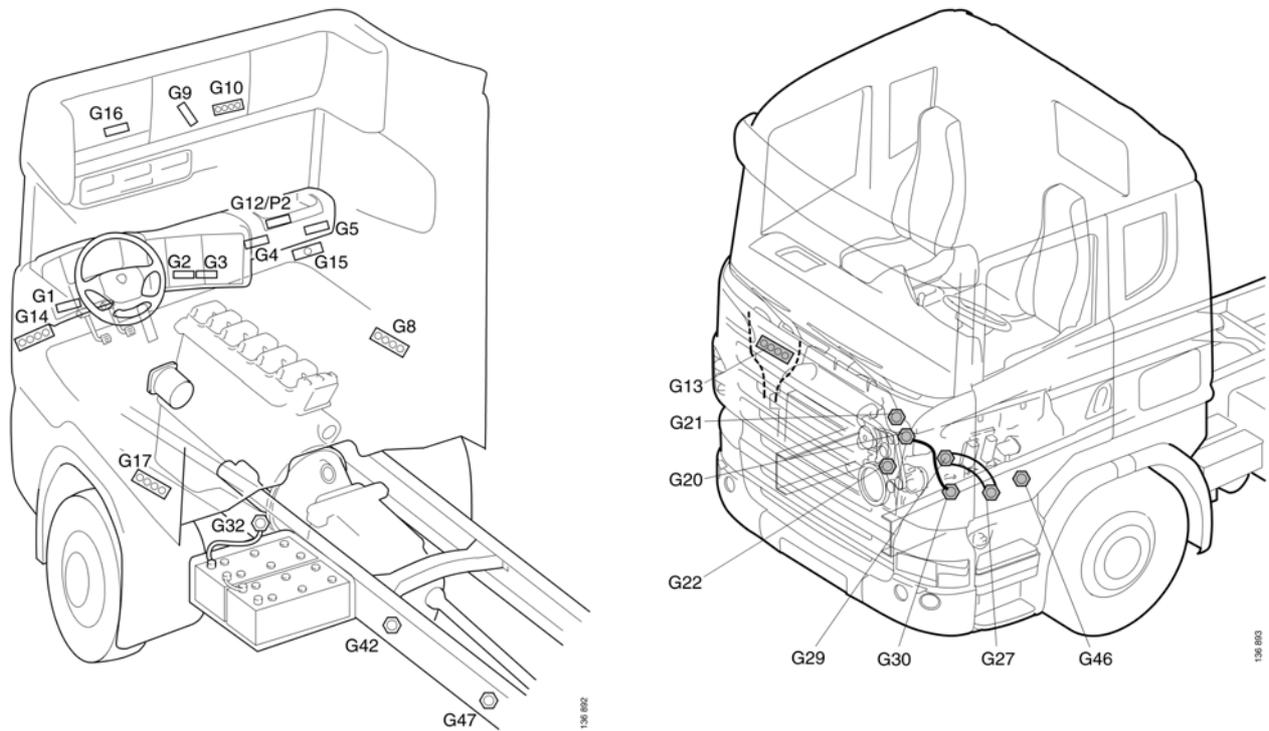


---

# Contents

Introduction	3
Electrical system in P, R and T series	4
DEC system	6
ECU system	7
CAN network	12
Overload on the CAN buses	12
Activation of the control unit	12
Vehicle internal time	13
ECU settings	14
Cable harness	15
Power supply	16
Positive supply	18
Moulded cables	19
Earthing	20
Connectors	24
User functions	26
Wiring Diagrams	28
Central electric unit	34
Repairing cables	35
Troubleshooting	40
Communication problems on the CAN buses	55
Abbreviations	67

# Earthing

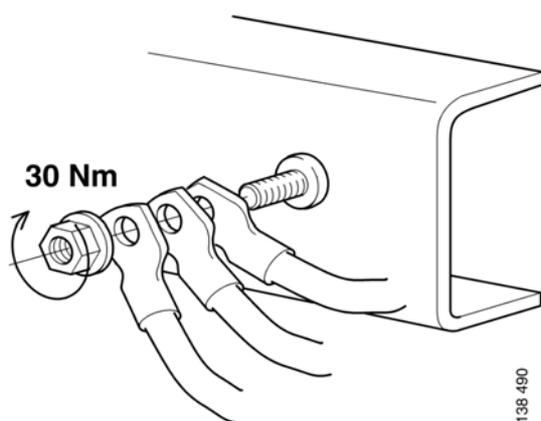


The main earthing lines are the left-hand frame member, engine and gearbox block, and the cab structure. To improve contact with the frame member, Scania has introduced a new earth bolt that is pressed firmly into the frame member. Scania has also introduced special earthing points on the frame for bodybuilders (G46 and G47).

Most of the components on and behind the instrument panel are earthed to one of the 21-pole earthing blocks (G1-G5) that are distributed behind the instrument panel. From each of these blocks a common cable runs to earthing points in the cab structure (G10, G14, G15). The earth cables are connected to these earthing points with ring terminals. The most important components and the components consuming most current are earthed directly to these earthing points. These earthing points can be found e.g. in the roof and the lower part of the A-pillars.

## Fitting the frame earth bolt

A maximum of three ring terminals should be connected to avoid an overload on the earthing point. If you need to connect more ring terminals, you must fit more earthing points.



*Earth connection nut, part number: 815133*

*A maximum of three ring terminals may be connected to each earth bolt. At least 1 turn of the bolt thread should be visible on the tightened joint. The earth connection nut is tightened to 30 Nm using a hand tool.*

## Fitting the frame earth bolt

If the earth bolt has broken or provides a poor contact with the vehicle, it must be renewed. Contact is provided between the grooves in the bolt and the frame member.

Note that the quality of the hole is crucial for a good electrical connection. Therefore any rust or paint in the hole must be removed before a new earth bolt can be fitted.

The hole must be checked before a new earth bolt is fitted, regardless of whether you are using the old hole or drilling a new one. If the hole is not within the tolerances, 14.2 mm  $\pm$ 0.1 mm, a new hole must be drilled.

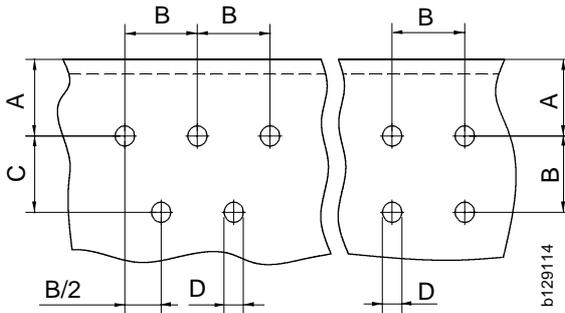
If a new hole has to be made, it should be drilled/reamed in stages up to the final diameter.

It is important for the hole to be made at right angles to the frame and for the hole to be as cylindrical as possible.

## Drilling holes

The pre-drilled holes should be used whenever possible.

If new holes have to be drilled closer to an existing hole than the picture shows, the existing holes should be welded closed, refer to the Bodywork Manual.

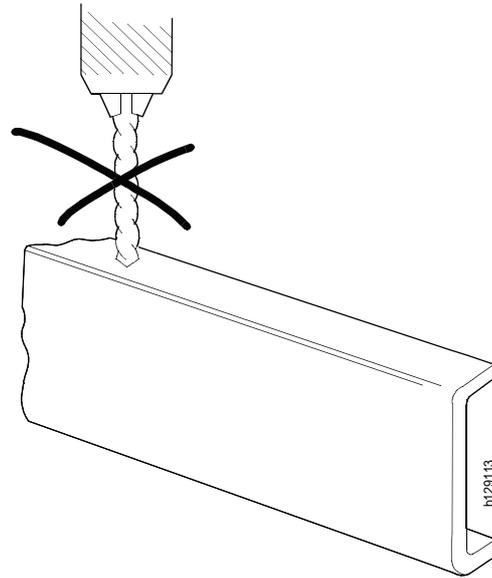


A. Distance hole - frame flange should be at least  $3 \times D$  and also at least 40 mm.

B. Minimum  $4 \times D$ .

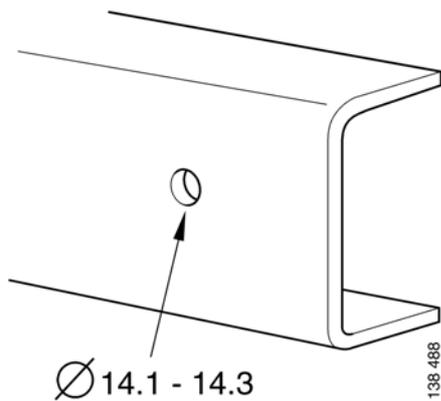
C. Minimum  $3 \times D$ .

**IMPORTANT!** It is not permitted to drill holes in the frame flanges.



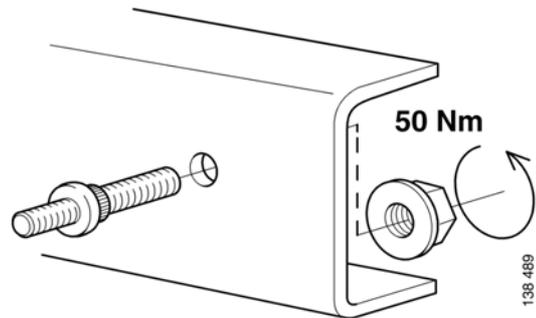
Holes are only to be drilled in the web of the side members. The strength and service life of the frame can be drastically affected by an incorrectly positioned hole. The only exceptions to this are holes drilled in the front part of the frame and in the rear overhang in areas where the loads are low.

## Hole diameter for earth bolt



*NB! The hole must be within the tolerance  $14.2 \text{ mm} \pm 0.1 \text{ mm}$ . If the hole is too large, the contact surface will be too small and this will result in too poor a connection.*

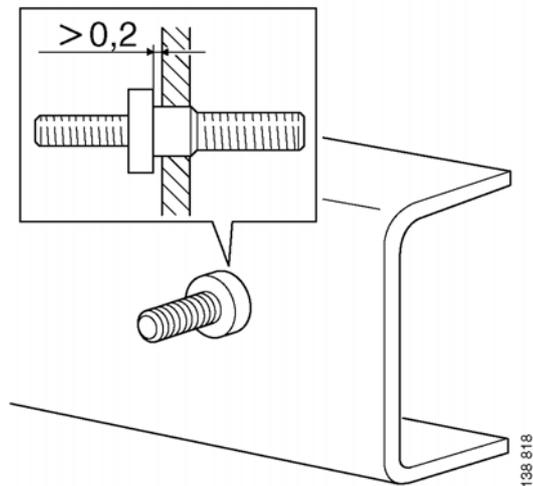
The nut is tightened using a hand tool until the earth bolt flange is in contact with the frame, but to a maximum of 50 Nm. If the nut is tightened more than this, there is a risk of the bolt breaking. If the earth bolt can be tightened quite easily in the frame, this indicates that the hole is too large. The grooves on the earth bolt must be in good contact with the frame.



Frame earth bolt part No: 1743995

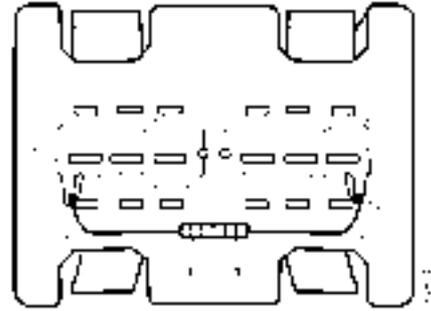
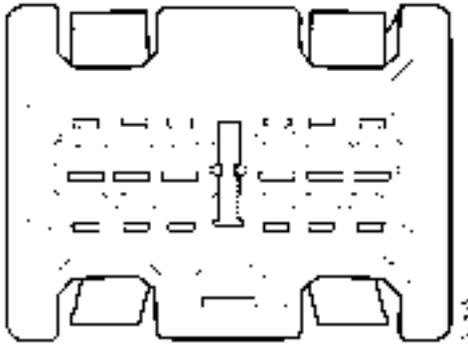
Flange nut part No: 815134

## Check

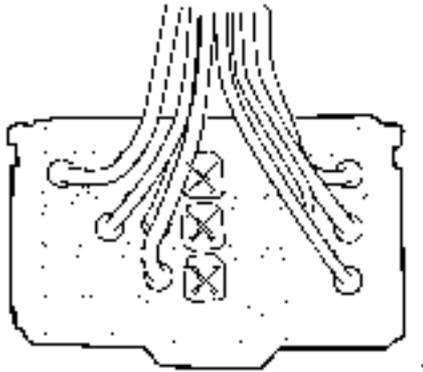


*The clearance between the earth bolt flange and the frame should be a maximum of 0.2 mm. If the clearance is greater than this, the hole is too small. Tap out the bolt, ream the hole to the correct size and fit a new earth bolt.*

CAN bus connection block

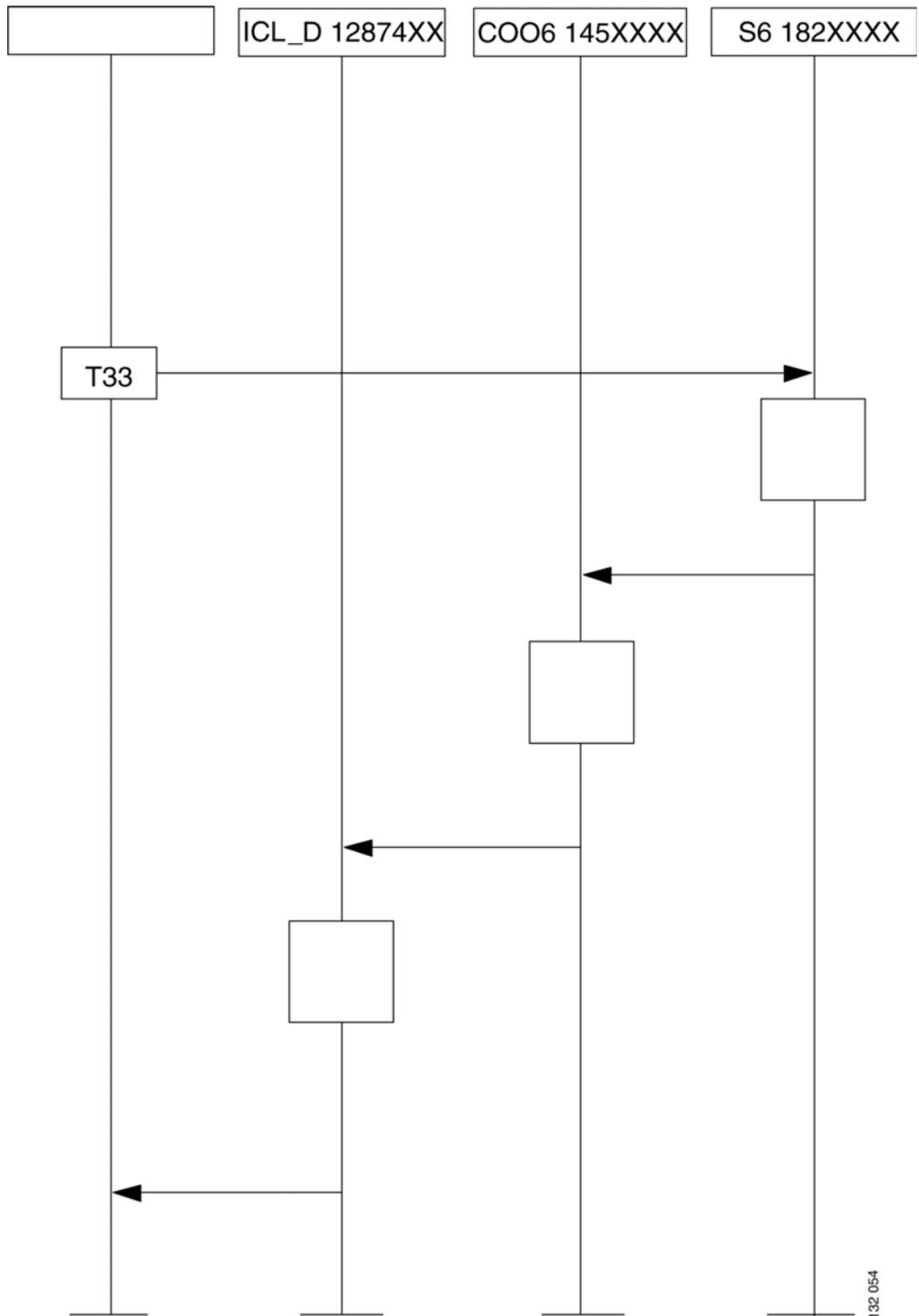


*Some of the CAN bus connection blocks are fitted with termination resistors. Renew the connection block if the termination resistor is faulty.*



*The middle row on the CAN bus connection block is inactive. Do not connect any equipment there.*

Function diagrams

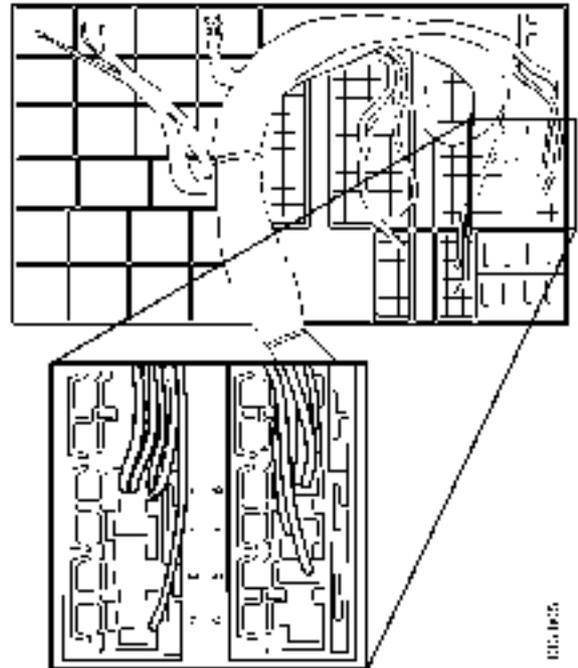
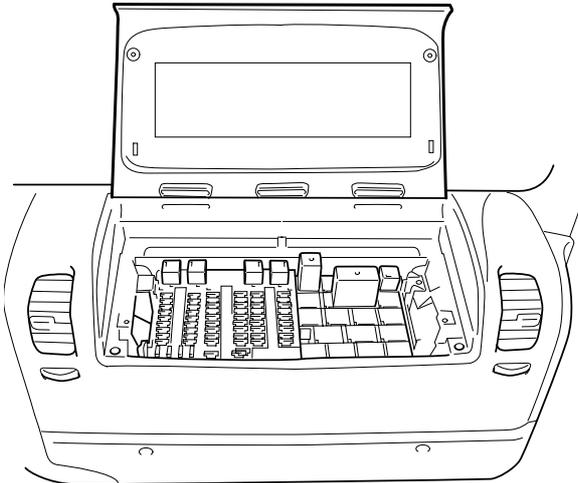


132 054

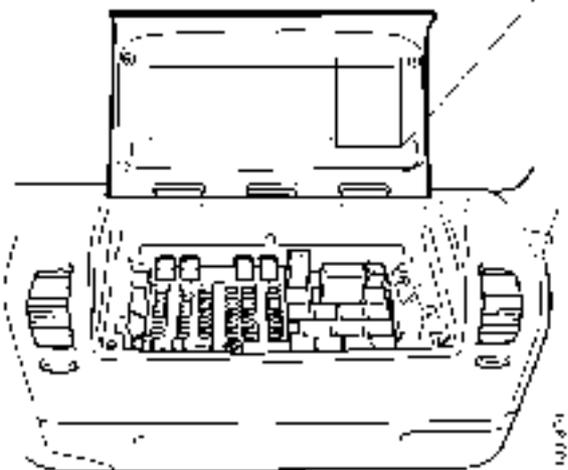
*Coolant temperature display: The engine control unit reads the value on the coolant temperature sensor. The information is then sent via the coordinator to the instrument cluster.*

# Central electric unit

The central electric unit (P2) distributes power to other systems and functions in the vehicle. Each connection is normally protected by a fuse and receives power supply via relays in the central electric unit.



100	100
101	101
102	102
103	103
104	104
105	105
106	106
107	107
108	108
109	109
110	110
111	111
112	112
113	113
114	114
115	115
116	116
117	117
118	118
119	119
120	120
121	121
122	122
123	123
124	124
125	125
126	126
127	127
128	128
129	129
130	130
131	131
132	132
133	133
134	134
135	135
136	136
137	137
138	138
139	139
140	140
141	141
142	142
143	143
144	144
145	145
146	146
147	147
148	148
149	149
150	150
151	151
152	152
153	153
154	154
155	155
156	156
157	157
158	158
159	159
160	160
161	161
162	162
163	163
164	164
165	165
166	166
167	167
168	168
169	169
170	170
171	171
172	172
173	173
174	174
175	175
176	176
177	177
178	178
179	179
180	180
181	181
182	182
183	183
184	184
185	185
186	186
187	187
188	188
189	189
190	190
191	191
192	192
193	193
194	194
195	195
196	196
197	197
198	198
199	199
200	200



The central electric unit is also numbered underneath. For connection of accessories, please refer to the Bodywork Manual.

A table showing the location and numbering of the fuses and relays is provided inside the cover of the central electric unit.

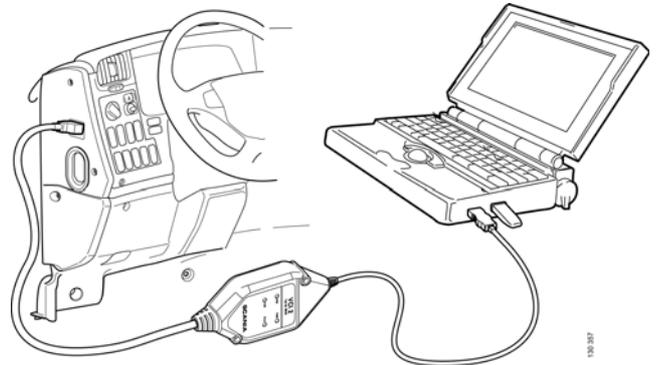
---

# Troubleshooting

## Troubleshooting using SDP

A PC-based diagnosis and programming tool is available for troubleshooting the ECU systems (SDP3). To be able to use SDP3 on a vehicle, an interface (VCI) and a hardware key (USB dongle) are required.

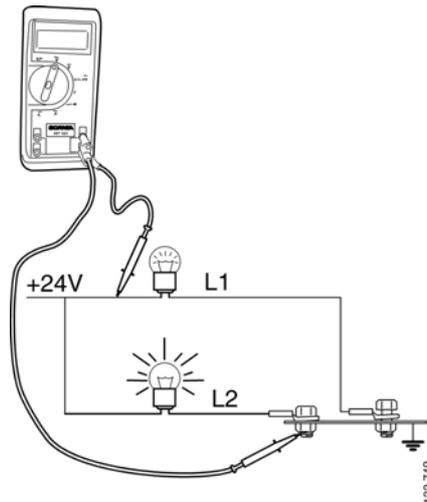
Unlike the 4-series, the VCI is now connected directly to a CAN bus (the green CAN bus). The VCI that is needed is called "VCI 2" and will only work on the PRT series vehicles. Refer also to the user instructions for SD3.



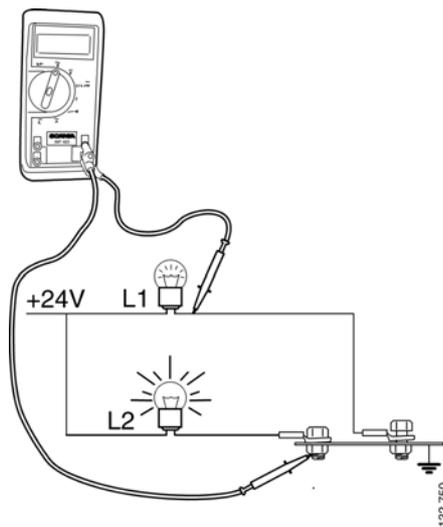
## Earth fault

Earth faults in the light circuits or circuits with warning lamps are frequently recognised because the lamps do not come on at full output.

Check using the same method as for a voltage drop.



*Good earth connection to the multimeter.  
Correct voltage to L1, but the lamp is glowing faintly.*

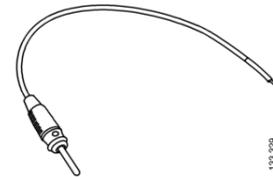
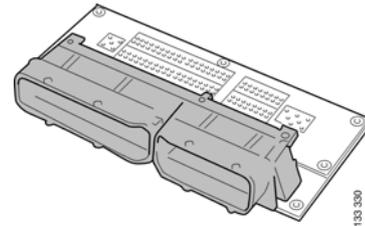
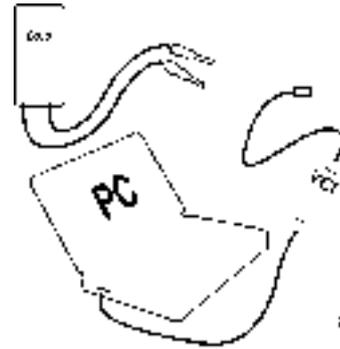


*Good earth connection to the multimeter.  
Faulty earth connection to L1. The multimeter shows a low value and the lamp L1 is glowing faintly.*

For troubleshooting you need

- SDP3 + VCI
- Measurement adapter kit 99511
- Multimeter
- Chart of the location of the control units on the CAN buses (see page 64).
- Fault code descriptions.

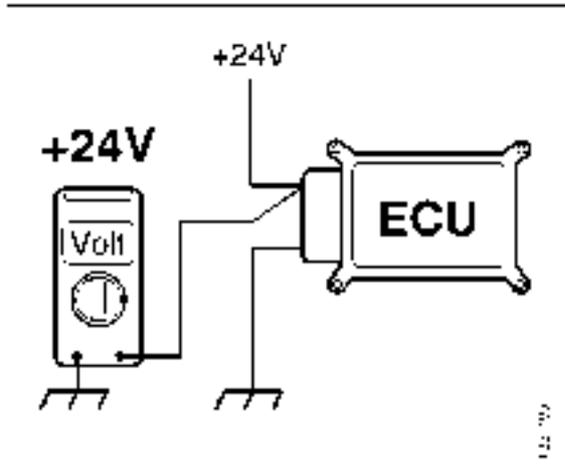
If SDP3 has not identified any control units, you will not obtain any fault code description in the program. This can be resolved by going to the SDP3 menu under "view" and "search for fault codes". There you can obtain a list with fault code descriptions for each supplementary number. You can find the supplementary number via the diagnostics position (IVD) on the instrument cluster (ICL), provided that the instrument can establish contact with the control units and that there are fault codes present. However, the instrument cluster always shows which systems it expects to receive a response from, i.e. which systems are fitted on the vehicle. If there are no fault codes, the instrument will respond with "no errors" and if the instrument cannot establish contact it will respond with "no contact".



In this case, however, it is not the fault codes that are most important, since it is the communication we want to test. If the instrument cluster responds with "no errors", this means that communication is working. Systems such as CTS, ATA, WTA and AUS must be running in order to establish contact with them

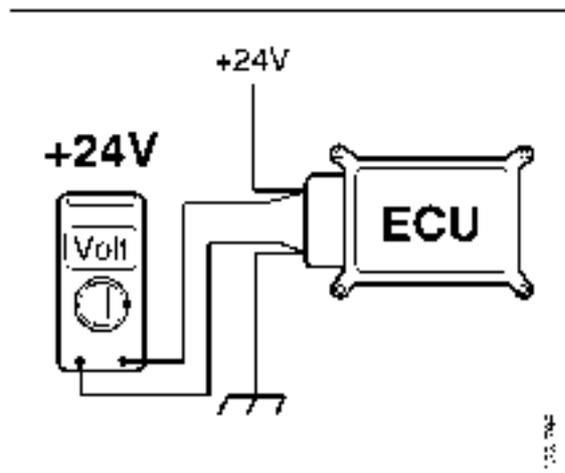
With drive position on and the systems active, you can measure as follows.

Diagram 1



*This measurement is carried out to make sure that the correct voltage is supplied to the component. If it already shows low, you must check the battery voltage. The control units may have fault codes for low supply voltages.*

Measurement 2a



*If the result is as above, the problem is in the connection. This is very unusual on control units located in the cab but occurs in bulb holders. It is easy to see if there is a problem on a lamp but it is very difficult to measure on a control unit. It is necessary to rely on fault codes. If, however, the measurement gives, for example, 21V and measurement 1 gives 24V, the fault is in the earth cable.*