

Workshop Manual

928

DR. ING. h. c. F. PORSCHE Aktiengesellschaft

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Diagnosis / troubleshooting alarm system

The alarm control unit is diagnosable. It can be read out only with System Tester 9288.

The menu includes the following functional groups:

- Fault memory
- Drive links
- Input signals
- Country codes
- Results
- System check

Note

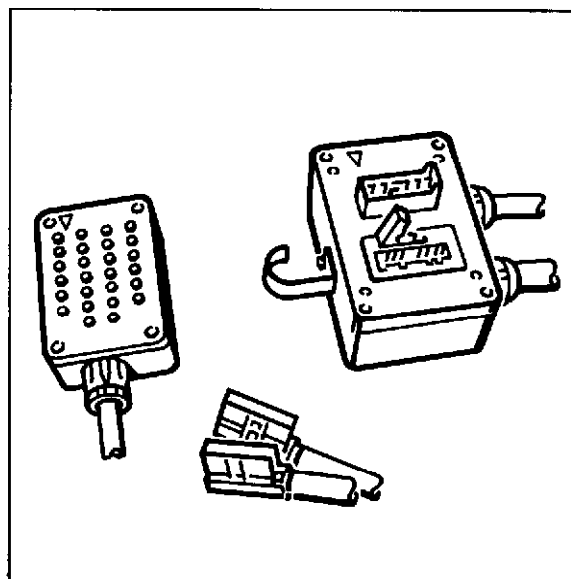
For some of the faults, two types of causes must be distinguished:

- The fault displayed is an actual fault that has to be remedied.
- The fault displayed is a fault condition that has been caused deliberately, e.g. by leaving the open glove compartment open.

Troubleshooting requires that the person performing the tests

- is familiar with the location of components, function and technical relationship of the systems being tested (refer to Model Information)
- is able to read and evaluate Porsche wiring diagrams
- knows the functions of circuits and relays
- is capable of using testers and of evaluating the test results.

Tools required for troubleshooting:
Special Tool 9540



1079-90

Note

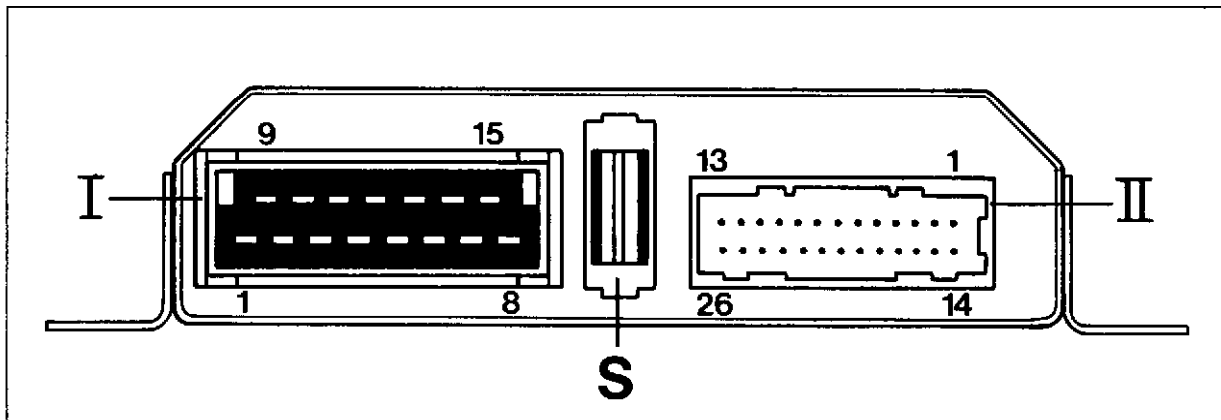
The Special Tool is required because connector II is fitted with miniature terminals.

To avoid damaging the terminals, always use the Special Tool for the tests.

When checking for continuity, attach connector to wiring harness only.

When checking signals and voltages, attach connector to wiring harness and control unit.

Pin assignments of alarm control unit connector

**Connector I**

Terminal:

- 1 – Term. 30
- 2 – Term. 31 (Ground)
- 3 – Term. 30
- 4 – Anti-drive off feature
- 5 –
- 6 – Term. 15
- 7 – Interior light
- 8 – Turn signal left
- 9 – Turn signal right
- 10 – Horn
- 11 – Motor „Closed“ Actuator door lock
- 12 – Motor „Open“ Actuator door lock
- 13 –
- 14 – LED front passenger's door
- 15 – LED driver's door

S – Fuse

Connector II

Terminal:

- 1 – Activate / closed
- 2 – Deactivate / open
- 3 – Rear lid contact
- 4 – Tailgate lock
- 5 – Hood contact
- 6 – Speedo signal Term. A
- 7 – Input 1
- 8 – Input 2
- 9 – Radio 2
- 10 – Central locking system position switch „Open“
- 11 – Central locking system button
- 12 – Central locking system position switch „Closed“
- 13 – Radio 1
- 14 – Diagnosis „L“
- 15 – Diagnosis „K“
- 16 – Glove compartment contact
- 17 – Input 3
- 18 – Term. 15
- 20 – Central locking system button light
- 21 – Door contacts
- 23 – Term. 61
- 24 – External electronics

Fault memory

Overview of possible displays

Control unit defective	Glove comp. open during activation
Voltage failure Term. 30 with active alarm system	Input 2 to ground during activation
Voltage failure during alarm output	Central lock button closed during activation
Position of the drives unplausible	Input 1 to ground during activation
Door(s) open during activation	Input 3 to positive during activation
Engine compartment open during activation	Position switch on drive closed during activation
Luggage comp. open during activation	Position switch on drive open during activation

Radio
(closed loop)
interrupted
during activation

Radio contact
to ground
during activation

Tailgate lock
switch
closed
during activation

Fault, Fault Code	Possible Causes, Elimination, Remarks
-------------------	---------------------------------------

Note

After a fault in the alarm system has occurred and after it has been remedied, the fault memory **must** be erased.

Test Point 1

Control unit defective – Replace control unit.

Test Point 2

Voltage failure Term. 30 with active alarm system

- Check battery.
- Check fuse at control unit.
- Check wiring according to wiring diagram.

Test Point 3

Voltage failure during alarm output

- Refer to Test Point 2.

Test Point 4

Position of the drives unplausible

This fault is also stored if, for example, the driver's door is open when the key is used to actuate the central locking system from the passenger's door.

- Disconnect plug II from control unit. Attach Special Tool 9540 at wiring harness.
With the doors unlocked, ground must be present at pin 10.
At the same time, no ground must be present at pin 12.
With the doors locked, ground must be present at pin 12.
At the same time, no ground must be present at pin 10.
- If required, check wiring according to wiring diagram.

Note

The T6 (driver's door) and T 22 (passenger's door) connectors are located inside the doors, i.e. the door trim must be removed if the connectors are to be checked.

Test Point 5

Doors(s) open during activation

- Check LH and RH door contact switches for shorts to ground.
- Check wire from alarm control unit plug II terminal 21 to the door contacts for short to ground, using Special Tool 9540.
- Check wire from rear cover unlocking actuator for short to ground across connector T 19.

Fault, Fault Code	Possible Causes, Elimination, Remarks
Test Point 6	<ul style="list-style-type: none"> - Check wire from relay base of central relay terminal D for short to ground. - Check wire to window winder/sunroof control unit plug I, terminal 5, for short to ground.
Engine compartment open during activation	<ul style="list-style-type: none"> - Check engine hood contact switch for short to ground. - Check wire from alarm control unit plug II, terminal 5, to engine hood contact switch for short to ground using Special Tool 9540. <p data-bbox="561 696 620 728">Note</p> <p data-bbox="561 757 1059 788">The wire is routed across connector T 33.</p> <ul style="list-style-type: none"> - Check socket side of wire from connector T 33 terminal 5 to engine compartment light for short to ground. - Check pin side of wire from connector T 33 terminal 5 to cooling air control plug II, terminal 6, for short to ground.
Test Point 7	<ul style="list-style-type: none"> - Check tailgate contact switch for short to ground. - Check wire from alarm control unit plug II, terminal 3, to contact switch for short to ground, using Special Tool 9540.
Luggage comp. open during activation	<p data-bbox="561 1205 620 1236">Note</p> <p data-bbox="561 1265 1177 1296">The wire is routed across connectors T 19 and T 9.</p>
Test Point 8	<ul style="list-style-type: none"> - Check glove compartment switch and glove compartment light for short to ground. - Check wire from alarm control unit plug II, terminal 16, to contact switch for short to ground, using Special Tool 9540.
Glove comp. open during activation	<p data-bbox="561 1579 620 1610">Note</p> <p data-bbox="561 1639 1044 1671">The wire is routed across connector T 1.</p>

Fault, Fault Code	Possible Causes, Elimination, Remarks
<p>Test Point 9 Input 2 to ground during activation</p>	<p>Note</p> <p>The fault display may appear if auxiliary systems (e.g. interior monitor) have been fitted.</p> <ul style="list-style-type: none"> - Check auxiliary system of input 2. - Check wire from alarm control unit plug II, terminal 8, to auxiliary system for short to ground, using Special Tool 9540.
<p>Test Point 10 Central lock button closed during activation</p>	<ul style="list-style-type: none"> - Check central locking system button. - Check wire from alarm control unit plug II, terminal 11, to button for short to ground, using Special Tool 9540.
<p>Test Point 11 Input 1 to ground during activation</p>	<ul style="list-style-type: none"> - Check auxiliary system of input 1. - Check wire from alarm control unit plug II, terminal 7, to auxiliary system for short to ground using Special Tool 9540.
<p>Test Point 12 Input 3 to ground during activation to positive</p>	<ul style="list-style-type: none"> - Check auxiliary system of input 3. - Check wire from alarm control unit plug II, terminal 17, to auxiliary system for short to ground using Special Tool 9540 check for short to positive.
<p>Test Point 13 Position switch on drive closed during activation</p>	<ul style="list-style-type: none"> - Check triggering of actuators. Ground must be present at connectors T6 and T22, terminals 11 and 12, in the quiescent state.
	<p>Note</p> <p>Connectors T6 (driver's door) and T 22 (passenger's door) are located inside the doors; i.e. the door trim must be removed when the connectors are to be checked. Positive voltage must be present at terminal 11 when the actuator is triggered in the „open“ direction. Positive voltage must be present at terminal 12 when the actuator is triggered in the „closed“ direction.</p>
	<p>Note</p> <p>The actuators are only triggered for several milliseconds.</p>

Fault, fault code	Possible causes, remedies, notes
Test Point 14 Position switch on drive open during activation	<ul style="list-style-type: none"> - Check wires from alarm control unit plug I, terminals 11 and 12, to the acutators for continuity. - Check position switch at actuator (refer to Test Point 4).
Test Point 15 Radio (closed loop) interrupted during activation	<ul style="list-style-type: none"> - On radios that do not have this contact, radio 1 input is wired to ground. Check wire from alarm control unit plug II, terminal 13, for continuity to ground.
Test Point 16 Radio contact to ground during activation	<ul style="list-style-type: none"> - Check insulating strip on radio. - Check wire from alarm control unit plug II, terminal 9, to radio plug, terminal 6, for short to ground. - Check alarm contact at radio or bracket, respectively.
Test point 17 Tailgate lock switch closed during activation	<ul style="list-style-type: none"> - Check tailgate release lock switch. - Check wiring from alarm control unit connector II, terminal 4, to tailgate release lock switch for short to ground.

Note

The wire is routed across connector T42.

Drive links

This function allows the following components to be triggered:

- Function display in lock buttons
- Lock
- Alarm horn
- Turn signals
- Interior light
- Button light in central locking system button
- External output

```
Function display
1 = on
3 = off
Return :           N
```

If the function display is turned on, the doors are locked and the LEDs light up permanently. The „on“ display flashes on the tester. If the function display is turned off again, the LEDs are turned off as well. The doors are unlocked again when the user returns to the menu.

```
Lock
1 = closed
3 = open
Return:           N
```

Lock closed: Doors are locked.
Lock open: Doors are unlocked.

```
Alarm horn
1 = on
3 = off
Return:           N
```

Alarm horn on: Alarm horn is triggered continuously (continuous sound).

```
Turn signals
1 = on
3 = off
Return:           N
```

Turn signals on: All turn signals are triggered continuously (continuously lit).

```
Interior light
1 = on
3 = off
Return:           N
```

The interior light must be in the door contact position.

```
Button light
1 = on
3 = off
Return:           N
```

Button light on: The light in the central lock system button is triggered.

```
External output
1 = on
3 = off
Return:           N
```

The external output is used to trigger other control units, e.g. ultrasonic monitoring of the interior.

Possible fault displays

1.

No activation
Door(s) open !

Return: N

- Close doors
- Check door contact wires to alarm control unit plug II terminal 21 for short to ground.

2.

No activation
Engine running!

Return: N

- Turn off engine, only switch on ignition.

3.

No response
Signal unplausible !

Return N

- Replace control unit.

4.

No activation
Fault summary!

Return: N

Note

Fault summary is displayed if several drive links (actuators) are triggered simultaneously, e.g. if turn signals are on while the function display is checked.

- Check wiring to alarm control unit plug I, terminals 8, 9, 10, 11, 12, and plug II, terminal 20, for short to positive.
- Check wiring to alarm control unit plug II, terminal 24 (if connected) and terminal 7, for short to ground.

5.

No activation
Fault summary !
Position switch ?

Return: N

- Refer to item 4.
- Also check position switch (refer to page D 90 - 5).

6.

Activation
correct.
Position switch?

Return: N

- Check position switch (refer to page D 90 - 5).

7.

No response
Signal unplausible !
Position switch ?

Return: N

- Check position switch (refer to page D 90 - 5).
- Replace control unit.

8.

Unknown
response code!

Return: N

- Check following ground points:
- 1. GP VII: Battery to body
- 2. GP VIII: Body to engine
- 3. GP V: Body to alarm control unit

Input signals

This function allows the following input signals to be checked:

- Door contacts
- Engine compartment switch
- Luggage compartment switch
- Position switches at drive motors
- Central locking system button
- Glove compartment button
- Radio closed loop
- Alarm contact radio bracket
- Tailgate lock button
- Microswitch for activation of alarm
- Microswitch for deactivation of alarm
- Input 1 (auxiliary system)
- Input 2 (auxiliary system)

- Input 3 (auxiliary system)
- Speedo signal
- Term. 15
- Term. 61

1.

Door(s)

- open -

Return: N

Open is displayed if at least one door is open. Closed is displayed if both doors are closed. If required, check wiring to alarm control unit for open circuit or short to ground according to wiring diagram.

2.

Engine compartment

- open -

Return: N

Open is displayed if engine hood is open. Closed is displayed if engine hood is closed. If required, check wiring to alarm control unit for open circuit or short to ground according to wiring diagram.

3.

Luggage compartment

- open -

Return N

Open is displayed if tailgate is open. Closed is displayed if tailgate is closed. If required, check wiring to alarm control unit for open circuit or short to ground according to wiring diagram.

4.

```

Position switch
open: - closed -
closed: - open -
Return: N

```

This display appears if both lock buttons are in the „open“ position.

4a.

```

Position switch
open: - closed -
closed: - closed -
Return: N

```

This display appears if one lock button is in the „open“ and one lock button is in the „closed“ position.

4b.

```

Position switch
open: - open -
closed: - closed -
Return: N

```

This display appears if both lock buttons are in the „closed“ position. If required, check position switch (refer to page D 90 - 5)

5.

```

Central locking
system button
- open -
Return: N

```

Open is displayed if the central locking system button has not been pressed down. Closed display appears if the central locking system button is pressed down.

6.

```

Glove compartment
- open -
Return: N

```

Open is displayed if glove compartment is open. Closed is displayed if glove compartment is closed.

7.

```

Radio
(closed loop)
- closed -
Return: N

```

The closed loop must be closed. On radios that do not have this contact terminal, terminal 13, plug II, is wired to ground.

- If the closed loop is open, check wiring from alarm control unit, terminal 13, to ground point V or to radio for open circuit.

8.

```

Radio contact
- open -
Return: N

```

If Radio contact closed is displayed:

- Check insulating strip on radio.
- Check wiring from alarm control unit plug II, terminal 9, to alarm contact at radio bracket or to alarm contact at CD player for short to ground.

9.

Tailgate lock
- open -
Return: N

Note

The spare key is needed for the checks acc. to items 9 to 11 since the ignition must be engaged during the check.

Open is displayed if tailgate lock has not been actuated. Closed is displayed if tailgate lock is actuated.

10.

Activate button
- open -
Return: N

Use the spare key to turn the locks of the driver and passenger doors in the „closing“ direction. The display must switch from open to closed.

- If closed is displayed in the off position, check wiring from lock cylinders to alarm control unit plug II, terminal 1, for proper grounding according to wiring diagram.
- If display remains in the open position after the lock cylinders have been actuated, check wiring for continuity according to wiring diagram.

11.

Deactivate button
- open -
Return: N

Use the spare key to turn the locks of the driver and passenger doors in the „opening“ direction. The display must switch from open to closed.

If closed is displayed in the off position, check wiring from lock cylinders to alarm control unit plug II, terminal 2, according to wiring diagram for short to ground.

If display remains in the open position after the lock cylinders have been actuated, check wiring for continuity according to wiring diagram.

12.

Input 1
- open -
Return: N

In the standard configuration, this input is not used. Auxiliary systems may be connected to this input.

Open is displayed if input is not used.

If required, check auxiliary systems according to manufacturer's instructions.

13.

Input 2
- open -
Return: N

Refer to item 12.

14.

Input 3	
- open -	
Return:	N

Refer to item 12.

15.

Speedo signal	
present	
Return:	N

Display is not present if vehicle is stationary.

Display is present if vehicle is moving.

If required, check wiring from alarm control unit plug II, terminal 6, to speedometer according to wiring diagram.

16.

Term. 15	
present	
Return:	N

If display is not present, check wire from alarm control unit plug II, terminal 18, to central electrical system according to wiring diagram.

17.

Term. 61	
present	
Return:	N

Note

If present is displayed although the engine is not running, this may be due to a summary fault (refer to item 4, Drive links functional group). In this case, start by remedying this fault.

If display is not present although the engine is running, check wire from alarm control unit plug II, terminal 23, to generator according to wiring diagram.

Country codes

The System Tester 9288 may be used to encode three pre-set alarm versions

1. RoW (Rest of world)
2. CH (Switzerland)
3. USA

Alarm output

RoW

- Alarm horn max. 30 sec. interval.
- Turn signals max. 5 min.
- Interior light flashes in an asynchronous manner with turn signals (if in door contact position).

CH

- Alarm horn max. 30 sec. continuous.

USA

- Alarm horn max. 4 mins. interval.
- Turn signals max. 8 min.
- Interior light flashes in an asynchronous manner with turn signals (if in door contact position).

Alarm system encoding

When replacing the control unit, activate one of the preset country codes according to the national C number.

RoW

C numbers: 00, 05, 07, 09, 11, 12, 13, 14, 16, 17, 19, 20, 21, 22, 27, 28, 99.

CH

C number: 10.

USA

C numbers: 02, 04, 06, 08, 15, 18, 23, 24, 26, 31, 32, 36.

Country code		
RDW	PORSCHE	*
1 = coding		
Return:		N

The Country code menu displays the coded version in the top left corner, e.g. RoW; the center displays Porsche or Workshop, depending on where the system has been coded. The asterisk on the right is displayed for versions that include the interior lights in the alarm emission.

Result memory

The result memory registers triggering of an alarm, the contact that triggered the alarm as well as the type of activation. A maximum of 10 results may be stored. If another result is stored, the oldest result stored is deleted.

The result with the highest number is the most up-to-date result.

Alarms may be triggered by contacts at the following components:

- Doors
- Engine compartment
- Luggage compartment
- Glove compartment
- Radio

Additional alarm triggering options:

- Term. 15 on after system has been activated
- Signal to input 1
- Signal to input 2
- Signal to input 3
- Position switch
- Open circuit of closed loop (radio).

Note

Up to three alarms may be triggered across input 2.

The following types of activation are to be distinguished:

- **normal**, i.e. locking the doors with the key, thus activating the central locking system
- **locking three times**, i.e. locking one of the door locks rapidly for three consecutive times
- **System check**

The type of activation may be invoked with button 1 on the below display:

```
Alarm:          - x -
activated by
xxxxxxxxxxxxxxxx
```

Note

Erase the result memory whenever the alarm system has been checked.

System check

The System check menu item may be used to check all components triggering an alarm (except Term. 15). In this case, the alarm horn is only triggered twice for a short interval.

The following display appears after the System check menu item has been called:

```
System check !  
Continue:      >
```

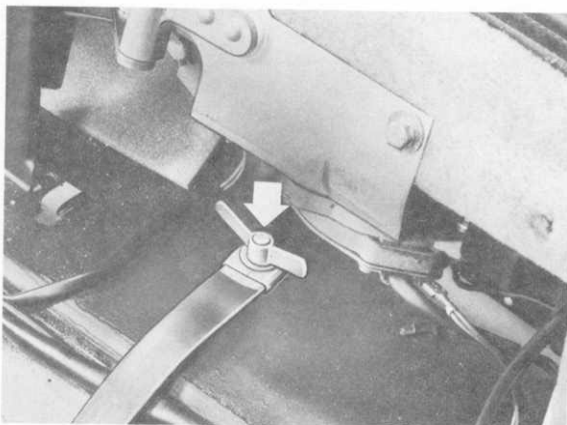
The individual alarm-triggering components that may trigger an alarm (except Term. 15) can now be checked. E.g. if a door is opened, an alarm is triggered. At the same time, triggering of the alarm is stored in the result memory. After the check has been completed and the > key has been pressed, the following display appears:

```
Note:  
Erase result  
memory !  
Return:      N
```

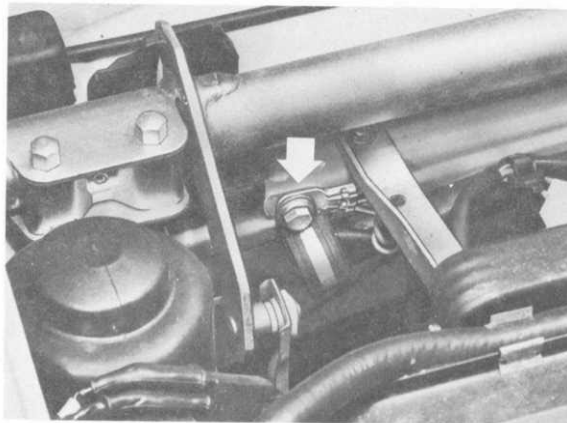
The result memory **must** be erased since the check has been stored in the memory.

GROUND POINTS ON CAR

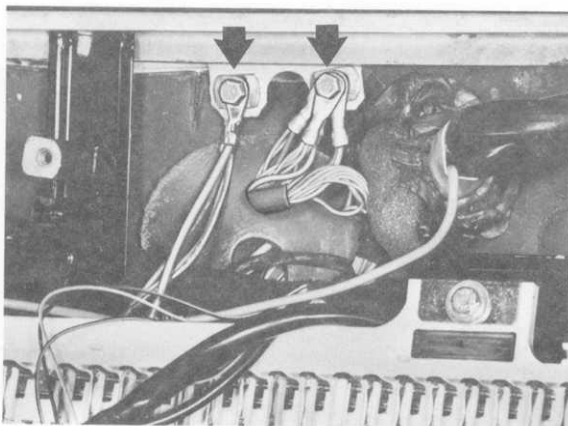
1. Battery negative pole to body in trunk at rear left.



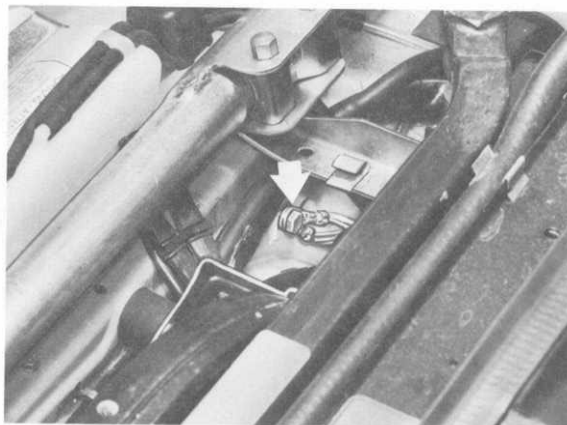
4. Ground point on front left cross member.



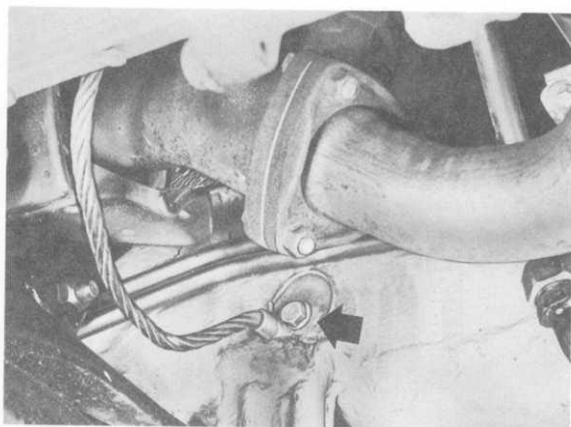
2. Ground points above central electric board.



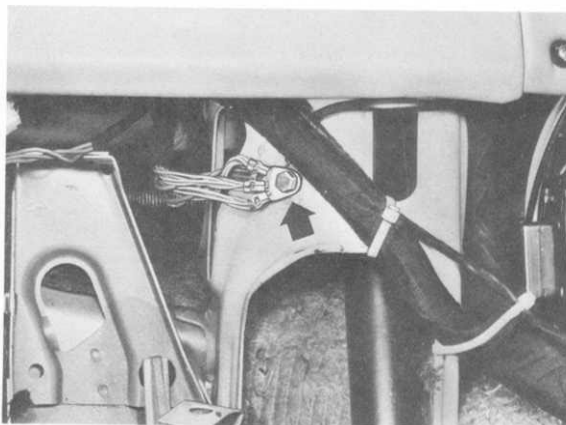
5. Ground point on front right cross member.



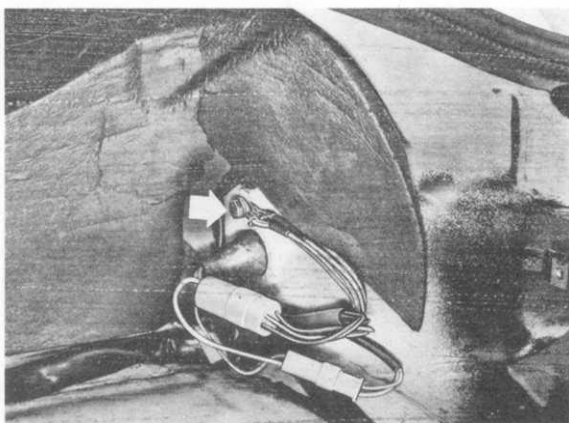
3. Engine ground to body on right side member.



6. Ground point underneath instrument panel next to steering column.



7. Ground point in trunk at rear right underneath side trim panel.



Side trim panel has to be removed to make this ground point accessible.

**Correction to circuit diagrams,
Models 87 and 88, Sheet 7**

The cable colors on connectors
3, 6 and 7 on the control unit to adjust the
seating position are not correct. The correct
assignments are:

Pin 1: brown

Pin 2: blue

Pin 3: red

The cable color at connector 11, pin 2
is green / brown (GN/BR), and not grey /
brown (GR/BR) as given.

Additional electrical equipment

Note

Additional electrical equipment is only to be connected to the points described below.

Terminal 30, no fuse protection:

Screw connections to central electrics supply line

Terminal X, no fuse protection:

Leading to fuse 33

Terminal 15, no fuse protection:

Leading to fuse 43

Terminal 31:

Ground point V (above central electrics)

Provision for fuses

Note

Additional electrical equipment must be protected against overloads if the above connection facilities are used.

1. Fuse 32:

The fuse must be wired to (for example) plug R inside the central electrics.

2. Separate fuses

Repairing wiring harness no. 121

Note

As of Model Year '93, the combination wirings for ABS, BVA (brake pad wear indicator) and RDK (tire pressure monitoring system) are incorporated into the wiring harness. If the wiring is damaged, the integral wirings can be cut off and may be replaced by repair wires. Carry out the following functional check after the repair:

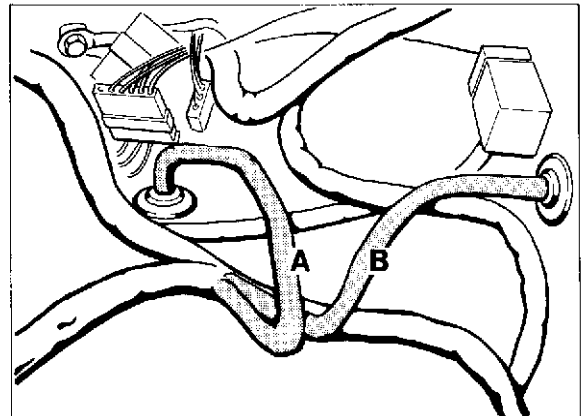
- ABS: Check with ABS tester.
- BVA: The warning lamp must go off when the engine is running and if the pads are o.k.
- RDK: The warning lamp must go off within the specified air pressure range.

Joints

Rear: Inside the spare wheel well
 Left-hand front: Inside the wheel housing
 Right-hand front: Behind the Central Electrical System

Rear

1. Disconnect battery.
2. Remove spare wheel.
3. Cut open the insulating tube of wiring harness No. 121 from the rubber grommets to the outgoing wire and remove the tube.



*A - Left-hand combination wire
 B - Right-hand combination wire*

1318-97

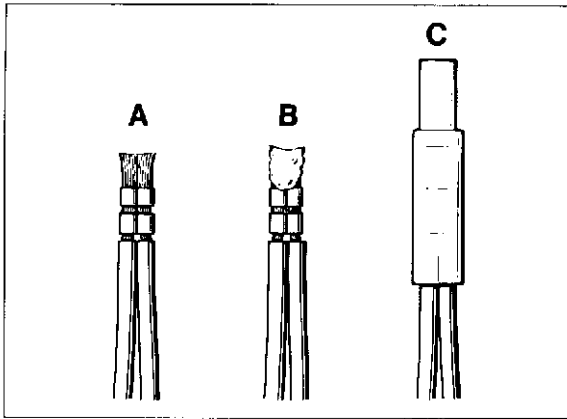
4. Remove PVC insulating tape.
5. Remove shrink-fit caps from joints.
6. Cut off connector.
7. Remove combination wires.
8. Install repair wires from wheel carriers towards spare wheel well.

Note

Use correct repair wires. The right-hand and left-hand repair wires are of different lengths.

9. Strip wires on a length of 10 mm.

10. Connect wires according to table using crimp connectors and standard crimping tool (A).



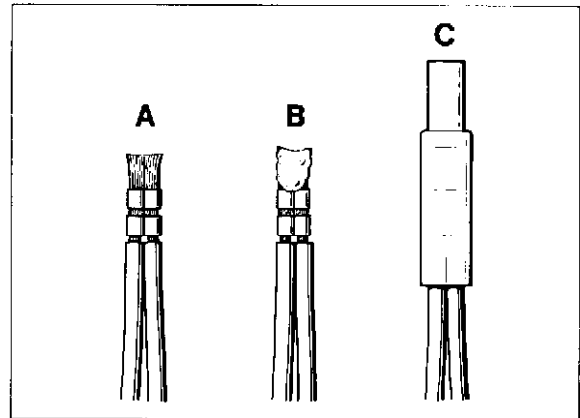
1316-97

Combination wire		Wiring harness no. 121
Color	Length	Color
		rear left
br/ge	60 mm	br/ge
br/rt	90 mm	br/rt
br/bl	120 mm	ws/sw*
br/ws	150 mm	ws*
br	180 mm	br
br/gn	210 mm	sw
br/sw	240 mm	ws
		rear right
br/ge	60 mm	br/ge
br/rt	90 mm	br/rt
br/bl	120 mm	ge/sw*
br/ws	150 mm	ge*
br	180 mm	br
br/gn	210 mm	sw
br/sw	240 mm	ge

* screened wires

- br - brown
- sw - black
- ge - yellow
- rt - red
- bl - blue
- ws - white
- gn - green

11. Solder tips after crimping the connectors (B).
12. Fit shrink-fit caps and shrink them into place using a hot air gun (C).
13. Wrap up entire connection joint area using commercially available PVC tape.



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Left-hand front

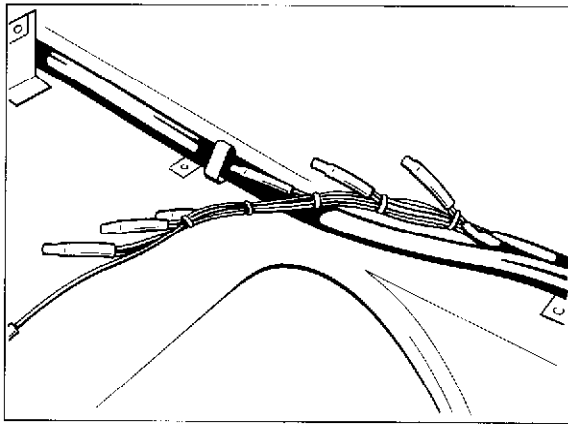
1. Disconnect battery.
2. Unbolt left-hand front wheel.
3. Remove left-hand front wheel housing liner.
4. Cut off combination wire 300 mm from outgoing wire and remove wire.
5. Remove insulating tube along a length of 240 so that only 60 mm remain until the outgoing wire.
6. Cut wiring to correct length according to table.
7. Install repair wire.
8. Route repair wire in connection area parallel to wiring harness No. 121.
9. Strip wirings over a length of 10 mm.
10. Connect wires according to table using crimp connectors and standard crimping tool (A).

Combination wire		Wiring harness no. 121
Color	Length	Color
		left-hand front
br/ge	60 mm	br/ge
br/rt	90 mm	br/rt
br/bl	120 mm	rt/sw*
br/ws	150 mm	rt*
br	180 mm	br
br/gn	210 mm	sw
br/sw	240 mm	rt

* screened wires

br - brown
 sw - black
 ge - yellow
 rt - red
 bl - blue
 ws - white
 gn - green

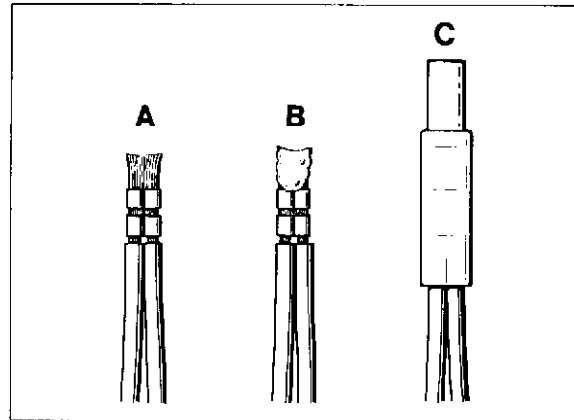
11. Solder tips after crimping the connectors (B).
12. Fit shrink-fit caps and shrink them into place using a hot air gun (C).



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13. Wrap up entire connection joint area using commercially available PVC tape.

11. Strip wires along a length of 10 mm.
12. Connect wiring according to table, using crimp connectors and standard crimping tool (A).



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Right-hand front

1. Disconnect battery.
2. Remove right-hand front wheel.
3. Remove right-hand front wheel housing liner.
4. Cut off combination wire at the wheel housing grommet and remove combination wire.
5. Undo Central Electrical System and move out of the way towards the rear.
6. Pull wire (above Central Electrical System) inwards.
7. Cut open insulating tube up to the connecting points.
8. Remove shrink-fit caps from connecting points.
9. Cut off connector.
10. Install repair wire, starting from the wheel housing end.

Combination wire		Wiring harness no.121
Color	Length	Color
right-hand front		
br/ge	60 mm	br/ge
br/rt	90 mm	br/rt
br/bl	120 mm	gn/sw*
br/ws	150 mm	gn*
br	180 mm	br
br/gn	210 mm	sw
br/sw	240 mm	gn

* screened wires

- br - brown
- sw - black
- ge - yellow
- rt - red
- bl - blue
- ws - white
- gn - green

13. Solder tips after crimping the connectors (B).
14. Fit shrink caps and shrink them into place using a hot air gun.
15. Wrap up entire connection joint area using commercially available PVC tape.

Note

Route excess wire length above Central Electrical System.