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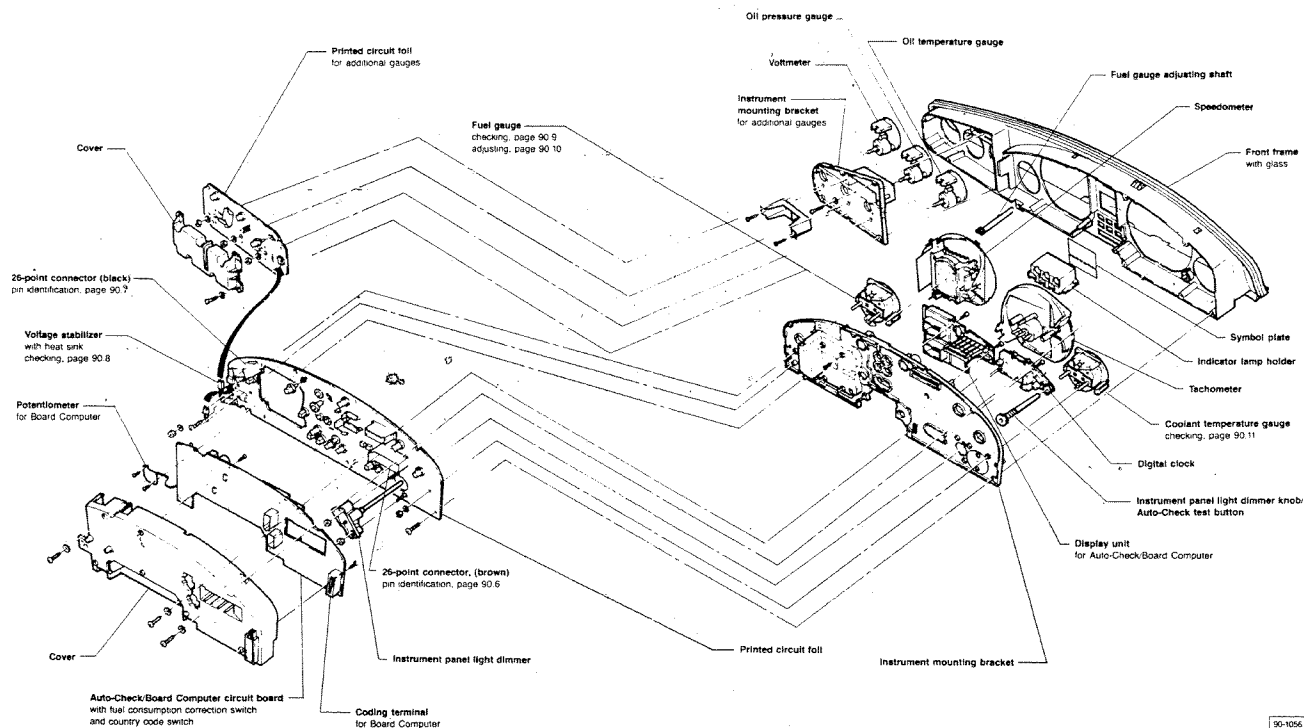
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#### Voltage stabilizer

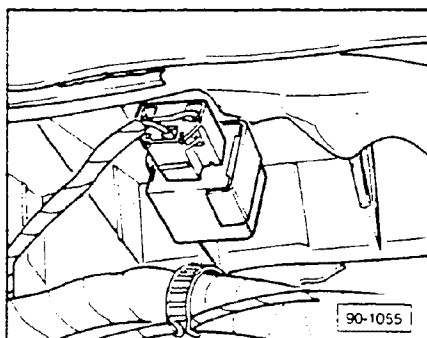
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#### Voltmeter

- checking 90.14



90-1056

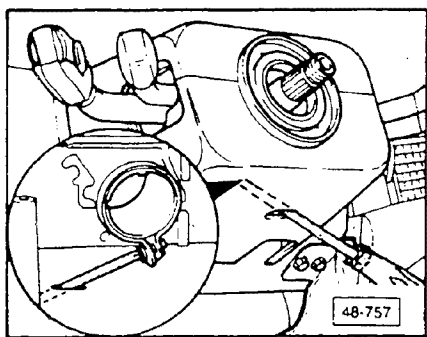


► Fig. 1 Emergency flasher/turn signal indicator relay, installation position

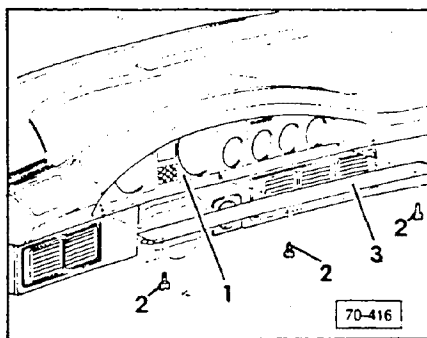
## Note

Relay is behind the instrument panel cluster and is attached to the instrument panel with a clamp.

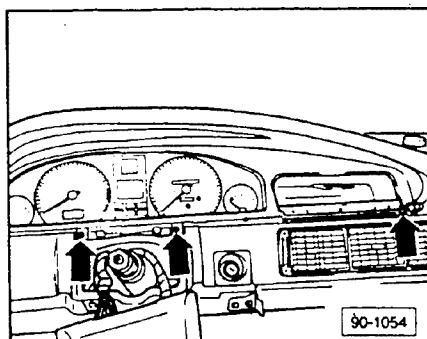
## Instrument cluster, removing/installing



- remove battery ground strap
- remove steering wheel horn pad
- disconnect wiring
- remove steering wheel
  - 40 Nm (30.0 ft lb)
- loosen screw for steering column switch retaining clamp
- lift switch assembly forward
- remove electrical connectors

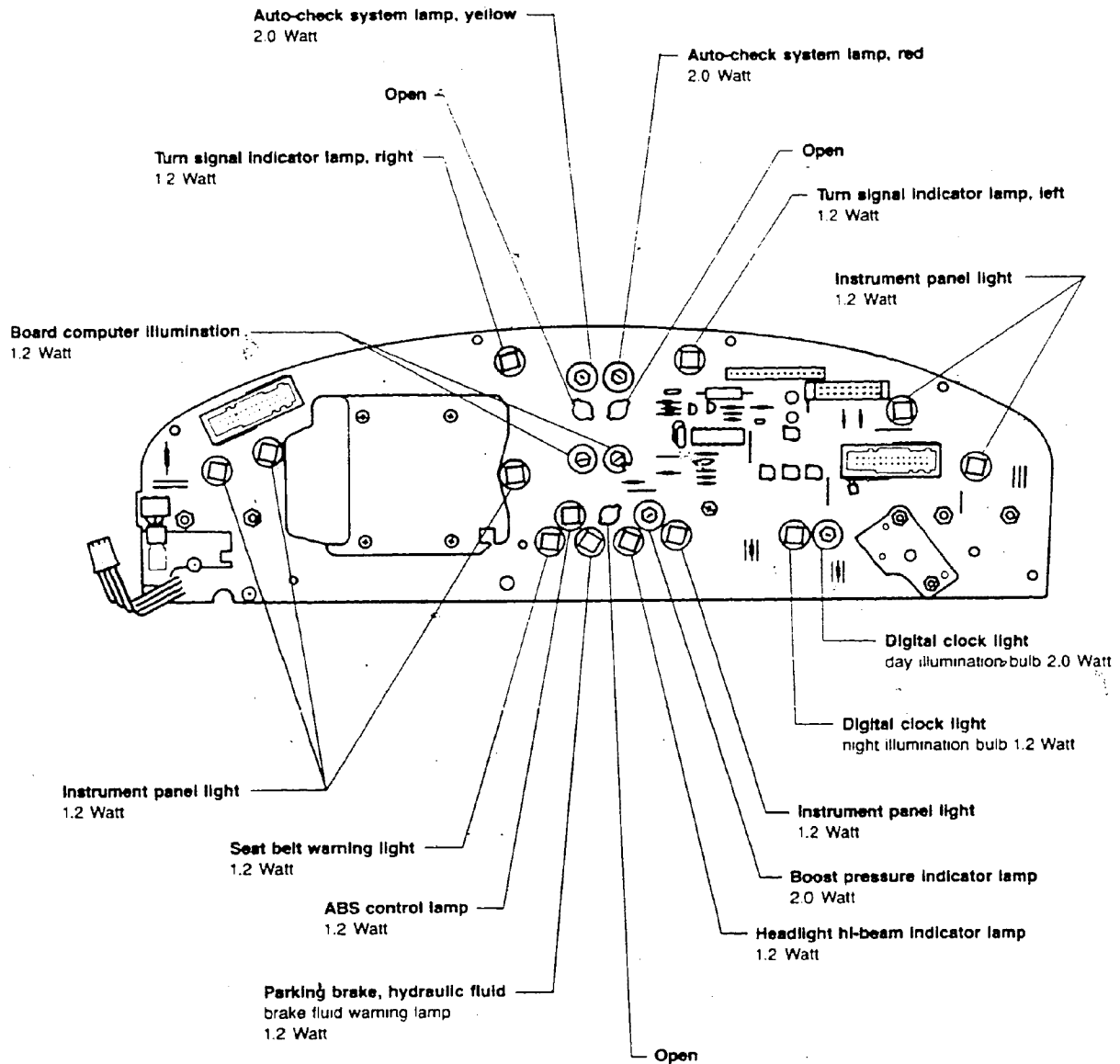


- remove retaining screws 2
- pull cover strip 3 off



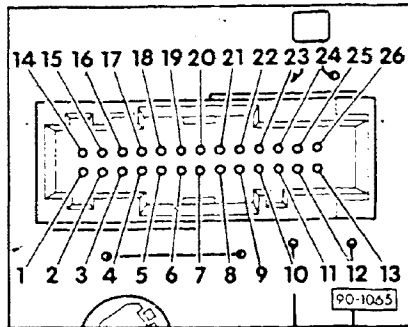
- remove mounting screws (arrows)
- carefully pull instrument cluster from instrument panel
- disconnect electrical connectors and remove instrument cluster

## Instrument cluster control lamp identification



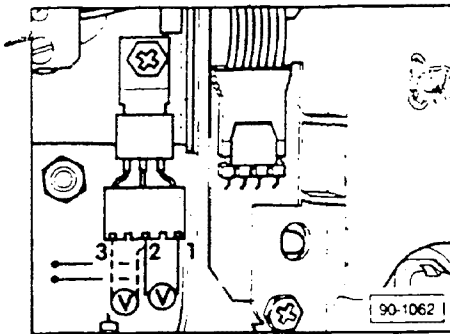
90-1057

## Electrical System – Instruments



### 26-point connector (brown) on instrument cluster, terminal identification

- 1 Open
- 2 Terminal 15
- 3 Open
- 4 Negative (–) terminal for engine coolant overheating warning lamp
- 5 Negative (–) terminal for boost pressure indicator lamp
- 6 Negative (–) terminal for oil pressure control lamp
- 7 Open
- 8 Terminal 30 (+)
- 9 Speedometer signal
- 10 Negative (–) terminal for brake pad wear indicator lamp
- 11 Terminal 31
- 12 Input signal from ignition control unit for tachometer
- 13 Open
- 14 Negative (–) terminal for coolant temperature gauge
- 15 Open
- 16 Open
- 17 Open
- 18 Open
- 19 Open
- 20 Open
- 21 Open
- 22 Open
- 23 Open
- 24 Terminal 31
- 25 Open
- 26 Open



### ▶ Voltage stabilizer, checking

#### Note

When checking the voltage stabilizer, do not disconnect the battery ground strap or connectors from the instrument cluster.

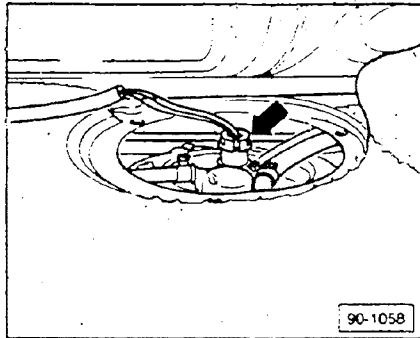
- connect voltmeter between plus (+) connection 1 and ground 2
- switch ignition **ON**
  - approximately battery voltage

#### If **NOT OK**

- check wiring using current flow diagram
- connect voltmeter between terminal 3 and ground 2
  - 9.75V-10.25V

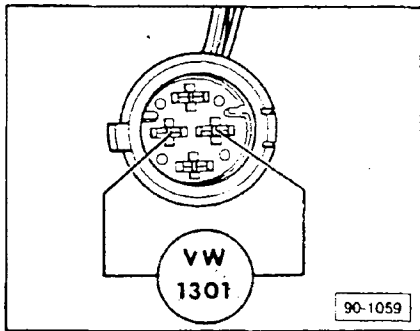
#### If **NOT OK**

- replace voltage stabilizer



### Fuel gauge, checking

- remove connector from fuel gauge sender (arrow)



- connect **VW 1301** to connector of fuel gauge sender
- switch ignition **ON**
- adjust **VW 1301** as follows:
  - 400 = empty
  - 58 = full

#### Note

When making connections, be sure that terminals are not pushed back into connector housing or damaged.

Fuel gauge needle must fall within range **A** when setting is 400.

Fuel gauge needle must fall within range **B** when setting is 58.

#### Note

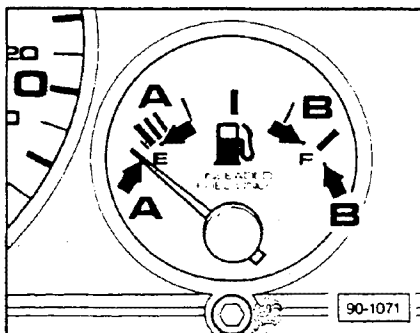
The fuel gauge can be adjusted if it is slightly out of tolerance.

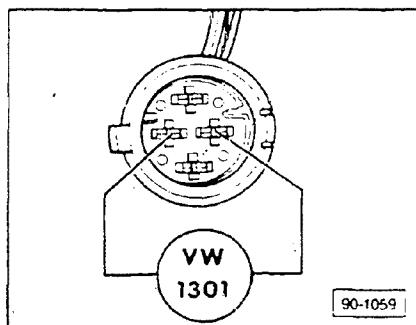
If the fuel gauge cannot be adjusted to tolerance,

- check voltage supply to fuel gauge
- check voltage stabilizer

If **OK**

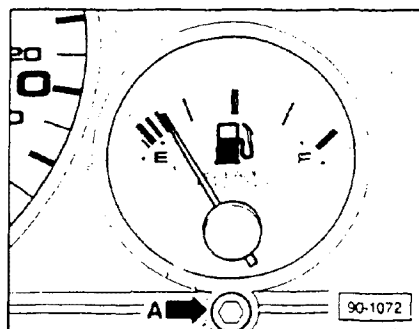
- replace fuel gauge



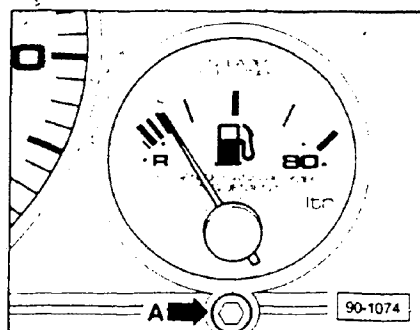


### Fuel gauge, adjusting

- remove connector from fuel gauge sender
- connect **VW 1301** to connector of fuel gauge sender
- switch ignition **ON**



- adjust **VW 1301** to 250
- fuel gauge must be on the third line of the red reserve area

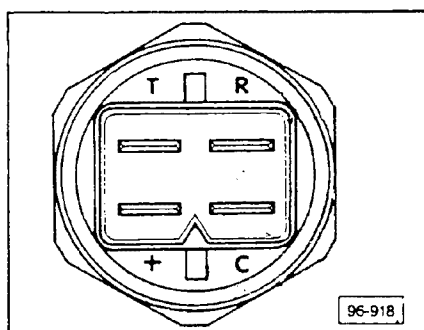


If **NO**

- adjust gauge by turning screw **A**

### Note

Screw **A** is located behind cover strip. To remove strip, see page 90.4.



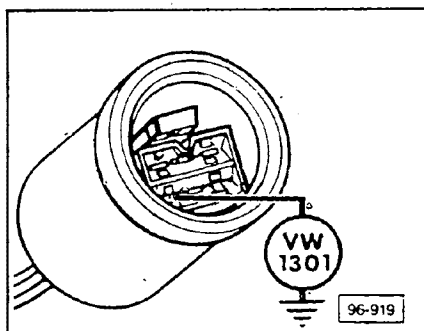
## Coolant temperature gauge, checking

### Electronic thermoswitch connections

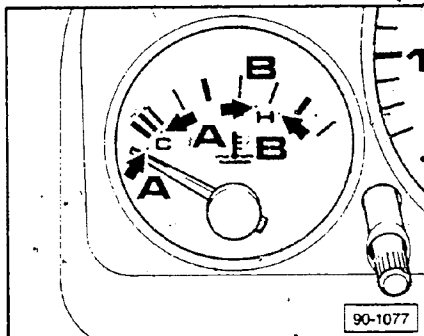
- + voltage supply, terminal 15a
- C to overheat warning lamp
- R to A/C control unit
- T to coolant temperature gauge

### Note

The electronic thermoswitch is located on the water flange on the cylinder head.



- remove connector from thermoswitch
- connect **VW 1301** to contact T and ground
- adjust **VW 1301** to 660

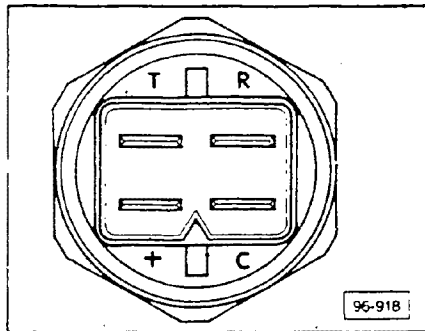


- switch ignition: **ON**
  - needle must stay in range A
- adjust **VW 1301** to 50
  - needle must stay in range B

### If NO

- check for break in wiring using current flow diagram
- check voltage stabilizer

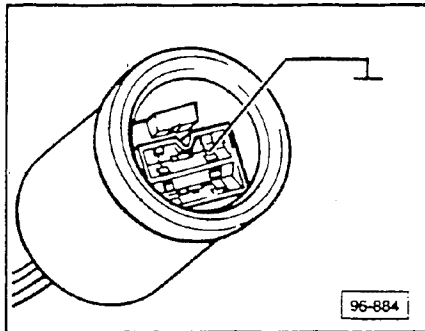
If specified values still cannot be reached,  
 ■ replace coolant temperature gauge



### Engine coolant overheating warning lamp, checking

#### Electronic thermoswitch connections

- + voltage supply, terminal 15a
- C to overheat warning lamp
- R to A/C control unit
- T to coolant temperature gauge



- remove connector from electronic thermoswitch
- connect contact **C** to ground with jumper wire
- switch ignition **ON**
  - overheating warning lamp flashes for approximately 30 seconds

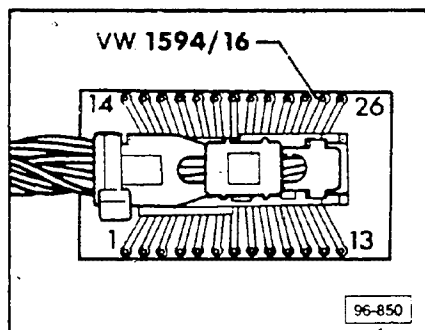
#### If **NO**

- check warning lamp **OR** repair break in wiring using current flow diagram

If warning lamp still does **NOT** flash

- replace instrument cluster printed circuit board

## Electrical System – Instruments



### Speedometer sender, checking

#### Note

The speedometer sender is located in the left hand side of the transmission housing near the drive axle flange.

- remove 26-point black connector from instrument cluster
- attach 26-point connector to measuring adapter **1594/16**
- connect digital multimeter **US 1119** between contacts **4** and **10**
- set multimeter to ohm range
- place transmission in neutral and apply parking brake
- secure vehicle with wheel chocks to prevent rolling
- raise left front of vehicle at proper lift point until wheel turns freely
- place jack stand under vehicle for safety
- slowly rotate wheel
  - reading must alternate between 0.0 ohm and  $\infty$  ohm

#### If NO

- repair break in wiring according to current flow diagram **OR** replace speed sensor

### Additional gauges, checking

#### Note

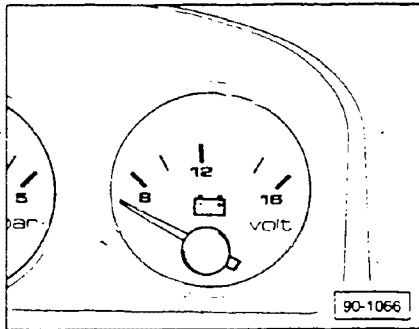
If the specified values are not obtained during the following tests,

- check for breaks in the wiring using the current flow diagram **OR** check voltage stabilizer

If wiring and voltage stabilizer are **OK**,

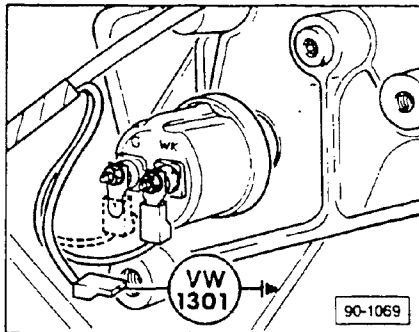
- replace the specific gauge being tested

## Electrical System – Instruments



### ▶ Voltmeter, checking

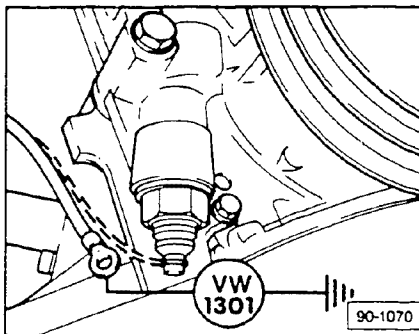
- switch ignition **ON**
  - approximately battery voltage



### ▶ Oil pressure gauge, checking

- remove connector **G** from oil pressure sender in left hand side of engine compartment
- attach **VW 1301** between connector and ground
- switch ignition **ON**
- adjust **VW 1301** to the following:

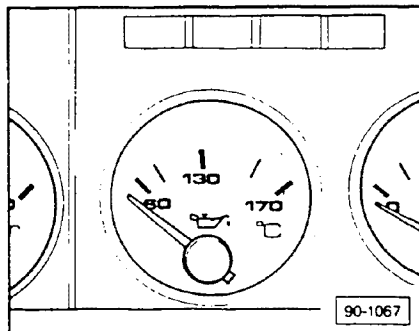
|     |                 |         |
|-----|-----------------|---------|
| 350 | gauge must show | 5.0 bar |
| 150 |                 | 2.0 bar |
| 10  |                 | 0.0 bar |



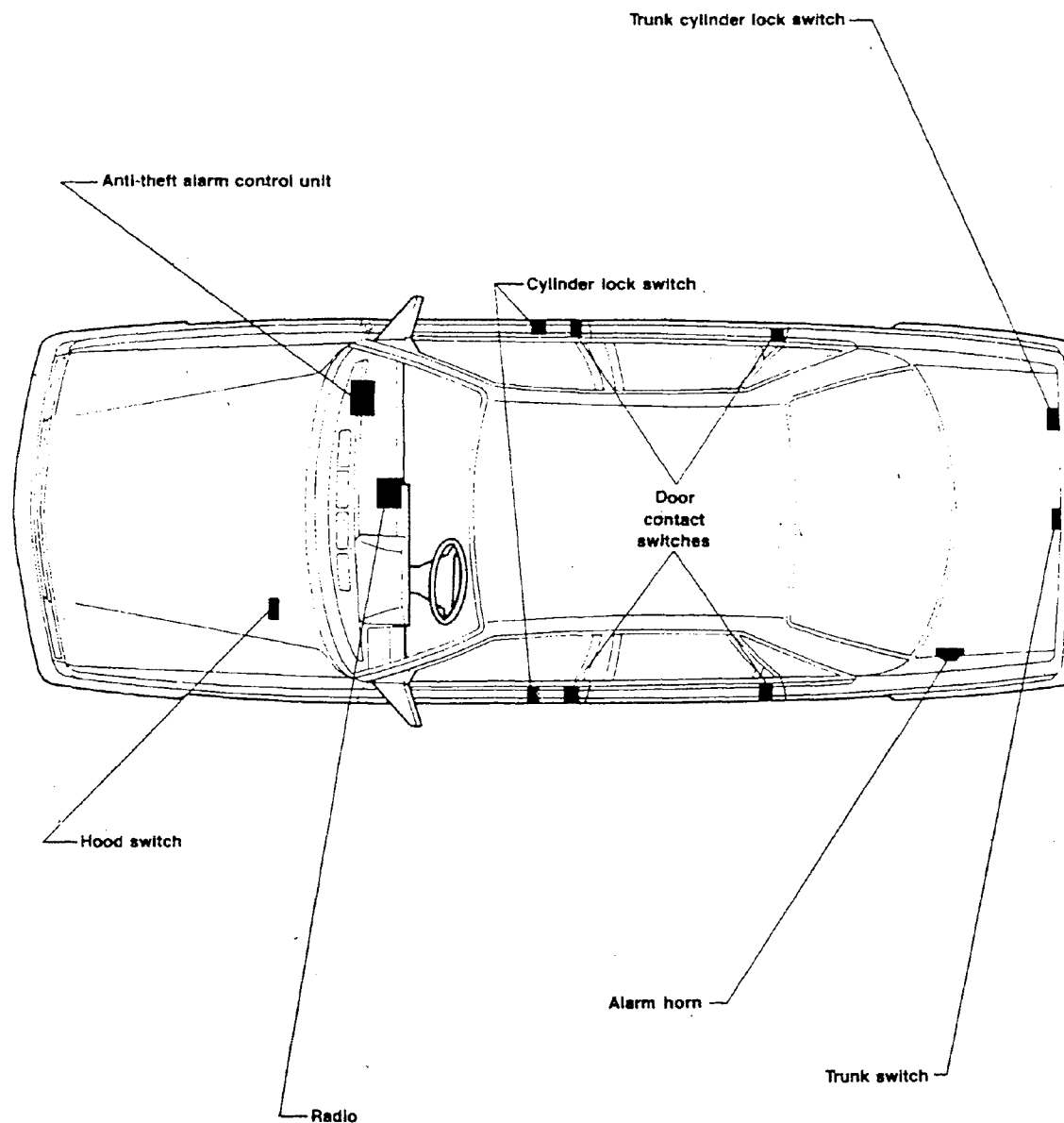
### ▶ Oil temperature gauge, checking

- remove connector from oil temperature sender (on oil pump)
- attach **VW 1301** between connector and ground
- switch ignition **ON**
- adjust **VW 1301** to the following:

|     |                 |               |
|-----|-----------------|---------------|
| 26  | gauge must show | 170°C (338°F) |
| 150 |                 | 130°C (266°F) |
| 690 |                 | 60°C (140°F)  |

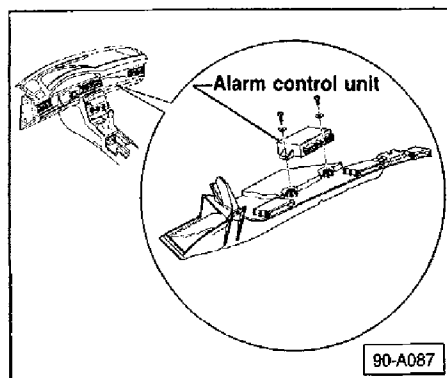


## Electrical System – Instruments



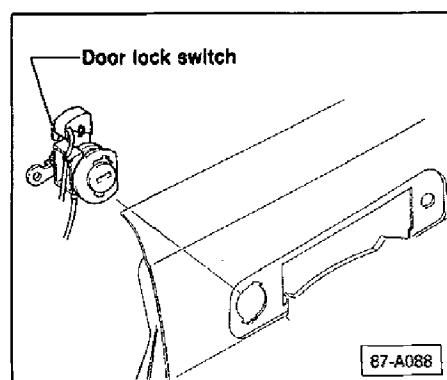
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## Electrical System – Instruments



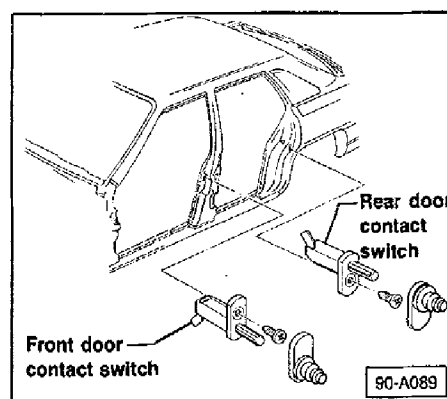
► Fig. 1 Anti-theft alarm control unit

Located under right side of instrument panel behind glove compartment.



► Fig. 2 Door lock switches

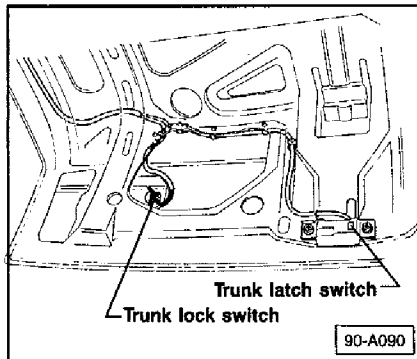
Door lock switches turn system **ON** and **OFF**.  
Switches are located in both front doors.



► Fig. 3 Door contact switches

These switches are the same switches that operate the interior lights.

## Electrical System – Instruments



► Fig. 4 Trunk switches

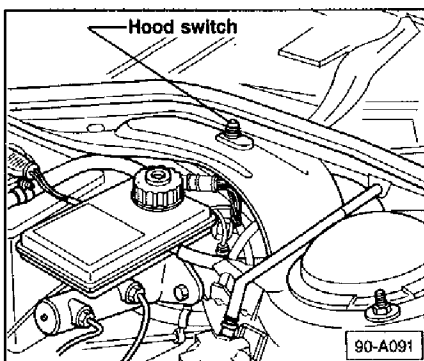
**A — Trunk lock cylinder switch**

The trunk lock cylinder switch is closed and completes a ground circuit whenever the trunk is opened with the key.

This allows trunk to be opened without activating the alarm.

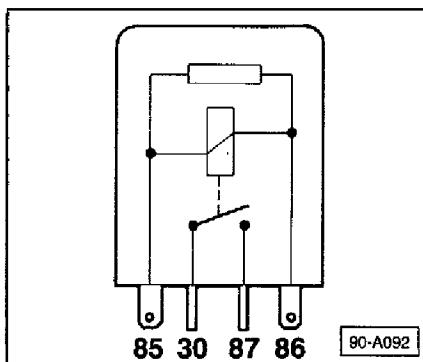
**B — Trunk latch switch**

The trunk latch switch is mounted with a bracket on the inside of the latch assembly. The switch is closed when the latch is open (trunk open) and completes a ground circuit.



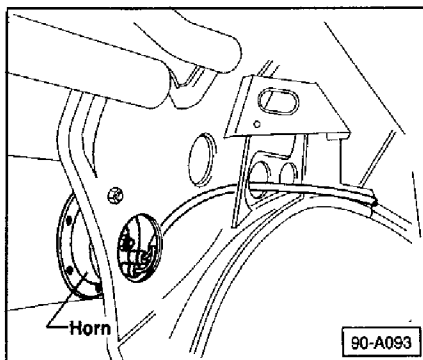
► Fig. 5 Hood switch

The switch closes and completes a ground circuit when the hood is opened. This activates the alarm if it is switched **ON**.



► Fig. 6 Starter relay

This relay supplies power to the starter. Terminal **86** of the relay received power from Terminal **50** of the ignition switch. Terminal **85** of the relay receives a ground from the alarm control unit.



► Fig. 7 Anti-theft alarm horn

Located in the luggage compartment above the left rear wheel housing.

### Anti-theft alarm system, troubleshooting

- check the following first:
  - battery fully charged
  - fuses S4, S12 OK
- remove cover under glove compartment
- remove glove compartment
- disconnect 3-point and 12-point connectors from Anti-theft control unit

All measurements are performed with **US 1119**.

If all measurements are within specifications and Anti-theft system does not work

- replace Anti-theft control unit

more

## Electrical System – Instruments

| Test step | Item to be tested                                                         | Test conditions                                                                                                                                                                                                                      | Specified value | Cause of problem                                                                                                                                                                             |
|-----------|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1         | Power supply                                                              | <ul style="list-style-type: none"> <li>connect voltmeter between cavities 1 and 2 of 3-point connector at Anti-theft control unit</li> </ul>                                                                                         | 12 Volts        | If <b>NOT OK</b> <ul style="list-style-type: none"> <li>repair break in wiring using wiring diagram</li> </ul>                                                                               |
| 2         | Ignition power supply                                                     | <ul style="list-style-type: none"> <li>connect voltmeter between cavity 7 of 12-point connector and cavity 1 of 3-point connector</li> </ul>                                                                                         | 12 Volts        | If <b>NOT OK</b> <ul style="list-style-type: none"> <li>repair break in wiring using wiring diagram</li> <li><b>OR</b></li> <li>replace ignition switch</li> </ul>                           |
| 3         | Horn control                                                              | <ul style="list-style-type: none"> <li>bridge cavities 2 and 3 of 3-point connector</li> </ul>                                                                                                                                       | Horn sounds     | If <b>NOT OK</b> <ul style="list-style-type: none"> <li>repair break in wiring using wiring diagram</li> <li><b>OR</b></li> <li>replace horn</li> </ul>                                      |
| 4         | Starter circuit<br><br><b>Note</b><br>Gear selector must be in "P" or "N" | <ul style="list-style-type: none"> <li>bridge cavity 1 of 3-point connector and cavity 1 of 12-point connector</li> </ul>                                                                                                            | Starter cranks  | If <b>NOT OK</b> <ul style="list-style-type: none"> <li>repair break in wiring using wiring diagram</li> <li><b>OR</b></li> <li>replace defective relay, starter or ignition lock</li> </ul> |
| 5         | Signal from driver's or passenger's door "system ON"                      | <ul style="list-style-type: none"> <li>connect voltmeter between cavity 2 of 3-point connector and cavity 8 of 12-point connector</li> <li>close door</li> <li>insert key in cylinder</li> <li>turn and hold against stop</li> </ul> | 12 Volts        | If <b>NOT OK</b> <ul style="list-style-type: none"> <li>repair break in wiring using wiring diagram</li> <li><b>OR</b></li> <li>replace defective door switch</li> </ul>                     |

## Electrical System – Instruments

| Test step | Item to be tested                                        | Test conditions                                                                                                                                                                                                                              | Specified value                     | Cause of problem                                                                                                                                                                                                 |
|-----------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ⑥         | Signal from driver's or passenger's door<br>"system OFF" | <ul style="list-style-type: none"> <li>■ connect voltmeter between cavity 2 of 3-point connector and cavity 3 of 12-point connector</li> <li>■ close door</li> <li>■ insert key in cylinder</li> <li>■ turn and hold against stop</li> </ul> | 12 Volts                            | <ul style="list-style-type: none"> <li>■ repair break in wiring using wiring diagram</li> <li style="text-align: center;"><b>OR</b></li> <li>■ replace defective door switch</li> </ul>                          |
| ⑦         | Signal<br>"hood OPEN"                                    | <ul style="list-style-type: none"> <li>■ connect voltmeter between cavity 2 of 3-point connector and cavity 4 of 12-point connector</li> </ul>                                                                                               | hood open: 12V<br>hood closed: 0V   | If <b>NOT OK</b> <ul style="list-style-type: none"> <li>■ repair break in wiring using wiring diagram</li> <li style="text-align: center;"><b>OR</b></li> <li>■ replace defective hood switch</li> </ul>         |
| ⑧         | Signal<br>"doors OPEN"                                   | <ul style="list-style-type: none"> <li>■ connect voltmeter between cavity 2 of 3-point connector and cavity 5 of 12-point connector</li> </ul>                                                                                               | doors closed: 0V<br>door open: 12V  | If <b>NOT OK</b> <ul style="list-style-type: none"> <li>■ repair break in wiring using wiring diagram</li> <li style="text-align: center;"><b>OR</b></li> <li>■ replace defective door contact switch</li> </ul> |
| ⑨         | Signal                                                   | <ul style="list-style-type: none"> <li>■ connect voltmeter between cavity 2 of 3-point connector and cavity 9 of 12-point connector</li> </ul>                                                                                               | trunk closed: 0V<br>trunk open: 12V | If <b>NOT OK</b> <ul style="list-style-type: none"> <li>■ repair break in wiring using wiring diagram</li> <li style="text-align: center;"><b>OR</b></li> <li>■ replace defective trunk switch</li> </ul>        |
| ⑩         | Signal from trunk lock cylinder<br>"alarm OFF"           | <ul style="list-style-type: none"> <li>■ connect voltmeter between cavity 2 of 3-point connector and cavity 10 of 12-point connector</li> <li>■ unlock trunk and hold key against stop</li> </ul>                                            | 12V                                 | If <b>NOT OK</b> <ul style="list-style-type: none"> <li>■ repair break in wiring using wiring diagram</li> <li style="text-align: center;"><b>OR</b></li> <li>■ replace defective trunk lock cylinder</li> </ul> |

## This is what's new:

Since the last filming of this fiche, we added or changed:

### Group 91

- integrated TB 91-91-07,  
CD changer, troubleshooting
- added telephone repair and  
troubleshooting information  
for the first time

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