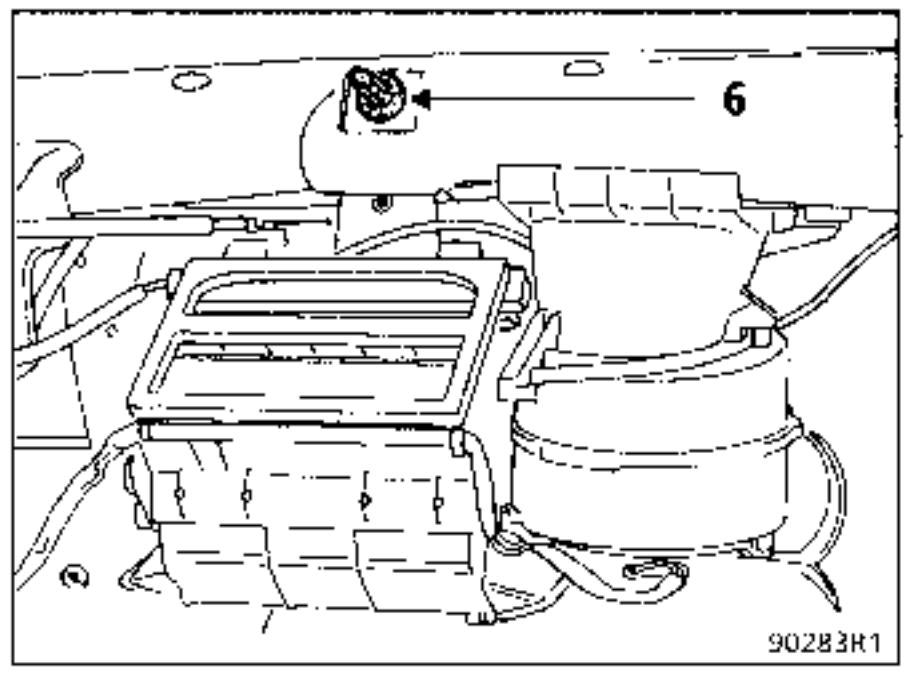
Remove :
- the two securing screws (2) from the heater assembly,
- the two securing screws (3) near the front left and righthand door pillars,
- the two nuts (4) in the speaker apertures (1).

Disconnect :
- the pedal assembly connector,
- the connector (5) between the fascia panel wiring harness and the windscreen wiper harness.

Remove the fascia panel.

REFITTING

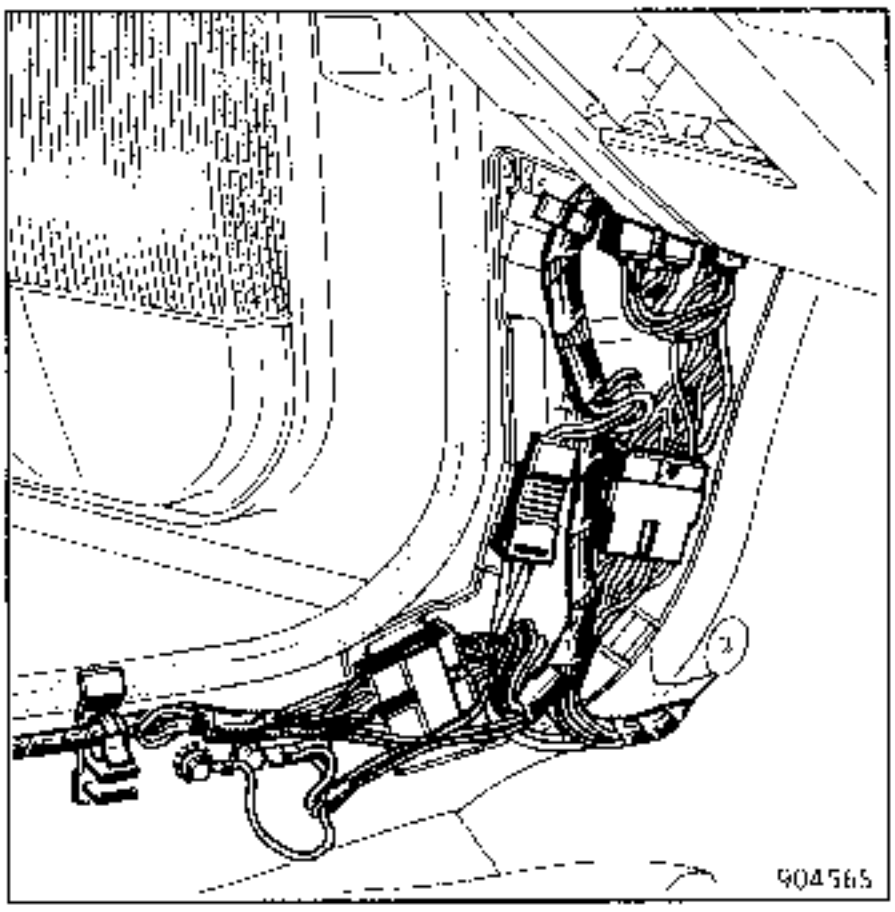
Check that the plastic locator (6) is in position.

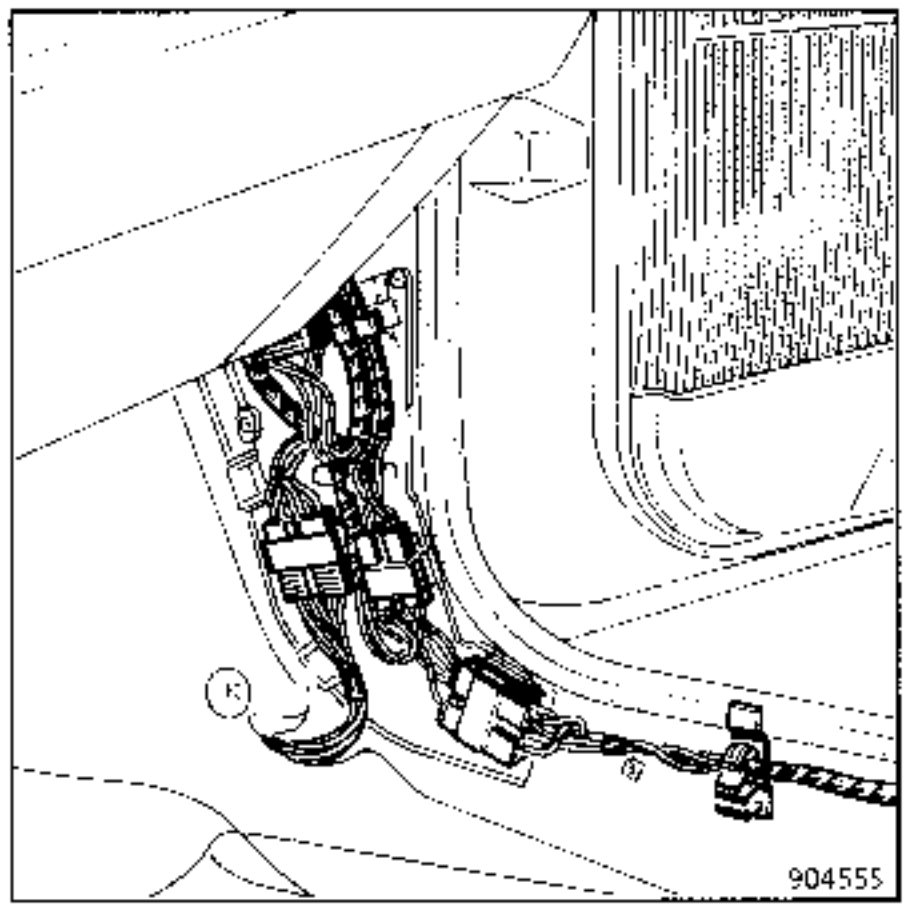


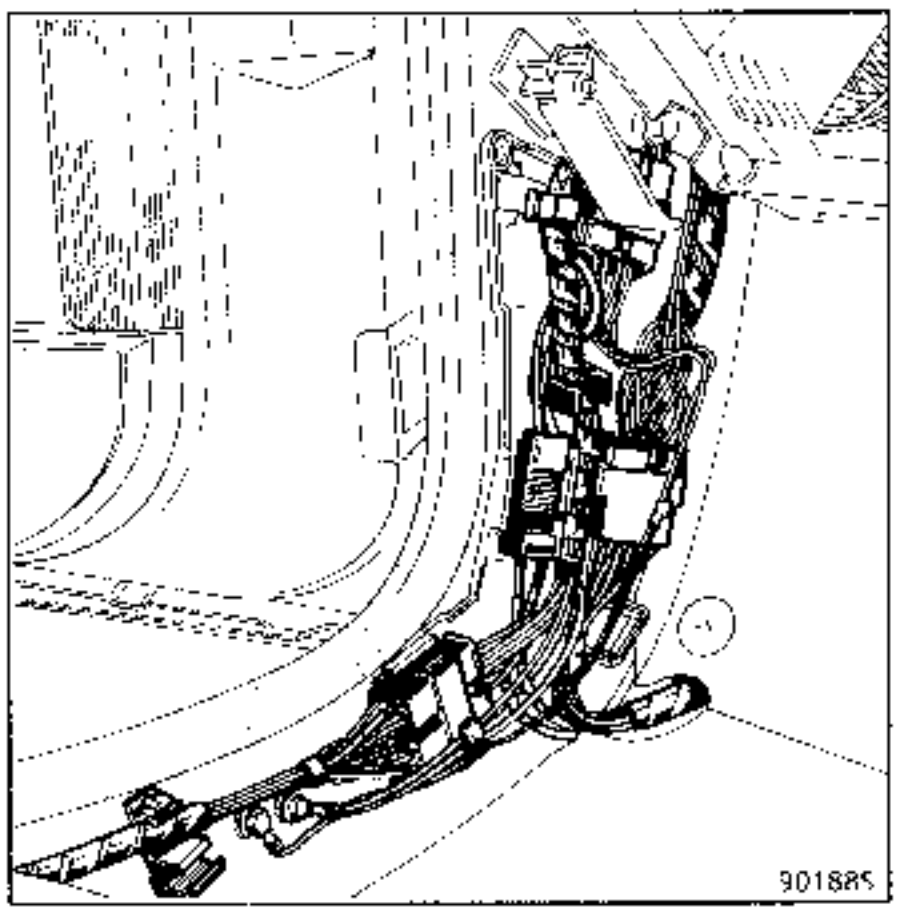
Place the fascia panel in position and fit it on to the locator (6) (take care not to trap the wiring) and secure the fascia panel in place.

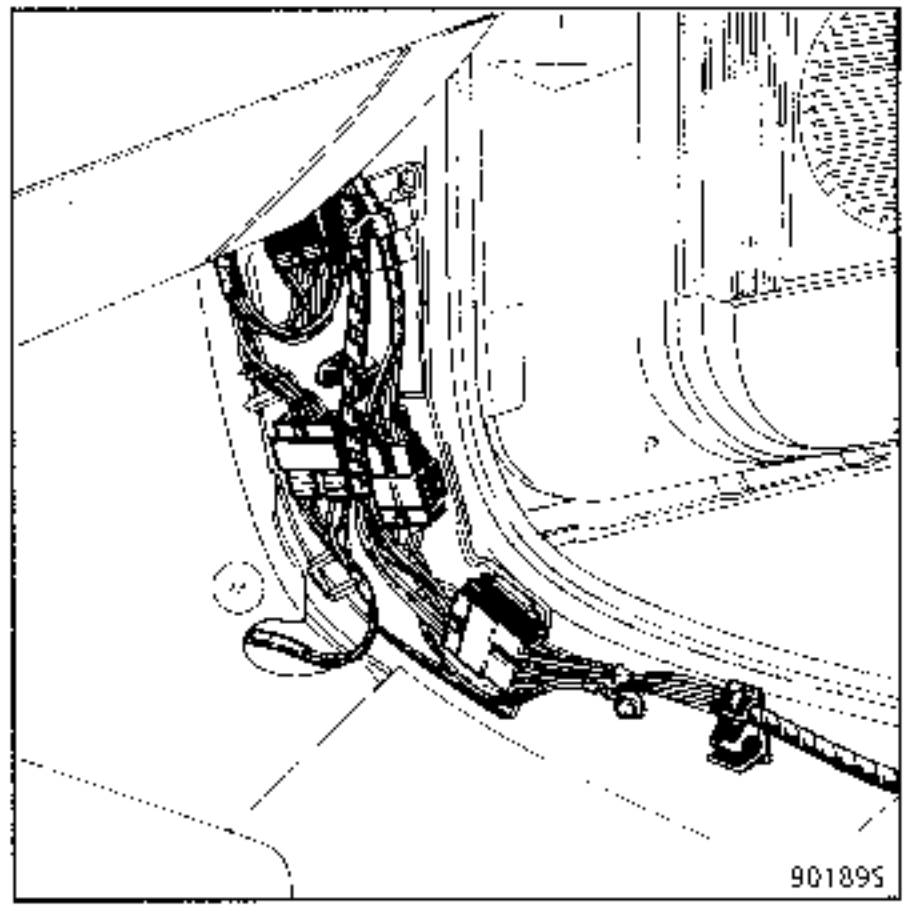
Special points for refitting

Ensure that the wiring is in its original positions.









Do not forget to reconnect the connector (5) on the fascia panel harness, the windscreen wiper harness and the pedal assembly connector.

Before refitting the lower cover, check that the rubber locating studs are in position and fit the cover over them.

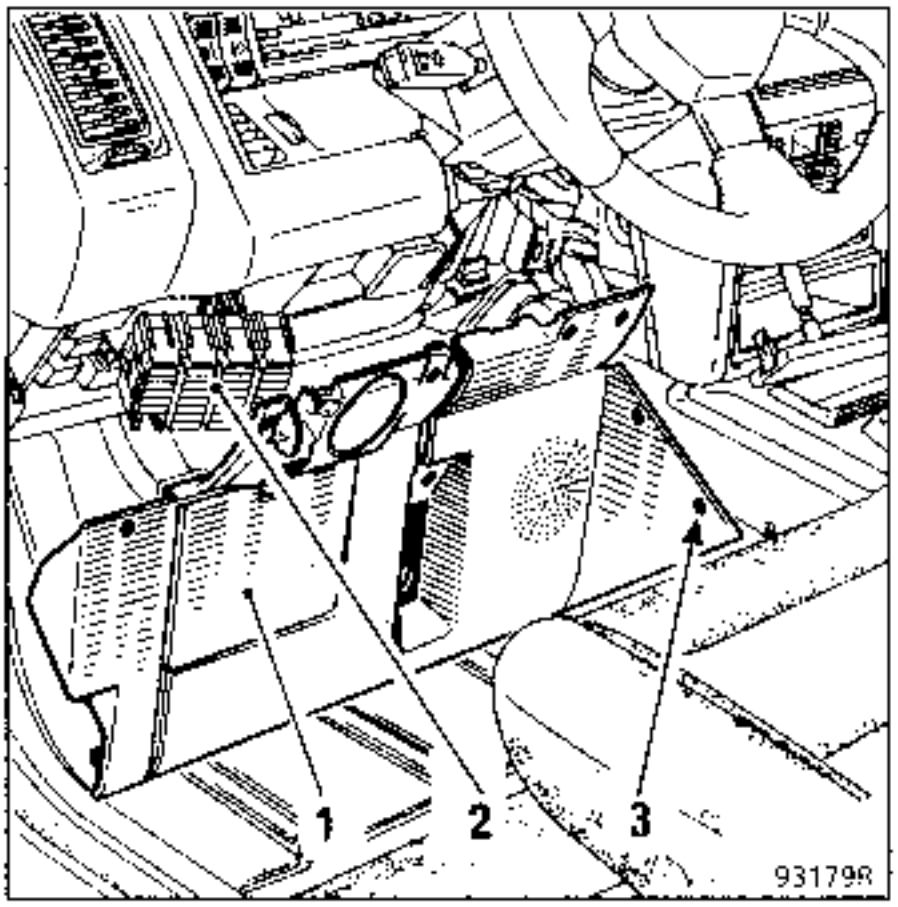
Reconnect the battery, with the ignition switched off and check that all the accessories are operating correctly.

NOTE : If the steering wheel is too near the steering wheel half casings, adjust the position of the steering column universal joint.

REMOVING

Disconnect the battery.

Remove :
- the central console,
  the left and righthand lower body side trims,
- the steering wheel after first marking its position,
  the lower and upper steering column half casings which are connected to one another by four screws,



Open the door (1).

Unclip the fuse holder casings (2).

Remove the steering column adjustment lever.

Remove :
- the 9 screws (3) that retain the trim under the steering wheel and remove the trim by tilting it,
- the trim on the lefthand side of the glove box.

CHOKE CONTROL (depending on version)

REMOVING

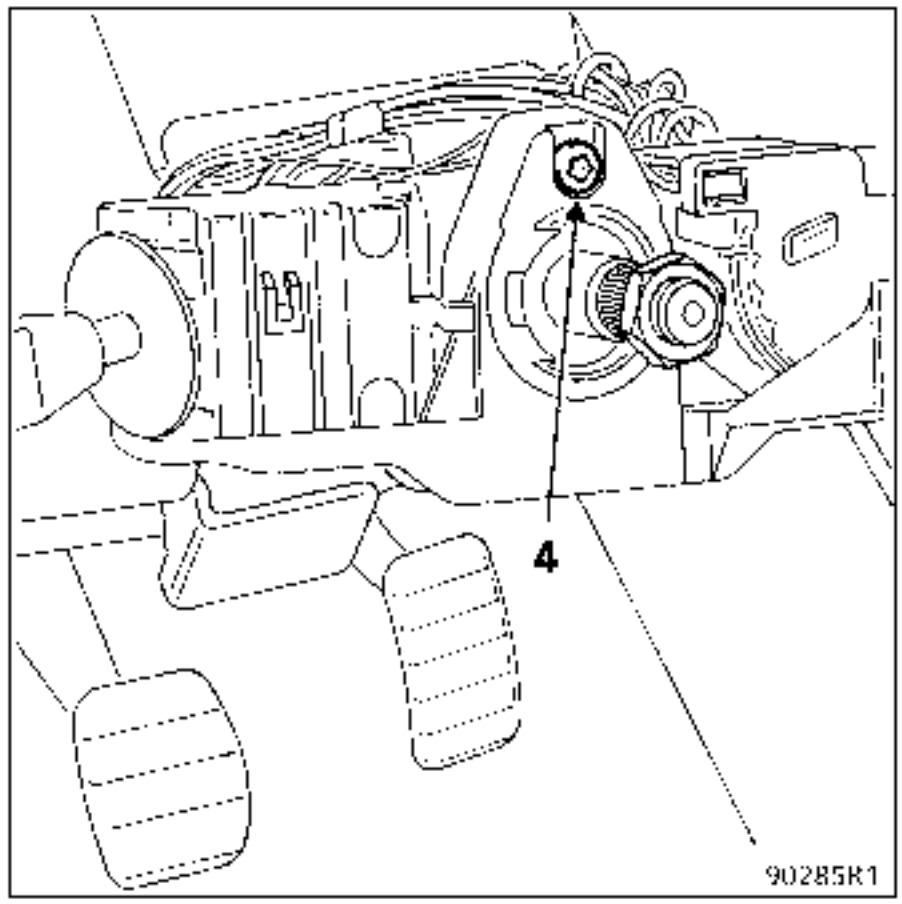
Unclip the cable at the carburettor end.

Remove the 2 foam anti-noise pads which are on the cable sleeve.

Unclip :
- the warning light connector,
- the knob assembly at the fascia panel end and remove the complete control, together with its cable sleeve and cable.

STEERING COLUMN

REMOVING



Unscrew screw (4) without removing it, then push it back to free the clamping taper.

Disconnect the connectors and remove the control assembly.

STEERING COLUMN (continued)

Disconnect the starter switch.

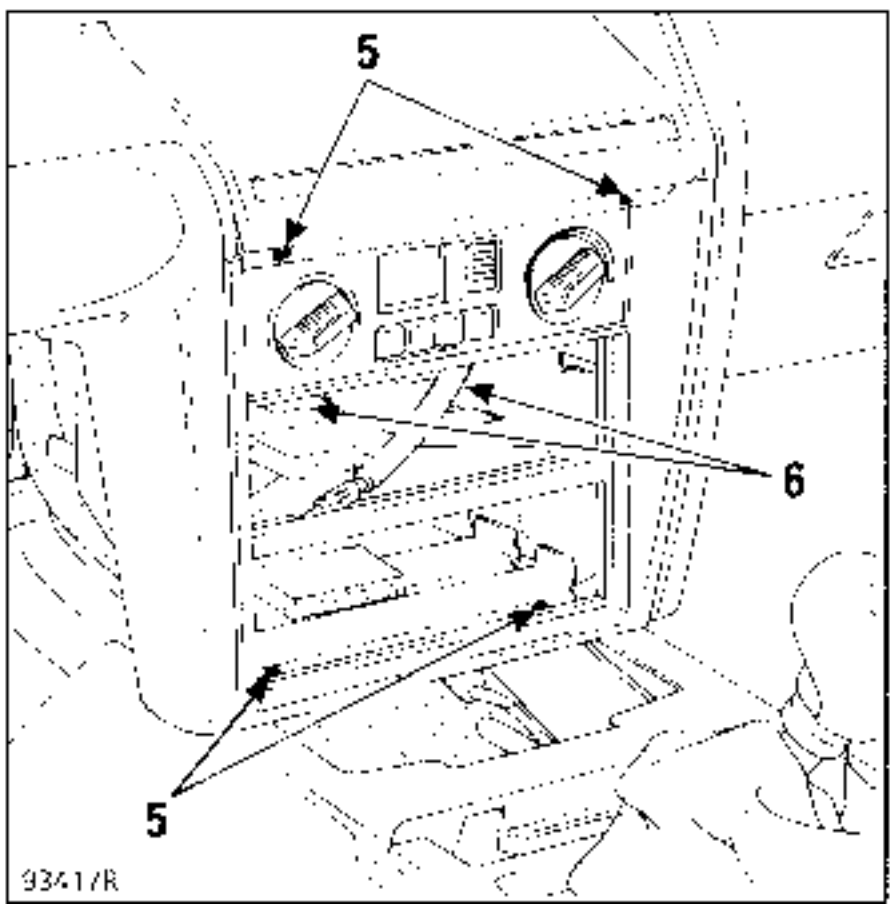
Place the steering wheel in position and turn it to gain access to the universal joint clamping bolt.

Remove the universal joint clamping bolt.

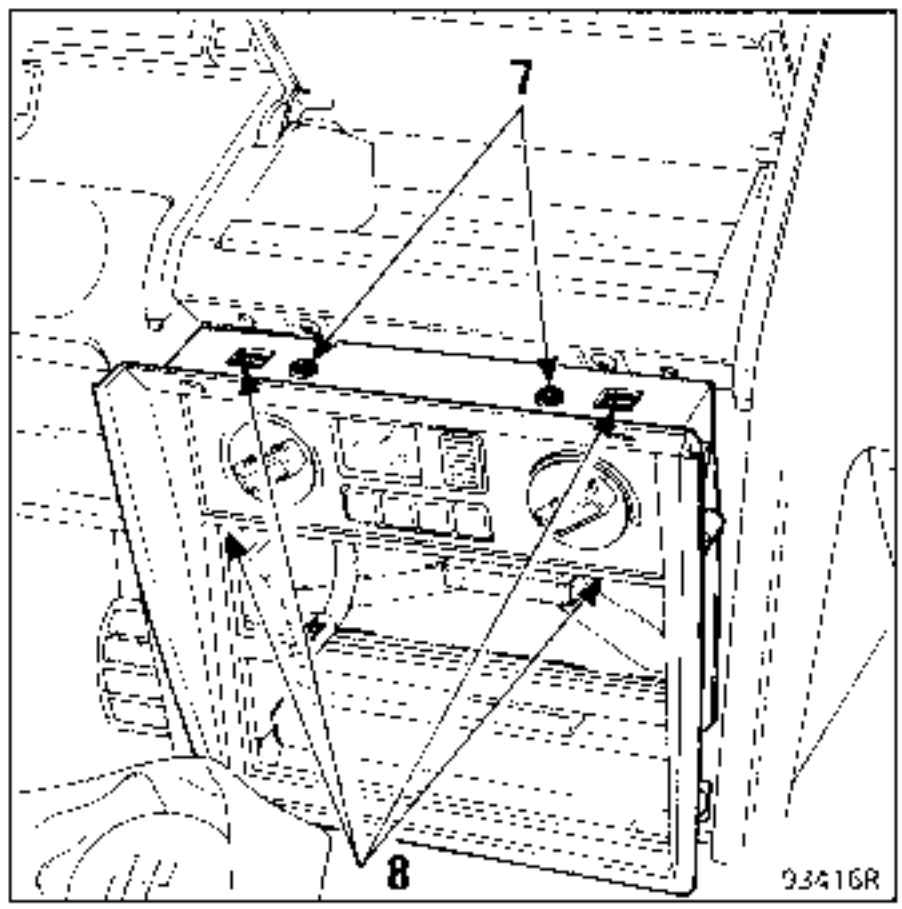
Remove the five fastenings to secure the column in place (2 screws, 1 bolt, 1 nut and 1 Torx screw).

Tilt the column downwards and pull it to remove it.

HEATER CONTROL PANEL AND RADIO MOUNTING



Remove :
- the radio or the radio compartment trim,
- the lower compartment casing,
- the four screws (5) that hold the control panel in place,
  the two nuts (6) at the back of the radio mounting bracket.

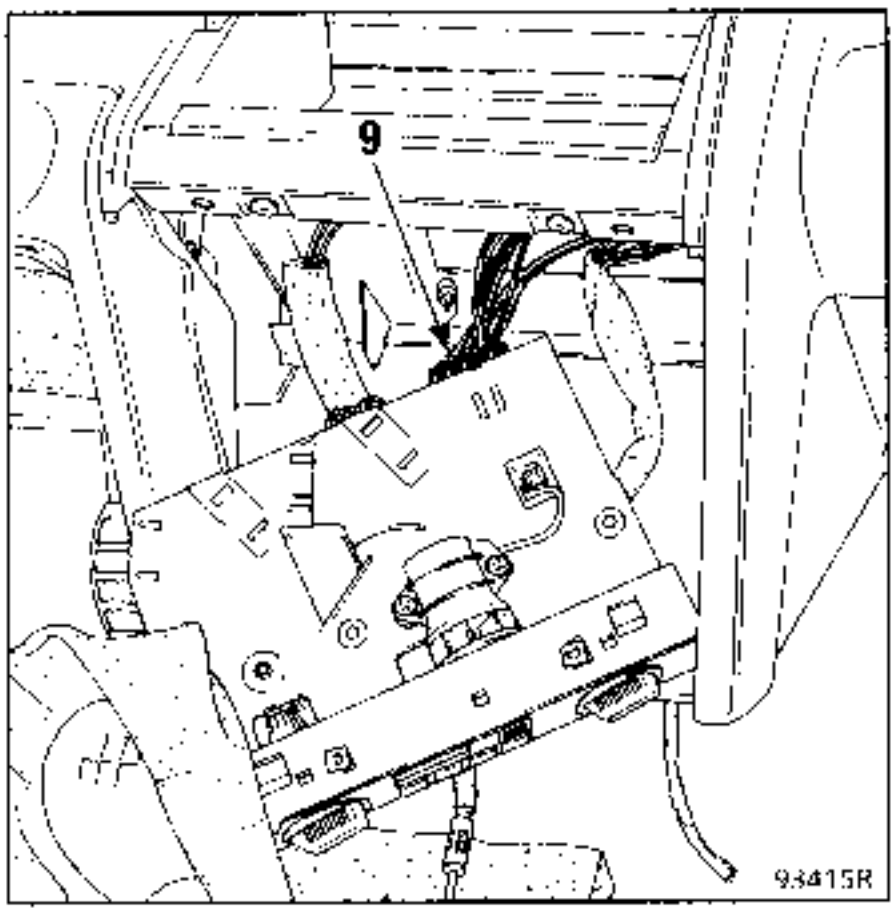


Pull out the mounting, slightly, from the fascia panel.

Remove the two screws (7) that secure the control panel to the mounting.

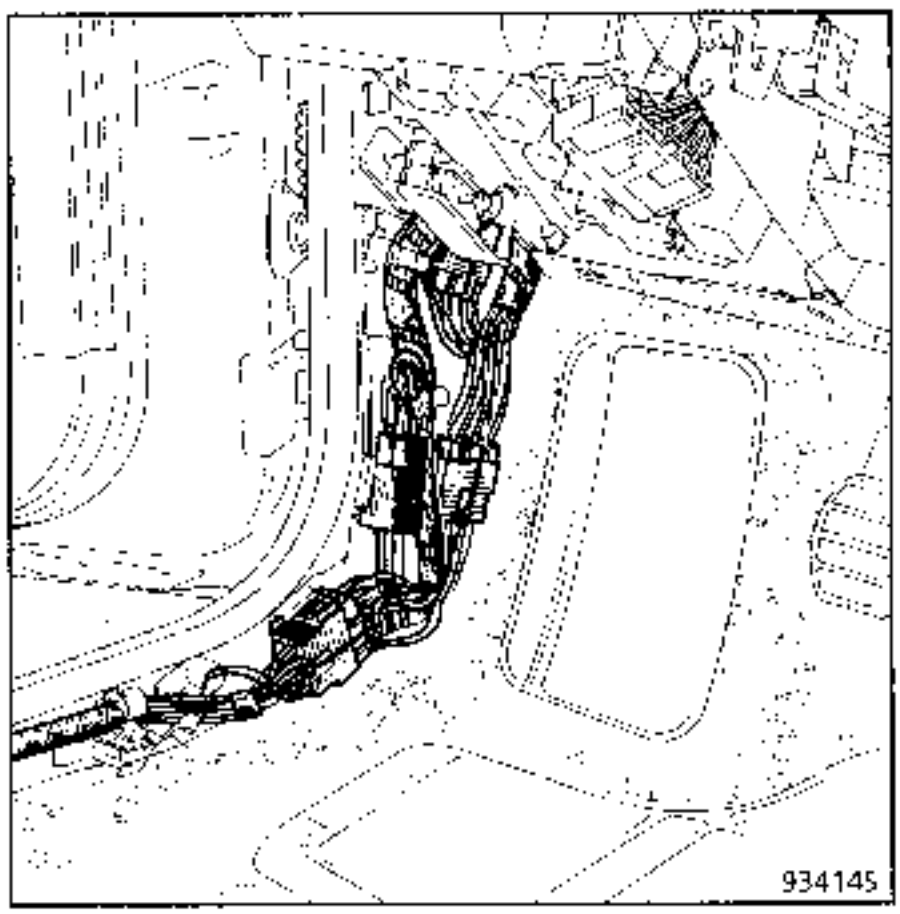
Unclip the four studs (8) that retain the control panel and push the panel inwards.

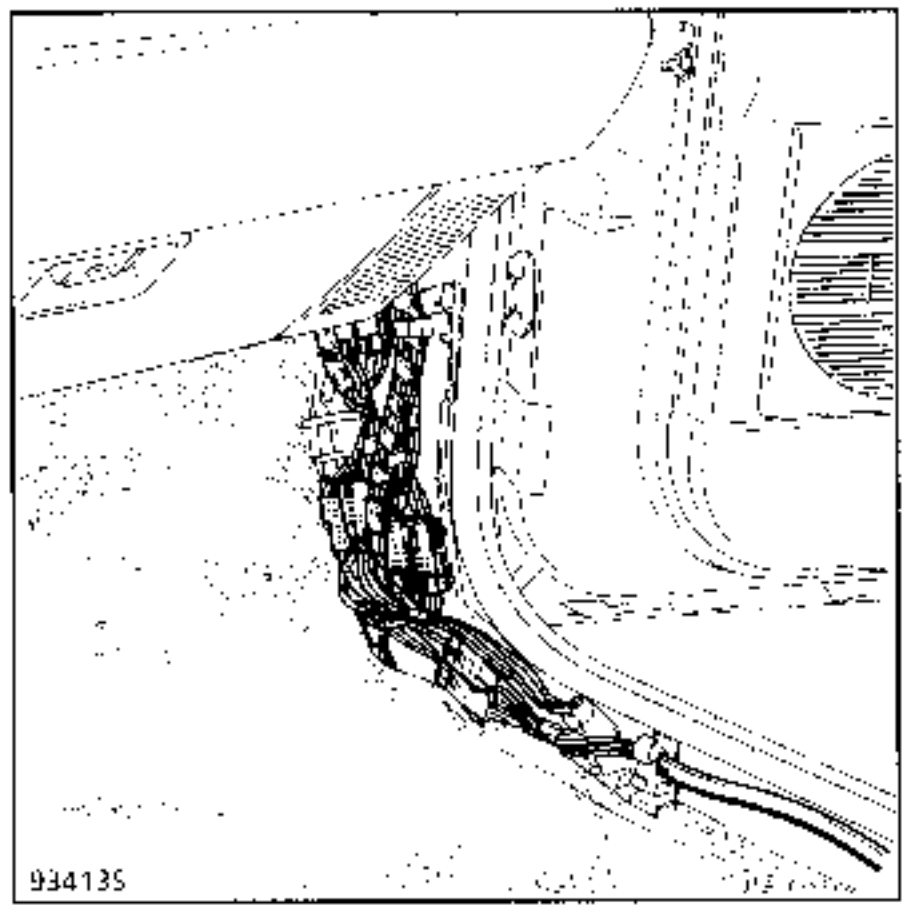
Remove the mounting by tilting it downwards.



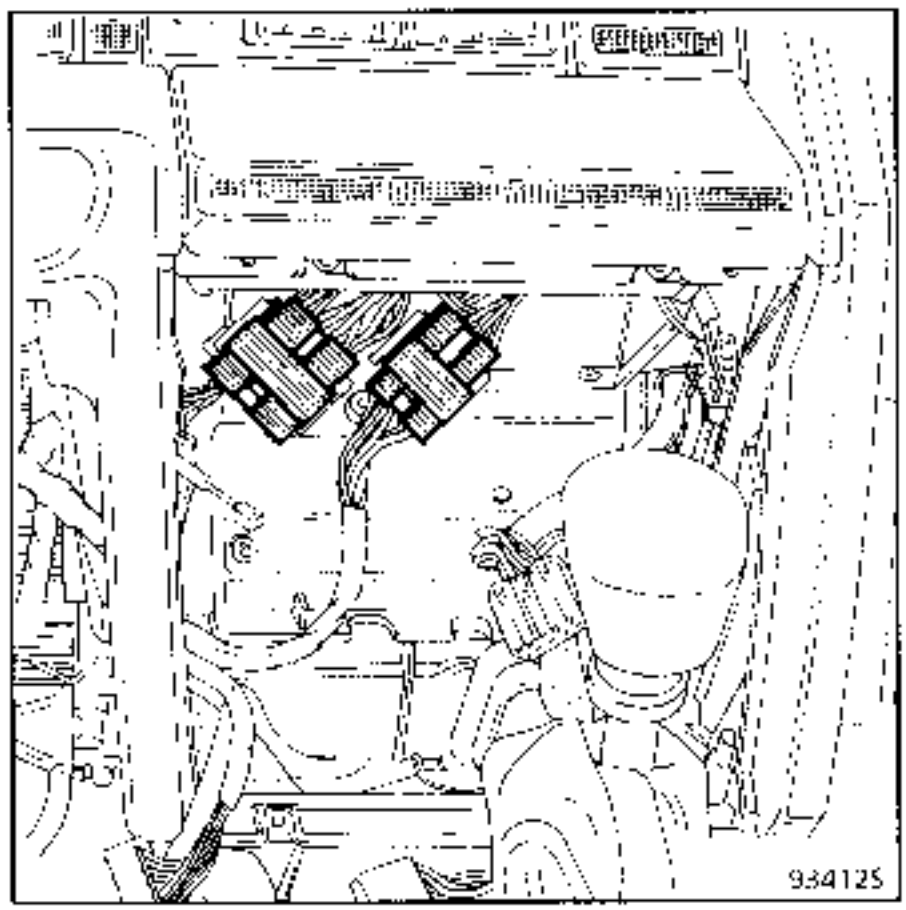
Disconnect :

- the brown connector (9) that provides the electrical supply to the panel, without removing it.

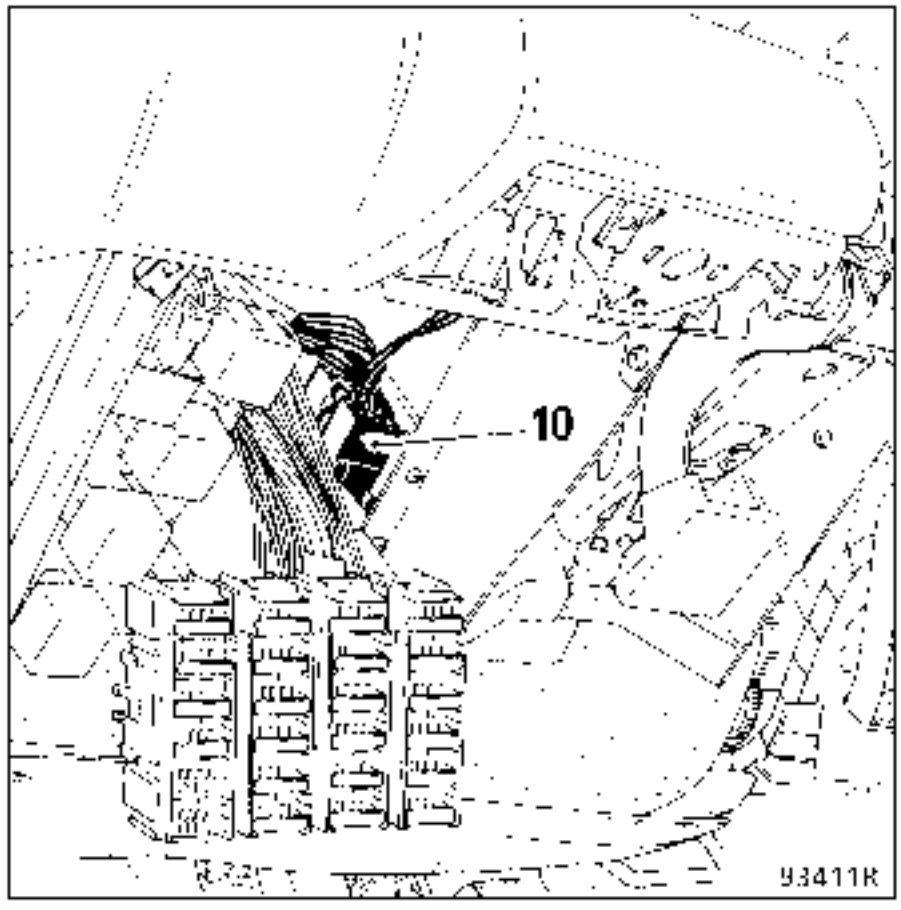




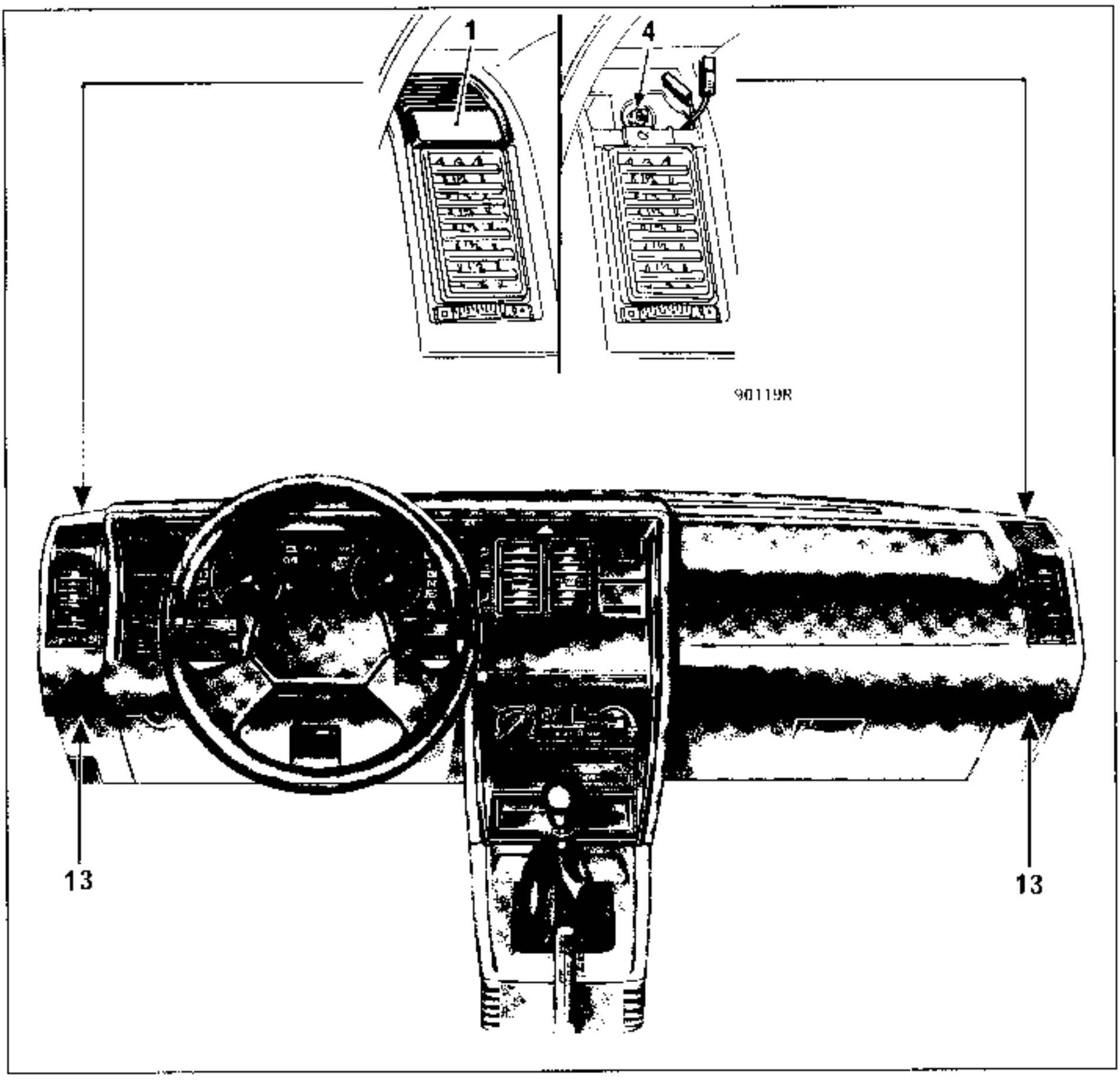
- Disconnect the connectors on the front lefthand and righthand door pillars and remove the screws that retain the earth terminals.



- Disconnect the two connectors located on the air distribution casing,
- Disconnect the speedometer drive cable,
- Disconnect the pulse generator connector on the speedometer drive cable (depending on version).



- Disconnector connector (10) on the scuttle wiring harness.

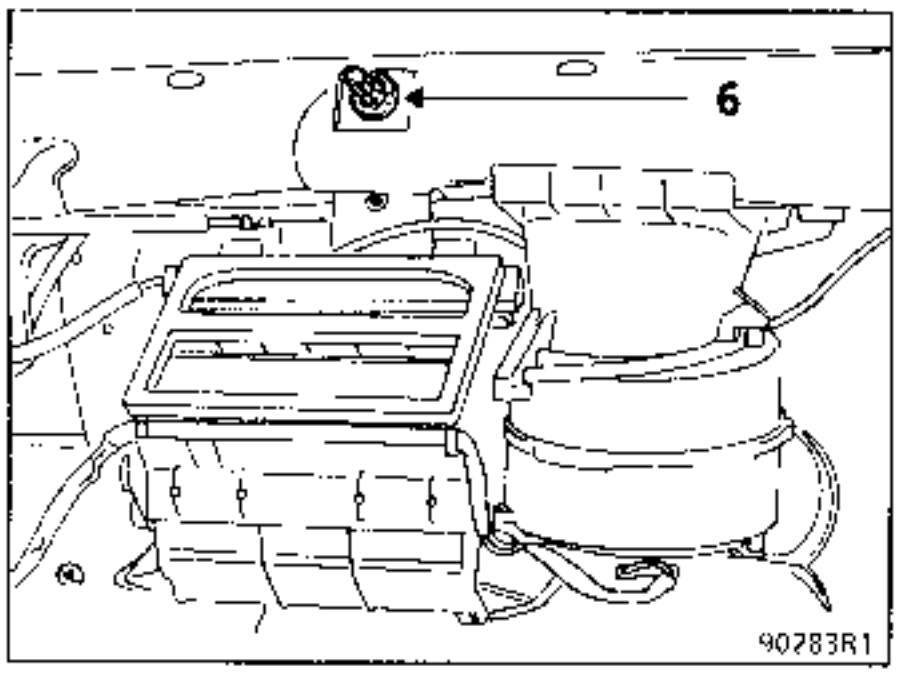


On both left and righthand sides :

Unclip the trim (11),

Remove :
- the speaker grille,
- the two lower securing screws (13),
- the 2 upper securing screws (12),
- the fascia panel.

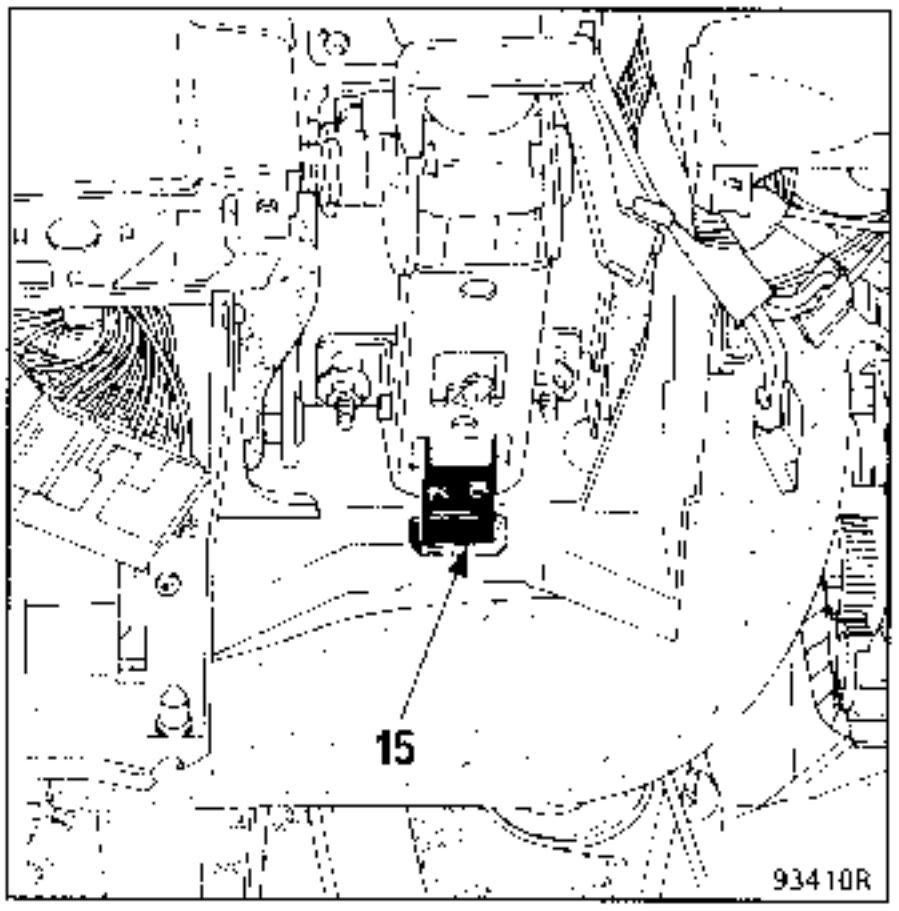
REFITTING



Check that the plastic locator (14) is in position.

Place the panel on the locator and on its four securing points (take care that it does not trap the wiring harnesses or foul the steering column intermediate shaft).

Secure the fascia panel in place.



Place the steering column in position, engaging the tab (15) into its location and the steering column shaft in its universal joint.

Secure the steering column in place.

Fit the universal joint clamping bolt without tightening it. When the steering wheel is fitted, adjust the lengthwise position of the steering column shaft and clamp the universal joint bolt.

Refit the radio mounting and the heater control panel.

Reconnect the speedometer drive cable, all the connectors and earth wires.

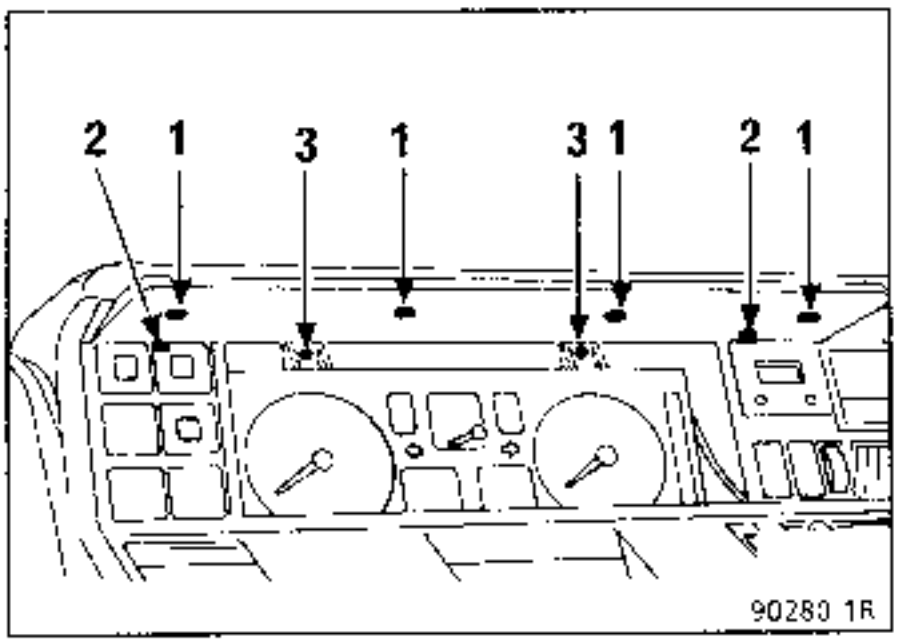
Connect the battery, with the ignition switched off and then check the operation of all the accessories before refitting all the trim.

REMOVING

Disconnect the battery.

Remove the fours screws (1) with a stub screwdriver.

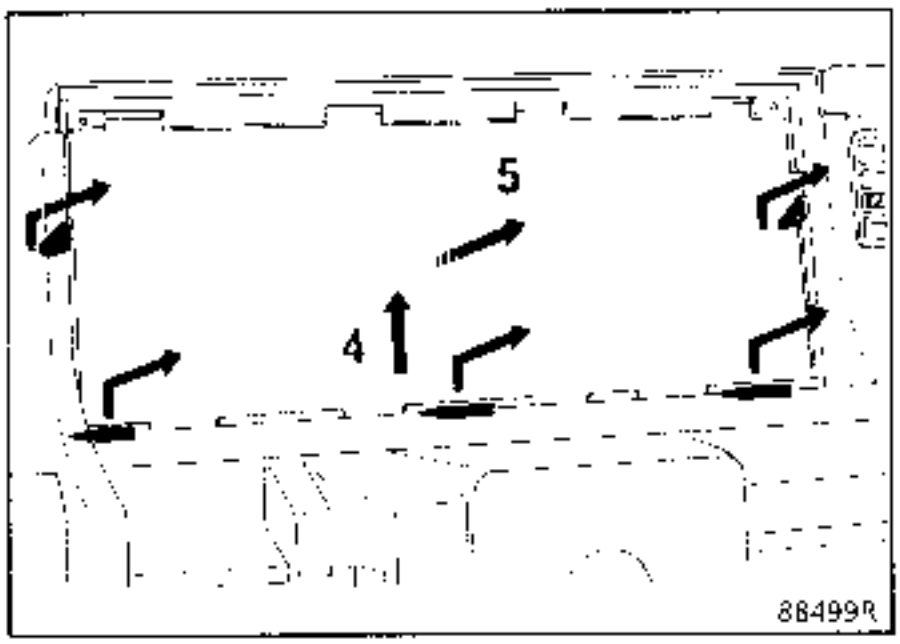
Push in the two studs (2) on the panel visor and swing it to remove it.



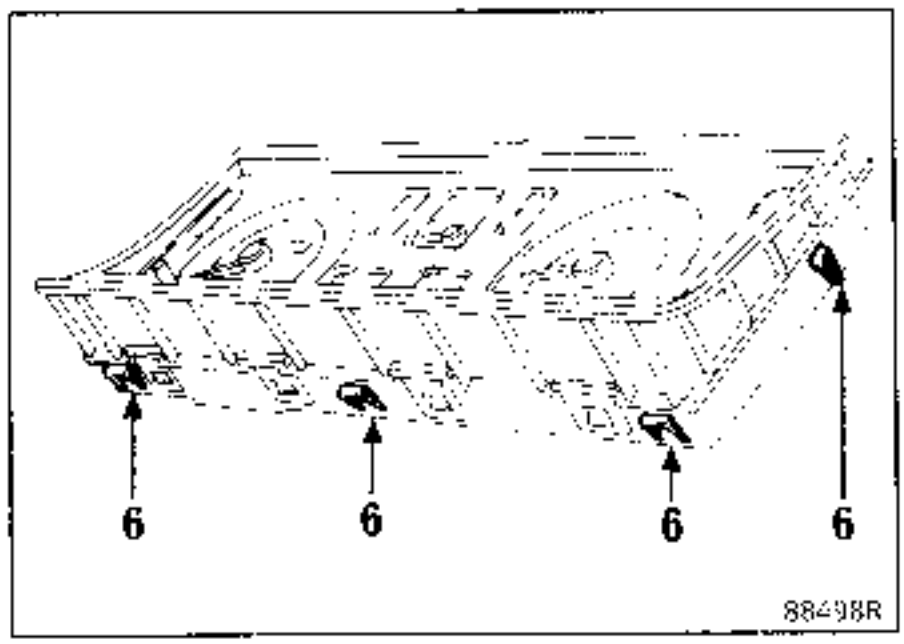
Disconnect the speedometer drive cable through the fuse box access panel.

Remove the two screws from the instrument panel (3).

Lift the panel (4) as far as it will go.



Remove the instrument panel (5) whilst holding it up to free the lugs (6).



REFITTING (Special points)

Before reconnecting them, check that the connectors and their wires are all in good condition.

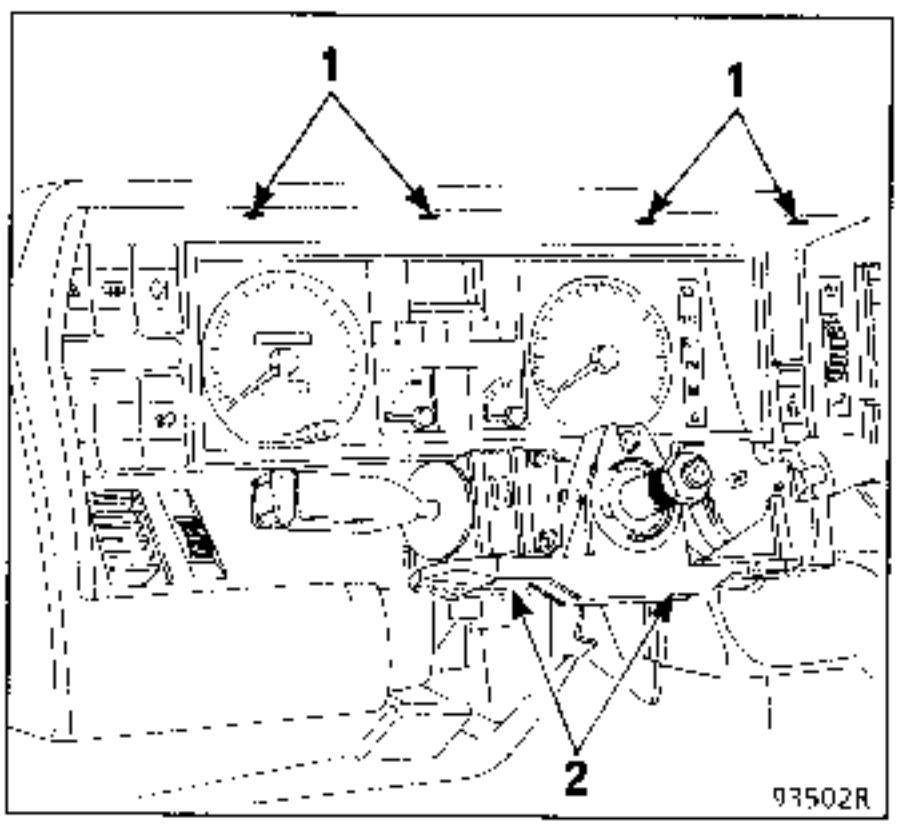
Ensure that the connectors are fully clipped in place.

Check the operation of all the instrument panel functions.

REMOVING

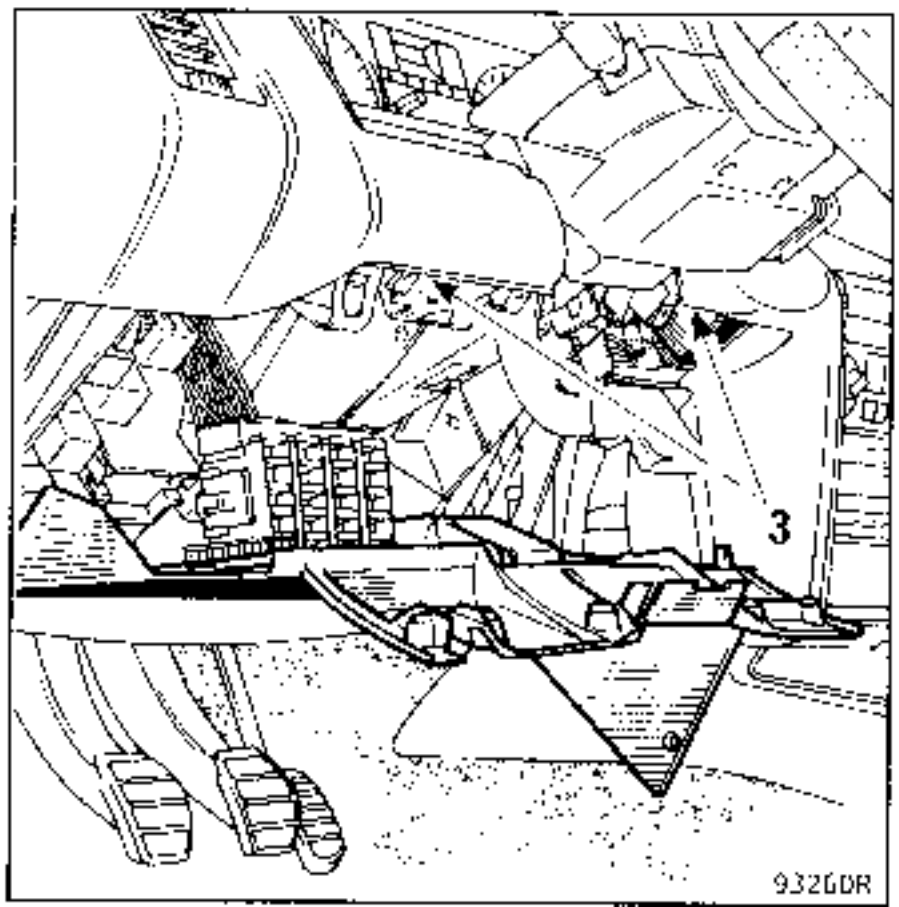
Disconnect the battery.

Remove :
- the lower cover under the fascia panel (9 screws),
- the 2 screws that retain the visor (2).

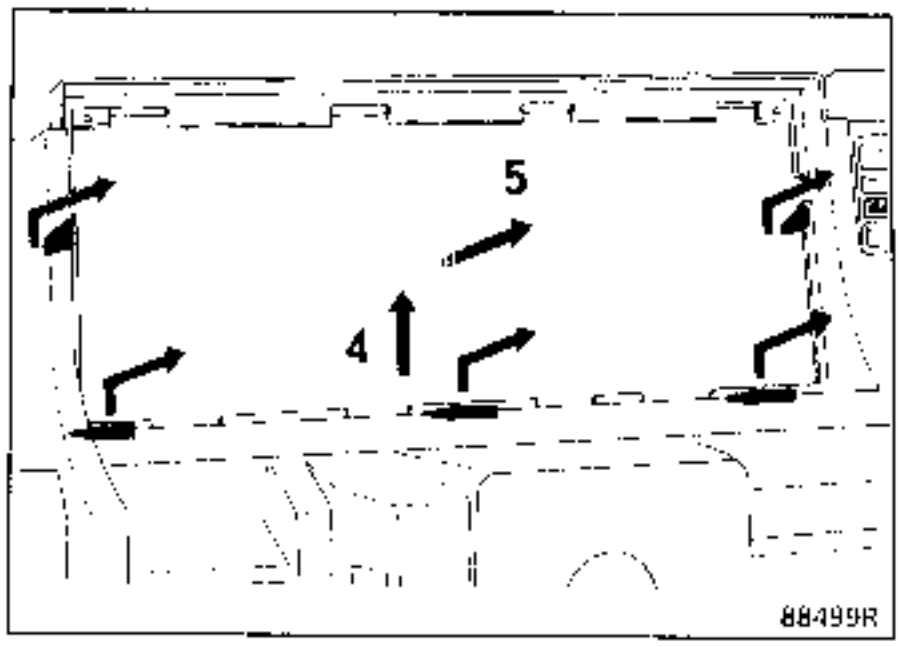


Disconnect the speedometer drive cable.

Remove :
- the 4 screws from the visor (1) and swing it to remove it,
- the 2 screws from the panel (3).



Lift the instrument panel fully up and remove it, whilst holding it raised.



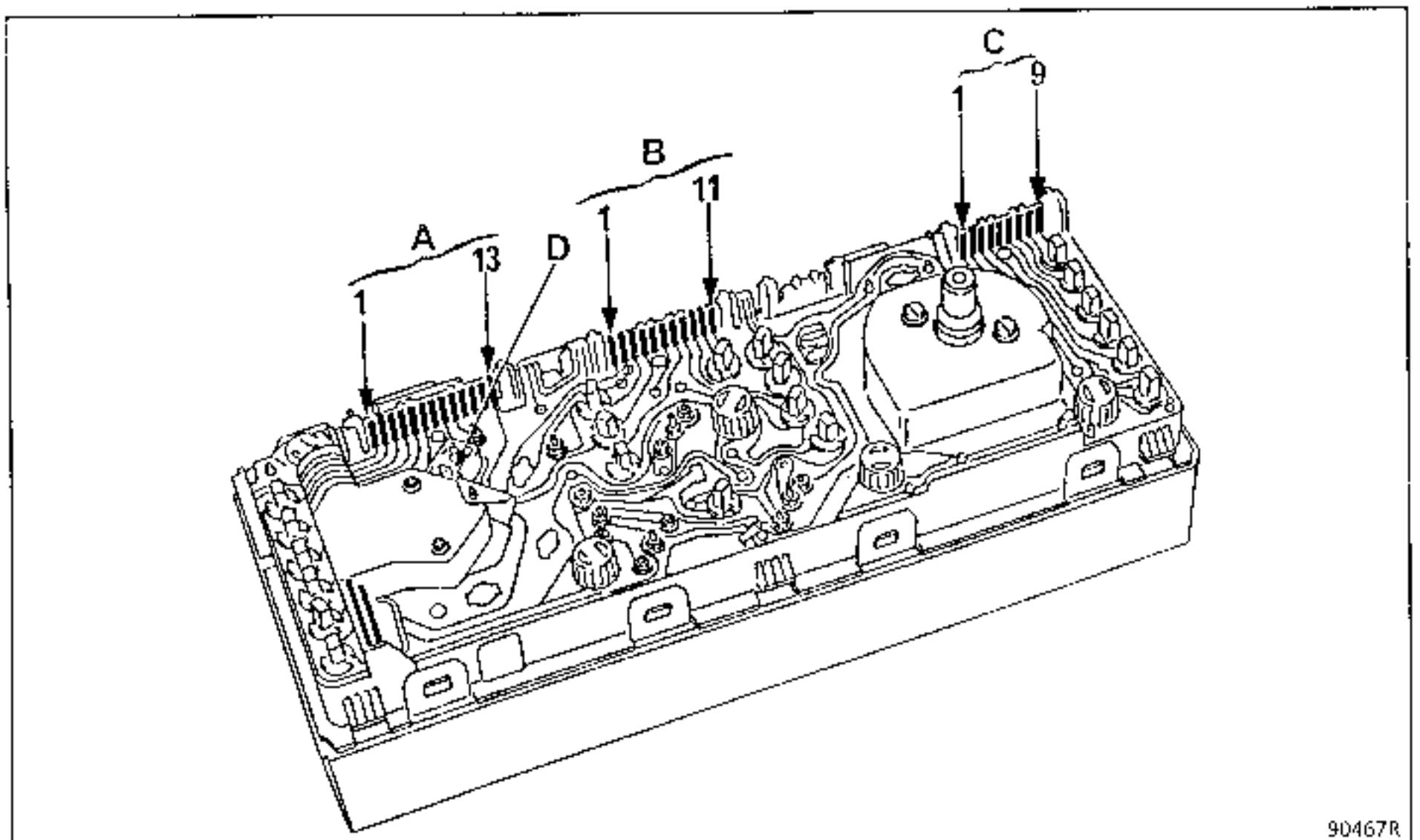
REFITTING (Special points)

Before reconnecting them, check that the connectors and their wires are all in good condition.

Ensure that the connectors are fully clipped in place.

Check the operation of all the instrument panel functions.

CONNECTIONS



Connector A (13-track)

1 Hazard warning light repeater
2 Brake wear warning light
3 Transmission engagement or transmission selection warning light (Automatic transmission)
4 Minimum washer bottle level or ABS or excessive speed warning light*
5 Choke or seat belts "on" warning light*
6 Automatic transmission and injection warning light
7 Not used
8 Tachometer
9 Oil pressure indicator or warning light (2 bars)**
10 Not used
11 Not used
12 Not used
13 Fuel gauge

Connector B (11-track)

1 Minimum fuel level warning light
2 Oil pressure warning light 0.3 bar
3 – after ignition
4 Pre-heater or catalytic convertor defect warning light*
5 LH direction indicator repeater
6 Coolant temperature indicator*
7 RH direction indicator repeater
8 Coolant temperature warning light
9 Brake (Nivocode) and handbrake warning light
10 Not used
11 Charge/discharge warning light

Connector C (9-track)

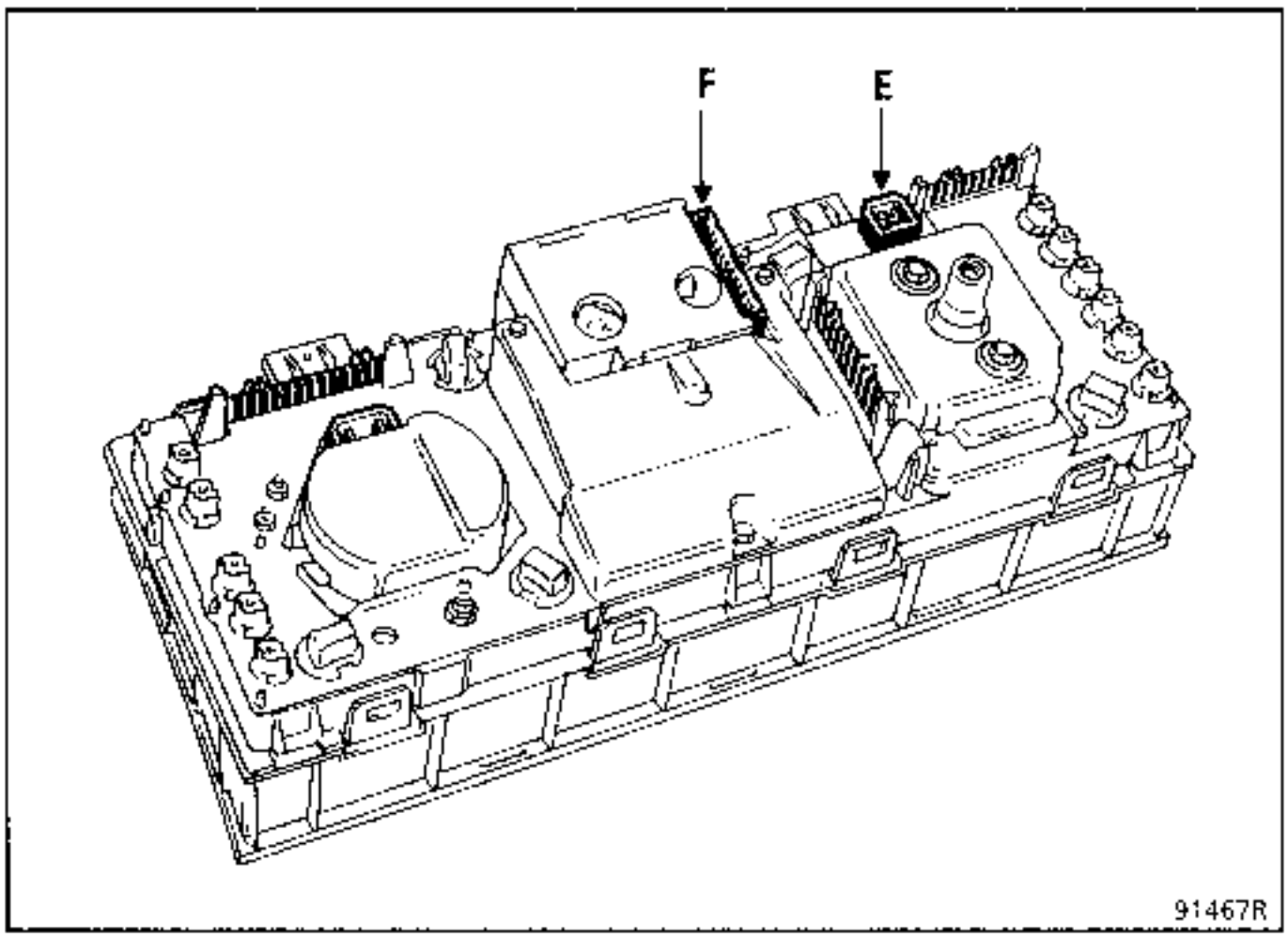
1 Coolant temperature indicator
2 Instrument panel lighting
3 Main beam warning light
4 Dipped beam warning light
5 Side light warning light
6 Front fog lights warning light
7 Rear fog light warning light
8 Heated rear screen warning light
9 Earth

Connector D

1 Oil level sensor
3 Oil level sensor

* depending on country
** depending on version

CONNECTIONS



Connector E (2-track)

1 On-board computer reset button
2 Earth

Connector F (15-track)

1 On-board computer earth
2 + before ignition
3 − after ignition
4 Speed signal
5 Flow sensor signal
6 Fuel gauge signal
7 Outside temperature signal
8 Lighting rheostat
9 Instrument panel lighting
10 Outside temperature electronic earth
11 Fuel gauge electronic earth
12 Fuel gauge warning light
13 On-board computer reset button
14 On-board computer display
15 Not used

SPEED SIGNAL INFORMATION

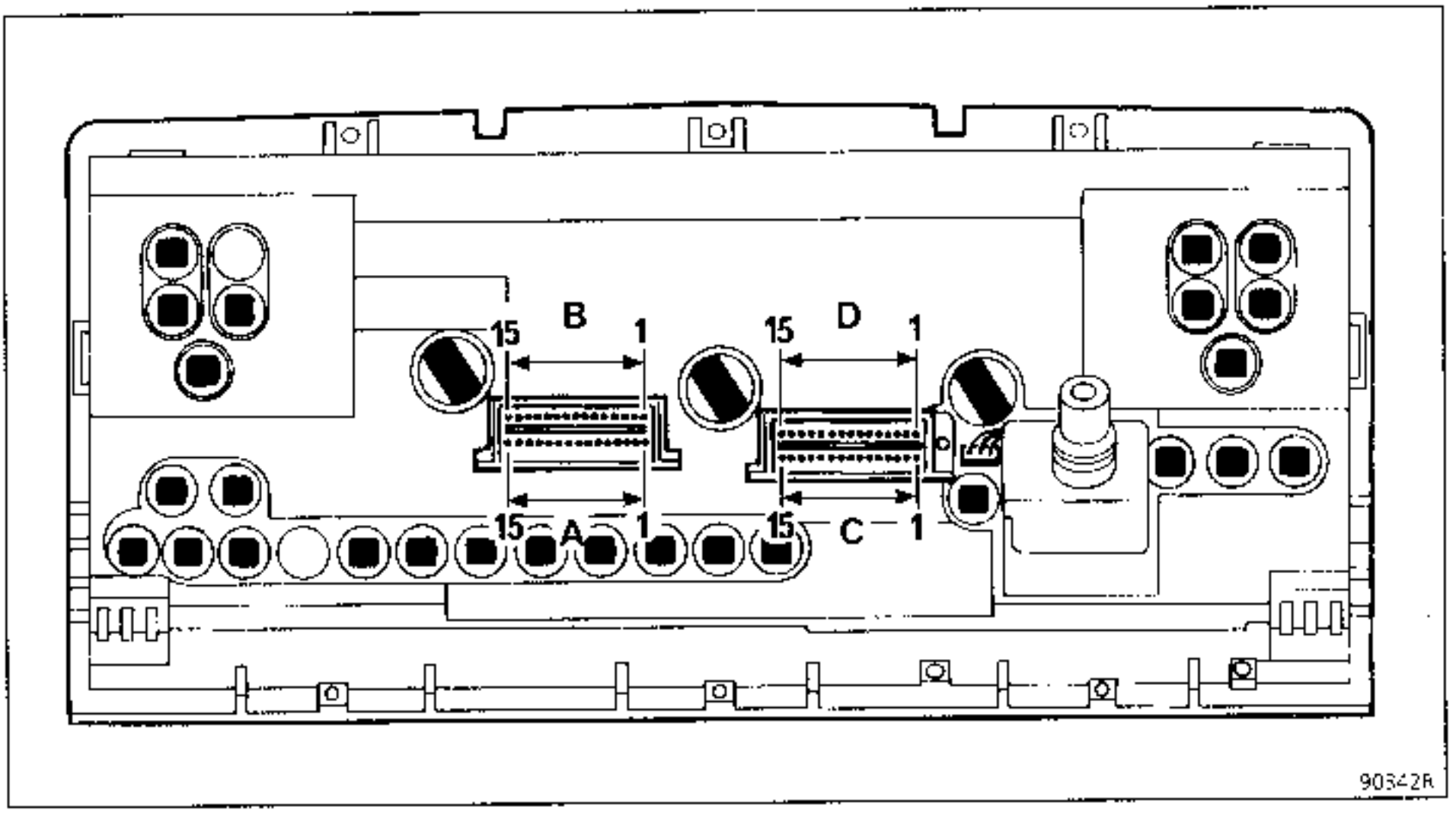
The speedometer cable is fitted with a speed sensor. Vehicle speed information is sent to the on board computer.

Connection via the black 3-way connector

1 + 12 V after ignition
2 Vehicle speed information
3 Earth

NOTE : Connection of the other 3 connectors is identical to that on a conventional type instrument panel (see previous pages).

CONNECTIONS



Connector A (red)

1 Hazard warning light repeater
2 Not used
3 RH direction indicator repeater
4 + after ignition (instrument panel fuse)
5 Choke warning light
6 Pre-heater warning light
7 Front fog lights warning light
8 Rear fog light warning light
9 Heated rear screen warning light
10 ABS warning light
11 AR4 automatic transmission warning light
12 Seat belts "on" warning light (depending on equipment level)
13 Handbrake warning light
14 Not used
15 Not used

Connector B (black)

1 Not used
2 LH direction indicator repeater
3 Not used
4 On-board computer display (by earthing circuit)
5 Not used
6 Windscreen washer level warning light
7 Brake pad wear warning light
8 Instrument panel lighting (instrument panel fuses)
9 Not used
10 Injection/Automatic transmission warning light
11 Oil pressure drop indicator to voice synthesiser
12 Voice synthesiser speaker
13 Voice synthesiser speaker
14 Electronic earth
15 + before ignition (interior light fuse)

CONNECTIONS (continued)

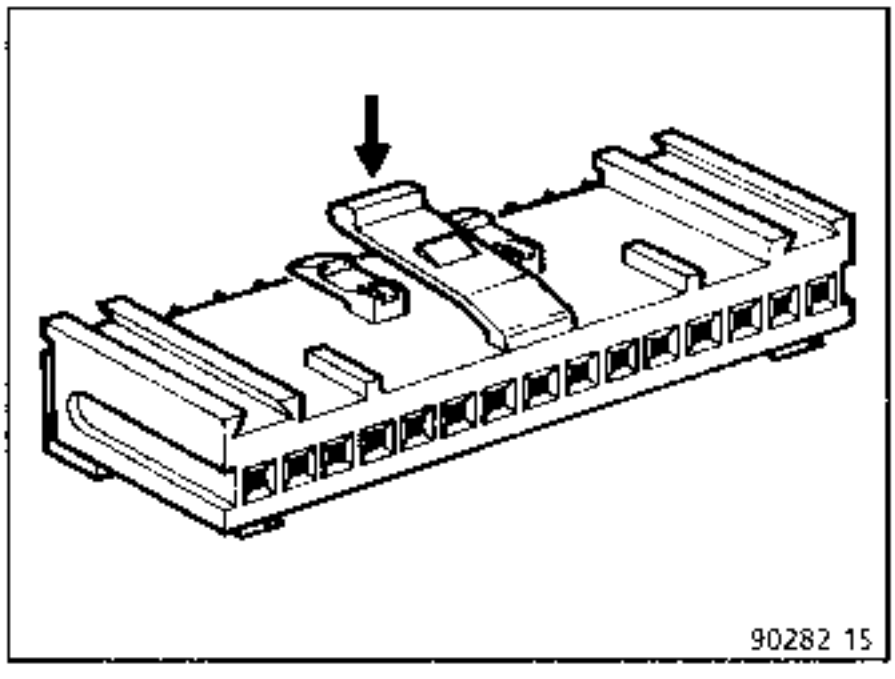
Connector C (blue with retaining lock)

1 Not used *
2 Not used*
3 Not used
4 Coolant temperature warning light via temperature switch
5 Charge/discharge warning light
6 Oil pressure warning light (0.35 bar pressure switch)
7 Brake warning light (Nivocode)
8 Dipped beam warning light
9 Warning lights earth
10 Main beam warning light
11 Side lights warning light
12 Diesel tachometer
13 Petrol tachometer
14 Voice synthesiser demonstration and repeat **
15 Oil pressure warning light (2 bar pressure switch)

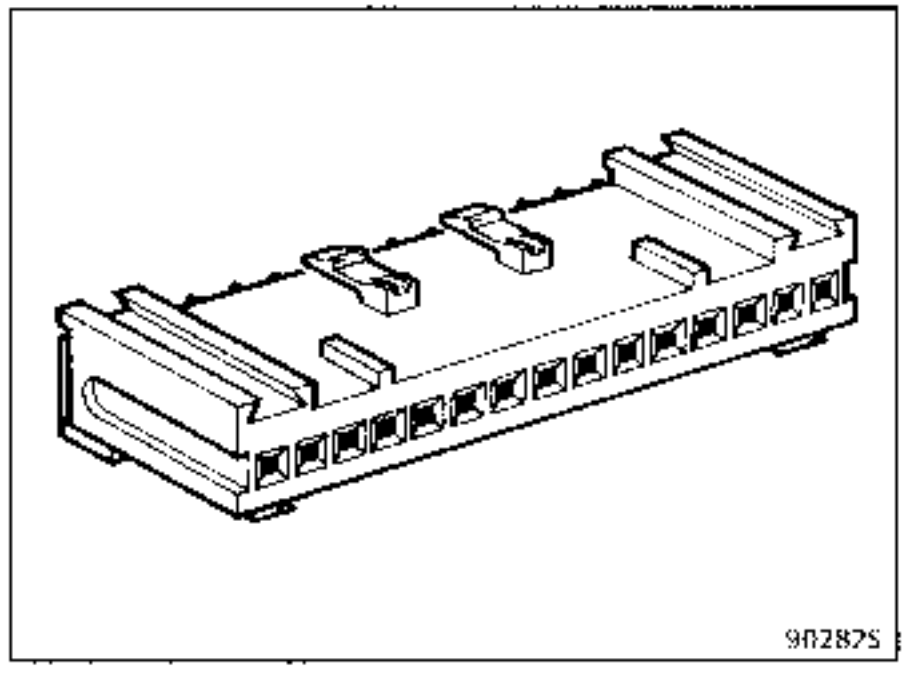
Connector D (blue)

1 Flow sensor signal
2 Not used
3 Coolant temperature via temperature switch
4 External temperature sensor return (in rear view mirror)
5 To external temperature sensor (in rear view mirror)
6 Fuel gauge return
7 Radio shut-off**
8 To fuel gauge
9 To oil level sensor
10 Oil level sensor return
11 Rear LH door signal**
12 Rear RH door signal**
13 Warning lights earth
14 Driver's door signal**
15 Passenger door signal**

Connector with retaining lock



Connector without retaining lock



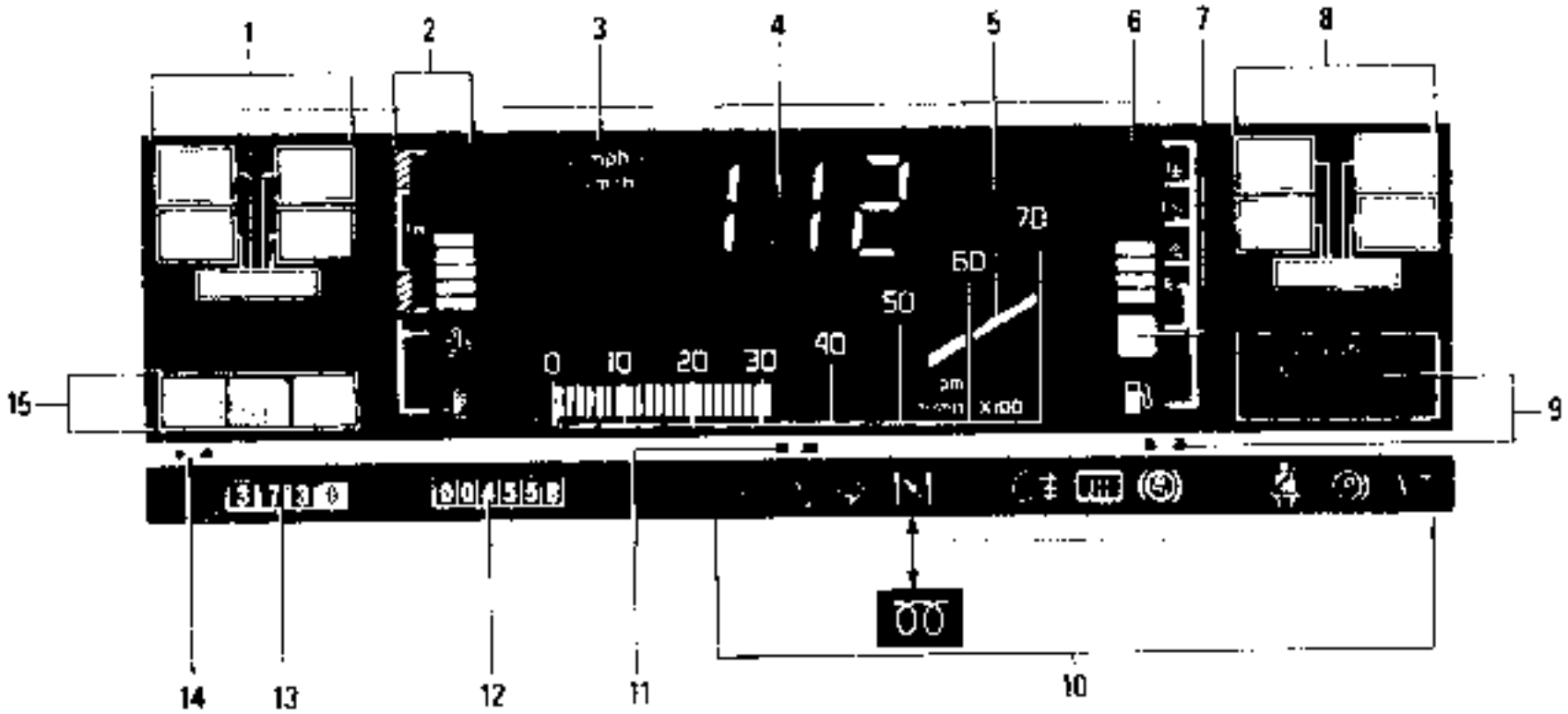
* Speed signal output to be used for special applications
** Vehicle equipped with voice synthesiser

DESCRIPTION

The electronic instrument panel consists of several distinctly separate units contained in a single casing :

- a liquid crystal display assembly,
- a warning light assembly.

In addition, the instrument panel checks that certain sensors and detectors are operating correctly and, if they are not, displays an error code in place of the speed display.



NOTE : The lighting rheostat controls the brightness of the display.

1/ WARNING LIGHTS

- Braking system defect warning light (Nivocode).
  This warning light is tested when the ignition is switched on, before the engine starts but should switch off as soon as the engine is running.

- Battery charge/discharge warning light.
  This warning light switches on when the ignition is switched on but should switch off when the engine starts.

- Coolant temperature warning light.
  This warning light should be off when the ignition is switched on.
  It illuminates **when the 115 °C temperature switch* opens.**

- Engine oil pressure warning light.
  This should switch on when the ignition is switched on and switch off when the engine starts.

Special features of the J type petrol engine

There are two pressure switches*.

One set at **0.35 bars** which maintains a permanent check on the oil pressure. Its warning light illuminates if the oil pressure falls below **0.35 bars**.

The second pressure switch (2 bars) checks the oil pressure at speeds above **2 500 rpm**. Its warning light illuminates if the oil pressure falls below **2 bars** at engine speeds of more than **2 500 rpm**.

(*) Sensors, detectors or wiring, whose condition is monitored by the instrument panel.

DESCRIPTION

2/ OIL LEVEL OR COOLANT TEMPERATURE BARGRAPH

A - Oil level *

The engine oil level is displayed only after the ignition has been switched off for at least two minutes with the vehicle stationary.

When the ignition is switched on, the bargraph segments will illuminate after approximately two seconds.

The coolant temperature bargraph will replace the above display when the ignition switch is operated a second time or when the engine is running or the vehicle is in motion.

B - **Engine coolant temperature**

A thermistor controls the operation of some of the segments on the bargraph.

If the engine overheats, the the opening of the **115 °C*** temperature switch switches on the complete bargraph **(10 segments)**, with the engine running.

NOTE : When the engine coolant temperature is lower than **52 °C**, one of the bargraph segments should be illuminated.

At a coolant temperature of 52 °C, two segments should switch on, etc.

3/ SPEED DISPLAY UNITS

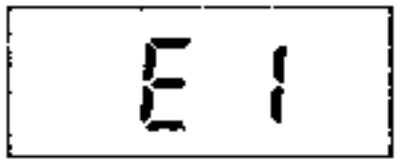
km/h or mph.

4/ DIGITAL SPEED DISPLAY AND DIAGNOSTIC CODE

The speed signal is provided by the speedometer drive cable that drives the mileometer drums. A sensor built in to this mechanism provides the speed signal to the instrument panel and the on-board computer **(5 pulses per metre)**.

Diagnostic code display

Example :



This display will appear in place of the speed display under the following conditions :

after the ignition has been switched off for at least two minutes,

if one of the sensors or detectors or their wiring monitored by the instrument panel is defective (See fault-finding on pages 83-24 and 83-39).

NOTE : The codes range from E1 to E9.

- the vehicle is stationary.

5/ TACHOMETER

The engine speed is displayed by means of a 50 segment bargraph **(7 segments per 1 000 rpm)**.

Petrol engine
Scale : 0 to 7 000 rpm.
At speeds of more than 6 000 rpm, the complete bargraph will flash.

6/ FUEL LEVEL BARGRAPH*

Each segment of the bargraph represents 1/10 of the fuel tank capacity.

WARNING : When filling the tank, the vehicle must have been stationary for at least **15 seconds** for the fuel contents level to be correct with the ignition switched off.

7/ MINIMUM FUEL LEVEL WARNING LIGHT

When the quantity of fuel in the tanks falls to below **5 litres**, the minimum fuel level warning light will flash.

(*) Sensors, detectors or wiring, whose condition is monitored by the instrument panel.

8/ SERVICE WARNING LIGHTS

- Screen washer fluid minimum level warning light.
- Front brake pad wear warning light.
- Electronic defect warning light.
  It illuminates as soon as the ignition is switched on and should go extinguish when the engine is running (injection test warning light).

9/ ON-BOARD COMPUTER

9/ RESET BUTTON

10/ OTHER WARNING LIGHTS

11/ BUTTON TO CHANGE UNITS

km/h or mph (for righthand drive vehicles).

12/ TOTAL MILEAGE RECORDER

13/ TRIP MILEAGE RECORDER

14/ TRIP MILEAGE RECORDER RESET BUTTON

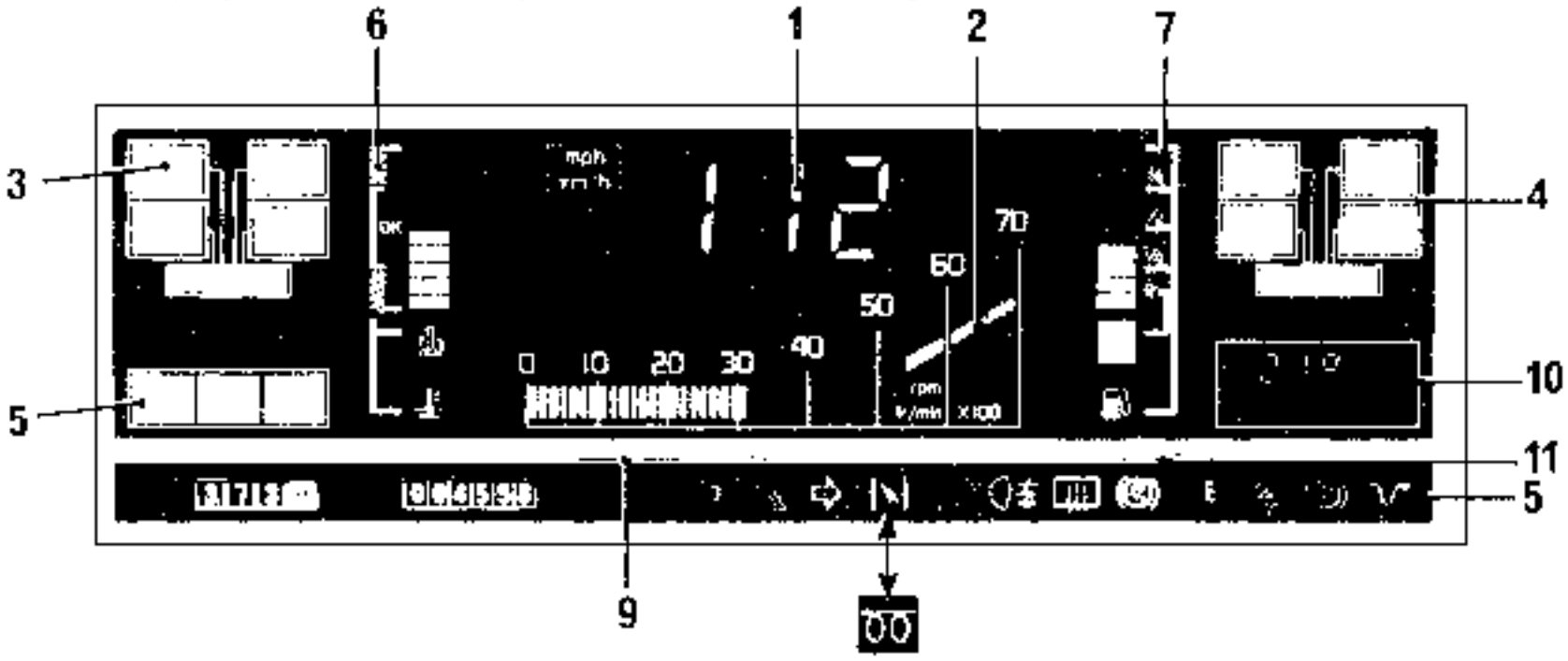
15/ LIGHTING WARNING LIGHTS

DESCRIPTION

The electronic instrument panel consists of several distinctly separate units contained in a single casing :

- a liquid crystal display assembly,
- a warning light assembly,
- a voice synthesiser unit (depending on equipment level).

In addition, the instrument panel checks that certain sensors and detectors are operating correctly and, if they are not, displays an error code in place of the speed display.



NOTE : The lighting rheostat controls the brightness of the display.

1/ VEHICLE SPEED

The digital speedometer consists of three figures that can indicate a maximum speed of 255 km/h.

The speed data is provided by a sensor built-in to the mechanical mileometer assembly.

2/ ENGINE SPEED

The engine speed is displayed by means of a 50 segment bargraph (7 segments per **1 000 rpm**). The first three segments are illuminated as soon as the ignition is switched on, before the engine starts).

A - Petrol engines

The engine speed displayed on the bargraph ranges from **0 to 7 000 rpm**. At speeds of more than **6 000 rpm**, the bargraph will flash.

B - Diesel engines

The engine speed displayed on the bargraph ranges from **0 to 5 500 rpm**. At speeds of more than **4 800 rpm**, the bargraph will flash.

3/ DANGER WARNING LIGHT

If one of the following defects is detected, the warning light that corresponds to the actual defect will switch on together with the "STOP" warning light. There will also be a spoken message.

- **BATTERY CHARGING SYSTEM DEFECT**

  This warning light will illuminate when the ignition is switched on and should extinguish when the engine starts.

  If the warning light illuminates whilst the engine is running, it is an indication of a defect in the charging system.

DESCRIPTION (continued)

The voice synthesiser will generate the spoken message "electrical system defect" if :

- the charging defect lasts for more than **10 seconds**,
- the oil pressure has been correct for at least **60 seconds**.

- **BRAKING SYSTEM DEFECT**

This warning light is tested when the ignition is switched on and should extinguish as soon as the engine starts.

If the warning light remains illuminated with the engine running, it is an indication that there is a defect in the braking system (brake fluid level, pressure drop in the braking system).

The spoken message "braking system defect" is generated when the + circuit, after the ignition switch is closed and there is an indication of a defect in the braking system.

As soon as it is detected, this defect is memorised and the warning light will remain illuminated until the ignition is switched off.

- **OIL PRESSURE DROP**

This warning light should illuminate when the ignition is switched on and extinguish as soon as the engine starts.

If the warning light remains on with the engine running, it is an indication of low pressure in the lubrication system (**0.35 bar** minimum pressure switch and **2 bar** pressure switch for speeds of more than **2 500 rpm**).

The spoken message "low oil pressure" is generated if :

- the + circuit after ignition is closed,
- the engine has been running for at least 10 seconds,
- the defect has been detected for more than 2 seconds.

- **ENGINE COOLANT TEMPERATURE**

This warning light should extinguish when the ignition is on and the engine is running. If the warning light illuminates, it is an indication that the engine coolant temperature is too high (higher than **115 °C**).

The spoken message "engine overheating" is generated when :

- the ignition is on,
- an overheating condition has been detected for more than one second,
- the oil pressure has been correct for more than **10 seconds**.

4/ SERVICE WARNING LIGHTS

When one of the following defects is detected, the corresponding warning light will illuminate together with the "SERVICE" warning light.

A spoken message is generated for certain defects under the following conditions.

- **BRAKE PAD WEAR**

If this warning light illuminates it is an indication that the brake pads require replacing.

The spoken message "BRAKE PADS WORN" is generated with the ignition on, when the defect has been detected for a total of **30 seconds** since the ignition was switched on. The defect is held in the memory until the ignition is switched off.

DESCRIPTION (continued)

- **AUTOMATIC TRANSMISSION - INJECTION WARNING LIGHT**

  This warning light indicates a defect in the fuel injection system or the automatic transmission. It illuminates when the ignition is switched on and extinguishes when the engine is started

  There is no spoken message for these defects.

- **SCREEN WASHER BOTTLE LEVEL**

  This warning light indicates that the screen washer bottle is empty.

  There is no spoken message for this defect.

- **ANTI-LOCK BRAKING SYSTEM (ABS) DEFECT**

  This warning light illuminates when the ignition is switched on and extinguishes when the engine starts.

  It indicates that there is a defect in the anti-lock braking system.

  There is no spoken message for this defect.

5/ OTHER WARNING LIGHTS

6/ OIL AND WATER BARGRAPH

This displays the following two readings in succession :

- oil level,
- coolant temperature.

When the ignition is switched on, before the engine is started, the oil level reading is automatically selected if the ignition has been off for more than two minutes.

There will be no display on the bargraph before a maximum of 2.5 seconds after switching on the ignition.

Once the "engine running" signal is received, or if the vehicle is moving, the bargraph will provide a direct coolant temperature reading.

If an "engine overheating" signal is received from the temperature switch, all the bargraph segments will illuminate. (One bargraph segment corresponds to approximately 10°C. The bargraph indicates temperatures higher than 50°C).

7/ FUEL LEVEL BARGRAPH

The level of fuel in the tank is shown by ten segments and by a "minimum fuel level" warning light.

Each of the bargraph segments corresponds to 1/10 of the fuel tank capacity.

8/ VOICE SYNTHESISER

Functions covered :

- handbrake,
- side doors not closed properly,
- lights not switched off,
- minimum fuel level,
- brake pads worn,
- drop in oil pressure,
  engine overheating,
- braking system defects,
- electrical charging system defect,
- no defect,
- fault diagnosis.

FUNCTIONS

- handbrake on,
- doors not closed properly,
- lights left on

The message "HANDBRAKE ON" is generated when :

- the handbrake is applied,
  the ignition is on,
- the vehicle is moving at a speed of more than **10 mph** (15 km/h).

A message such as "**FRONT** RIGHTHAND DOOR NOT PROPERLY CLOSED" is generated when :

- the door in question is not closed properly,
- the ignition is on,
  the vehicle is moving at a speed of more than **10 mph** (15 km/h).

The message "LIGHTS ON" is generated when :

- the side lights are on,
- the ignition is switched off,
- the driver's door is opened.

MINIMUM FUEL LEVEL MESSAGE

A spoken message of the type "**FUEL** LEVEL LOW" is generated when the fuel reaches the minimum level (less than **5 litres).**

BRAKE PAD WEAR

The spoken message "BRAKE PADS WORN" is generated when :

the ignition is switched on,
- the defect has been detected for a total of more than **30 seconds** since the ignition was switched on.

OIL PRESSURE DROP

The defect "DROP IN OIL PRESSURE" is detected either by the first minimum oil pressure switch or by the second pressure switch (when the engine speed is higher than **2 500 rpm**).

The spoken message "DROP IN OIL PRESSURE" is generated when :

- the ignition is on,
- the engine has been running for at least **10 seconds,**
- the defect has been detected for at least **2 seconds.**

ENGINE OVERHEATING

Excessive temperatures are detected by a temperature switch (**115 °C**).

The spoken message "ENGINE OVERHEATING" is generated when :

- the ignition is switched on,
- the overheating condition has been detected for more than **1 second,**
- the oil pressure has been correct for more than **10 seconds,**

The message is not transmitted if the temperature switch is defective.

BRAKING SYSTEM DEFECT

The message "BRAKING SYSTEM DEFECT" is generated when :

- the ignition is switched on.,
- the defect is detected in the braking system.

The defect is memorised until the ignition is switched off (the warning light remains illuminated).

CHARGING SYSTEM DEFECT

The spoken message "ELECTRICAL SYSTEM CIRCUIT DEFECT" is generated when :

- the charging defect has been detected for more than **10 seconds,**
- the oil pressure has been correct for more **than 60 seconds**.

The message will not be transmitted if the first pressure switch (0.35 bars) is defective.

Musical "self-test" signal

The musical self-test signal is generated under the following conditions :

- if there is a defect in one of the sensors or detectors,
- if the ignition has been switched on for for more than **1 second,**
  if the engine is stopped.

VOICE SYNTHESISER

Conditions under which the messages are generated

Types of spoken message	Conditions under which message is generated	Fault detected by :	Held in memory until ignition switched off
Oil pressure drop	Ignition on Engine running for more than 10 **seconds** Fault detected for **2 seconds**	Oil pressure switch (Circuit earthed)	
Engine overheating	Ignition on Fault detected for **1 second** Oil pressure correct for more than **10 seconds**	Temperature switch (Circuit earthed)	
Battery charging system defect	Oil pressure correct for more than **60 seconds** Fault detected for **10 seconds**	Voltage regulator (warning light circuit earthed)	
Braking system defect	Ignition on Braking system defect	Sensor on brake fluid reservoir (Circuit earthed)	X
Minimum fuel level	Ignition on Fault detected for 30 **seconds** Less than **5 litres**	Fuel tank unit (Circuit earthed)	X
Brake pads	Ignition on Fault detected for more than a total of **30 seconds** since ignition switched on	Brake pads (Circuit earthed)	X
Rear lefthand door Rear righthand door Front righthand door Front lefthand door	Ignition on Vehicle speed more than **10 ± 5 mph (15 ± 5 km/h)** Doors not fully closed	Door switches (Circuit earthed)	
Handbrake on	Ignition on Vehicle speed more than **10 ± 5 mph (15 ± 5 km/h)** Handbrake applied	Switch (Circuit earthed)	
Lights on	Ignition off Side lights on Driver's door open	Circuit earthed via the door switch + side lights	

DESCRIPTION (continued)

A fault detected by one of the sensors switches off the message "MONITORED FUNCTIONS CORRECT".

The musical signal replaces the "lights still on" message when all the voice synthesiser messages have been obliterated.

NOTE : Any of the warning messages will interrupt any of the messages currently being transmitted unless the message in question is already a warning message. The interrupted message will be re-transmitted if the conditions giving rise to it still exist.

9/ "OBLITERATION" SWITCH

This cuts out all the voice synthesiser messages when the switch operated by its button earths the circuit.

NOTE : The obliteration does not apply to the defect summary messages :

- the musical signal can be obliterated,
- if the obliteration system is operating, the "lights still on" message is replaced by the musical signal.

DEMONSTRATION RE-RUN SWITCH

When this switch earths its circuit, with the ignition on, the system can be used either to re-transmit the messages, re-run the defect summary or carry out a demonstration run (this switch is mounted with the other switches on the fascia panel).

Operating the re-run switch when one or more consecutive messages are being transmitted or re-transmitted, interrupts the message currently being broadcast and causes the message to be re-transmitted.

During the demonstration run, if no defect is present, all the bargraphs on the instrument panel will switch on.

10/ ON-BOARD COMPUTER

11/ RESET BUTTON

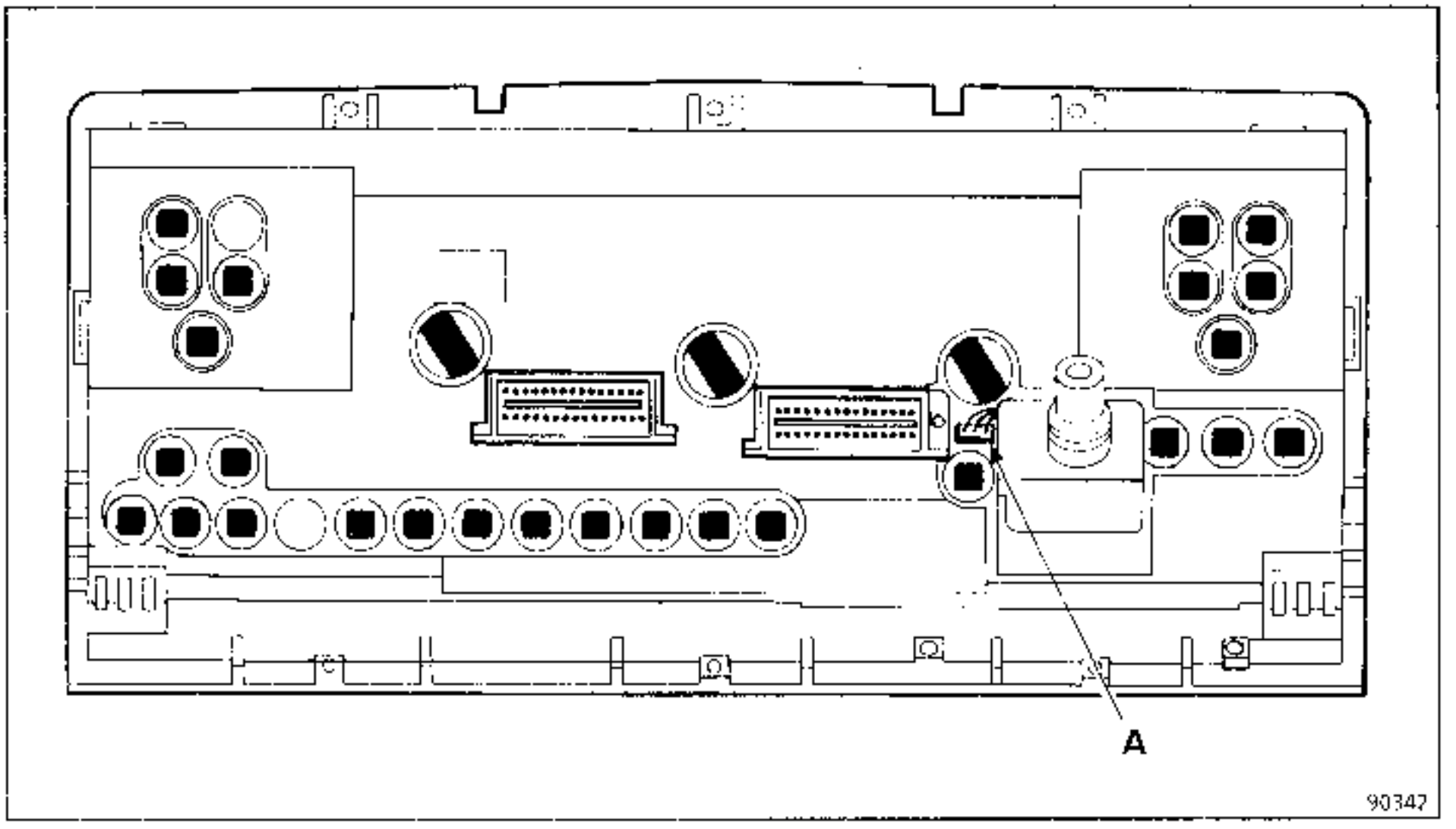
SERVICING

THE ELECTRONIC INSTRUMENT PANEL CANNOT BE REPAIRED. THE ONLY SERVICING OPERATIONS THAT CAN BE CARRIED OUT ON IT ARE REPLACING THE BULBS AND TESTING THE SPEEDOMETER CONNECTOR (A).

Carry out a careful fault finding operation and, if necessary, replace the instrument panel with a standard service exchange unit.

Return the faulty instrument panel in the packing in which the service exchange unit was delivered. The returned instrument panel must be in perfect condition (with no traces of internal dismantling) and accompanied by the fault record card, **duly filled in**. If it is not, the panel will not be accepted for service exchange.

Removing the bulbs.

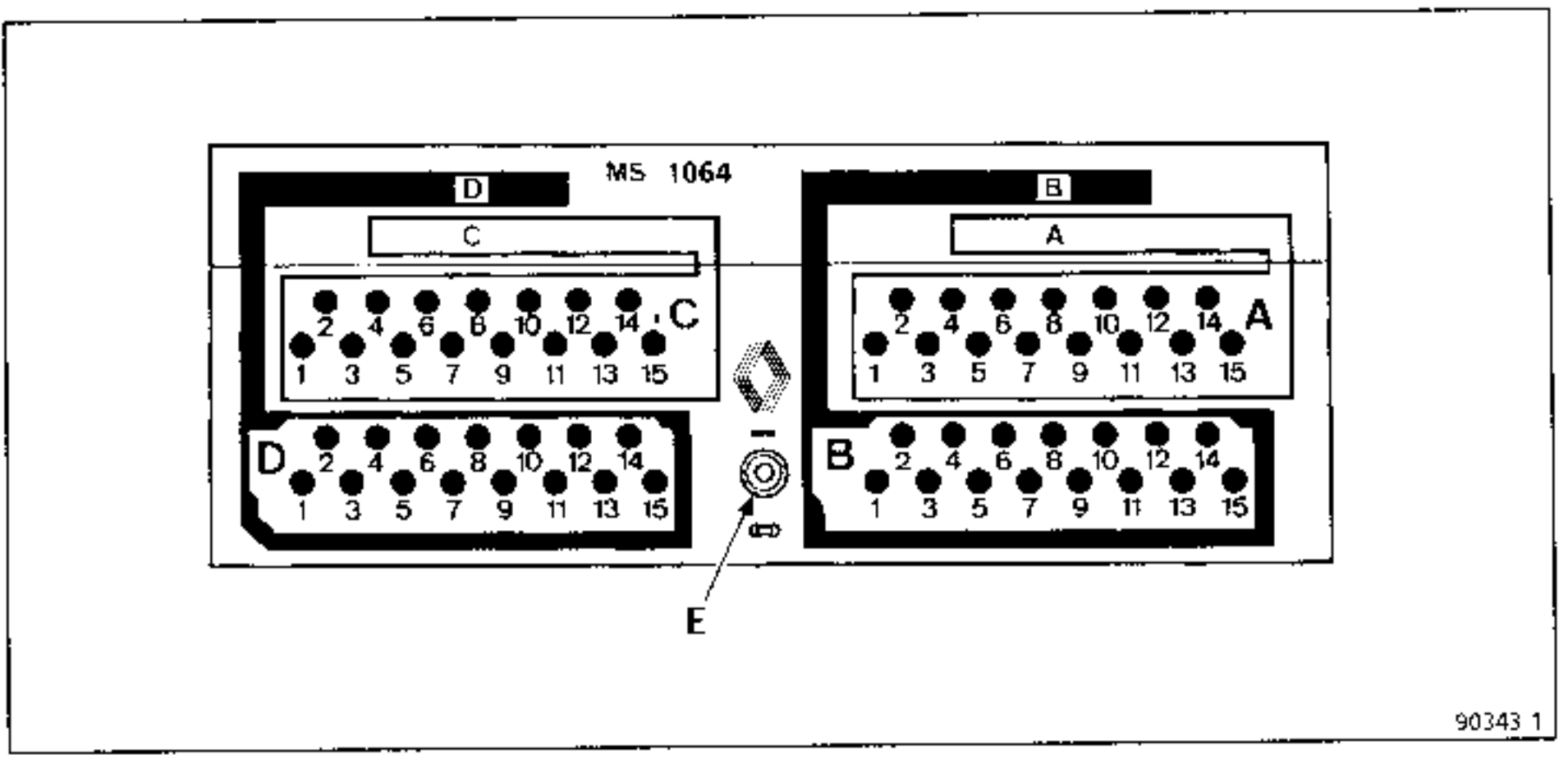


Do not remove the white plastic cover. Take out the bulbs with flat jawed pliers.

FAULT-FINDING AND PRECAUTIONS TO BE TAKEN ON THE ELECTRONIC INSTRUMENT PANEL

ESSENTIAL SPECIAL TOOLING	
MS. 1064	Junction block for testing the wiring using the XR 25 or a multimeter

The use of a junction block is essential for testing the wiring and the sensors or detectors when confirming general fault-finding procedures on the instrument panel itself (whether coded or not).



A : Red connector **A**
B : Black connector **B**
C : Blue connector **C**, with lock retaining system
D : Blue connector **D**, without lock retaining system
E : Chassis earth (reference)

CONNECTING

Connect the junction block into the system in place of the instrument panel.
Connect the free wire on the junction block to a chassis component (the earth connection must be absolutely perfect). This wire is used to check the continuity of the earth circuits.

PRINCIPLE OF TEST METHOD

Place the probes of the **XR 25** or the multimeter on the contacts identified by the numbers on the junction block which correspond to the fault-finding sequence or connection described in this manual.

PRECAUTIONS

- Never wrongly connect the earth at the instrument panel connectrons or on the sensors, as this could irreparably damage the instrument panel.

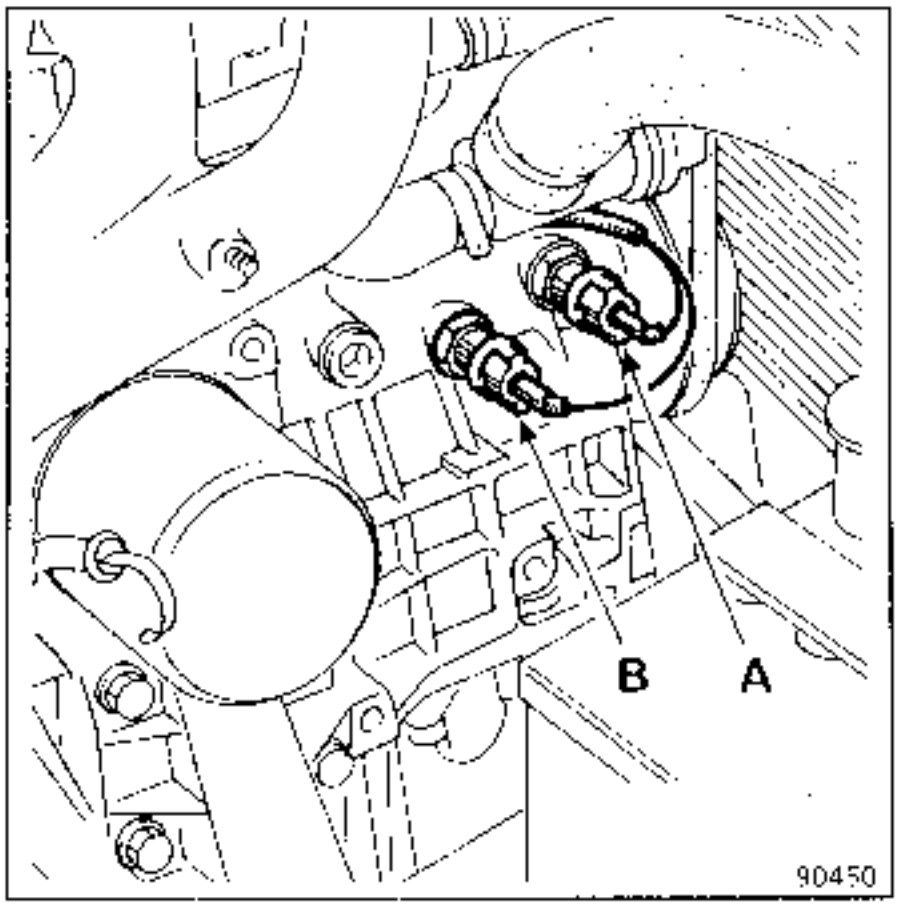
Example :
Cross-connection of the rear view mirror de-icing system earth and the external temperature sensor return wire.

- Do not use a test lamp.
- **Never disconnect the battery or remove the instrument panel supply wire when the ignition is switched on.**

SPECIAL POINTS (J type petrol engine)

Defect : If the oil pressure warning light remains switched on with the engine running at idling speed, but switches off when the speed reaches **2500 rpm**.

Cause : Wires cross-connected on the pressure switch connectors

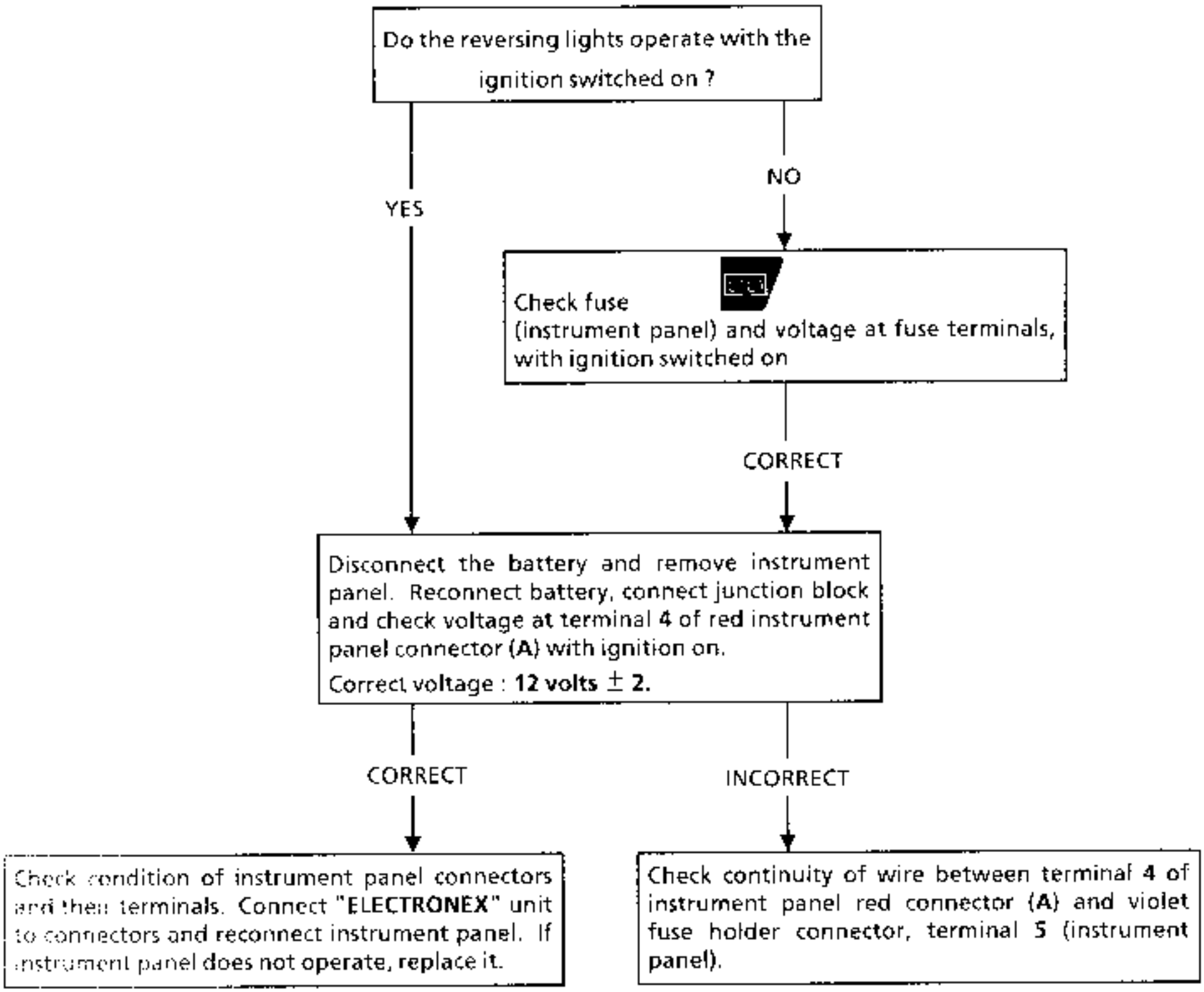


A = 2 bars

B = 0.35 bar

FAULT-FINDING

Defect : Instrument panel not operating (no panel lighting or, when applicable, no clock, no stop and service warning light with ignition on, no liquid crystal display).



NOTE : See Wiring Diagram Manual

FAULT-FINDING

Defect : With ignition on or engine running, no liquid crystal display on the instrument panel and, when applicable, no clock, operate lighting rheostat (variation in brightness of lighting, but no display), check :

5 amp fuse (interior light) on black fuse holder connector terminals **4** and  **10**.

With voltmeter, check voltage at terminal **10** on fuse holder connector

CORRECT

Disconnect the battery and remove the instrument panel. Reconnect the battery. **Connect junction block** and check voltage between terminals **14** (-) and **15** (+) on black instrument panel connector (B) (with 5 amp fuse in place). Correct voltage : **12 volts** ± **2**.

CORRECT

Check condition of instrument panel connector and its pins. Connect "ELECTRONEX" to connector and reconnect instrument panel. If still defective, replace instrument panel.

INCORRECT

Check continuity and insulation of wire between terminal **15** of black instrument panel connector (B) and terminal **10** of the fuse holder connector.

CORRECT

Check continuity and insulation of the wire between terminal **14** on black instrument panel connector (B) and earth wire on front RH door pillar. Check that wire is tight and in good condition (paint, corrosion).

INCORRECT

Check continuity and insulation of wire between fuse holder connector, terminal **4** and harness. See Wiring Diagram Manual.

FAULT-FINDING

Defect : With ignition on and rheostat operating, there is very little variation in the brightness of the side light and headlight warning lights and direction indicator repeater operating when not selected. The danger warning lights (STOP) operate normally. When the vehicle is being driven, the instrument panel displays incorrect readings.

Disconnect the battery **after switching off the ignition.**

Remove the instrument panel and check that the earth wire on the blue instrument panel connector (D) that has no retaining lock, terminal 13, has not come out of its contact on the connector. If it is OK, connect up the junction block and check :

Continuity between terminal 13 on blue connector (D) without a lock and the (-) terminal on the junction block. Correct reading : **0** to **2 Ω** - Incorrect : greater than **2 Ω**.

CORRECT

With ignition on and **heater blower on maximum**, measure with a voltmeter in position "mV" the voltage between blue instrument panel connector **(D)** without a lock, terminal **13, and** (-) on junction block. Correct reading : **5** to **20** mV (pointer should move). Incorrect : **0**.

CORRECT

Check condition of instrument panel connector and its pins. Connect "ELECTRONEX" to connector and reconnect instrument panel. If still defective, replace instrument panel.

INCORRECT

Check continuity between terminal **13** on blue connector **(D)** without lock and earth wire on red radio connector, twice, **7** tracks on terminal **B5**.

CORRECT

Check fastening of earth on front LH **door** pillar and condition of wires **(2 black wires)** (corrosion, paint, loose).

CORRECT

Check earth bar (black) which is in 2nd position to right of fascia panel harness. Continuity between chassis earth wire and wire on radio connector at **B5**

INCORRECT

Wire broken or terminal loose.

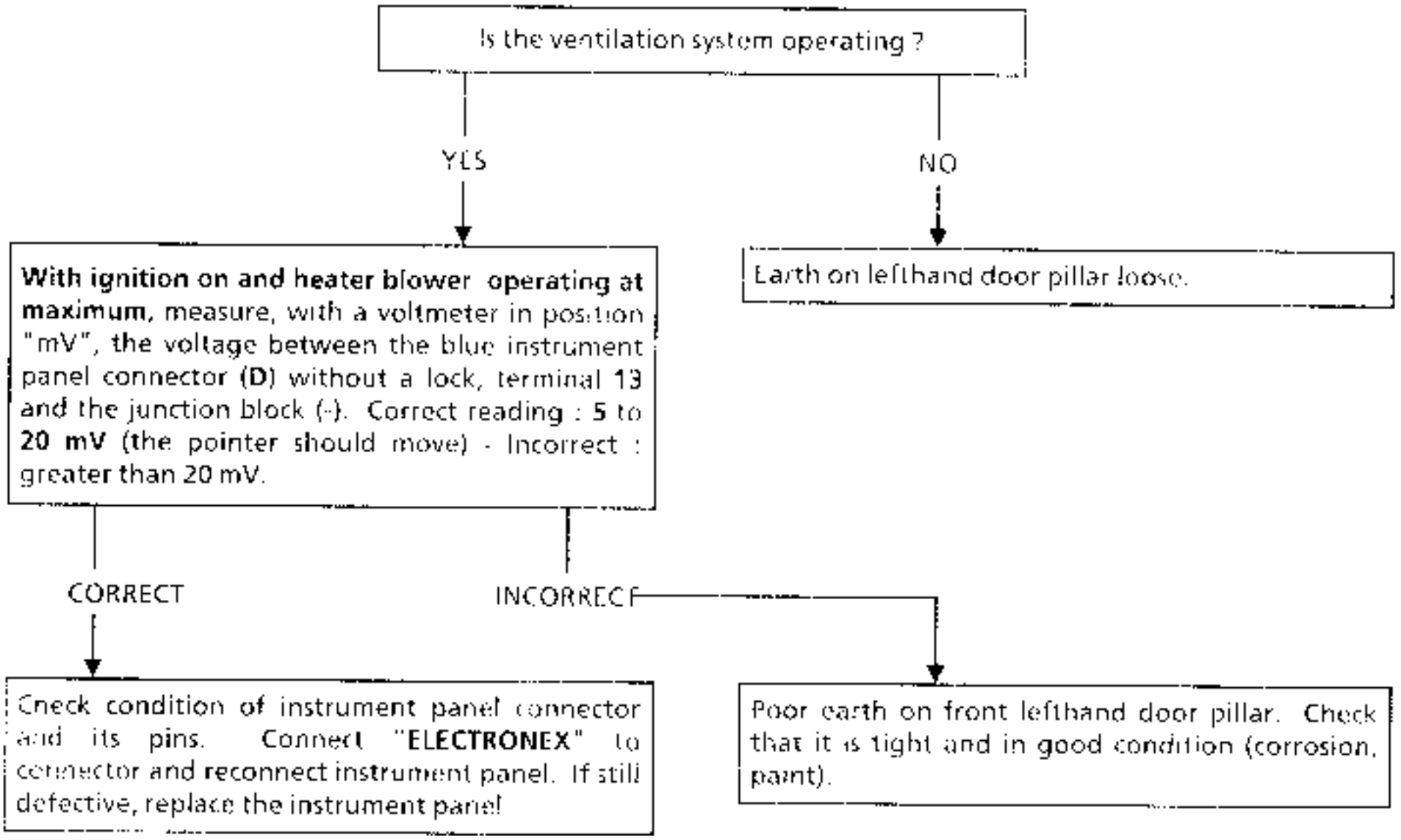
INCORRECT

FAULT-FINDING

Defect : When the vehicle is being driven, the instrument panel displays incorrect readings and the instrument panel lighting may vary in brightness, with the warning light switching on for no apparent reason.

Disconnect the battery **after switching off the ignition**.

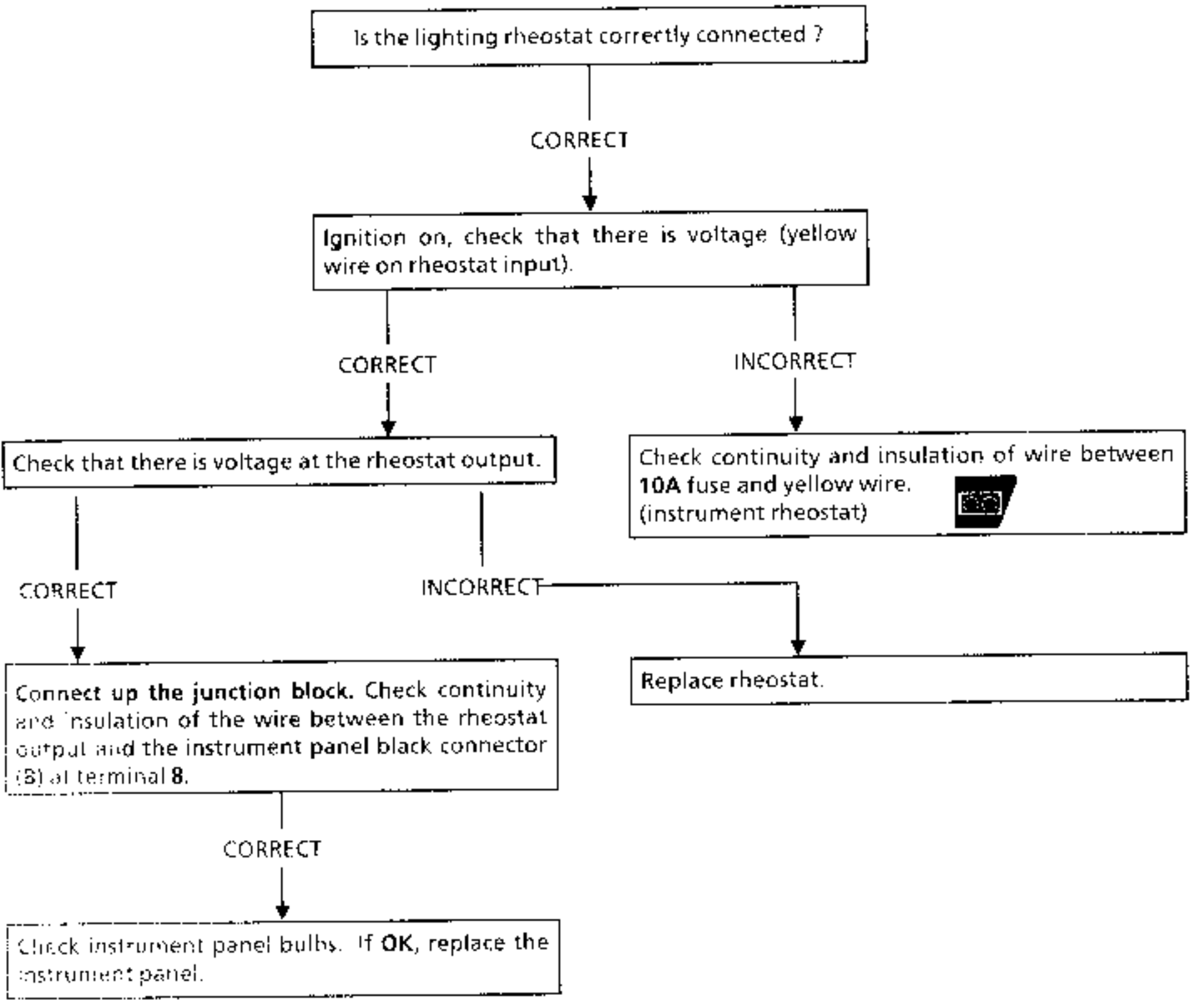
Remove the instrument panel, connect up the junction block and the battery and check :



FAULT-FINDING

Defect : With the ignition on, the instrument panel does not operate (no change when the instrument panel lighting rheostat is operating). The STOP and SERVICE warning lights operate, but the display is very dim.

Check :



See **Wiring Diagram Manual**.

FAULT-FINDING

Defect : no speed display

Mileometer and trip mileage operating, but no speed display.

↓

Check connection of connector (A) and condition of wires (red wire speedometer end)

↓

CORRECT

↓

Replace instrument panel.

No mileometer display and no speed display.

↓

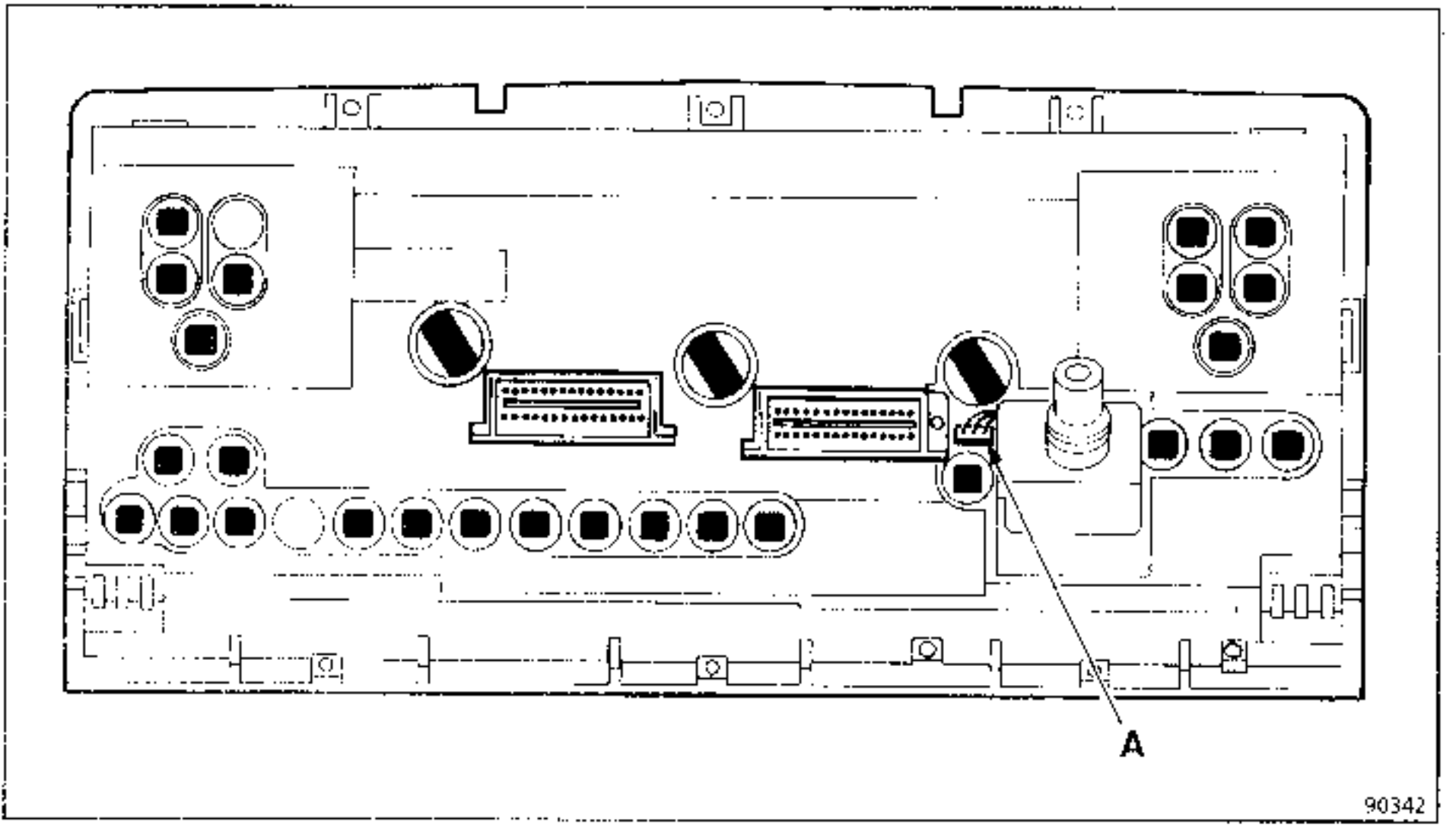
Check condition and operation of speedometer drive cable.

↓

CORRECT

↓

Replace instrument panel.



FAULT-FINDING

Defect : no tachometer display.

Petrol engine with electronic ignition module (AEI) or power module.

Disconnect the **AEI** or power module and check resistance at **AEI** or power module between contacts **A** and **C**.
Correct reading : **1000 Ω ± 500**.

↓ CORRECT

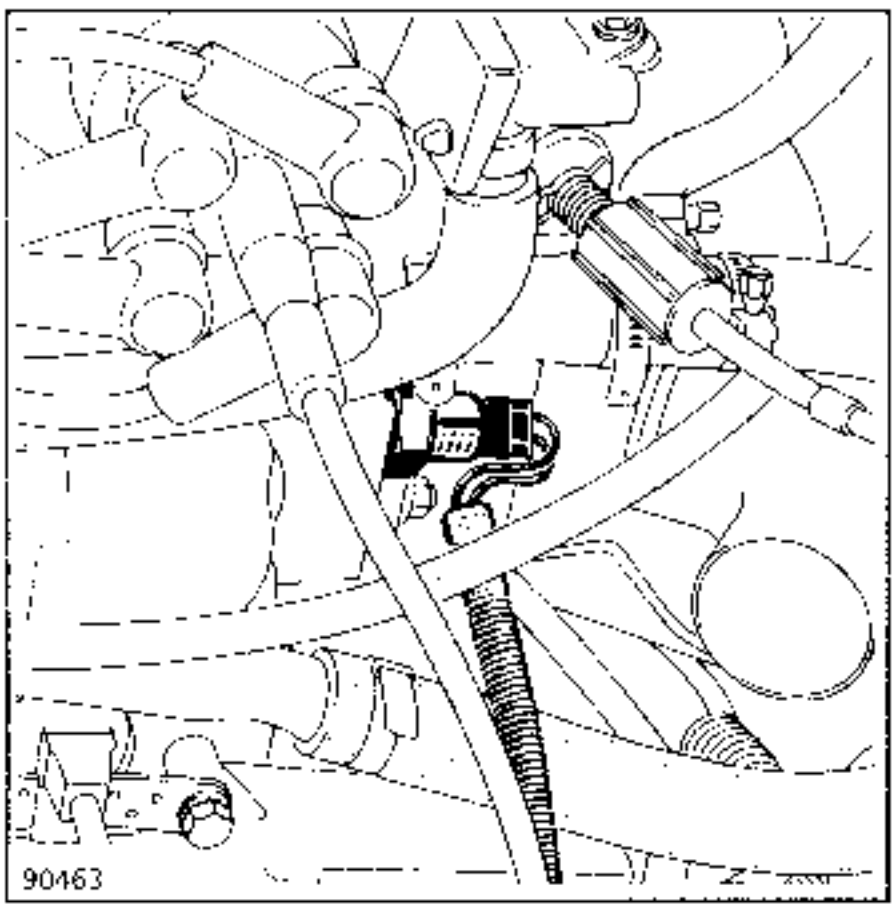
Connect junction block. Check continuity and insulation of tachometer wire between terminal **C** on **AEI** connection and terminal **13** of blue instrument panel connector (**C**) with lock.

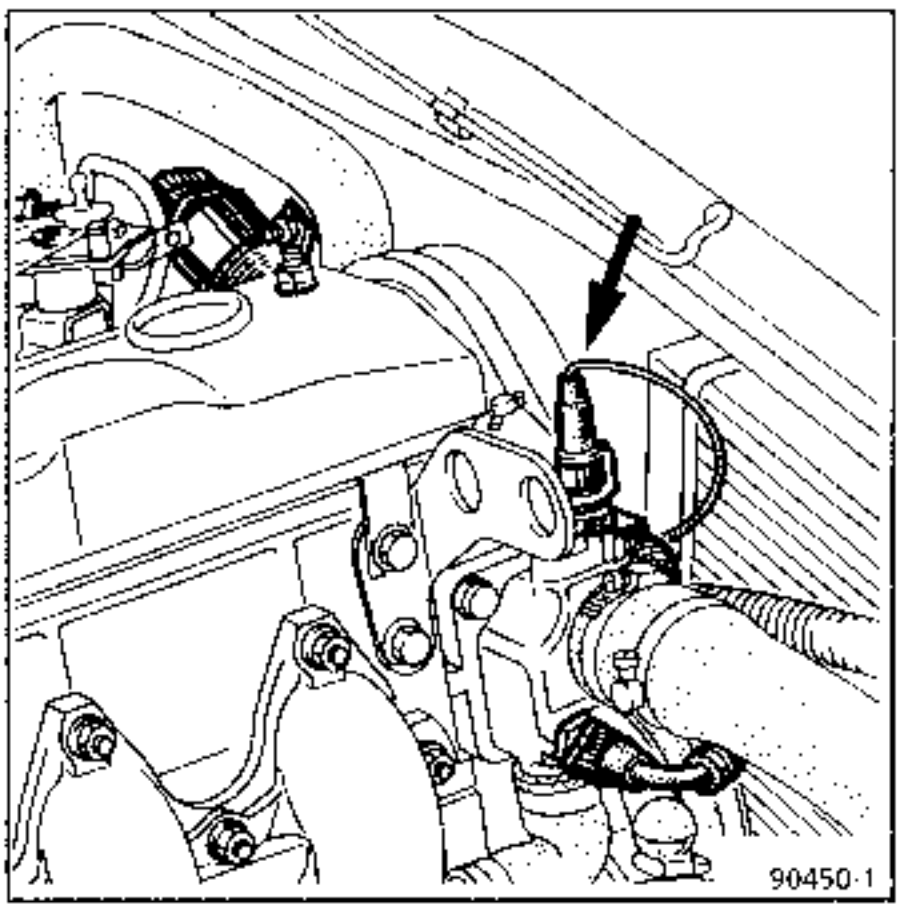
↓ CORRECT

Check condition of instrument panel connector and its pins. Connect the "ELECTRONEX" to the connector and reconnect the instrument panel. If still defective, replace the instrument panel.

FAULT-FINDING

Defect : no engine coolant temperature display.





Check that the sensor is correctly connected and the condition of the terminals and wires.

CORRECT

Check the voltage. with the ignition on, at the sensor connector (J type petrol engine), terminal **2** (**F** type petrol engine).
Correct voltage : **4 to 6 volts.**

CORRECT

INCORRECT

Check the sensor with the ohmmeter

R (Ω)	Coolant temperature
90 ± 10	115°C ± 5
140 ± 10	100°C ± 5
760 ± 50	50°C ± 5
3 000 ± 200	20°C ± 5

Connect junction block. Check the continuity and insulation of the wire between sensor connector (J type petrol engine), terminal **2** (F type petrol engine) and terminal **3** on blue instrument panel connector **(D)** without lock.

CORRECT

CORRECT

Check condition of the instrument panel connector and its pins. Connect the "ELECTRONEX" to the connector and reconnect the instrument panel. If still defective, replace the instrument panel

FAULT-FINDING

WARNING LIGHTS

The fault-finding test sequence is identical to that for the other tests.

a) Warning lights which are earthed via the instrument panel and the supply (+) for which comes via their control switches :

- side lights	blue connector (C) with lock	terminal 11
headlights	blue connector (C) with lock	terminal 10
- rear fog light	red connector (A)	terminal 8
- front fog lights	red connector (A)	terminal 7
- direction indicator light	red connector (A)	terminal 3 (righthand)
- direction indicator light	black connector (B)	terminal 2 (lefthand)
- heated rear screen	red connector (A)	terminal 9
- hazard warning lights	red connector (A)	terminal 1

b) Warning lights whose supply (+) comes via the instrument panel and the earths for which are via switches :

- handbrake	red connector (A)	terminal 13
- choke	red connector (A)	terminal 5
- pre-heater	red connector (A)	terminal 6
- brake pads	black connector (B)	terminal 7
- automatic transmission/ injection	black connector (B)	terminal 10
- screen washer bottle level	black connector (B)	terminal 6
- charge/discharge	blue connector (C) with lock	terminal 5
- oil pressure (0.35 bar)	blue connector (C) with lock	terminal 6
- coolant temperature	blue connector (C) with lock	terminal 4
- oil pressure (2 bars)	blue connector (C) with lock	terminal 15
- brake fluid level (nivocode)	blue connector (C) with lock	terminal 7

NOTE : The full supply for the dipped headlights comes through the switch (+) **terminal 8** - (-) **terminal 9** blue connector **(C)** with a locking system.

FAULT-FINDING

FOR ANY OTHER DEFECT, CHECK, USING THE JUNCTION BLOCK :

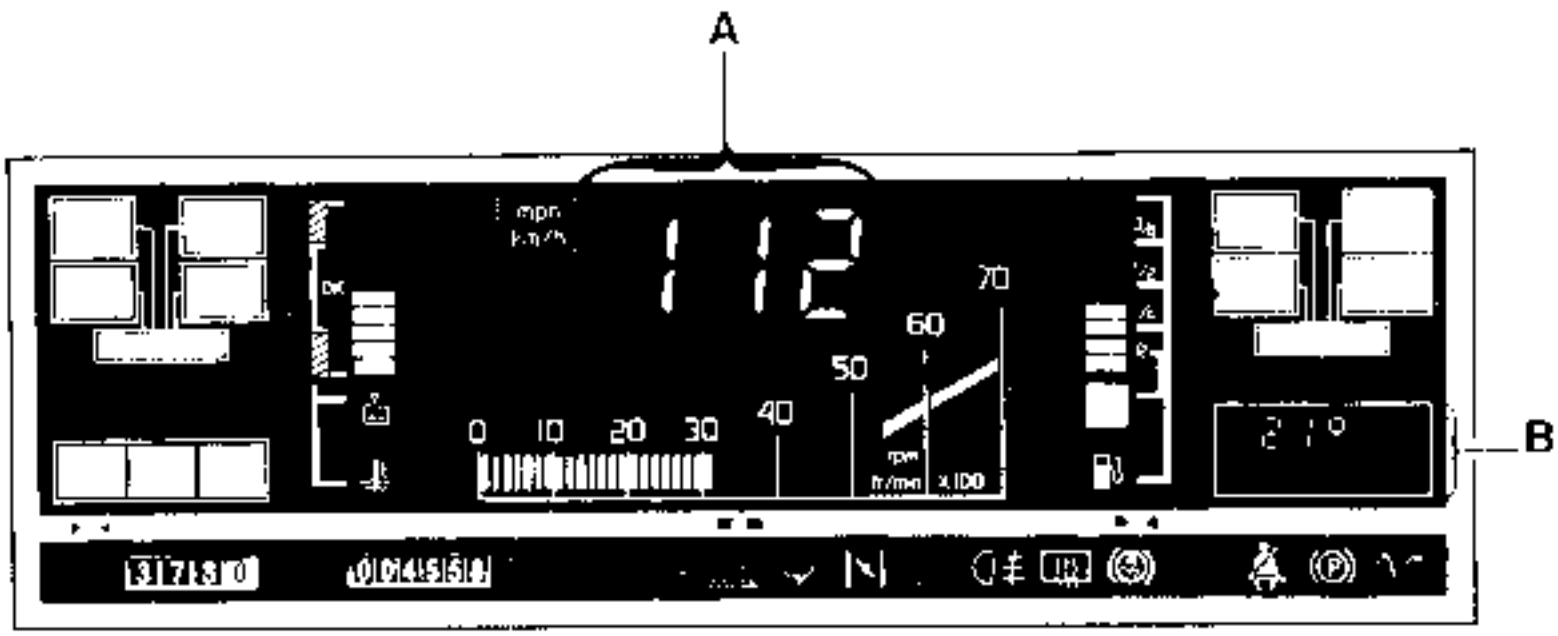
THE INSTRUMENT PANEL EARTH CIRCUITS :

- electronic earth	black connector **(B)**	terminal **14**
- warning light earth : see pages **83-31** and **83-32**.		

INSTRUMENT PANEL CURRENT SUPPLY :

- + before ignition switch :	black connector **(B)**	terminal **15**
- + after ignition switch :	red connector **(A)**	terminal **4**
- - instrument panel lighting :	black connector **(B)**	terminal **8**

FAULT-FINDING



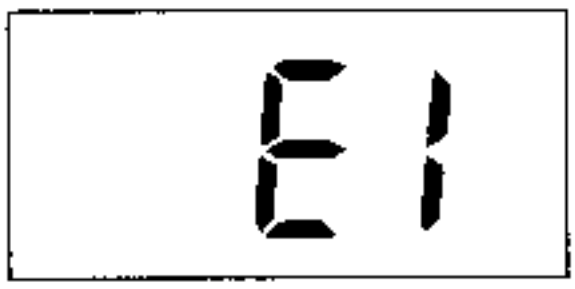
I - ZONE A

The instrument panel displays defects on the following sensors and their wiring :

- fuel gauge,
- instrument panel resistance,
- engine oil pressure switch,
- engine oil level indicator,
- external temperature sensor,
- engine coolant temperature switch,

by messages which are displayed in place of the vehicle speed.

Example :



If a defect occurs on more than one sensor, these codes will be displayed one after the other.

CONDITIONS UNDER WHICH THE CODED MESSAGE APPEARS

The ignition must have been switched off for at least **2 minutes**.

Ignition switch to be in "ignition on" position.

WARNING:
If the starter is operated or if the ignition switch is switched off and then on again, the fault-finding codes are eliminated. You will have to wait for a period of 2 minutes before they reappear.

NOTE : The fault-finding mode can be selected without waiting for 2 minutes by switching off the ignition and disconnecting the battery.

The code will be erased as soon as the defect is rectified.

FAULT-FINDING

DEFECT DISPLAY (ZONE A)

Code	Defective sensor or wiring	Defect	For rectification, see page :
E1	Instrument panel resistance	Short-circuit	83-42
E2	Fuel gauge	Disconnected or wire broken	83-43
E3	Not used	Not used	
E4*	**2 bar** oil pressure switch	Disconnected or wire broken or open contact	83-44
E5	Engine oil level sensor	Disconnected or wire broken or short-circuit	83-45
E6	External temperature sensor (in rear view mirror)	Broken or disconnected	83-46
E7		Short-circuit	83-47
E8	Engine coolant temperature switch	Disconnected or broken	83-48
E9*	**0.35 bar** oil pressure switch	Disconnected or wire broken or short-circuit	83-49

* For the **F type** engine there is only one oil pressure switch **(0.35 bar)**. If a defect occurs on this, both codes **(E4-E9)** will be displayed one after the other.

FAULT-FINDING

DEFECT DISPLAY (ZONE A)

Code	Defective sensor or wiring	Defect	Voice synthesiser	Page
E1	Not used	-	-	-
E2	Fuel gauge	Disconnected or wire broken	musical	83-43
E3	Not used	Not used		-
E4*	**2 bar** oil pressure switch	Disconnected or wire broken or short-circuit	musical	83 44
E5	Engine oil level sensor	Disconnected or wire broken or short-circuit	musical	83-45
E6	External temperature sensor (in rear view mirror)	Broken or disconnected	musical	83-46
E7		Short-circuit		83 47
E8	Engine coolant temperature switch	Disconnected or circuit broken	musical	83-48
E9*	**0.35 bar** oil pressure switch	Disconnected or wire broken or short-circuit	musical	83-49

* For the **F type** engine there is only one oil pressure switch **(0.35 bar)**. If a defect occurs on this, both codes **(E4-E9)** will be displayed one after the other.

FAULT-FINDING

1 - Code E1 "instrument panel resistance"

When code **E1** is displayed, none of the segments of the fuel gauge bargraph on the instrument panel should be illuminated.

NOTE : The instrument panel is fitted with a resistance (which cannot be removed) to adapt the electronic instrument panel to the capacity of the fuel tank fitted to the X48 type vehicle.

FAULT-FINDING

Instrument panel resistance short-circuiting.
Replace instrument panel.

FAULT-FINDING

2 - Code E2 "fuel gauge"

Code **E2** is displayed. None of the segments of the fuel gauge bargraph on the instrument panel should be illuminated.

Check, in the following order :

That the gauge tank unit is correctly connected and that the wires and terminals on the connector are in good condition.

CORRECT

With the ignition on and code **E2** displayed, earth the fuel gauge connector wire, on terminal **1**. All the fuel gauge bargraph segments should illuminate and code **E2** should disappear (after **4 seconds**).

YES

With the ignition on and **E2** displayed, connect wires 1 and **4** on the fuel gauge connector. All the fuel gauge bargraph segments should illuminate and code **E2** should disappear (after **4 seconds**).

YES

Check fuel gauge.

NO

Connect the junction block. Check the continuity and insulation of the wire from terminal 1 of the fuel gauge connector to the blue instrument panel connector (D), without a lock, terminal **8**.

CORRECT

Check the condition of the instrument panel connector and its terminals. Connect the "ELECTRONEX" to the connector and reconnect the instrument panel. If still defective, change the instrument panel.

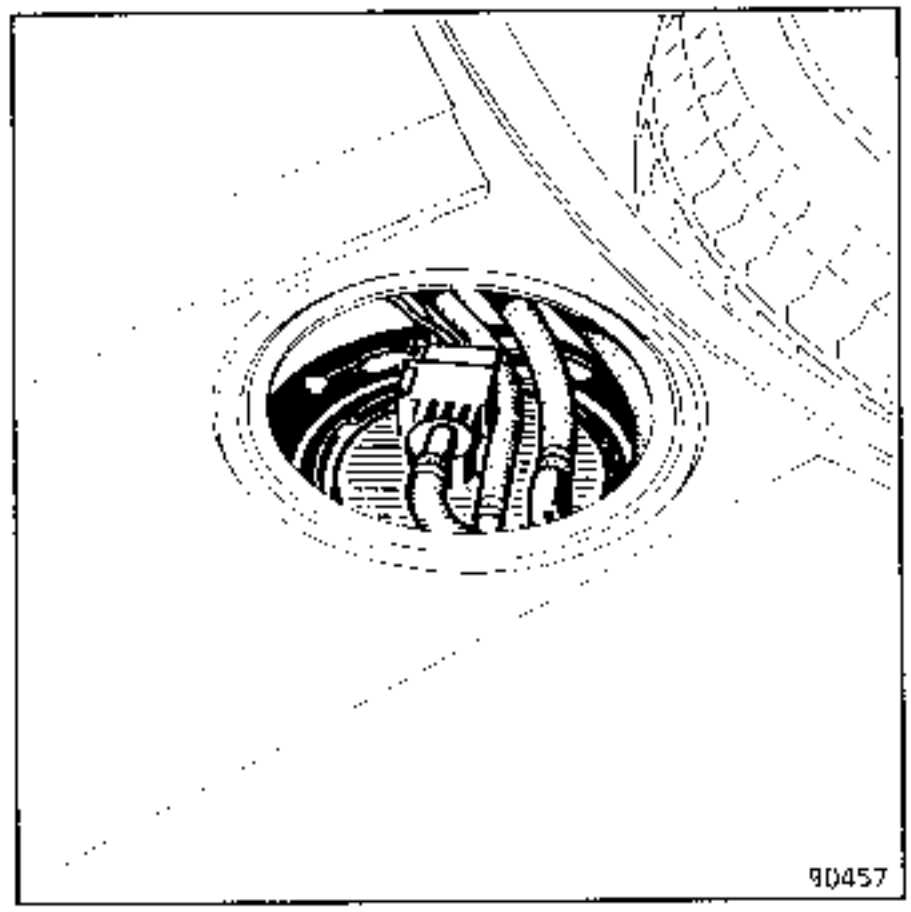
NO

Check the continuity between terminal **4** on the fuel gauge connector and earth.

Correct value : **0** to **5 Ω**.

INCORRECT

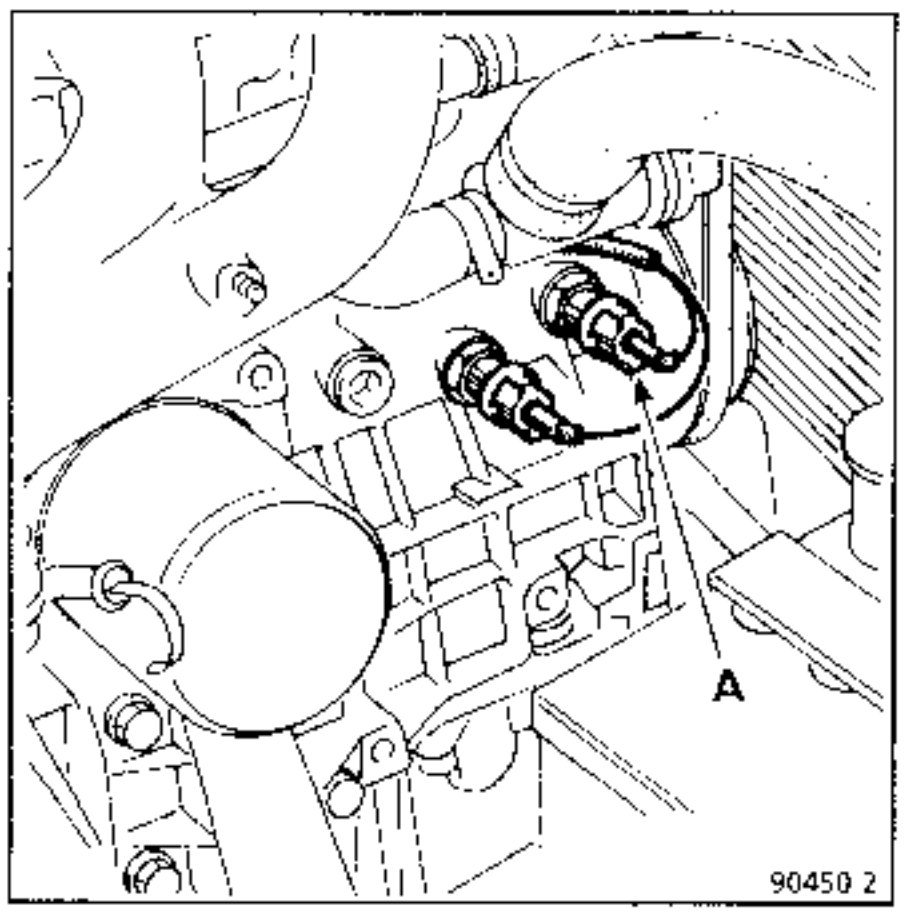
Connect the junction block. Check the continuity and insulation of the wire from terminal **4** of the fuel gauge connector and terminal **6** of the blue instrument panel connector **(D)**, without a lock.



FAULT-FINDING

3 - Code E4 "2 bar oil pressure switch (A)"

Only fitted to J type petrol engines.



If code **E4** is displayed, check :

That the pressure switch is correctly connected and the condition of the terminal and the wire.

CORRECT

With the ignition on, code **E4** displayed, earth the pressure switch wire. Code **E4** should disappear **(4 seconds)**.

YES

Replace the pressure switch **(A)** (switch jammed).

NO

Check the voltage between the pressure switch wire and earth with the ignition on.
Correct voltage : **11 volts ± 2.**

CORRECT

Check the condition of the instrument panel connector and its pins. Connect the "ELECTRONEX" to the connector and reconnect the instrument panel. If still defective, change the instrument panel.

INCORRECT

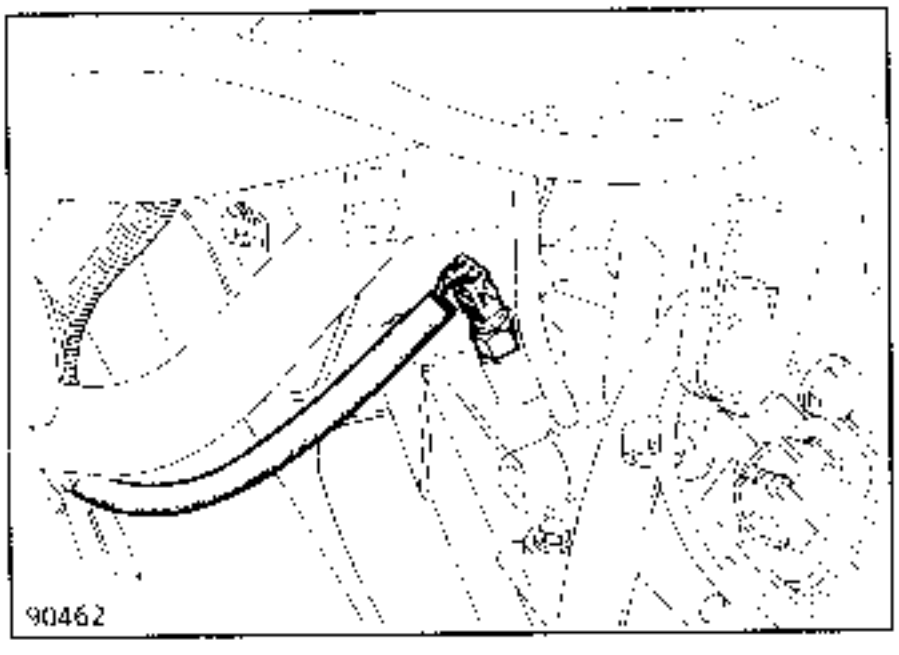
Connect the junction block. Check continuity and insulation of wire between pressure switch and connector and blue instrument panel connector **(C)** with lock, terminal **15.**

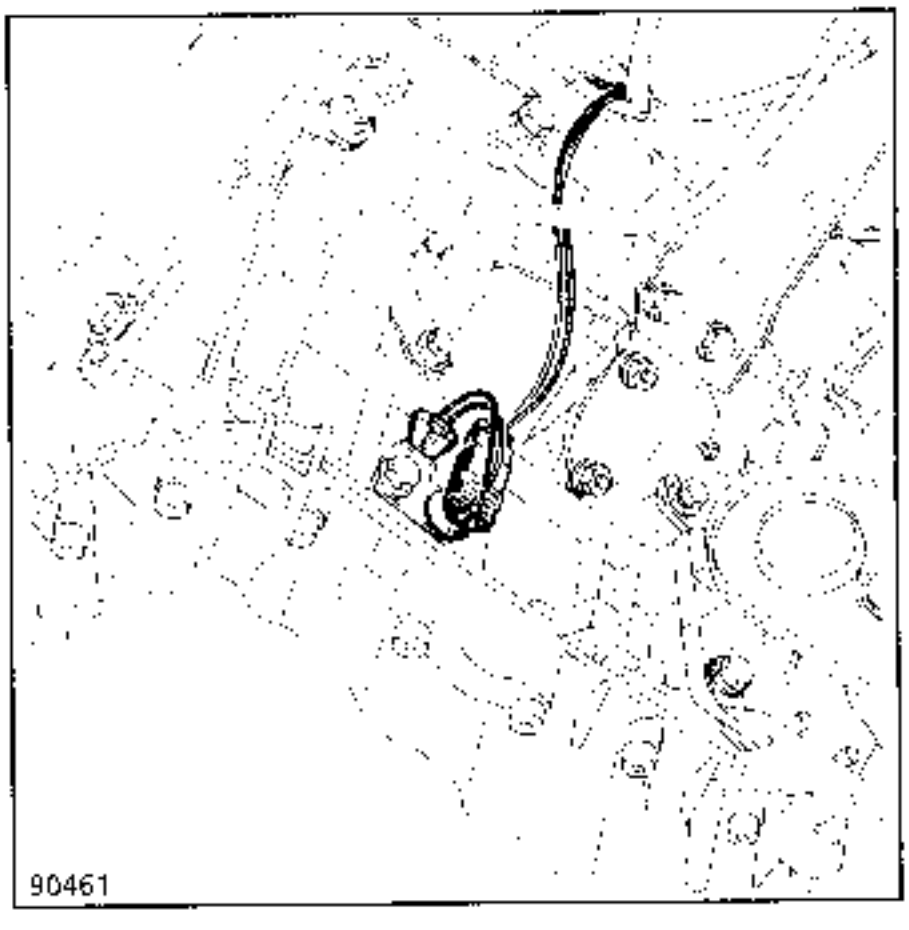
CORRECT

FAULT-FINDING

4 - Code E5 "Engine oil level sensor"

If code **E5** is displayed and none of the oil level indicator bargraph segments is illuminated.





Check:

That the sensor is correctly connected and the condition of its terminals and wires.

CORRECT

Measure the continuity of the sensor with an ohmmeter. Correct value : **5** to **30 Ω**.

CORRECT

Measure voltage between terminal **1 (F type petrol engine)** or **3 (J type petrol engine)** on the sensor connector, wiring end and earth with ignition on. Correct reading **0.5** to **8 volts**.

Measure continuity between terminal **3 (F type petrol engine)** or **1 (J type petrol engine)** on the sensor connector, wiring end and earth. Correct reading: **0** to **30 Ω**.

CORRECT

Connect the junction block. Check insulation and continuity of the wire from terminal **3 (F type petrol engine)** or **1 (J type petrol engine)** on the sensor connector to the blue instrument panel connector (D) without a lock, terminal 10.

CORRECT

Check the condition of the instrument panel connector and its pins. Connect the "ELECTRONEX" to the connector and reconnect the instrument panel. If still defective, change the instrument panel.

INCORRECT

Connect the junction block. Check insulation and continuity of the wire from terminal **1** (F **type petrol engine**) or **3** (J **type petrol engine**) on the sensor connector to the blue instrument panel connector (D) without a lock, terminal **9**.

CORRECT

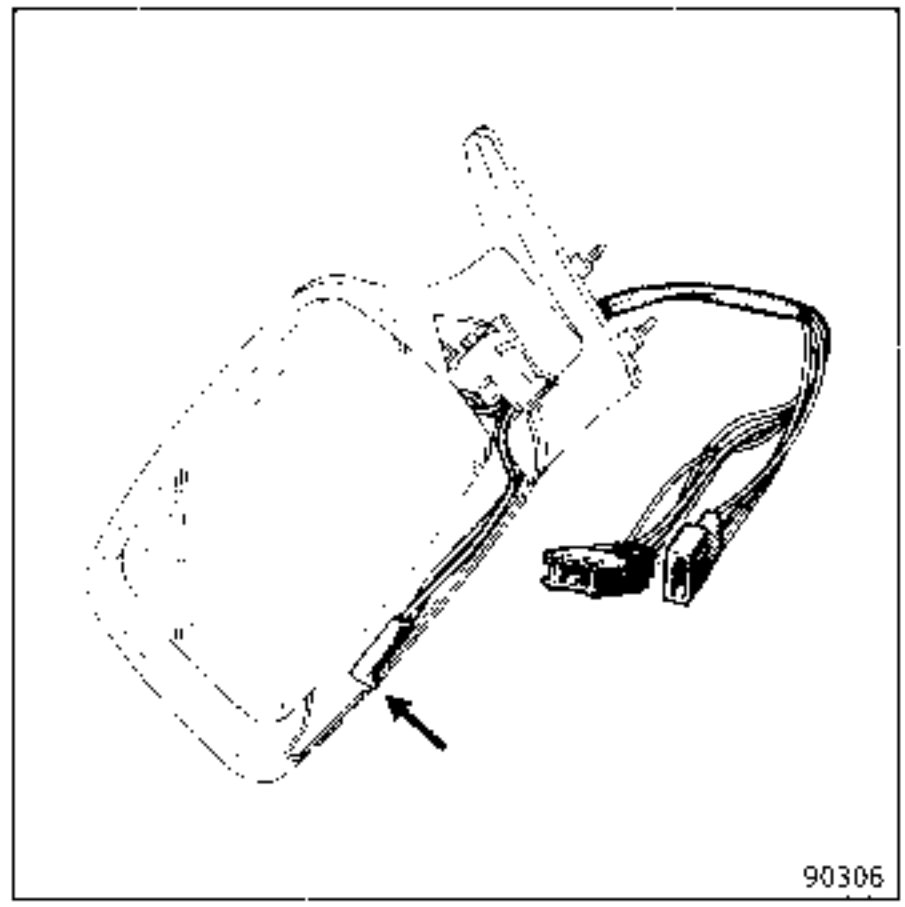
FAULT-FINDING

5 - Codes E6 - E7 "External temperature sensor"

This sensor is mounted in the lefthand rear view mirror and access can be gained to its connector by removing the speaker grille. **The sensor, however, cannot be removed.**

a) Code E6 with the external temperature display on the on-board computer flashing (sensor or wiring circuit broken or disconnected).

Check :


90306

That the sensor (white connector) is correctly connected and the condition of the terminals and wires

CORRECT

Disconnect the white connector and check the sensor circuit, with an ohmmeter, between terminal **A3** and **B3** on the white connector. correct values are :

Temperature	Resistance
0°C	6 kΩ ± 500
20°C	3 kΩ ± 300
25°C	2.5 kΩ ± 300
30°C	2 kΩ ± 300

NOTE : After carrying out the repair, the battery must be disconnected to stop the on-board computer display from flashing.

CORRECT

Check the voltage between terminal **B3** on the white connector (harness end) and earth, with the ignition switched on. Correct voltage : **2 to 6 volts.**

Check, with an ohmmeter, continuity between terminal A3 on the white connector and earth, with the ignition off. Correct value : **0 to 5 Ω.**

CORRECT

INCORRECT

Connect the junction block. Check insulation and continuity of the wire between the sensor white connector terminal **A3** and the instrument panel blue connector **(D)** without lock, at terminal **4.**

Connect the junction block. Check insulation and continuity of the wire between the sensor white connector terminal **B3** and the instrument panel blue connector **(D)** without lock, at terminal **5.**

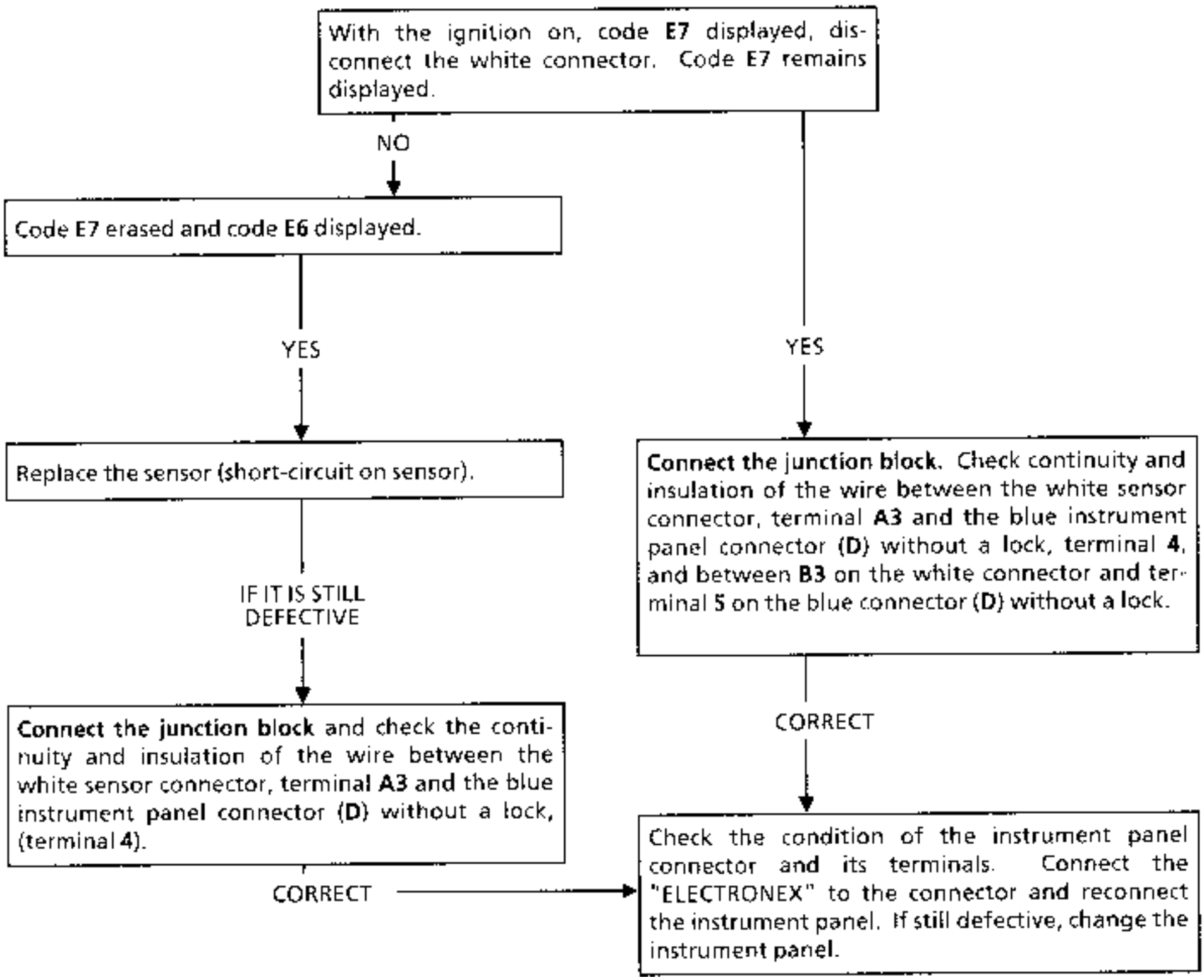
CORRECT

CORRECT

Check the condition of the instrument panel connector and its pins. Connect the "ELECTRONEX" to the connector and reconnect the instrument panel. If still defective, change the instrument panel.

FAULT-FINDING

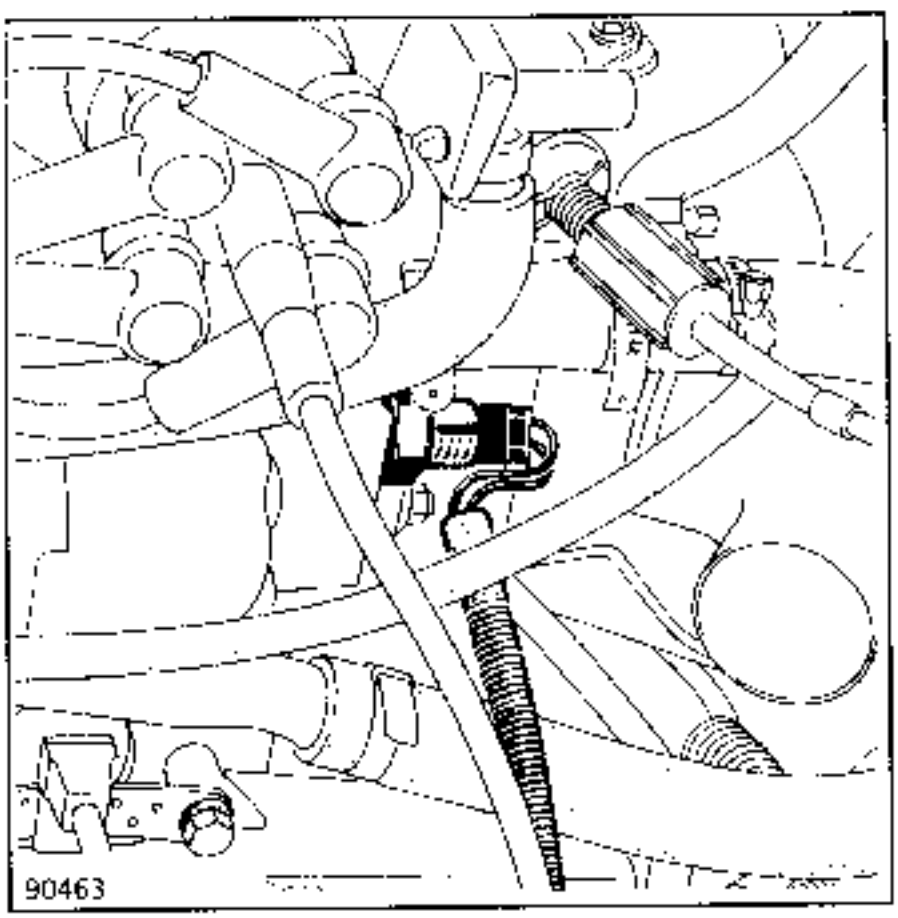
b) Code E7 with a display of 50°C on the on-board computer, which is not flashing (ambient temperature lower than 50°C; sensor or its wiring short-circuited).

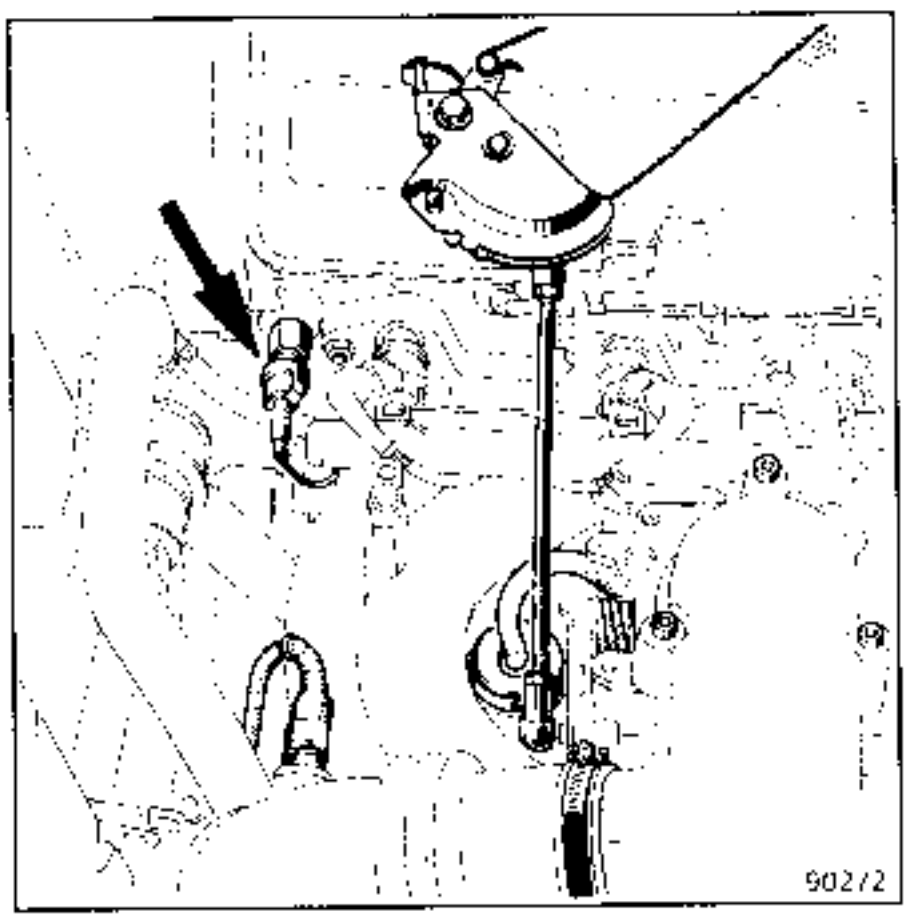


FAULT-FINDING

6 - Code E8 "Engine coolant temperature switch"

Code **E8** is displayed and the coolant temperature switch is on (if the coolant temperature is greater than **80°C**, no diagnostic code will be displayed).





Check:

That the temperature switch is correctly connected and its terminals and wires are in good condition.

CORRECT

Ignition on, code **E8** displayed. Earth the wire on the temperature switch connector (**J type petrol engine**), terminal **1 (F type petrol engine)**. Code **E8** should disappear and the coolant temperature warning light should extinguish.

YES

Change the temperature switch (temperature switch remaining open).

NO

Check, with an ohmmeter, the voltage at the temperature switch connector (**J type petrol engine**) terminal **1** (**F type petrol engine**) and earth. Correct voltage : **2** to **12 volts.**

CORRECT

Check the condition of the instrument panel connector and its pins. Connect the "ELECTRONEX" to the connector and reconnect the instrument panel. If still defective, change the instrument panel.

INCORRECT

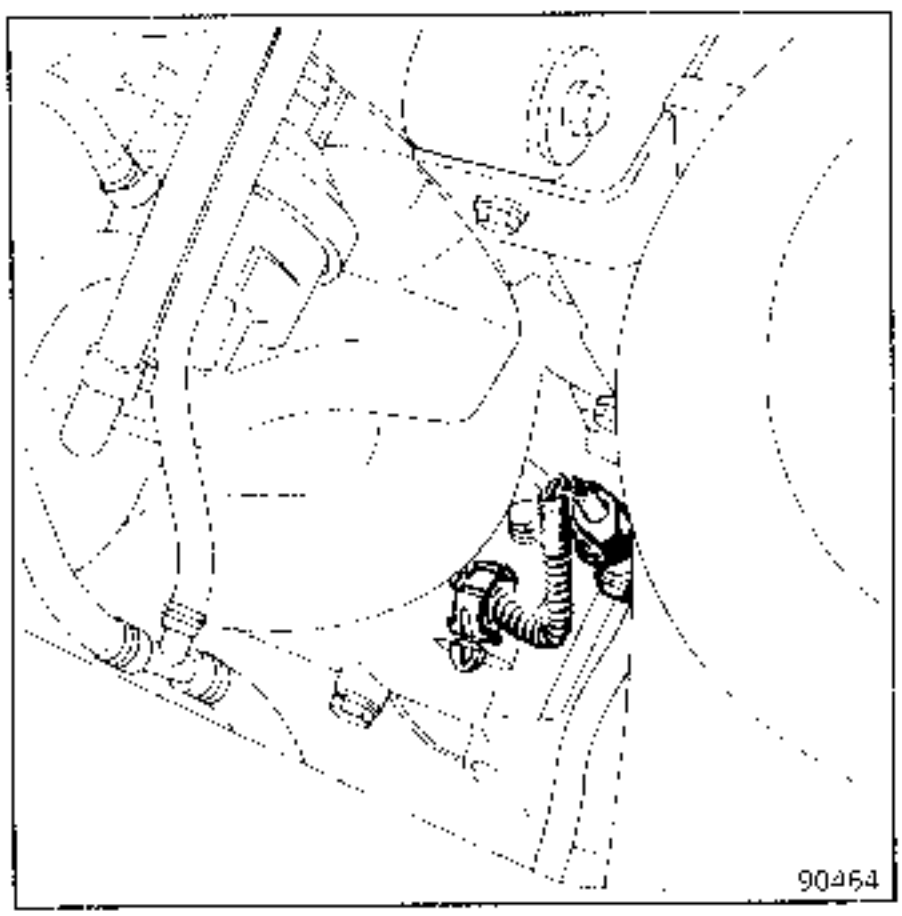
Connect the junction block. Check the continuity and insulation of the wire between the temperature switch connector (**J type petrol engine**), terminal **1** (**F type petrol engine**) and the blue instrument panel connector (**C**), with lock, terminal **4**.

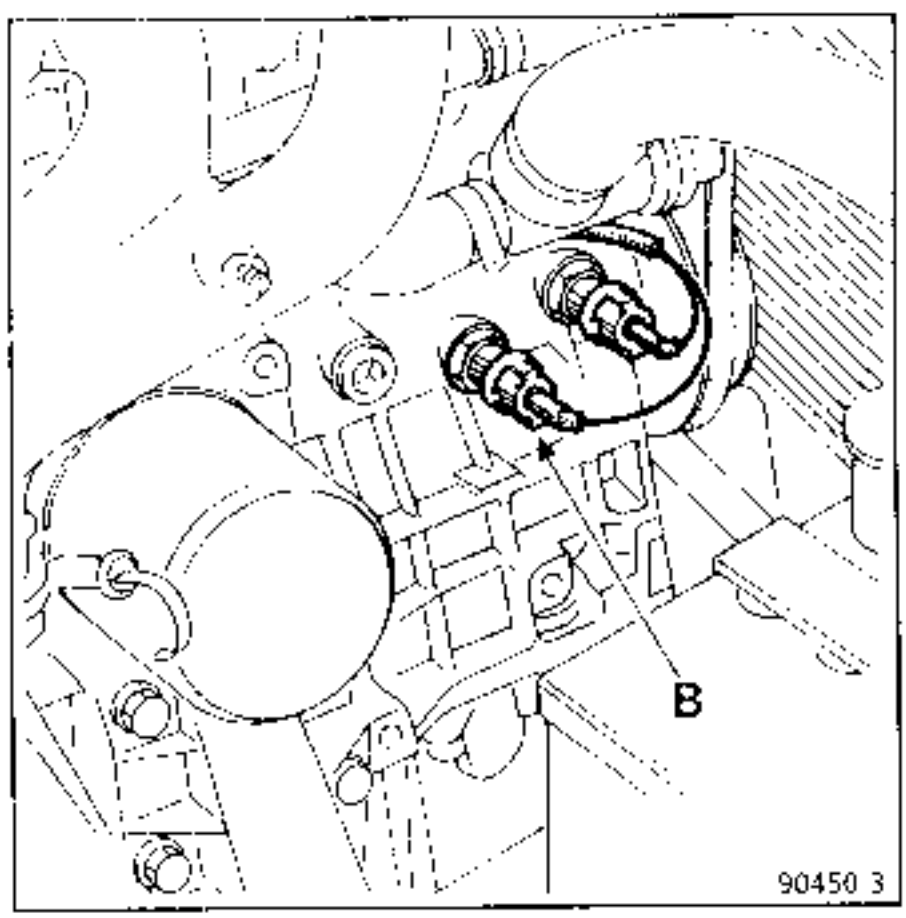
INCORRECT

FAULT-FINDING

7 - Code E9 "0.35 bar oil pressure switch (B)"

Code **E9** is displayed and the oil pressure warning light is off.





Check:

That the sensor is correctly connected and the condition of its terminal and wire.

CORRECT

Ignition on, code **E9** displayed, earth the temperature switch wire. Code **E9** should disappear and the oil pressure warning light should illuminate.

YES

Change pressure switch (**B**) (pressure switch jammed).

NO

Check the voltage between the oil pressure switch wire and earth, with the ignition on.
Correct voltage : **11 volts ± 2**.

CORRECT

Check the condition of the instrument panel connector and its pins. Connect the "ELECTRONEX" to the connector and reconnect the instrument panel. If still defective, change the instrument panel.

INCORRECT

Connect the junction block. Check the continuity and insulation of wire from pressure switch connector to the blue instrument panel connector (**C**), with lock, terminal **6**.

CORRECT

FAULT-FINDING

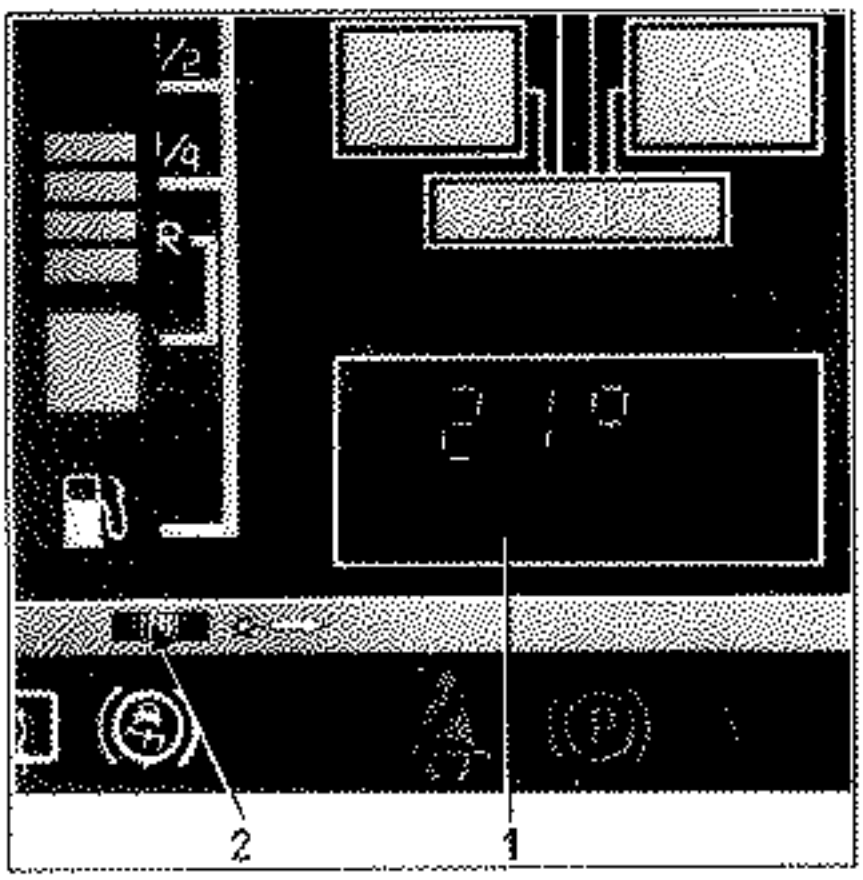
VOICE SYNTHESISER

Should a defect arise on the voice synthesiser, check the sensors and detectors by selecting the fault-finding sequence on the on-board computer and checking the coded messages or which warning lights illuminate. Only the door sensors cannot be tested via the instrument panel.

The voice synthesiser unit cannot be removed from the instrument panel and therefore, if the synthesiser is defective, the instrument panel assembly must be replaced.

ON-BOARD COMPUTER

DESCRIPTION



The electronics of this instrument panel are centralised in a circuit comprising a microprocessor, which controls the mileage indicator liquid crystal display and the on-board computer displays (this screen will be referred to as the display module).

Display logic

The display module comprises a loop made up of 7 screen displays.

Changeover from one type of screen to the next is carried out by button 3.

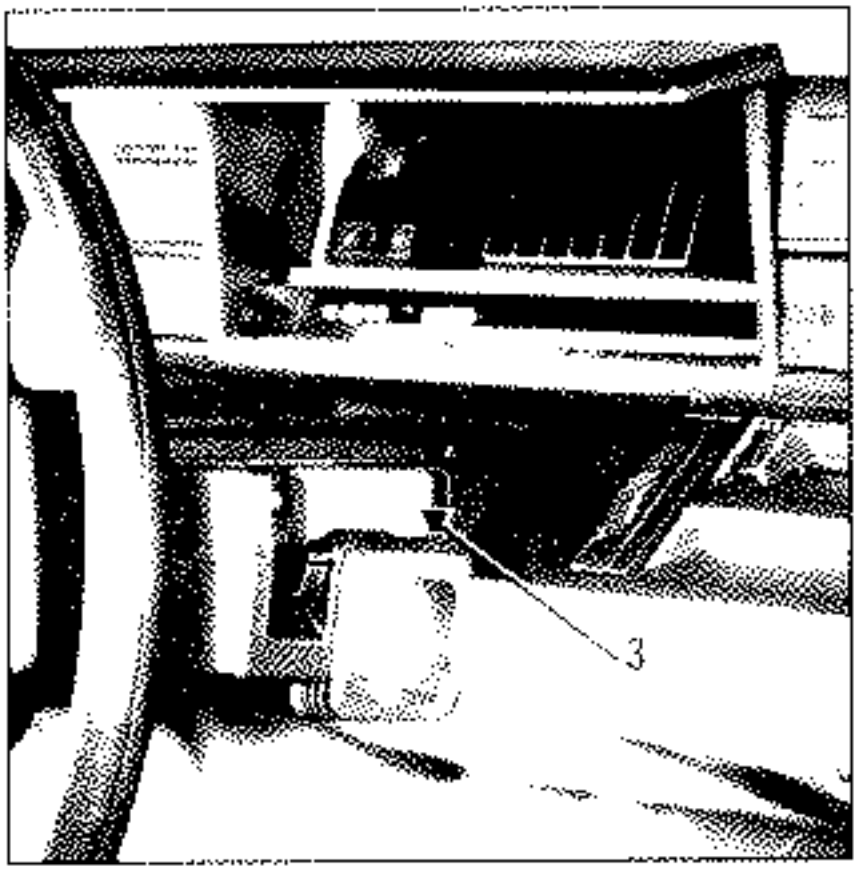
When the ignition is switched on, the amount of fuel in the tank will be displayed.

ON-BOARD COMPUTER

1 Display

2 "Start" key
zeros the memories
zeros the trip mileage indicator

3 Display selection key (at the end of the windscreen wiper switch stalk).



THE ON-BOARD COMPUTER LOOP

The on-board computer display is selected by means of key 3.

This operation runs through 7 types of display one after the other.

- **The amount of fuel remaining in the tank**
  There is no display below **5 litres**.

- **Range (in km)**
  This is obtained by dividing the quantity of fuel remaining in the tank by the average consumption since the Start key was pressed.

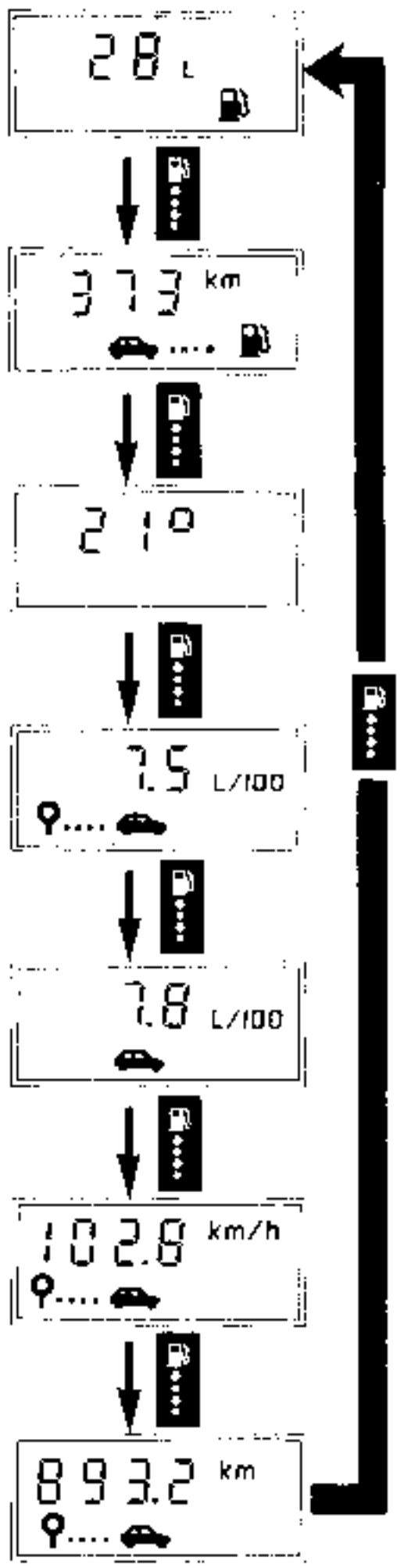
- **External temperature in degrees Celsius**
  Capacity - **30** to **+ 50**.

- **Average fuel consumption (in l/100 km)**
  Obtained by dividing the fuel consumed by the distance covered since the last time the Start key was pressed.
  Minimum distance required to obtain display : **400 m**.
  Maximum capacity for fuel consumed: **2 500 litres**.

- **Consumption at any given point (in l/100 km)**
  Minimum distance required to obtain display: **400 m**.
  Minimum speed required to obtain display : **40 km/h**.
  The figure displayed is limited to three times the average fuel consumption.

- **Average speed (in km/h)**
  Obtained by dividing the distance covered by the time elapsed since the last time the Start key was pressed. Minimum distance required to obtain display: **400 m**.
  Capacity : **250 hours** since the last time the ignition was switched on (stops deducted).

- **Distance travelled (in km)**
  Since the last time the Start key was pressed.
  Displayed in hundreds of metres up to **1 000 km**.
  Maximum capacity : **9 999 km**.



R3521

ON-BOARD COMPUTER

DESCRIPTION (continued)

NOTE : If any of the maximum capacities of the indicators are exceeded, the system returns to zero (as with Start key). After the current is switched off (battery disconnected), press key **2** to stop the display flashing and to restart the function.

WARNING : if one of the displays flashes with the the current having been cut off, see fault-finding sequence on the following page.

The displays are calculated from the following data :

- the injection computer which sends one pulse every **160 mm³** of fuel consumed or a flow sensor delivering one pulse every **80 mm³**,

- a thermistor mounted in the external rear view mirror,

- a fuel gauge tank unit providing information for the fuel consumption unit (**5 Ω per** litre),

- the speed information is given by the instrument **panel** or by a speed sensor (**5 pulses per metre**).

OPERATING

The on-board computer is zeroed by pressing key (2)

FAULT DETECTION

The on-board computer has been designed so that it detects and informs the driver of any defect which might affect the fuel content display.

If { the amount of fuel in the tank / the range / the average consumption / the given point consumption }

displays flash, it is an indication that there has been a fuel signal defect for more than **10 km.**

If only { the amount of fuel in the tank / the range }

displays flash, it is an indication that there has been a fuel signal defect for more **than 2 minutes**.

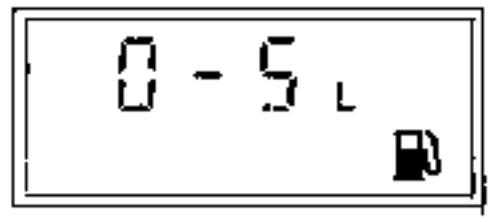
NOTE : When the ignition is first switched off **and** then switched on again, the display will show **99 L** and will flash.

If only the external temperature display flashes, it is an indication that the temperature signal has been defective for more **than 2 minutes**.

NOTE : after disconnecting the battery, the display module will show **50°C** and will flash.

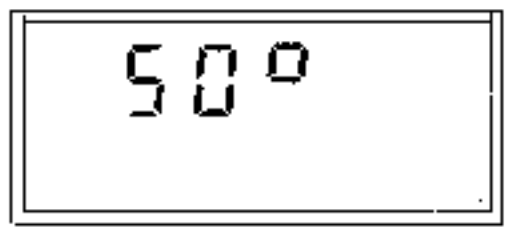
Other cases (when the display does not flash).

If the display module shows that less than **5 litres** of fuel remain in the tank.



But the tank is not empty, there is a short-circuit on the tank unit or its wiring.

If the display module shows a temperature of **50°C**.



But the temperature is not **50°C**, it is an indication of a short-circuit on the **thermistor** or its wiring.

Before carrying out any rectification work, start the on board computer fault-finding sequence.

FAULT-FINDING SEQUENCE

The instrument panel microprocessor incorporates a test programme for the :

- receiver (display module),

  sensors which are connected to it (fuel gauge unit, fuel flow signal, speed signal, temperature signal).

ACCESS TO THE FAULT-FINDING SEQUENCE

WITH THE ENGINE STOPPED

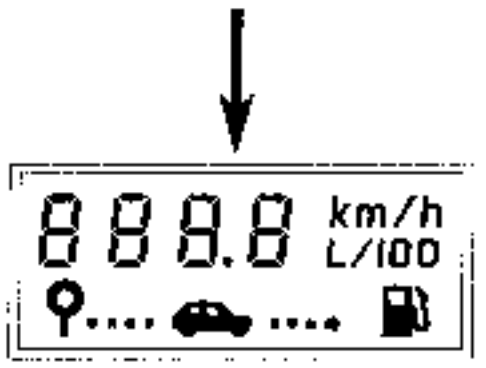
- Switch on the ignition.
- Disconnect and reconnect the battery negative ( ) terminal.

ON-BOARD COMPUTER

FAULT-FINDING

TESTING THE DISPLAY

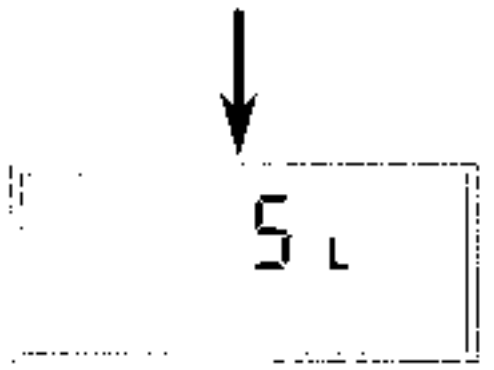
If all the display segments are illuminated and flashing



Check that no section of the segments is missing.

TESTING THE FLOW SENSOR

Press key **3** (run-through key) and start the engine.

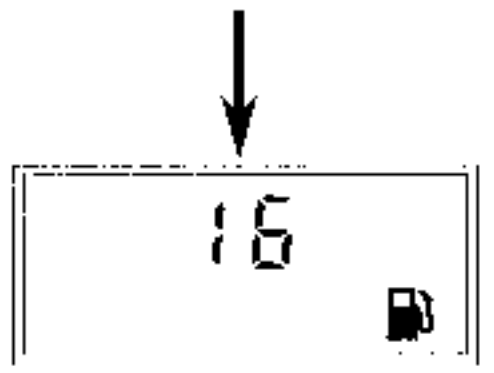


The display module will show the pulse frequency in Hertz.

The display should be other than zero (engine running).
Example : **5 Hz**.

CHECKING THE FUEL GAUGE TANK UNIT

Press key **3** (run-through key).

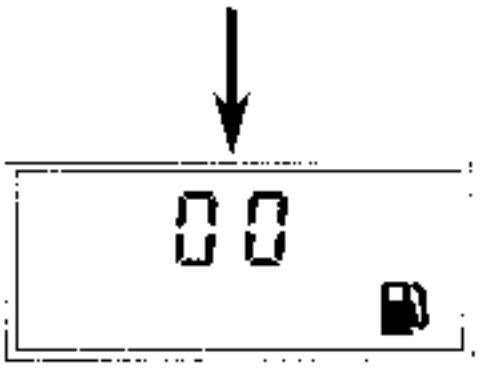


The display module should show the quantity of fuel remaining in the tank.
Example : **16 litres.**

NOTE : under fault-finding conditions, the display module will show the true figure even if there is less than **5** litres in the tank.

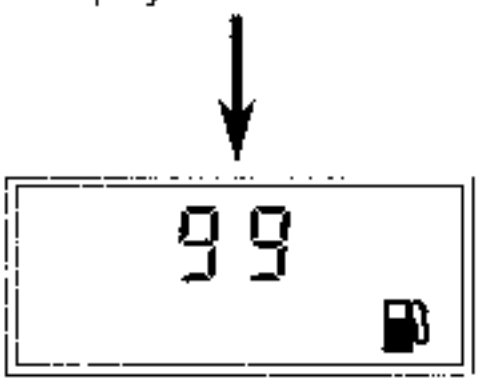
OTHER FAULT-FINDING DISPLAYS FOLLOWING THE FAULT-FINDING SEQUENCE (testing the fuel gauge tank unit)

1st ARRANGEMENT
If the module displays zeros.



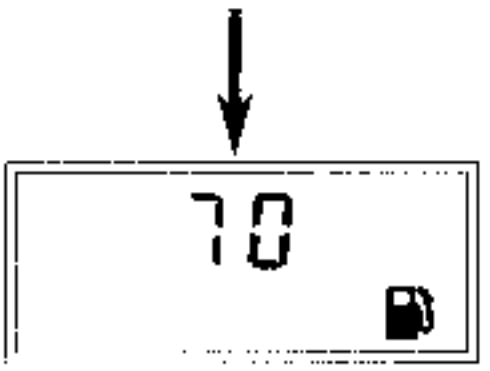
It is an indication that there is a short-circuit on the tank unit or its wiring.

If the module displays **99**.



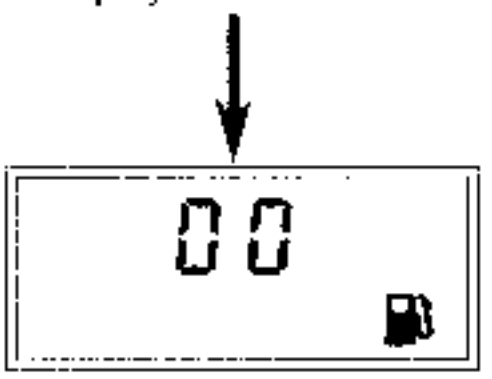
It is an indication of a broken circuit on the tank unit or its wiring.

2nd ARRANGEMENT (model year 1990)
If the module displays **70**.



It is an indication that there is a short-circuit on the tank unit or its wiring.

If the module displays zeros.



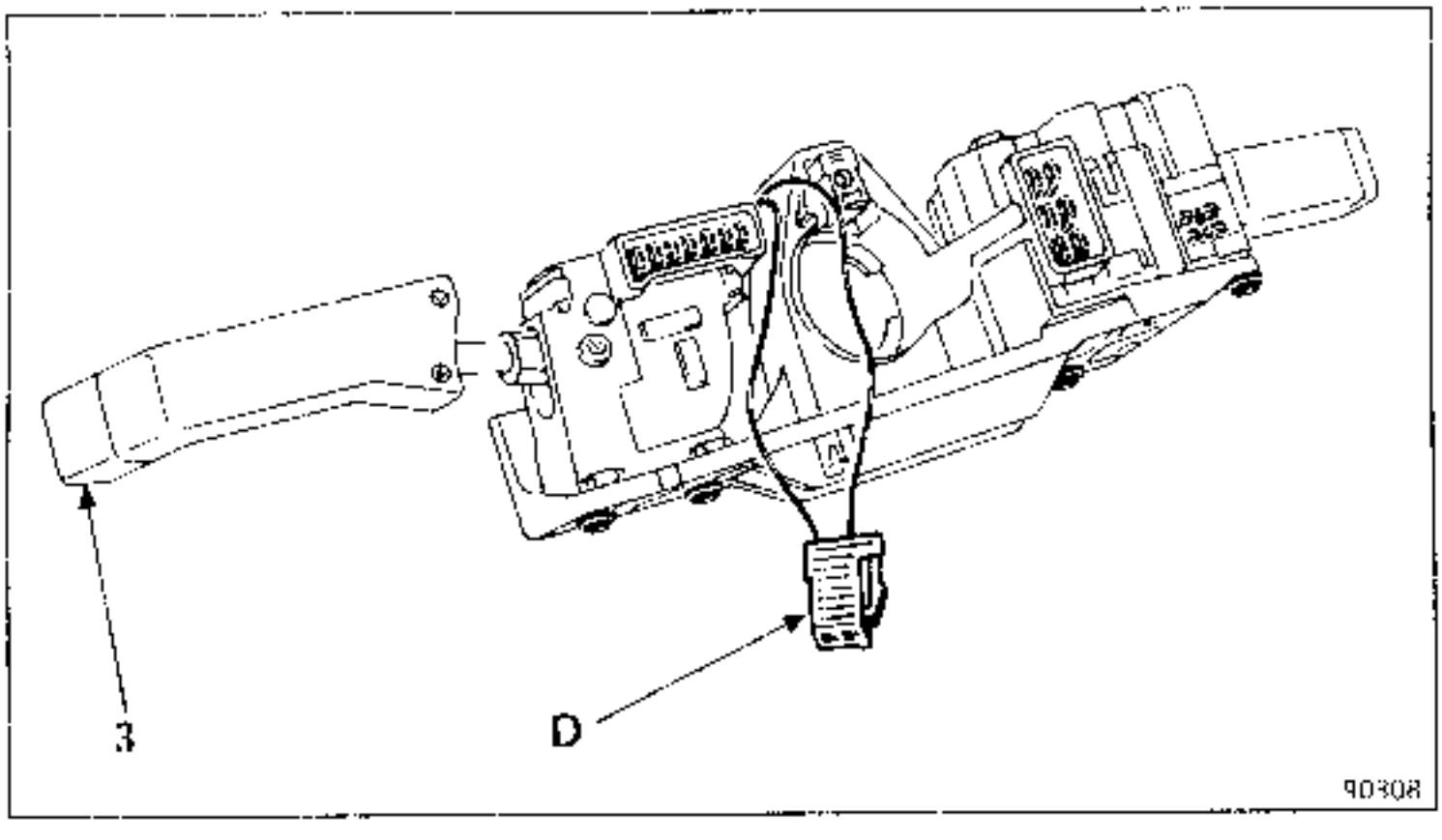
It is an indication that there is a broken circuit on the tank unit or its wiring.

END OF FAULT-FINDING SEQUENCE
To exit the fault-finding sequence, just press key **2** (Start key).

ON-BOARD COMPUTER

OTHER FAULT-FINDING

Defect : if the display selector key (3) (at the end of the windscreen wiper stalk) does not cause the various displays to run through.



Check:

That connector (D) is correctly connected and check its wires are in good condition

OK

Switch on the ignition, cross connect the two wires on the wiring side of the connector (D). Does the display run through?

YES

Replace the control.

NO

Connect the junction block and check the continuity of the wire between the black connector (B), terminal **4** and the junction block (-).
Switch (3) operating : R = **0.2** to 1 Ω
Switch (3) released : R = ∞

CORRECT

Check the condition of the instrument panel connector and its pins. Connect the "ELECTRONEX" to the connector and reconnect the instrument panel. If still defective, replace the instrument panel.

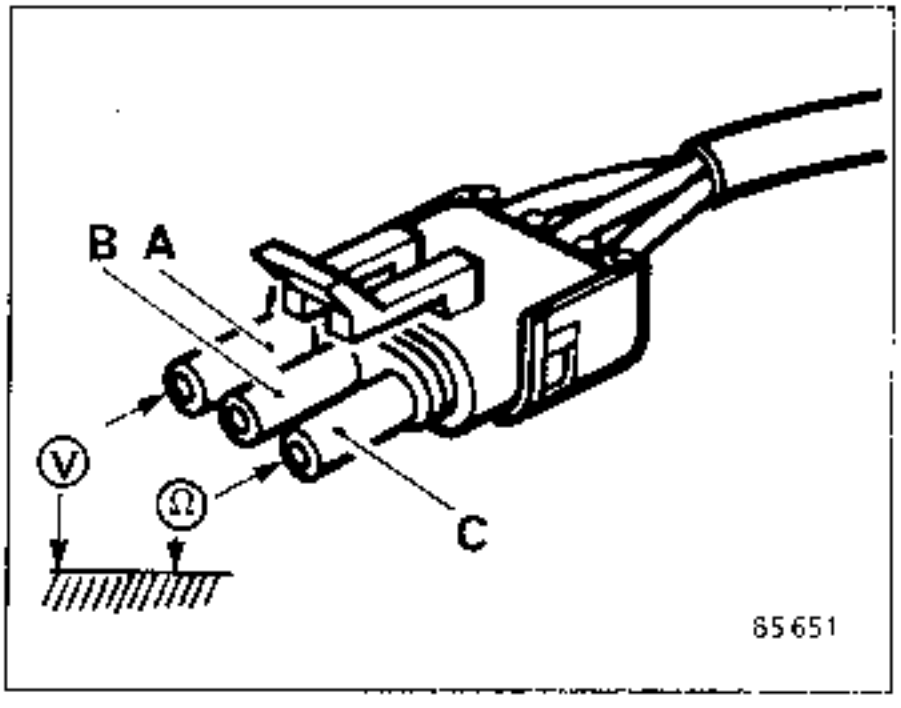
INCORRECT

Check the continuity of the wire between the black connector (B), terminal **4**, and the earth wire on the front LH door pillar with switch (3) operating

INCORRECT

Broken wire between instrument panel connector and earth on LH door pillar (this wire passes via a terminal bar in the centre of the fascia panel harness).

TESTING THE FLOW SENSOR (F TYPE PETROL ENGINES)



Disconnect the flow sensor and check :

- the voltage (**A**) "+ after ignition" and the continuity (**C**),
- connect the junction block and test the continuity between terminals (**B**) and **1** on the blue instrument panel connector (**D**), without lock system.

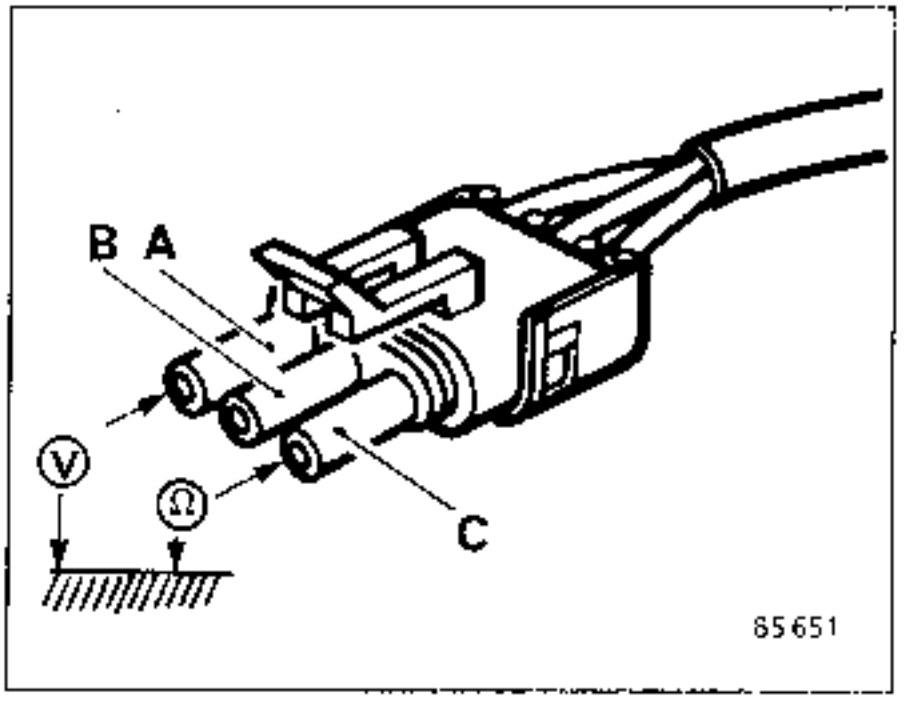
If it is incorrect, check the continuity and insulation of the wires.

NOTE : Fuel injection engines use the flow sensor signal from the electronic injection system.

TESTING THE AIR TEMPERATURE SENSOR

T° Farenheit	T° Celsius	RESISTANCE			
- 22	- 30	approx.	13350	Ohms	± 200
- 13	- 25	approx.	12250	Ohms	± 200
- 4	- 20	approx.	11050	Ohms	± 200
5	- 15	approx.	9800	Ohms	± 200
14	- 10	approx.	8600	Ohms	± 200
23	- 5	approx.	7400	Ohms	± 200
32	0	approx.	6300	Ohms	± 200
41	5	approx.	5300	Ohms	± 200
50	10	approx.	4400	Ohms	± 200
59	15	approx.	3700	Ohms	± 200
68	20	approx.	3100	Ohms	± 200
77	25	approx.	2500	Ohms	± 200
86	30	approx.	2100	Ohms	± 200
95	35	approx.	1750	Ohms	± 200
104	40	approx.	1450	Ohms	± 200
113	45	approx.	1250	Ohms	± 200
122	50	approx.	1000	Ohms	± 200
131	55	approx.	850	Ohms	± 200

TESTING THE FLOW SENSOR (F TYPE PETROL ENGINES)



Disconnect the flow sensor and check :

- the voltage (**A**) "+ after ignition" and the continuity (**C**),
- connect the junction block and test the continuity between terminals (**B**) and **1** on the blue instrument panel connector (**D**), without lock system.

If it is incorrect, check the continuity and insulation of the wires.

NOTE : Fuel injection engines use the flow sensor signal from the electronic injection system.

TESTING THE AIR TEMPERATURE SENSOR

T° Farenheit	T° Celsius	RESISTANCE			
- 22	- 30	approx.	13350	Ohms	± 200
- 13	- 25	approx.	12250	Ohms	± 200
- 4	- 20	approx.	11050	Ohms	± 200
5	- 15	approx.	9800	Ohms	± 200
14	- 10	approx.	8600	Ohms	± 200
23	- 5	approx.	7400	Ohms	± 200
32	0	approx.	6300	Ohms	± 200
41	5	approx.	5300	Ohms	± 200
50	10	approx.	4400	Ohms	± 200
59	15	approx.	3700	Ohms	± 200
68	20	approx.	3100	Ohms	± 200
77	25	approx.	2500	Ohms	± 200
86	30	approx.	2100	Ohms	± 200
95	35	approx.	1750	Ohms	± 200
104	40	approx.	1450	Ohms	± 200
113	45	approx.	1250	Ohms	± 200
122	50	approx.	1000	Ohms	± 200
131	55	approx.	850	Ohms	± 200

CONNECTOR CONNECTIONS (continued)

15-pin connector (D) (type MTIS)

1 On-board computer earth
2 + APV (before ignition)
3 + APC (after ignition)
4 On-board computer speed signal
5 Flow sensor signal
6 Fuel gauge tank unit signal
7 External temperature signal
8 Rheostat
9 On-board computer lighting
10 External temperature electronic earth
11 Fuel gauge tank unit electronic earth
12 Fuel gauge warning light
13 On-board computer zeroing
14 On-board computer run-through
15 Not used

2-pin connector (E)

1 On-board computer zeroing
2 Earth

3-pin connector (F)

Oil level sensor

SPEED SIGNAL

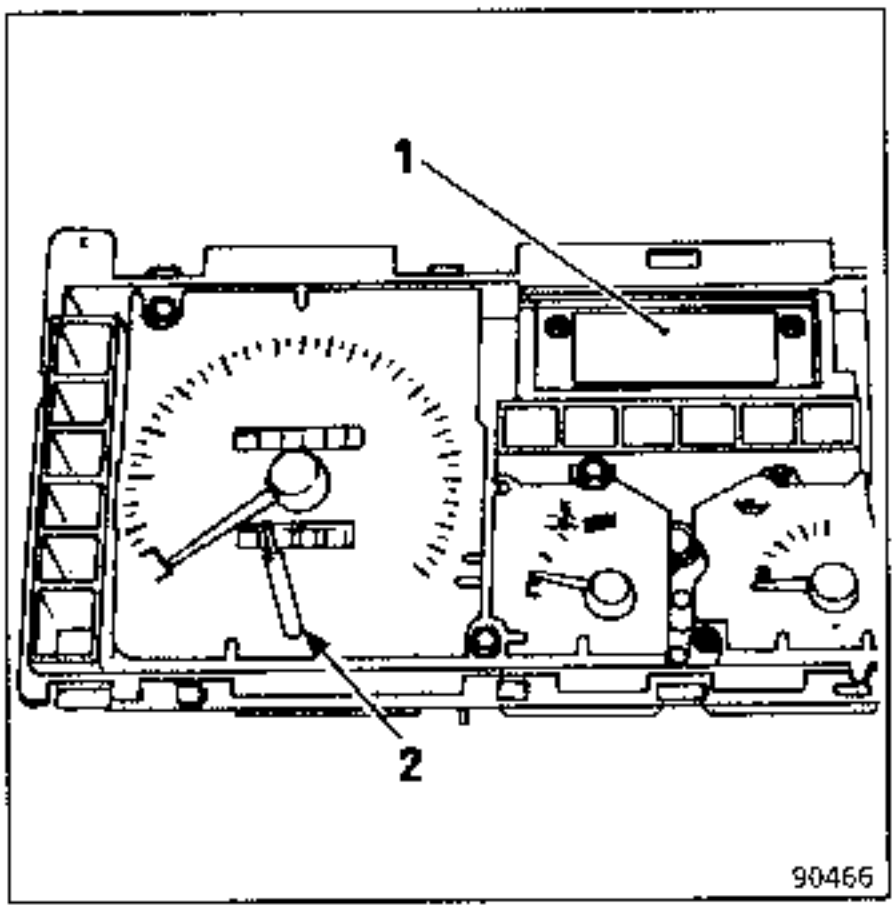
The speedometer drive cable has a speed sensor on it. The vehicle speed signal is used by the on-board computer and the injection system computer.

Connection via black 3-pin connector

1 + 12 V after ignition
2 Vehicle speed signal
3 Earth

ON-BOARD COMPUTER

DESCRIPTION



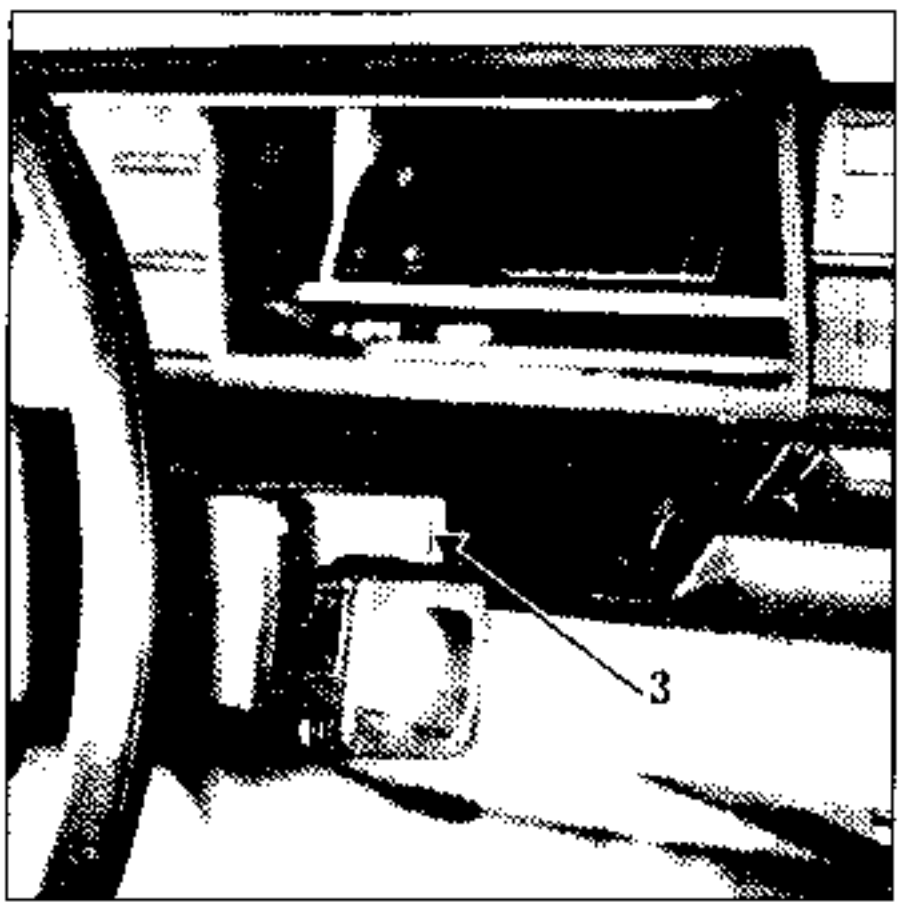
ON-BOARD COMPUTER

ON-BOARD COMPUTER

1 Display

2 Start key
Zeros the memories
Zeros the trip mileage indicator

3 Display selection key (at the end of the windscreen wiper stalk).



The electronics of this instrument panel are centralised in a circuit comprising a microprocessor, which controls the mileage indicator liquid crystal display and the on-board computer displays (this screen will be referred to as the display module).

Display logic

The display module comprises a loop made up of 7 screen displays.

Changeover from one type of screen to the next is carried out by button 3.

When the ignition is switched on, the amount of fuel in the tank will be displayed.

THE ON-BOARD COMPUTER LOOP

The on-board computer display is selected by means of key 3.

This operation runs through 7 types of display one after the other.

- **The amount of fuel remaining in the tank**
  There is no display below **5 litres**.

- **Range (in km)**
  This is obtained by dividing the quantity of fuel remaining in the tank by the average consumption since the Start key was pressed.

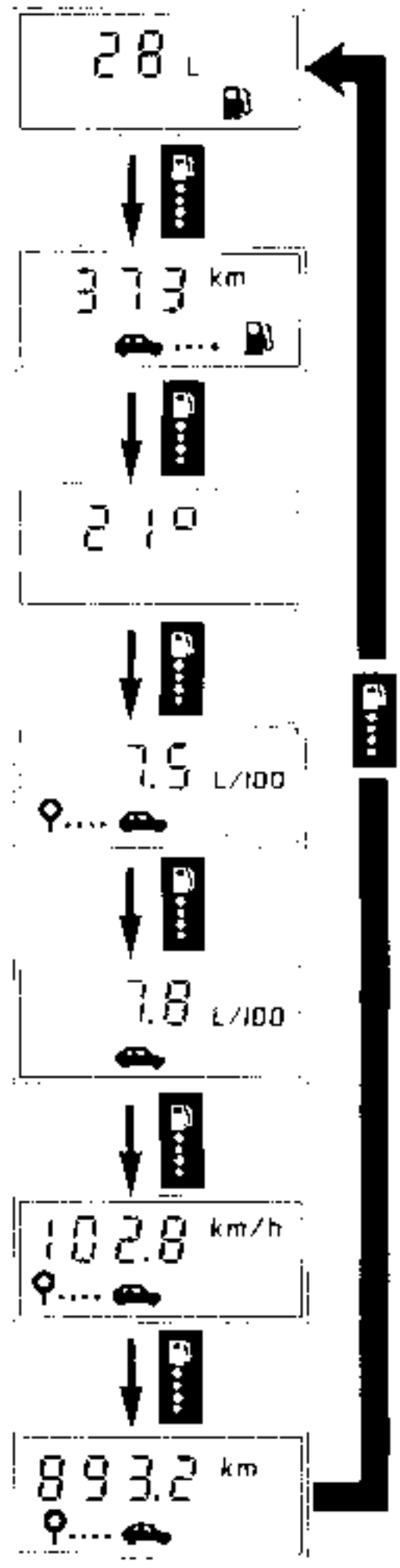
- **External temperature in degrees Celsius**
  Capacity - **30** to **+ 50**.

- **Average fuel consumption (in l/100 km)**
  Obtained by dividing the fuel consumed by the distance covered since the last time the Start key was pressed.
  Minimum distance required to obtain display : **400 m**.
  Maximum capacity for fuel consumed : **2 500 litres**.

- **Consumption at any given point (in l/100 km)**
  Minimum distance required to obtain display: **400 m**.
  Minimum speed required to obtain display : **40 km/h**.
  The figure displayed is limited to three times the average fuel consumption.

- **Average speed (in km/h)**
  Obtained by dividing the distance covered by the time elapsed since the last time the Start key was pressed. Minimum distance required to obtain display: **400 m**.
  Capacity : **250 hours** since the last time the ignition was switched on (stops deducted).

- **Distance travelled (in km)**
  Since the last time the Start key was pressed.
  Displayed in hundreds of metres up to **1 000 km**.
  Maximum capacity : **9 999 km**.



83521

ON-BOARD COMPUTER

DESCRIPTION (continued)

NOTE : If any of the maximum capacities of the indicators are exceeded, the system returns to zero (as with Start key). After the current is switched off (battery disconnected), press key **2** to stop the display flashing and to restart the function.

WARNING : If one of the displays flashes with the the current having been cut off, see fault-finding sequence on the following page.

The displays are calculated from the following data :

- the injection computer which sends one pulse every **160 mm³** of fuel consumed or a flow sensor delivering one pulse every **80 mm³**,
- a thermistor mounted in the external rear view mirror,
- a fuel gauge tank unit providing information for the fuel consumption unit (**5 Ω** per litre),
- the speed information is given by the instrument panel or by a speed sensor (**5 pulses per metre**).

OPERATING

The on-board computer is zeroed by pressing key (2).

FAULT DETECTION

The on-board computer has been designed so that it detects and informs the driver of any defect which might affect the fuel content display.

the amount of fuel in the tank
the range
the average consumption
the given point consumption

displays flash, it is an indication that there has been a fuel signal defect for more than **10 km**.

the amount of fuel in the tank
the range

displays flash, it is an indication that there has been a fuel signal defect for more than **2 minutes**.

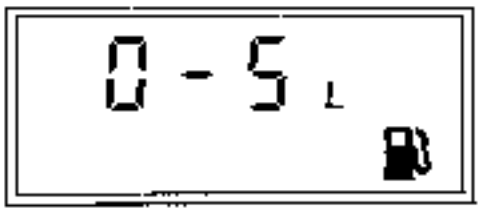
NOTE : When the ignition is first switched off and then switched on again, the display will show **99 L** and will flash.

If only the external temperature display flashes, it is an indication that the temperature signal has been defective for more than **2 minutes**.

NOTE : after disconnecting the battery, the display module will show **50°C** and will flash.

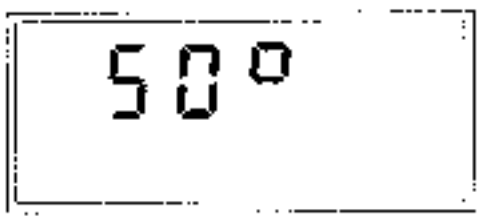
Other cases (when the display does not flash).

If the display module shows that less than **5 litres** of fuel remain in the tank.



But the tank is not empty, there is a short-circuit on the tank unit or its wiring.

If the display module shows a temperature of **50°C**.



But the temperature is not **50°C**, it is an indication of a short-circuit on the thermistor or its wiring.

Before carrying out any rectification work, start the on-board computer fault-finding sequence.

ON-BOARD COMPUTER

FAULT-FINDING SEQUENCE

The instrument panel microprocessor incorporates a test programme for the :

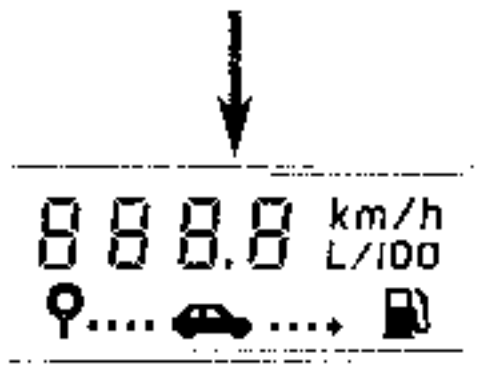
- receiver (display module),
- sensors which are connected to it (fuel gauge unit, fuel flow signal, speed signal, tempera ture signal).

ACCESS TO THE FAULT-FINDING SEQUENCE

WITH THE ENGINE STOPPED
- Switch on the ignition.
- Disconnect and reconnect the battery negative ( ) terminal.

TESTING THE DISPLAY

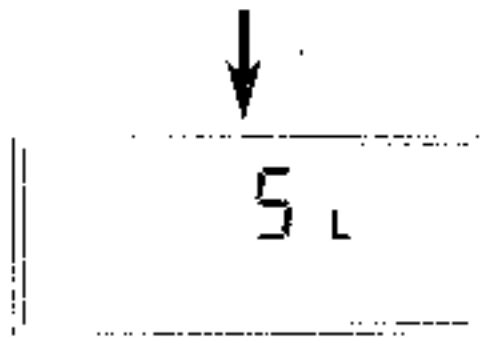
If all the segments of the display module are displayed and flashing.



Check that no section of the segments is missing.

TESTING THE FLOW SENSOR

Press key 3 (run-through key) and start the en gine.

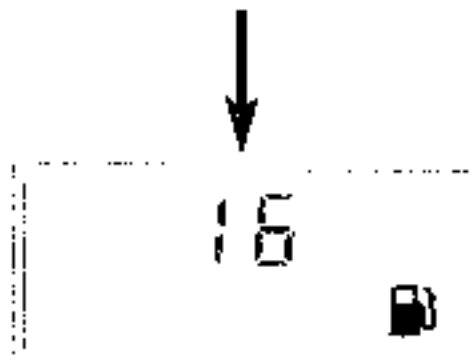


The display module will show the pulse frequency in Hertz.

The display should be other than zero (engine running).
Example : **5 Hz**.

TESTING THE FUEL GAUGE TANK UNIT

Press key 3 (run through key).

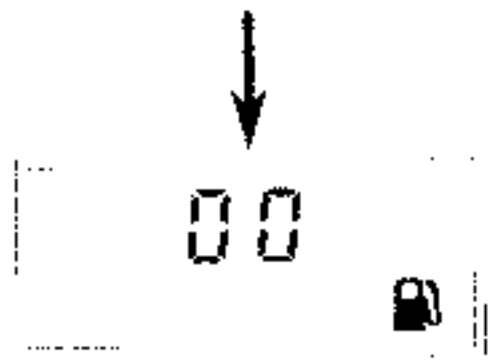


The display module should show the quantity of fuel remaining in the tank.
Example : **16 litres**.

NOTE : under fault finding conditions, the display module will show the true figure even if there is less than **5 litres** in the tank.

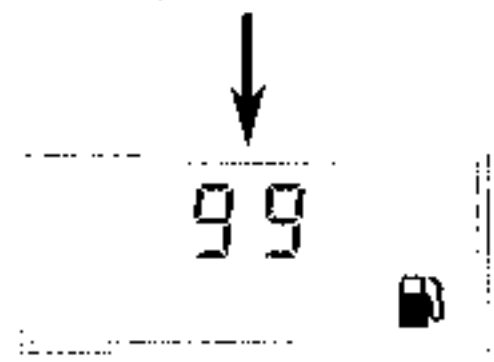
OTHER FAULT-FINDING DISPLAYS FOLLOWING THE FAULT-FINDING SEQUENCE (testing the fuel gauge tank unit)

1st ARRANGEMENT
If the module displays zeros.



It is an indication that there is a short-circuit on the tank unit or its wiring.

if the module displays **99**.



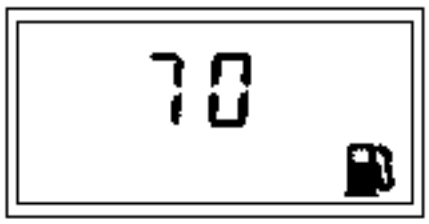
It is an indication of a broken circuit on the tank unit or its wiring.

ON-BOARD COMPUTER

OTHER FAULT-FINDING SEQUENCE FOR THE FUEL GAUGE TANK UNIT

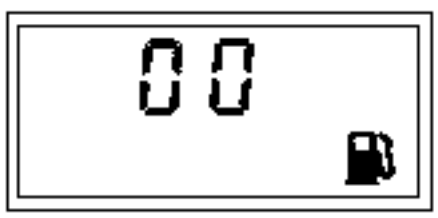
2nd ARRANGEMENT (model year 1990)

If the module displays 70.



It is an indication that there is a short-circuit on the tank unit or its wiring.

If the module displays zeros.

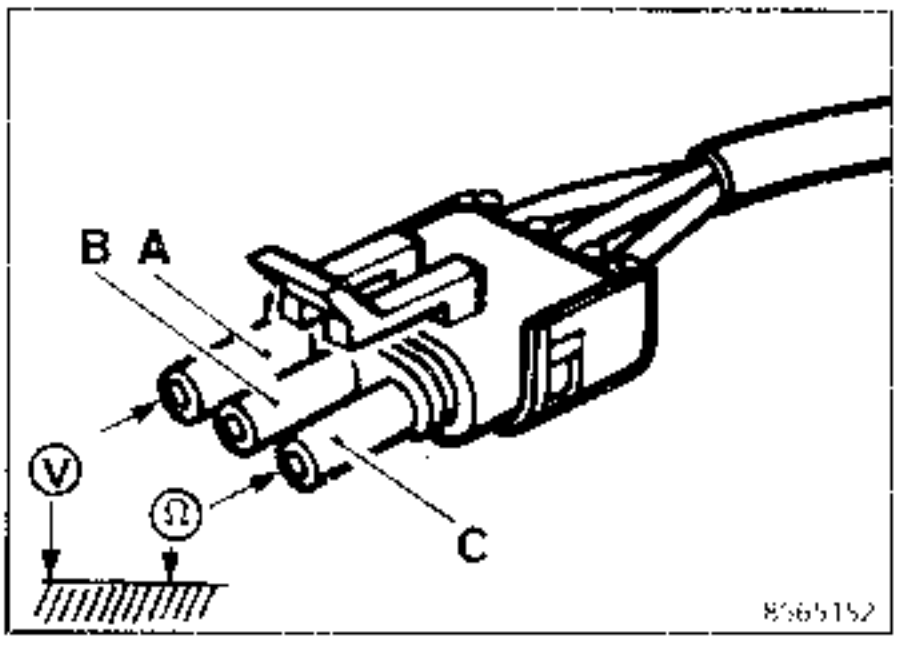


It is an indication that there is a broken circuit on the tank unit or its wiring.

END OF FAULT-FINDING SEQUENCE

To exit the fault-finding sequence, just turn button 2 (Start key) in a clockwise direction.

CHECKING THE FLOW SENSOR (F TYPE PETROL ENGINE)



Disconnect the flow sensor and check :

The voltage (A) "+ after ignition" and the continuity (C).

- connect the junction block and test the continuity between terminals (B) and 1 on the blue instrument panel connector (D), without lock system.

If it is incorrect, check the continuity and insulation of the wires.

NOTE : Fuel injection engines use the flow sensor signal from the electronic injection system.

CHECKING THE AIR TEMPERATURE SENSOR

T° Farenheit	T° Celsius	RESISTANCE			
- 22	- 30	approx.	13350	Ohms	± 200
- 13	- 25	approx.	12250	Ohms	± 200
- 4	- 20	approx.	11050	Ohms	± 200
5	- 15	approx.	9800	Ohms	± 200
14	- 10	approx.	8600	Ohms	± 200
23	- 5	approx.	7400	Ohms	± 200
32	0	approx.	6300	Ohms	± 200
41	5	approx.	5300	Ohms	± 200
50	10	approx	4400	Ohms	± 200
59	15	approx.	3700	Ohms	± 200
68	20	approx.	3100	Ohms	± 200
77	25	approx.	2500	Ohms	± 200
86	30	approx.	2100	Ohms	± 200
95	35	approx.	1750	Ohms	± 200
104	40	approx	1450	Ohms	± 200
113	45	approx.	1250	Ohms	± 200
122	50	approx.	1000	Ohms	± 200
131	55	approx.	850	Ohms	± 200

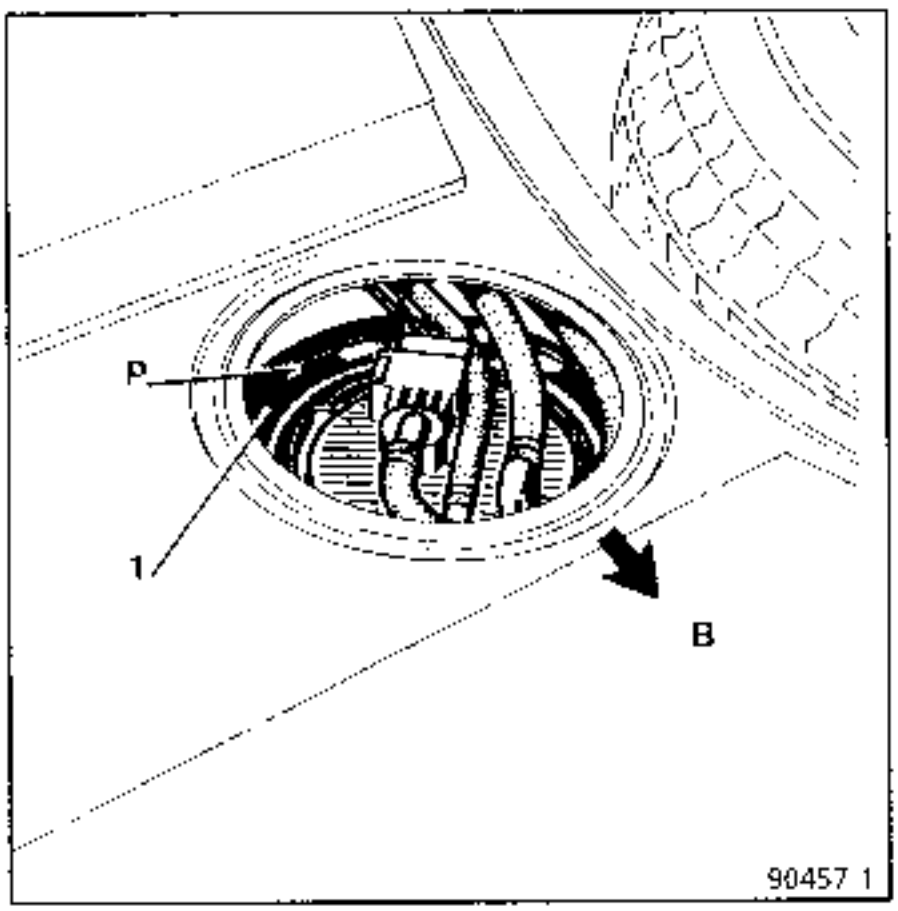
REMOVAL

Before removing the fuel level sensor, take note of the following precautions.

Do not smoke.

Do not bring a naked flame or carry out work involving red hot parts (welding, etc) near the working area.

After draining off the fuel, ensure that its container is properly closed.



On vehicles fitted with adjustable rear seats :

- tilt the rear seats forward,
- remove the floor covering from the boot.

On vehicles not fitted with adjustable rear seats :

- undo the rear seat clips,
- release the rear seat and pull it forward,
- remove the rear seat belts to free the rear seat-back,
- lift the boot floor covering.

Remove the tank unit plastic cover.

Disconnect :

- the electrical connector,
- the pipes.

Move the pipes and connector to one side out of the way and secure them to the side of the vehicle.

Turn the ring (1) to free the studs (P).

Try to free the ring, in a sideways direction, as shown by arrow (B).

WARNING : On certain vehicles the tank unit is too high in relation to the floor and the ring (1) cannot be freed in a sideways direction without slightly lowering the tank.

Proceed as follows :

- fully loosen the tank securing straps,
- free the ring (1). If there is still insufficient room, remove the tank,
- remove the tank unit.

IMPORTANT

When handling the tank unit, take care to ensure that the base (3) is correctly positioned in relation to the top (2).

REFITTING

SPECIAL POINTS

- Fit a new seal.
- Refit the tank unit into its slot.
- Refit the ring and if it has been removed, refit the tank.
- Connect up the pipes and fit the hose clips.
- Reconnect the connectors.

CONNECTIONS

With electronic instrument panel

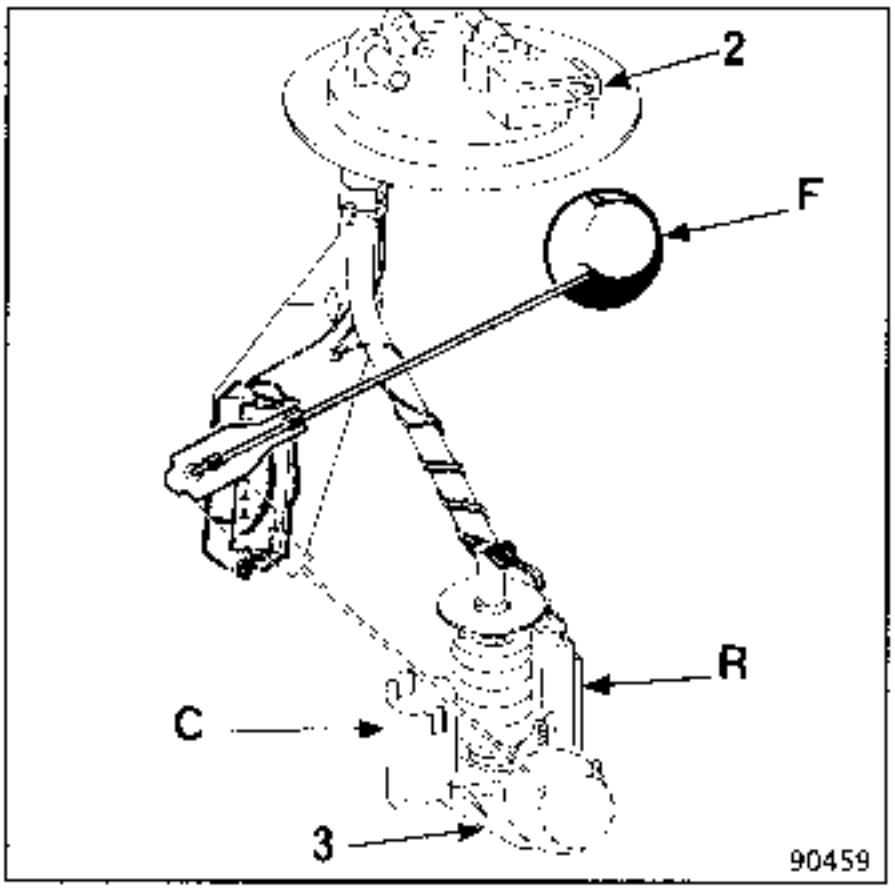
1 Indicator on instrument panel
2 Not used
3 Not used
4 Earth

With conventional instrument panel

1 Not used
2 Indicator on instrument panel
3 Minimum level
4 Earth

With on-board computer

1 Indicator on instrument panel
2 Not used
3 Not used
4 Earth



Special points and operations on vehicles fitted with an electronic instrument panel or an on-board computer.

This tank unit has **2** sections :

- a float mounted on an arm (F),

- a variable height strainer (C).

To improve the accuracy of the instrument panel reading, the tank unit is fitted with a strainer, the height of which is variable, which moves down or up to suit the distortion of the plastic tank. This strainer is fitted with sensors which move along a track on a variable resistance (R) which is added to the resistance in the float unit.

The strength of the resistance (R) varies from 0 to approximately 25Ω. This system cannot be removed.

TESTING

Vehicles with a conventional instrument panel.

Vehicles fitted with the 2nd type of on-board computer (1990 model).

INDICATOR

Display	Readings across terminals 2 and 4 (Ω)
4/4	7 MAXIMUM
3/4	51 ± 5
1/2	100 ± 10
1/4	150 ± 16
Reserve tank	300 + 200

TESTING (continued)

Vehicles fitted with the 1st type of on-board computer.

INDICATOR

Display	Readings across terminals 1 and 4 (Ω)
4/4	326 ± 10
3/4	289 ± 10
1/2	220 ± 10
1/4	148 ± 10
Reserve tank	78.4 ± 10
Lower stop	13.1 ± 10

2nd type (since June 1989)

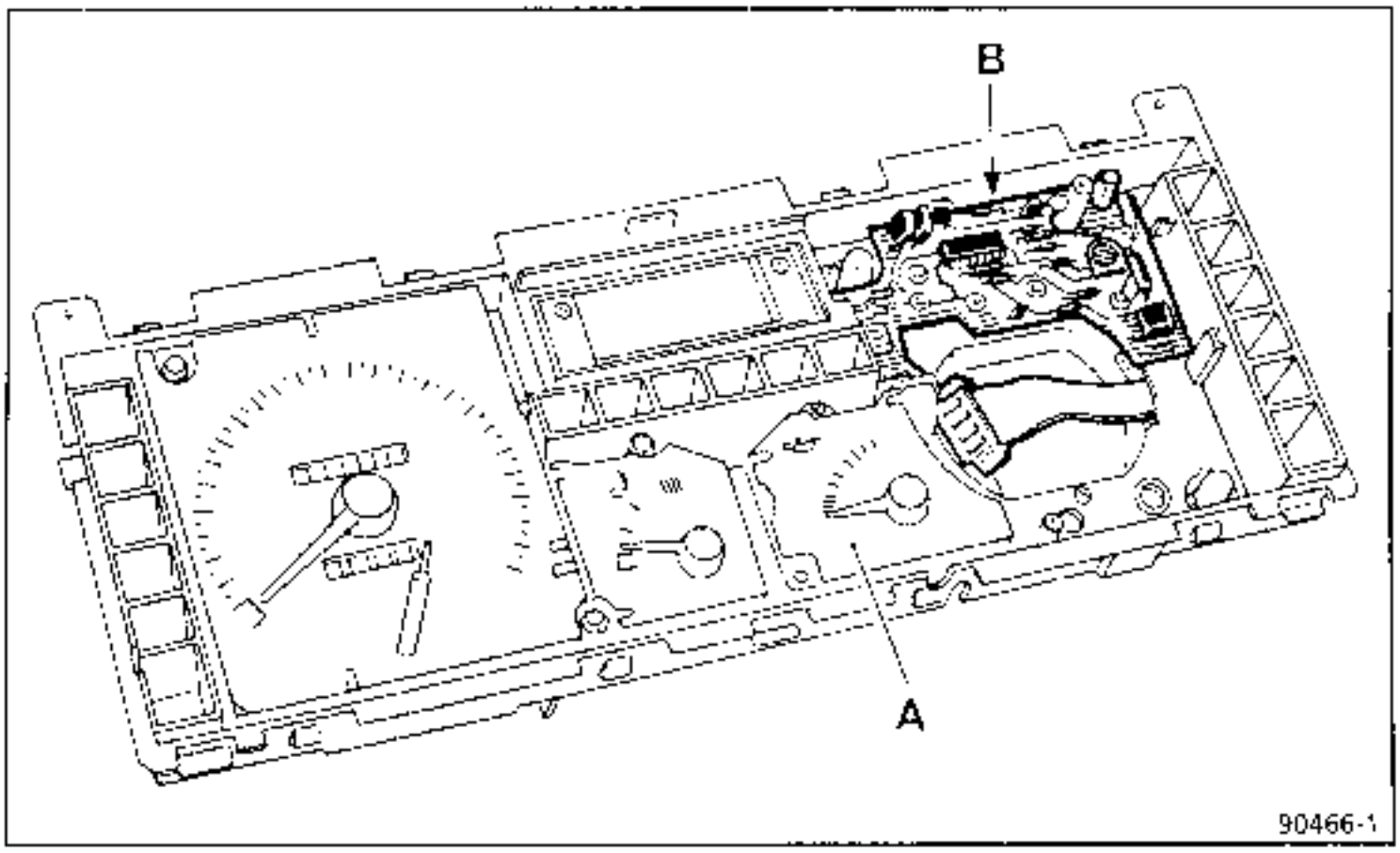
Display	Resistance at terminals 1 and 3 (Ω)
Lower stop	25 ± 5
4/4	60 ± 5
3/4	130 ± 5
1/2	200 ± 10
1/4	280 ± 16
Reserve tank	335 ± 20

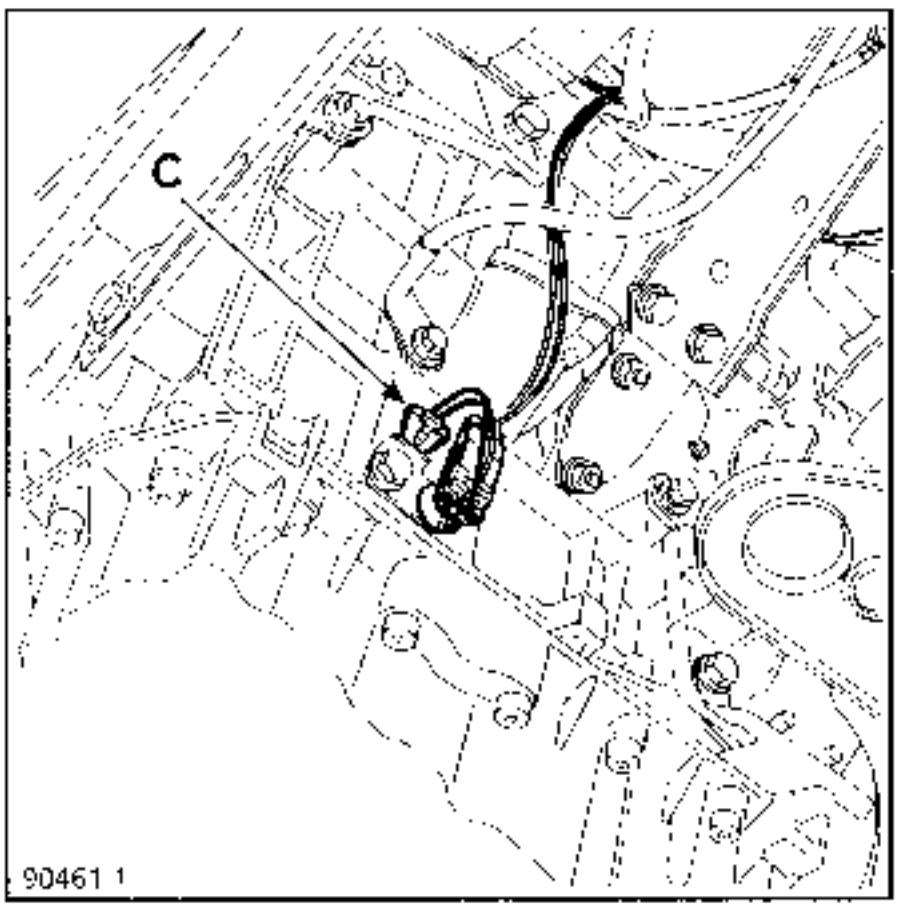
TESTING THE MOVING STRAINER

Secure the float in the upper position and gradually push down the strainer whilst reading on the ohmmeter, (terminals 1 and 4), the variation in the resistance.

The correct resistance variation is a lowering of **25 Ω ± 5 Ω**.

NOTE : All these figures are given for information only. Check that the resistance varies as the float is moved.





A Oil level indicator

B Electronic unit

C Oil level sensor

Operation

The oil level sensor consists of a wire with a high coefficient of resistivity. The thermal conductivity of this wire when a current is passed through it, is not the same immersed in fluid as it is when in the open air.

When the ignition is switched on, the oil pressure warning light switches on. An electronic unit (on the instrument panel) passes current to the terminals of the oil level sensor.

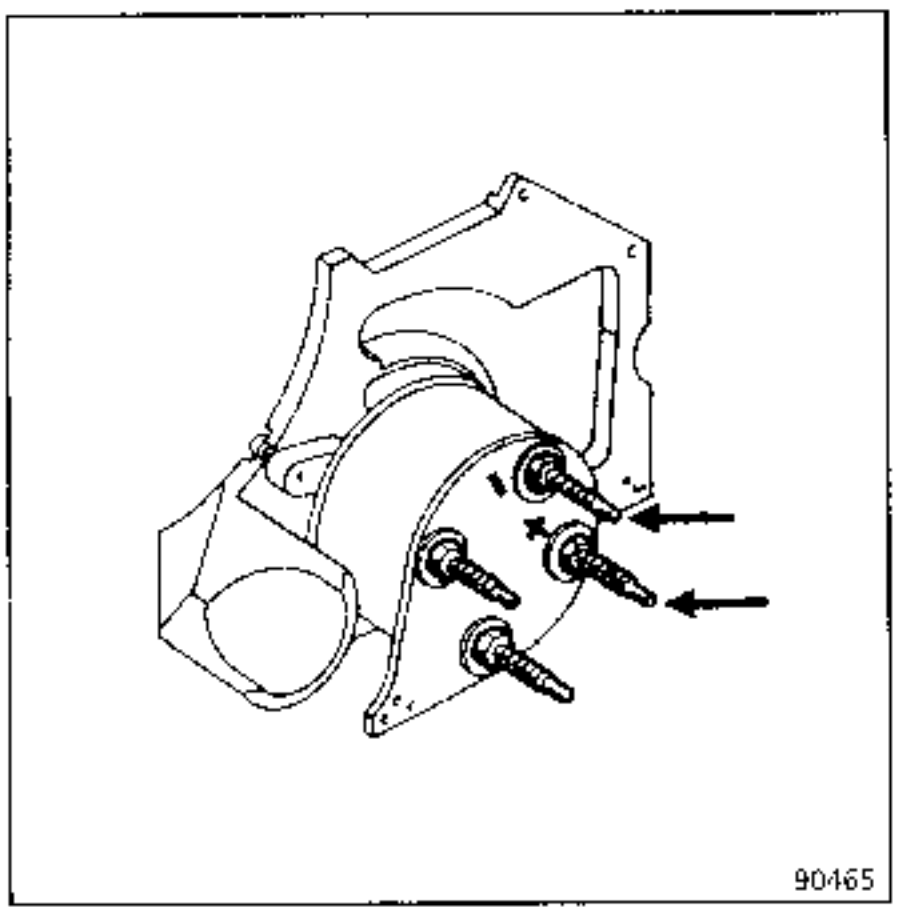
After a given fixed time, there will be a voltage variation across the terminals of the sensor, the strength of which will depend on the amount of wire which is immersed. This voltage variation is recorded by the electronic unit, which then sends the data to the level indicator.

When the engine is running, if the oil pressure is high enough, the pressure switch cuts off the warning light circuit. It also cuts out the electronic unit and therefore the oil level is no longer displayed.

TESTING

OIL LEVEL INDICATOR

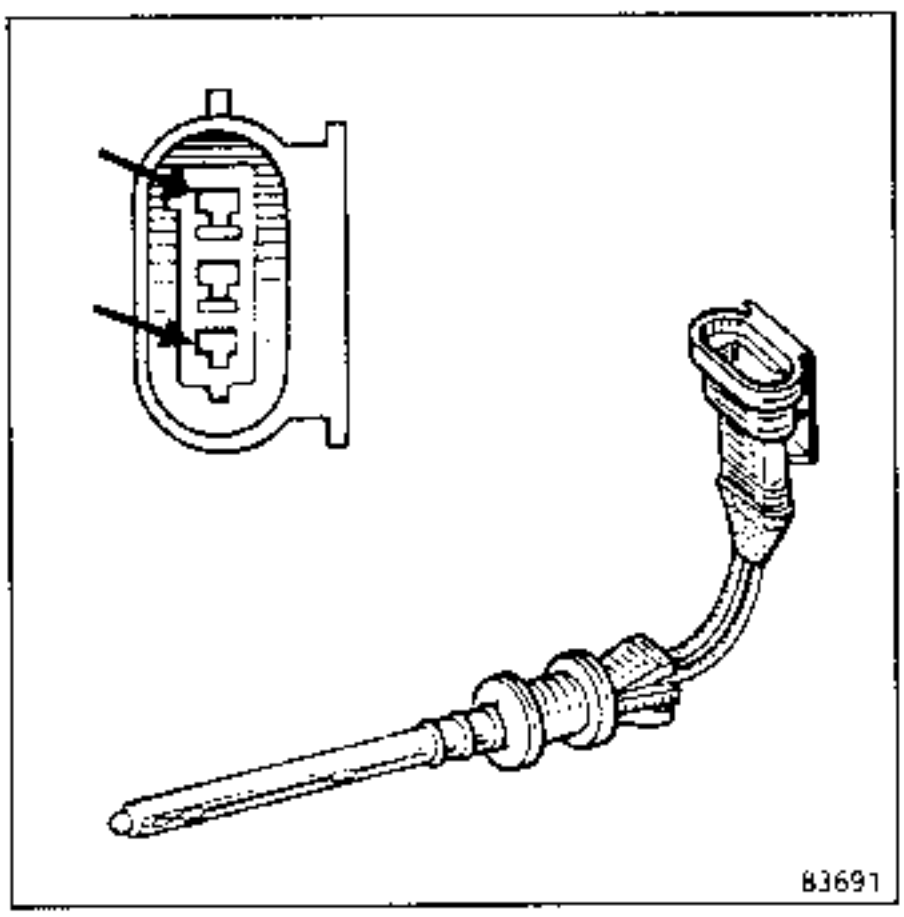
- Remove the indicator before carrying out the test.
- Connect an ohmmeter across the two terminals. The ohmmeter should register a resistance.



OIL LEVEL SENSOR

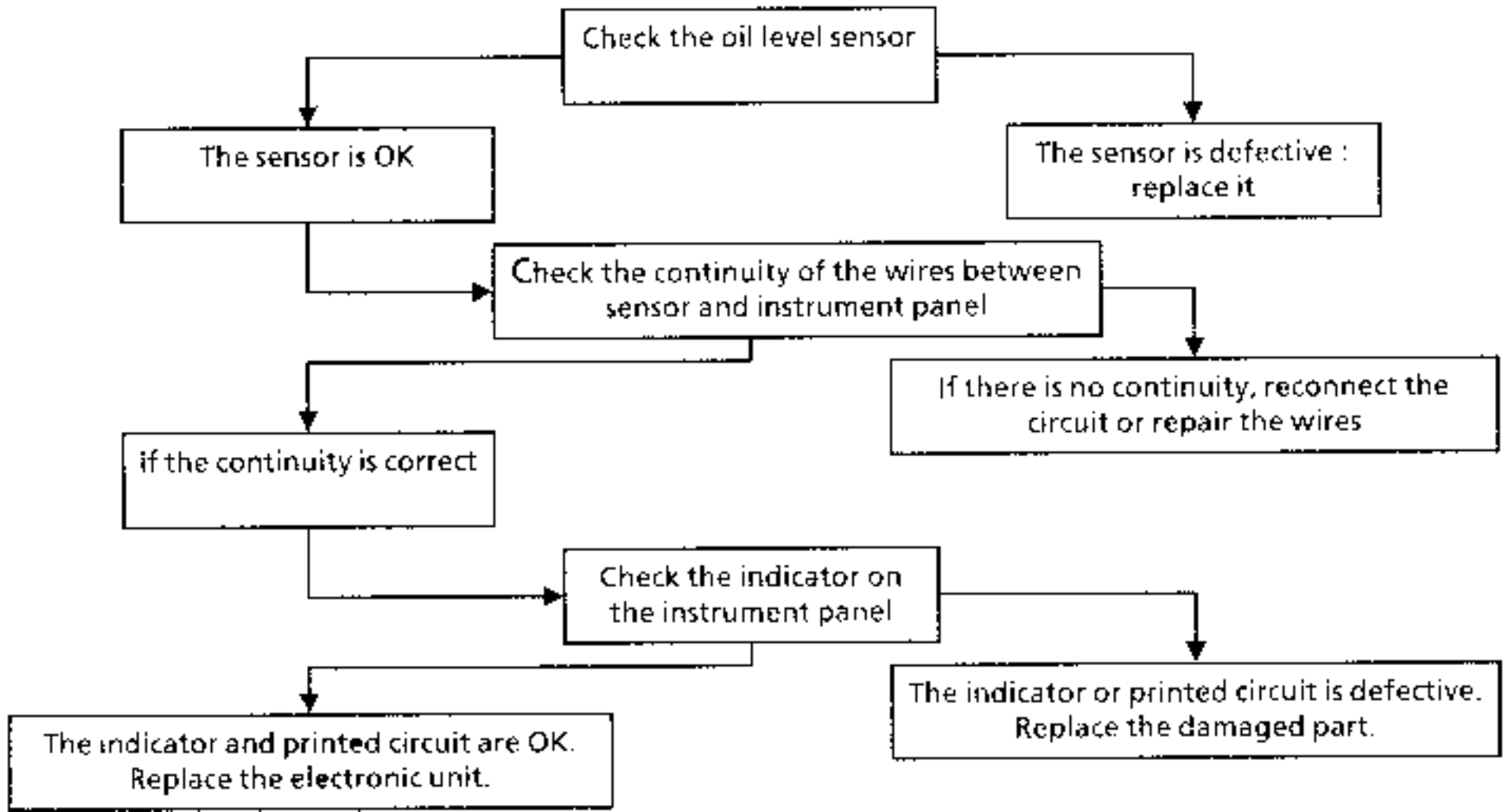
Connect an ohmmeter across the two terminals of the oil level sensor.

Correct reading : **5** to **30 Ω**.



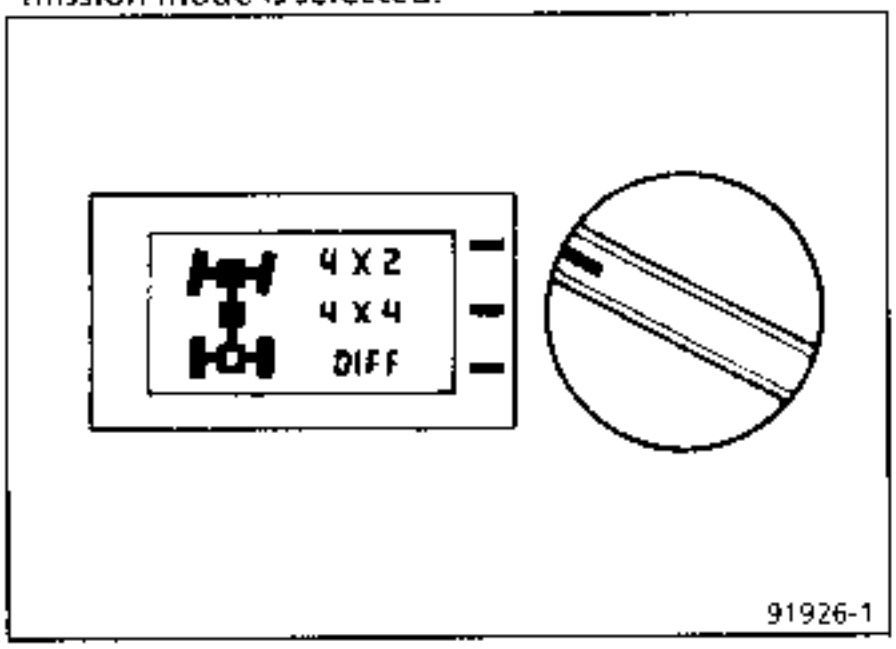
Fault-finding

If the oil level indicator does not operate when the ignition is switched on (the oil pressure warning light will illuminate.



TRANSMISSION ENGAGEMENT INDICATOR UNIT AND TRANSMISSION ENGAGEMENT WARNING LIGHT

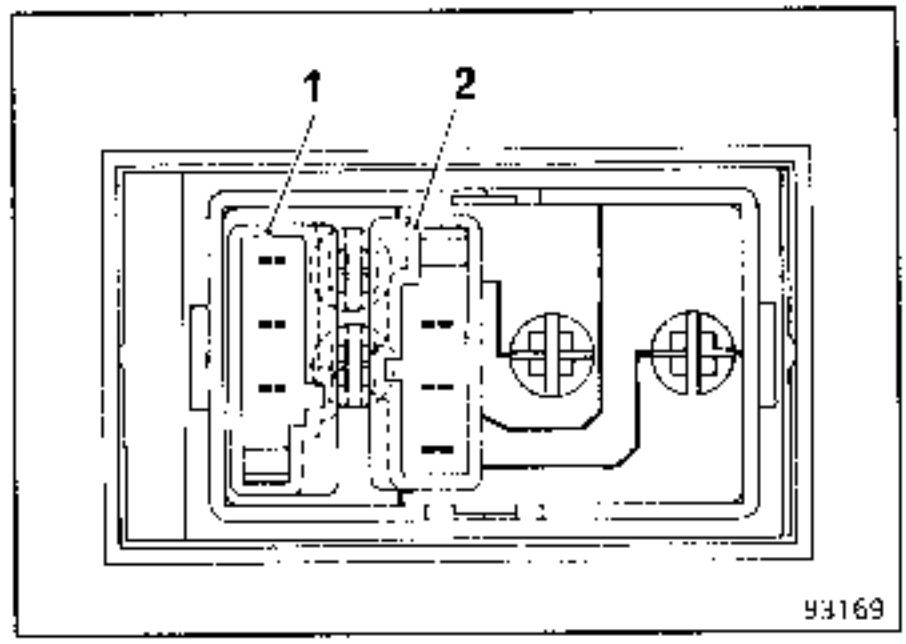
Vehicle types **K 48 4 x 4** are fitted with a detector unit and a warning light which show which transmission mode is selected.



At **B** : **4 x 4** : 4 wheel drive because the longitudinal transmission shaft is engaged. **4 x 4** warning light on central console switched on,

At **C** : **DIFF** : 4 wheel drive plus rear differential lock engaged.
4 x 4 and **DIFF** warning light on central console illuminated together with **DIFF** warning light on instrument panel.

CONNECTIONS



1 Black 3-pin connector

1 Not used
2 + after ignition
3 Transmission engagement warning light on differential lock switch panel

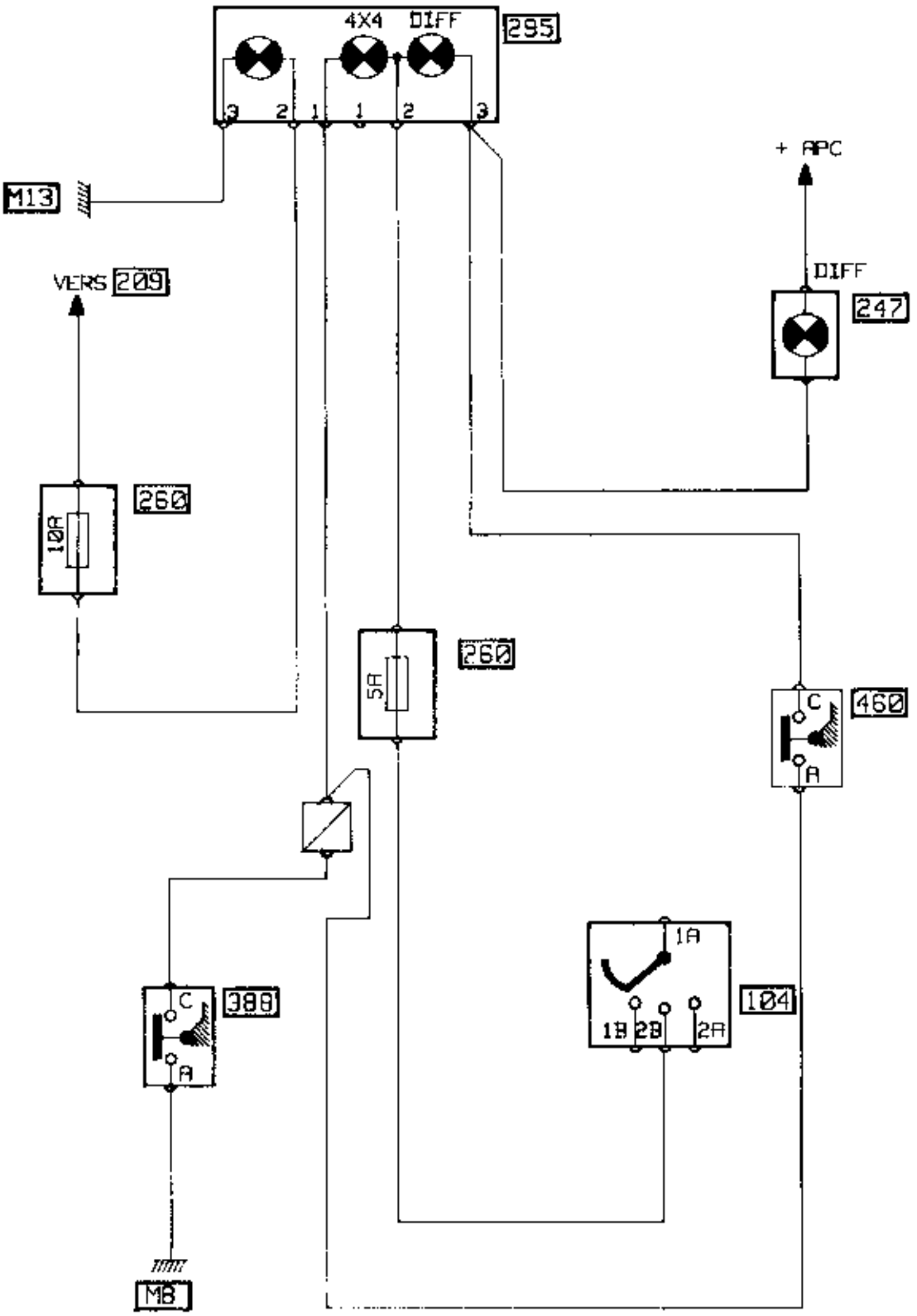
2 Grey 3-pin connector

1 Longitudinal transmission shaft engagement switch
2 Lighting
3 Earth

Key

104	Ignition switch
209	Switch stalk
247	Instrument panel
260	Fuse
295	Warning light unit
388	4 x 4 warning light switch
460	Rear final drive switch
M8	Injection earth
M13	Console earth
APC	After ignition

4 X 4 ENGAGEMENT WARNING LIGHTS



GENERAL

Description

The cruise control system allows the vehicle to be driven at a constant speed, without the need for the driver to keep his foot on the accelerator pedal.

The system has no limiting action.

The system is only operational from 25 mph (40 km/h).

The system has three parts:

1) A pneumatic part comprising:
   - a vacuum pump with its own regulation solenoid valve,
   - a safety breather solenoid valve,
   - a control valve acting by deforming a flexible diaphragm against the throttle control.

2) An electronic part comprising:
   - the cruise control computer which compares the actual vehicle speed with the speed required by the driver,
   - an engine over-revving relay which prevents the engine over-revving if the cruise control is used for intermediate gears.

3) A control and safety part comprising:
   - the cruise control on/off switch,
   - the switches on the steering wheel which allow the settings to be modified and system operation to be cancelled,
   - the stop and clutch switches which cancel the cruise control function at the slightest touch.

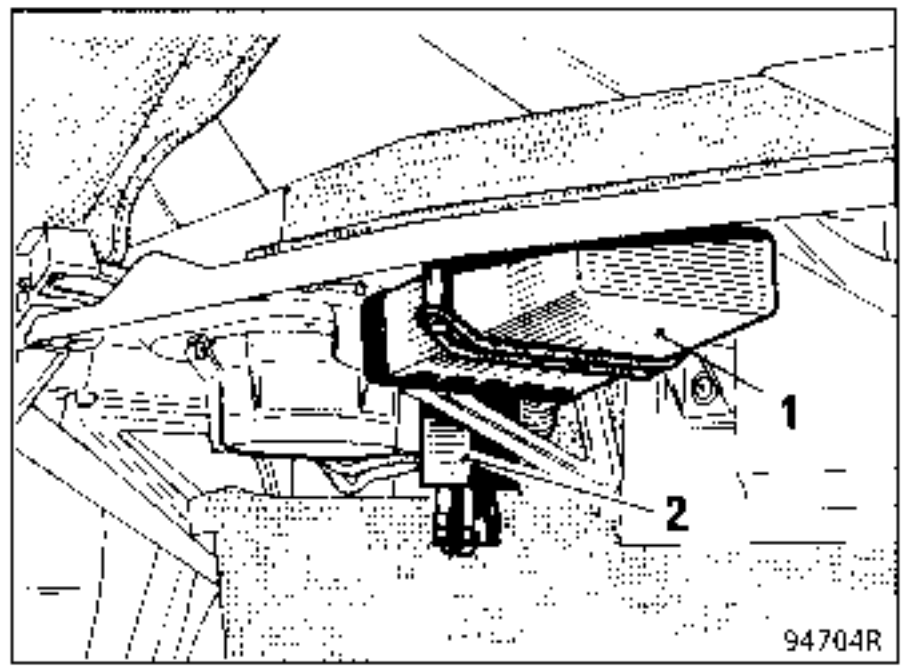
LOCATION OF COMPONENTS

Cruise control computer (1)

This is located in the boot, under the right hand side shelf behind the speaker (B 48).

This is located in the boot, behind the carpet trim on the right hand side of the rear floor (L 48).

On this model, the computer is strapped to a metal mounting.



Engine over-revving relay (2)

This is located in a vertical position between the speaker and the computer, on a metal bracket mounted by one of the speaker bolts (B48).

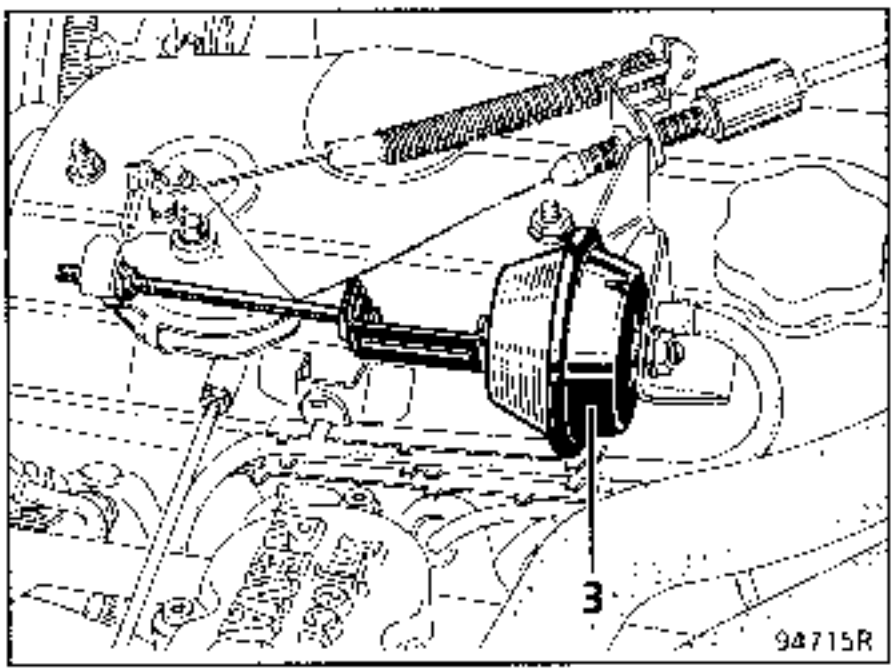
This is mounted by a metal bracket on the computer gaiter (L 48).

Vacuum pump and safety solenoid valve

These are located on the front right hand wheel arch, under a plastic protective cover which must be removed to reach the components, by removing its five mounting bolts.

Control valve (3)

This is located on the rocker box cover and acts on the accelerator control.

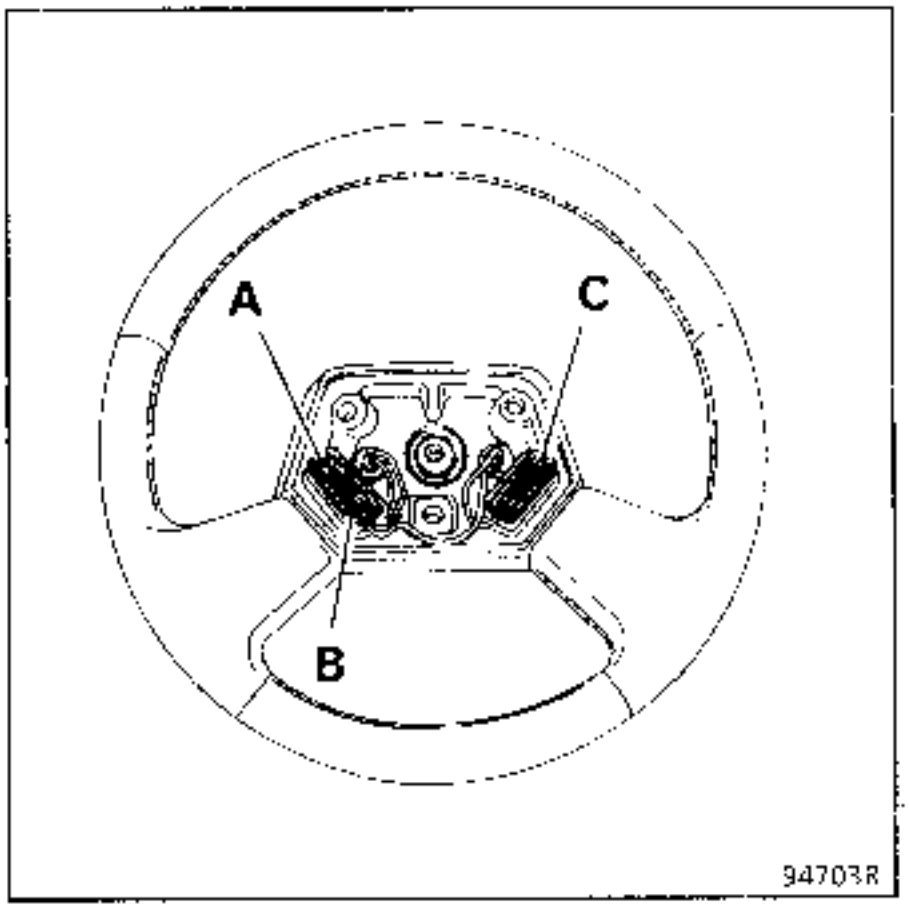


The valve acts on the throttle control in parallel with the pedal control.

The mounting does not impede control of the accelerator by foot, even during the regulation period.

The pedal follows the movements of the valve under its own weight. The driver may therefore accelerate the vehicle himself at any moment, should he so desire.

Switches on the steering wheel



Cruise control on/off switch

This is located on the centre console on the right hand side of the handbrake lever.

OPERATION

Ignition on, − after ignition feed is supplied to the cruise control switch.

Once the ignition has been turned on, + after ignition feed is supplied to the cruise control computer on track 5, and also to the over-revving relay.

The over-revving relay then supplies the cruise control regulator on track 7 via the stop and clutch switches, connected in series, and then the vacuum pump on track A and the safety solenoid valve on track 2.

The cruise control computer examines two parameters:

1) actual vehicle speed, on track 9 of the computer, from the speed sensor, or the electric speedometer if fitted to the vehicle.

2) memory of the required speed on track 3 of the cruise control computer.

These items of information are permanently compared, allowing the vacuum pump to be operated, which supplies a vacuum to the pneumatic valve which acts on the accelerator control.

Stability of the vehicle speed **(regulated speed)** is assured by alternate earth controlling of track 4 of the computer, supplying track B on the vacuum pump, and track 6 on the computer, supplying track C on the regulation solenoid valve incorporated in the vacuum pump.

NOTE : the safety solenoid valve allows the circuit to breathe when its earth is removed on track 1.

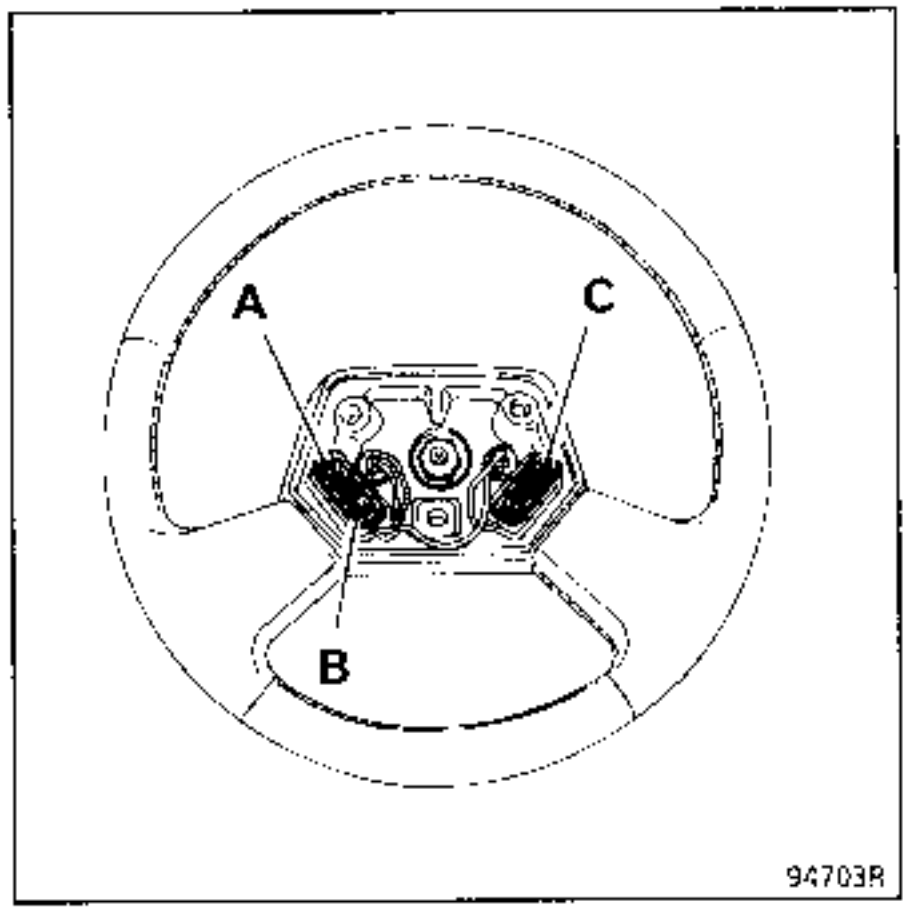
This earth on track 1, allowing the solenoid valve to operate, is only sent on track 1 of the cruise control computer if the vehicle speed is a minimum of 25 mph (40 km/h), information via track 9.

STARTING REGULATION

After pressing the cruise control button, with the vehicle moving at a stable speed (greater than 25 mph (40 km/h)), press the left hand side of switch **A ($\sqrt{\ }$ $\frac{-}{+}$) once.**

The voltage on track 3 of the unit (5 volts) passes via a 100 Ω resistor.

The regulation speed is memorised and the driver may remove his foot from the accelerator pedal.



From this moment, when the left hand side of switch A (V) is pressed, this increases the **regulated speed**. The driver may also accelerate using the pedal then press on the left hand side of switch **A**, when the desired speed is reached so that this new speed is memorised.

NOTE : the memorised speed may be exceeded at any moment by pressing the accelerator pedal. When the pedal is released, the vehicle returns to the memorised speed. Memorisation of regulated speeds is continuous from 25 mph (40 km/h).

SAFETY

Safety is ensured by :
- 1 engine over-revving relay,
- 2 stop connectors,
- 1 clutch switch, (manual gearbox only).

When the engine reaches 5 400 rpm, the over-revving relay receives this information from the rev-counter on track 3 and reaches its switching threshold.

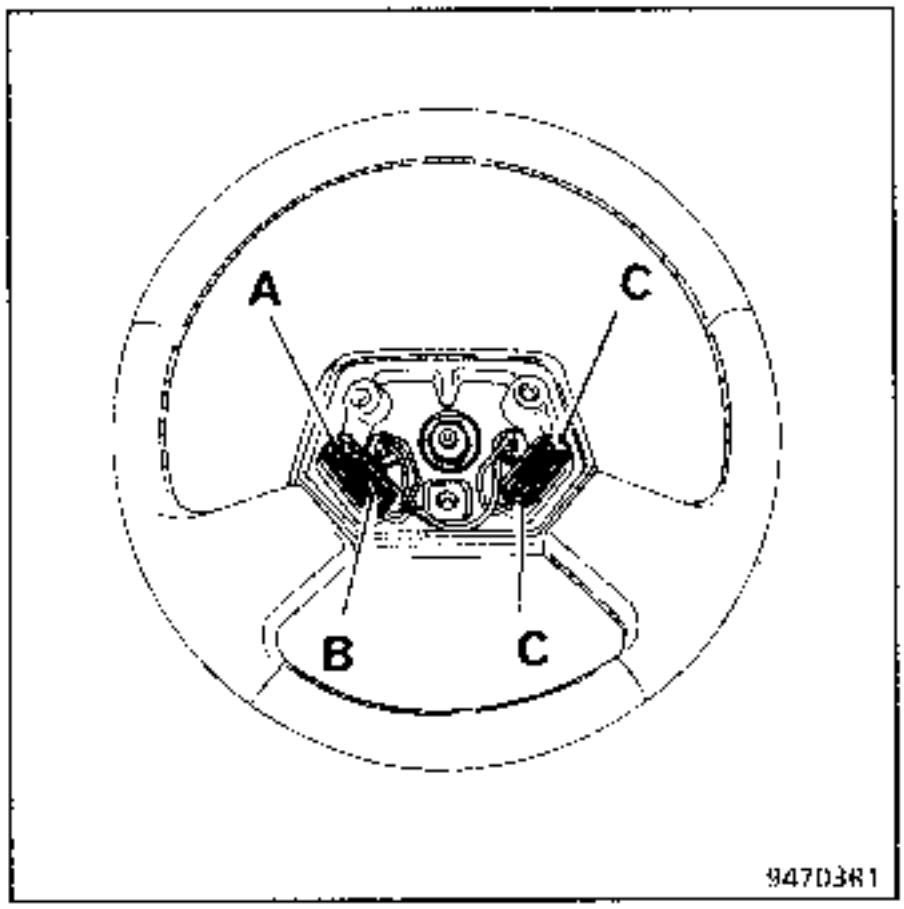
The feed to the cruise control computer safety circuit (which goes from track 5 to track 7) is cut, as is the feed on track 2 of the safety solenoid valve and track A of the vacuum pump.

The computer cuts the earth on track 1, which supplies track 1 of the safety solenoid valve, and the pneumatic circuit is allowed to breathe; the vehicle speed is no longer regulated. Pressing the brake pedal or the clutch pedal (manual gearbox) will have the same consequence. The stop switch also sends information (stop) to the computer on track 2, in addition to the first switch, to give a dual level of safety.

The right hand switch on the steering wheel (regardless of which side C), (O) cuts cruise control operation, by directly earthing track 3 on the computer.

The computer cuts the earth on track 1, supplying track 1 of the safety solenoid valve , and sends an earth on track 6, supplying track C on the vacuum pump.

The safety solenoid valve and the regulation solenoid valve allow the pneumatic circuit to breathe.



The regulated speed remains in the memory in all these safety cases.

To recall the speed memorised, press the left hand switch on the steering wheel on side B (R). The voltage on track 3 of the computer (5 volts) passes via a 330 Ω resistor

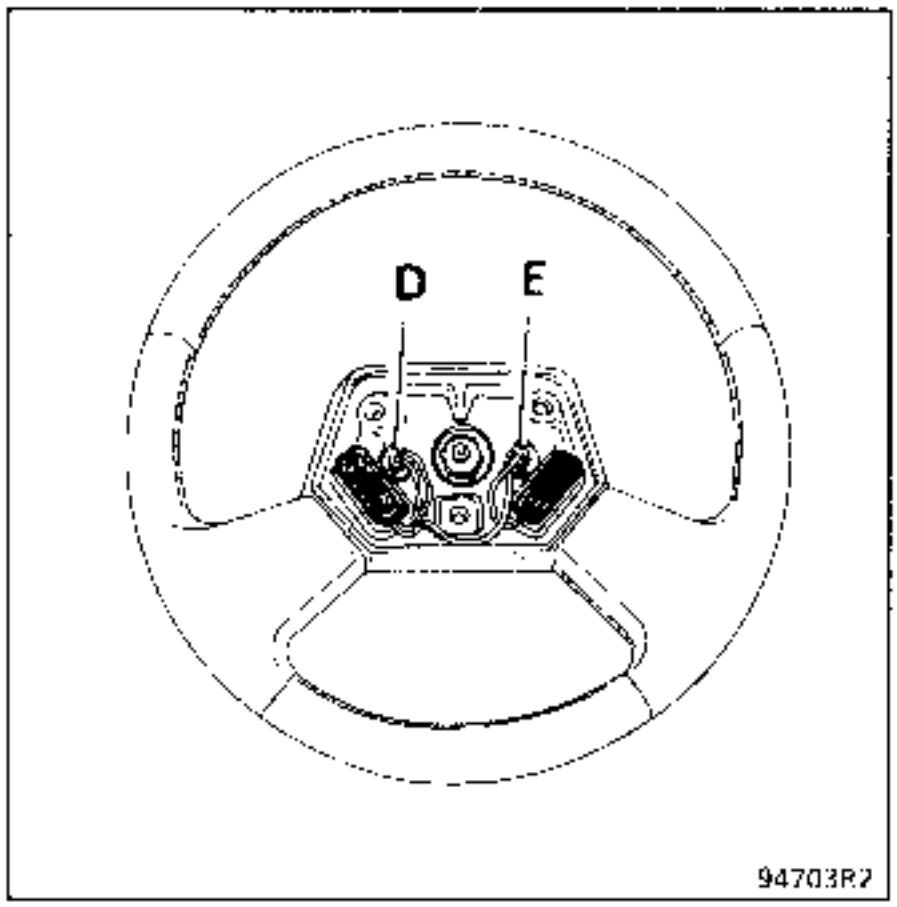
The computer will automatically return the vehicle to the speed memorised previously (as soon as the vehicle speed has reached 25 mph (40 km/h)).

NOTE : cutting the feed to the cruise control using the on/off switch or by turning the ignition off, cancels the regulated speed in the memory.

FAULT FINDING

If the system does not operate correctly, a series of measurements may be made on the steering wheel track terminals.

Remove the hub cover without disconnecting the wires.
Place a voltmeter between the two clips connected to the terminals for tracks (D) and (E) (see diagram).



With the engine running at idle speed, press the cruise control on/off switch. The voltage at the clips connected to the terminals for tracks (D) and (E) should be approximately 5 volts (from track 3 of the cruise control computer).

When the following switches on the steering wheel are pressed, the following voltages should be noted:

- pressing R = 2.5 volts approximately
- pressing √ = 1.3 volt approximately
- pressing 0 = 0 volt

Turn the ignition off, disconnect the two clips for the track terminals and connect an ohmmeter between the two wire clips. The values should be as follows:

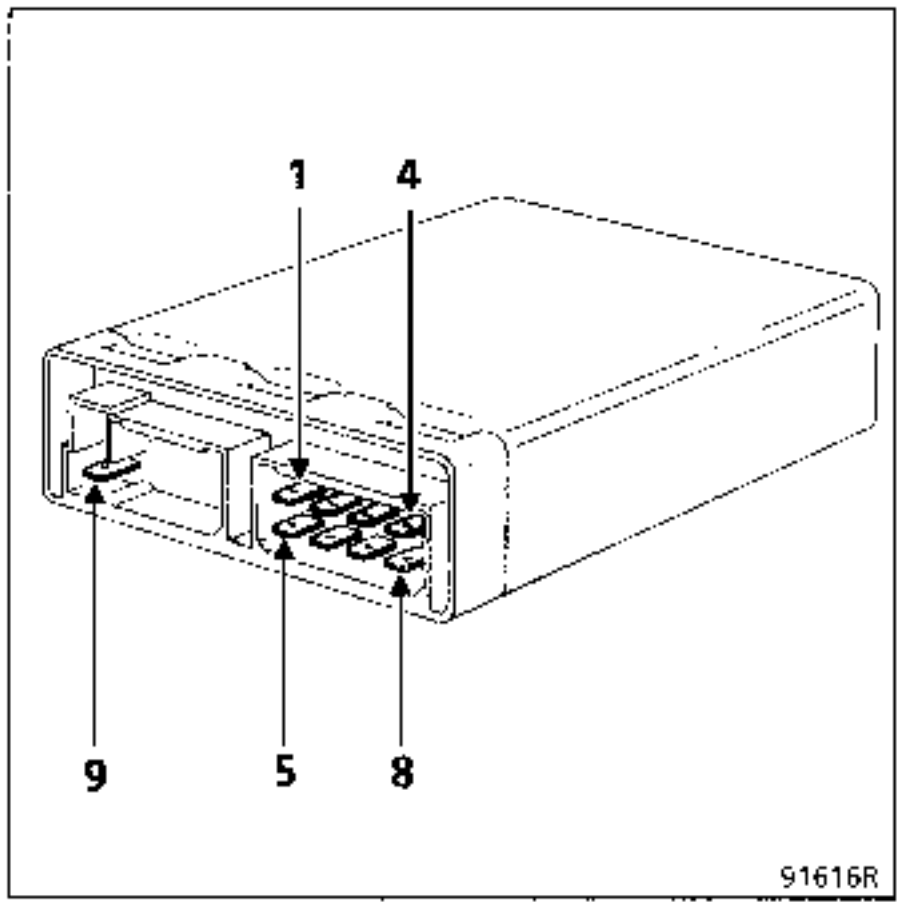
- pressing R = 330 Ω ± 15
- pressing √ = 100 Ω ± 5
- pressing 0 = 0 Ω

These measurements are used to check:

- the earth on track 8 of the cruise control computer,
- the 5 volts feed output on track 3,
- the 12 volts feed on track 5,
- the resistances of the steering wheel switches.

If the values are not correct, refer to the first fault chart (see following page).

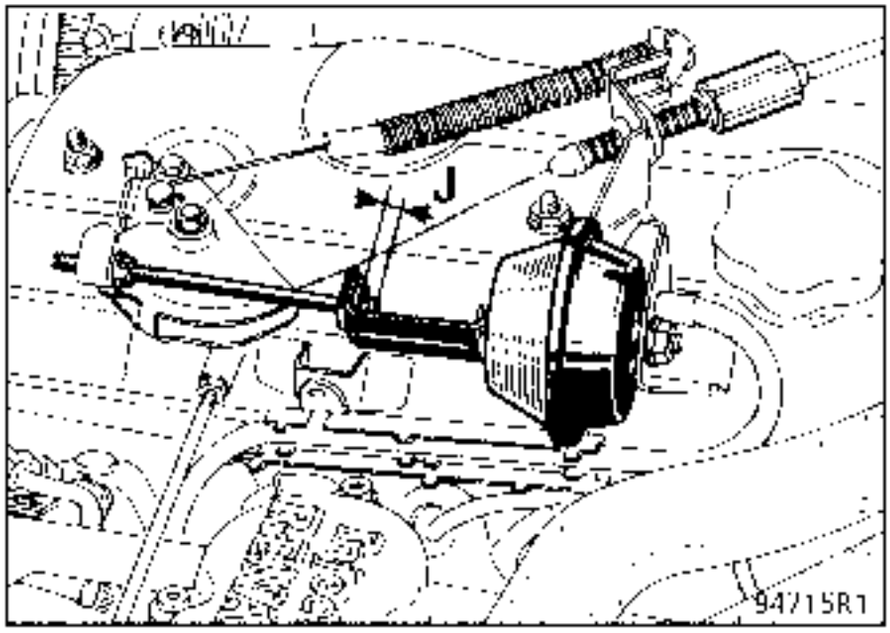
If the values are correct, refer to the fault chart for checking on track 2.



1 Solenoid valve control
2 Stop input
3 Steering wheel control
4 Pump control (accelerator)
5 Feed (+ 12 volts)
6 Deceleration control
7 Clutch - brake safety
8 Earth
9 Speed information

ADJUSTING THE MECHANICAL CONTROL

With the valve in the rest position and the throttle control in the idle speed position, a safety play of **1.5 mm** maximum should be noted.

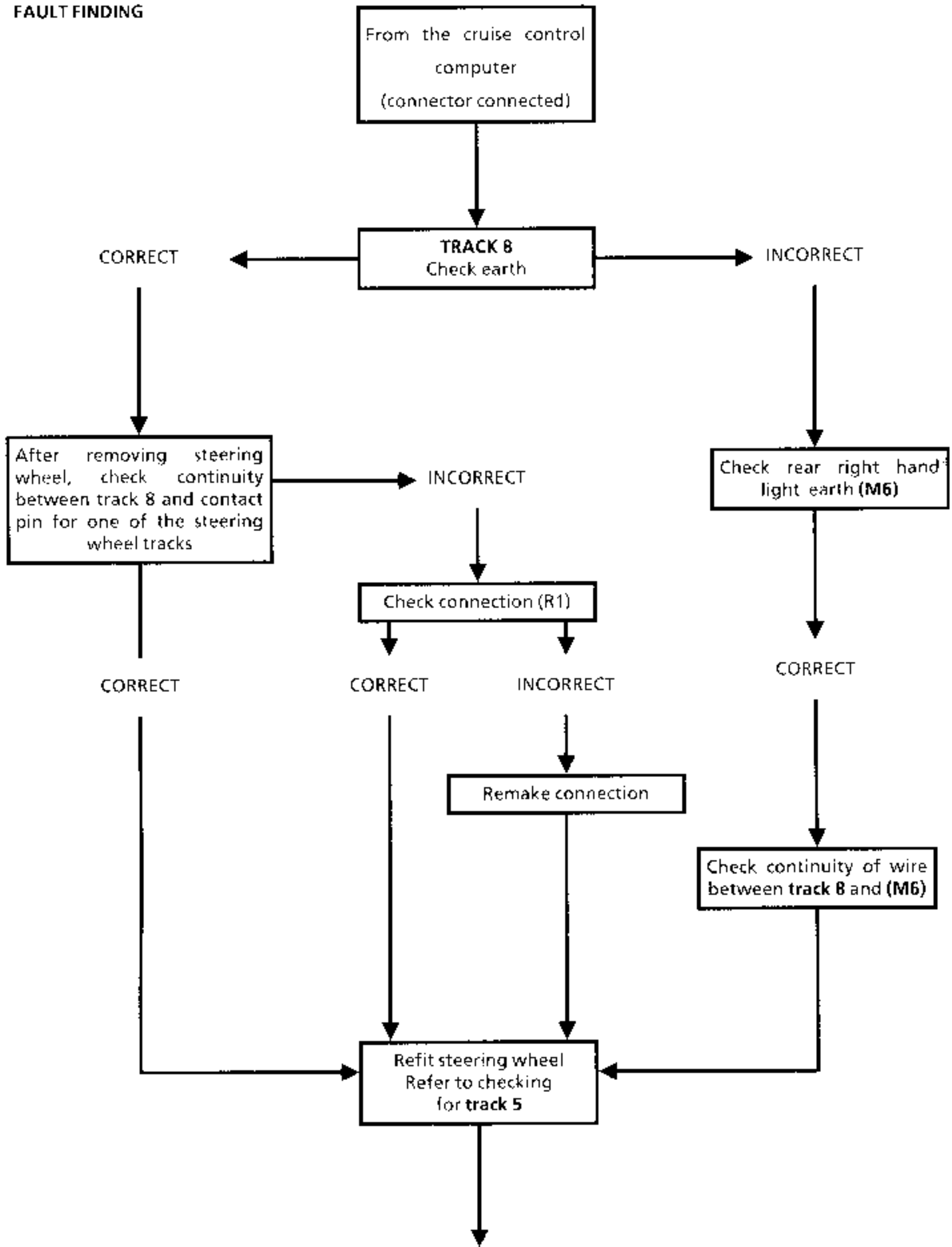


Slacken the lock nut.

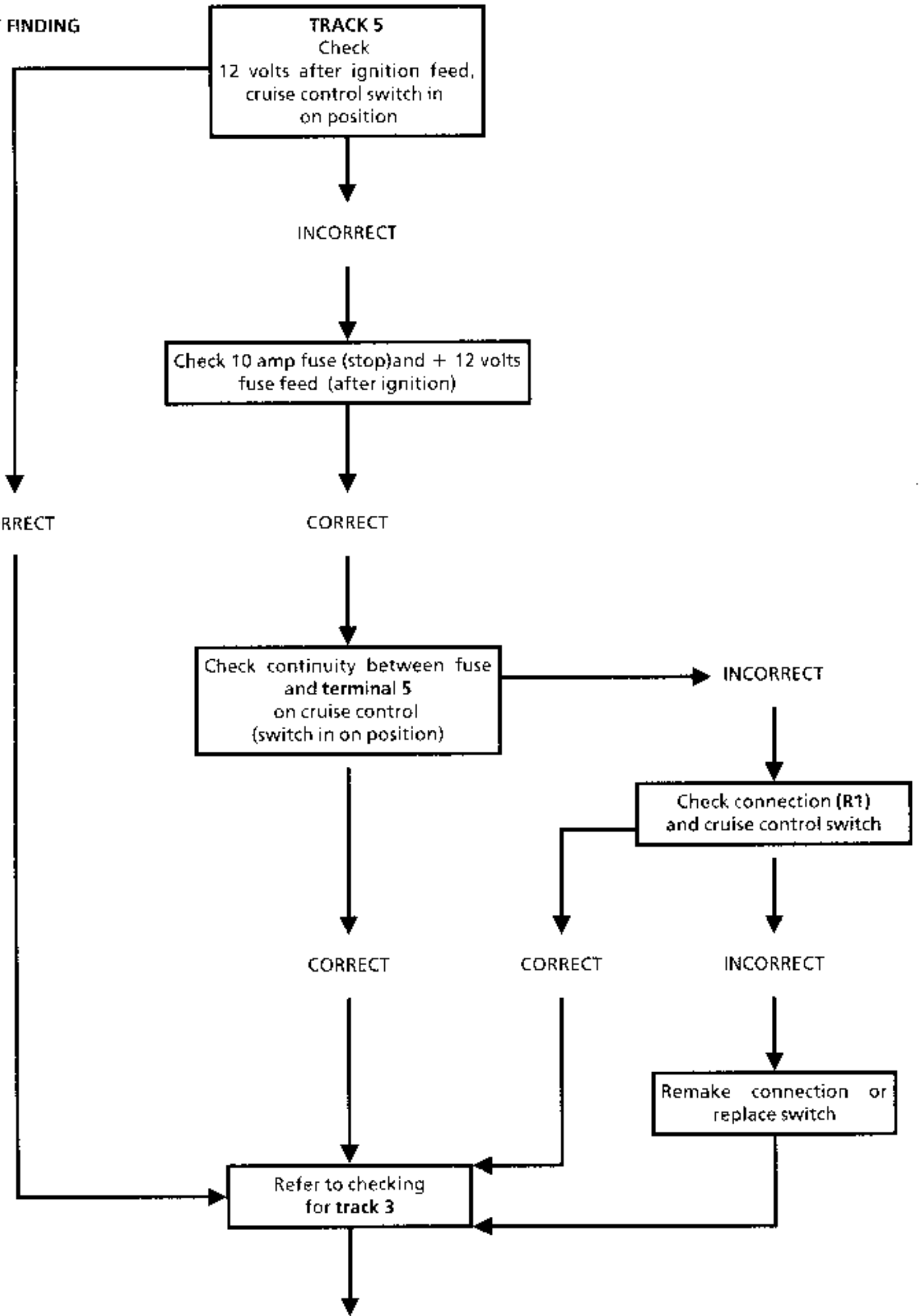
Adjust the play (J) adjusting the length of the rod by tightening or slackening it.

Tighten the lock nut again.

FAULT FINDING



FAULT FINDING



FAULT FINDING

TRACK 3
Ignition on, cruise control switch set to on position

Check voltage, approximately 5 volts

CORRECT

INCORRECT

Replace cruise control computer

After removing steering wheel, check continuity between **track 3** and contact pin for one of the steering wheel tracks

INCORRECT

CORRECT

After removing steering wheel
Press **(R)**
on steering wheel switch,
voltage should be
2.5 volts approximately.
Press (V ⏚) voltage
= 1.3 volt approximately

Remake connection
(R1)

INCORRECT

- Remove steering wheel,
- Clean tracks using cloth dampened with cleaning agent,
- Coat tracks with "Electronex"
- Repeat measurement.

CORRECT

INCORRECT

Refit steering wheel
Refer to checking
for track **2**

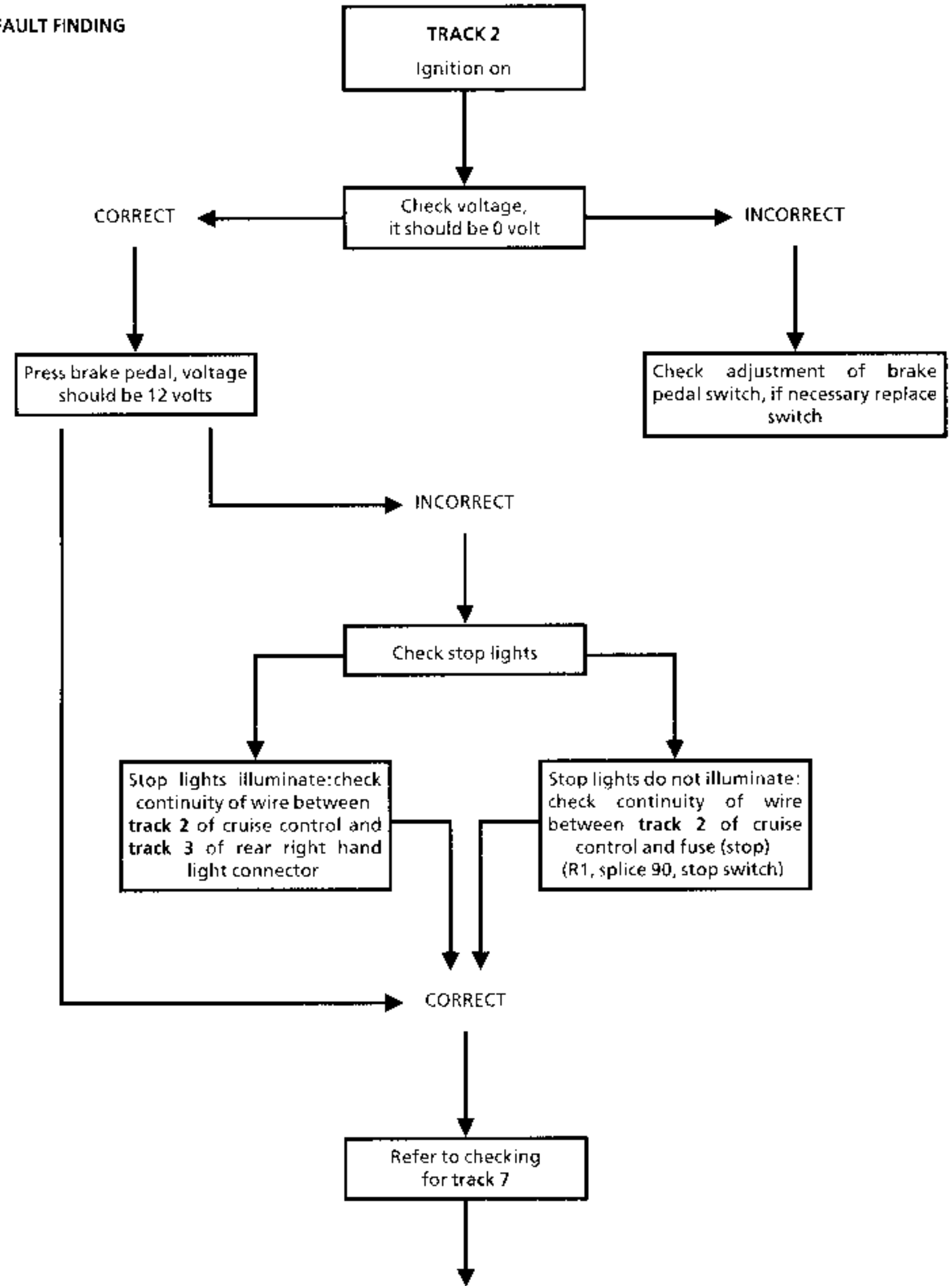
CORRECT

Replace steering wheel track contact pins

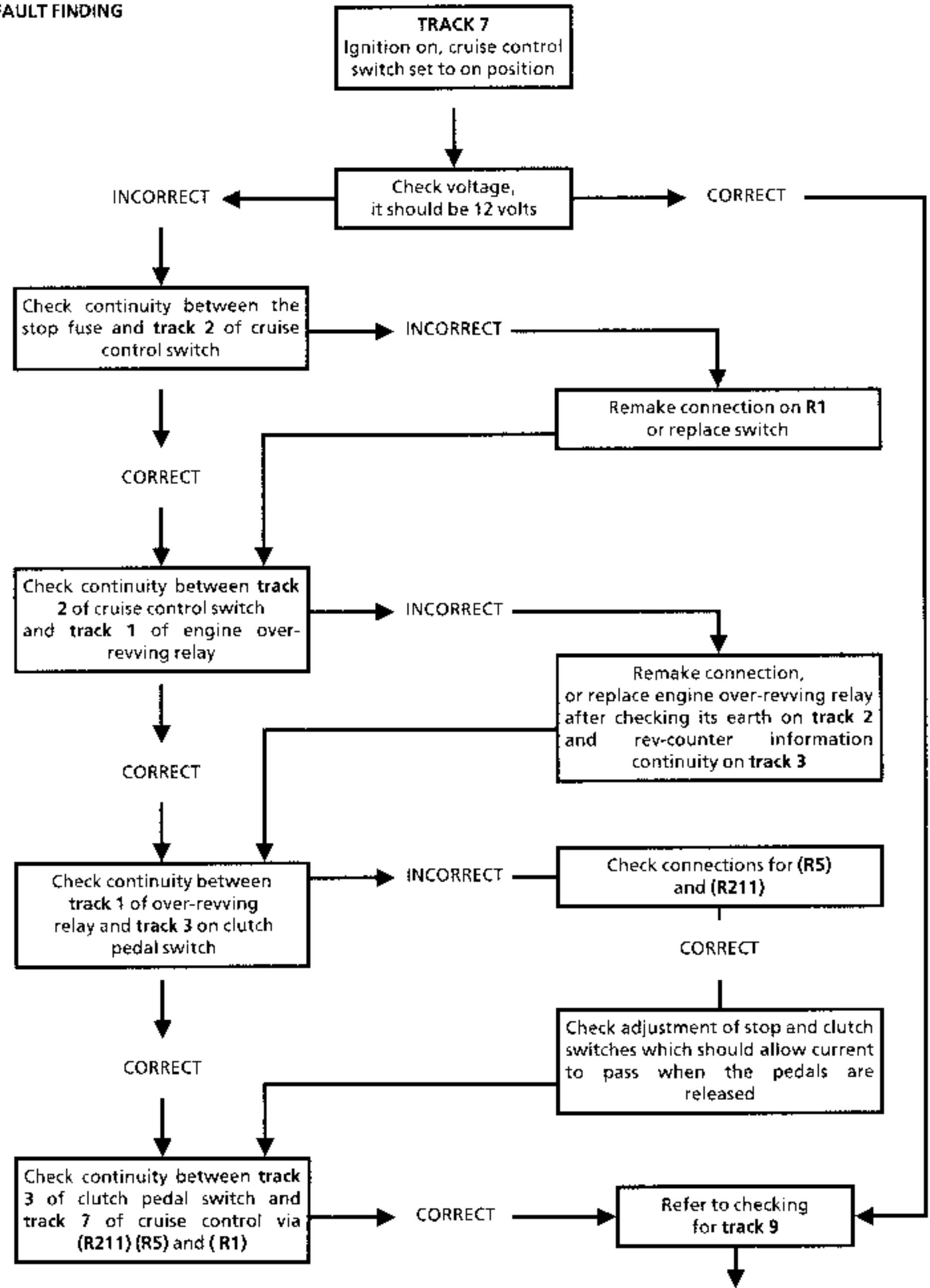
INCORRECT

Replace switches on steering wheel

FAULT FINDING



FAULT FINDING



FAULT FINDING

TRACK 9

To ensure speed information is being sent correctly by the speed sensor, set the on-board computer to fault finding sequence after disconnecting then reconnecting the battery, and check that when the vehicle is moving, the value is not zero (see Workshop Repair Manual for on-board computer) . To ensure that speed information is being correctly sent by the electric speedometer (if fitted to the vehicle) , operate the voice synthesiser, vehicle moving, for information of the type "*parking brake applied*" or "*front left hand door incorrectly closed*"

CORRECT

Replace the cruise control computer after checking the connection **(R1)** and continuity of the wire **track 9** are correct

INCORRECT

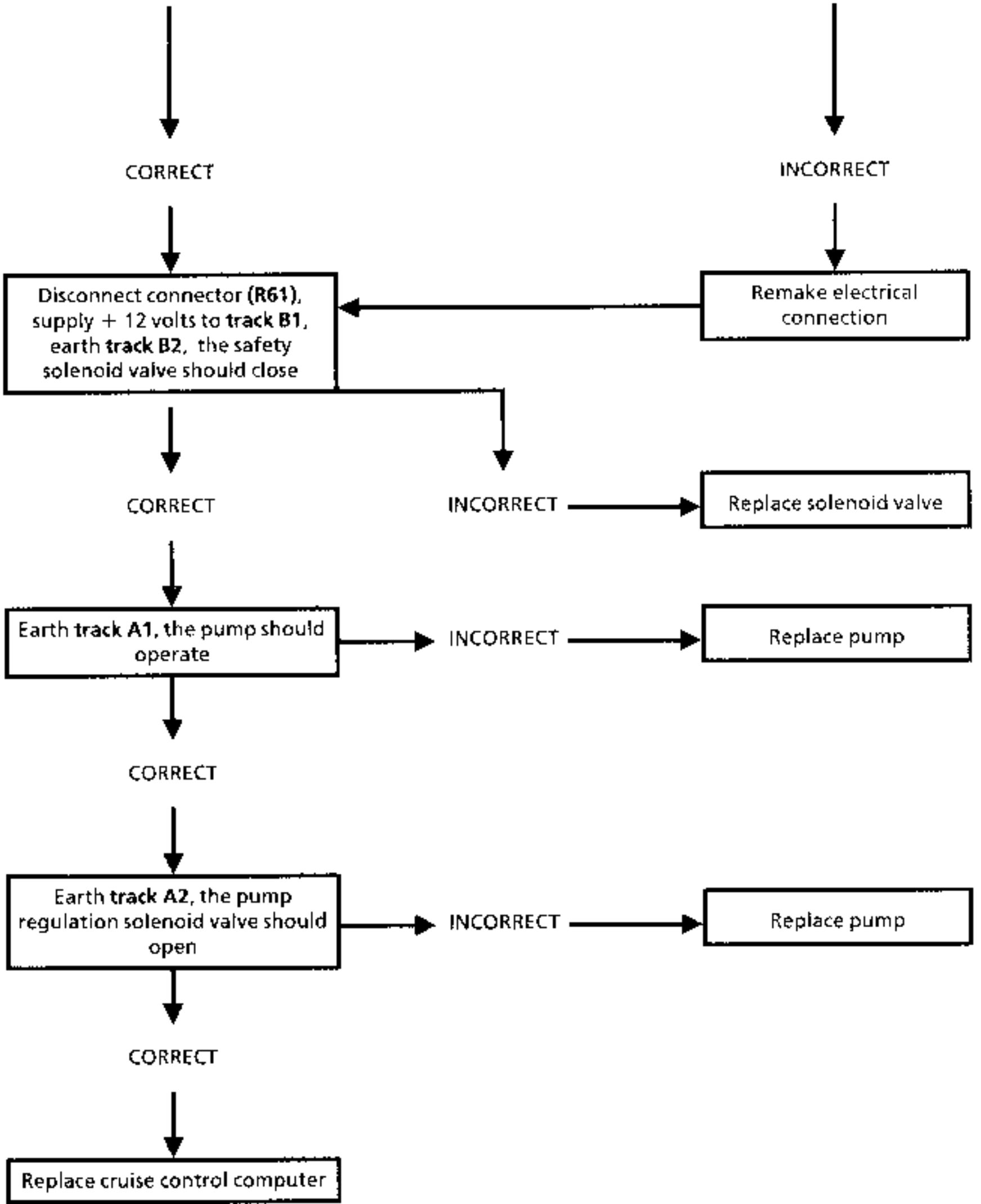
Replace speed sensor or electric speedometer if fitted to the vehicle

CHECKING THE PUMP AND SAFETY SOLENOID VALVE

Check the continuity between the following wires:

- **track 7** on cruise control computer and **track A** on pump
- **track 4** on cruise control computer and **track B** on pump,
- **track 6** on cruise control computer and **track C** on pump,
- then **track 7** on cruise control computer and **track 2** on safety solenoid valve,
- **track 1** on cruise control computer and **track 1** on safety solenoid valve.

FAULT FINDING



REMOVAL

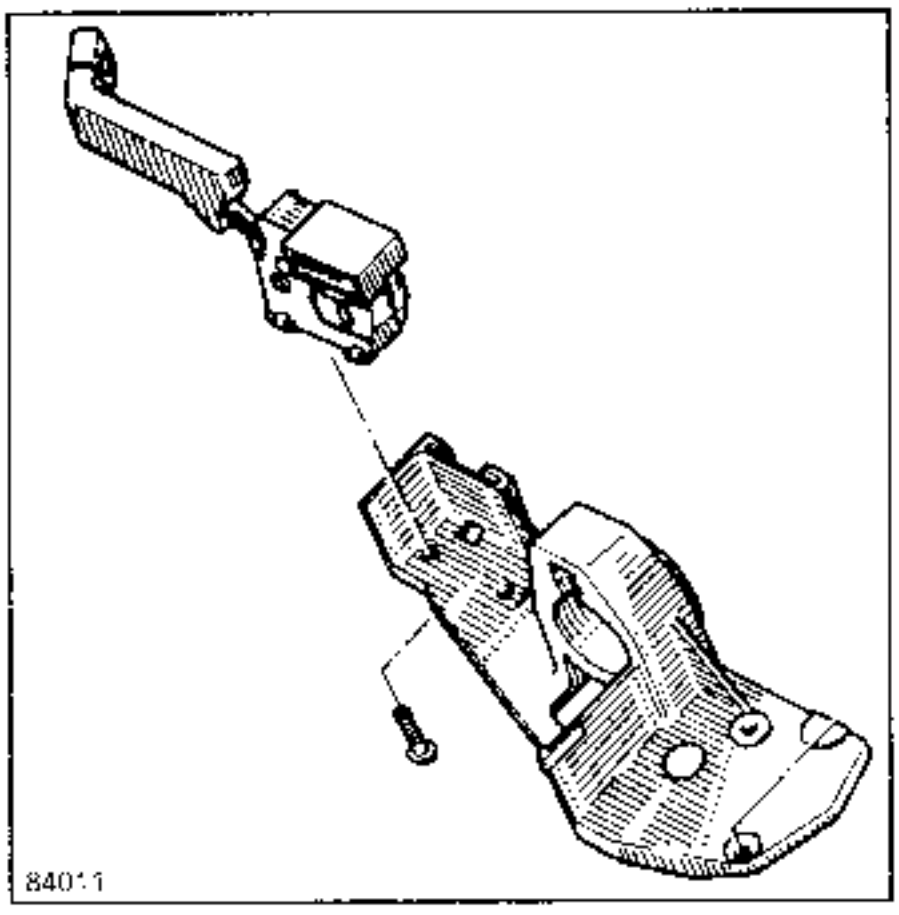
Disconnect the battery.

Remove :

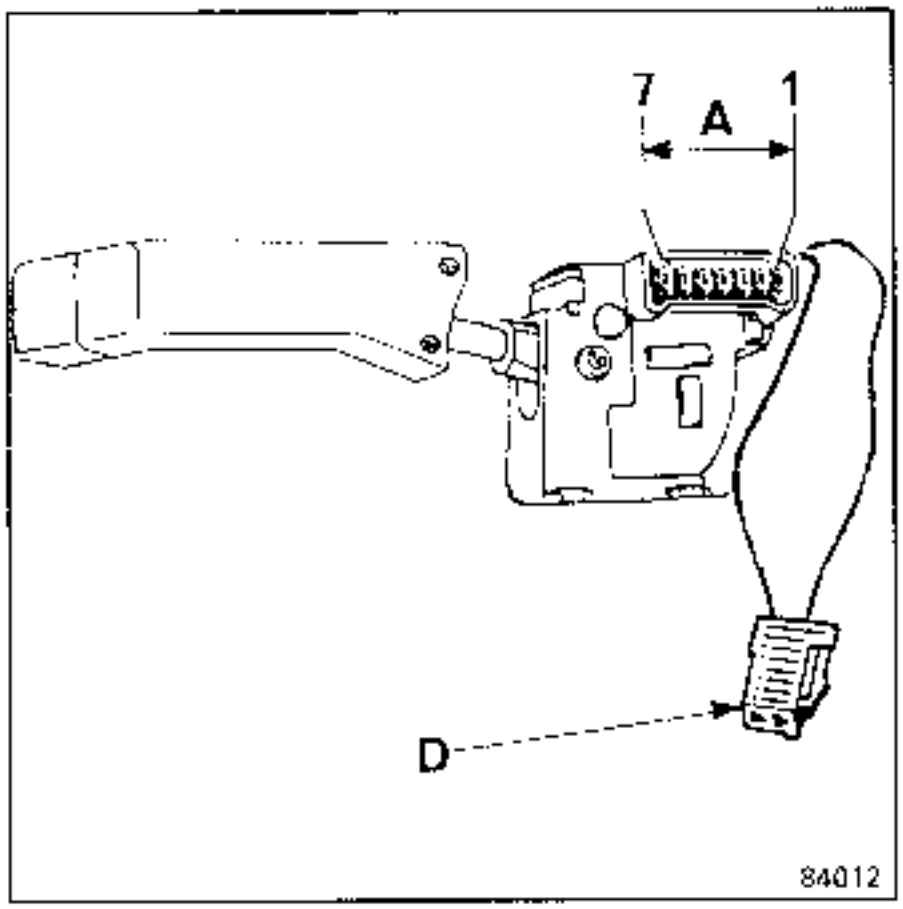
- the steering wheel,
- the two steering column half casings,
- the two screws,

Disconnect the connectors.

Remove the switch stalk assembly



CONNECTIONS



CONNECTIONS

(A) SCREEN WIPER CONNECTOR

1 Timed sweep input
2 + after ignition
3 High speed
4 Low speed
5 Park/Timer
6 − after ignition
7 Screen washer

(D) ON-BOARD COMPUTER SWITCH CONNECTOR

REMOVAL

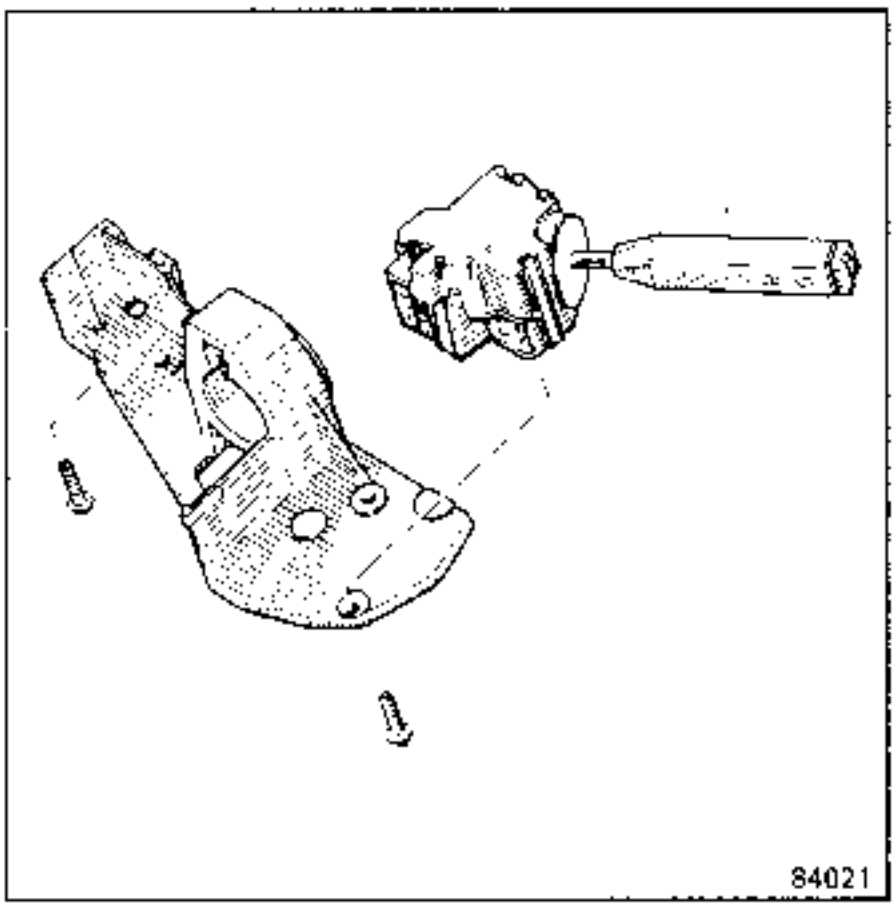
Disconnect the battery.

Remove :

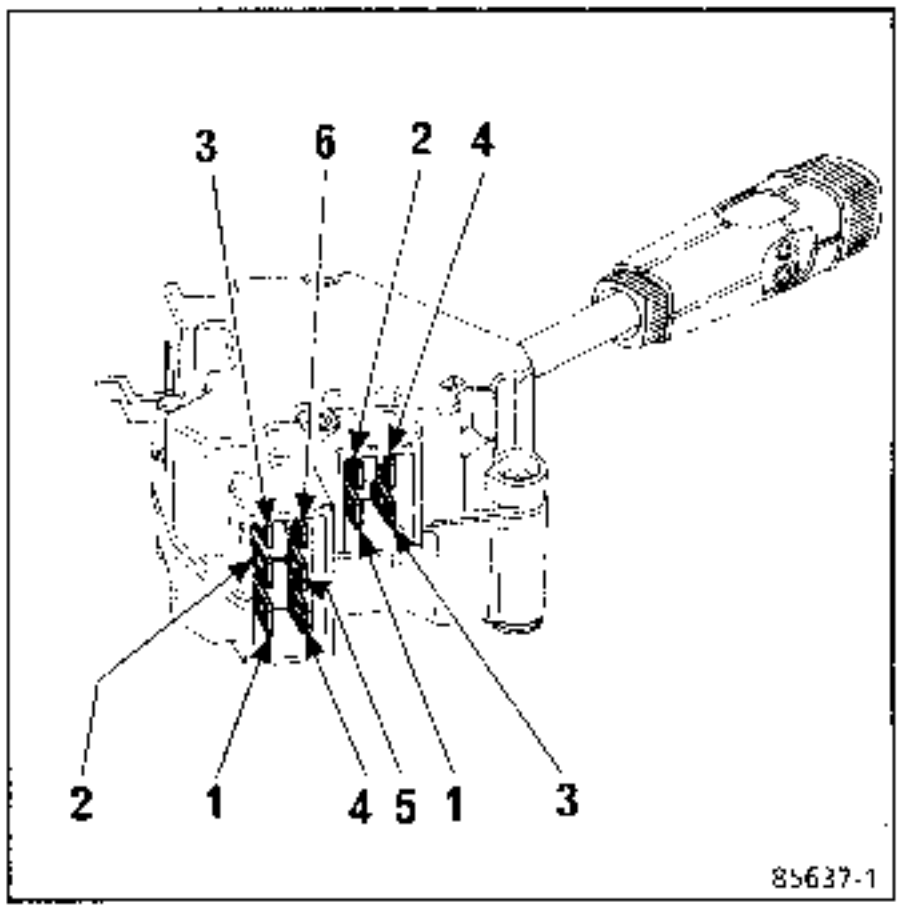
- the steering wheel,
- the two steering column half casings,
- the two screws,

Disconnect the connectors.

Remove the switch stalk assembly



CONNECTIONS



Lighting connector

Pin	Description
1	Main beam
2	Dipped beam
3	+ before ignition
4	Sidelights

Direction indicator - Horn Connector

Pin	Description
1	Horn
2	Rear fog light output
3	+ before ignition
4	RH direction indicator
5	Flasher unit
6	LH direction indicator

REMOVAL

Disconnect the battery.

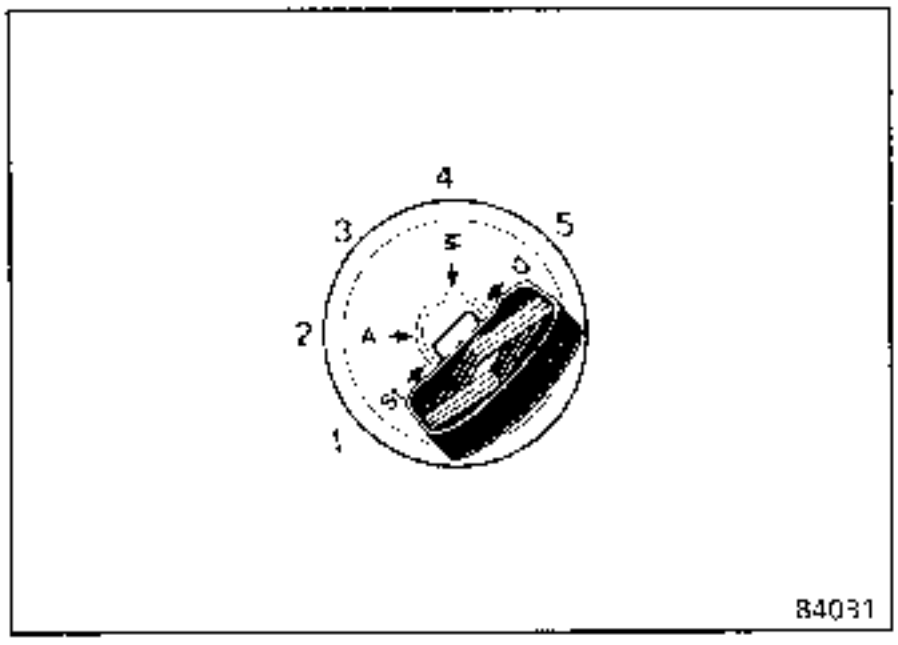
Remove:

- the steering column half casings,
- the switch cover.

Disconnect the black and the grey connectors.

Remove the switch securing screws using a cranked screwdriver.

Place the key in the "garage" position (3).

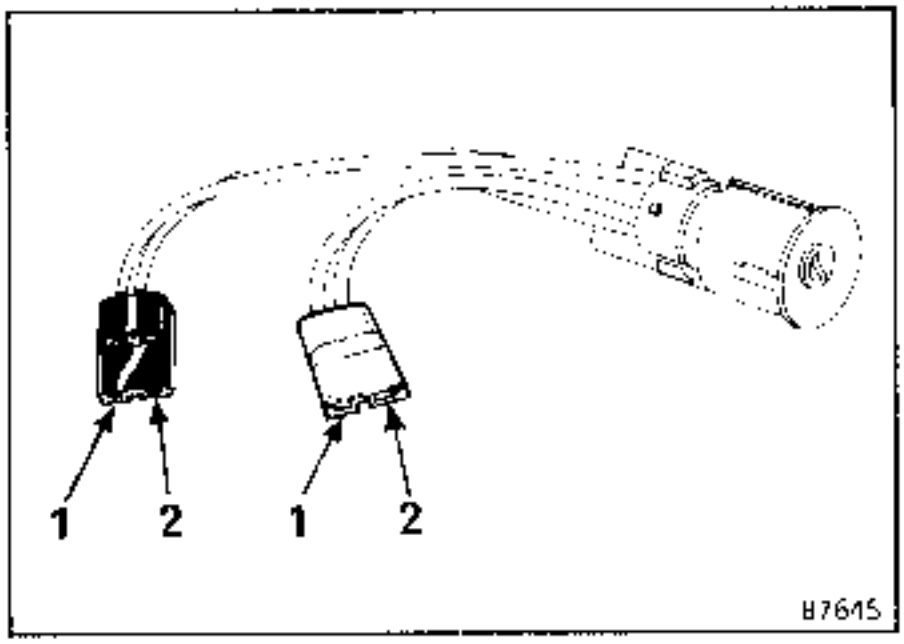


Press the retaining lugs and take out the switch.

REFITTING (special point)

Ensure that the wiring is correctly positioned.

CONNECTIONS



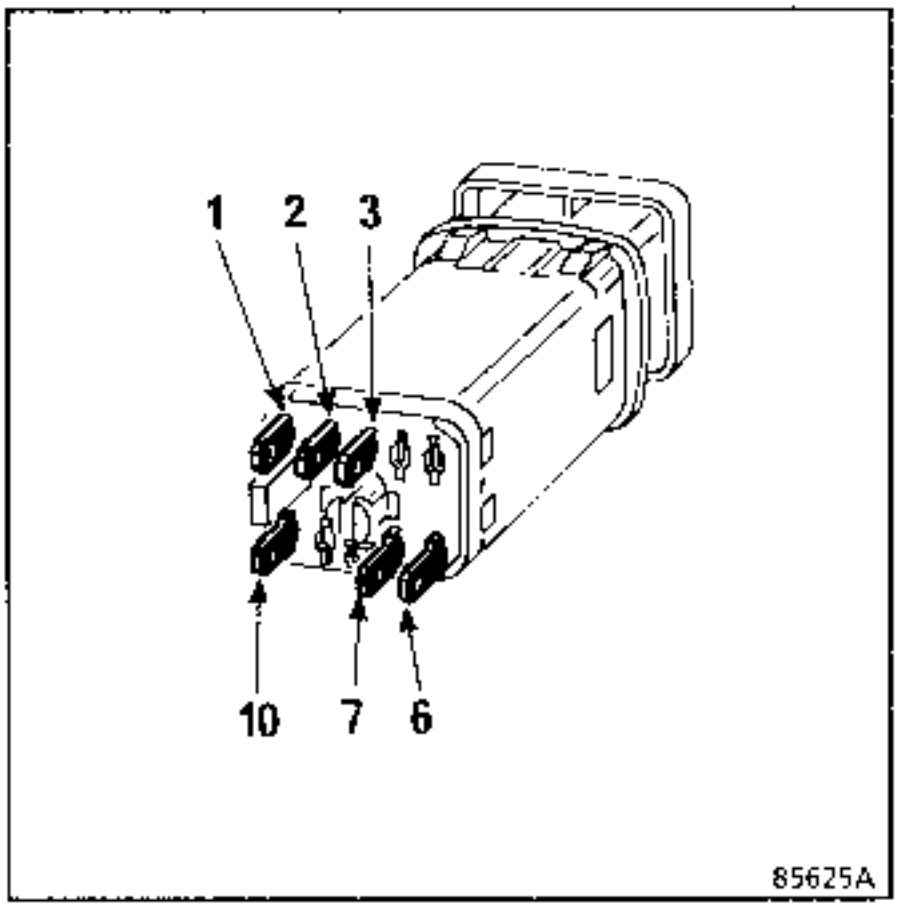
Black connector

Pin	Description
1	+ before ignition
2	Starter

Grey connector

Pin	Description
1	Accessories
2	+ after ignition

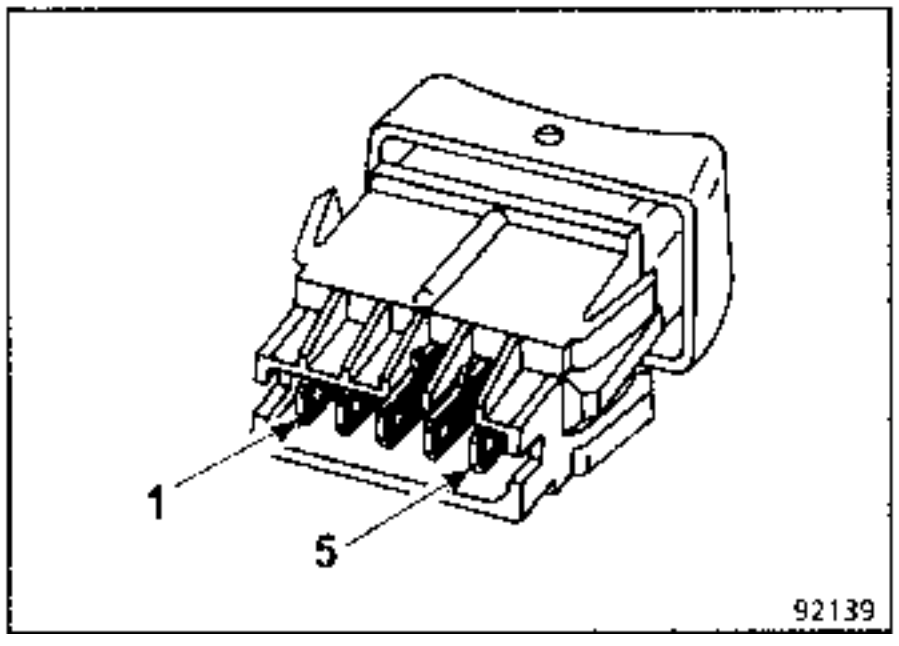
HEATED REAR SCREEN SWITCH
(1st arrangement)



CONNECTIONS

1 + after ignition
2 Relay control
3 Lighting +
6 Not used
7 Earth
10 Warning light

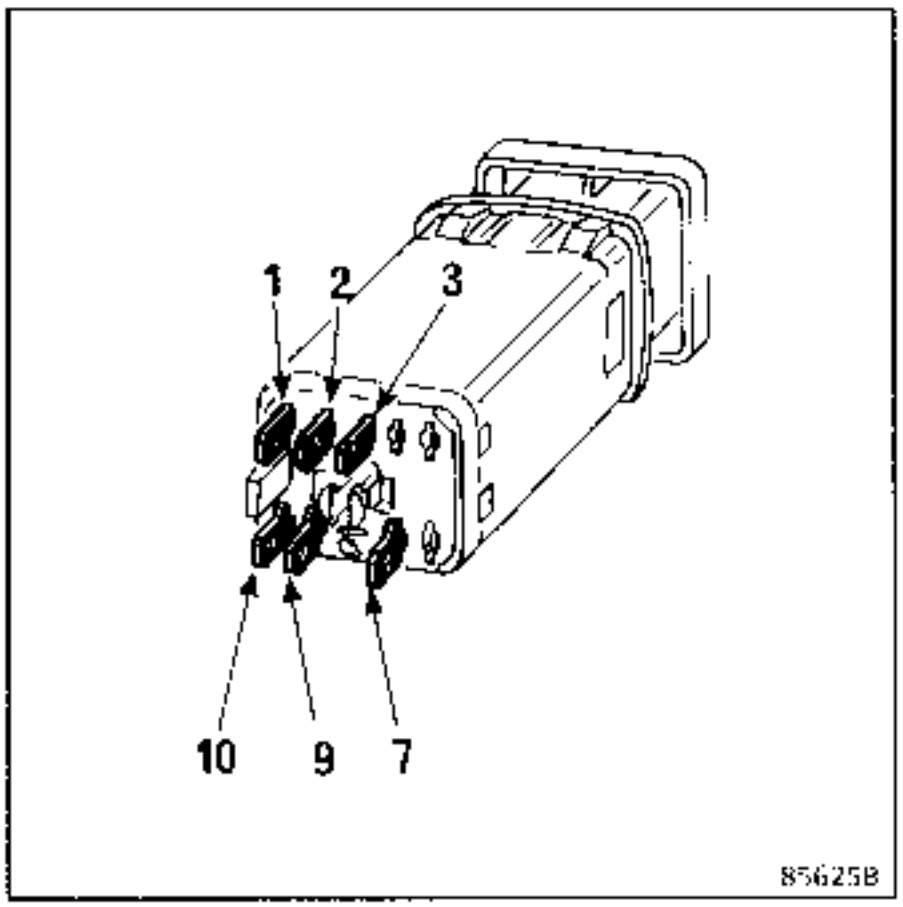
(2nd arrangement)



CONNECTIONS

1 Warning light
2 Screen relay –
3 + after ignition
4 Earth
5 Lighting +

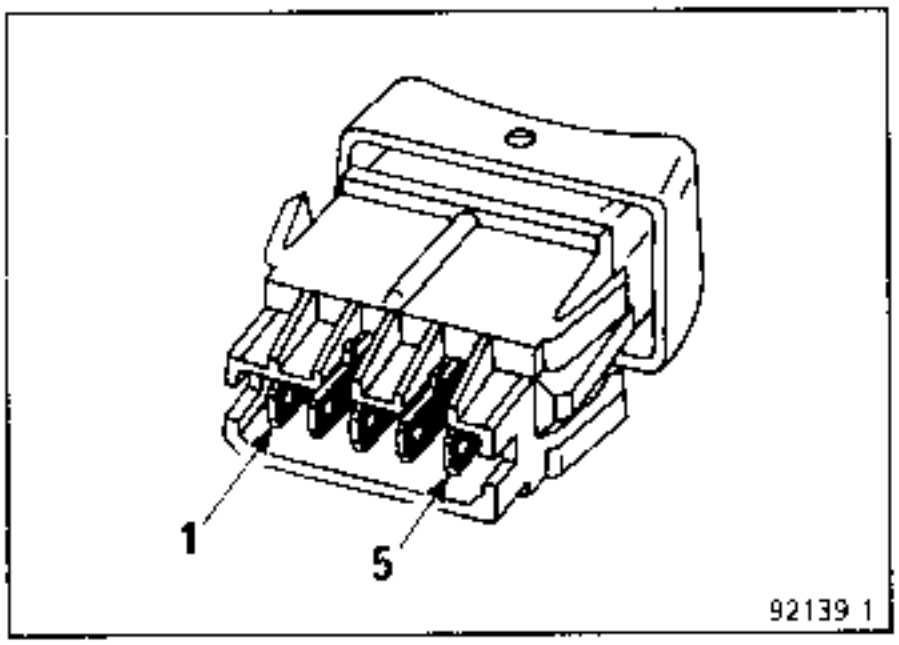
REAR FOG LIGHTS
(1st arrangement)



CONNECTIONS

1 To fog light fuse
2 Supply
3 Lighting
7 Earth
9 Not used
10 Warning light

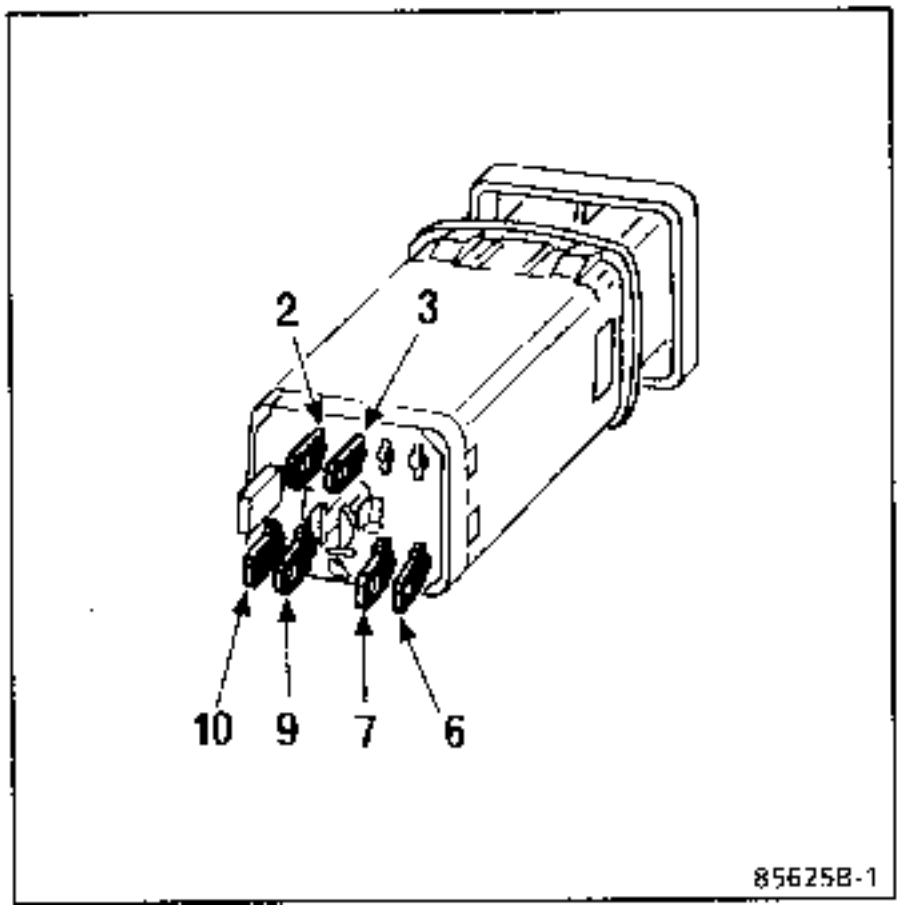
REAR FOG LIGHTS
(2nd arrangement)



CONNECTIONS

1 Warning light
2 Rear fog light -
3 Rear fog light +
4 Lighting +
5 Earth

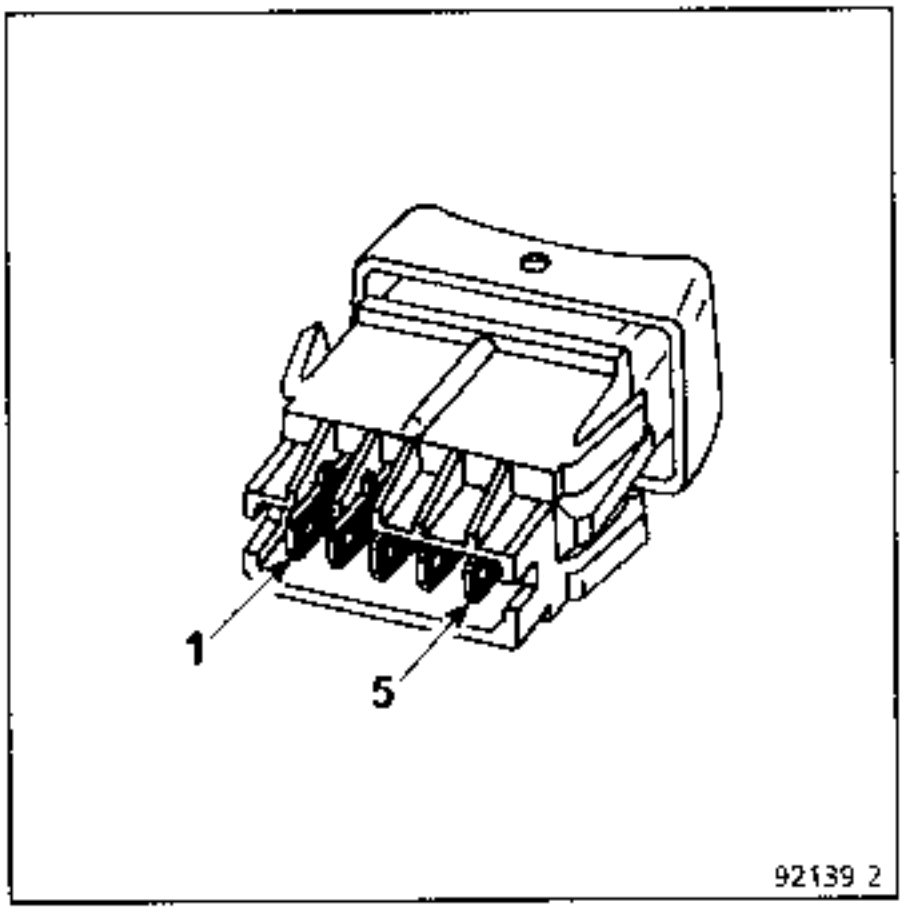
FRONT FOG LIGHTS
(1st arrangement)



CONNECTIONS

2 Supply
3 Lighting
6 Not used
7 Earth
9 Relay energising
10 Warning light

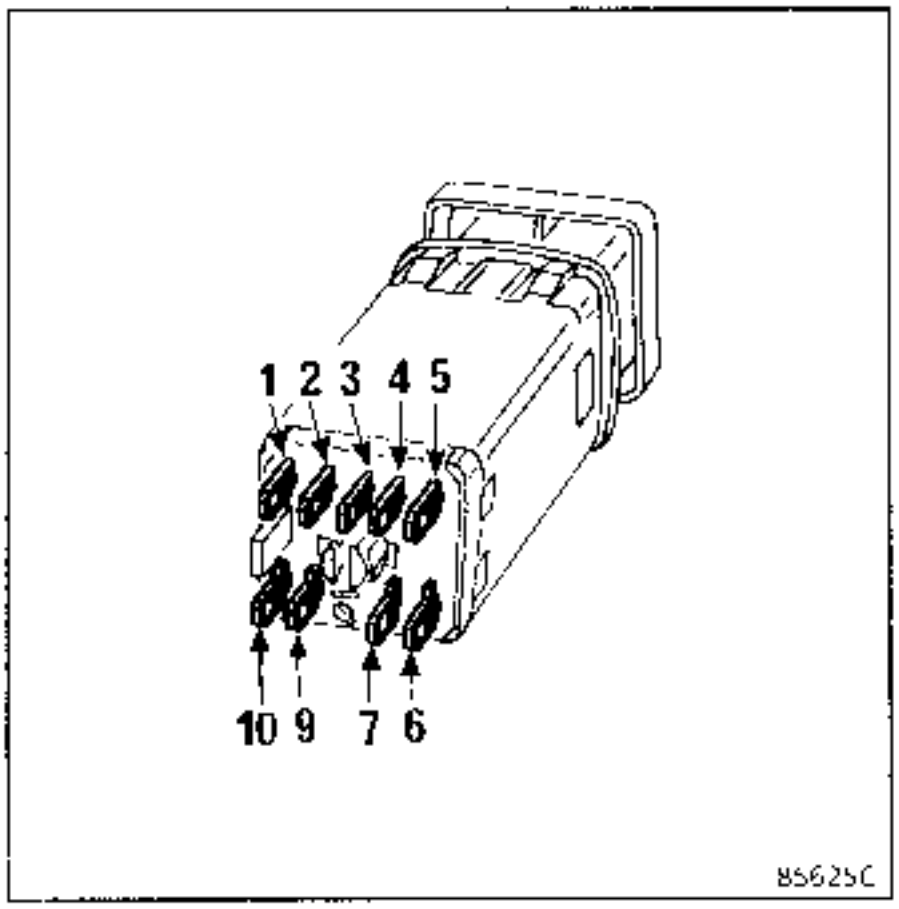
(2nd arrangement)



CONNECTIONS

1 Not used
2 Front fog light +
3 Lighting +
4 Lighting +
5 Earth

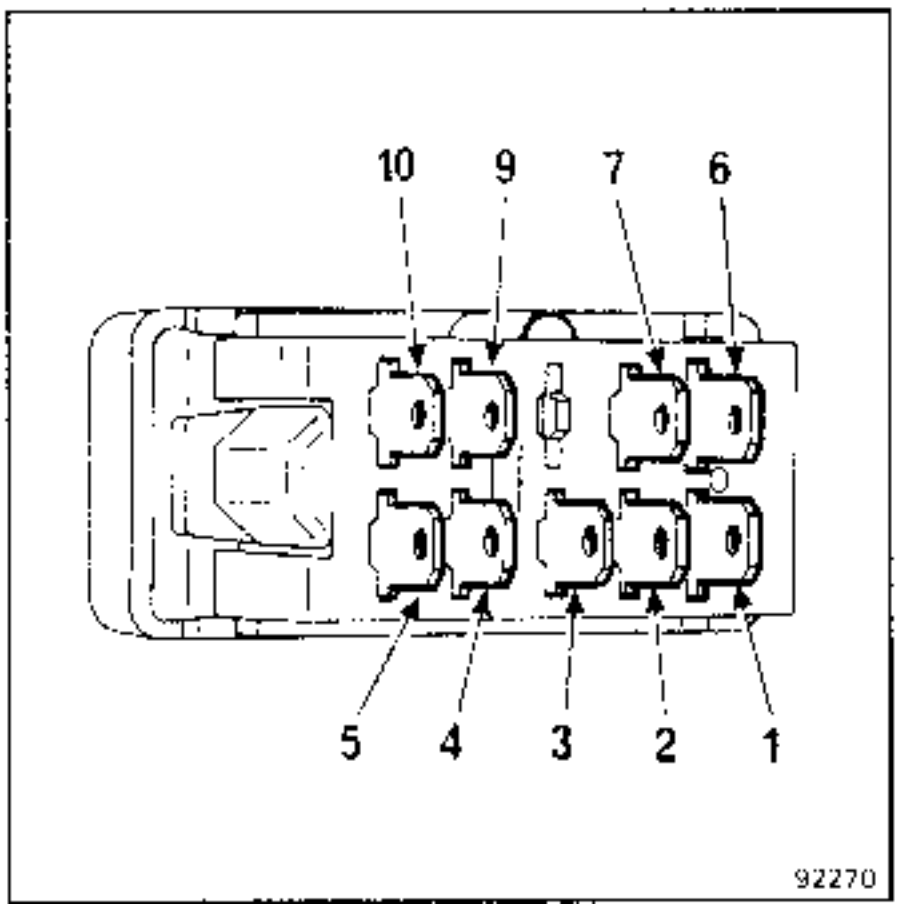
HAZARD WARNING LIGHTS
(1st arrangement)



CONNECTIONS

1 RH direction indicator
2 LH direction indicator
3 Lighting
4 + before ignition
5 + after ignition
6 Flasher unit + (fuse)
7 Earth
9 Direction indicator control switch
10 Warning light

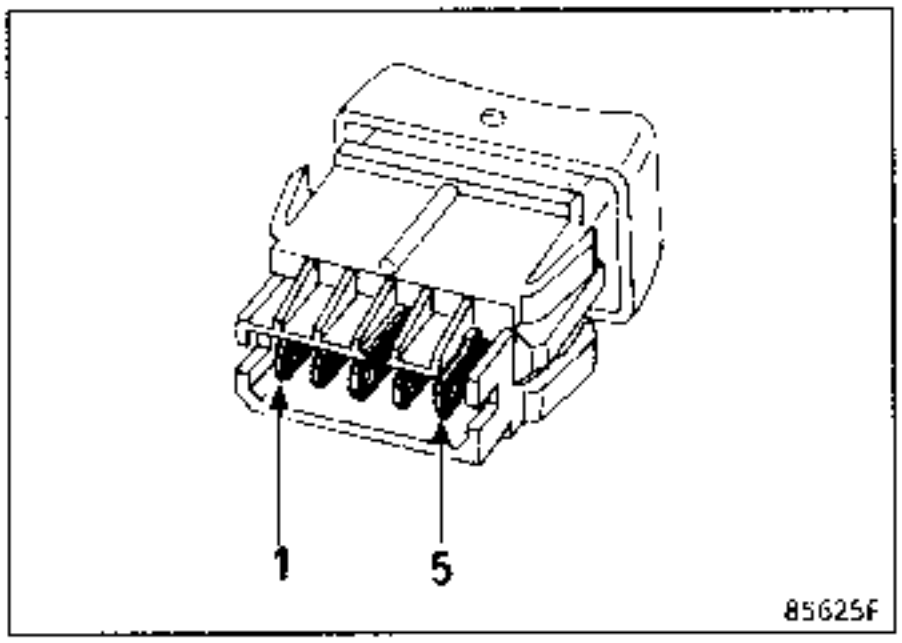
(2nd arrangement)



CONNECTIONS

1 Lighting +
2 + after ignition
3 + before ignition
4 Flasher unit
5 LH direction indicator
6 RH direction indicator
7 Hazard warning light repeater
9 Direction indicator fuse +
10 Earth

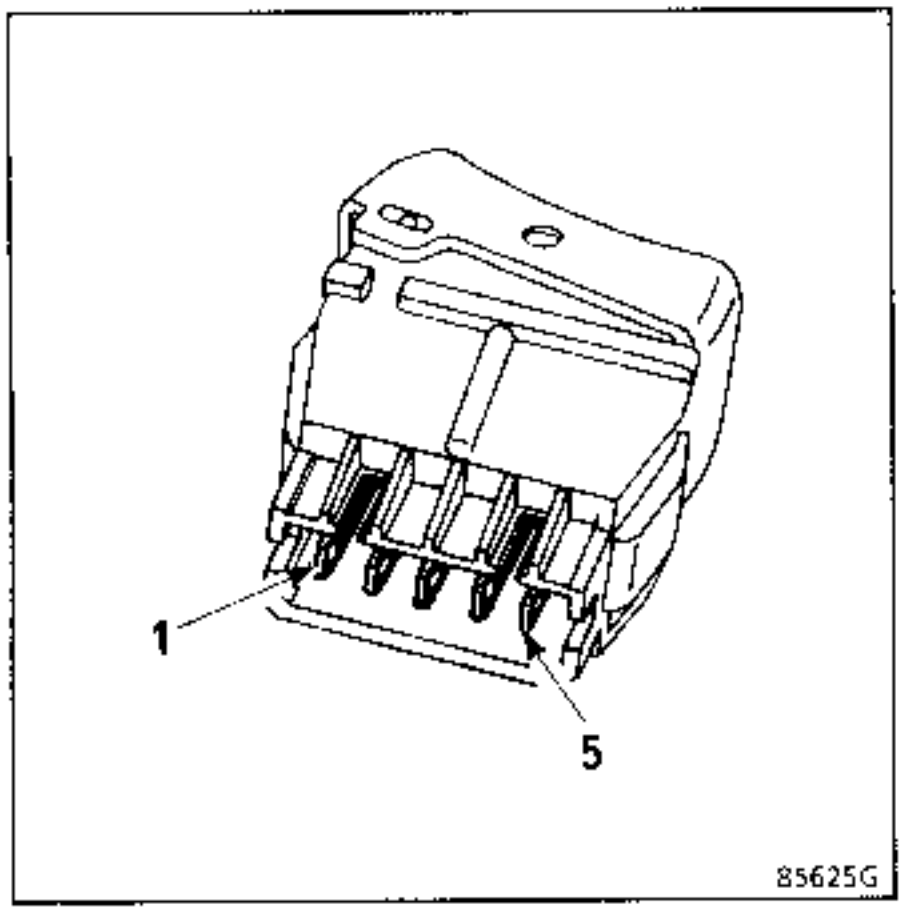
DOOR LOCKS
(1st and 2nd arrangements)



CONNECTIONS

1 Lock doors
2 Lighting +
3 + before ignition
4 Earth
5 Unlock doors

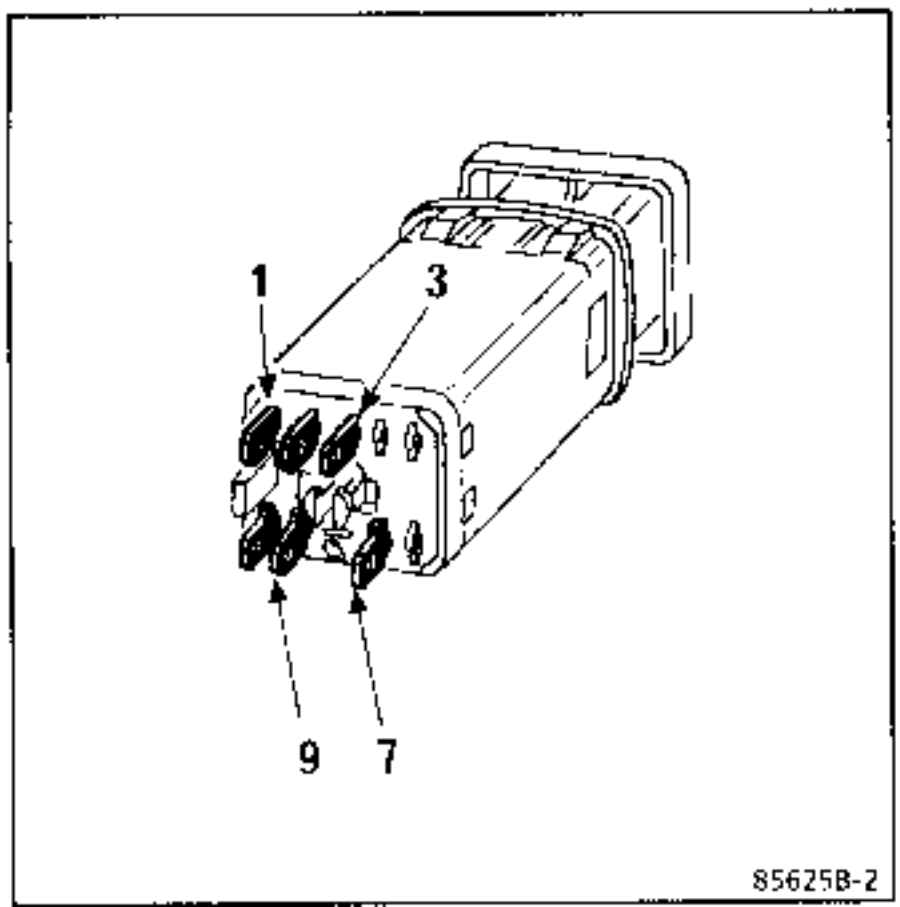
WINDOW RISER LOCKING SWITCH



CONNECTIONS

1 Not used
2 To passenger switch lock (earth)
3 Earth
4 Lighting earth
5 Lighting

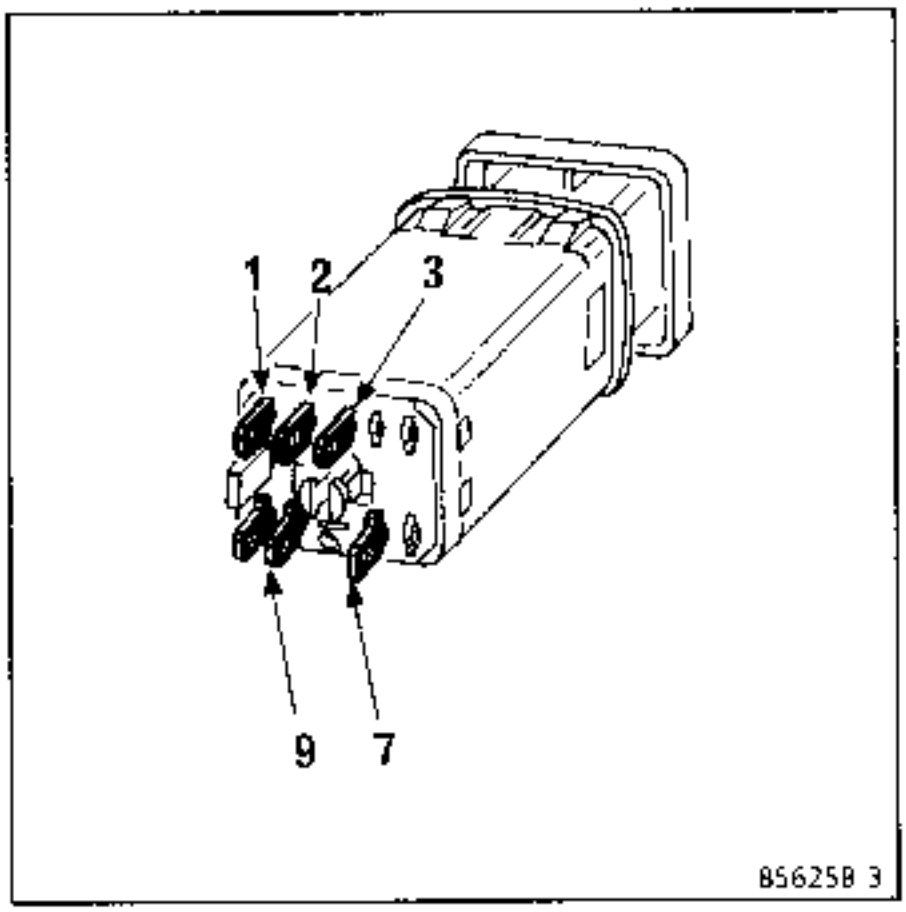
REAR SCREEN WIPER SWITCH
(1st arrangement)



CONNECTIONS

1 Timed sweep
3 Lighting
7 Earth
9 After ignition

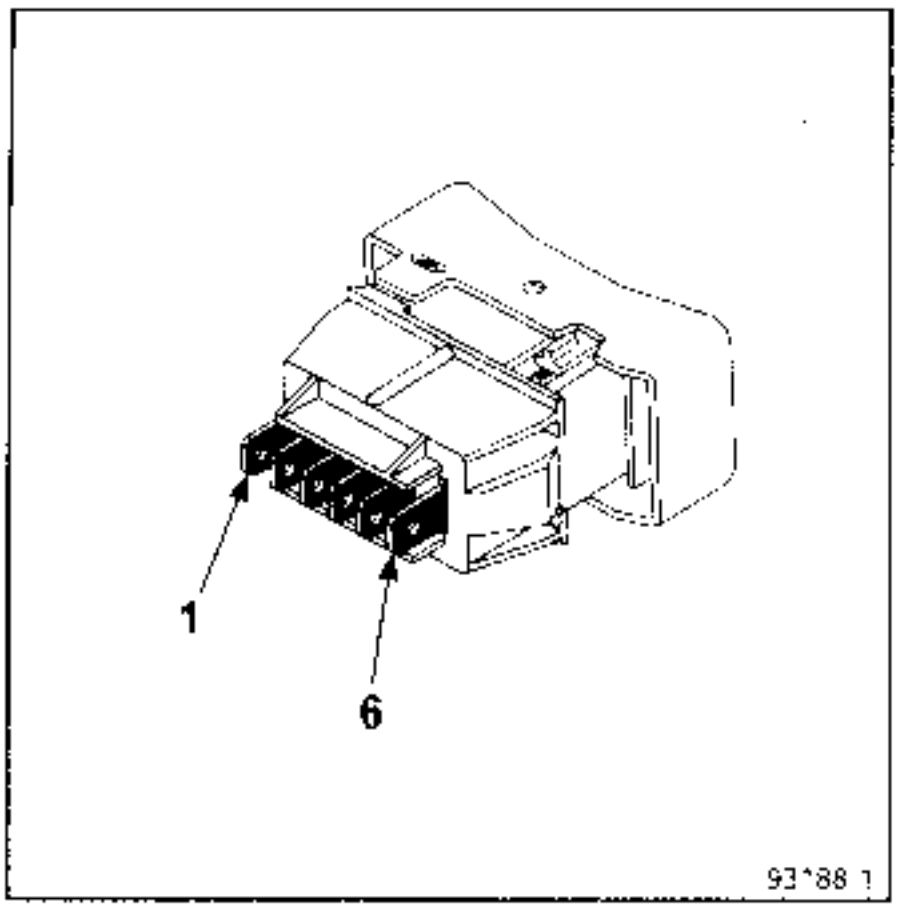
SCREEN WASHER SWITCH



CONNECTIONS

1 To pin 10 on screen wiper switches
2 Washer pump +
3 Lighting
7 Earth
9 + after ignition

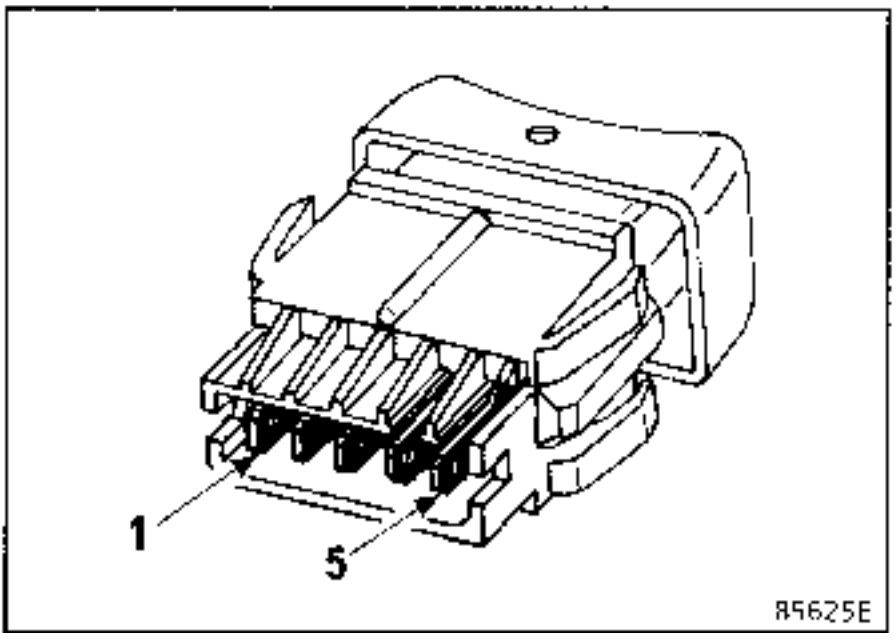
REAR SCREEN WASHER SWITCH
(2nd arrangement)



CONNECTIONS

1 Washer pump +
2 Wiper motor −
4 + after ignition
5 Lighting
6 Earth

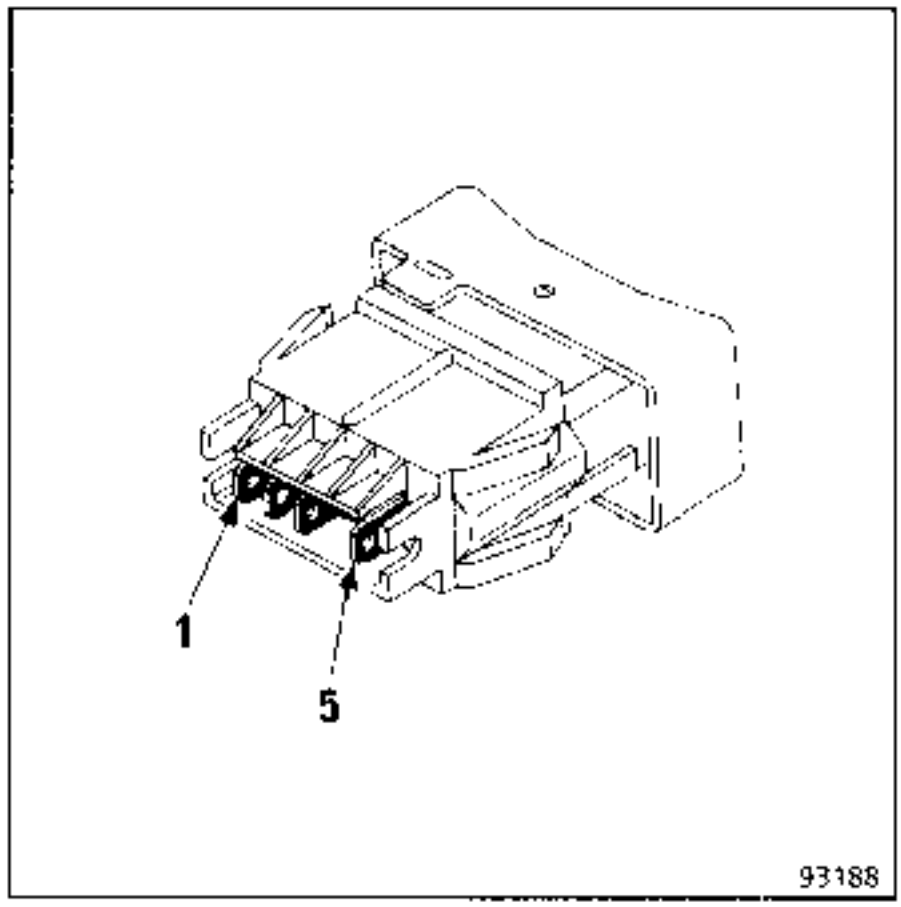
WINDOW RISER SWITCH
(1st arrangement)



CONNECTIONS

1 Motor
2 Earth
3 − after ignition
4 Lighting +
5 Motor

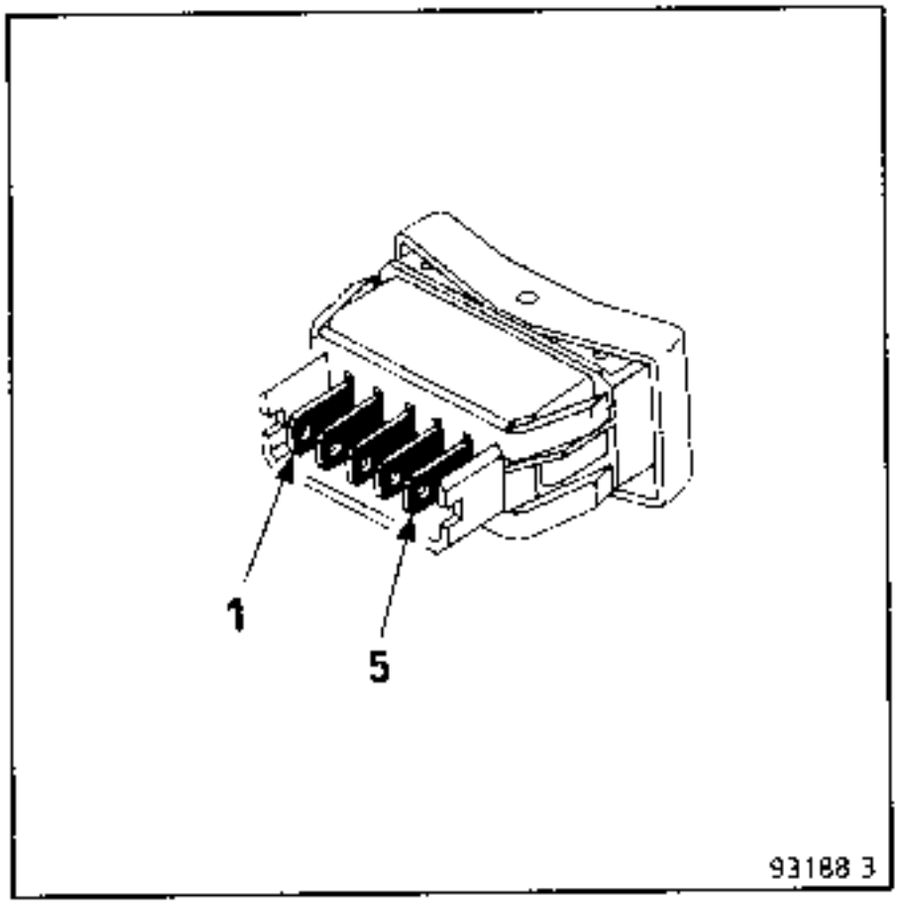
VOICE SYNTHESISER SWITCH



CONNECTIONS

1 Synthesiser
2 Lighting +
3 Synthesiser
5 Earth

REAR WINDOW RISER SWITCH

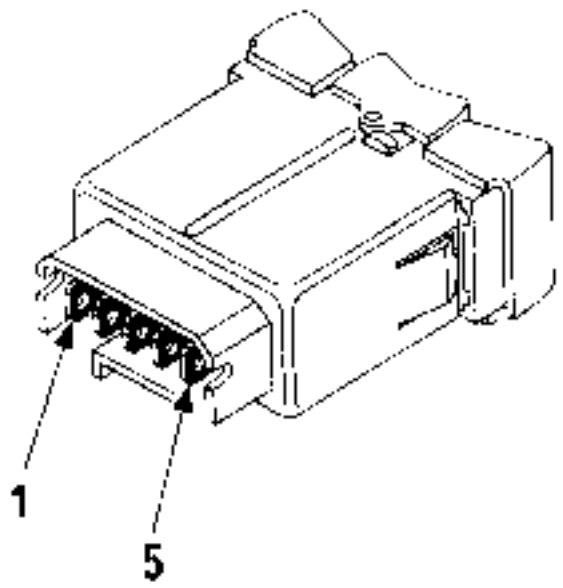


CONNECTIONS

1 Motor
2 Earth
3 + after ignition
4 Lighting +
5 Motor

WINDOW RISER (ONE-TOUCH) SWITCH
(2nd arrangement)

NOTE : The one-touch unit is an integral part of the switch.

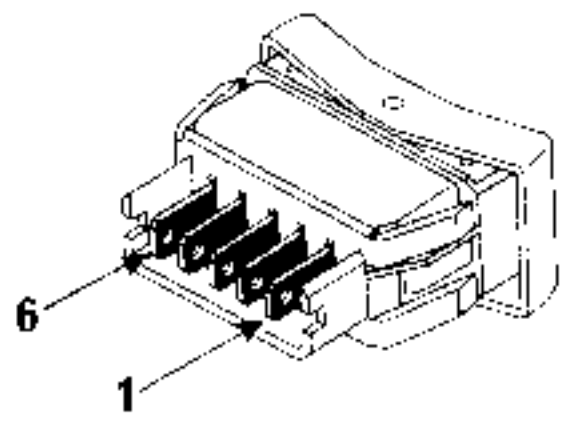


93188-7

CONNECTIONS

1 Motor
2 Earth
3 + after ignition
4 Lighting +
5 Motor

PASSENGER SIDE WINDOW RISER SWITCH
(2nd arrangement)



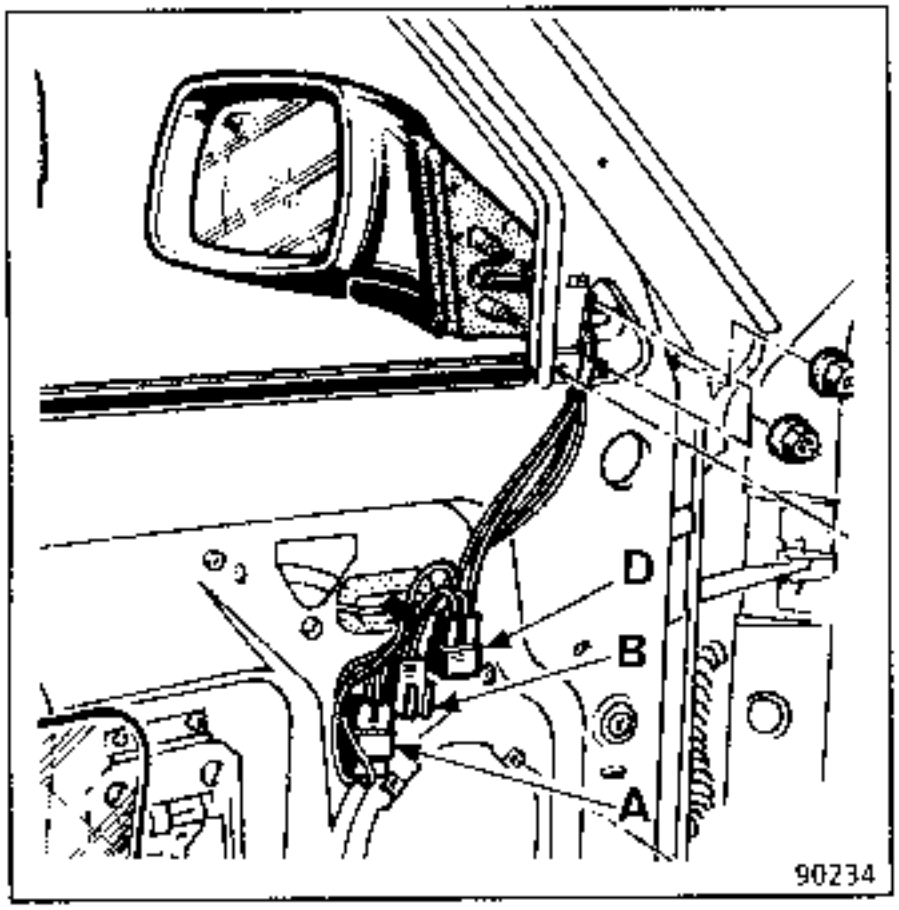
93188 4

CONNECTIONS

1 Lighting +
2 Motor
3 + after ignition or earth
4 + after ignition
5 + after ignition or earth
6 Motor

NOTE : It is possible to raise and lower the windows with the ignition off and the front doors open.

REAR VIEW MIRROR CONTROL



CONNECTIONS

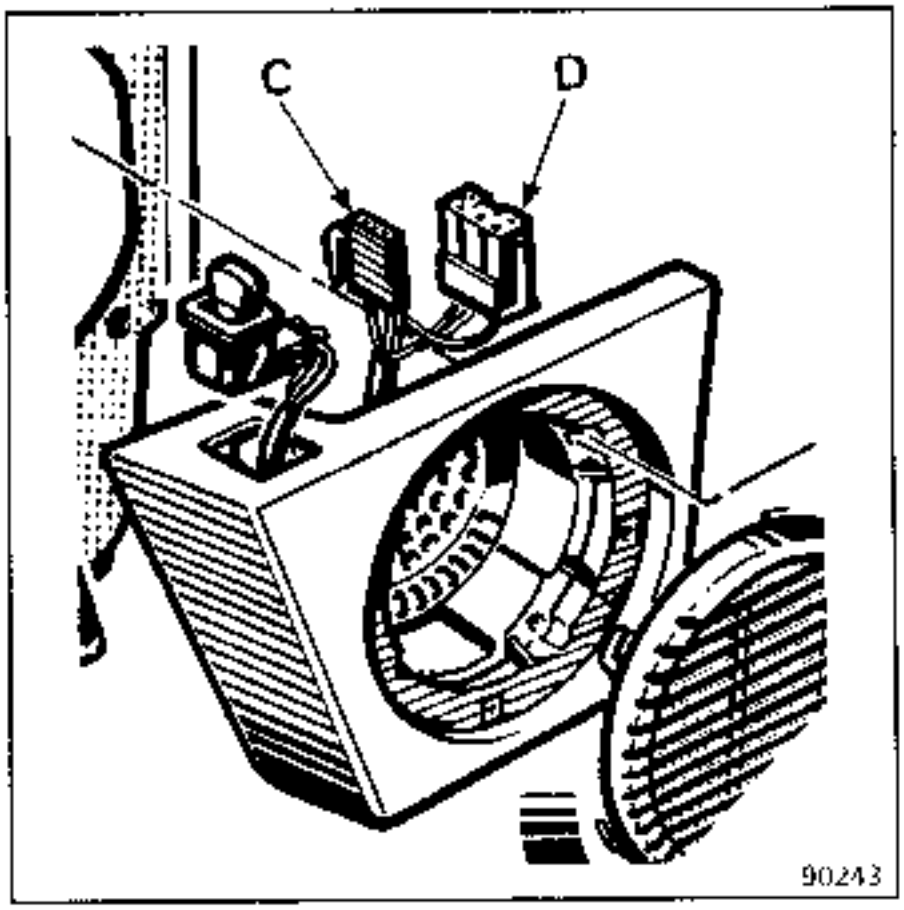
Connector **A** (white)

A1 Defrosting earth
A3 Temperature sensor

B2 + after ignition, defrosting
B3 Temperature sensor

Connector **B** (grey)

1 Rear view mirror common
2 Rear view mirror X
3 Rear view mirror Y



CONNECTIONS

Connector **C** (grey)

1 Rear view mirror, common
2 Rear view mirror adjustment, driver's side
3 Rear view mirror adjustment, passenger side

Connector **D** (black) 1st arrangement

A1 + before ignition
A3 Earth

B1 Passenger side rear view mirror, common
B2 Passenger side rear view mirror X
B3 Passenger side rear view mirror Y

Connector **D** (black) 2nd arrangement

A1 Passenger side rear view mirror adjustment
A2 + before ignition
A3 Passenger side rear view mirror adjustment

B1 Driver's side rear view mirror adjustment
B2 Driver's side rear view mirror adjustment
B3 Earth
B4 Rear view mirror, common

REMOVAL

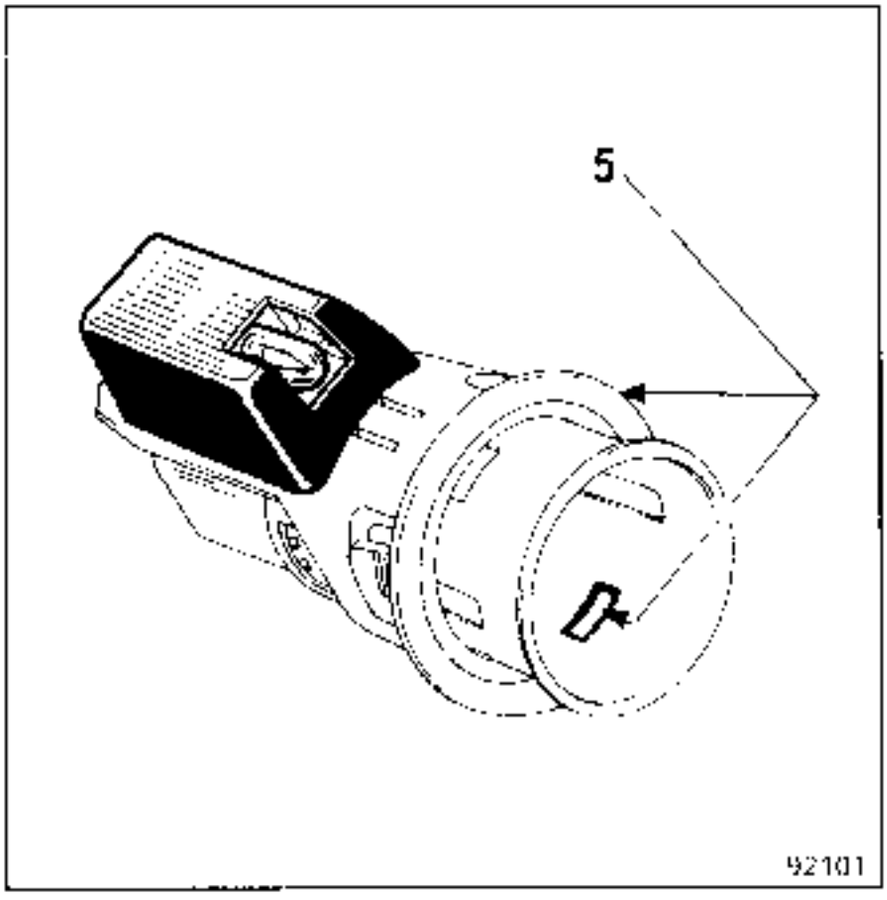
Disconnect the battery.

Remove the ash tray.

Remove the cigar lighter.

To remove the fixed part of the cigar lighter (metal section), push the back of its body whilst unclipping the two lugs (**5**).

Remove the connector.



Take out the plastic part by pushing the back of it

REMOVAL

Disconnect the battery.

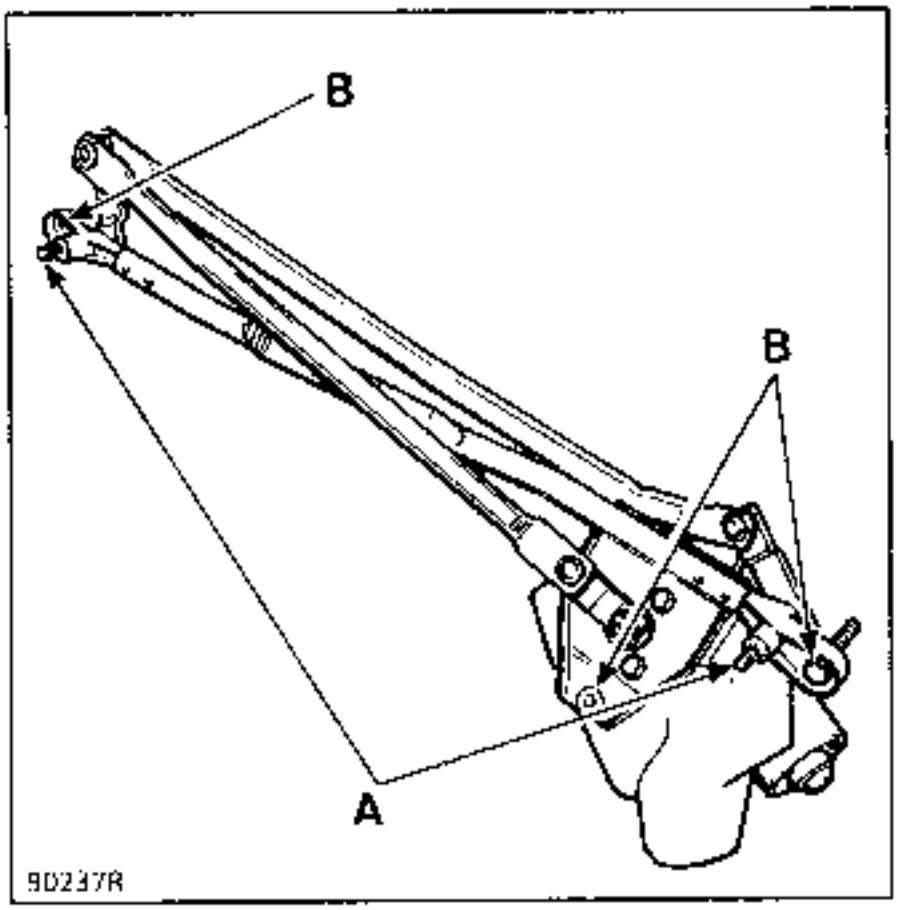
Remove the screws from the wiper arms.

Disengage the wiper arms from their shafts using tool **Elé. 1294-01** as mentioned in Technical Note number 1953.

Remove:
- the scuttle cross panel (7 screws),
- the three nuts (B) securing the mechanism.

Disconnect the connector.

Take out the mechanism.



REFITTING

Refit the mechanism and reconnect the connector.

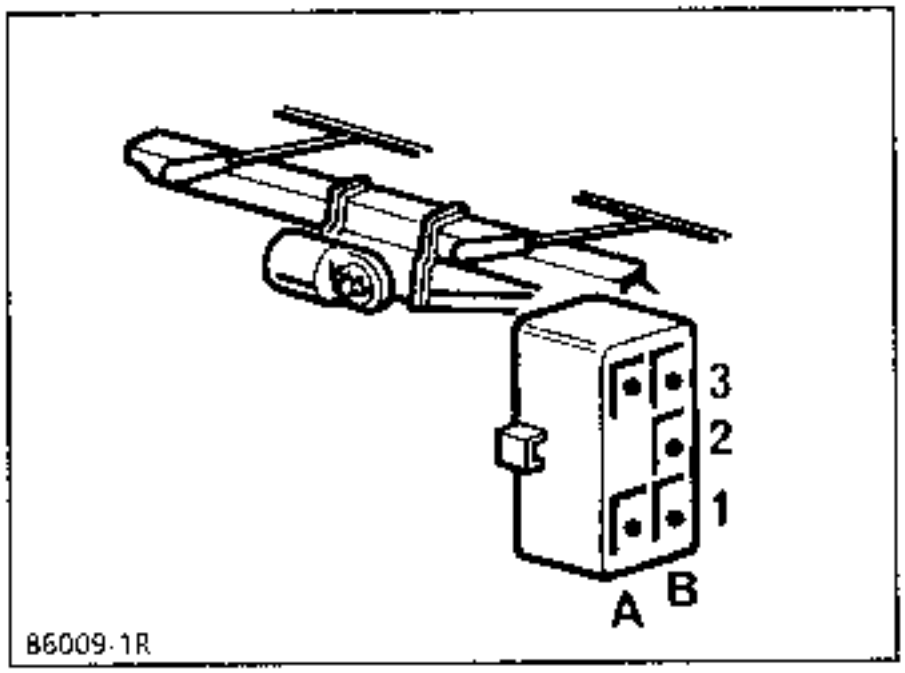
Check that the motor is correctly in the "park" position before refitting the wiper arms.

Clean the grooves on the wiper arm shafts using a metal brush.

Refit the wiper arms.

Fit the new screws and torque tighten them to 2 daN.m (± 15 %) using a torque wrench.

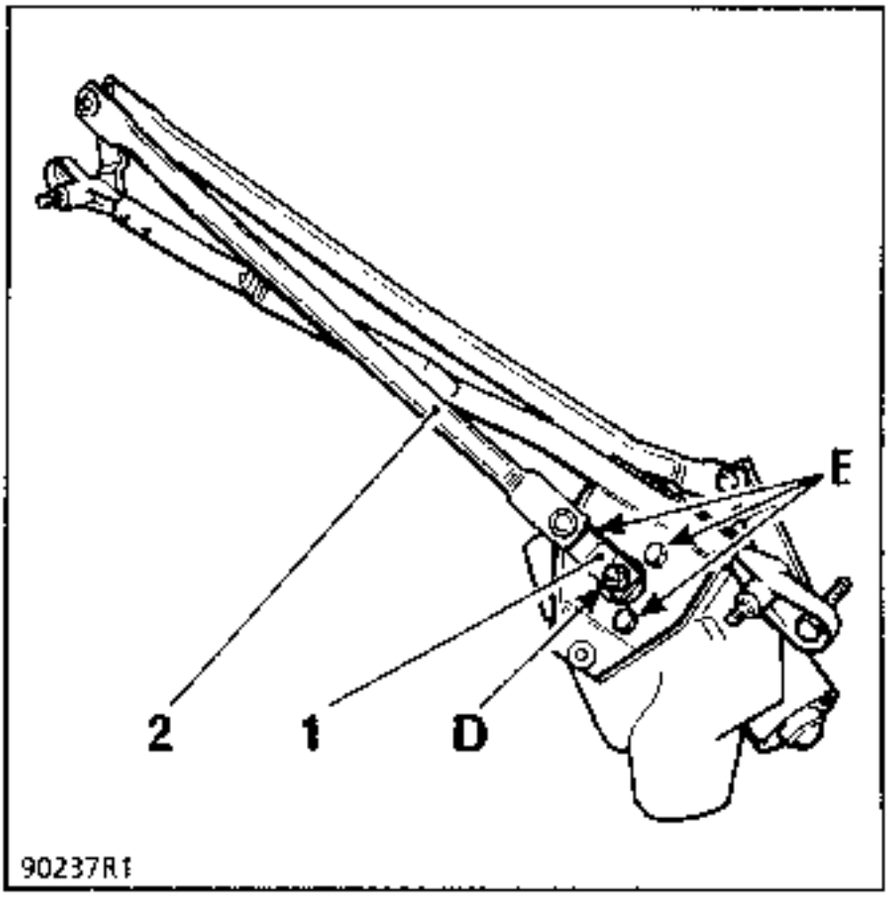
CONNECTIONS



A1 Fast speed
A3 Earth

B1 Low speed
B2 "Park" +
B3 "Park"

REMOVING THE MOTOR (mechanism removed)



Unscrew securing nut (D) which secures the drive link (1).

Remove the three screws (E) which secure the motor in place and remove the motor.

When refitting, ensure that links (1) and (2) are correctly aligned when the motor is in the park position.

REMOVAL

Disconnect the battery.

Remove:
- the wiper arm securing nut,
- the wiper arm from its shaft using special tool **Elé. 1294**.

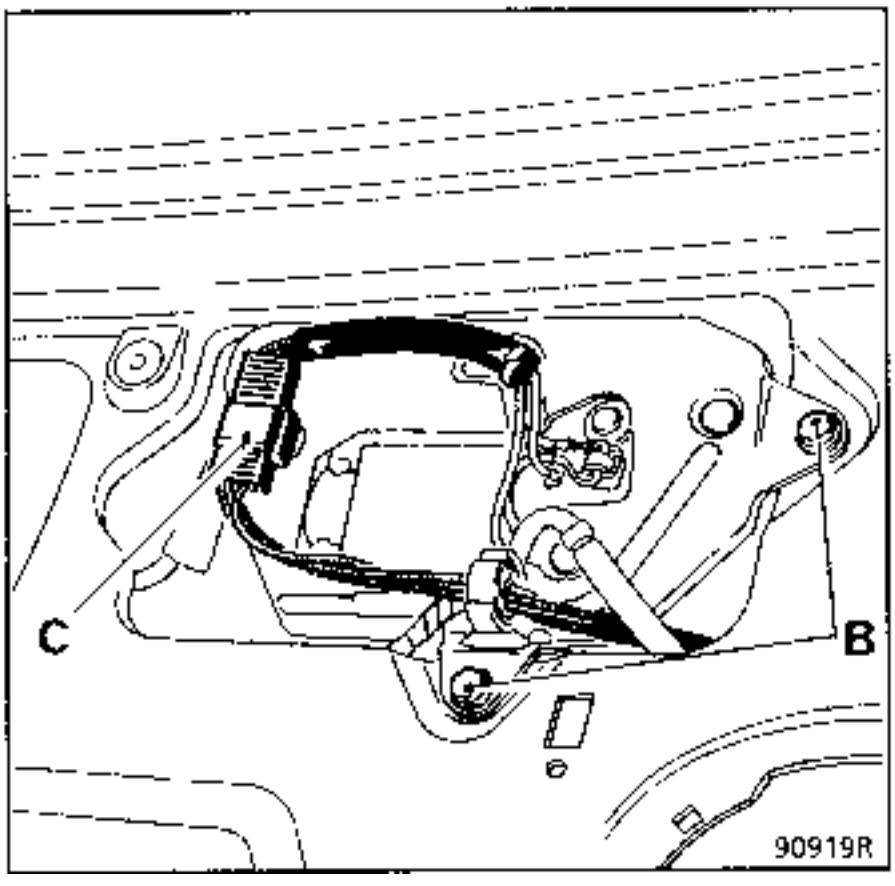
From the inside :

Remove the interior tailgate trim.

Remove the connector (locking tab C).

Take out the 2 screws (B).

Remove the motor.



REFITTING

When refitting, ensure that the motor is in the fixed park position before refitting the wiper arm.

Torque tighten the new nut to 2 daN.m (± 10 %).

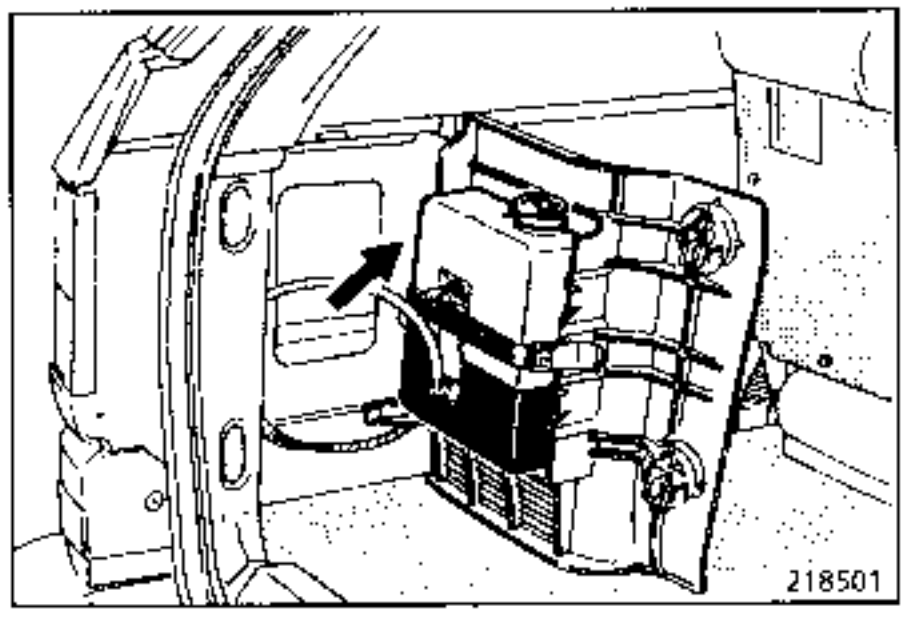
NOTE : The motor will only operate when the tailgate is closed.

CONNECTIONS

Pin	Description
1	Wiper +
2	Fixed park +
3	Earth

REAR SCREEN WIPER TIMER

The rear screen wiper timer is located behind the lefthand side panel trim, near the rear washer bottle.



REMOVAL

Disconnect the battery.

Remove:
- the wiper arm securing nut,
- the wiper arm from its shaft using special tool **Elé. 1294.**

From the inside :

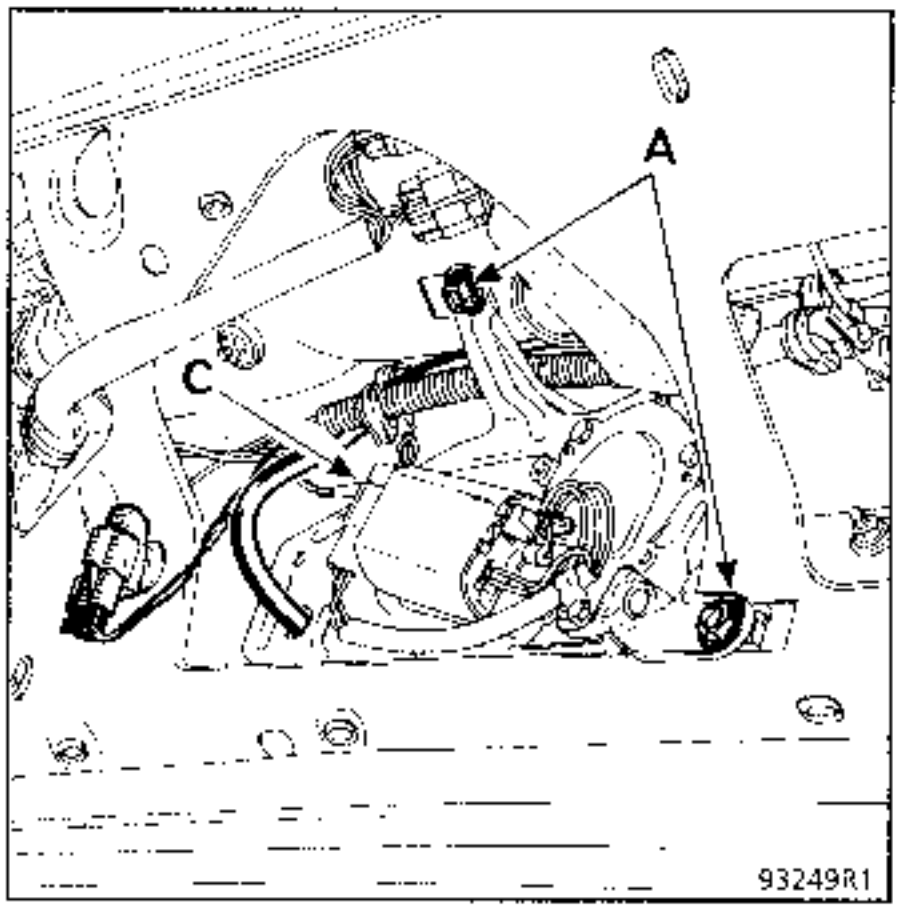
Remove the interior tailgate trim.

Remove the connector (locking tab C).

Take out the 2 screws (A).

Disconnect the washer jet pipe.

Remove the motor.



REFITTING

When refitting, ensure that the motor is in the fixed park position before refitting the wiper arm.

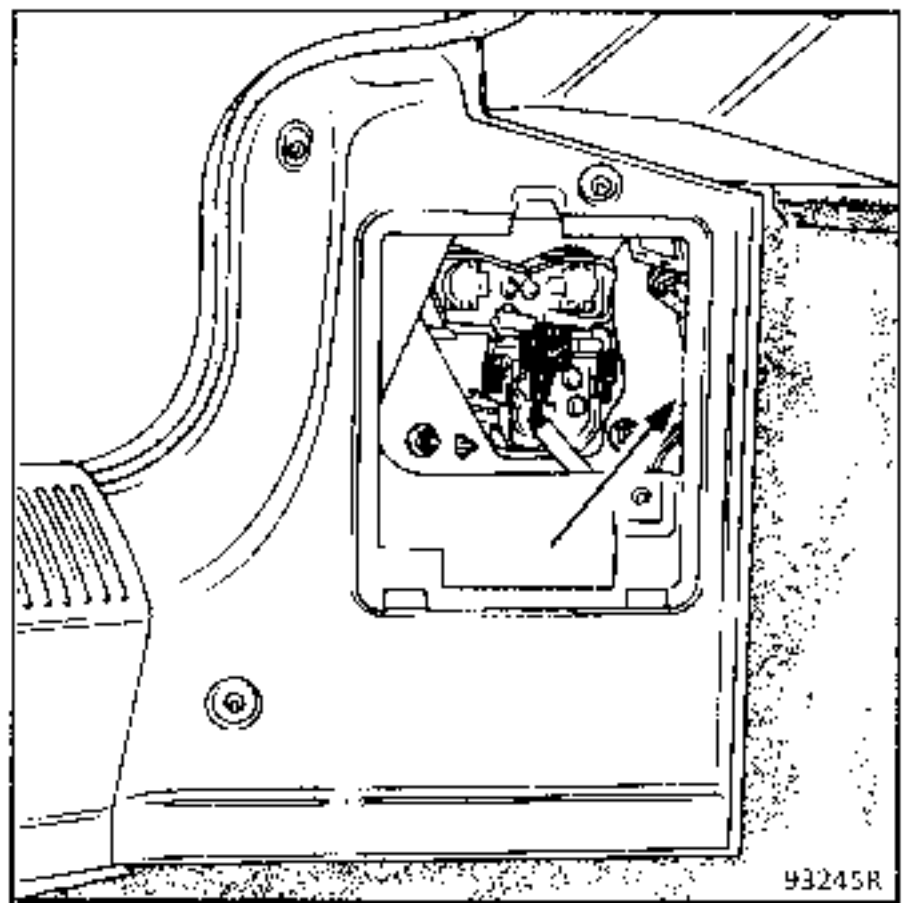
Torque tighten the new nut to 2 daN.m (± 10 %).

CONNECTIONS

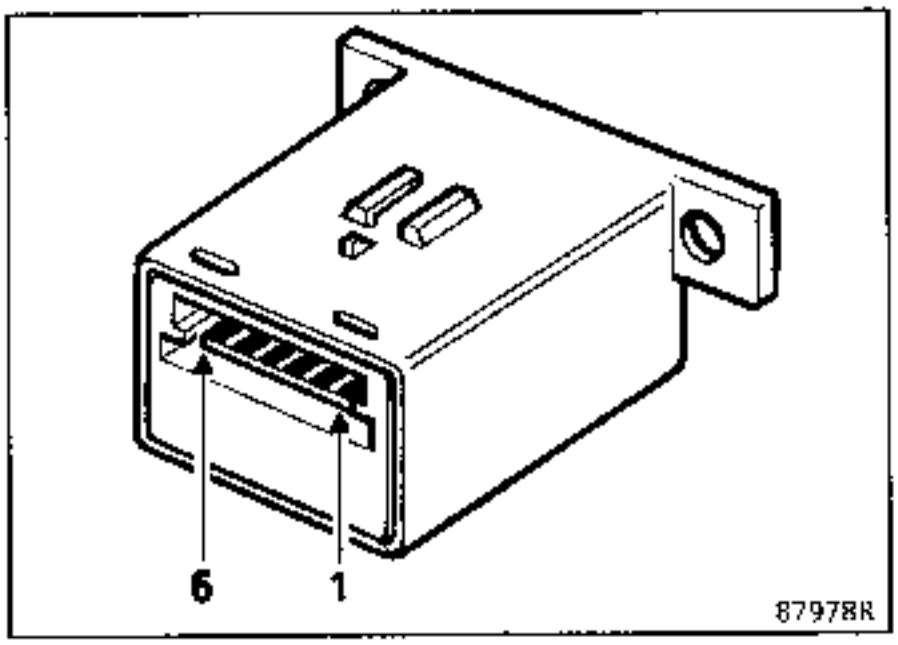
Pin	Description
1	Wiper +
2	Fixed park +
3	Earth

REAR SCREEN WIPER TIMER

The rear screen wiper timer is located behind the lefthand side panel trim, near the rear washer bottle.



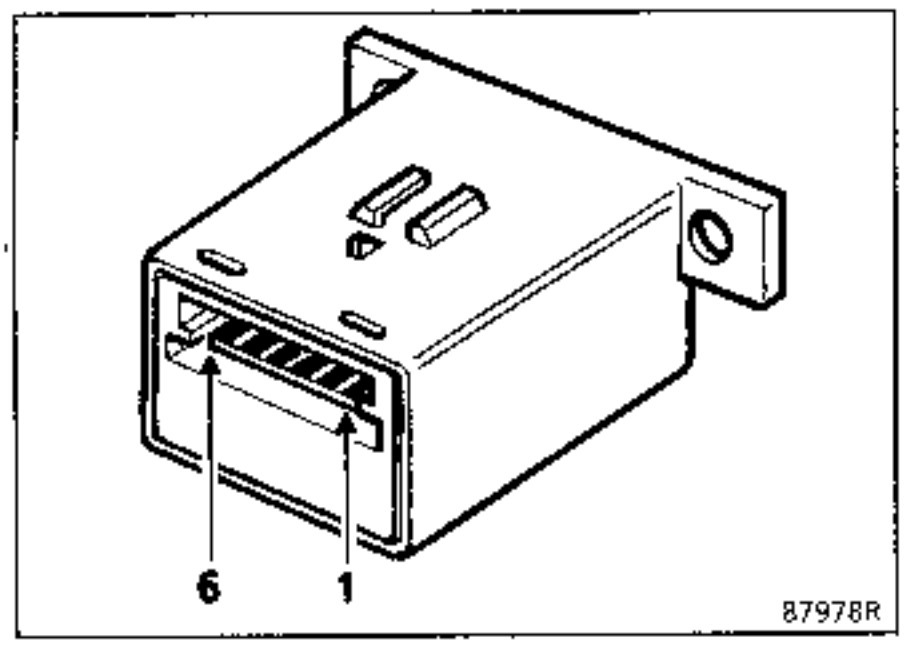
WINDSCREEN WIPER SWEEP TIMER



CONNECTIONS

Pin	Description
1	Earth
2	Washer pump +
3	Sweep timer control
4	Wiper fixed park
5	+ after ignition
6	Sweep timing signal to motor

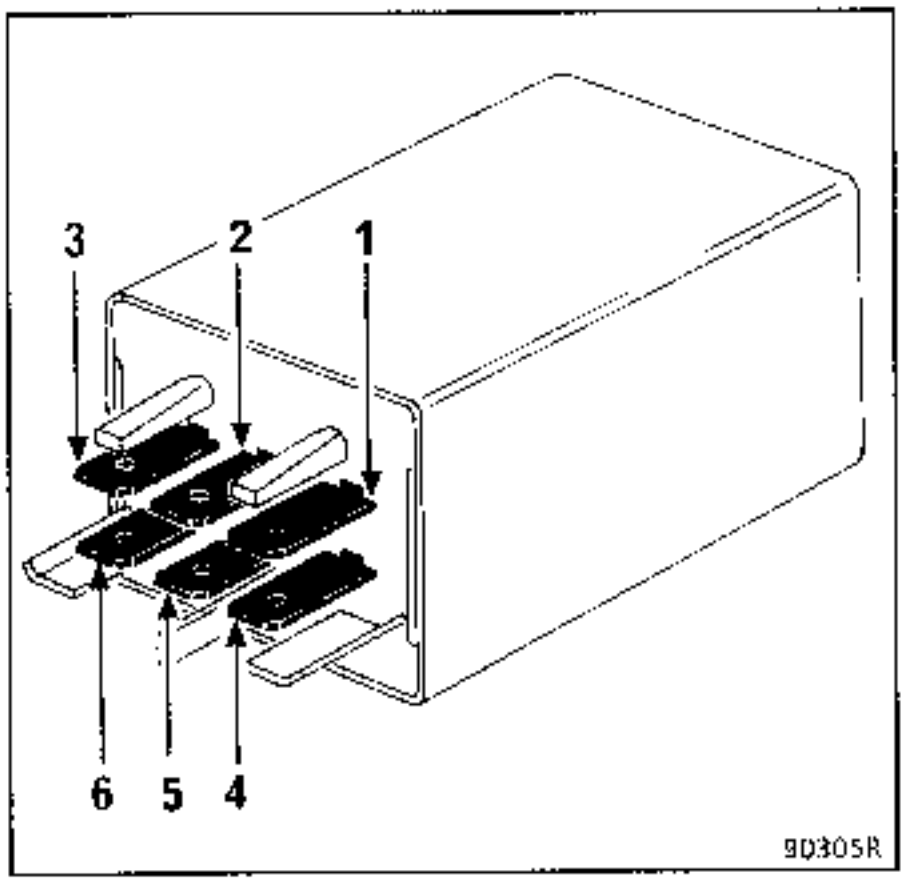
REAR SCREEN WIPER TIMER



CONNECTIONS

Pin	Description
1	Earth
2	Washer pump +
3	Sweep timer control
4	Earth
5	+ after ignition
6	Sweep timing signal to motor

DOOR LOCK RELAY TIMER



Timer delay : **3 seconds** ± 1

CONNECTIONS

Pin	Description
1	Doors locked control
2	Timer earth
3	Doors opened control
4	CPE* motor closed supply
5	+ before ignition
6	CPE* motor open supply

*CPE : ELECTRIC DOOR LOCKS

NOTE : On vehicles fitted with an engine immobiliser system, this timer is incorporated in the decoder unit.

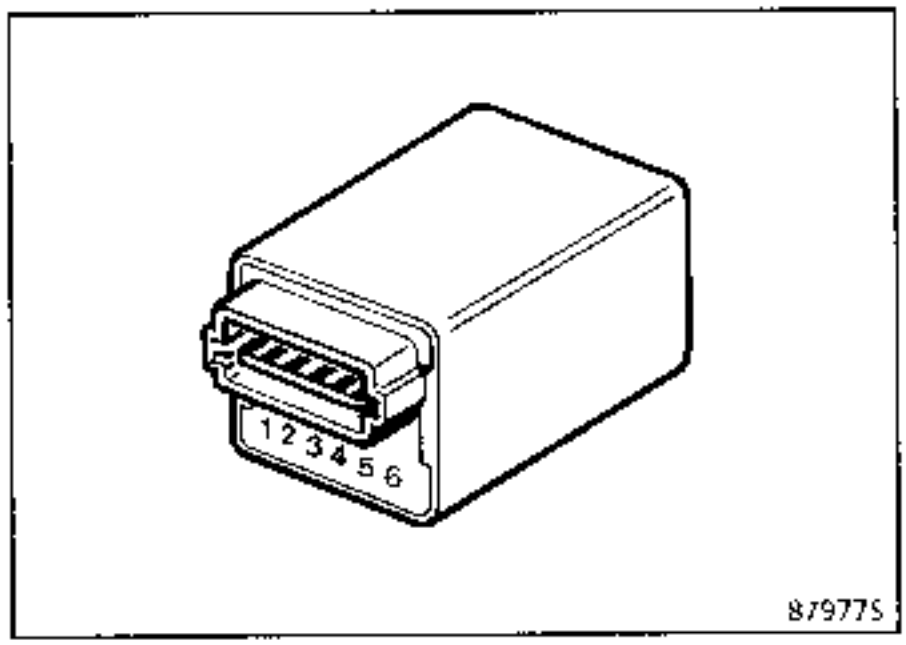
This timer is located :

B48
Near the lefthand rear light.

L48
Under the rear parcel shelf on the lefthand side.

K48
Behind the interior boot trim on the lefthand side.

INTERIOR LIGHTING TIMER



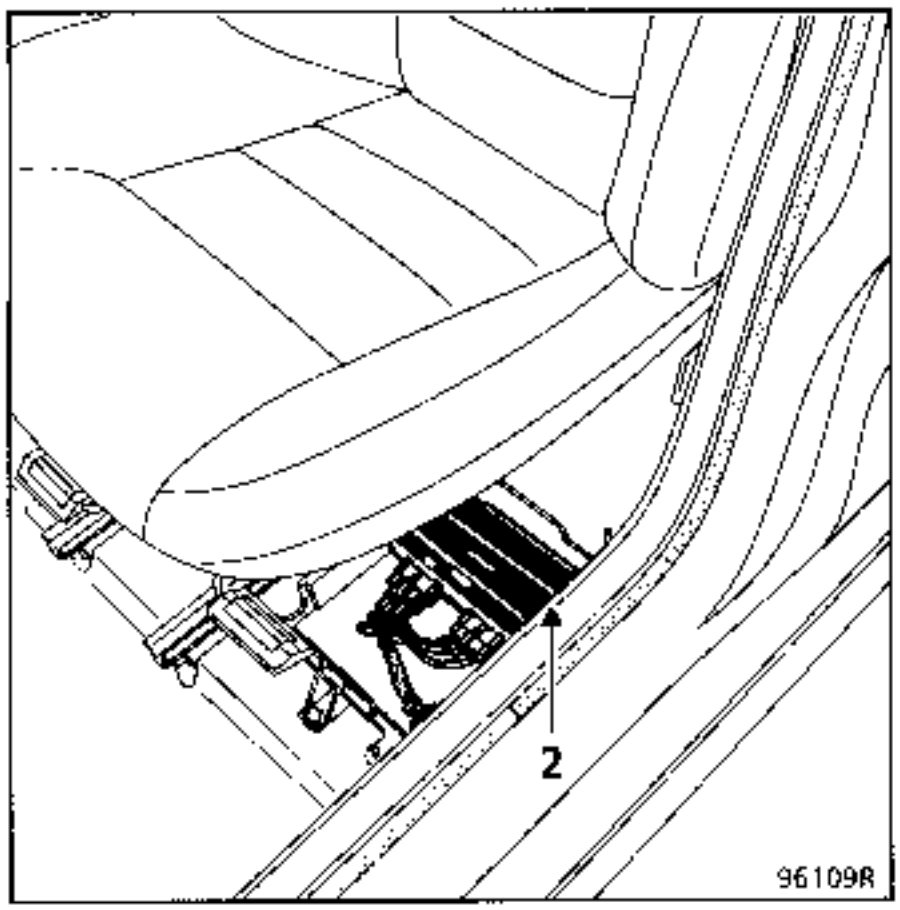
CONNECTIONS

Pin	Description
1	– before ignition
2	Interior lighting, common (earth)
3	Earth
4	Not used
5	Interior lighting switch
6	Infra-red remote control

NOTE : On vehicles fitted with an engine immobiliser system, the timer is incorporated in the decoder unit.

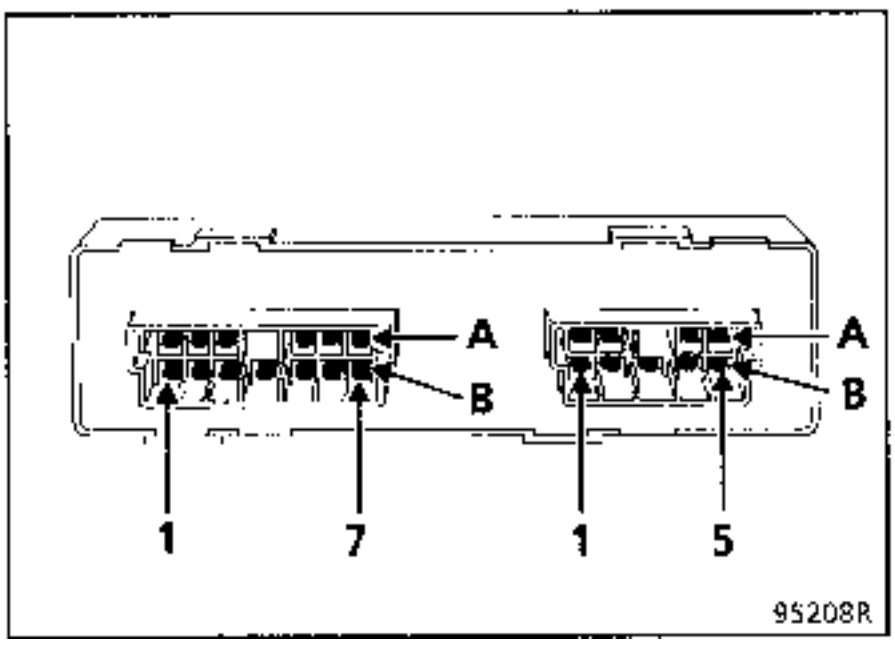
The following functions are integrate in the unit :
- door locking timer,
- infra-red code,
- interior lighting timer
- engine immobiliser system.

It is located underneath the driver's seat.



WARNING : For replacement of the decoder unit, refer to Section 82.

DECODER UNIT CONNECTIONS



13 pin connector

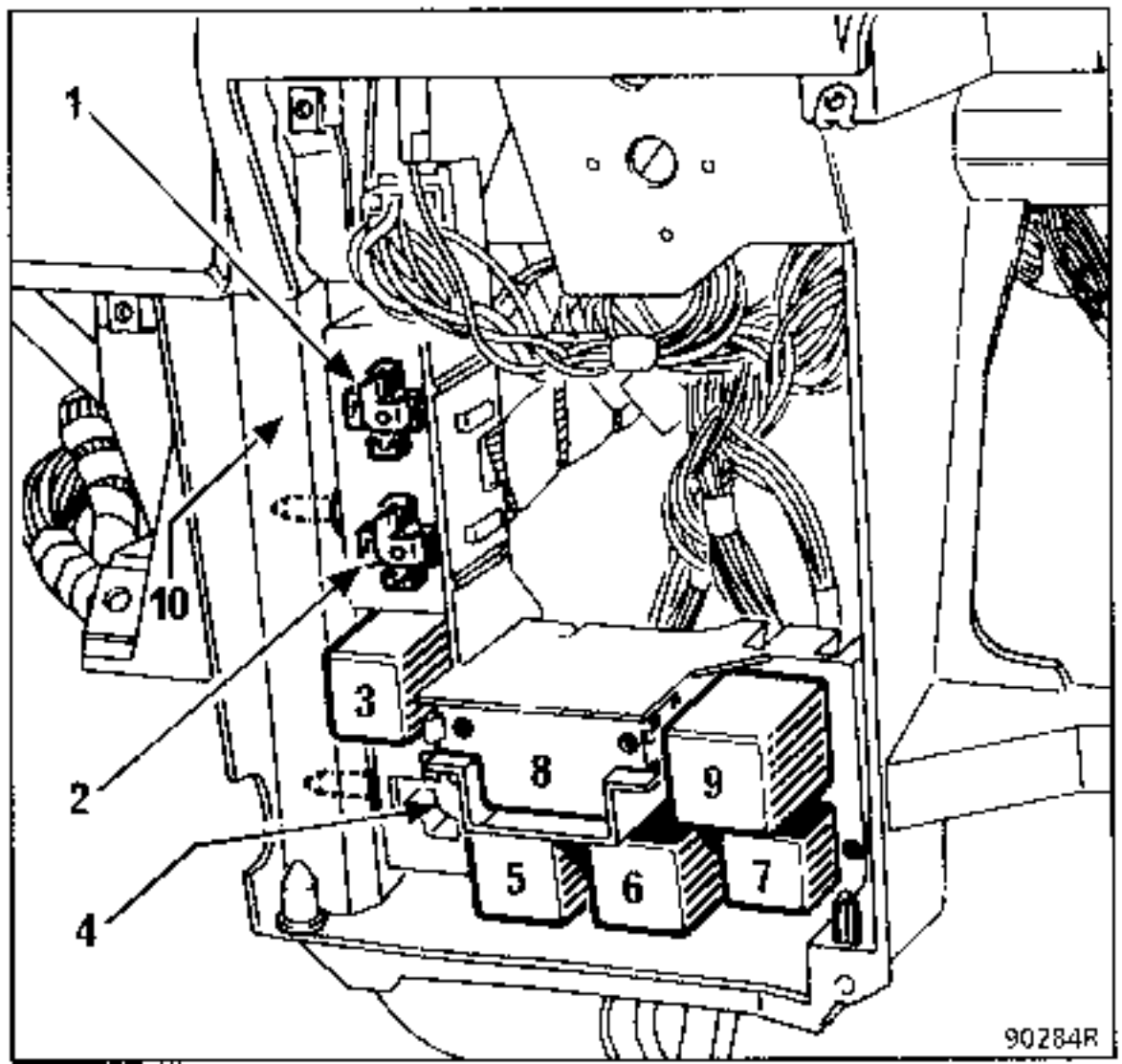
Pin	Description
A1	Infra-red entry
A2	Infra-red receiver supply
A3	Not used
A5	Coded signal to injection computer Unlocking signal to alarm
A6	Locking signal to alarm
A7	Door unlocking signal
B1	Door locking signal
B2	+ after ignition
B3	Front LH door switch
B4	Front RH door switch
B5	Rear LH door switch
B6	Rear RH door switch
B7	

9 pin connector

Pin	Description
A1	+ before ignition
A2	Fault-finding line K (not used)
A4	Fault-finding line L (not used)
A5	Earth
B1	Not used
B2	Doors locking
B3	Interior lighting timer
B4	Doors unlocking
B5	+ after ignition

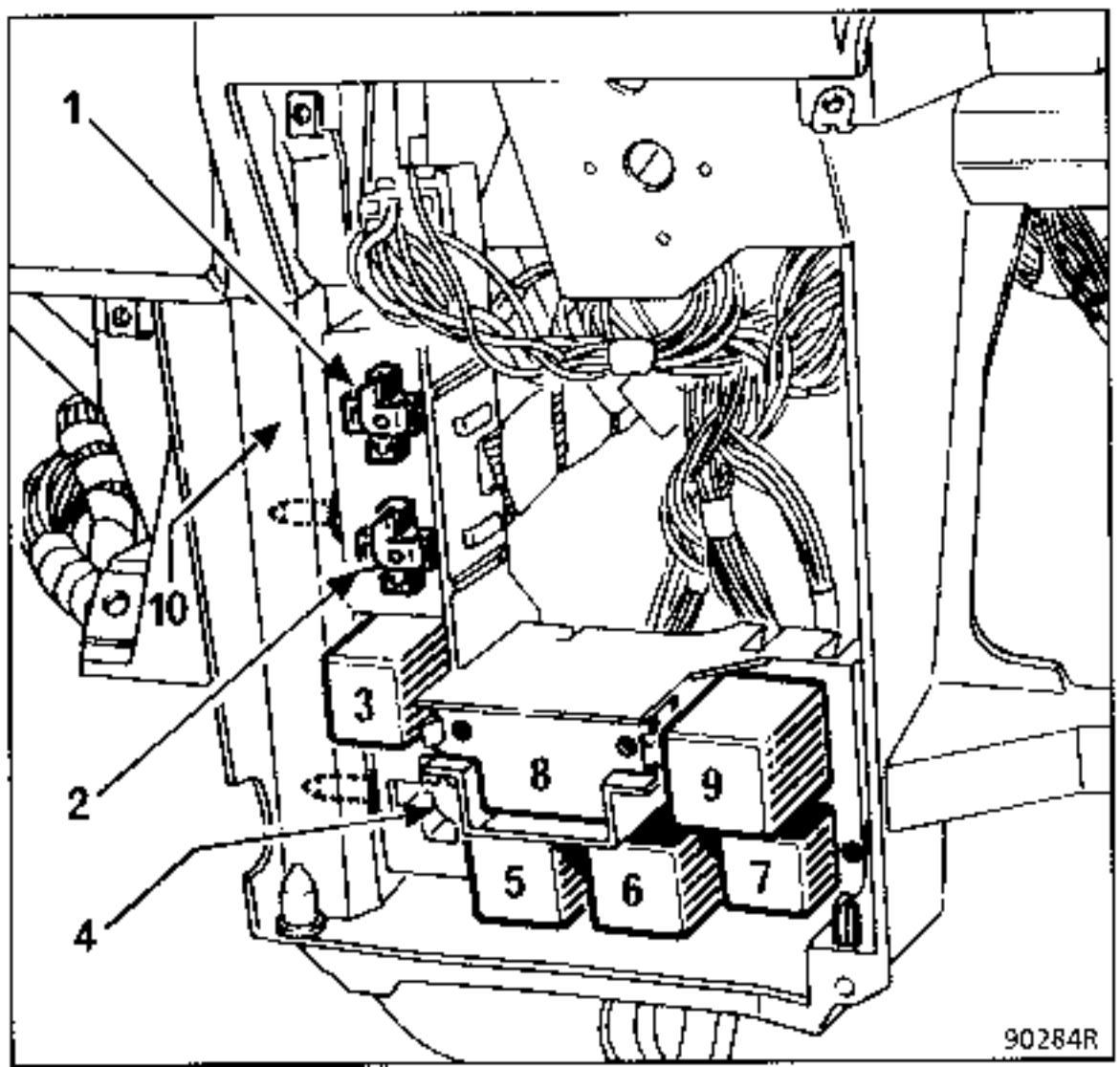
RELAY POSITIONS - 1st ARRANGEMENT

	Lefthand Drive	Righthand Drive	L485	Saudi Arabia
1	Rear fog light shunt	Rear fog light relay	Rear fog light shunt	Not used
2	Front fog light shunt	Not used	Front fog light shunt	Not used
3	Front fog light relay			Not used
4	Not used		Front righthand headlight relay	Heated rear screen relay
5	Flasher unit			
6	"Lights on" signal			
7	Heated rear screen relay			Over-speed relay
8	Screen wiper timer			
9	Electric door lock timer			



RELAY POSITIONS - 2nd ARRANGEMENT

	Lefthand Drive	Righthand Drive	Saudi Arabia
1	Front fog light shunt or electric window relay	Electric window relay	
2	Shunt or rear fog light relay	Rear fog light relay	Rear fog light shunt
3	Rear fog light relay		
4	Righthand headlight relay or heater control shunt	RH headlight relay	Over-speed relay
5	Flasher unit		
6	"Lights on" signal		
7	Heated rear screen relay		
8	Screen wiper timer		
9	Electric door lock timer		
10	Rheostat relay	-	



The rear screen element, which consists of a silk screen printed grid applied to the inside face of the glass, may be accidentally cut, and this renders the section concerned inoperative.

The exact point at which the break occurs can be determined using a voltmeter.

This type of damage can be repaired using heated rear screen repair varnish from SODICAM, Part n° 77 01 421 135 (2 g flask).

DETERMINING THE EXACT POINT OF THE BREAKAGE USING A VOLTMETER

Switch on the ignition.

Switch on the heated rear screen.

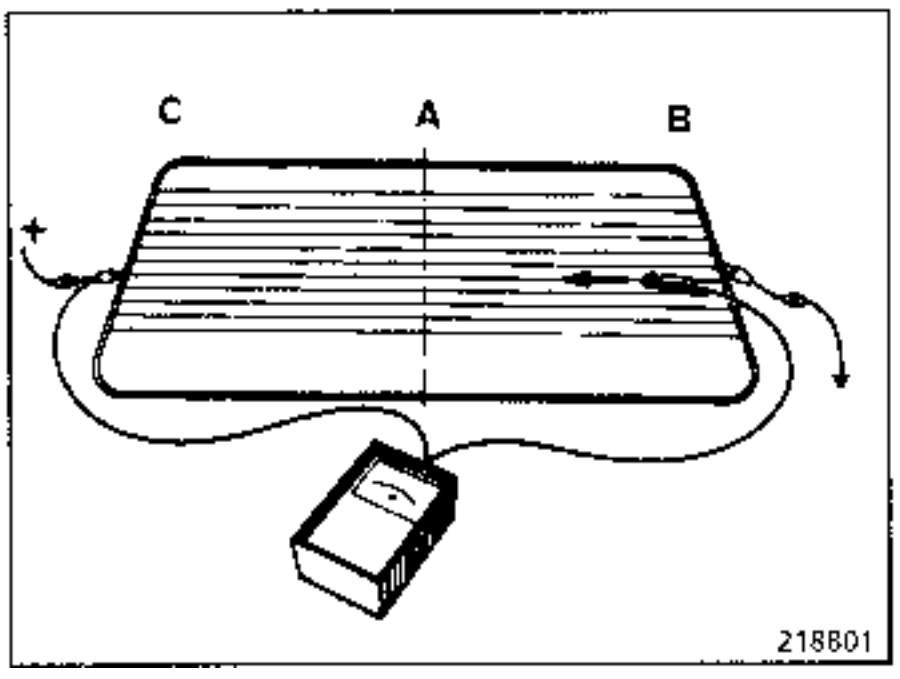
DETECTING BETWEEN LINES B AND A

Connect the + wire of the voltmeter to the + supply of the heated rear screen.

Apply the - probe of the voltmeter to one of the filaments on the - terminal side of the screen (line B). The voltage should be roughly the same as that at the battery terminals.

Move the - probe towards line A (see arrow) : the voltage should gradually fall.

If the voltage drops suddenly, the filament is broken at this point (carry out the check on each of the filaments).



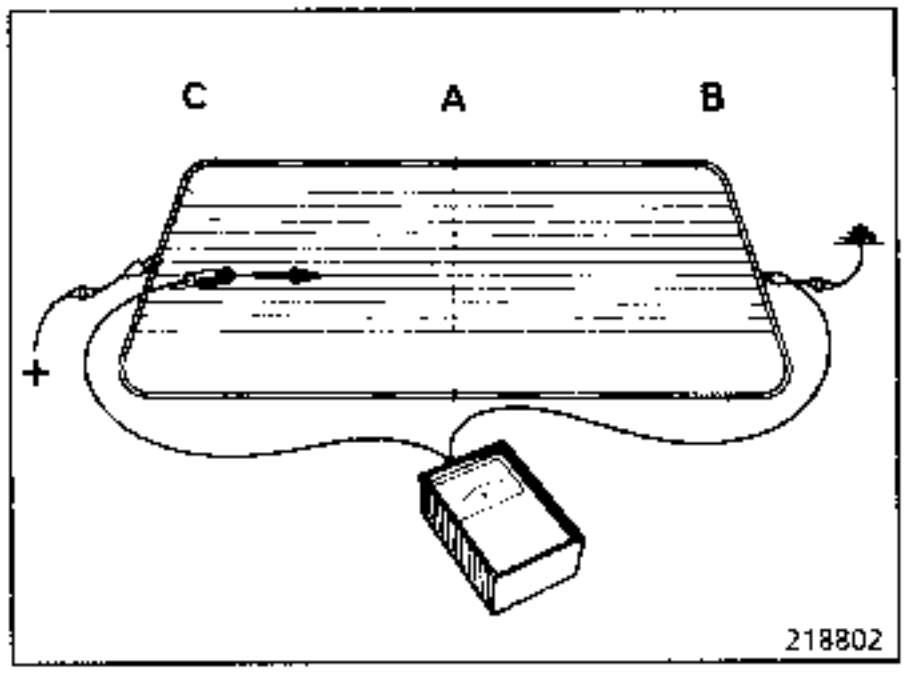
DETECTING BETWEEN LINES C AND A

Connect the - wire of the voltmeter to the - terminal of the heated rear screen.

Apply the − probe of the voltmeter to one of the filaments on the + side of the screen (line C). The voltage should be roughly the same as at the battery output.

Move the + probe towards line A (see arrow). The voltage should gradually fall.

If the voltage drops suddenly, the filament is broken at this point (carry out the check on each of the filaments).



REPAIRING A FILAMENT

Clean the area to be treated, locally, to remove all dust or grease, using, preferably alcohol or a glass cleaning product and wipe it with a clean, dry cloth.

To obtain an even repair, apply adhesive tape of the "Sellotape" type, either side of the section to be repaired, leaving the filament line uncovered.

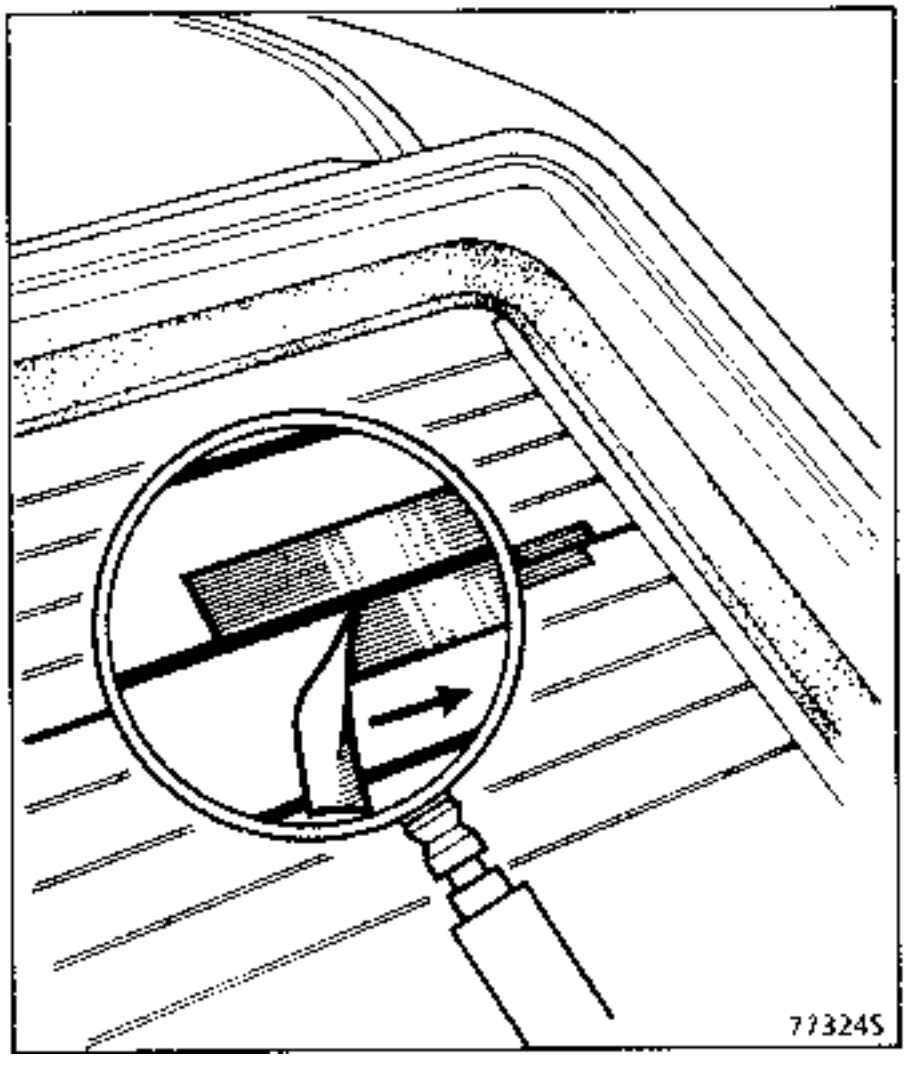
Before using the varnish, shake the flask to intermix any of the silver particles which may have settled to the bottom of the flask.

REPAIR (continued)

Using a small brush, apply a sufficient thickness of the varnish. If several coats have to be applied, leave the varnish to dry between each coat and do not apply more than three coats.

If, despite precautions, a run forms, it can be removed with a knife point or a razor blade, but only after having left the product for several hours to harden fully.

The adhesive tape used as a guide is not to be removed until approximately one hour after application. The tape is to be pulled off perpendicular to the filament, in the direction shown by the arrow. IF the varnish is applied at an ambient temperature of 20 °C , it will be fully dry in three hours. At temperatures lower than this, the drying time will be slightly longer.

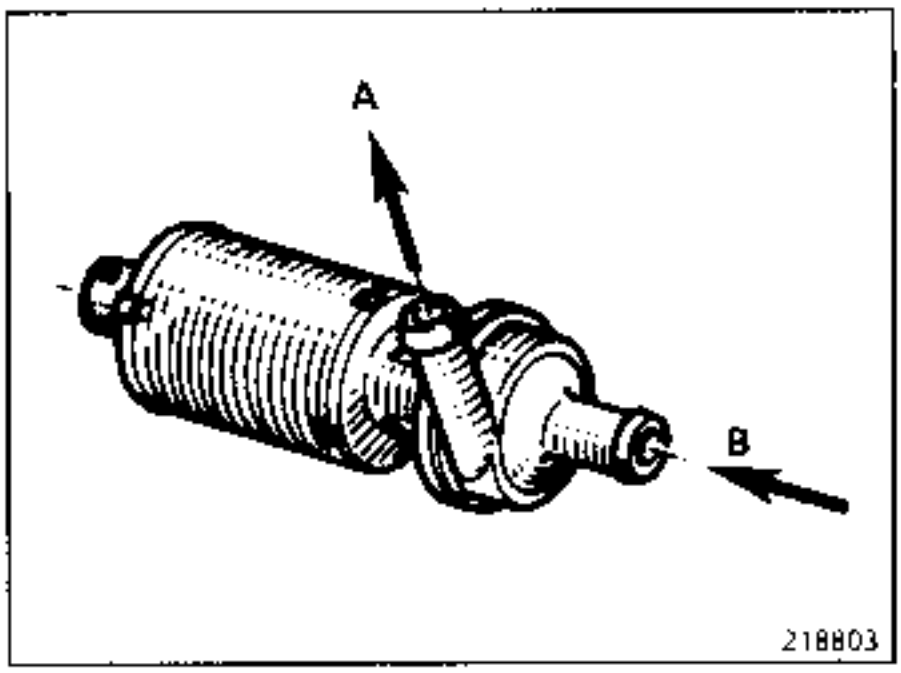


J7R turbocharged engines are fitted with a liquid cooled turbocharger.

Whilst the engine is running, the coolant is circulated by the engine driven main coolant pump. Whenever the engine is stopped, an auxiliary electric pump will take over. It is supplied by a timed relay (for approximately **12 minutes**), no matter what the engine temperature may be.

This coolant pump is mounted on the side of the front righthand shock absorber turret.

The pump suction entrance is on the pump-electric motor centre line and its output is perpendicular to this centre line.

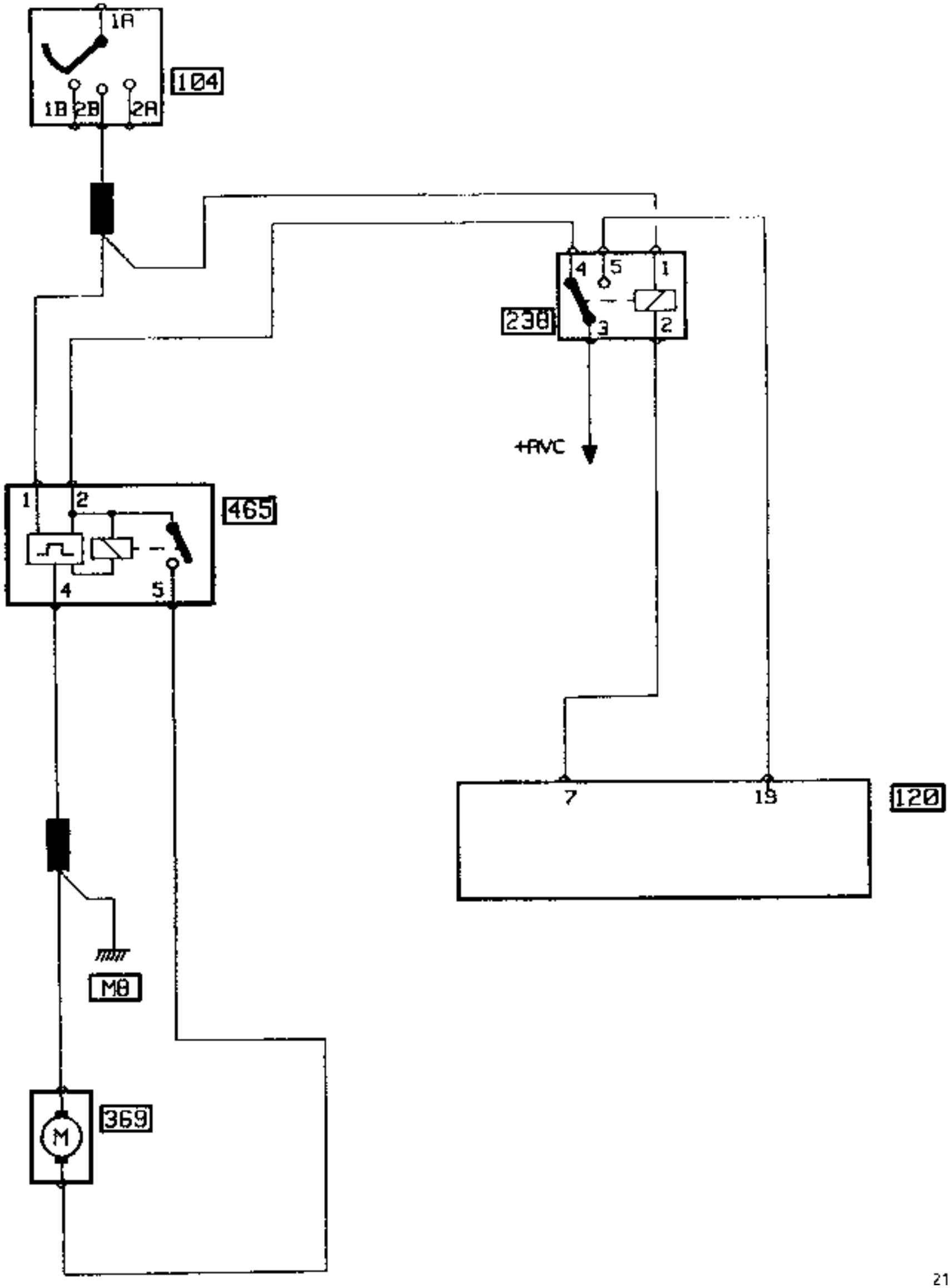


A Output
B Suction

KEY

104 Antitheft switch
120 Injection computer
238 Injection protection relay
369 Electric coolant pump
465 Coolant pump timer
M8 Injection system earth

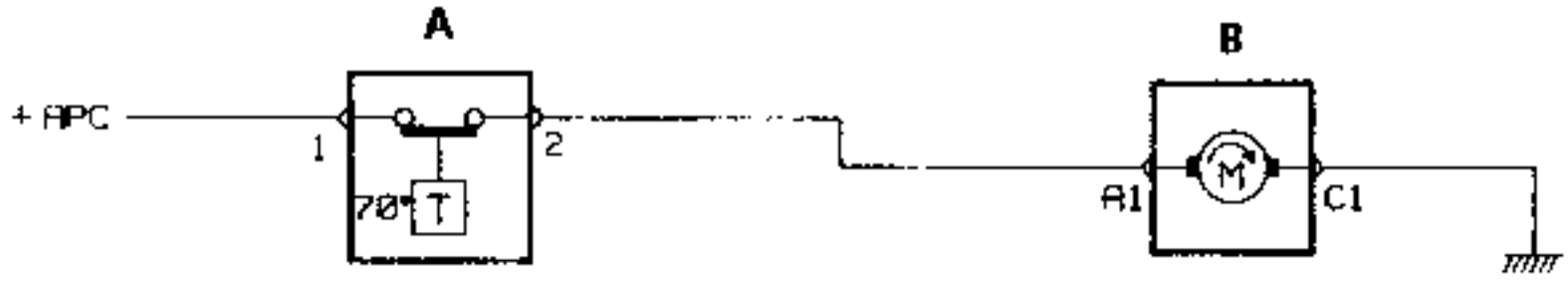
Wiring diagram



Vehicles equipped with the **J8S** engine have an electric coolant pump which speeds up the increase in the heater radiator temperature.

1st ARRANGEMENT

The pump turns as soon as the ignition is switched on and cuts out as soon as the temperature exceeds approximately 70° C.



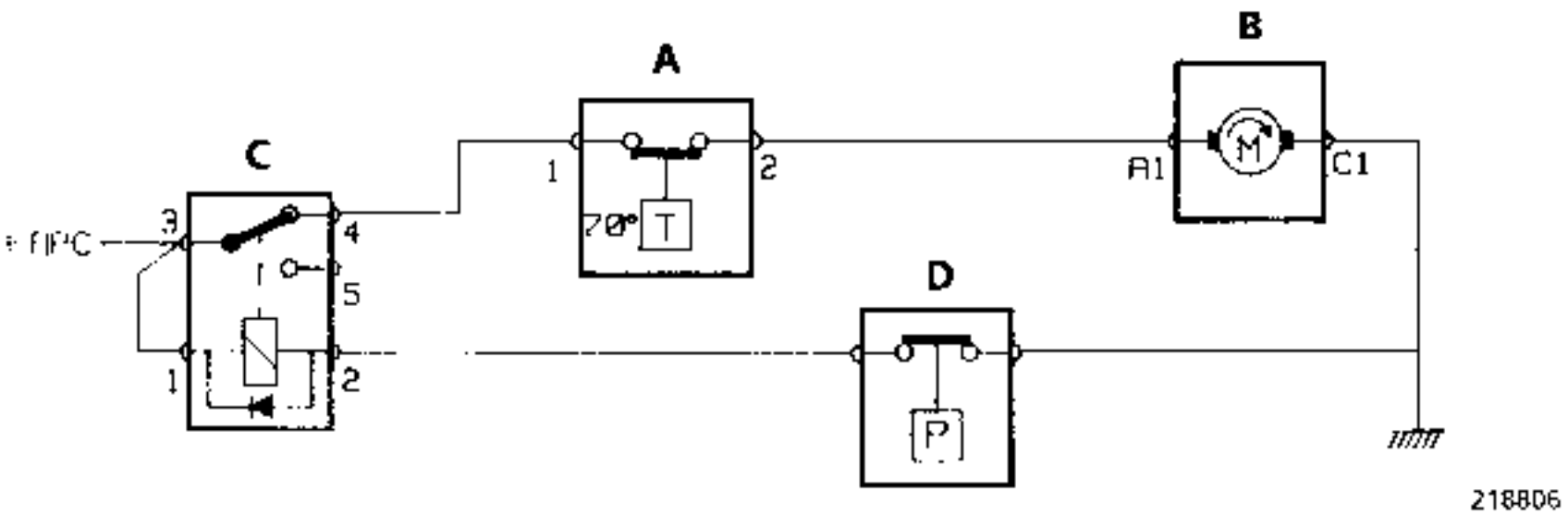
218805

2nd ARRANGEMENT

When the ignition is switched on, the relay is energised (relay earth via oil pressure switch) :

the pump does not operate

With the engine running (oil pressure established), the relay is no longer energised and supplies the electric pump which will stop operating as soon as the coolant temperature reaches approximately 70° C.



218806

A Thermocontact
B Electric coolant pump
C Relay
D Oil pressure switch

Vehicle types **X48E** (F3N engine with air conditioning) are equipped with an antipercolation system.

OPERATION

When the ignition is switched on :

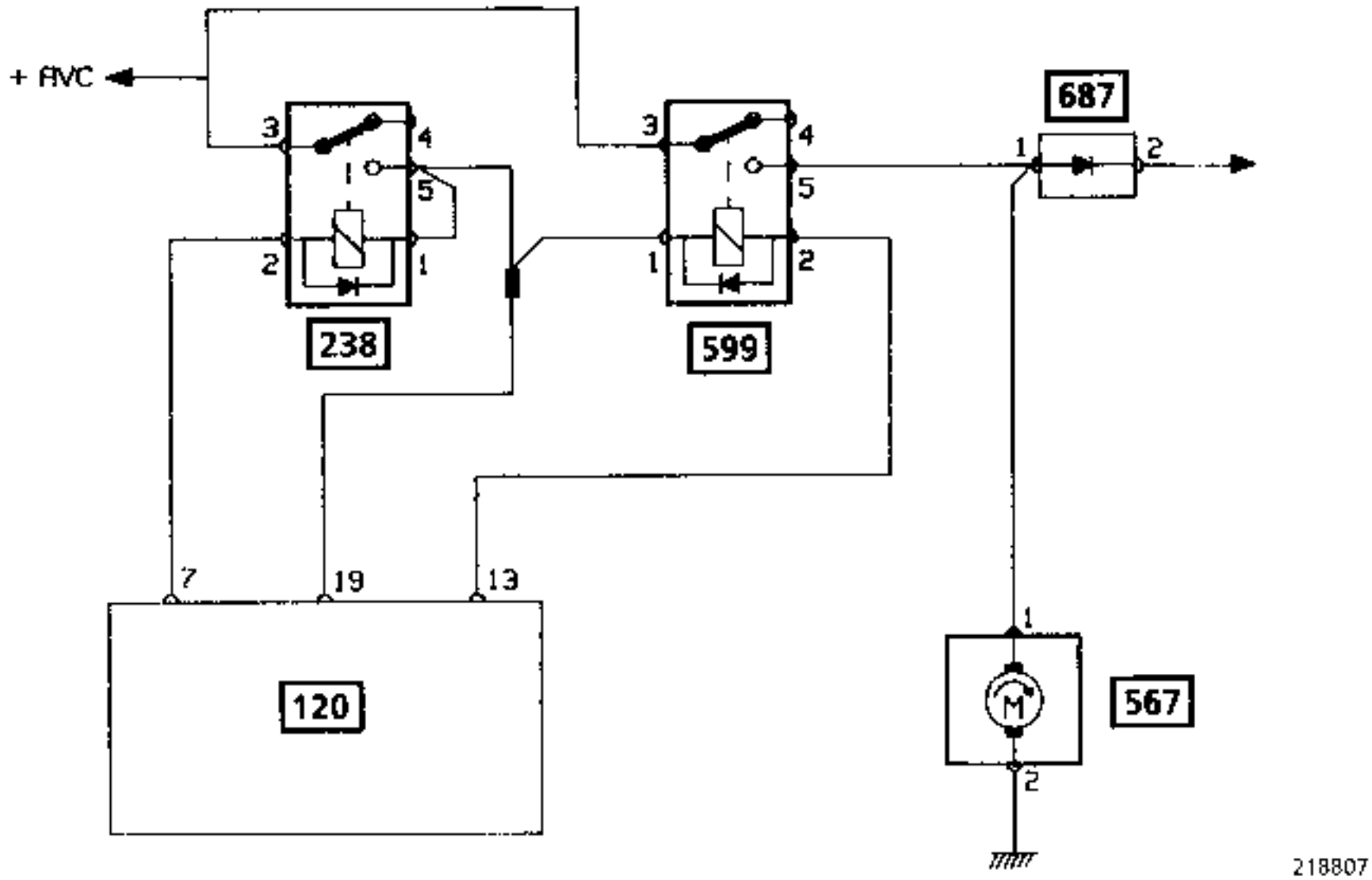
- the injection computer sends an earth via its track 7 to track 2 of the relay (238). This earth will be maintained for 30 seconds after each time the ignition is switched off or when the coolant temperature circuit reaches a temperature of more than 90° C.

- the injection computer sends a + for a few seconds via its track 19 to tracks 1 and 5 of the relay (238) to self-supply this (+ AVC at track 3).
  The relay (599) is therefore + supplied at track 1.

When the ignition is switched off, if the temperature of the coolant circuit is greater than 90°C, the injection computer sends an earth via its track 13 to track 2 of relay (599) and maintains that of relay (238).

The antipercolation coolant pump is then supplied as well as the cooling fans via the unit until the temperature drops back down to 90°C.

NOTE : The diode unit prevents the antipercolation pump being supplied when the cooling fans are operating and the engine is running.



+AVC	+ before ignition
120	Injection computer
238	Injection locking relay
567	Electric pump relay
599	Coolant pump support relay
687	Diode unit