

5.5.3 Overview of fault messages

The following table gives a brief description of all possible fault messages. Below the table a more detailed description of each message can be found.

Code no.	Number of flashes	Description
1	1	Emergency steering system pressure too low, $v > 5$ km/h
2	2	Oil level too low
3.1	3	Left-rear target-actual discrepancy too large
3.2	3	Right-rear target-actual discrepancy too large
4	4	Speed measured too irregular
5.1	5	Value of front corner sensor too small
5.2	5	Value of front angle sensor too large
6.1	6	Value of length sensor in left-rear cylinder too small
6.2	6	Value of length sensor in left-rear cylinder too large
7.1	7	Value of length sensor in right-rear cylinder too small
7.2	7	Value of length sensor in right-rear cylinder too large
8.1	8	Wire breakage/short-circuit in SP1
8.2	8	Wire breakage/short-circuit in SP2
8.3	8	Wire breakage/short-circuit in SP3
8.4	8	Wire breakage/short-circuit in SP4
9	9	Wire breakage/short-circuit in SP5.1 and/or SP5.2
10	10	Wire breakage/short-circuit in SP7
11.1	11	Wire breakage/short-circuit in SP8
11.2	11	Wire breakage/short-circuit in SP9
11.3	11	Wire breakage/short-circuit in SP10
11.4	11	Wire breakage/short-circuit in SP11
12	12	Wire breakage/short-circuit in SP12
13	13	Wire breakage/short-circuit in SP13
14	14	Wire breakage/short-circuit in SP6.1 and/or SP6.2
15	15	Lateral levelling and height control activated simultaneously
16.1	16	Both proximity switches on left activated
16.2	16	Both proximity switches on right activated
17	17	Both level sensors activated
18	18	Wire breakage/short-circuit in SP14
19	19	Wire breakage/short-circuit in SP15.1 and/or SP15.2
20	0 (via DCS-1)	Correction factors no longer valid

Fault code 1

The pressure in the emergency steering system is monitored by the pressure switch mounted on DS1 or DS (depending on vehicle type and superstructure). If this pressure becomes too low, the pressure switch switches after approx. 8 sec. provided the speed is in excess of 5 km/h. Below 5 km/h no fault message is triggered because owing to

slight internal leakage oil may leak out of the emergency steering system while the ignition is on and the engine off.

When the pressure switch switches, the steering system is put in the straight-ahead position and bypass valve SP12 is activated in order to compensate for the leak. If this is not successful within approx. 3 sec. at $v = 5$ to 45 km/h, a fault message is generated: the main steering system ensures that the axle is put in the straight-ahead position.

Fault code 2

If the oil level as measured with a float switch remains below the minimum for longer than 10 seconds, a fault message is generated and the emergency steering system is activated in order to steer the rear axle to the centre position. The HPVS control system is also deactivated. Lowest position and lowering lifting axle (if fitted) are operations that are still possible!

Fault code 3.1

The ECU continuously examines whether the difference between the desired value (target) and the actual value (actual) is not too large. The difference between these values can also be too large without this being due to a fault, for example if the ignition is on with the engine off. This is why no check is run at $v < 5$ km/h.

It may also happen that with rapid steering and a low engine speed the rear axle cannot steer quickly enough. In this situation the system must not generate a fault message. A target-actual fault message may arise as a result of another fault, for example wire breakage in the angle sensor at left or right rear. The emergency steering system is activated until the axle is in the straight-ahead position. SP5.1 and SP5.2 are not activated, not even at high speed. The reason for this is that when bypass valve SP12 is activated for, say, HPVS the cylinders will still attempt to steer against the locked emergency steering system if, for instance, a steering valve (SP1 to 4) is jammed in the switched state.

(Before mid-1993 SP5.1 and SP5.2 were activated at high speed when this fault code was generated).

Fault code 3.2

As for fault code 3.1, for right rear.

Fault code 4

The ECU receives the speed signal via D3 in the tachograph or via the DAF system's CTE (central time unit). The pulses from D3 or from the CTE are not received, or only very irregularly, on the ECU. The system reacts as for fault code 3.1, though now with dual locking by activation of SP5.1 and SP5.2.

Fault code 5.1

Wire breakage or short-circuit in the circuit of the front angle sensor. The system reacts as for fault code 4.

Fault code 5.2

Wire breakage or short-circuit in the circuit of the front angle sensor. The system reacts as for fault code 4.

Fault code 6.1

Wire breakage or short-circuit in the circuit of the length sensor in the left rear cylinder. The system reacts as for fault code 3.1.

Fault code 6.2

Wire breakage or short-circuit in the circuit of the length sensor in the left rear cylinder. The system reacts as for fault code 3.1.

Fault code 7.1

Wire breakage or short-circuit in the circuit of the length sensor in the right rear cylinder. The system reacts as for fault code 3.1.

Fault code 7.2

Wire breakage or short-circuit in the circuit of the length sensor in the right rear cylinder. The system reacts as for fault code 3.1.

Fault code 8.1

A check is run for this when the valve is activated. Voltage must be constantly present for approx. 1 sec. The system reacts as for fault code 4.

Fault code 8.2

As for fault code 8.1, for SP2.

Fault code 8.3

As for fault code 8.1, for SP3.

Fault code 8.4

As for fault code 8.1, for SP4.

Fault code 9

A check is run for this when the valve is activated. Voltage must be constantly present for approx. 1 sec. The system reacts as for fault code 3.1.

Fault code 10

A check is run for this when the valve is activated. Voltage must be constantly present for approx. 1 sec. The system reacts as for fault code 4.

Fault code 11.1

A check is run for this when the valve is activated. Voltage must be constantly present for approx. 1 sec. The steering system remains activated.

Fault code 11.2

As for fault code 11.1, for SP9.

Fault code 11.3

As for fault code 11.1, for SP10.

Fault code 11.4

As for fault code 11.1, for SP11.

Fault code 12

A check is run for this when the valve is activated. Voltage must be constantly present for approx. 1 sec. The system reacts as for fault code 2.

Fault code 13

Hier wordt op gecontroleerd wanneer de klep wordt aangestuurd. Er moet ca. 1 sec. A check is run for this when the valve is activated. Voltage must be constantly present for approx. 1 sec. The system remains activated, the buzzer gives a signal.

Note: on M series, and from end of 1993, SP13 is no longer fitted.

Fault code 14

A check is run for this when the valve is activated. Voltage must be constantly present for approx. 1 sec. Where superstab is fitted: as for fault code 11.1, otherwise the system continues to work as normal.

Fault code 15

Height and lateral levelling control systems are deactivated, steering system continues to function.

Note: on vehicles with 'spring-loaded switches' this fault code is not possible.

Fault code 16.1

Height control is deactivated, lateral levelling control and steering system are working normally.

Fault code 16.2

As for fault code 16.2, for right-hand side.

Fault code 17

Lateral levelling control is deactivated, height control and steering system are working normally.

Fault code 18

A check is run for this when the valve is activated. Voltage must be constantly present for approx. 1 sec. Raising the lifting axle is deactivated.

Fault code 19

A check is run for this when the valve is activated. Voltage must be constantly present for approx. 1 sec. Raising and lowering the lifting axle are deactivated.

Fault code 20

This fault code can only be displayed by means of DCS-1. The correction factors stored in the ECU are no longer valid. The computer then uses the default values to make calculations, as though ideal sensors were fitted. No system reaction (also no buzzer).

Remarks:

The system's reaction in the event of a particular fault message applies only to that specific fault message. It may be that one fault message is the result of another fault message. Example: fault code 1: leakage in emergency steering system - as a result, oil level too low after a while: fault code 2. **If several fault messages are given, then, it is important to find the primary cause during diagnostics!**

From end of 1995: some fault messages only become active when they have occurred 5x in quick succession. After a fault message the system resets itself and on the 5th time the fault is reported to the driver. Obviously this does not apply to fault messages that could be dangerous, such as AL1, AL2 (emergency steering pressure too low, oil level too low respectively) and AL20 (correction factors no longer valid).

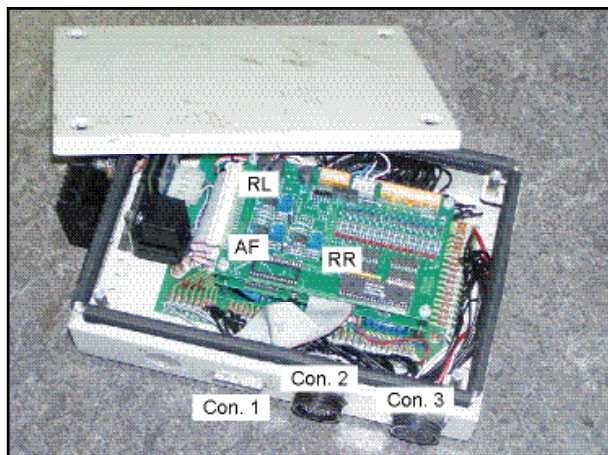
In general, the driver will get a signal when a fault occurs or has occurred. In the case of EVS faults, both the alarm lamp and the buzzer will be activated, while in the event of HPVS faults only the alarm lamp will come on.

5.6 Electrical diagrams

The circuit diagrams are arranged in such a way that the ECU is considered to be a black box. This means that only the connections that are outside the ECU are shown. The diagrams are also split into section diagrams so as to make things easier to read.

The colour of the wiring can be identified in the diagrams by a code consisting of the first and last letters of the colour, e.g. "red" = "rd", etc.

5.6.1 Overview of connectors and trimming potentiometers in e3 ECU



Con. 1: Connector 1 (for DCS-1)

Con. 2: Connector 2

Con. 3: Connector 3

RL: Length sensor EVS cylinder left

RR: Length-sensor EVS cylinder right

AF: Front angle potentiometer

5.6.2 Overview of circuit diagrams for M series

Diagram number	Description
11314	Connection to coils for HPVS and EVS valves
11315	Connection to potentiometers
11316	Connection to height control system
11317	Connection to proximity switches
11318	Connection to warning lamps, buzzer and nightlight switches
11319	Connection to lateral levelling control system, pressure switches, float switch, flow indicator, tachograph
11320	Power supply to ECU
11321	Power supply to ECU with lifting axle
13128	Connection to container lifting system

The diagrams mentioned can be found on the following pages.

