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1. EBS FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

1.2 EXPLANATORY NOTES TO EBS FAULT CODES

If there is an electrical fault in the EBS system, the symptom "open circuit in EBS pressure control" or "deactivation of EBS pressure control" may occur as a system reaction.

Open circuit in EBS pressure control

On application of the foot brake valve, the electronic unit will receive information on the desired vehicle deceleration from the brake pedal position sensor in the foot brake valve.

In the electronic unit, this vehicle deceleration command is converted into brake pressure to the brake cylinders.

If there is no feedback from the output pressure or wheel speed, there will be less accurate electronically controlled deceleration and brake force distribution.

Deactivation of EBS pressure control

The output pressure control in the brake cylinders is entirely pneumatic; i.e. there is no more electronically controlled deceleration and brake force distribution.

Fault code	Fault code description with possible cause	Symptom
11-18	Voltage on pin A8 of the EBS unit is too low due to: - contact resistance or poor connection to pin A8 of the EBS unit	- ABS on front axle deactivated - ASR brake control deactivated - EBS pressure control on front axle and drawn vehicle deactivated
11-31	Extremely low voltage (<3 V) on pin A8 of the EBS unit due to: - excessive contact resistance on pin A8 of the EBS unit - interruption on pin A8 of the EBS unit	- ABS on front axle deactivated - ASR brake control deactivated - EBS pressure control on front axle and drawn vehicle deactivated
12-18	Voltage on pin A9 of the EBS unit is too low due to: - contact resistance or poor connection to pin A9 of the EBS unit - short circuit to earth on pin B7 of the EBS unit	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated
12-31	Extremely low voltage (<3 V) on pin A9 of the EBS unit due to: - excessive contact resistance on pin A9 of the EBS unit - interruption on pin A9 of the EBS unit	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated
	Short circuit to earth on pin E4 or B7 of the EBS unit	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated - Pin B7 is connected to earth inside the EBS unit while the power supply to A9 and E4 is interrupted inside the unit.

Fault code	Fault code description with possible cause	Symptom
13-18	Voltage on pin A7 of the EBS unit is too low due to: - contact resistance or poor connection to pin A7 of the EBS unit	- No noticeable system limitation in EBS
14-32	Sensor supply voltage on pins D9, B13 or E1 of the EBS unit due is too low due to: - contact resistance or poor connection on specified connection points of the EBS unit - short circuit to earth on specified connection points of the EBS unit	- No noticeable system limitation in EBS
14-33	Constant voltage, even if the ignition is turned off and the brake is not applied, on pin D9, B13 or E1 of the EBS unit due to: - short circuit to supply on specified connection points of the EBS unit	- No noticeable system limitation in EBS
15-33	Constant voltage, even if the ignition is turned off and the brake is not applied, on pin B7 of the EBS unit due to: - short circuit to supply on pin B7 of the EBS unit	- No noticeable system limitation in EBS
16-11	Internal failure in EBS electronic unit	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated
16-12	Configuration parameters in the electronic unit incorrect due to: - incorrect programming - retrofitted components without identification card (oxford) change	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated
16-15	Internal failure in EBS electronic unit	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated
16-17	Voltage (>32 V) on pins A7, A8 and A9 of the EBS unit is too high due to: - excessive alternator/battery voltage - inductive voltage of external component	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated
16-18	Voltage on pins A7, A8 and A9 of the EBS unit at a speed of >2 km/h is too low due to: - insufficient battery voltage - poor earth connection to EBS electronic unit	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated
16-53	Incorrect tyre size due to: - incorrectly programmed tyre size - tyre sizes of front and rear axles in different tyre classes without unit having been reprogrammed - The difference in peripheral speed between the left and right wheel on the same axle exceeds 10%	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated
21-37	Interruption on pin C4 and/or C5 of the EBS unit, wheel speed sensor (F513)	- ABS on front axle, right deactivated - ASR brake/engine control deactivated

EBS

EBS fault codes

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Fault code	Fault code description with possible cause	Symptom
21-38	Unacceptable wheel speed sensor frequency signal from wheel speed sensor (F513) on pins C4 and C5 of the EBS unit due to: <ul style="list-style-type: none"> - loose pole ring - wrong assessment by EBS unit 	<ul style="list-style-type: none"> - ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated
21-41	Short circuit to earth on pin C4 and/or C5 of the EBS unit, wheel speed sensor (F513)	<ul style="list-style-type: none"> - ABS on front axle, right deactivated - ASR brake/engine control deactivated
21-42	Short circuit to supply on pin C4 and/or C5 of the EBS unit, wheel speed sensor (F513)	<ul style="list-style-type: none"> - ABS on front axle, right deactivated - ASR brake/engine control deactivated
21-44	Short circuit on pin C4 and/or C5 of the EBS unit, wheel speed sensor (F513)	<ul style="list-style-type: none"> - ABS on front axle, right deactivated - ASR brake/engine control deactivated
21-45	Incorrect wheel speed sensor sine-wave signal from wheel speed sensor (F513) on pins C4 and C5 of the EBS unit due to: <ul style="list-style-type: none"> - distorted wheel speed sensor ring - damaged wheel speed sensor ring 	<ul style="list-style-type: none"> - ABS on front axle, right deactivated - ASR brake/engine control deactivated
21-46	No uniformity (frequency changes) of wheel speed sensor signal from wheel speed sensor (F513) on pins C4 and C5 of the EBS unit due to: <ul style="list-style-type: none"> - heavy point due to brake disc wobble, for example 	<ul style="list-style-type: none"> - ABS on front axle, right deactivated - ASR brake/engine control deactivated
21-47	Excessive oscillation of wheel speed sensor signal (maximum/minimum level) from wheel speed sensor (F513) on pins C4 and C5 of the EBS unit due to: <ul style="list-style-type: none"> - excessive wheel bearing play - incorrect mounting of wheel speed sensor ring 	<ul style="list-style-type: none"> - ABS on front axle, right deactivated - ASR brake/engine control deactivated
21-48	Minimum value of wheel speed sensor signal from wheel speed sensor (F513) on pins C4 and C5 of the EBS unit is too low due to: <ul style="list-style-type: none"> - too large an air gap between wheel speed sensor ring and wheel speed sensor - contact resistance on pin C4 and/or C5 of the EBS unit 	<ul style="list-style-type: none"> - ABS on front axle, right deactivated - ASR brake/engine control deactivated
22-37	Interruption on pin D7 and/or D8 of the EBS unit, wheel speed sensor (F512)	<ul style="list-style-type: none"> - ABS on front axle, left deactivated - ASR brake/engine control deactivated
22-38	Unacceptable wheel speed sensor frequency signal from wheel speed sensor (F512) on pins D7 and D8 of the EBS unit due to: <ul style="list-style-type: none"> - loose pole ring - wrong assessment by EBS unit 	<ul style="list-style-type: none"> - ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated
22-41	Short circuit to earth on pin D7 and/or D8 of the EBS unit, wheel speed sensor (F512)	<ul style="list-style-type: none"> - ABS on front axle, left deactivated - ASR brake/engine control deactivated
22-42	Short circuit to supply on pin D7 and/or D8 of the EBS unit, wheel speed sensor (F512)	<ul style="list-style-type: none"> - ABS on front axle, left deactivated - ASR brake/engine control deactivated
22-44	Short circuit on pin D7 and/or D8 of the EBS unit, wheel speed sensor (F512)	<ul style="list-style-type: none"> - ABS on front axle, left deactivated - ASR brake/engine control deactivated

Fault code	Fault code description with possible cause	Symptom
22-45	Incorrect wheel speed sensor sine-wave signal from wheel speed sensor (F512) on pins D7 and D8 of the EBS unit due to: <ul style="list-style-type: none"> - distorted wheel speed sensor ring - damaged wheel speed sensor ring 	<ul style="list-style-type: none"> - ABS on front axle, left deactivated - ASR brake/engine control deactivated
22-46	No uniformity (frequency changes) of wheel speed sensor signal from wheel speed sensor (F512) on pins D7 and D8 of the EBS unit due to: <ul style="list-style-type: none"> - heavy point due to brake disc wobble, for example 	<ul style="list-style-type: none"> - ABS on front axle, left deactivated - ASR brake/engine control deactivated
22-47	Excessive oscillation of wheel speed sensor signal (maximum/minimum level) from wheel speed sensor (F512) on pins D7 and D8 of the EBS unit due to: <ul style="list-style-type: none"> - excessive wheel bearing play - incorrect mounting of wheel speed sensor ring 	<ul style="list-style-type: none"> - ABS on front axle, left deactivated - ASR brake/engine control deactivated
22-48	Minimum value of wheel speed sensor signal from wheel speed sensor (F512) on pins D7 and D8 of the EBS unit is too low due to: <ul style="list-style-type: none"> - too large an air gap between wheel speed sensor ring and wheel speed sensor - contact resistance on pin D7 and/or D8 of the EBS unit 	<ul style="list-style-type: none"> - ABS on front axle, left deactivated - ASR brake/engine control deactivated
23-37	Interruption on pin B1 and/or B2 of the rear axle modulator (D879), wheel speed sensor (F515)	<ul style="list-style-type: none"> - ABS on rear axle, right deactivated - ASR brake/engine control deactivated
23-41	Short circuit to earth on pin B1 and/or B2 of the rear axle modulator (D879), wheel speed sensor (F515)	<ul style="list-style-type: none"> - ABS on rear axle, right deactivated - ASR brake/engine control deactivated
23-42	Short circuit to supply on pin B1 and/or B2 of the rear axle modulator (D879), wheel speed sensor (F515)	<ul style="list-style-type: none"> - ABS on rear axle, right deactivated - ASR brake/engine control deactivated
23-44	Short circuit between pins B1 and B2 of the rear axle modulator (D879), wheel speed sensor (F515)	<ul style="list-style-type: none"> - ABS on rear axle, right deactivated - ASR brake/engine control deactivated
23-45	Incorrect wheel speed sensor sine-wave signal from wheel speed sensor (F515) on pins B1 and B2 of the rear axle modulator (D879) due to: <ul style="list-style-type: none"> - distorted wheel speed sensor ring - damaged wheel speed sensor ring 	<ul style="list-style-type: none"> - ABS on rear axle, right deactivated - ASR brake/engine control deactivated
23-46	No uniformity (frequency changes) of wheel speed sensor signal from wheel speed sensor (F515) on pins B1 and B2 of the rear axle modulator (D879) due to: <ul style="list-style-type: none"> - excessive wheel bearing play - incorrect mounting of wheel speed sensor ring 	<ul style="list-style-type: none"> - ABS on rear axle, right deactivated - ASR brake/engine control deactivated

Fault code	Fault code description with possible cause	Symptom
23-47	Excessive oscillation of wheel speed sensor signal (maximum/minimum level) from wheel speed sensor (F515) on pins B1 and B2 of the rear axle modulator (D879) due to: <ul style="list-style-type: none"> - excessive wheel bearing play - incorrect mounting of wheel speed sensor ring 	<ul style="list-style-type: none"> - ABS on rear axle, right deactivated - ASR brake/engine control deactivated
23-48	Minimum value of wheel speed sensor signal from wheel speed sensor (F515) on pins B1 and B2 of the rear axle modulator (D879) is too low due to: <ul style="list-style-type: none"> - too large an air gap between wheel speed sensor ring and wheel speed sensor - contact resistance on pin B1 and/or B2 of the rear axle modulator 	<ul style="list-style-type: none"> - ABS on rear axle, right deactivated - ASR brake/engine control deactivated
24-37	Interruption in wheel speed sensor (F514) on pins C1 and C2 of the rear axle modulator (D879)	<ul style="list-style-type: none"> - ABS on rear axle, left deactivated - ASR brake/engine control deactivated
24-41	Short circuit to earth in wheel speed sensor (F514) on pins C1 and C2 of the rear axle modulator (D879)	<ul style="list-style-type: none"> - ABS on rear axle, left deactivated - ASR brake/engine control deactivated
24-42	Short circuit to supply in wheel speed sensor (F514) on pins C1 and C2 of the rear axle modulator (D879)	<ul style="list-style-type: none"> - ABS on rear axle, left deactivated - ASR brake/engine control deactivated
24-44	Short circuit between pins C1 and C2 of the rear axle modulator (D879), wheel speed sensor (F514)	<ul style="list-style-type: none"> - ABS on rear axle, left deactivated - ASR brake/engine control deactivated
24-45	Incorrect wheel speed sensor sine-wave signal from wheel speed sensor (F514) on pins C1 and C2 of the rear axle modulator (D879) due to: <ul style="list-style-type: none"> - distorted wheel speed sensor ring - damaged wheel speed sensor ring 	<ul style="list-style-type: none"> - ABS on rear axle, left deactivated - ASR brake/engine control deactivated
24-46	No uniformity (frequency changes) of wheel speed sensor signal from wheel speed sensor (F514) on pins C1 and C2 of the rear axle modulator (D879) due to: <ul style="list-style-type: none"> - excessive wheel bearing play - incorrect mounting of wheel speed sensor ring 	<ul style="list-style-type: none"> - ABS on rear axle, left deactivated - ASR brake/engine control deactivated
24-47	Excessive oscillation of wheel speed sensor signal (maximum/minimum level) from wheel speed sensor (F514) on pins C1 and C2 of the rear axle modulator (D879) due to: <ul style="list-style-type: none"> - excessive wheel bearing play - incorrect mounting of wheel speed sensor ring 	<ul style="list-style-type: none"> - ABS on rear axle, left deactivated - ASR brake/engine control deactivated
24-48	Minimum value of wheel speed sensor signal from wheel speed sensor (F514) on pins C1 and C2 of the rear axle modulator (D879) is too low due to: <ul style="list-style-type: none"> - too large an air gap between wheel speed sensor ring and wheel speed sensor - contact resistance on pin C1 and/or C2 of the rear axle modulator 	<ul style="list-style-type: none"> - ABS on rear axle, left deactivated - ASR brake/engine control deactivated

Fault code	Fault code description with possible cause	Symptom
31-16	Large deviation between the duty cycle signals from the foot brake valve (F628) on pins E2 and E5 of the EBS unit due to: - internal fault in foot brake valve	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated - Low voltage on connection point A9 inside EBS unit
31-52	Large deviation between the duty cycle signals from the foot brake valve (F628) on pins E2 and E5 of the EBS unit due to: - internal fault in foot brake valve	- No noticeable system limitation in EBS
32-37	No signal from brake pedal position switch 1 in foot brake valve (F628) on pin E3 of the EBS unit due to: - defective switch - interruption on pin E3 of the EBS unit	- No noticeable system limitation in EBS
32-41	Brake pedal position switch 1 remains closed in foot brake valve (F628) or short circuit to earth on pin E3 of the EBS unit	- The actuating pressure control is active when the brake pedal is not applied; after a specified time (approx. 1 min.) the actuating pressure control will automatically disengage.
33-37	No signal from brake pedal position switch 2 in foot brake valve (F628) on pin E6 of the EBS unit due to: - defective switch in foot brake valve - interruption on pin E6 of the EBS unit	- No noticeable system limitation in EBS
33-41	Brake pedal position switch 2 remains closed in foot brake valve (F628) or short circuit to earth on pin E6 of the EBS unit	- The actuating pressure control is active when the brake pedal is not applied; after a specified time (approx. 1 min.) the actuating pressure control will automatically disengage.
34-41	Lower signal level from brake pedal position sensor 1 in foot brake valve (F628) on pin E2 of the EBS unit is too low during a specified period of time due to: - contact resistance on pin E2 of the EBS unit - internal fault in foot brake valve - short circuit to earth on pin E2 of the EBS unit	- No noticeable system limitation in EBS
34-43	Upper signal level from brake pedal position sensor 1 in foot brake valve (F628) on pin E2 of the EBS unit is too high during a specified time or the pulse width of the signal is incorrect due to: - short circuit to supply on pin E2 of the EBS unit - internal fault in foot brake valve - interruption on pin E1 of the EBS unit - interruption on connection point E2 of the EBS unit	- No noticeable system limitation in EBS

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Fault code	Fault code description with possible cause	Symptom
35-41	Lower signal level from brake pedal position sensor 2 in foot brake valve (F628) on pin E5 of the EBS unit is too low during a specified period of time due to: <ul style="list-style-type: none">- contact resistance on pin E5 of the EBS unit- internal fault in foot brake valve- short circuit to earth on pin E5 of the EBS unit	- No noticeable system limitation in EBS
35-43	Upper signal level from brake pedal position sensor 2 in foot brake valve (F628) on pin E5 of the EBS unit is too high during a specified time or the pulse width of the signal is incorrect due to: <ul style="list-style-type: none">- short circuit to supply on pin E5 of the EBS unit- internal fault in foot brake valve- interruption on pin E4 of the EBS unit- interruption on pin E5 of the EBS unit	- No noticeable system limitation in EBS
41-61	Communication via V-CAN on pins A1 and A3 of the EBS unit not possible when switching on ignition due to: <ul style="list-style-type: none">- interruption on pin A1 of the EBS unit- short circuit to earth on pin A3 of the EBS unit- short circuit to supply on pin A1 and/or A3 of the EBS unit	- ASR brake/engine control deactivated
41-63	Interrupted communication via V-CAN on pins A1 and A3 of the EBS unit due to: <ul style="list-style-type: none">- interruption on pin A1 and/or A3 of the EBS unit- short circuit to earth on pin A3 of the EBS unit- short circuit to supply on pin A1 and/or A3 of the EBS unit	- ASR brake/engine control deactivated
41-65	No CAN message "ERC1" received within a specified period of time from the engine management system in relation to the engine braking torque	- No noticeable system limitation in EBS
41-66	No CAN message "EEC1" received within a specified period of time from the engine management system in relation to the engine torque and engine speed	- No noticeable system limitation in EBS
41-67	No CAN message "ETC1" received within a specified period of time from the gearbox (AS Tronic) if the drive line is activated	- No noticeable system limitation in EBS
41-68	No CAN message "CCVS" received within a specified period of time from the engine management system in relation to the parking brake status, vehicle speed and clutch status	- No noticeable system limitation in EBS

Fault code	Fault code description with possible cause	Symptom
41-69	No CAN message "TCO1" received within a specified period of time from the tachograph in relation to the vehicle speed due to: <ul style="list-style-type: none"> - communication problem with the tachograph (MTCO) - K-factor in MTCO incorrect or not there - delayed loss of supply voltage on EBS unit when switching off ignition (this is a common production situation but it has been solved in subsequent production versions by the addition of relay G426) 	- No noticeable system limitation in EBS
41-71	No CAN message received from VIC within a specified period of time	- No noticeable system limitation in EBS
42-16	EBS unit does not receive correct CAN message from the rear axle modulator (D879) on pins B1 and B4 of the EBS unit	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated
42-61	Interrupted CAN communication with the rear axle modulator (D879) via pins B1 and B4 of the EBS unit due to: <ul style="list-style-type: none"> - short circuit to earth on pin B4 of the EBS unit - short circuit to supply on pin B1 and/or pin B4 of the EBS unit - short circuit between pin B1 and pin B4 of the EBS unit 	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated
43-61	CAN communication problem with the drawn vehicle ECU via pins B3 and B6 of the EBS unit	- No noticeable system limitation in EBS
43-63	Interrupted CAN communication, with a driving combination, with the drawn vehicle ECU via pins B3 and B6 of the EBS unit due to: <ul style="list-style-type: none"> - interruption on pins B3 and B6 of the EBS unit - short circuit between pin B3 and pin B6 of the EBS unit 	- No noticeable system limitation in EBS
43-75	Interrupted CAN communication, with a driving combination, with the drawn vehicle ECU via pin B3 (CAN-H) of the EBS unit due to: <ul style="list-style-type: none"> - interruption on pin B3 of the EBS unit - short circuit on pin B3 of the EBS unit 	- No noticeable system limitation in EBS
43-76	Interrupted communication, with a driving combination, with the drawn vehicle ECU via pin B6 (CAN-L) of the EBS unit due to: <ul style="list-style-type: none"> - interruption on pin B6 of the EBS unit - short circuit on pin B6 of the EBS unit 	- No noticeable system limitation in EBS
45-16	Interruption, short circuit to earth or short circuit to supply on pin A18 of the EBS unit	- No noticeable system limitation in EBS
51-21	Short circuit to earth on pin D11 of the EBS unit, ABS valve (B256)	- ABS on front axle, left deactivated
51-22	Short circuit to supply on pin D11 of the EBS unit, ABS valve (B256)	- ABS on front axle deactivated

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Fault code	Fault code description with possible cause	Symptom
51-23	Interruption on pin D12 of the EBS unit, ABS valve (B256)	- ABS on front axle, left deactivated
51-24	Interruption on pin D11 of the EBS unit, ABS valve (B256)	- ABS on front axle, left deactivated
51-25	Continuous actuation of ABS valve (B256) via pins D10 and D12 and/or D11 and D12 of the EBS unit due to: - internal short circuit in EBS unit	- ABS on front axle deactivated - EBS pressure control on front axle and drawn vehicle deactivated
51-26	Interruption on pin D10 of the EBS unit, ABS valve (B256)	- ABS on front axle, left deactivated
51-27	Short circuit to earth on pin D10 of the EBS unit, ABS valve (B256)	- ABS on front axle, left deactivated
51-28	Short circuit to supply on pin D10 of the EBS unit, ABS valve (B256)	- ABS on front axle deactivated
52-21	Short circuit to earth on pin C2 of the EBS unit, ABS valve (B257)	- ABS on front axle, right deactivated
52-22	Short circuit to supply on pin C2 of the EBS unit, ABS valve (B257)	- ABS on front axle deactivated
52-23	Interruption on pin C3 of the EBS unit, ABS valve (B257)	- ABS on front axle, right deactivated
52-24	Interruption on pin C2 of the EBS unit, ABS valve (B257)	- ABS on front axle, right deactivated
52-25	Continuous actuation of ABS valve (B257) via pins C1 and C3 and/or C2 and C3 of the EBS unit due to: - internal short circuit in EBS unit	- ABS on front axle deactivated - EBS pressure control on front axle and drawn vehicle deactivated
52-26	Interruption on pin C1 of the EBS unit, ABS valve (B257)	- ABS on front axle, right deactivated
52-27	Short circuit to earth on pin C1 of the EBS unit, ABS valve (B257)	- ABS on front axle, right deactivated
52-28	Short circuit to supply on pin C1 of the EBS unit, ABS valve (B256)	- ABS on front axle deactivated
53-32	Short circuit to earth on pin D12 or C3 of the EBS unit, ABS valve (B256 or B257)	- No noticeable system limitation in EBS
53-33	Short circuit to supply on pin D12 or C3 of the EBS unit, ABS valve (B256 or B257)	- ABS on front axle deactivated
55-12	Incorrect redundancy valve (B306) parameters due to: - redundancy valve connected to the EBS unit without the EBS unit having been programmed for a redundancy valve	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated
55-31	Interruption in redundancy valve (B306), measured via pin B12 of the EBS unit	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated
55-32	Short circuit to earth in redundancy valve (B306), measured via pin B12 of the EBS unit	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated

Fault code	Fault code description with possible cause	Symptom
55-33	Short circuit to supply in redundancy valve (B306), measured via pin B12 of the EBS unit	- ABS on front axle deactivated
57-12	Incorrect ASR cut-off valve (B309) parameters due to: - ASR cut-off valve connected to the EBS unit without the EBS unit having been programmed for an ASR cut-off valve	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated
57-31	Interruption on pin C6 of the EBS unit, ASR cut-off valve (B309)	- ASR brake control deactivated -
57-32	Short circuit to earth on pin C6 of the EBS unit, ASR cut-off valve (B309)	- ASR brake control deactivated -
57-33	Short circuit to supply on pin C6 of the EBS unit, ASR cut-off valve (B309)	- No noticeable system limitation in EBS
61-16	The current through the front axle modulator (B307) magnet coil measured via pins D1 and D2 of the EBS unit is incorrect due to: - copper short circuit in the magnet coil - short circuit or contact resistance between pins D1 and D2 of the EBS unit	- EBS pressure control on front axle deactivated
61-55	Front axle modulator (B307) output pressure measured on pin D6 of the EBS unit is incorrect in relation to the current through the magnet coil due to: - defective pressure sensor - too low a supply pressure	- EBS pressure control on front axle deactivated
62-42	Pressure sensor failure in front axle modulator (B307) due to: - short circuit to supply on pin D6 of the EBS unit - interruption on pin D3 of the EBS unit - short circuit to supply on pin D5 of the EBS unit	- Open circuit in EBS pressure control, front axle
62-43	With a nonactivated front axle modulator, the front axle modulator (B307) pressure sensor output signal on pin D6 of the EBS unit is too low or too high due to: - defective pressure sensor - no supply voltage or supply voltage too low on pin D9 of the EBS unit - interruption on pin D6 of the EBS unit - short circuit to earth on pin D6 of the EBS unit - air pressure at connection point 4 of the front axle modulator (B307) if the foot brake valve (F628) is not activated	- Open circuit in EBS pressure control, front axle
63-25	Permanent actuation of the front axle modulator (B307) due to: - short circuit to supply on one side and short circuit to earth on the other side	- Brake remains applied to front axle
63-32	Short circuit to earth on pin D1 of the EBS unit, front axle modulator (B307)	- EBS pressure control on front axle deactivated

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Fault code	Fault code description with possible cause	Symptom
63-33	Short circuit to supply on pin D1 of the EBS unit, front axle modulator (B307)	- EBS pressure control on front axle deactivated
63-34	Short circuit to earth on pin D2 of the EBS unit, front axle modulator (B307)	- EBS pressure control on front axle deactivated
63-35	Short circuit to supply on pin D2 of the EBS unit, front axle modulator (B307)	- EBS pressure control on front axle deactivated
63-36	Interruption on pin D1 and/or D2 of the EBS unit, front axle modulator (B307)	- EBS pressure control on front axle deactivated
64-13	The EBS unit parameters for the rear axle modulator type do not correspond with the parameters in the rear axle modulator (D879)	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated
64-16	Fault in the solenoid valves of the rear axle modulator (D879)	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated
64-51	Output pressure of the rear axle modulator (D879) is too high	- ABS on rear axle deactivated
64-52	Brake pressure signal difference between both pressure sensors in rear axle modulator (D879) is too high	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated
64-54	No pressure sensor signal in rear axle modulator (D879) or signal is incorrect (too high/too low)	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - Open circuit in EBS pressure control, rear axle
64-64	CAN communication problem of the EBS unit with the rear axle modulator (D879) via pins B1 and B4 of the EBS unit	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated
	Supply voltage on pin B7 of the EBS unit interrupted	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated - With an interruption on pin B7, connection points A9 and E4 inside the ECU will have a low voltage, causing brake pedal position sensor 2 to give no output signal, for instance. If the measurement is performed at B7, it will also turn out that B7 in this situation will be internally connected to earth in the ECU
	Interrupted earth connection or contact resistance in the earth connection of the rear axle modulator (D879)	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated
66-12	Incorrect drawn vehicle control valve (B308) parameters due to: - drawn vehicle control valve connected to the EBS unit without the EBS unit having been programmed for a drawn vehicle control valve	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated

Fault code	Fault code description with possible cause	Symptom
66-16	The current measured by the drawn vehicle control valve (B308) magnet coil via pins B10 and B11 of the ECU is incorrect due to: <ul style="list-style-type: none"> - copper short circuit in the magnet coil - short circuit or contact resistance between pins B10 and B11 of the EBS unit 	- EBS pressure control on drawn vehicle deactivated
66-55	Drawn vehicle control valve (B308) output pressure measured on pin B14 of the ECU is incorrect in relation to the current through the magnet coil due to: <ul style="list-style-type: none"> - defective pressure sensor - too low a supply pressure 	- EBS pressure control on drawn vehicle deactivated
67-42	Pressure sensor fault in drawn vehicle control valve (B308) due to: <ul style="list-style-type: none"> - short circuit to supply on pin B14 of the EBS unit - interruption on pin D3 of the EBS unit - short circuit to supply on pin D3 of the EBS unit 	- Open circuit in EBS pressure control, drawn vehicle
67-43	With a nonactivated drawn vehicle control valve, drawn vehicle control valve (B308) pressure sensor output signal on pin B14 of the EBS unit is too low or too high due to: <ul style="list-style-type: none"> - defective pressure sensor - no or too low a supply voltage to pressure sensor 	- Open circuit in EBS pressure control, drawn vehicle
67-51	With a non-activated drawn vehicle control valve and a speed >30 km/hour, drawn vehicle control valve (B308) pressure sensor output signal on pin B14 of the EBS unit is too low or too high due to: <ul style="list-style-type: none"> - defective pressure sensor 	- Open circuit in EBS pressure control, drawn vehicle
68-25	Permanent actuation of the drawn vehicle control valve (B308) due to: <ul style="list-style-type: none"> - short circuit to supply on one side and short circuit to earth on the other side 	- Brake remains applied to drawn vehicle
68-32	Short circuit to earth on pin B10 of the EBS unit, drawn vehicle control valve (B308)	- EBS pressure control on drawn vehicle deactivated
68-33	Short circuit to supply on pin B10 of the EBS unit, drawn vehicle control valve (B308)	- EBS pressure control on drawn vehicle deactivated
68-34	Short circuit to earth on pin B11 of the EBS unit, drawn vehicle control valve (B308)	- EBS pressure control on drawn vehicle deactivated
68-35	Short circuit to supply on pin B11 of the EBS unit, drawn vehicle control valve (B308)	- EBS pressure control on drawn vehicle deactivated
68-36	Interruption on pin B10 and/or B11 of the EBS unit, drawn vehicle control valve (B308)	- EBS pressure control on drawn vehicle deactivated
73-15	If a drawn vehicle with EBS sends a CAN message to the ECU of the prime mover, indicating that the "serious drawn vehicle failure" needs to be activated on DIP, this fault code will be stored in the prime mover ECU.	

2. EBS CUSTOMER PARAMETERS

2.1 INTRODUCTION

Customer parameters

Customer parameters are the settings of an electronic system. The customer parameters permit adapting control functions of a system to the customer's particular wishes and/or needs within certain limits. The customer parameters are stored in a list in the memory of the electronic unit. Customer parameters can be modified using the programming feature of DAVIE XD. Programming using DAVIE XD is only possible if the logged-in user has been registered as a "Master Technician".

Note:

Erroneous settings of customer parameters may affect the action of control functions to such an extent that they function erratically or not at all. After modification of the settings the (modified) customer parameters must be stored in the electronic unit using the programming function in the customer parameter overview.

Customer parameter names and codes

Each customer parameter in a system has its own name and code. The following explanation of the customer parameters includes only the codes. The availability of a customer parameter in a system depends on the programmed software in the electronic unit. The programmed software depends on the vehicle configuration/identity card data.

Standard values

Standard values, options and setting ranges may vary according to the software variants of DAVIE XD and the system. This is why they have not been included in the following explanation of the customer parameters.

2.2 EXPLANATORY NOTES TO EBS CUSTOMER PARAMETERS

EBS Customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
3-01	This is a comfort parameter setting which determines the pulsing "P-inshot" to the drawn vehicle.	0 bar	3.5 bar	The pressure pulse activation "P inshot" is only available on FT vehicles and is only active if a drawn vehicle without EBS system is coupled. This setting can be changed if: - there is a complaint relating to the towing of the drawn vehicle when braking is started.

3. SYSTEM INSPECTION WITH DAVIE XD

3.1 GENERAL

If the tyre size is changed or if the vehicle is adjusted in such a way that the configuration is changed, the electronic unit may have to be re-programmed.

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1. UPEC FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

1.2 EXPLANATORY NOTES TO UPEC FAULT CODES

Fault code	Fault code description with possible cause	Symptom
11-1	Internal communication fault in ECU	- Engine stalls and/or engine starts but does not fire
11-2	Internal communication fault in ECU	- Engine stalls and/or engine starts but does not fire
12-1	Internal fault in ECU due to: - defective EEPROM	- No noticeable system limitation in UPEC
13-1	Internal fault in ECU during the checking procedure after the ignition was switched off	- No noticeable system limitation in UPEC
13-2	Internal fault in ECU during the checking procedure after the ignition was switched off	- No noticeable system limitation in UPEC
13-4	Internal fault in ECU during the checking procedure after the ignition was switched off	- No noticeable system limitation in UPEC
13-8	Internal fault in ECU during the checking procedure after the ignition was switched off	- No noticeable system limitation in UPEC
14-1	Voltage on pin B15 but no voltage on pins B3 and B4 of the ECU due to: - faulty relay G126 - no activation of relay G126 - no supply voltage on relay G126 - open connection to pin B27 - short circuit to supply on pin B27	- Engine stalls and/or engine starts but does not fire - Communication fault with DAVIE so that fault code cannot be read out - Several systems will output error messages in connection with the CAN communication
15-1	Internal fault in ECU	- No noticeable system limitation
21-8	Voltage on pins B3 and B4, with no voltage being applied anymore on pin B15 of the ECU due to: - faulty relay G126 - short circuit to earth on pin B27 - short circuit to supply on pin B3 and/or B4	- Engine starts but will not fire - Communication fault with DAVIE so that fault code cannot be read out - Several systems will output error messages in connection with the CAN communication
22-1	Voltage on pins B3, B4 and B15 of the ECU is too high (>30 V) due to: - excessive alternator/battery voltage - inductive voltage of external component	- System response depending on voltage level
22-2	Voltage on pins B3, B4 and B15 of the ECU is too low (<14 V) due to: - insufficient supply voltage, for example during starting - contact resistance in power supply circuit	- System response depending on voltage level
22-4	Internal supply voltage fault in ECU	- System response depending on internal supply voltage fault
31-1	Short circuit to supply on pump unit connections, pin A24 and/or pin A25 of the ECU	- Engine stalls and/or engine starts but does not fire

Fault code	Fault code description with possible cause	Symptom
31-2	Short circuit to earth or interruption in the pump unit (B131) on pin A35 of the ECU, causing the pump unit of cylinder 1 to be switched off	- Engine running on 5 cylinders - Reduced engine output
	Short circuit to earth on pump unit connections, pin A24 and/or pin A25 of the ECU	- Engine stalls and/or engine starts but does not fire
	Short circuit to supply of the pump unit (B131) on pin A35 of the ECU	- Engine stalls and/or engine starts but does not fire
	Interruption in the pump unit (B131) on pin A24 of the ECU, causing the pump unit of cylinders 1, 2 and 3 to be switched off	- Engine running on 3 cylinders - Engine does not supply power
31-4	The valve inside the pump unit (B131) does not close due to: - jammed valve - internal contamination - internal wear	- Engine running on 5 cylinders - Reduced engine output
	The valve inside the pump unit (B131) does not close fast enough due to: - internal contamination - internal wear	- Reduced engine output
31-8	The valve inside the pump unit (B131) does not open fast enough due to: - mechanical problems - internal contamination	- No noticeable system limitation in UPEC
32-1	Short circuit to supply on pump unit connections, pin A24 and/or pin A25 of the ECU	- Engine stalls and/or engine starts but does not fire
32-2	Short circuit to earth or interruption in the pump unit (B135) on pin A26 of the ECU, causing the pump unit of cylinder 5 to be switched off	- Engine running on 5 cylinders - Reduced engine output
	Short circuit to earth on pump unit connections, pin A24 and/or pin A25 of the ECU	- Engine stalls and/or engine starts but does not fire
	Short circuit to supply of the pump unit (B135) on pin A26 of the ECU	- Engine stalls and/or engine starts but does not fire
	Interruption in the pump unit (B135) on pin A25 of the ECU, causing the pump unit of cylinders 4, 5 and 6 to be switched off	- Engine running on 3 cylinders - Engine does not supply power
32-4	The valve inside the pump unit (B135) does not close due to: - jammed valve - internal contamination - internal wear	- Engine running on 5 cylinders - Reduced engine output
	The valve inside the pump unit (B135) does not close fast enough due to: - internal contamination - internal wear	- Reduced engine output
32-8	The valve inside the pump unit (B135) does not open fast enough due to: - mechanical problems - internal contamination	- No noticeable system limitation in UPEC

Fault code	Fault code description with possible cause	Symptom
33-1	Short circuit to supply on pump unit connections, pin A24 and/or pin A25 of the ECU	- Engine stalls and/or engine starts but does not fire
33-2	Short circuit to earth or interruption in the pump unit (B133) on pin A34 of the ECU, causing the pump unit of cylinder 3 to be switched off	- Engine running on 5 cylinders - Reduced engine output
	Short circuit to earth on pump unit connections, pin A24 and/or pin A25 of the ECU	- Engine stalls and/or engine starts but does not fire
	Short circuit to supply of the pump unit (B133) on pin A34 of the ECU	- Engine stalls and/or engine starts but does not fire
	Interruption in the pump unit (B133) on pin A24 of the ECU, causing the pump unit of cylinders 1, 2 and 3 to be switched off	- Engine running on 3 cylinders - Engine does not supply power
33-4	The valve inside the pump unit (B133) does not close due to: - jammed valve - internal contamination - internal wear	- Engine running on 5 cylinders - Reduced engine output
	The valve inside the pump unit (B133) does not close fast enough due to: - internal contamination - internal wear	- Reduced engine output
33-8	The valve inside the pump unit (B133) does not open fast enough due to: - mechanical problems - internal contamination	- No noticeable system limitation in UPEC
34-1	Short circuit to supply on pump unit connections, pin A24 and/or pin A25 of the ECU	- Engine stalls and/or engine starts but does not fire
34-2	Short circuit to earth or interruption in the pump unit (B136) on pin A27 of the ECU, causing the pump unit of cylinder 6 to be switched off	- Engine running on 5 cylinders - Reduced engine output
	Short circuit to earth on pump unit connections, pin A24 and/or pin A25 of the ECU	- Engine stalls and/or engine starts but does not fire
	Short circuit to supply of the pump unit (B136) on pin A27 of the ECU	- Engine stalls and/or engine starts but does not fire
	Interruption in the pump unit (B136) on pin A25 of the ECU, causing the pump unit of cylinders 4, 5 and 6 to be switched off	- Engine running on 3 cylinders - Engine does not supply power
34-4	The valve inside the pump unit (B136) does not close due to: - jammed valve - internal contamination - internal wear	- Engine running on 5 cylinders - Reduced engine output
	The valve inside the pump unit (B136) does not close fast enough due to: - internal contamination - internal wear	- Reduced engine output

Fault code	Fault code description with possible cause	Symptom
34-8	The valve inside the pump unit (B136) does not open fast enough due to: - mechanical problems - internal contamination	- No noticeable system limitation in UPEC
35-1	Short circuit to supply on pump unit connections, pin A24 and/or pin A25 of the ECU	- Engine stalls and/or engine starts but does not fire
35-2	Short circuit to earth or interruption in the pump unit (B132) on pin A33 of the ECU, causing the pump unit of cylinder 2 to be switched off	- Engine running on 5 cylinders - Reduced engine output
	Short circuit to earth on pump unit connections, pin A24 and/or pin A25 of the ECU	- Engine stalls and/or engine starts but does not fire
	Short circuit to supply of the pump unit (B132) on pin A33 of the ECU	- Engine stalls and/or engine starts but does not fire
	Interruption in the pump unit (B132) on pin A24 of the ECU, causing the pump unit of cylinders 1, 2 and 3 to be switched off	- Engine running on 3 cylinders - Engine does not supply power
35-4	The valve inside the pump unit (B132) does not close due to: - jammed valve - internal contamination - internal wear	- Engine running on 5 cylinders - Reduced engine output
	The valve inside the pump unit (B132) does not close fast enough due to: - internal contamination - internal wear	- Reduced engine output
35-8	The valve inside the pump unit (B132) does not open fast enough due to: - mechanical problems - internal contamination	- No noticeable system limitation in UPEC
36-1	Short circuit to supply on pump unit connections, pin A24 and/or pin A25 of the ECU	- Engine stalls and/or engine starts but does not fire
36-2	Short circuit to earth or interruption in the pump unit (B134) on pin A28 of the ECU, causing the pump unit of cylinder 4 to be switched off	- Engine running on 5 cylinders - Reduced engine output
	Short circuit to earth on pump unit connections, pin A24 and/or pin A25 of the ECU	- Engine stalls and/or engine starts but does not fire
	Short circuit to supply of the pump unit (B134) on pin A28 of the ECU	- Engine stalls and/or engine starts but does not fire
	Interruption in the pump unit (B134) on pin A25 of the ECU, causing the pump unit of cylinders 4, 5 and 6 to be switched off	- Engine running on 3 cylinders - Engine does not supply power
36-4	The valve inside the pump unit (B134) does not close due to: - jammed valve - internal contamination - internal wear	- Engine running on 5 cylinders - Reduced engine output
	The valve inside the pump unit (B134) does not close fast enough due to: - internal contamination - internal wear	- Reduced engine output

Fault code	Fault code description with possible cause	Symptom
36-8	The valve inside the pump unit (B134) does not open fast enough due to: <ul style="list-style-type: none"> - mechanical problems - internal contamination 	- No noticeable system limitation
41-1	Voltage level of crankshaft sensor (F552) sine-wave signal on pins A1 and A13 of the ECU is too low due to: <ul style="list-style-type: none"> - too large an air gap between flywheel and crankshaft sensor - contact resistance in connection points - short circuit or interruption 	- No engine speed signal on pin B5 of the ECU
	Excessive oscillation of crankshaft sensor (F552) sine-wave signal on pin A1 of the ECU due to: <ul style="list-style-type: none"> - irregularity in flywheel circumference - faulty fitting of the flywheel 	- No noticeable system limitation in UPEC
41-2	Too low a voltage level of camshaft sensor (F558) sine-wave signal on pins A2 and A14 of the ECU due to: <ul style="list-style-type: none"> - too large an air gap between pulse disc and camshaft sensor - contact resistance in connection points - short circuit or interruption 	- Longer start time before engine fires
	Excessive oscillation of camshaft sensor (F558) sine-wave signal on pins A2 and A14 of the ECU due to: <ul style="list-style-type: none"> - irregularity in pulse disc circumference - faulty fitting of the pulse disc 	- Longer start time before engine fires
41-8	Incorrect or unacceptable sine-wave signals of both the crankshaft sensor (F552) and camshaft sensor (F558) due to: <ul style="list-style-type: none"> - contact resistance in connection points - defective ECU - interruption or short circuit in crankshaft sensor and camshaft sensor 	- Engine stalls and/or engine starts but does not fire
42-1	Signal of crankshaft sensor (F552) on pins A1 and A13 of ECU fails due to: <ul style="list-style-type: none"> - poor connection/bad contact - faulty sensor 	- No engine speed signal on pin B5
42-2	Synchronisation of crankshaft sensor signal and camshaft sensor signals is not correct due to: <ul style="list-style-type: none"> - loose pulse disc - incorrect timing setting - signal disturbance caused by external influences 	- Engine starts but will not fire
42-4	Missing or unacceptable sine-wave signal of crankshaft sensor (F552) due to: <ul style="list-style-type: none"> - interruption on pin A1 and/or A13 of the ECU - short circuit to earth on pin A1 of the ECU - short circuit to supply on pin A1 of the ECU - short circuit between pins A1 and A13 of the ECU 	- No engine speed signal on pin B5 of the ECU

Fault code	Fault code description with possible cause	Symptom
42-8	Unacceptable sine-wave signal of crankshaft sensor (F552) due to: - missing hole in flywheel, for example due to fouling	- No noticeable system limitation in UPEC
43-1	Interruption or short circuit/short circuit to supply/short circuit to earth in the camshaft sensor (F558) on pin A2 and/or A14 of the ECU	- Longer start time before engine fires
43-2	Unacceptable sine-wave signal of camshaft sensor (F558) due to: - loose pulse plate	- Longer start time before engine fires
43-4	Missing or unacceptable sine-wave signal of camshaft sensor (F558) due to: - interruption on pin A2 and/or A14 of the ECU - short circuit to earth on pin A2 of the ECU - short circuit to supply on pin A2 of the ECU - short circuit between pins A2 and A14 of the ECU	- Longer start time before engine fires
43-8	Synchronisation signal from camshaft sensor (F558) faulty or missing under dynamic conditions due to: - contact resistance in connection points of camshaft sensor - faulty camshaft sensor - mechanical damage of the pulse plate or camshaft sensor - interruption on pin A14 of the ECU - too low a voltage level of camshaft signal	- Longer start time before engine fires
44-1	Excessive engine speed caused by: - downhill driving - incorrect changing down into a lower gear	- No noticeable system limitation in UPEC
45-1	Signal measurement via coolant temperature sensor (F566) not correct due to: - interruption on pin A22 and/or A5 of the ECU	- Thermometer gives no reading - ECU switches to default replacement value for engine coolant temperature
45-2	Signal measurement via coolant temperature sensor (F566) not correct due to: - short circuit to earth on pin A22 of the ECU - short circuit between pins A22 and A5 of the ECU	- Thermometer gives no reading - ECU switches to default replacement value for engine coolant temperature
45-4	No signal measurement via coolant temperature sensor (F566) due to: - internal ECU fault	- Thermometer gives no reading - ECU switches to default replacement value for coolant temperature
46-1	Boost pressure signal measurement via inlet air boost pressure/temperature sensor (F649) not correct due to: - short circuit to supply on pin A12 and/or A23 of the ECU	- Reduced engine output - ECU switches to default replacement value for boost pressure
46-2	Boost pressure signal measurement via inlet air boost pressure/temperature sensor (F649) not correct due to: - interruption on pin A23 and/or A12 of the ECU - short circuit to earth on pin A23 and/or A12 of the ECU	- Reduced engine output - ECU switches to default replacement value for boost pressure

Fault code	Fault code description with possible cause	Symptom
46-4	No boost pressure signal measurement via inlet air boost pressure/temperature sensor (F649) due to: - internal ECU fault	- Reduced engine output - ECU switches to default replacement value for boost pressure
47-1	Inlet air temperature signal measurement via inlet air boost pressure/temperature sensor (F649) not correct due to: - interruption on pin A21 and/or A17 of the ECU	- ECU switches to default replacement value for inlet air temperature
47-2	Inlet air temperature signal measurement via inlet air boost pressure/temperature sensor (F649) not correct due to: - short circuit to earth on pin A21 of the ECU - short circuit between pins A21 and A17 of the ECU	- ECU switches to default replacement value for inlet air temperature
47-4	No inlet air temperature signal measurement via inlet air boost pressure/temperature sensor (F649) due to: - internal ECU fault	- ECU switches to default replacement value for inlet air temperature
48-1	Signal measurement via fuel temperature sensor (F565) not correct due to: - interruption on pin A6 and/or A11 of the ECU	- ECU switches to default replacement value for fuel temperature
48-2	Signal measurement via fuel temperature sensor (F565) not correct due to: - short circuit to earth on pin A11 of the ECU - short circuit between pins A11 and A6 of the ECU	- ECU switches to default replacement value for fuel temperature
48-4	No fuel temperature signal measurement via fuel temperature sensor (F565) due to: - internal ECU fault	- ECU switches to default replacement value for fuel temperature
51-1	Signal measurement on potentiometer in accelerator pedal sensor (F672) not correct due to: - short circuit to supply on pin B23 of the ECU - interruption on pin B35 of the ECU - short circuit between pin B16 and pin B23 of the ECU - moisture in connector connection	- Indistinct response to accelerator pedal - Engine runs at increased idling speed
51-2	Signal measurement on potentiometer in accelerator pedal sensor (F672) not correct due to: - interruption on pin B16 and/or pin B23 of the ECU - short circuit to earth on pin B16 and/or pin B23 of the ECU - short circuit between pin B16 and pin B35 of the ECU - short circuit between pin B23 and pin B35 of the ECU - moisture in connector connection	- Indistinct response to accelerator pedal - Engine runs at increased idling speed
51-4	No signal measurement on potentiometer in accelerator pedal sensor (F672) due to: - internal ECU fault	- Indistinct response to accelerator pedal - Engine runs at increased idling speed

Fault code	Fault code description with possible cause	Symptom
51-8	Conflict between position of idling switch and output signal of potentiometer in accelerator pedal sensor (F672) due to: <ul style="list-style-type: none"> - short circuit to supply on pin B16 of the ECU - short circuit between pin B17 and pin B25 of the ECU - short circuit to earth on pin B17 of the ECU - moisture in connector connection 	<ul style="list-style-type: none"> - No response to accelerator pedal - Engine runs at increased idling speed
	Conflict between position of idling switch and output signal of potentiometer in accelerator pedal sensor (F672) due to: <ul style="list-style-type: none"> - interruption on pin B17 and/or pin B25 of the ECU 	<ul style="list-style-type: none"> - When the accelerator pedal is depressed the idling speed of the engine increases gradually.
52-8	After the ignition had been switched on, the brake pedal was operated several times (20x) while the accelerator pedal was still being operated	<ul style="list-style-type: none"> - No noticeable system limitation
53-1	Short circuit to supply of vehicle speed signal of MTCO (B525) on pin B29 of the ECU	<ul style="list-style-type: none"> - Cruise control cannot be activated - Variable vehicle speed limitation function cannot be activated - Engine brake can be activated with the vehicle stationary - Control function for engine speed control cannot be activated
53-2	Short circuit to earth of vehicle speed signal of MTCO (B525) on pin B29 of the ECU	<ul style="list-style-type: none"> - Cruise control cannot be activated - Variable vehicle speed limitation function cannot be activated - Engine brake can be activated with the vehicle stationary - Control function for engine speed control cannot be activated
53-8	Unacceptable vehicle speed signal of MTCO (B525) on pin B29 of the ECU due to: <ul style="list-style-type: none"> - interruption on pin B29 - excessive vehicle speed for example due to incorrectly programmed K factor in MTCO - loose pulse ring in gearbox 	<ul style="list-style-type: none"> - Cruise control cannot be activated - Variable vehicle speed limitation function cannot be activated - Engine brake can be activated with the vehicle stationary - Control function for engine speed control cannot be activated
54-1	Too high a voltage on the atmospheric pressure sensor in the ECU due to: <ul style="list-style-type: none"> - internal fault in ECU 	<ul style="list-style-type: none"> - No noticeable system limitation in UPEC
54-2	Too low a voltage on the atmospheric pressure sensor in the ECU due to: <ul style="list-style-type: none"> - internal fault in ECU 	<ul style="list-style-type: none"> - No noticeable system limitation in UPEC
54-4	Internal ECU fault relating to the atmospheric pressure sensor	<ul style="list-style-type: none"> - No noticeable system limitation in UPEC
55-8	Frequency of speed signal of electronically controlled fan clutch (B335) on pin B30 of the ECU is too high due to: <ul style="list-style-type: none"> - mechanically blocked fan clutch 	<ul style="list-style-type: none"> - No noticeable system limitation in UPEC

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Fault code	Fault code description with possible cause	Symptom
55-9	Unacceptable frequency of speed signal of electronically controlled fan clutch (B335) on pin B30 of the ECU in relation to engine speed due to: <ul style="list-style-type: none"> - interruption on pin B30 - short circuit to supply or to earth on pin B30 - fan leakage - no supply voltage 	- Reduced engine power (coolant temperature may increase excessively as a result of which the coolant overheating safety may be activated)
56-1	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipe of cylinder 1 - defective/clogged injector of cylinder 1 - air in fuel system - internal leakage of pump unit of cylinder 1 - clogged injector pipe of cylinder 1 - too low a combustion pressure in cylinder 1 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power
56-2	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipe of cylinder 5 - defective/clogged injector of cylinder 5 - air in fuel system - internal leakage of pump unit of cylinder 5 - clogged injector pipe of cylinder 5 - too low a combustion pressure in cylinder 5 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power
56-3	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipes of cylinders 1 and 5 - defective/clogged injectors of cylinders 1 and 5 - air in fuel system - internal leakage of pump units of cylinders 1 and 5 - clogged injector pipes of cylinders 1 and 5 - too low a combustion pressure in cylinders 1 and 5 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power
56-4	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipe of cylinder 3 - defective/clogged injector of cylinder 3 - air in fuel system - internal leakage of pump unit of cylinder 3 - clogged injector pipe of cylinder 3 - too low a combustion pressure in cylinder 3 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power

Fault code	Fault code description with possible cause	Symptom
56-5	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipes of cylinders 1 and 3 - defective/clogged injectors of cylinders 1 and 3 - air in fuel system - internal leakage of pump units of cylinders 1 and 3 - clogged injector pipes of cylinders 1 and 3 - too low a combustion pressure in cylinders 1 and 3 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power
56-6	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipes of cylinders 3 and 5 - defective/clogged injectors of cylinders 3 and 5 - air in fuel system - internal leakage of pump units of cylinders 3 and 5 - clogged injector pipes of cylinders 3 and 5 - too low a combustion pressure in cylinders 3 and 5 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power
56-7	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipes of cylinders 1, 3 and 5 - defective/clogged injectors of cylinders 1, 3 and 5 - air in fuel system - internal leakage of pump units of cylinders 1, 3 and 5 - clogged injector pipes of cylinders 1, 3 and 5 - too low a combustion pressure in cylinders 1, 3 and 5 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power
56-8	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipe of cylinder 6 - defective/clogged injector of cylinder 6 - air in fuel system - internal leakage of pump unit of cylinder 6 - clogged injector pipe of cylinder 6 - too low a combustion pressure in cylinder 6 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power

Fault code	Fault code description with possible cause	Symptom
56-9	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipes of cylinders 1 and 6 - defective/clogged injectors of cylinders 1 and 6 - air in fuel system - internal leakage of pump units of cylinders 1 and 6 - clogged injector pipes of cylinders 1 and 6 - too low a combustion pressure in cylinders 1 and 6 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power
56-10	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipes of cylinders 5 and 6 - defective/clogged injectors of cylinders 5 and 6 - air in fuel system - internal leakage of pump units of cylinders 5 and 6 - clogged injector pipes of cylinders 5 and 6 - too low a combustion pressure in cylinders 5 and 6 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power
56-11	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipes of cylinders 1, 5 and 6 - defective/clogged injectors of cylinders 1, 5 and 6 - air in fuel system - internal leakage of pump units of cylinders 1, 5 and 6 - clogged injector pipes of cylinders 1, 5 and 6 - too low a combustion pressure in cylinders 1, 5 and 6 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power
56-12	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipes of cylinders 3 and 6 - defective/clogged injectors of cylinders 3 and 6 - air in fuel system - internal leakage of pump units of cylinders 3 and 6 - clogged injector pipes of cylinders 3 and 6 - too low a combustion pressure in cylinders 3 and 6 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power

Fault code	Fault code description with possible cause	Symptom
56-13	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipes of cylinders 1, 3 and 6 - defective/clogged injectors of cylinders 1, 3 and 6 - air in fuel system - internal leakage of pump units of cylinders 1, 3 and 6 - clogged injector pipes of cylinders 1, 3 and 6 - too low a combustion pressure in cylinders 1, 3 and 6 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power
56-14	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipes of cylinders 3, 5 and 6 - defective/clogged injectors of cylinders 3, 5 and 6 - air in fuel system - internal leakage of pump units of cylinders 3, 5 and 6 - clogged injector pipes of cylinders 3, 5 and 6 - too low a combustion pressure in cylinders 3, 5 and 6 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power
56-15	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipes of cylinders 1, 3, 5 and 6 - defective/clogged injectors of cylinders 1, 3, 5 and 6 - air in fuel system - internal leakage of pump units of cylinders 1, 3, 5 and 6 - clogged injector pipes of cylinders 1, 3, 5 and 6 - too low a combustion pressure in cylinders 1, 3, 5 and 6 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power
57-1	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipe of cylinder 2 - defective/clogged injector of cylinder 2 - air in fuel system - internal leakage of pump unit of cylinder 2 - clogged injector pipe of cylinder 2 - too low a combustion pressure in cylinder 2 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power

Fault code	Fault code description with possible cause	Symptom
57-2	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipe of cylinder 4 - defective/clogged injector of cylinder 4 - air in fuel system - internal leakage of pump unit of cylinder 4 - clogged injector pipe of cylinder 4 - too low a combustion pressure in cylinder 4 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power
57-3	Irregular engine running detected by the ECU due to: <ul style="list-style-type: none"> - fuel leak of injector pipes of cylinders 2 and 4 - defective/clogged injectors of cylinders 2 and 4 - air in fuel system - internal leakage of pump units of cylinders 2 and 4 - clogged injector pipes of cylinders 2 and 4 - too low a combustion pressure in cylinders 2 and 4 caused by a mechanical defect of the engine (valve seal etc.) 	- Irregular engine running and reduced engine power
61-8	Internal CAN fault in ECU	- System reaction depending on the missing V CAN data
62-2	No CAN message received from ABS/EBS ECU relating to the engine torque control due to: <ul style="list-style-type: none"> - communication problem with ABS/EBS ECU 	- No noticeable system limitation in UPEC
	Communication problem via V-CAN on pin B11 or pin B12 of the ECU due to: <ul style="list-style-type: none"> - interruption on pin B11 or B12 of the ECU - short circuit to supply on pin B11 or B12 of the ECU 	- Rev counter gives no reading - Thermometer gives no reading
	Communication problem via V-CAN on pin B12 of the ECU due to: <ul style="list-style-type: none"> - short circuit to earth on pin B12 of the ECU 	- Rev counter gives no reading
63-2	No CAN message received from ABS/EBS ECU relating to the engine braking function due to: <ul style="list-style-type: none"> - communication problem with ABS/EBS ECU 	- No noticeable system limitation in UPEC
	Communication problem via V-CAN on pin B11 or pin B12 of the ECU due to: <ul style="list-style-type: none"> - interruption on pin B11 or B12 of the ECU - short circuit to supply on pin B11 or B12 of the ECU 	- Rev counter gives no reading - Thermometer gives no reading
	Communication problem via V-CAN on pin B12 of the ECU due to: <ul style="list-style-type: none"> - short circuit to earth on pin B12 of the ECU 	- Rev counter gives no reading

Fault code	Fault code description with possible cause	Symptom
65-2	No CAN message received from transmission ECU due to: - communication problem with transmission ECU	- No noticeable system limitation in UPEC
	Communication problem via V-CAN on pin B11 or pin B12 of the ECU due to: - interruption on pin B11 or B12 of the ECU - short circuit to supply on pin B11 or B12 of the ECU	- Rev counter gives no reading - Thermometer gives no reading
	Communication problem via V-CAN on pin B12 of the ECU due to: - short circuit to earth on pin B12 of the ECU	- Rev counter gives no reading
66-2	No CAN message received from transmission ECU due to: - communication problem with transmission ECU	- No noticeable system limitation in UPEC
	Communication problem via V-CAN on pin B11 or pin B12 of the ECU due to: - interruption on pin B11 or B12 of the ECU - short circuit to supply on pin B11 or B12 of the ECU	- Rev counter gives no reading - Thermometer gives no reading
	Communication problem via V-CAN on pin B12 of the ECU due to: - short circuit to earth on pin B12 of the ECU	- Rev counter gives no reading
67-2	No CAN message received from transmission ECU due to: - communication problem with transmission ECU	- No noticeable system limitation in UPEC
	Communication problem via V-CAN on pin B11 or pin B12 of the ECU due to: - interruption on pin B11 or B12 of the ECU - short circuit to supply on pin B11 or B12 of the ECU	- Rev counter gives no reading - Thermometer gives no reading
	Communication problem via V-CAN on pin B12 of the ECU due to: - short circuit to earth on pin B12 of the ECU	- Rev counter gives no reading
68-1	No CAN message received from transmission ECU due to: - communication problem with transmission ECU	- No noticeable system limitation in UPEC
	Communication problem via V-CAN on pin B11 or pin B12 of the ECU due to: - interruption on pin B11 or B12 of the ECU - short circuit to supply on pin B11 or B12 of the ECU	- Rev counter gives no reading - Thermometer gives no reading
	Communication problem via V-CAN on pin B12 of the ECU due to: - short circuit to earth on pin B12 of the ECU	- Rev counter gives no reading

Fault code	Fault code description with possible cause	Symptom
69-1	No communication with immobiliser when switching on the ignition, or immobiliser code does not correspond with UPEC code due to: <ul style="list-style-type: none"> - defective immobiliser - ignition key not adjusted to the immobiliser - immobiliser not matched to UPEC ECU - voltage on pin B15 but no voltage on pins B3 and B4 of the ECU 	- Engine starts but will not fire
	Communication problem via V-CAN on pin B11 and/or pin B12 of the ECU due to: <ul style="list-style-type: none"> - interruption on pin B11 and/or pin B12 of the ECU - short circuit to supply on pin B11 of the ECU 	- Engine starts but will not fire - Several systems will output error messages in connection with the CAN communication
	Communication problem via V-CAN on pin B12 of the ECU due to: <ul style="list-style-type: none"> - short circuit to supply on pin B12 of the ECU 	- Several systems will output error messages in connection with the CAN communication
71-1	Short circuit to supply of glow relay (G014) on pin B10 of the ECU	- Glow function cannot be activated
71-2	Short circuit to earth of glow relay (G014) on pin B10 of the ECU	- Glow function permanently activated
71-8	Interruption in glow relay (G014) on pin B10 of the ECU	- Glow function cannot be activated
73-1	Short circuit to supply of exhaust brake solenoid valve (B192) on pin B9 of the ECU	- Exhaust brake cannot be activated
73-2	Short circuit to earth of exhaust brake solenoid valve (B192) on pin B9 of the ECU	- Exhaust brake permanently activated
	No supply voltage on glow relay, exhaust brake and DEB due to faulty fuse	- Glow function cannot be activated - Exhaust brake cannot be activated - DEB cannot be activated
73-8	Interruption in exhaust brake solenoid valve (B192) on pin B9 of the ECU	- Exhaust brake cannot be activated
74-1	Short circuit to supply of connection point for DIP stop indicator on pin B6 of the ECU	- No noticeable system limitation in UPEC
74-2	Short circuit to earth of connection point for DIP stop indicator on pin B6 of the ECU	- No noticeable system limitation in UPEC
74-8	Interruption in connection point for DIP stop indicator on pin B6 of the ECU	- No noticeable system limitation in UPEC
75-1	Short circuit to supply of DEB solenoid valve (B247) on pin B18 of the ECU	- Reduced braking power of DEB
75-2	Short circuit to earth of DEB solenoid valve (B247) on pin B18 of the ECU	- DEB permanently activated - Irregular engine running
75-8	Interruption in DEB solenoid valve (B247) on pin B18 of the ECU	- Reduced braking power of DEB
77-1	Short circuit to supply of DEB solenoid valve (B248) on pin A8 of the ECU	- Reduced braking power of DEB
77-2	Short circuit to earth of DEB solenoid valve (B248) on pin A8 of the ECU	- DEB permanently activated - Irregular engine running
77-8	Interruption in DEB solenoid valve (B248) on pin A8 of the ECU	- Reduced braking power of DEB

Fault code	Fault code description with possible cause	Symptom
78-1	Short circuit to supply of electronically controlled fan clutch (B335) on pin A9 of the ECU	- Fan speed too high
78-2	Short circuit to earth of electronically controlled fan clutch (B335) on pin A9 of the ECU	- Fan speed too low
78-8	Speed of electronically controlled fan clutch (B335) cannot be controlled due to: - interruption on pin A9 and/or A16 of the ECU - interruption on pins A9 and B30 of the ECU	- Fan speed is no longer controlled and increases to maximum
81-8	When the steering column switch is operated, several input signals are present at the ECU at the same time due to: - short circuit to supply on pin B34 of the ECU	- Cruise control function cannot be activated - At the steering column switch the "RES" function is overruled by the "Set+" function
	When the steering column switch is operated, several input signals are present at the ECU at the same time due to: - short circuit to supply on pin B32 of the ECU	- Cruise control function cannot be activated - At the steering column switch the "RES" function is overruled by the "Set-" function
	When the steering column switch is operated, several input signals are present at the ECU at the same time due to: - short circuit to supply on pin B33 of the ECU	- "RES" function at the steering column switch cannot be activated
	When the steering column switch is operated, several input signals are present at the ECU at the same time due to: - short circuit to supply on pin B24 of the ECU	- Cruise control function cannot be activated - Control function for engine speed control cannot be activated
82-4	Input signal, via clutch pedal proximity switch (E575), on pin B20 of the ECU remains present, despite the fact that the vehicle has already reached a certain speed. This is due to: - defective proximity switch - short circuit to supply on pin B20 - towing the vehicle with the engine running	- No system response when operating the clutch pedal
83-1	Short circuit to supply on pin B28 of the ECU	- Engine speed/torque limiting control cannot be activated
83-8	Unacceptable load on pin B28 of the ECU due to: - excessive contact resistance on connection point	- Engine speed/torque limiting control cannot be activated

2. UPEC CUSTOMER PARAMETERS

2.1 INTRODUCTION

Customer parameters

Customer parameters are the settings of an electronic system. The customer parameters permit adapting control functions of a system to the customer's particular wishes and/or needs within certain limits. The customer parameters are stored in a list in the memory of the electronic unit. Customer parameters can be modified using the programming feature of DAVIE XD. Programming using DAVIE XD is only possible if the logged-in user has been registered as a "Master Technician".

Note:

Erroneous settings of customer parameters may affect the action of control functions to such an extent that they function erratically or not at all. After modification of the settings the (modified) customer parameters must be stored in the electronic unit using the programming function in the customer parameter overview.

Customer parameter names and codes

Each customer parameter in a system has its own name and code. The following explanation of the customer parameters includes only the codes. The availability of a customer parameter in a system depends on the programmed software in the electronic unit. The programmed software depends on the vehicle configuration/identity card data.

Standard values

Standard values, options and setting ranges may vary according to the software variants of DAVIE XD and the system. This is why they have not been included in the following explanation of the customer parameters.

2.2 EXPLANATORY NOTES TO UPEC CUSTOMER PARAMETERS

UPEC customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
Settings relating to "limiting functions"				
2-02	Setting of the maximum vehicle speed in the "vehicle speed limiting" control function.			During production a standard value was programmed which can be modified here. Password-protected.
2-07	Setting of the idling speed.			
2-10	Setting of the maximum vehicle speed in the "vehicle speed limiting for special applications" control function.			Application example: foot board protection with refuse collection vehicles.
2-11	Setting of the maximum vehicle speed at which driving is possible in the "engine speed control" control function.			
2-36	In the following situation the total number of litres of fuel consumed up to that moment must be input again via this customer parameter: - after programming the UPEC unit (applicable when replacing the UPEC unit). - when reprogramming the UPEC unit because the value indicated on the DIP display is not correct.			The total number of litres of fuel consumed can be read on the "old" UPEC unit. If this information is no longer present, it is also possible to input the average fuel consumption directly via this customer parameter, after which the total number of litres of fuel consumed is automatically calculated. This information is needed to enable DIP to display again the correct average fuel consumption and the total number of litres of fuel consumed.
Settings relating to "engine speed control"				
2-14	Setting of the maximum engine speed in the "engine speed control" control function.	higher than the highest value of (2-27, 2-28, 2-29)		This fixes the maximum engine speed when the "set+" function of the steering column switch or engine speed control application connector (A068) is activated.

UPEC customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
2-15	Setting of the minimum engine speed in the "engine speed control" control function.	equal to or higher than 2-07	lower than the lowest value of (2-27, 2-28, 2-29)	This fixes the minimum engine speed when the "set-" function of the steering column switch or engine speed control application connector (A068) is activated. If the setting of 2-15 is higher than 2-07, it is not possible to increase the engine speed using the "set+" function if the actual engine speed is lower than the value of 2-15.
2-18	Setting the increase rate of the engine speed in the control function "engine speed control" using the steering column switch.			This fixes the increase rate with activated engine speed control when the "set+" function of the steering column switch is activated.
2-19	Setting the decrease rate of the engine speed in the control function "engine speed control" using the steering column switch.			This fixes the decrease rate with activated engine speed control when the "set-" function of the steering column switch is activated.
2-20	Setting the engine speed increase and decrease rates in the control function "engine speed control" using the steering column switch or with the aid of the engine speed control application connector (A068).			This fixes the increase and decrease rates with activated engine speed control when the "set+" or "set-" function of the steering column switch or engine speed control application connector (A068) is activated (tip function).
2-22	Setting of the engine speed increase and decrease rates at the transitions between engine idling speed, "Nvar", "N2" or "N3" through the engine speed control application connector (A068).			
2-27	Setting of the desired engine speed corresponding to the "RES" function of the steering column switch.	higher than 2-15	lower than 2-14	
2-28	Setting of the desired engine speed corresponding to "N2" of the engine speed control application connector (A068).	higher than 2-15	lower than 2-14	
2-29	Setting of the desired engine speed corresponding to "N3" of the engine speed control application connector (A068).	higher than 2-15	lower than 2-14	

UPEC customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
Settings relating to the "engine speed control" switching on and switching off conditions				
2-30	This enables setting whether or not the electronic unit must be capable of responding to the accelerator pedal when in the "engine speed control" control function.			If "active" has been set, it will be possible to accelerate when the engine speed control function is active. If "not active" has been set, the accelerator pedal is ignored when the engine speed control function is active. See also 2-31.
2-31	Setting of the maximum engine speed attainable when the control function "engine speed control" is active, when the accelerator pedal is operated (if 2-30 has been adjusted to the use of the accelerator pedal) and connection point B28 of the electronic unit has been connected to earth.			This speed limitation functions only from UPEC software version 6.4.
2-32	Setting of the parking brake as switching on and switching off condition for the "engine speed control" control function.			If "not active" has been selected, the parking brake is ignored. If "active" has been selected, the engine speed control is switched off and switching-on is disabled as soon as the parking brake is put in the driving position.
2-33	Setting of the brake pedal to prevent the control function "engine speed control" from being switched off when the brake pedal is operated.			If 2-33 has been set to "active" and 2-34 to "not active", the control function "engine speed control" will not be switched off when the brake pedal is subsequently operated while the clutch pedal is being depressed.
2-34	Setting of the clutch pedal as switching on and switching off condition for the "engine speed control" control function.			If "not active" has been set, the clutch pedal is ignored; if "active" has been set, the engine speed control is switched off as soon as the clutch pedal is operated.
Other settings relating to components(This customer parameter group only applies to components, not to trucks)				
2-35	This enables setting whether engine warnings resulting from a detected fault must be displayed via a connection point linked to a warning lamp, or via the V-CAN which is connected to VIC. In the latter case VIC can generate warnings on DIP.			

3. SYSTEM INSPECTION WITH DAVIE XD

3.1 GENERAL

If the vehicle has been modified and the configuration changed, the electronic unit may have to be re-programmed.

If the electronic unit is replaced, new UPEC software must be loaded into the unit using DAVIE.

The immobiliser code for the fuel release is automatically "read" when the ignition is switched on.

3.2 ENGINE BRAKE TEST

Note:

1. This test must be done with the engine at operating temperature.
2. To obtain a good comparison, ensure that during the test neither the air-conditioning system compressor nor the air supply system are switched on or off.

During this test, the engine speed will be increased and decreased while the exhaust brake/DEB is activated.

After this, the engine speed will again be increased and decreased, this time without the exhaust brake/DEB being activated.

In both cases the fall in engine speed when slowing down will be measured per second. The ratio between the measured values with and without activated exhaust brake/DEB will be expressed as a percentage.

3.3 SPEED VARIATION CONTROL TEST

One of the controls of the engine management system is the uniform operation of the engine via the speed variation control (this speed variation is recorded via the crankshaft sensor).

Too large a variation in speed is prevented by correcting the quantity of injected fuel per cylinder.

Due to a fault in the fuel system (bad injector, fuel leakage etc.) the fuel correction applied to a cylinder may have increased to such an extent that it falls outside the permitted specification.

Note:

Bear in mind the fact that a mechanical defect in a cylinder (compression loss) may affect the fuel correction for another cylinder that falls outside the permitted specification.

Here the relation is as follows:

in case of compression loss of cylinder:	1	5	3	6	2	4
a positive fuel correction on cylinder:	3	6	2	4	1	5

In the "speed variation control" test the fuel correction of each cylinder is determined during a trip cycle (a trip cycle where a high engine load is required for a long period), on the basis of the total fuel consumption.

The "speed variation control test" in DAVIE is one of the diagnostic tools that can be applied in case of complaints about fuel consumption and reduced engine power.

Other tests are the acceleration test and plotting a boost pressure curve; in principle these have to be carried out before the "speed variation control test" is carried out.

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1. AS TRONIC FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

1.2 EXPLANATORY NOTES TO AS TRONIC FAULT CODES

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Fault code	Fault code description with possible cause	Symptom
84	Incorrect or missing vehicle speed signal via message on CAN network	<ul style="list-style-type: none"> - In automatic mode the gearbox may shift down early or late - No further system limitation - Automatic mode available
86	Incorrect or missing cruise control signal via message on CAN network, with the cruise control function being active	<ul style="list-style-type: none"> - In automatic mode the gearbox may change gears accidentally during the cruise control function - No noticeable system limitation
91	Incorrect or missing accelerator pedal position signal via message on CAN network	<p>When driving:</p> <ul style="list-style-type: none"> - shifting quality may be affected - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - driving off from a stationary position is possible - drive off and manoeuvring quality may be affected
92	Incorrect or missing percentual engine torque signal at current speed via message on CAN network	<ul style="list-style-type: none"> - No noticeable system limitation - Automatic mode available
158	Excessive modulator supply voltage: - pin A4 / A5	<p>When driving:</p> <ul style="list-style-type: none"> - no noticeable system limitation - automatic mode available <p>At standstill:</p> <ul style="list-style-type: none"> - if this fault is present before switching on the ignition, the gearbox will not leave the self-test cycle. It is not possible to drive off.
	Insufficient modulator supply voltage: - pin A4 / A5	<p>When driving:</p> <ul style="list-style-type: none"> - no gear changes possible <p>At standstill:</p> <ul style="list-style-type: none"> - automatic mode not available - no gear changes possible - if a gear has been engaged, the modulator will shift the gearbox to neutral when the ignition is switched off
190	Incorrect or missing engine speed signal via message on CAN network	<p>When driving:</p> <ul style="list-style-type: none"> - clutch is closed in a time-controlled fashion, which results in abrupt clutching - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - when driving off in the manoeuvring position, the clutch is operated in a time-controlled fashion, which results in abrupt clutching

Fault code	Fault code description with possible cause	Symptom
512	Incorrect or missing desired engine torque signal via message on CAN network (derived from engine management accelerator pedal position signal)	When driving: <ul style="list-style-type: none"> - clutch may close abruptly after changing gears, which affects the shifting quality - automatic mode not available At standstill: <ul style="list-style-type: none"> - driving off from a stationary position is possible
513	Incorrect or missing current engine torque signal via message on CAN network	When driving: <ul style="list-style-type: none"> - shifting quality when shifting up and down may have been affected - automatic mode not available At standstill: <ul style="list-style-type: none"> - driving off from a stationary position is possible
520	Incorrect or missing current intarder brake torque via message on CAN network	<ul style="list-style-type: none"> - Automatic mode not available - No further system limitation
	Incorrect or missing current engine braking torque signal via message on CAN network	<ul style="list-style-type: none"> - If the engine brake is active, this may affect the shifting quality when shifting is started - Automatic mode not available
556	Incorrect or missing intarder configuration signal via message on CAN network	<ul style="list-style-type: none"> - Automatic mode not available - No noticeable system limitation
	Incorrect or missing engine brake configuration signal via message on CAN network	<ul style="list-style-type: none"> - Automatic mode not available - No noticeable system limitation
558	Incorrect or missing signal from the accelerator pedal idling switch via message on CAN network	When driving: <ul style="list-style-type: none"> - automatic mode not available - no noticeable system limitation when driving At standstill: <ul style="list-style-type: none"> - no response to the accelerator pedal as a result of which it is not possible to drive off from a stationary position
559	Incorrect or missing kickdown signal via message on CAN network	<ul style="list-style-type: none"> - Kickdown function not available - No noticeable system limitation - Automatic mode available
561	Incorrect or missing ASR engine control "active" signal via message on CAN network	<ul style="list-style-type: none"> - Automatic mode not available - No noticeable system limitation
562	Incorrect or missing ASR differential brake control "active" signal via message on CAN network	<ul style="list-style-type: none"> - Automatic mode not available - No noticeable system limitation
563	Incorrect or missing ABS "active" signal via message on CAN network	<ul style="list-style-type: none"> - Automatic mode not available - No noticeable system limitation
595	Incorrect or missing cruise control "active" signal via message on CAN network	<ul style="list-style-type: none"> - Automatic mode not available - No noticeable system limitation
597	Incorrect or missing service brake switch signal via message on CAN network	<ul style="list-style-type: none"> - Automatic mode not available - When the vehicle is coasting, the clutch will be opened at a vehicle speed exceeding 1.5 km/h.
904	Incorrect or missing front axle speed signal via message on CAN network	<ul style="list-style-type: none"> - Automatic mode available - No noticeable system limitation

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Fault code	Fault code description with possible cause	Symptom
1623	Incorrect or missing tachograph speed signal via message on CAN network	<ul style="list-style-type: none"> - Automatic mode available - If there is an internal speed signal, no noticeable system limitation
3002	Modulator, selector valve Y2 for splitter range: <ul style="list-style-type: none"> - short circuit to earth - interruption 	<ul style="list-style-type: none"> - Automatic mode not available - If the fault occurs during shifting, the engaged gear will remain engaged. The modulator will try to shift the vehicle to a suitable gear, both at standstill and when driving. If this is not possible, the gearbox will be shifted to the neutral position.
	<ul style="list-style-type: none"> - short circuit to supply 	<ul style="list-style-type: none"> - Automatic mode not available - If the fault occurs during shifting, the engaged gear will remain engaged. The modulator will try to shift the vehicle to a suitable gear, both at standstill and when driving. If this is not possible, the gearbox will be shifted to the neutral position. - PTO 1/2 cannot be selected - Manoeuvring position not available in D and R
3003	Modulator, selector valve Y3 for splitter range: <ul style="list-style-type: none"> - short circuit to supply - interruption 	<ul style="list-style-type: none"> - Automatic mode not available - If the fault occurs during shifting, the engaged gear will remain engaged. The modulator will try to shift the vehicle to a suitable gear, both at standstill and when driving. If this is not possible, the gearbox will be shifted to the neutral position.
	<ul style="list-style-type: none"> - short circuit to earth 	<ul style="list-style-type: none"> - Automatic mode not available - If the fault occurs during shifting, the engaged gear will remain engaged. The modulator will try to shift the vehicle to a suitable gear, both at standstill and when driving. If this is not possible, the gearbox will be shifted to the neutral position. - PTO 1/2 cannot be selected -Manoeuvring position not available in D and R
3004	Modulator, selector valve Y4 for gate selection: <ul style="list-style-type: none"> - short circuit to earth - interruption 	<ul style="list-style-type: none"> - Automatic mode not available - If the fault occurs during shifting, the engaged gear will remain engaged. The modulator will try to shift the vehicle to a suitable gear, both at standstill and when driving. If this is not possible, the gearbox will be shifted to the neutral position.
	<ul style="list-style-type: none"> - short circuit to supply 	<ul style="list-style-type: none"> - Automatic mode not available - If the fault occurs during shifting, the engaged gear will remain engaged. The modulator will try to shift the vehicle to a suitable gear, both at standstill and when driving. If this is not possible, the gearbox will be shifted to the neutral position. - Manoeuvring position not available in D

Fault code	Fault code description with possible cause	Symptom
3005	Modulator, selector valve Y5 for gate selection: <ul style="list-style-type: none"> - short circuit to earth - short circuit to supply - interruption 	<ul style="list-style-type: none"> - Automatic mode not available - If the fault occurs during shifting, the engaged gear will remain engaged. The modulator will try to shift the vehicle to an adjusted gear. If this is not possible, the gearbox will be shifted to the neutral position.
3006	Modulator, selector valve Y6 for main range: <ul style="list-style-type: none"> - short circuit to earth - short circuit to supply - interruption 	<ul style="list-style-type: none"> - Automatic mode not available - If the fault occurs during shifting, the engaged gear will remain engaged. The modulator will try to shift the vehicle to an adjusted gear. If this is not possible, the gearbox will be shifted to the neutral position.
3007	Modulator, selector valve Y7 for main range: <ul style="list-style-type: none"> - short circuit to earth - short circuit to supply - interruption 	<ul style="list-style-type: none"> - Automatic mode not available - If the fault occurs during shifting, the engaged gear will remain engaged. The modulator will try to shift the vehicle to an adjusted gear. If this is not possible, the gearbox will be shifted to the neutral position.
3008	Modulator, selector valve Y8 for rear-mounted range box: <ul style="list-style-type: none"> - short circuit to earth - short circuit to supply - interruption 	<ul style="list-style-type: none"> - Automatic mode not available - Shifting to low range is no longer possible - If the fault occurs during shifting, the engaged gear will remain engaged. The modulator will try to shift the vehicle to an adjusted gear. If this is not possible, the gearbox will be shifted to the neutral position.
3009	Modulator, selector valve Y9 for rear-mounted range box: <ul style="list-style-type: none"> - short circuit to earth - short circuit to supply - interruption 	<ul style="list-style-type: none"> - Automatic mode not available - Shifting to high range is no longer possible - If the fault occurs during shifting, the engaged gear will remain engaged. The modulator will try to shift the vehicle to an adjusted gear. If this is not possible, the gearbox will be shifted to the neutral position.
3010	Modulator, air supply main valve Y10: <ul style="list-style-type: none"> - short circuit to earth - interruption 	<p>When driving:</p> <ul style="list-style-type: none"> - no more gear changes possible - the gearbox cannot shift to the neutral position: the engaged gear remains engaged. <p>At standstill:</p> <ul style="list-style-type: none"> - if the problem already exists when the ignition is switched on, the system is not available; it is therefore not possible to drive off.
	<ul style="list-style-type: none"> - short circuit to supply 	<p>When driving:</p> <ul style="list-style-type: none"> - automatic mode not available - shifting to all gears is possible <p>At standstill:</p> <ul style="list-style-type: none"> - driving off from a stationary position is possible

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Fault code	Fault code description with possible cause	Symptom
3012	Short circuit to earth or interruption at output for power supply to reversing light relay (G350): - pin C9 of actuating unit (D955)	<ul style="list-style-type: none"> - Actuating unit output switches off - Reversing lights cannot be switched on - Automatic mode remains available - No noticeable system limitation
	Short circuit to supply at output for power supply to reversing light relay (G350): - pin C9 of actuating unit (D955)	<ul style="list-style-type: none"> - Reversing lights continuously switched on - Automatic mode remains available - No noticeable system limitation
3017	Modulator, selector valve Y1 for transmission brake: - short circuit to earth	<p>When driving:</p> <ul style="list-style-type: none"> - extended shifting time when shifting up (engine control now also synchronises when shifting up) - shifting up blocked if the speed of the input shaft drops below the idling speed of the engine after shifting - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - extended self-test (mechanical position of the clutch more difficult to determine) - extended shifting time when engaging a gear from neutral position - extended PTO engaging time
	- interruption	<p>When driving:</p> <ul style="list-style-type: none"> - extended shifting time when shifting up (engine control now also synchronises when shifting up) - shifting up blocked if the speed of the input shaft drops below the idling speed of the engine after shifting - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - extended self-test (mechanical position of the clutch more difficult to determine) - extended shifting time when engaging a gear from neutral position - driving off from a stationary position is possible
	- short circuit to supply	<p>When driving:</p> <ul style="list-style-type: none"> - no more gear changes possible - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - driving off from a stationary position is possible - extended shifting time, air supply main valve is not switched on until the clutch has been opened

Fault code	Fault code description with possible cause	Symptom
3018	Short circuit to earth or interruption of selector valve Y17 (slowly open clutch): - pin B9 of modulator (D954)	<ul style="list-style-type: none"> - Modulator output is switched off - Selector valve Y16 (quickly open clutch) takes over function - Reduced comfort during clutching - No automatic mode available
	Short circuit to supply of selector valve Y17 (slowly open clutch): - pin B9 of modulator (D954)	<ul style="list-style-type: none"> - No more gear changes possible, system not available - At standstill the gearbox will automatically be shifted to the neutral position if the clutch is open
3019	Short circuit to earth or interruption of selector valve Y15 (close clutch slowly): - pin B7 of modulator (D954)	<ul style="list-style-type: none"> - Modulator output is switched off - Selector valve Y14 (close clutch rapidly) takes over function - Reduced comfort during clutching - No automatic mode available
	Short circuit to supply of selector valve Y15 (close clutch slowly): - pin B7 of modulator (D954)	<ul style="list-style-type: none"> - No more gear changes possible, system not available - When driving, the required clutch position is controlled by selector valves (clutch open) - At standstill the gearbox is automatically shifted to the neutral position after a few seconds
3020	Short circuit to earth or interruption of selector valve Y16 (open clutch rapidly): - pin B12 of modulator (D954)	<ul style="list-style-type: none"> - Modulator output is switched off - Selector valve Y17 (open clutch slowly) takes over function - Extended shifting time - Reduced comfort during clutching - No automatic mode available
	Short circuit to supply of selector valve Y16 (open clutch rapidly): - pin B12 of modulator (D954)	<ul style="list-style-type: none"> - Actuating unit (D955) is switched off - System not available
3021	Short circuit to earth or interruption of selector valve Y14 (close clutch rapidly): - pin B8 of modulator (D954)	<ul style="list-style-type: none"> - Modulator output is switched off - Selector valve Y15 (close clutch slowly) takes over function - Extended shifting times - Reduced comfort during clutching - No automatic mode available
	Short circuit to supply of selector valve Y14 (close clutch rapidly): - pin B8 of modulator (D954)	<ul style="list-style-type: none"> - No more gear changes possible, system not available - When driving, the required clutch position is controlled by selector valves (clutch open) - At standstill the gearbox is automatically shifted to the neutral position after a few seconds
3022	Short circuit to earth or interruption of power supply to internal speed sensor (F705) or actuating unit (D955): - pin B18 of modulator (D954) - pin A11 of modulator (D954)	<ul style="list-style-type: none"> - No more gear changes possible - If the vehicle comes to a halt, the clutch is automatically opened - Gearbox shifts automatically to the neutral position - System not available
	Short circuit to supply of internal speed sensor (F705) or actuating unit (D955): - pin B18 of modulator (D954) - pin A11 of modulator (D954)	<ul style="list-style-type: none"> - Fault is recognised during self-test when switching ignition off/on - No noticeable system limitation - Automatic mode remains available

Fault code	Fault code description with possible cause	Symptom
3026	Engine configuration not recognised via message on CAN network due to: - communication problem with UPEC ECU	<ul style="list-style-type: none"> - Automatic mode remains available, but reduced shifting characteristics are possible - Downshift speed may be too low, which results in reduced shifting comfort - Reduced comfort during declutching
3027	Incorrect or missing engine configuration signal via message on CAN network	<ul style="list-style-type: none"> - Automatic mode remains available, but reduced shifting characteristics are possible - Downshift speed may be too low, which results in reduced shifting comfort - Reduced comfort during declutching
3033	Engine brake configuration signal not recognised via message on CAN network due to: - communication problem with UPEC ECU	<ul style="list-style-type: none"> - No noticeable system limitation - Automatic mode available
3059	Incorrect PTO 1 status signal via message on CAN network, in the following situation: - PTO 1 status signal active - no request (PTO switch) for PTO 1 - no actuation (VIC ECU) of PTO 1	<ul style="list-style-type: none"> - With a PTO 1 request the PTO 1 output of the VIC ECU is actuated normally - No noticeable system limitation - Automatic mode available
3060	Incorrect PTO 2 status signal via message on CAN network, in the following situation: - PTO 2 status signal active - no request (PTO switch) for PTO 2 - no actuation (VIC ECU) of PTO 2	<ul style="list-style-type: none"> - With a PTO 2 request the PTO 2 output of the VIC ECU is actuated normally - No noticeable system limitation - Automatic mode available
3061	Incorrect PTO 1 status signal via message on CAN network, in the following situation: - PTO 1 status signal active - request (PTO switch) for disengaging PTO 1 is present	<p>When driving:</p> <ul style="list-style-type: none"> - no more gear changes possible - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - If the vehicle comes to a halt, the clutch is automatically opened - at standstill the gearbox is automatically shifted to the neutral position - no more gear changes possible - system not available
3062	Incorrect PTO 2 status signal via message on CAN network, in the following situation: - PTO 2 status signal active - request (PTO switch) for disengaging PTO 2 is present	<p>When driving:</p> <ul style="list-style-type: none"> - no more gear changes possible - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - If the vehicle comes to a halt, the clutch is automatically opened - at standstill the gearbox is automatically shifted to the neutral position - no more gear changes possible - system not available
3063	Missing PTO 1 status signal via message on CAN network, in the following situation: - request (PTO switch) for PTO 1 is present - actuation of PTO 1 solenoid valve via VIC ECU	<ul style="list-style-type: none"> - Actuation of PTO 1 is discontinued - PTO 1 is not available - No noticeable system limitation - Automatic mode available
3064	Missing PTO 2 status signal via message on CAN network, in the following situation: - request (PTO switch) for PTO 2 is present - actuation of PTO 2 solenoid valve via VIC ECU	<ul style="list-style-type: none"> - Actuation of PTO 2 is discontinued - PTO 2 not available - No noticeable system limitation - Automatic mode available

Fault code	Fault code description with possible cause	Symptom
3090	Internal modulator fault (D954) due to: <ul style="list-style-type: none"> - communication problem between internal processors of modulator (D954) - basic software 1 and 2 of modulator (D954) has been corrupted 	When driving: <ul style="list-style-type: none"> - no more gear changes possible - automatic mode not available At standstill: <ul style="list-style-type: none"> - If the vehicle comes to a halt, the clutch is automatically opened - at standstill the gearbox is automatically shifted to the neutral position - no more gear changes possible - system not available
3091	Incorrect or missing ABS/EBS signal via message on CAN network due to: <ul style="list-style-type: none"> - communication problem with ABS/EBS 	<ul style="list-style-type: none"> - Automatic mode not available - No noticeable system limitation
3098	Incorrect or missing speed signal from the gearbox input shaft (measured by the integrated speed sensor in the modulator (D954)) due to: <ul style="list-style-type: none"> - defective integrated speed sensor in the modulator - incorrect mechanical operation of the transmission brake clutch 	When driving: <ul style="list-style-type: none"> - extended shifting times - reduced shifting comfort when changing gears; when shifting up and down, the clutch in neutral position will be partially closed to adjust the speed of the input shaft to that of the engine - with engaged gear the input shaft speed signal is replaced with the output shaft speed signal - automatic mode not available At standstill: <ul style="list-style-type: none"> - extended shifting time when engaging a gear - reduced clutch comfort when closing the clutch
3099	Incorrect or missing output shaft speed signal (measured by the internal speed sensor (F705)) due to: <ul style="list-style-type: none"> - defective internal speed sensor (F705) 	<ul style="list-style-type: none"> - Internal speed signal is replaced with the vehicle speed signal from the MTCO sensor (F533) - No noticeable system limitation - Automatic mode available
3101	Incorrect or missing input shaft speed signal and incorrect or missing output shaft speed signal due to: <ul style="list-style-type: none"> - defective integrated speed sensor in the modulator - incorrect mechanical operation of the transmission brake clutch - defective internal speed sensor (F705) - defective modulator (D954) 	When driving: <ul style="list-style-type: none"> - no more gear changes possible - automatic mode not available At standstill: <ul style="list-style-type: none"> - If the vehicle comes to a halt, the clutch is automatically opened - at standstill the gearbox is automatically shifted to the neutral position - no more gear changes possible - system not available
3102	The ratio between the speed signal of the input shaft and that of the output shaft is not acceptable in relation to the engaged gear ratio.	When driving: <ul style="list-style-type: none"> - no more gear changes possible; the gearbox tries to automatically shift to the neutral position - automatic mode not available At standstill: <ul style="list-style-type: none"> - driving off from a stationary position in automatically selected drive-off gears is possible

Fault code	Fault code description with possible cause	Symptom
3107	<p>Incorrect or missing supply voltage of the clutch travel sensor in the clutch unit:</p> <ul style="list-style-type: none"> - pin B15 of the clutch unit (B385) 	<p>When driving:</p> <ul style="list-style-type: none"> - reduced clutch comfort when opening and closing the clutch; this is done in a time-controlled fashion - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - shunting is not possible - if driving off from a stationary position does not take place within a certain period of time, the gearbox will be automatically shifted to the neutral position. The drive-off gear must then be selected manually. - reduced clutch comfort when closing the clutch
3108	<p>Internal fault in actuating unit (D955) due to:</p> <ul style="list-style-type: none"> - unacceptable gear lever position sensor signals in relation to each other - defective selector switch (E590) 	<p>When driving:</p> <ul style="list-style-type: none"> - no gear changes possible - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - when driving off, the drive-off gear will be selected in accordance with the position of the selector switch, both forward and reverse - after the ignition has been switched off, the gearbox will be shifted to the neutral position - the system will not be available when the ignition is switched on
3110	<p>Incorrect or missing internal CAN signal due to:</p> <ul style="list-style-type: none"> - communication problem with internal CAN system - internal short circuit on pin C1 or C3 of actuating unit (D955) - internal short circuit on pin A3 or A6 of modulator (D954) 	<p>When switching on the ignition:</p> <ul style="list-style-type: none"> - fault is recognised during self-test - system is not available <p>When driving:</p> <ul style="list-style-type: none"> - no gear changes possible - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - if the vehicle comes to a halt, the last selected drive-off gear is engaged; it is only possible to drive in this gear. If reverse was the last selected drive-off gear, the gearbox is automatically shifted to the neutral position.
3111	<p>No recognition of "realtime" signal (time/date) via message on CAN network due to:</p> <ul style="list-style-type: none"> - communication problem with UPEC ECU 	<ul style="list-style-type: none"> - No noticeable system limitation - Automatic mode available -
3112	<p>Incorrect or missing "realtime" signal (time/date) via message on CAN network (this signal is used to calculate the clutch load):</p> <ul style="list-style-type: none"> - clutch load can no longer be checked 	<ul style="list-style-type: none"> - No noticeable system limitation - Automatic mode available -
3113	<p>Intarder configuration signal not recognised via message on CAN network due to:</p> <ul style="list-style-type: none"> - communication problem with EST 42 ECU - incorrect programming of AS Tronic basic software 	<ul style="list-style-type: none"> - No noticeable system limitation - Automatic mode not available

Fault code	Fault code description with possible cause	Symptom
3114	Clutch closes unexpectedly during standstill and with engaged gear. Current clutch position changes without the solenoid valves of the clutch unit being actuated. The clutch unit travel sensor transmits clutch movements to the modulator. <ul style="list-style-type: none"> - Poor freedom of movement of clutch plate on the keyways of the input shaft - During controlled closing of the clutch, the clutch remains temporarily open due to insufficient mechanical freedom of movement of the clutch (heavy point) - Mechanical fault of clutch unit solenoid valves 	At standstill: <ul style="list-style-type: none"> - gearbox is automatically shifted to the neutral position - once the neutral position has been reached, it will be possible to drive on after the selector switch has been changed from position D-N-D - automatic mode not available
3117	It is not possible to teach-in the clutch during the self-test. No change in clutch position is detected, despite actuation of solenoid valves Y14 to Y17 in the clutch unit. Possible cause: <ul style="list-style-type: none"> - internal modulator fault (D954) - internal clutch unit fault (B385) - electrical fault in wiring harness between modulator and clutch unit - incorrect clutch travel sensor signal, engine speed signal or input shaft speed signal 	<ul style="list-style-type: none"> - System is not available
3118	Clutch does not open despite the fact that solenoid valves Y16 and Y17 are actuated: <ul style="list-style-type: none"> - internal modulator fault (D954) - internal clutch unit fault (B385) - electrical fault in wiring harness between modulator and clutch unit - incorrect clutch travel sensor signal, engine speed signal or input shaft speed signal 	When driving: <ul style="list-style-type: none"> - no more gear changes possible - automatic mode not available At standstill: <ul style="list-style-type: none"> - if the vehicle comes to a halt, a new effort is made to open the clutch - at standstill the gearbox is automatically shifted to the neutral position - system is not available
3119	Clutch does not close despite the fact that solenoid valves Y14 and Y15 are actuated. The clutch cannot transmit any engine torque. <ul style="list-style-type: none"> - Clutch travel sensor does not recognise the closing motion of the clutch when driving or when the engine is idling - Input shaft speed is not equal to the engine speed - Admissible solenoid valve switch-on time is exceeded 	When driving: <ul style="list-style-type: none"> - no more gear changes possible - automatic mode not available At standstill: <ul style="list-style-type: none"> - if the vehicle comes to a halt, the clutch is opened - at standstill the gearbox is automatically shifted to the neutral position - system is not available
3120	Selector valve Y17 (slowly open clutch) is not working despite actuation (3x): <ul style="list-style-type: none"> - mechanical fault of selector valve Y17 	<ul style="list-style-type: none"> - Function is taken over by redundant selector valve Y16 - Reduced shifting comfort - Automatic mode not available
3121	Selector valve Y16 (open clutch rapidly) is not working despite actuation (3x): <ul style="list-style-type: none"> - mechanical fault of selector valve Y16 	<ul style="list-style-type: none"> - Function is taken over by redundant selector valve Y17 - Reduced shifting comfort - Automatic mode not available
3122	Selector valve Y15 (close clutch slowly) is not working despite actuation (3x): <ul style="list-style-type: none"> - mechanical fault of selector valve Y15 	<ul style="list-style-type: none"> - Function is taken over by redundant selector valve Y14 - Reduced shifting comfort - Automatic mode not available

Fault code	Fault code description with possible cause	Symptom
3123	Selector valve Y14 (close clutch rapidly) is not working despite actuation (3x): <ul style="list-style-type: none"> - mechanical fault of selector valve Y14 	<ul style="list-style-type: none"> - Function is taken over by redundant selector valve Y15 - Reduced shifting comfort - Automatic mode not available
3124	Incorrect clutch travel sensor signal due to: <ul style="list-style-type: none"> - clutch travel sensor signal being outside ranch - increasing input shaft speed during standstill, with the clutch sensor detecting an opened clutch - unacceptable difference between engine speed and input shaft speed, with clutch being open 	<p>When driving:</p> <ul style="list-style-type: none"> - clutch is opened and closed in a time-controlled fashion - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - shunting is not possible - if driving off from a stationary position does not take place within a certain period of time, the gearbox will be automatically shifted to the neutral position. The drive-off gear must then be selected manually. - reduced clutch comfort when closing the clutch as you drive off
3126	Incorrect pressure sensor signal from integrated pressure sensor in the modulator (D954) due to: <ul style="list-style-type: none"> - defective pressure sensor in modulator - pressure sensor signal outside range - defective modulator (D954) 	<ul style="list-style-type: none"> - System available, provided there is sufficient air supply to the modulator - Teaching in of position sensors of selector valves and clutch position during the self-test takes more time than usually - Automatic mode not available
3127	Incorrect ECU temperature signal from integrated temperature sensor in the modulator (D954) due to: <ul style="list-style-type: none"> - defective temperature sensor in modulator - temperature sensor signal outside range - defective modulator (D954) 	<ul style="list-style-type: none"> - No noticeable system limitation - Automatic mode not available
3129	Position sensor signal, main range, in the modulator (D954): <ul style="list-style-type: none"> - short circuit to earth - short circuit to supply - interruption 	<p>When driving:</p> <ul style="list-style-type: none"> - if the fault occurs during shifting, the signal "gear engaged" from the main range position sensor will be generated in a time-controlled fashion - no more gear changes possible, except from neutral position - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - the possibility to shift to the neutral position is monitored by testing the engaging cylinder for gate selection by actuating selector valves Y4 and Y5 - driving off from a stationary position is possible - to prevent tooth-to-tooth contact, the air supply main valve Y10 and main range selector valves Y6/Y7 remain engaged until the clutch position during closing exceeds a particular value

Fault code	Fault code description with possible cause	Symptom
3132	Teach-in fault, main range position sensor, during self-test: <ul style="list-style-type: none"> - main range position sensor signal outside range - if there is insufficient air pressure and the air pressure sensor is not defective, an effort is made to shift the main range to the neutral position - internal modulator fault (D954); selector valves Y6/Y7 are not actuated correctly - mechanically defective gearbox 	<ul style="list-style-type: none"> - With ignition off, the gearbox is shifted to the neutral position - With ignition on, the selector valves Y6/Y7 (main range) and Y10 (air supply) are actuated. As a result the gearbox must be shifted to the neutral position. This takes place 3 times. - Mechanical neutral position is measured by the main range position sensor. If this signal is out of range and there is sufficient air pressure (air pressure sensor in modulator), a teach-in fault is stored. - System not available
3133	Position sensor signal, gate selection in the modulator (D954): <ul style="list-style-type: none"> - short circuit to earth - short circuit to supply - interruption 	When driving: <ul style="list-style-type: none"> - only the gears opposite to the reverse gear can be shifted - automatic mode not available At standstill: <ul style="list-style-type: none"> - only the drive-off gears opposite to the reverse gear can be shifted - reverse gear not available
3136	Teach-in fault, gate selection position sensor, during self-test: <ul style="list-style-type: none"> - if sufficient air pressure is available, the gate selection sensor signal is out of range after 3 failed efforts to select another gate position - if insufficient air pressure is available, the gate selection sensor signal is out of range after a certain waiting time and a new effort - internal modulator fault (D954); selector valves Y4/Y5 are not actuated correctly - mechanically defective gearbox 	<ul style="list-style-type: none"> - In case of an electrical fault in selector valves Y4/Y5 for gate selection the ECU tries to engage the forward gears of the main range: 12AS - 2nd/3rd gear of main range; 16AS - 3rd/4th gear of main range - If the forward gears cannot be engaged, the ECU will try to engage the reverse gear gate of the main range: 12AS - R/1st gear of main range; 16AS - 1st/2nd gear of main range - If it is possible to teach-in a gate, only the gears in that particular gate can be shifted - If this is not possible, the system is not available - Automatic mode not available
3137	Position sensor signal, rear-mounted range box in the modulator (D954): <ul style="list-style-type: none"> - short circuit to earth - short circuit to supply - interruption 	When driving: <ul style="list-style-type: none"> - only gears in the high or low range can be shifted - no shifting up/down is possible when driving - if the fault occurs when shifting up/down, the gears will be shifted in a time-controlled and delayed fashion - Automatic mode not available At standstill: <ul style="list-style-type: none"> - all drive-off gears can be engaged - main valve Y10 and rear-mounted range box valve Y8 or Y9 remain actuated until the clutch has reached a certain position. This prevents tooth-to-tooth contact of the rear-mounted range box

Fault code	Fault code description with possible cause	Symptom
3140	<p>Teach-in fault, rear-mounted range box position sensor, during self-test:</p> <ul style="list-style-type: none"> - if there is sufficient air pressure, the sensor signal of the rear-mounted range box is out of range - internal modulator fault (D954); selector valve Y8 or Y9 is not actuated correctly - mechanically defective gearbox 	<ul style="list-style-type: none"> - With ignition off, the gearbox remains in the last selected range - Through actuation of main valve Y10 and selector valve Y8 or Y9 for the rear-mounted range box, the position of the engaged range is ensured once again - If it is only possible to teach-in the low range, gears can only be shifted in this range - If it is only possible to teach-in the high range, gears can only be shifted in this range - If it is impossible to teach-in either the low or the high range, no more gears can be shifted - System is not available
3141	<p>Position sensor signal, splitter range in the modulator (D954):</p> <ul style="list-style-type: none"> - short circuit to earth - short circuit to supply - interruption 	<ul style="list-style-type: none"> - It is not possible to shift gears in the splitter range - Driving is only possible in the last selected position of the splitter range: K1 or K2. If we assume that K2 is the last selected position, the PTO function will not be available - If the selected gear cannot be engaged, the next higher gear is engaged, if possible - If the fault occurs when shifting the splitter range, this range will be shifted in a time-controlled and delayed fashion - Automatic mode not available
3144	<p>Teach-in fault, splitter range position sensor, during self-test:</p> <ul style="list-style-type: none"> - if there is sufficient air pressure, the sensor signal of the splitter range is out of range - internal modulator fault (D954); selector valve Y2 or Y3 is not actuated correctly - mechanically defective gearbox 	<ul style="list-style-type: none"> - With ignition off, the gearbox remains in the last selected range - Through actuation of main valve Y10 and selector valve Y2 or Y3 for the splitter range, the position of the engaged range is ensured once again - If it is only possible to teach-in the low range, only low-range gears can be engaged - If it is only possible to teach-in the high range, only high-range gears can be engaged - If it is impossible to teach-in either the low or the high range, no more gears can be shifted - System is not available
3145	<p>Rear-mounted range box does not disengage from the last selected position after actuation:</p> <ul style="list-style-type: none"> - insufficient air pressure available - internal modulator fault (D954); selector valves Y8/Y9 are not actuated correctly - mechanically defective gearbox 	<p>When driving:</p> <ul style="list-style-type: none"> - when shifting from the low to the high range, the highest gear of the low range is engaged - when shifting from the high to the low range, the lowest gear of the high range is engaged - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - if it is impossible to shift the low range, the lowest gear in the high range is selected as drive-off gear - no reverse shifting possible in the high range

Fault code	Fault code description with possible cause	Symptom
3146	Rear-mounted range box does not disengage from the last selected position after actuation: <ul style="list-style-type: none"> - insufficient air pressure available - internal modulator fault (D954); selector valves Y8/Y9 are not actuated correctly - mechanically defective gearbox 	When driving: <ul style="list-style-type: none"> - if the rear-mounted range box is not switched over to the other position after 3 attempts, the highest gear of the low range is engaged when shifting from the low to the high range. When shifting from the high to the low range, the lowest gear of the high range is engaged. - automatic mode not available At standstill: <ul style="list-style-type: none"> - if it is impossible to shift the low range, the lowest gear in the high range is selected as drive-off gear - new attempts to shift the rear-mounted range box can still be made
3147	Rear-mounted range box neither shifts in the high range nor in the low range within a certain period of time: <ul style="list-style-type: none"> - insufficient air pressure available - internal modulator fault (D954); selector valves Y8/Y9 are not actuated correctly - mechanically defective gearbox 	<ul style="list-style-type: none"> - If the selected range cannot be engaged after 3 attempts, the last shifted range will be engaged - If the last selected range can no longer be engaged either, the gearbox will shift to the neutral position - New attempts to shift the rear-mounted range box can still be made - Automatic mode not available
3148	Splitter range does not disengage from last selected position: <ul style="list-style-type: none"> - insufficient air pressure available - internal modulator fault (D954); selector valve Y2 or Y3 is not actuated correctly - mechanically defective gearbox 	When driving: <ul style="list-style-type: none"> - if the selected gear cannot be engaged, the next higher gear is engaged, if possible - only the gears in the last selected position of the splitter range can be engaged - automatic mode not available At standstill: <ul style="list-style-type: none"> - only the drive-off gears in the last selected position of the splitter range can be engaged
3149	Splitter range does not disengage from the last selected position after actuation: <ul style="list-style-type: none"> - insufficient air pressure available - internal modulator fault (D954); selector valves Y2/Y3 are not actuated correctly - mechanically defective gearbox 	When driving: <ul style="list-style-type: none"> - if the selected gear cannot be engaged, the next higher gear is engaged, if possible - only the gears in the last selected position of the splitter range can be engaged - automatic mode not available At standstill: <ul style="list-style-type: none"> - only the drive-off gears in the last selected position of the splitter range can be engaged
3150	Splitter range neither shifts in the high range nor in the low range (K1 or K2) within a certain period of time: <ul style="list-style-type: none"> - insufficient air pressure available - internal modulator fault (D954); selector valves Y2/Y3 are not actuated correctly - mechanically defective gearbox 	<ul style="list-style-type: none"> - Fault is stored during standstill - System is not available

Fault code	Fault code description with possible cause	Symptom
3151	<p>Gate selection cylinder does not disengage from the last selected gate after actuation:</p> <ul style="list-style-type: none"> - insufficient air pressure available - internal modulator fault (D954); selector valves Y4/Y5 are not actuated correctly - mechanically defective gearbox 	<p>When driving:</p> <ul style="list-style-type: none"> - if the fault occurs during shifting, the gearbox will shift down to the last selected gear - if the previous gear cannot be engaged because the speed is too high, the gear closest to the previous one is engaged - if the highest possible gear cannot be engaged because the speed is too high, the gearbox will automatically shift to the neutral position - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - if the desired drive-off gear cannot be engaged, the gearbox will automatically shift to the neutral position - a new drive-off gear can only be selected using the selector switch
3152	<p>Gate selection cylinder does not disengage from the last selected gate after actuation:</p> <ul style="list-style-type: none"> - insufficient air pressure available - internal modulator fault (D954); selector valves Y4/Y5 are not actuated correctly - mechanically defective gearbox 	<p>When driving:</p> <ul style="list-style-type: none"> - selection cylinder returns to the last selected position and the gearbox shifts back to the last engaged gear - if the last selected gear cannot be engaged because the speed is too high, the gear closest to the previous one is engaged - if the highest possible gear cannot be engaged because the speed is too high, the gearbox will automatically shift to the neutral position - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - if the desired drive-off gear cannot be engaged, the gearbox will automatically shift to the neutral position
3153	<p>Gate selection cylinder does not shift to new or previous end position within a certain period of time:</p> <ul style="list-style-type: none"> - insufficient air pressure available - internal modulator fault (D954); selector valves Y4/Y5 are not actuated correctly - mechanically defective gearbox 	<ul style="list-style-type: none"> - Both at standstill and when driving the gearbox will automatically shift to the neutral position - A new gear must be selected using the selector switch - If no gate can be selected, the system is not available - Automatic mode not available
3154	<p>Main range sensor signal still displays "gear engaged", with the clutch opened and the gearbox shifted to the neutral position:</p> <ul style="list-style-type: none"> - insufficient air pressure available - internal modulator fault (D954); selector valves Y6/Y7 are not actuated correctly - mechanically defective gearbox 	<p>When driving:</p> <ul style="list-style-type: none"> - clutch only closes in the last selected gear - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - shifting is not possible until the neutral position signal has been recognised - driving off from a stationary position in the current gear is possible, provided it is equal to or lower than the lowest gear of the high range

Fault code	Fault code description with possible cause	Symptom
3155	Main range does not switch in selected gear: <ul style="list-style-type: none"> - insufficient air pressure available - internal modulator fault (D954); selector valves Y6/Y7 are not actuated correctly - mechanically defective gearbox 	<ul style="list-style-type: none"> - Gearbox does not disengage from the neutral position within a certain period of time or the selected gear is not reached within a certain period of time - If the above fault occurs when driving or during standstill, the gearbox will automatically shift to the neutral position - Automatic mode not available
3156	Main range engages a gear which does not correspond with the position sensor signal from the main range	<ul style="list-style-type: none"> - When driving and at standstill the gearbox is automatically shifted to the neutral position. If the neutral position cannot be reached, the clutch will remain open. - Automatic mode not available
3157	Gate selection sensor signal changes when driving, without a new gear being selected	<ul style="list-style-type: none"> - Main valve Y10 and selector valve Y4 or Y5 for gate selection are actuated cyclically to ensure the position of the engaged gear - Automatic mode available
3158	Main range sensor signal changes when driving, without a new gear being selected	<ul style="list-style-type: none"> - Main valve Y10 and selector valve Y6 or Y7 for main range are actuated to ensure the position of the engaged gear - If the last selected gear can no longer be engaged mechanically, a gear corresponding with the current vehicle speed is shifted - Automatic mode available
3159	The rear-mounted range box sensor signal changes when driving, without a new gear being selected	<ul style="list-style-type: none"> - Main valve Y10 and selector valve Y8 or Y9 for rear-mounted range box are actuated to ensure the position of the engaged gear - If the last selected gear can no longer be engaged mechanically, a gear corresponding with the current vehicle speed is shifted - Automatic mode available
3160	The splitter range sensor signal changes when driving, without a new gear being selected	<ul style="list-style-type: none"> - Main valve Y10 and selector valve Y2 or Y3 for splitter range and Y6 or Y7 for main range are actuated to ensure the position of the engaged gear - If the last selected gear can no longer be engaged mechanically, a gear corresponding with the current vehicle speed is shifted - Automatic mode available
3163	Incorrect or missing engine speed increase signal via message on CAN network	<p>When driving:</p> <ul style="list-style-type: none"> - no gear changes possible - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - driving off from a stationary position is possible, although the clutch and shifting comfort will be affected

Fault code	Fault code description with possible cause	Symptom
3166	<p>Incorrect accelerator pedal potentiometer signal via message on CAN network:</p> <ul style="list-style-type: none"> - accelerator pedal position exceeds stationary position and stationary signal is active 	<p>When driving:</p> <ul style="list-style-type: none"> - shifting is possible - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - driving off from a stationary position and shunting are not possible - system is not available
3169	<p>Post-switch function for supply voltage of modulator (D954) does not switch off:</p> <ul style="list-style-type: none"> - pins A11 and B18 of modulator (D954) will still receive supply voltage after the ignition has been switched off - modulator outputs cannot be switched 	<p>When driving:</p> <ul style="list-style-type: none"> - no gear changes possible - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - if the vehicle comes to a halt, the clutch will open and the gearbox is automatically shifted to the neutral position - driving off from a stationary position is not possible - system is not available
3170	<p>Incorrect modulator supply voltage or incorrect post-switch function for modulator supply voltage during self-test:</p> <ul style="list-style-type: none"> - pin A4/A5 of modulator (D954) without supply voltage when ignition is switched on and off - pins A11 and B18 of modulator (D954) without supply voltage when the ignition is switched on 	<ul style="list-style-type: none"> - When driving and at standstill all modulator and clutch unit switching is blocked - Current shifting and clutch positions are maintained - System not available
3175	<p>Incorrect supply voltage on modulator, power supply after ignition, with ignition turned on and idling engine:</p> <ul style="list-style-type: none"> - pin A1 of modulator (D954) 	<p>When driving:</p> <ul style="list-style-type: none"> - no more gear changes possible - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - if the engine is idling, the drive-off gears (forward and reverse) can be engaged - if the engine is not running, the gearbox automatically shifts to the neutral position and the modulator switches off - when switching the ignition off and on, the self-test will not be finished successfully and the system will not be available
3177	<p>No CAN communication possible between any vehicle systems due to problems with the V-CAN:</p> <ul style="list-style-type: none"> - short circuit to earth, short circuit to supply or interruption on pin A8/A12 and/or pin A13/A14 of modulator - defective modulator (D954) 	<p>When driving:</p> <ul style="list-style-type: none"> - no gear changes possible - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - if the vehicle comes to a halt, the clutch will open and the gearbox is automatically shifted to the neutral position - driving off from a stationary position is not possible - system is not available

Fault code	Fault code description with possible cause	Symptom
3178	Warning CAN communication between all vehicle systems possibly not OK	<ul style="list-style-type: none"> - When driving: - no gear changes possible - automatic mode not available - - At standstill: - if the vehicle comes to a halt, the clutch will open and the gearbox is automatically shifted to the neutral position - driving off from a stationary position is not possible - system is not available
3179	Overloaded CAN communication system between all vehicle systems. Not all CAN messages can be sent in the same cycle.	<p>When driving:</p> <ul style="list-style-type: none"> - no gear changes possible - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - if the vehicle comes to a halt, the clutch will open and the gearbox is automatically shifted to the neutral position - driving off from a stationary position is not possible - system is not available
3180	No CAN message received from engine management (UPEC) due to: <ul style="list-style-type: none"> - communication problem with the engine management (UPEC) 	<p>When driving:</p> <ul style="list-style-type: none"> - no gear changes possible - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - if the vehicle comes to a halt, the clutch will open and the gearbox is automatically shifted to the neutral position - driving off from a stationary position is not possible - system is not available
3181	No CAN message received from engine management (UPEC) due to: <ul style="list-style-type: none"> - communication problem with the engine management (UPEC) 	<p>When driving:</p> <ul style="list-style-type: none"> - no gear changes possible - automatic mode not available <p>At standstill:</p> <ul style="list-style-type: none"> - if the vehicle comes to a halt, the clutch will open and the gearbox is automatically shifted to the neutral position - driving off from a stationary position is not possible - system is not available
3182	Incorrect or missing cruise control vehicle speed signal received via CAN message due to: <ul style="list-style-type: none"> - communication problem with the engine management (UPEC) 	<ul style="list-style-type: none"> - Wheel speed signals are missing - Automatic mode not available - When the vehicle is coasting, the clutch will be opened at a vehicle speed exceeding 1.5 km/h.
3183	Incorrect or missing engine brake signal received via CAN message from engine management (UPEC) due to: <ul style="list-style-type: none"> - communication problem with the engine management (UPEC) 	<ul style="list-style-type: none"> - If the engine brake is active, this may affect the shifting quality when shifting is started - No further system limitation - Automatic mode not available

Fault code	Fault code description with possible cause	Symptom
3184	No CAN message received from the intarder (EST 42) due to: - communication problem with intarder (EST 42)	- No noticeable system limitation - Automatic mode not available
3188	Internal modulator fault (D954) due to: - missing or defective basic program(s)	When driving: - no gear changes possible - automatic mode not available At standstill: - if the vehicle comes to a halt, the clutch will open and the gearbox is automatically shifted to the neutral position - driving off from a stationary position is not possible - system is not available
3189	Internal modulator fault (D954) due to: - missing or defective basic program(s)	When driving: - no gear changes possible - automatic mode not available At standstill: - if the vehicle comes to a halt, the clutch will open and the gearbox is automatically shifted to the neutral position - driving off from a stationary position is not possible - system is not available
3190	Internal modulator fault (D954) due to: - missing or defective basic program(s) - fault recognised during self-test	When driving: - no gear changes possible - automatic mode not available At standstill: - if the vehicle comes to a halt, the clutch will open and the gearbox is automatically shifted to the neutral position - driving off from a stationary position is not possible - system is not available
3191	Internal modulator fault (D954) due to: - missing or defective basic program(s) - fault recognised during self-test	When driving: - no gear changes possible - automatic mode not available At standstill: - if the vehicle comes to a halt, the clutch will open and the gearbox is automatically shifted to the neutral position - driving off from a stationary position is not possible - system is not available
3192	Internal modulator fault (D954) due to: - communication problem between processors in modulator	- If the fault still occurs after the ignition has been switched off and on, an average drive-off gear will be selected when driving off from a stationary position - No noticeable system limitation - Automatic mode not available

Fault code	Fault code description with possible cause	Symptom
3193	The modulator temperature measured by the integrated temperature sensor is too high: - temperature > 130 degrees Celsius	When driving: - no gear changes possible - automatic mode not available At standstill: - if the vehicle comes to a halt, the clutch will open and the gearbox is automatically shifted to the neutral position - driving off from a stationary position is not possible - system is not available
3194	Front axle speed signals not recognised via message on CAN network	- No noticeable system limitation - Automatic mode not available
3198	Relative wheel speed sensor signals not recognised via message on CAN network	- No noticeable system limitation - Automatic mode available
3199	No CAN message received from ABS/EBS unit due to: - communication problem with ABS/EBS	- An average drive-off gear is selected when driving off from a stationary position - No noticeable system limitation - Automatic mode available
3210	No CAN message received from the MTCO due to: - communication problem with the MTCO	- No noticeable system limitation, if there is a redundant internal speed signal - Automatic mode available
3227	Internal modulator fault (D954) due to: - missing or defective basic program(s) - fault recognised during self-test	When driving: - no gear changes possible - automatic mode not available At standstill: - if the vehicle comes to a halt, the clutch will open and the gearbox is automatically shifted to the neutral position - driving off from a stationary position is not possible - system is not available
3235	No PTO active signal received by AS Tronic ECU from VIC via CAN message due to: - communication problem with the VIC	- No PTO 1 and PTO 2 actuation possible
3236	No CAN message received from the VIC due to: - communication problem with the VIC	- No PTO 1 actuation possible
3237	No CAN message received from the VIC due to: - communication problem with the VIC	- No PTO 2 actuation possible

2. SYSTEM INSPECTION WITH DAVIE XD

2.1 GENERAL

If the tyre size is changed or if the vehicle is adjusted in such a way that the configuration is changed, the electronic unit may have to be re-programmed.

2.2 'TRANSMISSION' MENU

The 'Transmission' menu is subdivided into two tests:

- static selector shaft position test
- dynamic selector shaft position test

Both tests are used to check the mechanical operation of the AS Tronic gearbox. This is done by reading the position of all selector shafts in gears that have been determined beforehand. These positions are shown on the DAVIE display by means of a position value, the so-called INC (increment). Upon the start of both tests the accessory test report needs to be printed. The measured position values should be incorporated in the test report, so that the mechanical operation of the gearbox can be evaluated.

Static selector shaft position test

This test is carried out with a stationary vehicle and running engine. Using the "+" and "-" buttons on the DAVIE display the gearbox can be shifted up and down respectively. Changing between RL and RH is done by means of button "Reverse gears". In this way the desired gears of the relevant test report can be selected. Per selected gear the measured position values can be compared with the correct position values that are stated between brackets in the test report.

Dynamic selector shaft position test

If no appreciable deviations are found in the static selector shaft position test, the dynamic selector shaft position test can be carried out subsequently. This test is carried out while driving with a loaded gearbox. Again, the accessory test report should be printed (both test reports are identical, however the test conditions differ). While driving, the desired gears of the relevant test report can be selected using the operating unit. Per selected gear the measured position values can be compared with the correct position values that are stated between brackets in the test report.

2.3 'CLUTCH ACTUATOR' MENU

This test provides an indication of the performance of the clutch/clutch actuator, and can best be carried out on a moving vehicle.

The "absolute clutch stroke" is the clutch stroke from a fully closed to a fully opened position, expressed in mm.

The "relative clutch stroke" indicates the position of the clutch in % instead of mm.

The "clutch status" indicates whether at that moment the clutch is "opened" or "closed" or whether the clutch "slips".

The above measurements are closely connected. For instance, the clutch position "closed" is expressed in mm and %.

A closed clutch gives a relative clutch stroke of 100% in a position between 37 and 60 mm. An opened clutch gives a relative clutch stroke of about 0% in a position between 18 and 40 mm. The clutch position sensor in the clutch actuator measures the distance from a fully closed to a fully opened clutch.

Example:

Clutch position/stroke:

fully closed (100%) = 37 mm

fully opened (approx. 0%) = 18 mm

Difference (clutch stroke) = approx. 19 mm

The position of clutch operation components changes during the service life of the clutch plate. For this reason the clutch stroke of approx. 19 mm will move along the "operating range" of the clutch actuator. This is visible by the changing clutch position (in mm) of the opened and closed clutch.

The "absolute change-over" is the point at which the clutch "engages"; depending on tolerances and wear this point is between 12 and 45 mm.

If the accelerator pedal is not operated, the "low idling switch" is active.

A number of situations are shown by way of example:

Neutral

In neutral the clutch is closed; therefore "engine speed in" and "input shaft speed" have to be virtually equal.

With a closed clutch the "relative clutch stroke" is 100%; also, the "clutch status" indicates that the clutch is closed.

If the accelerator pedal is not operated, the "low idling switch" is active.

Selecting D or R

If D or R is selected, the clutch will open, which is indicated by the "clutch status" and the "input shaft speed" which has become 0 rpm.

With an opened clutch the "relative clutch stroke" is approx. 0%.

If the accelerator pedal is not operated, the "low idling switch" is still active.

When driving away, the clutch will close and the engine and input shaft speeds will be virtually equal.

At the same time the "low idling switch" status will change to not active.

Selecting Manoeuvring R or Manoeuvring D

Selection of Manoeuvring R or Manoeuvring D gives the same result as selection of D and R, until the accelerator pedal is depressed.

The "low idling switch" status changes to not active and the "clutch status" indicates that the clutch slips.

Also, the "relative clutch stroke" indicates that the clutch does not close completely; the stroke will be between 30 and 50%, depending on the resistance that has to be overcome.

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1. VIC FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

1.2 EXPLANATORY NOTES TO VIC FAULT CODES

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Fault code	Fault code description with possible cause	Symptom
12401-3	Short circuit to supply on pin B21 of the ECU	- Gearbox gate protection is active at low speeds; it is impossible to shift gate 1-2 at low speeds
12401-20	Interruption or short circuit to earth on pin B21 of the ECU	- Gearbox gate protection does not function; it is possible to shift gate 1-2 at higher speeds
12501-3	Short circuit to supply on pin B19 of the ECU	- Shifting down to the low range remains possible, even at higher speeds
12501-20	Interruption or short circuit to earth on pin B19 of the ECU	- It is not possible to shift down to the low range, even at low speeds
12701-21	Interruption on pin C05 of the ECU	- Rear fog lamps are not working - Headlamp washers are not working
12702-3	Short circuit to supply on pin C50 of the ECU	- Relay G237 is no longer energised, the windscreen wipers are not working
12702-20	Interruption or short circuit to earth on pin C50 of the ECU	- Windscreen wipers are not working
	Short circuit to earth on pin C50 of the ECU	- Windscreen wiper motor runs at low speed with steering column switch in 0-position
12703-22	Interruption on pin A01 of the ECU	- Windscreen wipers are not working
	Short circuit to supply on pin A01 of the ECU	- Windscreen wiper motor runs at low speed with steering column switch in 0-position
12703-4	Short circuit to earth on pin A01 of the ECU	- Windscreen wipers are not working
12704-22	Short circuit to supply on pin C48 of the ECU	- Headlamp wiper motor is permanently activated
	Interruption on pin C48 of the ECU	- Headlamp wiper motor does not function when the switch is operated
12704-4	Short circuit to earth on pin C48 of the ECU	- Headlamp wiper motor does not function when the switch is operated
13401-24	Short circuit to earth or excessive load on pin E09 of the ECU	- Prime mover left flasher lights: not flashing at the front, flashing with too high a frequency at the rear
13401-5	Interruption or insufficient load on pin E09 of the ECU	- Prime mover left flasher lights are not working
13402-24	Short circuit to earth or excessive load on pin E08 of the ECU	- Prime mover right flasher lights: not flashing at the front, flashing with too high a frequency at the rear
13402-5	Interruption or insufficient load on pin E08 of the ECU	- Prime mover right flasher lights are not working
13403-24	Short circuit to earth or excessive load on pin E07 of the ECU	- Prime mover left flasher lights: not flashing at the rear, flashing with too high a frequency at the front
13403-5	Interruption or insufficient load on pin E07 of the ECU	- Prime mover left flasher lights are not working

Fault code	Fault code description with possible cause	Symptom
13404-24	Short circuit to earth or excessive load on pin E04 of the ECU	- Prime mover right flasher lights: not flashing at the rear, flashing with too high a frequency at the front
13404-5	Interruption or insufficient load on pin E04 of the ECU	- Prime mover right flasher lights are not working
13405-24	Short circuit to earth or excessive load on pin A07 of the ECU	- Drawn vehicle left flasher lights are not working
13406-24	Short circuit to earth or excessive load on pin A08 of the ECU	- Drawn vehicle right flasher lights are not working
21301-3	Short circuit to supply on pin D16 of the ECU	- Air pressure gauge, circuit 1, gives no reading
21301-20	Interruption or short circuit to earth on pin D16 of the ECU	- Air pressure gauge, circuit 1, gives no reading
21301-23	Voltage out of range; voltage between 0 and 1 V on pin D16 of the ECU	- Air pressure gauge, circuit 1, gives no reading
21301-25	Voltage out of range; voltage between 4 and 5 V on pin D16 of the ECU	- Air pressure gauge, circuit 1, gives no reading
21302-3	Short circuit to supply on pin D11 of the ECU	- Air pressure gauge, circuit 1, gives no reading
21302-20	Interruption or short circuit to earth on pin D11 of the ECU	- Air pressure gauge, circuit 2, gives no reading
21302-23	Voltage out of range; voltage between 0 and 1 V on pin D11 of the ECU	- Air pressure gauge, circuit 2, gives no reading
21302-25	Voltage out of range; voltage between 4 and 5 V on pin D11 of the ECU	- Air pressure gauge, circuit 2, gives no reading
21303-3	Short circuit to supply on pin D31 of the ECU	- Air pressure gauges, circuits 1 and 2, give no reading
21303-4	Short circuit to earth on pin D31 of the ECU	- Flashing instrument lighting on DIP-4, no possibility to read fault codes
21901-3	Short circuit to supply on pin B24 of the ECU	- The traction control can be activated independently of speed; normally the traction control can no longer be activated above 30 km/h
22001-21	Interruption on pin C05 of the ECU or interruption in the voltage supply	- Rear fog light relay is no longer automatically deactivated when the lighting is switched off
22002-3	Short circuit to supply on pin C40 of the ECU	- Rear fog lights remain lit, irrespective of the position of the switch
22002-20	Interruption or short circuit to earth on pin C40 of the ECU	- Rear fog lights are not working
22601-21	Interruption on pin C08 of the ECU	- No glow indication on DIP-4
22901-22	Interruption or short circuit to supply on pin D15 of the ECU	- Yellow warning "Coolant level low" is activated
22901-23	Voltage signal is outside of tolerance field	- Information on the main display does not correspond with the actual coolant level; a warning may be displayed
23801-4	Short circuit to earth on pin D04 of the ECU	- Instrument lighting can no longer be dimmed

Fault code	Fault code description with possible cause	Symptom
23801-5	Interruption or insufficient load on pin D04 of the ECU	- Instrument lighting can no longer be dimmed
23802-21	Interruption on pin C07 of the ECU	- Instrument lighting can no longer be dimmed
24202-19	No CAN message received from transmission ECU due to: - communication problem with transmission ECU	- No noticeable system limitation in VIC
24204-19	No CAN message received from intarder ECU due to: - communication problem with intarder ECU	- No noticeable system limitation in VIC
24401-2	Fault when reading the chassis number	- Red warning "VIC configuration fault"
25601-16	Engine speed too high	- Yellow warning "engine speed too high" is active; the engine speed is higher than 2450 rpm for more than 1 second
26001-3	Short circuit to supply on pin B23 of the ECU (manually operated gearbox)	- PTO 1 is permanently activated
26001-20	Interruption or short circuit to earth on pin B23 of the ECU (manually operated gearbox)	- PTO 1 is not activated upon operation of the switch; also, a yellow PTO 1 warning becomes active
26002-3	Short circuit to supply on pin C46 of the ECU (manually operated gearbox)	- PTO 2 is permanently activated
26002-20	Interruption or short circuit to earth on pin C46 of the ECU (manually operated gearbox)	- PTO 2 is not activated upon operation of the switch; also, a yellow PTO 2 warning becomes active
26101-11	No signal on pin B01/B07 of the ECU of the engine oil level sensor (F673)	- Red warning "engine oil level too low" is activated
26201-3	Short circuit to supply on pin B23 of the ECU (AS Tronic)	- PTO 1 is permanently activated
26201-20	Interruption or short circuit to earth on pin B23 of the ECU (AS Tronic)	- PTO 1 is not activated upon operation of the switch; also, a yellow PTO 1 warning becomes active
26202-3	Short circuit to supply on pin C46 of the ECU (AS Tronic)	- PTO 2 is permanently activated
26202-20	Interruption or short circuit to earth on pin C46 of the ECU (AS Tronic)	- PTO 2 is not activated upon operation of the switch; also, a yellow PTO 2 warning becomes active
27201-3	Short circuit to supply on pin C42 of the ECU	- Engine cannot be started; relay G372/G303 remains energised (depending on the production date, this connection is on pin C44 of the ECU with vehicles \geq 2004-25) - Lighting remains lit, relay G301 remains energised - Cab heater cannot be switched on, relay D871/D901 remains energised

Fault code	Fault code description with possible cause	Symptom
27201-19	No CAN message received "engine speed"	There is no power supply on output C42 so that <ul style="list-style-type: none"> - there is no start protection when the engine is running; relay G303/G372 cannot be energised - Swedish lighting is not working; relay G301 cannot be energised - the cab heater is not switched off; relay D871/D901 is not energised
27201-20	Interruption or short circuit to earth on pin C42 of the ECU	<ul style="list-style-type: none"> - There is no start protection when the engine is running; relay G303/G372 cannot be energised - Swedish lighting is not working; relay G301 cannot be energised - The cab heater is not switched off; relay D871/D901 is not energised
30801-2	Interruption of power supply on pin A02 of the ECU	<ul style="list-style-type: none"> - Alarm light function is not working
30802-2	Interruption of power supply on pin A09 of the ECU	<ul style="list-style-type: none"> - Alarm light function is not working
30803-2	Interruption of power supply on pin E03 of the ECU	<ul style="list-style-type: none"> - Direction indicator function is not working
33301-19	No CAN message received from CAN extension box due to: <ul style="list-style-type: none"> - communication problem with CAN extension box 	<ul style="list-style-type: none"> - No noticeable system limitation in VIC

2. VIC CUSTOMER PARAMETERS

2.1 INTRODUCTION

Customer parameters

Customer parameters are the settings of an electronic system. The customer parameters permit adapting control functions of a system to the customer's particular wishes and/or needs within certain limits. The customer parameters are stored in a list in the memory of the electronic unit. Customer parameters can be modified using the programming feature of DAVIE XD. Programming using DAVIE XD is only possible if the logged-in user has been registered as a "Master Technician".

Note:

Erroneous settings of customer parameters may affect the action of control functions to such an extent that they function erratically or not at all. After modification of the settings the (modified) customer parameters must be stored in the electronic unit using the programming function in the customer parameter overview.

Customer parameter names and codes

Each customer parameter in a system has its own name and code. The following explanation of the customer parameters includes only the codes. The availability of a customer parameter in a system depends on the programmed software in the electronic unit. The programmed software depends on the vehicle configuration/identity card data.

Standard values

Standard values, options and setting ranges may vary according to the software variants of DAVIE XD and the system. This is why they have not been included in the following explanation of the customer parameters.

2.2 EXPLANATORY NOTES TO VIC CUSTOMER PARAMETERS, RESTRICTED VERSION

In the restricted version the parameter settings need to be programmed individually; the below table contains an explanation of the settings for the manually operated gearbox and the AS Tronic.

VIC Customer parameter code	Explanation	Dependencies:		Notes
		Minimum value to be set:	Maximum value to be set:	
Group 1	Engaging conditions for the PTO			These settings allow you to determine when the PTO must be engaged in the case of a manually operated gearbox.
1-01	Setting used to determine whether the brake pedal (brake signal) has influence on the engaging of the PTO.			The setting "not active" means that the brake pedal (brake signal) has no influence on the engaging of the PTO. The setting "active" means that the brake pedal (brake signal) has influence on the engaging of the PTO.
1-02	Setting used to determine the influence of the brake pedal (brake signal) on the engaging of the PTO. See also 1-01.			The setting "depressed" only allows the PTO to be engaged if the brake pedal is operated. The setting "released" only allows the PTO to be engaged if the brake pedal is not operated.
1-03	Setting used to determine whether the clutch pedal (clutch signal) has influence on the engaging of the PTO.			The setting "not active" means that the clutch pedal (clutch signal) has no influence on the engaging of the PTO. The setting "active" means that the clutch pedal (clutch signal) has influence on the engaging of the PTO.
1-04	Setting used to determine the influence of the clutch pedal (clutch signal) on the engaging of the PTO. See also 1-03.			The setting "depressed" only allows the PTO to be engaged if the clutch is operated. The setting "released" only allows the PTO to be engaged if the clutch is not operated.

VIC Customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
1-05	Setting used to determine whether the parking brake (parking brake signal) has influence on the engaging of the PTO.			The setting "not active" means that the parking brake (parking brake signal) has no influence on the engaging of the PTO. The setting "active" means that the parking brake (parking brake signal) has influence on the engaging of the PTO.
1-06	Setting used to determine the influence of the parking brake (parking brake signal) on the engaging of the PTO. See also 1-05.			The setting "used" only allows the PTO to be engaged if the parking brake is activated. The setting "released" only allows the PTO to be engaged if the parking brake is not activated.
1-07	Setting used to determine whether the running of the engine has influence on the engaging of the PTO.			The setting "not active" means that the running of the engine has no influence on the engaging of the PTO. The setting "active" means that the running of the engine has influence on the engaging of the PTO.
1-08	Setting used to determine whether the PTO may only be engaged with a running or non-running engine. See also 1-07.			The setting "running" only allows the PTO to be engaged if the engine is running. The setting "non-running" only allows the PTO to be engaged if the engine is not running.
1-09	Setting of the minimum engine speed at which the PTO can be engaged. See also 1-08.			
1-10	Setting of the minimum vehicle speed at which the PTO can be engaged.			
1-11	Setting of the time at which the engaging conditions must have been met; after this time the PTO is engaged.			All engaging conditions must have been met within this set time; after this time the PTO engaged. A warning is activated on DIP-4 if the engaging conditions have not been met within the set time.
Group 2	PTO disengaging conditions			These settings allow you to determine when the PTO must be disengaged in the case of a manually operated gearbox.

VIC Customer parameter code	Explanation	Dependencies:		Notes
		Minimum value to be set:	Maximum value to be set:	
1.12	Setting used to determine whether the brake pedal (brake signal) has influence on the disengaging of the PTO.			The setting "not active" means that the brake pedal (brake signal) has no influence on the disengaging of the PTO. The setting "active" means that the brake pedal (brake signal) has influence on the disengaging of the PTO.
1.13	Setting used to determine the influence of the brake pedal (brake signal) on the disengaging of the PTO. See also 1-12.			The setting "depressed" disengages the PTO if the brake pedal is operated. The setting "released" disengages the PTO if the brake pedal is not operated.
1.14	Setting used to determine whether the clutch pedal (clutch signal) has influence on the disengaging of the PTO.			The setting "not active" means that the clutch pedal (clutch signal) has no influence on the disengaging of the PTO. The setting "active" means that the clutch pedal (clutch signal) has influence on the disengaging of the PTO.
1.15	Setting used to determine the influence of the clutch pedal (clutch signal) on the disengaging of the PTO. See also 1-14.			The setting "depressed" disengages the PTO if the clutch is operated. The setting "released" disengages the PTO if the clutch is not operated.
1.16	Setting used to determine whether the parking brake (parking brake signal) has influence on the disengaging of the PTO.			The setting "not active" means that the parking brake (parking brake signal) has no influence on the disengaging of the PTO. The setting "active" means that the parking brake (parking brake signal) has influence on the disengaging of the PTO.
1.17	Setting used to determine the influence of the parking brake (parking brake signal) on the disengaging of the PTO. See also 1-16.			The setting "used" disengages the PTO when the parking brake is activated. The setting "released" disengages the PTO when the parking brake is not activated.
1.18	Setting used to determine whether the engine speed has influence on the disengaging of the PTO.			The setting "not active" means that the engine speed has no influence on the disengaging of the PTO. The setting "active" means that the engine speed has influence on the disengaging of the PTO.

VIC Customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
1-19	Setting which determines whether the PTO is disengaged when the engine is running or not. See also 1-18.			The setting "running" disengages the PTO when the engine is running. The setting "non-running" disengages the PTO when the engine is not running.
1-20	Setting of the maximum engine speed at which the PTO is disengaged. See also 1-19.			
1-21	Setting of the maximum vehicle speed at which the PTO is disengaged.			
1-22	Setting of the time at which the PTO must have been disengaged.			The PTO must actually have been disengaged within this time. If the PTO has not been disengaged within the time set, a warning on DIP-4 is activated.
	Setting of the engaging conditions for the PTO control function for PTO-1			These settings apply to vehicles equipped with AS Tronic.
1-31	Setting which is used to select stationary or non-stationary PTO use.			The setting "stationary" means PTO use with a stationary vehicle. The setting "non-stationary" means PTO use with a moving vehicle.
1-32	Setting of the maximum engine speed at which the PTO is disengaged.			
1-33	AS Tronic PTO time			Setting of the communication time between VIC and AS Tronic ECU.
1-34	Setting used to determine the time at which VIC expects feedback from a PTO that is engaged.			Within this set time the VIC must receive feedback indicating that the PTO is actually engaged; this feedback is effected by means of the status switch in the PTO.
1-35	Setting used to determine the time at which VIC expects feedback from a PTO that is disengaged.			Within this set time the VIC must receive feedback indicating that the PTO is actually engaged; this feedback is effected by means of the status switch in the PTO.

2.3 EXPLANATORY NOTES TO VIC CUSTOMER PARAMETERS, ELABORATE VERSION

In the elaborate version it is possible to select a fixed parameter setting for a manually operated gearbox or an AS Tronic; see the overview. It is also possible to not use the default setting and to program the parameters individually; see the tables for a manually operated gearbox or an AS Tronic.

Default settings for a manually operated gearbox

An overview of the PTO type is shown on the main screen; a selection can be made between:

1. stationary use (non-moving vehicle)
2. non-stationary use (moving vehicle)
3. Engine PTO

When one of these settings is selected, default settings will be programmed.

The below overview lists the default settings per PTO type:

1. stationary use; the following default engaging conditions apply to this setting:
 - parking brake in parking position, and
 - depressed clutch and
 - engine is running, and
 - engine speed is below 700 rpm, and
 - vehicle speed is lower than 1 km/h, and
 - PTO is engaged by means of switch (on dashboard and/or superstructure).

The following standard disengaging conditions apply to this setting:

- engine is not running, or
- vehicle speed is higher than 2 km/h, or
- PTO is disengaged by means of switch (on dashboard and/or superstructure).

2. non-stationary use; the following default engaging conditions apply to this setting:
 - depressed clutch and
 - engine is running, and
 - engine speed is below 700 rpm, and
 - vehicle speed is lower than 1 km/h, and
 - PTO is engaged by means of switch (on dashboard and/or superstructure).

The following standard disengaging conditions apply to this setting:

- engine is not running, or
 - PTO is disengaged by means of switch (on dashboard and/or superstructure).
3. engine PTO; the following default engaging conditions apply to this setting:
 - engine is not running, and
 - PTO is engaged by means of switch (on dashboard and/or superstructure).

The following standard disengaging conditions apply to this setting:

- PTO is disengaged by means of switch (on dashboard and/or superstructure).

If the above settings have been modified, the PTO type is followed by the text "modified".

Upon selection of one of the three default settings a subsequent screen appears in which "advanced" can be selected.

In this overview you can modify the individual parameters; the settings are explained in the table below.

VIC customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
Group 1	Setting of the engaging conditions for the PTO control function for PTO 1 and/or PTO 2			These settings allow you to determine when the PTO must be engaged in the case of a manually operated gearbox.
1-01/1-45	Setting used to determine whether the brake pedal (brake signal) has influence on the engaging of the PTO.			The setting "not active" means that the brake pedal (brake signal) has no influence on the engaging of the PTO. The setting "active" means that the brake pedal (brake signal) has influence on the engaging of the PTO.
1-02/1-46	Setting used to determine the influence of the brake pedal (brake signal) on the engaging of the PTO. See also 1-01.			The setting "depressed" only allows the PTO to be engaged if the brake pedal is operated. The setting "released" only allows the PTO to be engaged if the brake pedal is not operated.
1-03/1-47	Setting used to determine whether the clutch pedal (clutch signal) has influence on the engaging of the PTO.			The setting "not active" means that the clutch pedal (clutch signal) has no influence on the engaging of the PTO. The setting "active" means that the clutch pedal (clutch signal) has influence on the engaging of the PTO.
1-04/1-48	Setting used to determine the influence of the clutch pedal (clutch signal) on the engaging of the PTO. See also 1-03.			The setting "depressed" only allows the PTO to be engaged if the clutch is operated. The setting "released" only allows the PTO to be engaged if the clutch is not operated.
1-05/1-49	Setting used to determine whether the parking brake (parking brake signal) has influence on the engaging of the PTO.			The setting "not active" means that the parking brake (parking brake signal) has no influence on the engaging of the PTO. The setting "active" means that the parking brake (parking brake signal) has influence on the engaging of the PTO.

VIC customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
1-06/1-50	Setting used to determine the influence of the parking brake (parking brake signal) on the engaging of the PTO. See also 1-05.			The setting "used" only allows the PTO to be engaged if the parking brake is activated. The setting "released" only allows the PTO to be engaged if the parking brake is not activated.
1-07/1-51	Setting used to determine whether the running of the engine has influence on the engaging of the PTO.			The setting "not active" means that the running of the engine has no influence on the engaging of the PTO. The setting "active" means that the running of the engine has influence on the engaging of the PTO.
1-08/1-52	Setting used to determine whether the PTO may only be engaged with a running or non-running engine. See also 1-07.			The setting "running" only allows the PTO to be engaged if the engine is running. The setting "non-running" only allows the PTO to be engaged if the engine is not running.
1-09/1-53	Setting of the maximum engine speed at which the PTO can be engaged. See also 1-08.			
1-10/1-54	Setting of the maximum vehicle speed at which the PTO can be engaged.			
Group 2	Setting of the disengaging conditions for the PTO control function for PTO 1 and/or PTO 2			These settings allow you to determine when the PTO must be disengaged in the case of a manually operated gearbox.
1-12/1-55	Setting used to determine whether the brake pedal (brake signal) has influence on the disengaging of the PTO.			The setting "not active" means that the brake pedal (brake signal) has no influence on the disengaging of the PTO. The setting "active" means that the brake pedal (brake signal) has influence on the disengaging of the PTO.
1-13/1-56	Setting used to determine the influence of the brake pedal (brake signal) on the disengaging of the PTO. See also 1-12.			The setting "depressed" disengages the PTO if the brake pedal is operated. The setting "released" disengages the PTO if the brake pedal is not operated.

VIC customer parameter code	Explanation	Dependencies:		Notes
		Minimum value to be set:	Maximum value to be set:	
1-14/1-57	Setting used to determine whether the clutch pedal (clutch signal) has influence on the disengaging of the PTO.			The setting "not active" means that the clutch pedal (clutch signal) has no influence on the disengaging of the PTO. The setting "active" means that the clutch pedal (clutch signal) has influence on the disengaging of the PTO.
1-15/1-58	Setting used to determine the influence of the clutch pedal (clutch signal) on the disengaging of the PTO. See also 1-14.			The setting "depressed" disengages the PTO if the clutch is operated. The setting "released" disengages the PTO if the clutch is not operated.
1-16/1-59	Setting used to determine whether the parking brake (parking brake signal) has influence on the disengaging of the PTO.			The setting "not active" means that the parking brake (parking brake signal) has no influence on the disengaging of the PTO. The setting "active" means that the parking brake (parking brake signal) has influence on the disengaging of the PTO.
1-17/1-60	Setting used to determine the influence of the parking brake (parking brake signal) on the disengaging of the PTO. See also 1-16.			The setting "used" disengages the PTO when the parking brake is activated. The setting "released" disengages the PTO when the parking brake is not activated.
1-18/1-61	Setting used to determine whether the engine speed has influence on the disengaging of the PTO.			The setting "not active" means that the engine speed has no influence on the disengaging of the PTO. The setting "active" means that the engine speed has influence on the disengaging of the PTO.
1-19/1-62	Setting which determines whether the PTO is disengaged when the engine is running or not. See also 1-18.			The setting "running" disengages the PTO when the engine is running. The setting "non-running" disengages the PTO when the engine is not running.
1-20/1-63	Setting of the maximum engine speed at which the PTO is disengaged. See also 1-19.			
1-21/1-64	Setting of the maximum vehicle speed at which the PTO is disengaged.			

VIC customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
Group 3	Other PTO settings			These settings allow you to determine when the PTO must be engaged in the case of a manually operated gearbox.
1-34/1-66	Setting used to determine the time at which VIC expects feedback from a PTO that is engaged.			Within this set time the VIC must receive feedback indicating that the PTO is actually engaged; this feedback is effected by means of the status switch in the PTO.
1-35/1-67	Setting used to determine the time at which VIC expects feedback from a PTO that is disengaged.			Within this set time the VIC must receive feedback indicating that the PTO is actually engaged; this feedback is effected by means of the status switch in the PTO.

Default settings for an AS Tronic gearbox

An overview of the PTO type is shown on the main screen; a selection can be made between:

1. stationary use (non-moving vehicle)
2. non-stationary use (moving vehicle)

When one of these settings is selected, default settings will be programmed.

The below overview lists the default settings per PTO type:

1. stationary use; the following default engaging conditions apply to this setting:
 - parking brake in parking position, and
 - AS Tronic in neutral position (N) and engine is running, and
 - engine speed is below 700 rpm, and
 - vehicle speed is lower than 1 km/h, and
 - PTO is engaged by means of switch (on dashboard and/or superstructure).

The following standard disengaging conditions apply to this setting:

- parking brake in driving position, or
- engine is not running, or
- vehicle speed is higher than 1 km/h, or
- PTO is disengaged by means of switch (on dashboard and/or superstructure).

2. stationary use; the following default engaging conditions apply to this setting:
 - parking brake in driving position, and
 - AS Tronic in neutral position (N) and engine is running, and
 - engine speed is below 700 rpm, and
 - vehicle speed is lower than 1 km/h, and
 - PTO is engaged by means of switch (on dashboard and/or superstructure).

The following standard disengaging conditions apply to this setting:

- engine is not running, or
- PTO is disengaged by means of switch (on dashboard and/or superstructure).

If the above settings have been modified, the PTO type is followed by the text "modified".

The default setting can be modified by means of a modification in the main menu. The settings are explained in the table below.

VIC customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
Group 1	Setting of the engaging conditions for the PTO control function for PTO 1 and/or PTO 2			These settings apply to vehicles equipped with AS Tronic.
1-68/1-76	Setting used to determine whether the parking brake (parking brake signal) has influence on the engaging of the PTO.			The setting "not active" means that the parking brake (parking brake signal) has no influence on the engaging of the PTO. The setting "active" means that the parking brake (parking brake signal) has influence on the engaging of the PTO.
1-69/1-77	Setting used to determine the influence of the parking brake (parking brake signal) on the engaging of the PTO. See also 1-68.			The setting "used" only allows the PTO to be engaged if the parking brake is activated. The setting "released" only allows the PTO to be engaged if the parking brake is not activated.
1-70/1-78	Setting of the maximum engine speed at which the PTO is engaged.			
1-71/1-79	Setting of the maximum vehicle speed at which the PTO is engaged.			
Group 2	Setting of the disengaging conditions for the PTO control function for PTO 1 and/or PTO 2			These settings apply to vehicles equipped with AS Tronic.
1-73/1-81	Setting used to determine whether the parking brake (parking brake signal) has influence on the disengaging of the PTO.			The setting "not active" means that the parking brake (parking brake signal) has no influence on the disengaging of the PTO. The setting "active" means that the parking brake (parking brake signal) has influence on the disengaging of the PTO.

VIC customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
1-74/1-82	Setting used to determine the influence of the parking brake (parking brake signal) on the disengaging of the PTO.			The setting "used" only allows the PTO to be disengaged if the parking brake is activated. The setting "released" only allows the PTO to be disengaged if the parking brake is not activated.
1-32/1-83	Setting of the maximum engine speed at which the PTO is disengaged.			
1-75/1-84	Setting of the maximum vehicle speed at which the PTO is disengaged.			
	Setting of the FAG traction control			This setting allows you to determine when the FAG traction control must be disengaged.
1-27	Setting of the vehicle speed for engaging and disengaging the traction control.			The 30 km/h setting means that with a vehicle speed exceeding 30 km/h the traction control cannot be activated; with a vehicle speed below 30 km/h, however, the traction control can be activated.
	Oil level parameters			Setting permitting compensation of the electronic oil level control
1-23	Setting permitting compensation of the electronically measured oil level with the actual oil level in the engine			With a change of value higher than 0 the level is compensated upwards; with a change of value lower than 0 (negative value) the level is compensated downwards
1-24	Setting permitting compensation of the electronically measured oil level, depending on the engine inclination. This setting is intended for coach applications for example, as here the engine inclination varies in comparison with the truck application			With a change of value higher than 100 the level is compensated upwards; with a change of value lower than 100 the level is compensated downwards
	ESC parameters			Setting of the switching on and switching off conditions of the ECS-DC3 control function "(PTO) engine speed control" via the engine speed control application connector (A068). Only with vehicles equipped with a BE or CE engine.

VIC customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
1-28	Setting of the brake pedal so that the control function "engine speed control" is switched off when the brake pedal is operated.			If "not active" has been selected, the brake pedal is ignored. If "active" has been selected, the engine speed control is switched off and switching-on is prevented when the brake pedal is operated.
1-29	Setting of the clutch pedal so that the control function "engine speed control" is switched off when the clutch pedal is operated.			If "not active" has been set, the clutch pedal is ignored; if "active" has been set, the engine speed control is switched off as soon as the clutch pedal is operated.
1-30	Setting of the parking brake so that the control function "engine speed control" is switched off when the parking brake is released.			If "not active" has been selected, the parking brake is ignored. If "active" has been selected, the engine speed control is switched off and switching-on is prevented when the parking brake pedal is released.

3. SYSTEM INSPECTION WITH DAVIE XD

3.1 GENERAL

If the vehicle is modified and the configuration changed, the electronic unit may have to be programmed.

After a gearbox has been replaced by a gearbox that uses a different reduction rate, it will be necessary to reprogram the VIC by means of DAVIE XD.

This is to ensure that the downshift protection is enabled and disabled at the correct vehicle speeds. If the vehicle configuration is changed, this should always be reported.

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1. EMAS FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

1.2 EXPLANATORY NOTES TO EMAS FAULT CODES

Fault code	Fault code description with possible cause	Symptom
600-00	Centring pressure above 175 bar due to: - defective accumulator - non-switching accumulator valve (SP071)	- Trailing axle in centre position and does not steer anymore
600-01	Centring pressure too low due to: - leak in centring circuit - non-switching accumulator relief valve (SP041)	- Trailing axle in centre position and does not steer anymore
600-03	Internal fault in centring circuit pressure sensor (PSY)	- Trailing axle in centre position and does not steer anymore
	Short circuit to earth in angle sensors (F687 and F688) on pin C3 of the ECU	
	Interruption or short circuit to earth in pressure sensors (PSX and PSY) on pin D4 of the ECU	
	Short circuit to earth in centring circuit pressure sensor (PSY) on pin C9 of the ECU	
600-04	Internal fault in centring circuit pressure sensor (PSY)	- Trailing axle in centre position and does not steer anymore
	Short circuit to supply in front axle angle sensor (F687) on pin C14 of the ECU	
	Short circuit to earth or to supply in angle sensors (F687 and F688) on pin C3 of the ECU	
	Short circuit to supply in trailing axle angle sensor (F688) on pin C12 of the ECU	
	Short circuit to earth or to supply in pressure sensors (PSX and PSY) on pin D4 of the ECU	
	Interruption or short circuit to supply in centring circuit pressure sensor (PSY) on pin C9 of the ECU	
	Short circuit in centring circuit pressure sensor (PSY) between pins C9 and D4 of the ECU	
	Short circuit to supply in steering circuit pressure sensor (PSX) on pin C10 of the ECU	
	Interruption in pressure sensors (PSX and PSY) on pin D3 of the ECU	
600-15	Centring pressure above 100 bar due to: - defective accumulator	- Trailing axle in centre position and does not steer anymore
600-16	Centring pressure above 60 bar due to: - defective accumulator	- Trailing axle in centre position and does not steer anymore
600-17	Centring pressure too low due to: - leak in centring circuit	

Fault code	Fault code description with possible cause	Symptom
600-18	Centring pressure too low and centring circuit cannot be filled in time due to: - leak in centring circuit	- Trailing axle in centre position and does not steer anymore
601-00	Control pressure too low during start-up phase with pressure relief valve (SP201) due to: - the fluid flow not being controlled due to mechanical blocking of the pressure relief valve (SP201)	
601-01	Control pressure too high while the pressure relief valve (SP201) is not being actuated due to: - the fluid flow not being controlled due to mechanical blocking of the pressure relief valve (SP201)	- Trailing axle in centre position and does not steer anymore
601-03	Internal fault in steering circuit pressure sensor (PSX)	- Trailing axle in centre position and does not steer anymore
	Short circuit to supply in front axle angle sensor (F687) on pin C14 of the ECU	
	Short circuit to earth or to supply in angle sensors (F687 and F688) on pin C3 of the ECU	
	Short circuit to supply in trailing axle angle sensor (F688) on pin C12 of the ECU	
	Short circuit to earth or to supply in pressure sensors (PSX and PSY) on pin D4 of the ECU	
	Short circuit to supply in centring circuit pressure sensor (PSY) on pin C9 of the ECU	
	Interruption or short circuit to supply in steering circuit pressure sensor (PSX) on pin C10 of the ECU	
	Short circuit in pressure sensors (PSX and PSY) between pins C10 and D4 of the ECU	
	Interruption in pressure sensors (PSX and PSY) on pin D3 of the ECU	
601-04	Internal fault in steering circuit pressure sensor (PSX)	- Trailing axle in centre position and does not steer anymore
	Short circuit to earth in angle sensors (F687 and F688) on pin C3 of the ECU	
	Interruption or short circuit to earth in pressure sensors (PSX and PSY) on pin D4 of the ECU	
	Short circuit to earth in steering circuit pressure sensor (PSX) on pin C10 of the ECU	
601-15	Control pressure regulation via pressure relief valve (SP201) inadequate due to: - the fluid flow not being controlled due to mechanical blocking of the pressure relief valve (SP201)	

Fault code	Fault code description with possible cause	Symptom
601-16	Control pressure too low with active release valve (SP051) due to: <ul style="list-style-type: none"> - the fluid flow not being controlled due to mechanical blocking of the control valve (SP201) - the fluid flow not being controlled due to mechanical blocking of the pressure relief valve (SP201) 	- Trailing axle in centre position and does not steer anymore
601-17	Control pressure too high with pressure relief valve (SP201) due to: <ul style="list-style-type: none"> - the fluid flow not being controlled due to mechanical blocking of the pressure relief valve (SP201) 	- Trailing axle in centre position and does not steer anymore
601-18	Control pressure too high with release valve (SP051) not active due to: <ul style="list-style-type: none"> - the fluid flow not being controlled due to mechanical blocking of the pressure relief valve (SP201) - exchanged pressure sensor connectors 	- Trailing axle in centre position and does not steer anymore
603-10	Value of speed-dependent signal changes too fast due to: <ul style="list-style-type: none"> - poor contact connections on pin A3 of the ECU 	
603-12	Module does not function correctly	
603-16	Vehicle speed-dependent signal too high	
603-18	Vehicle speed-dependent signal too low	
603-31	Internal failure in MTCO electronic unit (B525)	- Trailing axle in centre position and does not steer anymore
	Internal failure in EBS electronic unit (D880)	- Trailing axle in centre position and does not steer anymore - EBS or ABS warning
	Internal failure in VIC electronic unit (D900)	- Trailing axle in centre position and does not steer anymore
	Interruption, short circuit to earth or to supply of speed signal on pin D12 of the ECU	- Trailing axle in centre position and does not steer anymore
	Interruption of vehicle speed-dependent signal on pin A3 of the ECU	- Trailing axle in centre position and does not steer anymore
	Short circuit to earth of vehicle speed-dependent signal on pin A3 of the ECU	- Trailing axle co-steers
604-03	Internal failure in front axle angle sensor (F687)	- Trailing axle in centre position and does not steer anymore
	Interruption or short circuit to earth in front axle angle sensor (F687) on pin C14 of the ECU	
	Interruption, short circuit to earth or to supply in angle sensors (F687 and F688) on pin C3 of the ECU	
	Short circuit to earth in pressure sensors (PSX and PSY) on pin D4 of the ECU	

Fault code	Fault code description with possible cause	Symptom
604-04	Internal failure in front axle angle sensor (F687)	- Trailing axle in centre position and does not steer anymore
	Short circuit to supply in angle sensor (F687) on pin C14 of the ECU	
	Short circuit between pin C14 and pin C3 of the ECU	
	Short circuit to earth or to supply in angle sensors (F687 and F688) on pin C3 of the ECU	
	Short circuit to supply in trailing axle angle sensor (F688) on pin C12 of the ECU	
	Short circuit to earth or to supply in pressure sensors (PSX and PSY) on pin D4 of the ECU	
	Short circuit to supply in centring circuit pressure sensor (PSY) on pin C9 of the ECU	
	Short circuit to supply in steering circuit pressure sensor (PSX) on pin C10 of the ECU	
	Interruption in angle sensors (F687 and F688) on pin C4 of the ECU	
604-10	Internal failure in front axle angle sensor (F687)	- Trailing axle in centre position and does not steer anymore
	Interruption, short circuit to earth or to supply in angle sensors (F687 and F688) on pin C3 of the ECU	
	Short circuit to earth in pressure sensors (PSX and PSY) on pin D4 of the ECU	
	Interruption in angle sensors (F687 and F688) on pin C4 of the ECU	
604-16	Front axle angle sensor (F687) not properly adjusted	- Trailing axle in centre position and does not steer anymore
	Internal failure in front axle angle sensor (F687)	
604-18	Front axle angle sensor (F687) not properly adjusted	- Trailing axle in centre position and does not steer anymore
	Internal failure in front axle angle sensor (F687)	
604-31	Front axle angle sensor (F687) not properly adjusted	- Trailing axle in centre position and does not steer anymore
	Internal failure in front axle angle sensor (F687)	
605-02	Deviation of trailing axle angle relative to centre position too large due to: <ul style="list-style-type: none"> - defective angle sensor - incorrectly adjusted angle sensor 	
605-03	Internal failure in trailing axle angle sensor (F688)	- Trailing axle in centre position and does not steer anymore
	Interruption or short circuit to earth in angle sensors (F687 and F688) on pin C3 of the ECU	
	Interruption or short circuit to earth in trailing axle angle sensor (F688) on pin C12 of the ECU	
	Short circuit to earth in pressure sensors (PSX and PSY) on pin D4 of the ECU	

Fault code	Fault code description with possible cause	Symptom
605-04	Internal failure in trailing axle angle sensor (F688)	- Trailing axle in centre position and does not steer anymore
	Short circuit to supply in front axle angle sensor (F687) on pin C14 of the ECU	
	Short circuit to earth or to supply in angle sensors (F687 and F688) on pin C3 of the ECU	
	Short circuit to supply in trailing axle angle sensor (F688) on pin C12 of the ECU	
	Short circuit to earth or to supply in pressure sensors (PSX and PSY) on pin D4 of the ECU	
	Short circuit to supply in centring circuit pressure sensor (PSY) on pin C9 of the ECU	
	Short circuit to supply in steering circuit pressure sensor (PSX) on pin C10 of the ECU	
	Interruption in angle sensors (F687 and F688) on pin C4 of the ECU	
605-10	Internal failure in trailing axle angle sensor (F688)	- Trailing axle in centre position and does not steer anymore
	Short circuit to supply in front axle angle sensor (F687) on pin C14 of the ECU	
	Interruption, short circuit to earth or to supply in angle sensors (F687 and F688) on pin C3 of the ECU	
	Interruption, short circuit to earth or to supply in trailing axle angle sensor (F688) on pin C12 of the ECU	
	Short circuit to earth or to supply in pressure sensors (PSX and PSY) on pin D4 of the ECU	
	Short circuit to supply in centring circuit pressure sensor (PSY) on pin C9 of the ECU	
	Short circuit to supply in steering circuit pressure sensor (PSX) on pin C10 of the ECU	
	Interruption in angle sensors (F687 and F688) on pin C4 of the ECU	

Fault code	Fault code description with possible cause	Symptom
605-16	Internal failure in trailing axle angle sensor (F688)	- Trailing axle in centre position and does not steer anymore
	Trailing axle angle sensor (F688) not properly adjusted	
	Short circuit to supply in front axle angle sensor (F687) on pin C14 of the ECU	
	Short circuit to earth or to supply in angle sensors (F687 and F688) on pin C3 of the ECU	
	Short circuit between pin C12 and pin C3 of the ECU	
	Short circuit to supply in trailing axle angle sensor (F688) on pin C12 of the ECU	
	Short circuit to earth or to supply in pressure sensors (PSX and PSY) on pin D4 of the ECU	
	Short circuit to supply in centring circuit pressure sensor (PSY) on pin C9 of the ECU	
	Short circuit to supply in steering circuit pressure sensor (PSX) on pin C10 of the ECU	
	Interruption in angle sensors (F687 and F688) on pin C4 of the ECU	
605-18	Internal failure in trailing axle angle sensor (F688)	- Trailing axle in centre position and does not steer anymore
	Trailing axle angle sensor (F688) not properly adjusted	
	Interruption in angle sensors (F687 and F688) on pin C3 of the ECU	
	Interruption or short circuit to earth in trailing axle angle sensor (F688) on pin C12 of the ECU	
605-31	Trailing axle angle sensor signal (F688) changes insufficiently due to: - defective angle sensor	
608-10	The difference between the desired and actual trailing axle steering angle changes too often	
608-31	The difference between the desired and actual trailing axle steering angle is too large	
609-02	Insufficient supply voltage on pins B1, B2 and/or A1 of the ECU	- Trailing axle in centre position and does not steer anymore
	Control valve (SP011) circuit resistance does not meet the specifications	
609-03	Internal failure in control valve (SP011)	- Trailing axle in centre position and does not steer anymore
	Interruption or short circuit to earth in control valve (SP011) on pin B16 of the ECU	
	Interruption or short circuit to earth in control valve (SP011) on pin B17 of the ECU	
609-04	Short circuit to supply in pressure relief valve (SP201) on pin B13 of the ECU	- Trailing axle in centre position and does not steer anymore
	Short circuit to supply in control valve (SP011) on pin B16 of the ECU	

Fault code	Fault code description with possible cause	Symptom
609-12	Internal failure in control valve (SP011)	- Trailing axle in centre position and does not steer anymore
	Interruption or short circuit to supply in control valve (SP011) on pin B16 of the ECU	
	Interruption in control valve (SP011) on pin B17 of the ECU	
610-02	Internal failure in release valve (SP051)	- Trailing axle in centre position and does not steer anymore
	Interruption, short circuit to earth or to supply in release valve (SP051) on pin B10 of the ECU	
	Interruption or short circuit to earth in release valve (SP051) on pin B11 of the ECU	
610-03	Interruption, short circuit to earth or to supply in release valve (SP051) on pin B10 or B11 of the ECU	
610-12	Internal failure in release valve (SP051)	- Trailing axle in centre position and does not steer anymore
	Interruption or short circuit to supply in release valve (SP051) on pin B10 of the ECU	
	Interruption in release valve (SP051) on pin B11 of the ECU	
611-02	Internal failure in accumulator valve (SP071)	- Trailing axle in centre position and does not steer anymore
	Interruption, short circuit to earth or to supply in accumulator valve (SP071) on pin B7 of the ECU	
	Interruption or short circuit to earth in accumulator valve (SP071) on pin B8 of the ECU	
611-03	Interruption, short circuit to earth or to supply in accumulator valve (SP071) on pin B7 or B8 of the ECU	- Trailing axle in centre position and does not steer anymore
611-12	Internal failure in accumulator valve (SP071)	- Trailing axle in centre position and does not steer anymore
	Interruption, short circuit to earth or to supply in accumulator valve (SP071) on pin B7 of the ECU	
	Interruption or short circuit to earth in accumulator valve (SP071) on pin B8 of the ECU	
612-02	Internal failure in valve block of the fluid flow control (B372)	- Trailing axle in centre position and does not steer anymore
	Interruption, short circuit to earth or to supply in pressure relief valve (SP201) on pin B13 of the ECU	
	Interruption or short circuit to earth in pressure relief valve (SP201) on pin B14 of the ECU	
612-03	Short circuit to supply in pressure relief valve (SP201) on pin B13 of the ECU	- Trailing axle in centre position and does not steer anymore
	Short circuit to supply in control valve (SP011) on pin B16 of the ECU	

Fault code	Fault code description with possible cause	Symptom
612-12	Internal failure in valve block of the fluid flow control (B372)	- Trailing axle in centre position and does not steer anymore
	Interruption or short circuit to earth in pressure relief valve (SP201) on pin B13 of the ECU	
	Interruption or short circuit to earth in pressure relief valve (SP201) on pin B14 of the ECU	
612-31	Pressure relief valve (SP201)	
613-03	Supply voltage on pin A1 of the ECU too low	
613-04	Supply voltage on pins B1, B2 and/or A1 of the ECU too high	- Trailing axle in centre position and does not steer anymore
613-16	Supply voltage on pins B1, B2 and/or A1 of the ECU too low	- Trailing axle in centre position and does not steer anymore
	Interruption on pin A1 of the ECU	
613-18	Supply voltage on pins B1, B2 and/or A1 of the ECU too low	- Trailing axle in centre position and does not steer anymore
614-02	Internal failure in EMAS electronic unit (D932)	- Trailing axle in centre position and does not steer anymore
614-16	Internal failure in EMAS electronic unit (D932)	- Trailing axle in centre position and does not steer anymore
614-18	Internal failure in EMAS electronic unit (D932)	- Trailing axle in centre position and does not steer anymore
	Short circuit to supply in front axle angle sensor (F687) on pin C14 of the ECU	
	Short circuit to earth or to supply in angle sensors (F687 and F688) on pin C3 of the ECU	
	Short circuit to supply in trailing axle angle sensor (F688) on pin C12 of the ECU	
	Short circuit to earth or to supply in pressure sensors (PSX and PSY) on pin D4 of the ECU	
	Short circuit to supply in centring circuit pressure sensor (PSY) on pin C9 of the ECU	
	Short circuit to supply in steering circuit pressure sensor (PSX) on pin C10 of the ECU	
615-16	Internal failure in EMAS electronic unit (D932)	- Trailing axle in centre position and does not steer anymore
615-18	Internal failure in EMAS electronic unit (D932)	- Trailing axle in centre position and does not steer anymore
616-03	Supply voltage on pins B1 and B2 of the ECU too low	
616-04	Supply voltage on pins B1, B2 and/or A1 of the ECU too high	- Trailing axle in centre position and does not steer anymore
616-16	Supply voltage on pins B1, B2 and/or A1 of the ECU too low	- Trailing axle in centre position and does not steer anymore
	Short circuit to earth or interruption on pin B1 and/or B2 of the ECU	

Fault code	Fault code description with possible cause	Symptom
616-18	Short circuit to earth or interruption on pin B1 and/or B2 of the ECU	- Trailing axle in centre position and does not steer anymore
	Supply voltage on pins B1, B2 and/or A1 of the ECU too low	
617-31	Internal failure in UPEC electronic unit (D814)	- Trailing axle in centre position and does not steer anymore
	Interruption, short circuit to earth or to supply on pin D17 of the ECU	
618-31	EMAS system not calibrated	
620-10	Internal failure in MTCO electronic unit (B525)	- Trailing axle in centre position and does not steer anymore
	Interruption, short circuit to earth or to supply of speed signal on pin D12 of the ECU	
621-02	Accumulator relief valve (SP041) circuit resistance does not meet the specifications	
621-03	Internal failure in accumulator relief valve (SP041)	- Trailing axle in centre position and does not steer anymore
621-04	Short circuit to supply in accumulator relief valve (SP041) on pin B4 of the ECU	- Trailing axle in centre position and does not steer anymore
621-12	Internal failure in accumulator relief valve (SP041)	- Trailing axle in centre position and does not steer anymore
	Interruption, short circuit to earth or to supply in accumulator relief valve (SP041) on pin B4 of the ECU	
	Interruption or short circuit to earth in accumulator relief valve (SP041) on pin B5 of the ECU	
622-31	Interruption in supply voltage (after ignition) on pin A1 of the ECU	- Trailing axle in centre position and does not steer anymore - No communication with DAVIE possible
623-31	Possibly air inside EMAS system	- Trailing axle in centre position and does not steer anymore
624-31	EMAS system not calibrated	- Trailing axle in centre position and does not steer anymore
625-31	Internal failure in EMAS electronic unit (D932)	- Trailing axle in centre position and does not steer anymore
626-31	EMAS system not fully calibrated due to: - incorrect calibration of front axle angle sensor (F687)	- Trailing axle in centre position and does not steer anymore
627-31	EMAS system not fully calibrated due to: - incorrect calibration of trailing axle angle sensor (F688)	- Trailing axle in centre position and does not steer anymore
628-31	EMAS system not fully calibrated due to: - incorrect calibration of pressure sensors (PSX and PSY)	- Trailing axle in centre position and does not steer anymore
629-31	Internal UPEC failure (D814)	- Trailing axle in centre position and does not steer anymore
	Interruption, short circuit to earth or to supply of engine speed signal on pin D17 of the ECU	

Fault code	Fault code description with possible cause	Symptom
630-31	Short circuit to supply in front axle angle sensor (F687) on pin C14 of the ECU	- Trailing axle in centre position and does not steer anymore
	Short circuit to earth or to supply in angle sensors (F687 and F688) on pin C3 of the ECU	
	Short circuit to supply in trailing axle angle sensor (F688) on pin C12 of the ECU	
	Short circuit to earth or to supply in pressure sensors (PSX and PSY) on pin D4 of the ECU	
	Short circuit to earth or to supply in centring circuit pressure sensor (PSY) on pin C9 of the ECU	
	Short circuit to supply in steering circuit pressure sensor (PSX) on pin C10 of the ECU	
631-31	Cannot reach nominal pressure in steering circuit while steering circuit needs to be filled, due to: <ul style="list-style-type: none"> - the fluid flow not being controlled due to mechanical blocking of the pressure relief valve (SP201) - non-switching release valve (SP051) 	- Trailing axle in centre position and does not steer anymore
632-31	Difference between desired and actual trailing axle angle too large due to: <ul style="list-style-type: none"> - control valve (SP011) 	- Trailing axle in centre position and does not steer anymore
633-31	Difference between desired and actual trailing axle angle too large due to: <ul style="list-style-type: none"> - loose angle sensor lever - defective angle sensor 	- Trailing axle in centre position and does not steer anymore
634-31	Internal failure in EBS electronic unit (D880)	- Trailing axle in centre position and does not steer anymore - EBS or ABS warning
	Internal failure in VIC electronic unit (D900)	- Trailing axle in centre position and does not steer anymore
	Short circuit to supply of vehicle speed-dependent signal on pin A3 of the ECU	- Trailing axle co-steers
635-31	Internal MTCO failure (B525)	- Trailing axle in centre position and does not steer anymore

2. SYSTEM INSPECTION WITH DAVIE XD

2.1 GENERAL

When changes are made to the EMAS system or when it is opened, the system must be calibrated.

2.2 "CALIBRATION" MENU

The "Calibration" menu is divided into several tests:

- Air test
- Bleeding
- Releasing the pressure
- Hydraulic test
- Electric test
- Complete calibration

Air test

This test is used to check whether there is air in the EMAS system.

If so, the EMAS system must be bled.

Bleeding

With this test, an air test will be carried out first. If air is found in the EMAS system, the trailing axle will be steered back and forth and there is a possibility of releasing air. Afterwards another air test will be carried out to check whether there is still air in the system.

If air is still present, the above routine is repeated.

Releasing the pressure

If centring circuit components or components connected to the centring circuit need to be removed, the pressure in the centring circuit must be released. When this test is selected, the pressure in the centring circuit will be released by opening and closing various valves.

Hydraulic test

Checking the hydraulic system:

With this test it is checked whether the various valves are properly steered and/or the system lines are properly connected. Furthermore, the central position of the steering cylinder is also calibrated.

Electric test

Checking the electric system:

With this test it is checked whether all sensors and valves of the EMAS system are connected; furthermore, the resistors of the coils are checked.

Complete calibration

The complete calibration consists of:

- Electric test
- Hydraulic test
- Air test

The sensors are calibrated in between.

This complete calibration is necessary after virtually any work is carried out on the system.

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1. HYDRONIC 10 (ACH-EW) FAULT CODES

1.1 INTRODUCTION

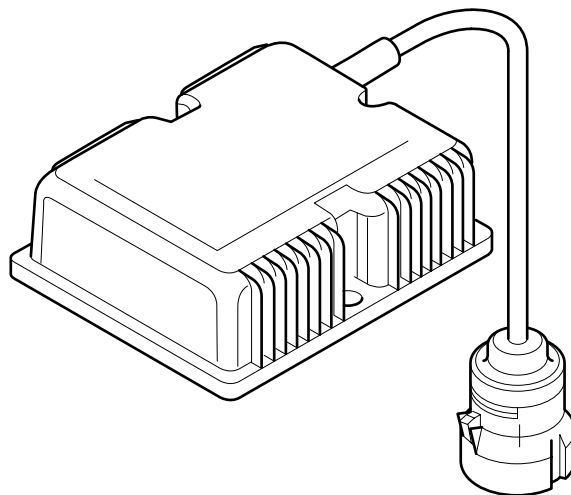
If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

HYDRONIC 10 (ACH-EW)

1.2 EXPLANATORY NOTES TO FAULT CODES FOR HYDRONIC 10 (ACH-EW) WITH ELECTRONIC UNIT D901

The below explanatory notes to fault codes apply to the Hydronic 10 (ACH-EW) with the electronic unit D901. The electronic unit can be identified by the cast-on cable with connector.

Applicable to:
CF85 and XF95 (chassis number < 0E621373)
production date <2003-37



K101650

6

Fault code	Fault code description with possible cause	Symptom
0-0	Internal communication fault in ECU (D901) due to: - defective ECU	- Cab heater does not start or fails during operation
0-1	Internal communication fault in ECU (D901) due to: - defective ECU	- Cab heater does not start or fails during operation
1-0	Fault when starting ACH-EW, no flame is detected within the start time. Flame sensor value remains below 80°C, voltage on pins 10 and 12 of the 18-pin connector at the bottom of the ECU <2.23 V due to: - no or insufficient supply of fuel - insufficient supply of inlet air - clogged exhaust - fouled or damaged burner - voltage too high or too low during glowing	- Cab heater does not start After 2 failed starts the cab heater switches off and generates a fault.
1-4	Too many starts without flame detection due to: - no or insufficient supply of fuel - insufficient supply of inlet air - clogged exhaust - fouled or damaged burner - voltage too high or too low during glowing	- Cab heater shuts down after 10 failed starts (20 start attempts) and the ECU will block
2-0	Flame extinguishes repeatedly during operation due to: - no or insufficient supply of fuel - insufficient supply of inlet air - undervoltage or overvoltage - excessively high flame sensor temperature - excessively high overheating sensor temperature - defective combustion device - fouled or damaged burner - clogged or fouled exhaust	- Cab heater fails or emits smoke and supplies insufficient heat

Fault code	Fault code description with possible cause	Symptom
3-1	Voltage (>30 V for at least 20 seconds) on pins A5 and A6 of the ECU (D901) is too high due to: - excessive alternator/battery voltage	- Cab heater fails during operation
3-2	Voltage (<20 V for at least 20 seconds) on pins A5 and A6 of the ECU (D901) is too low due to: - insufficient supply voltage, for example during starting	- Cab heater fails during operation
4-0	Flame signalling when switching on. Flame sensor value above 80°C, despite 4 minutes' cold-air ventilation; voltage on pins 10 and 12 of the 18-pin connector at the bottom of the ECU >2.23 V due to: - defective flame sensor	- Cab heater does not start
5-1	Flame sensor short circuit on pins 10 and 12 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start or fails during operation
5-2	Open connection of flame sensor on pins 10 and 12 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start or fails during operation
6-1	Short circuit in coolant temperature sensor on pins 9 and 11 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start or fails during operation
6-2	Open connection of coolant temperature sensor on pins 9 and 11 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start or fails during operation
7-1	Short circuit in fuel metering pump (B122) on pins A1 and A2 of the ECU	- Cab heater does not start or fails during operation
7-2	Open connection in fuel metering pump (B122) on pins A1 and A2 of the ECU	- Cab heater does not start or fails during operation
8-3	Combustion device speed deviation due to: - defective combustion device - defective electronic unit (D901)	- Cab heater fails with a delay of 60 seconds during operation
9-1	Glow filament short circuit on pins 3 and 4 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start
9-2	Open connection of glow filament on pins 3 and 4 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start
10-0	Too fast a rise in coolant temperature due to: - poor flow of coolant - coolant shortage - use of intarder	- Cab heater fails during operation
10-4	ACH-EW safety function switched on as a result of: - too many overheatings	- Cab heater fails. The ECU blocks after 3 failed starts.
11-1	Short circuit in coolant circulation pump on pins 6 and 7 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start or fails during operation
11-2	Open connection of coolant circulation pump on pins 6 and 7 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start or fails during operation

HYDRONIC 10 (ACH-EW)

Hydronic 10 (ACH-EW) fault codes

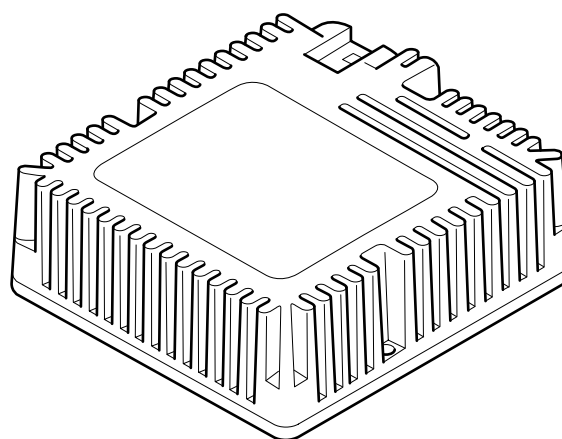
DAVIE XD diagnostics manual

Fault code	Fault code description with possible cause	Symptom
13-1	Overheating sensor short circuit on pins 5 and 8 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start or fails during operation
13-2	Open connection of overheating sensor on pins 5 and 8 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start or fails during operation
13-3	Difference between value of overheating sensor and value of coolant temperature sensor too large due to: <ul style="list-style-type: none">- poor flow of coolant- coolant shortage- use of intarder	- Cab heater does not start or fails during operation
15-1	Short circuit in wiring "signal ACH-EW on" to pin A9 on ECU ALS-S (D911)	- No interior detection alarm system (ALS-S)

1.3 EXPLANATORY NOTES TO FAULT CODES FOR HYDRONIC 10 (ACH-EW) WITH ELECTRONIC UNIT D979

The below explanatory notes to fault codes apply to the Hydronic 10 (ACH-EW) with the electronic unit D979. The electronic unit can be identified by the connector which is directly fitted in the unit.

Applicable to:
CF85 and XF95 (chassis number ≥ 0E621373)
production date ≥2003-37



K101651

Fault code	Fault code description with possible cause	Symptom
0-0	Internal communication fault in ECU (D979) due to: - defective ECU	- Cab heater does not start or fails during operation
0-1	Internal communication fault in ECU (D979) due to: - defective ECU	- Cab heater does not start or fails during operation
1-0	Fault when starting ACH-EW, no flame is detected within the start time. Flame sensor value remains below 80°C, voltage on pins 15 and 16 of the 18-pin connector at the bottom of the ECU <2.23 V due to: - no or insufficient supply of fuel - insufficient supply of inlet air - clogged exhaust - fouled or damaged burner - voltage too high or too low during glowing	- Cab heater does not start. After 2 failed starts the cab heater switches off and generates a fault.
1-4	Too many starts without flame detection due to: - no or insufficient supply of fuel - insufficient supply of inlet air - clogged exhaust - fouled or damaged burner - voltage too high or too low during glowing	- Cab heater shuts down after 10 failed starts (20 start attempts) and the ECU will block

HYDRONIC 10 (ACH-EW)

Hydronic 10 (ACH-EW) fault codes

DAVIE XD diagnostics manual

Fault code	Fault code description with possible cause	Symptom
2-0	Flame extinguishes repeatedly during operation due to: <ul style="list-style-type: none"> - no or insufficient supply of fuel - insufficient supply of inlet air - undervoltage or overvoltage - excessively high flame sensor temperature - excessively high overheating sensor temperature - defective combustion device - fouled or damaged burner - clogged or fouled exhaust 	- Cab heater fails or emits smoke and supplies insufficient heat
3-1	Voltage (>30 V for at least 20 seconds) on pins C2 and C3 of the ECU (D979) is too high due to: <ul style="list-style-type: none"> - excessive alternator/battery voltage 	- Cab heater fails during operation
3-2	Voltage (<20 V for at least 20 seconds) on pins C2 and C3 of the ECU (D979) is too low due to: <ul style="list-style-type: none"> - insufficient supply voltage, for example during starting 	- Cab heater fails during operation
4-0	Flame signalling when switching on. Flame sensor value above 80°C, despite 4 minutes' cold-air ventilation; voltage on pins 15 and 16 of the 18-pin connector at the bottom of the ECU >2.23 V due to: <ul style="list-style-type: none"> - defective flame sensor 	- Cab heater does not start
5-1	Flame sensor short circuit on pins 15 and 16 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start or fails during operation
5-2	Open connection of flame sensor on pins 15 and 16 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start or fails during operation
6-1	Short circuit in coolant temperature sensor on pins 14 and 18 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start or fails during operation
6-2	Open connection of coolant temperature sensor on pins 14 and 18 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start or fails during operation
7-1	Short circuit in fuel metering pump (B122) on pins C4 and C3 of the ECU	- Cab heater does not start or fails during operation
7-2	Open connection in fuel metering pump (B122) on pins C4 and C3 of the ECU	- Cab heater does not start or fails during operation
8-3	Combustion device speed deviation due to: <ul style="list-style-type: none"> - defective combustion device - defective electronic unit (D979) 	- Cab heater fails with a delay of 60 seconds during operation
9-1	Glow filament short circuit on pins 2 and 7 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start
9-2	Open connection of glow filament on pins 2 and 7 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start
10-0	Too fast a rise in coolant temperature due to: <ul style="list-style-type: none"> - poor flow of coolant - coolant shortage - use of intarder 	- Cab heater fails during operation

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Fault code	Fault code description with possible cause	Symptom
10-4	ACH-EW safety function switched on as a result of: - too many overheatings	- Cab heater fails. The ECU blocks after 3 failed starts.
11-1	Short circuit in coolant circulation pump on pins 3 and 6 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start or fails during operation
11-2	Open connection of coolant circulation pump on pins 3 and 6 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start or fails during operation
13-1	Overheating sensor short circuit on pins 11 and 17 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start or fails during operation
13-2	Open connection of overheating sensor on pins 11 and 17 of the 18-pin connector at the bottom of the ECU	- Cab heater does not start or fails during operation
13-3	Difference between value of overheating sensor and value of coolant temperature sensor too large due to: - poor flow of coolant - coolant shortage - use of intarder	- Cab heater does not start or fails during operation
15-1	Short circuit in wiring "signal ACH-EW on" to pin A1 on ECU ALS-S (D911)	- No interior detection alarm system (ALS-S)

HYDRONIC 10 (ACH-EW)

Hydronic 10 (ACH-EW) fault codes

DAVIE XD diagnostics manual

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2. SYSTEM INSPECTION WITH DAVIE XD

2.1 GENERAL

Deleting the fault codes will also reset any blocked ECU.

HYDRONIC 10 (ACH-EW)

System inspection with DAVIE XD

DAVIE XD diagnostics manual

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1. CDS-3 FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

1.2 EXPLANATORY NOTES TO CDS-3 FAULT CODES

Fault code	Fault code description with possible cause	Symptom
2-4	<ul style="list-style-type: none"> - Interruption of motor for central door lock on co-driver's side (B200) on pin 12 of the ECU 	<ul style="list-style-type: none"> - Driver's door cannot be locked/unlocked using the remote control - Co-driver's door cannot be locked using the remote control - Co-driver's door cannot be locked using the dashboard switch - Co-driver's door is not locked if the driver's door is key-locked - Co-driver's door cannot be unlocked using the dashboard switch - Driver's door is not locked if the co-driver's door is key-locked
	<ul style="list-style-type: none"> - Interruption of motor for central door lock on co-driver's side (B200) on pin 14 of the ECU 	<ul style="list-style-type: none"> - Driver's door cannot be unlocked using the remote control
	<ul style="list-style-type: none"> - Interruption of motor for central door lock on driver's side (B199) on pin 15 of the ECU 	<ul style="list-style-type: none"> - Driver's door cannot be locked using the remote control - Co-driver's door cannot be locked using the remote control when driver's door is locked - Co-driver's door is not locked if the driver's door is key-locked - Driver's door is not locked if the co-driver's door is key-locked
3-6	Short circuit to earth on pin 2 of the ECU	<ul style="list-style-type: none"> - Alarm system is not switched on when operating the remote control - Alarm system is not switched off when operating the remote control - Interior lighting does not respond to CDS-3 signal

2. SYSTEM INSPECTION WITH DAVIE XD

2.1 GENERAL

When replacing a CDS-3 electronic unit, the unit must be initialised by means of DAVIE XD after installation. Initialisation includes adjustment of the two remote controls.

2.2 MENU "INITIALISING NEW UNIT"

The option "Initialising new unit" can be found in the menu "Programming".

This menu consists of three components:

- activating remote controls
- deactivating remote controls
- Initialising new unit

Activating hand-held transmitters

2 remote controls come standard with each CDS-3 unit. Another 6 remote controls may be added.

Deactivating hand-held transmitters

With this option it is possible to deactivate remote controls, for instance when one of the remote controls has been lost. With this option all remote controls are deactivated, so that at least two remote controls will need to be adjusted once again.

Initialising new unit

Only a new "empty" unit can be initialised. Once initialised, a unit cannot be initialised again with this DAVIE XD option.

Having installed the unit, go to menu "Programming" in DAVIE XD and select option "Initialising new unit".

It is necessary to adjust at least two remote controls. The remote control has been adjusted when it recognises the signal sent by the remote control.

The unit must have recognised this signal four times and this needs to be true for both remote controls.

Should something go wrong during initialisation and should the procedure be aborted because of this, the procedure can be repeated after renewed startup. A unit, once initialised, cannot be initialised again.

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1. ECAS-2 FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

1.2 EXPLANATORY NOTES TO ECAS-2 FAULT CODES

Fault code	Fault code description with possible cause	System response
01	Internal failure in ECAS-2 electronic unit due to: - incorrectly programmed parameter	- No further system limitation
02	Internal failure in ECAS-2 electronic unit due to: - height sensor calibration data	- No further system limitation
03	Internal failure in ECAS-2 electronic unit due to: - ROM memory fault	- No further system limitation
04	Internal failure in ECAS-2 electronic unit due to: - Wabco data	- No further system limitation
05	Internal failure in ECAS-2 electronic unit due to: - height sensor calibration data parameter fault	- No further system limitation
06	Internal failure in ECAS-2 electronic unit due to: - defective RAM memory	- No further system limitation
08	Internal failure in ECAS-2 electronic unit due to: - pressure sensor calibration data	- No further system limitation
09	Solenoid valve failure Supply voltage fault on pin 1 of the ECU due to: - interrupted wire 1117 - defective fuse (E051)	- No rear axle chassis height control - Driving height is not reached
10	Rear axle height sensor failure, right Supply voltage fault due to: - defective height sensor (F613) - interruption or short circuit to supply of height sensors (F612 + F613) on pin 8 or pin 25 of the ECU - interruption of earth connection of height sensors (F612 + F613)	- Driving height is not reached - Part chassis height control or none at all - Difference in height level on left and right side
11	Rear axle height sensor failure, right Supply voltage fault due to: - defective height sensor (F612) - interruption or short circuit to supply of height sensors (F612 + F613) on pin 8 or pin 25 of the ECU - interruption of earth connection of height sensors (F612 + F613)	- Driving height is not reached - Difference in height level on left and right side - Part chassis height control or none at all
12	Front axle height sensor failure Supply voltage fault due to: - defective height sensor (F614) - interruption or short circuit to supply of height sensor (F614) on pin 26 of the ECU - interruption of earth connection of height sensor (F614)	- Driving height is not reached - Part chassis height control or none at all - No chassis height control, front axle
16	Short circuit to supply of driven axle pressure sensor on pin 5 or pin 6 of the ECU	
17	Short circuit to supply of driven axle pressure sensor on pin 5 or pin 6 of the ECU	

Fault code	Fault code description with possible cause	System response
20	Short circuit to earth of rear axle height sensor (F613), right, on pin 8 or pin 25 of the ECU - Height sensor (F613) defective	- Difference in height level on left and right side - Driving height is not reached - No rear axle chassis height control
21	Short circuit to earth of rear axle height sensor (F612), left, on pin 8 or pin 25 of the ECU - Height sensor (F612) defective	- No rear axle chassis height control - Driving height is not reached - Difference in height level on left and right side
22	Short circuit to earth of front axle height sensor (F614) on pin 26 of the ECU - Height sensor (F614) defective	- No chassis height control, front axle
26	Interruption or short circuit to earth of driven axle pressure sensor - Fuse (E062) defective - Short circuit to earth on pin 5 or 6 of the ECU - Interruption on pin 5 or 6 of the ECU - Interruption on connection 1 of pressure sensor (F615) - Interruption of earth connection of pressure sensor (F615)	- No communication with DAVIE - ECAS pilot lamp is not activated
27	Interruption or short circuit to earth of driven axle pressure sensor - Fuse (E062) defective - Short circuit to earth on pin 5 or 6 of the ECU - Interruption on pin 5 or 6 of the ECU - Interruption on connection 1 of pressure sensor (F615) - Interruption of earth connection of pressure sensor (F615)	- No communication with DAVIE - No rear axle chassis height control
30	Interruption or short circuit to supply of vented/ bled valve - Internal valve failure (B253) - Fuse (E051) defective - Interruption on pin 1 of the ECU - Interruption or short circuit to supply on pin 15 of the ECU	- No rear axle chassis height control - No chassis height control - Driving height is not reached - No chassis height control, front axle
31	Interruption or short circuit to supply of driven axle ECAS valve, right - Internal valve failure (B253) - Interruption on pin 1 of the ECU - Interruption or short circuit to supply on pin 13 of the ECU	- No rear axle chassis height control - No chassis height control - Driving height is not reached
32	Interruption or short circuit to supply of driven axle ECAS valve, right - Internal valve failure (B253) - Interruption on pin 1 of the ECU - Interruption or short circuit to supply on pin 31 of the ECU	- No rear axle chassis height control - No chassis height control - Driving height is not reached

ECAS-2

ECAS-2 fault codes

DAVIE XD diagnostics manual

Fault code	Fault code description with possible cause	System response
33	Interruption or short circuit to supply of trailing axle ECAS valve (admitting air) <ul style="list-style-type: none"> - Fuse (E051) defective - Interruption on pin 1 of the ECU - Interruption or short circuit to supply on pin 12 of the ECU 	<ul style="list-style-type: none"> - No chassis height control - Driving height is not reached - Trailing axle cannot lift/lower - Leading rear axle cannot lift/lower
34	Interruption or short circuit to supply of trailing axle ECAS valve (exhausting air) <ul style="list-style-type: none"> - Fuse (E051) defective - Interruption on pin 1 of the ECU - Interruption or short circuit to supply on pin 30 of the ECU 	<ul style="list-style-type: none"> - Driving height is not reached - No chassis height control - Leading rear axle cannot lift/lower - No chassis height control - No rear axle chassis height control - Trailing axle cannot lift/lower
35	No fault message	
36	Interruption or short circuit to supply of front axle ECAS valve (exhausting air) <ul style="list-style-type: none"> - Fuse (E051) defective - Interruption or short circuit to supply on pin 11 of the ECU 	<ul style="list-style-type: none"> - No chassis height control, front axle - Driving height is not reached - No chassis height control - Front axle chassis height changes with rear axle chassis height
37	No fault message	
40	Short circuit to earth of vented/bled valve <ul style="list-style-type: none"> - Internal valve failure (B253) - Short circuit to earth on pin 15 of the ECU 	<ul style="list-style-type: none"> - No rear axle chassis height control - No chassis height control, front axle
41	Short circuit to earth of driven axle ECAS valve (B253), left <ul style="list-style-type: none"> - Internal valve failure (B253) - Short circuit to earth on pin 13 of the ECU 	<ul style="list-style-type: none"> - No rear axle chassis height control
42	Short circuit to earth of driven axle ECAS valve (B253), right <ul style="list-style-type: none"> - Internal valve failure (B253) - Short circuit to earth on pin 31 of the ECU 	<ul style="list-style-type: none"> - No rear axle chassis height control
43	Short circuit to earth of trailing axle lifting valve (B253) Short circuit to earth on pin 12 of the ECU	<ul style="list-style-type: none"> - Leading rear axle cannot lift/lower
44	Short circuit to earth of trailing axle lowering valve (B253) <ul style="list-style-type: none"> - Short circuit to earth on pin 30 of the ECU 	<ul style="list-style-type: none"> - Leading rear axle cannot lift/lower
45	No fault message	
46	Short circuit to earth of front axle ECAS valve (B166) <ul style="list-style-type: none"> - Internal valve failure (B253) - Short circuit to earth on pin 11 of the ECU 	<ul style="list-style-type: none"> - No chassis height control, front axle
47	Short circuit to earth of ECAS valve (D802) <ul style="list-style-type: none"> - Internal valve failure (D802) - Calibration required 	
50	Fault message while lifting rear axle, right <ul style="list-style-type: none"> - Mechanical ECAS valve failure (B253) - Internal height sensor failure (F613) - Mechanical height sensor failure (F613) - Interruption of ECAS valve earth connection (B253) - Interruption on pin 15 of the ECU 	<ul style="list-style-type: none"> - Only fault message if ECAS is active - Difference in height level on left and right side - Driving height is not reached - No rear axle chassis height control

Fault code	Fault code description with possible cause	System response
51	Fault message while lifting rear axle, left <ul style="list-style-type: none"> - Mechanical ECAS valve failure (B253) - Internal height sensor failure (F612) - Mechanical height sensor failure (F612) - Interruption of ECAS valve earth connection (B253) - Interruption on pin 15 of the ECU 	<ul style="list-style-type: none"> - Only fault message if ECAS is active - Difference in height level on left and right side - Driving height is not reached - No rear axle chassis height control
52	Fault message while lifting front axle <ul style="list-style-type: none"> - Mechanical front axle ECAS valve failure (B166) - Internal height sensor failure (F614) - Mechanical height sensor failure (F614) - Interruption of ECAS valve earth connection (B166) - Interruption on pin 15 of the ECU 	<ul style="list-style-type: none"> - No chassis height control, front axle - Only fault message if ECAS is active - No chassis height control
60	Fault message while lowering rear axle, right <ul style="list-style-type: none"> - Mechanical ECAS valve failure (B253) - Internal height sensor failure (F613) - Mechanical height sensor failure (F613) - Interruption of ECAS valve earth connection (B253) - Interruption on pin 15 of the ECU 	<ul style="list-style-type: none"> - Only fault message if ECAS is active - Difference in height level on left and right side - Driving height is not reached - No rear axle chassis height control
61	Fault message while lowering rear axle, left <ul style="list-style-type: none"> - Mechanical ECAS valve failure (B253) - Internal height sensor failure (F612) - Mechanical height sensor failure (F612) - Interruption of ECAS valve earth connection (B253) - Interruption on pin 15 of the ECU 	<ul style="list-style-type: none"> - Only fault message if ECAS is active - Difference in height level on left and right side - Driving height is not reached - No rear axle chassis height control
62	Fault message while lowering front axle <ul style="list-style-type: none"> - Mechanical front axle ECAS valve failure (B166) - Internal height sensor failure (F614) - Mechanical height sensor failure (F614) - Interruption of ECAS valve earth connection (B166) 	<ul style="list-style-type: none"> - No chassis height control, front axle - Only fault message if ECAS is active - No chassis height control
80	Internal Wabco software failure	
81	No speed signal <ul style="list-style-type: none"> - Interruption or short circuit to supply on pin 22 of the ECU 	<ul style="list-style-type: none"> - No noticeable system limitation

2. ECAS-2 CUSTOMER PARAMETERS

2.1 INTRODUCTION

Customer parameters

Customer parameters are the settings of an electronic system. The customer parameters permit adapting control functions of a system to the customer's particular wishes and/or needs within certain limits. The customer parameters are stored in a list in the memory of the electronic unit. Customer parameters can be modified using the programming feature of DAVIE XD. Programming using DAVIE XD is only possible if the logged-in user has been registered as a "Master Technician".

Note:

Erroneous settings of customer parameters may affect the action of control functions to such an extent that they function erratically or not at all. After modification of the settings the (modified) customer parameters must be stored in the electronic unit using the programming function in the customer parameter overview.

Customer parameter names and codes

Each customer parameter in a system has its own name and code. The following explanation of the customer parameters includes only the codes. The availability of a customer parameter in a system depends on the programmed software in the electronic unit. The programmed software depends on the vehicle configuration/identity card data.

Standard values

Standard values, options and setting ranges may vary according to the software variants of DAVIE XD and the system. This is why they have not been included in the following explanation of the customer parameters.

2.2 EXPLANATORY NOTES TO ECAS-2 CUSTOMER PARAMETERS

ECAS Customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
4-02	This parameter makes it possible to increase the tolerance field (hysteresis) of the sensor sensitivity.			This is a solution if a customer complains about unstable regulation by ECAS-2. If a larger tolerance field is chosen, the height change of the chassis must be increased to allow ECAS to make a correction.
4-03	This parameter enables a certain vehicle slant to be reduced or increased.			Reduction makes the vehicle stand straighter (if the calibration is correct, i.e. the same height left and right). Increase will make the vehicle slant further, thereby enabling unstable horizontal settings to be prevented.
4-05	This parameter relates to the storage of faults in the electronic unit on the action of admitting air to or exhausting air from the air bellows.			A fault is identified if the height sensor reading does not change during the programmed time while it should have done because of the desired action. This time can be lengthened with this parameter. The ECAS system then waits longer before storing the fault because the height sensor reading has not changed.
4-06	This parameter enables an increase or decrease of the correction of the normal driving level, which is made when the lifting axle is raised.			An increase will correct the normal driving level more when the axle is being raised. The vehicle may exceed the maximum permissible height. A decrease will correct the normal driving level less or not at all when the axle is being raised. The ground clearance can become so small that the 3rd axle, when raised, regularly touches a bumpy road surface.

3. SYSTEM INSPECTION WITH DAVIE XD

3.1 CALIBRATING THE SENSORS

The sensors must be calibrated if the height and/or pressure sensors of the ECAS unit are replaced.

Note:

Calibration should be carried out with due care to avoid physical injury and material damage. Additionally, the trailing or leading rear axle may be lowered automatically during these operations.

A. Calibrating the sensors on replacing the ECAS unit

When the unit is programmed, the standard maximum chassis height of the rear axle and subsequently the desired maximum chassis height of the front axle are calibrated.

Explanation

1. Place the gauges between the driven axle and the chassis.
2. Lower the chassis using DAVIE XD until it rests on the gauges.

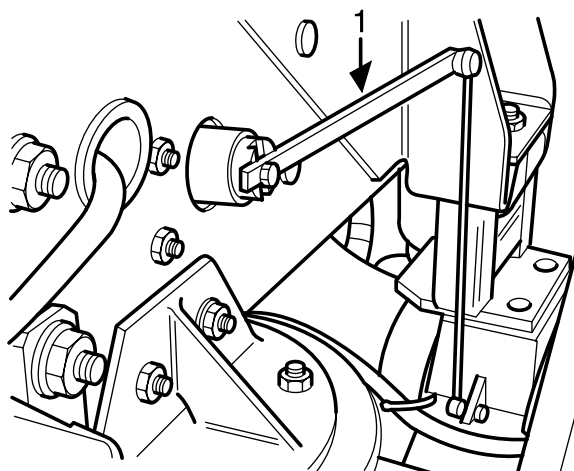
Note:

- On the front axle the vertical rod is adjustable. The height setting of this vertical rod must be such that lever (1) is horizontal when the driving height is approx. 80 mm.
- On high-volume vehicles the vertical rod on the rear axle is adjustable. The height setting of this vertical rod must be such that lever (1) is horizontal when the driving height is approx. 60 mm.
- When the height sensors have been calibrated, the pressure sensor is subsequently calibrated automatically. All the air is exhausted from the bellows.

3. Now bring the chassis to the desired maximum height at the front axle.

Note:

- The maximum height of the chassis is limited by the mechanical stop of the shock absorber.
- The highest level of standard sensor sensitivity setting must be a minimum of 20 mm above the normal driving level; otherwise an error will occur in the height sensor values.



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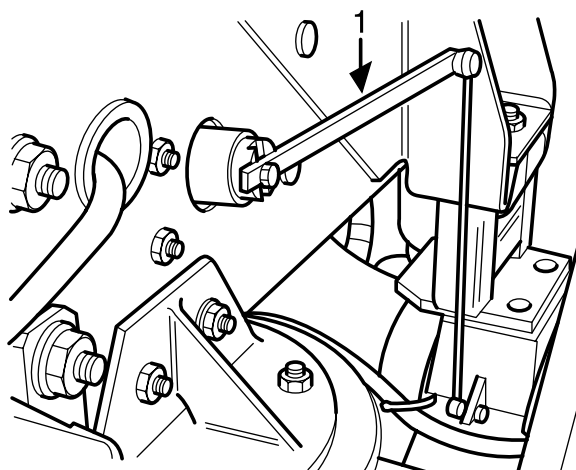
B. Calibrating the sensors when replacing the height and/or pressure sensor

If a height and/or pressure sensor has been replaced, the sensor must be recalibrated. The maximum desired chassis height at the rear axle and the maximum desired chassis height at the front axle are calibrated.

1. Place the gauges between the driven axle and the chassis.
2. Lower the chassis using DAVIE XD until it rests on the gauges.

Note:

- On the front axle the vertical rod is adjustable. The height setting of this vertical rod must be such that lever (1) is horizontal when the driving height is approx. 80 mm.
- On high-volume vehicles the vertical rod on the rear axle is adjustable. The height setting of this vertical rod must be such that lever (1) is horizontal when the driving height is approx. 60 mm.
- When the height sensors have been calibrated, the pressure sensor is subsequently calibrated automatically. All the air is exhausted from the bellows.



C900071

3. Now bring the chassis to the desired maximum height at the front axle. Then bring the chassis to the desired maximum height at the rear axle.

Note:

The maximum height of the chassis is limited by the mechanical stop of the shock absorber.

The shock absorber of the non-driven 3rd axle may reach its stop before the shock absorber of the driven axle.

The highest level of standard sensor sensitivity setting must be a minimum of 20 mm above the normal driving level; otherwise an error will occur in the height sensor values.

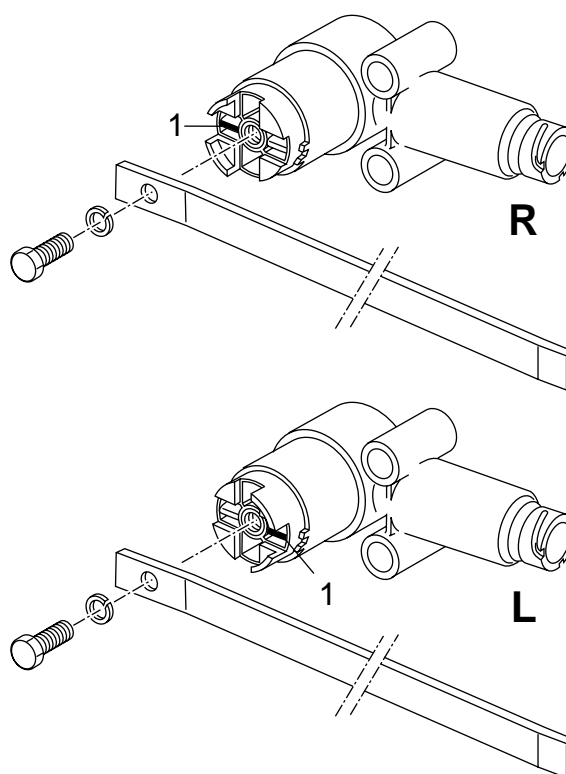
3.2 CHECKING HEIGHT SENSOR

The height sensor can be checked using DAVIE XD.

1. Admit air to the bellows. The value indicated by DAVIE XD must now show a linear increase.
2. Exhaust air from the bellows. The value indicated by DAVIE XD must now show a linear decrease.
3. If the value falls when air is admitted and rises when air is exhausted, the height sensor has been incorrectly fitted.
Item that requires special attention when fitting the height sensor:
There is a projection (1) on the hub of the height sensor. On the left-hand (L) height sensor the projection should point in the same direction as the electrical connection. On the right-hand (R) height sensor the position of the projection is turned 180° in relation to the projection on the left-hand height sensor.

Note:

If two height sensors are used, these two sensors, with the vehicle at the driving level, may give a different reading (caused, for example, by play in the linkage). This may result in the vehicle not being level. This can be solved by recalibrating the sensors.



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1. AIRTRONIC (ACH-EA) FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

1.2 EXPLANATORY NOTES TO AIRTRONIC D2/D4 (ACH-EA) FAULT CODES

Fault code	Fault code description with possible cause	Symptom
0-0	Internal fault in ECU (D871) due to: - defective ECU (D871) - insufficient battery voltage	- Cab heater does not start or fails during operation
0-1	Internal fault in ECU (D871) due to: - defective internal temperature sensor in ECU (D871)	- Cab heater does not start or fails during operation
1-0	Fault when starting ACH-EA, no flame is detected within the start time due to: - no or insufficient supply of fuel - insufficient supply of inlet air - clogged exhaust - defective flame sensor (combisensor F691) - defective glow filament (B168)	- Cab heater does not start or fails during operation
1-4	Too many failed start attempts (activation cut-off)	- Cab heater does not start. The cab heater shuts down after a maximum of 255 failed starts and the electronic unit will block. - Electronic unit released by erasing faults using DAVIE XD
2-0	Flame extinguishes repeatedly during operation due to: - no or insufficient supply of fuel - insufficient supply of inlet air - clogged exhaust - defective flame sensor (combisensor F691)	- Cab heater fails or emits smoke and supplies insufficient heat
3-1	Voltage (>30 V for at least 20 seconds) on pin 1 of the ECU (D871) is too high due to: - excessive alternator/battery voltage	- Cab heater fails during operation
3-2	Voltage (<20 V for at least 20 seconds) on pin 1 of the ECU (D871) is too low due to: - insufficient alternator/battery voltage - interruption on pin 1 of the ECU (D871)	- Cab heater fails during operation
4-0	Flame signalling when switching on due to: - defective flame sensor (combisensor F691) - defective ECU (D871)	- Cab heater does not start
5-1	Short circuit to earth or short circuit to supply of flame sensor (combisensor F691) on pins FF1 and FF2 of the ECU (D871)	- Cab heater does not start or fails during operation
5-2	Interruption of flame sensor (combisensor F691) on pins FF1 and/or FF2 of the ECU (D871)	- Cab heater does not start or fails during operation
5-3	The flame sensor signal (combisensor F691) is out of range	- Cab heater does not start or fails during operation
6-1	Short circuit to earth or short circuit to supply of thermostat unit (E566) temperature sensor on pin 13 and/or 10 of the ECU (D871)	- Cab heater does not start or fails during operation
6-2	Interruption of thermostat unit (E566) temperature sensor on pin 13 and/or 10 of the ECU (D871)	- Cab heater does not start or fails during operation

Fault code	Fault code description with possible cause	Symptom
7-1	Short circuit to earth or short circuit to supply of fuel metering pump (B122) on pin 4 and/or 9 of the ECU (D871)	- Cab heater does not start
	Internal fault in fuel metering pump (B122)	
7-2	Interruption on pin 4 and/or 9 of the ECU (D871), fuel metering pump (B122)	- Cab heater does not start
	Internal fault in fuel metering pump (B122)	
8-1	Short circuit to earth or short circuit to supply of cab heater fan (B305) on pins BM1 and BM2 of the ECU (D871)	- Cab heater does not start
	Internal fault in fan (B305)	
8-2	Interruption of cab heater fan (B305) on pins BM1 and/or BM2 of the ECU (D871)	- Cab heater does not start
	Internal fault in fan (B305)	
8-3	Cab heater fan (B305) speed deviation due to: - blocked vent - missing solenoid in electric motor - defective ECU (D871)	- Cab heater fails during operation
9-1	Short circuit to earth or short circuit to supply of glow filament (B168) on pin GS1 and/or GS2 of the ECU (D871)	- Cab heater does not start
9-2	Interruption of glow filament (B168) on pin GS1 and/or GS2 of the ECU (D871)	- Cab heater does not start
10-0	Cab heater gets overheated too often due to: - clogged hot air pipes - defective overheating sensor (combisensor F691) - insufficient supply of inlet air	- Cab heater fails during operation
10-4	ACH-EA safety function switched on as a result of: - too many overheatings	- The ECU is blocked
12-1	Short circuit to earth or short circuit to supply of thermostat unit (E566) on pin 10, 11 and/or 13 of the ECU (D871)	- Cab heater does not start - Cab heater does not switch on or off at the desired temperature
	Internal fault in thermostat unit (E566) or timer unit (E581)	
12-2	Interruption of temperature unit (F566) on pin 10 and/or 11 of the ECU (D871)	- Cab heater does not start - Cab heater does not switch on or off at the desired temperature
	Internal fault in thermostat unit (E566) or timer unit (E581)	
13-1	Short circuit to earth or short circuit to supply of overheating sensor (combisensor F691) on pins UF1 and FF2 of the ECU (D871)	- Cab heater does not start or fails during operation

AIRTRONIC (ACH-EA)

Airtronic (ACH-EA) fault codes

DAVIE XD diagnostics manual

Fault code	Fault code description with possible cause	Symptom
13-2	Interruption of overheating sensor (combisensor F691) on pins UF1 and/or FF2 of the ECU (D871)	- Cab heater does not start or fails during operation
13-3	Combisensor (F691) value is out of measuring range due to: <ul style="list-style-type: none">- clogged hot air pipes- defective overheating sensor (combisensor F691)- insufficient supply of inlet air- defective flame sensor (combisensor)	- Cab heater does not start or fails during operation

2. SYSTEM INSPECTION WITH DAVIE XD

2.1 GENERAL

Communication between DAVIE XD and the cab heater can only be established if the cab heater is switched on.

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1. ABS-D AND ABS/ASR-E FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

ABS-D AND ABS/ASR-E

ABS-D and ABS/ASR-E fault codes

DAVIE XD diagnostics manual

1.2 FAULT CODE OVERVIEW

Fault code	Fault code description with possible cause	Symptom
1-1	Minimum value of wheel speed sensor signal (F512) on pins B12 and B15 of the ECU is too low due to: - too large an air gap between the wheel speed sensor ring and the wheel speed sensor - contact resistance on pin B12 and/or B15	- ABS on front axle, left deactivated - ASR brake/engine control deactivated
1-2	Deviation of wheel speed sensor signal (F512) on pins B12 and B15 of the ECU due to: - incorrect tyre size	- ABS on front axle, left deactivated - ASR brake/engine control deactivated
1-3	Short circuit to supply in wheel speed sensor (F512) on pins B12 and B15 of the ECU	- ABS on front axle, left deactivated - ASR brake/engine control deactivated
1-4	Short circuit to earth in wheel speed sensor (F512) on pins B12 and B15 of the ECU	- ABS on front axle, left deactivated - ASR brake/engine control deactivated
1-5	Interruption in wheel speed sensor (F512) on pins B12 and B15 of the ECU	- ABS on front axle, left deactivated - ASR brake/engine control deactivated
1-6	Short circuit in wheel speed sensor (F512) on pins B12 and B15 of the ECU	- ABS on front axle, left deactivated - ASR brake/engine control deactivated
1-7	Incorrect sine-wave signal from wheel speed sensor (F512) on pins B12 and B15 of the ECU due to: - distorted wheel speed sensor ring - damaged wheel speed sensor ring	- ABS on front axle, left deactivated - ASR brake/engine control deactivated
1-8	Deviation of wheel speed sensor frequency (F512) on pins B12 and B15 of the ECU due to: - wheel slip of the left front wheel	- ABS on front axle, left deactivated - ASR brake/engine control deactivated
1-9	Wiring of wheel speed sensor other than wheel speed sensor (F512) connected to pins B12 and B15 of the ECU	- ABS on front axle, left deactivated - ASR brake/engine control deactivated
1-10	Unacceptable wheel speed sensor signal frequency (F512) on pins B12 and B15 of the ECU due to: - loose pole ring - wrong assessment by ECU	- ABS on front axle, left deactivated - ASR brake/engine control deactivated
1-12	Frequency of wheel speed sensor signal (F512) on pins B12 and B15 of the ECU is too high due to: - unstable contact in wheel speed sensor wiring	- ABS on front axle, left deactivated - ASR brake/engine control deactivated
2-1	Minimum value of wheel speed sensor signal (F513) on pins B10 and B13 of the ECU is too low due to: - too large an air gap between the wheel speed sensor ring and the wheel speed sensor - contact resistance on pin B10 and/or B13	- ABS on front axle, right deactivated - ASR brake/engine control deactivated
2-2	Deviation of wheel speed sensor signal (F513) on pins B10 and B13 of the ECU due to: - incorrect tyre size	- ABS on front axle, right deactivated - ASR brake/engine control deactivated

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Fault code	Fault code description with possible cause	Symptom
2-3	Short circuit to supply in wheel speed sensor (F513) on pins B10 and B13 of the ECU	- ABS on front axle, right deactivated - ASR brake/engine control deactivated
2-4	Short circuit to earth in wheel speed sensor (F513) on pins B10 and B13 of the ECU	- ABS on front axle, right deactivated - ASR brake/engine control deactivated
2-5	Interruption in wheel speed sensor (F513) on pins B10 and B13 of the ECU	- ABS on front axle, right deactivated - ASR brake/engine control deactivated
2-6	Short circuit in wheel speed sensor (F513) on pins B10 and B13 of the ECU	- ABS on front axle, right deactivated - ASR brake/engine control deactivated
2-7	Incorrect sine-wave signal from wheel speed sensor (F513) on pins B10 and B13 of the ECU due to: - distorted wheel speed sensor ring - damaged wheel speed sensor ring	- ABS on front axle, right deactivated - ASR brake/engine control deactivated
2-8	Deviation of wheel speed sensor frequency (F513) on pins B10 and B13 of the ECU due to: - wheel slip of the left front wheel	- ABS on front axle, right deactivated - ASR brake/engine control deactivated
2-9	Wiring of wheel speed sensor other than wheel speed sensor (F513) connected to pins B10 and B13 of the ECU	- ABS on front axle, right deactivated - ASR brake/engine control deactivated
2-10	Unacceptable wheel speed sensor signal frequency (F513) on pins B10 and B13 of the ECU due to: - loose pole ring - wrong assessment by ECU	- ABS on front axle, right deactivated - ASR brake/engine control deactivated
2-12	Frequency of wheel speed sensor signal (F513) on pins B10 and B13 of the ECU is too high due to: - unstable contact in wheel speed sensor wiring	- ABS on front axle, right deactivated - ASR brake/engine control deactivated
3-1	Minimum value of wheel speed sensor signal (F514) on pins B11 and B14 of the ECU is too low due to: - too large an air gap between the wheel speed sensor ring and the wheel speed sensor - contact resistance on pin B11 and/or B14	- ABS on rear axle, left deactivated - ASR brake/engine control deactivated
3-2	Deviation of wheel speed sensor signal (F514) on pins B11 and B14 of the ECU due to: - incorrect tyre size	- ABS on rear axle, left deactivated - ASR brake/engine control deactivated
3-3	Short circuit to supply in wheel speed sensor (F514) on pins B11 and B14 of the ECU	- ABS on rear axle, left deactivated - ASR brake/engine control deactivated
3-4	Short circuit to earth in wheel speed sensor (F514) on pins B11 and B14 of the ECU	- ABS on rear axle, left deactivated - ASR brake/engine control deactivated
3-5	Interruption in wheel speed sensor (F514) on pins B11 and B14 of the ECU	- ABS on rear axle, left deactivated - ASR brake/engine control deactivated
3-6	Short circuit in wheel speed sensor (F514) on pins B11 and B14 of the ECU	- ABS on rear axle, left deactivated - ASR brake/engine control deactivated

ABS-D AND ABS/ASR-E

Fault code	Fault code description with possible cause	Symptom
3-7	Incorrect sine-wave signal from wheel speed sensor (F514) on pins B11 and B14 of the ECU due to: - distorted wheel speed sensor ring - damaged wheel speed sensor ring	- ABS on rear axle, left deactivated - ASR brake/engine control deactivated
3-8	Deviation of wheel speed sensor frequency (F514) on pins B11 and B14 of the ECU due to: - wheel slip of the left rear wheel	- ABS on rear axle, left deactivated - ASR brake/engine control deactivated
3-9	Wiring of wheel speed sensor other than wheel speed sensor (F514) connected to pins B11 and B14 of the ECU	- ABS on rear axle, left deactivated - ASR brake/engine control deactivated
3-10	Unacceptable wheel speed sensor signal frequency (F514) on pins B11 and B14 of the ECU due to: - loose pole ring - wrong assessment by ECU	- ABS on rear axle, left deactivated - ASR brake/engine control deactivated
3-12	Frequency of wheel speed sensor signal (F514) on pins B11 and B14 of the ECU is too high due to: - unstable contact in wheel speed sensor wiring	- ABS on rear axle, left deactivated - ASR brake/engine control deactivated
4-1	Minimum value of wheel speed sensor signal (F515) on pins B17 and B18 of the ECU is too low due to: - too large an air gap between the wheel speed sensor ring and the wheel speed sensor - contact resistance on pin B17 and/or B18	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated
4-2	Deviation of wheel speed sensor signal (F515) on pins B17 and B18 of the ECU due to: - incorrect tyre size	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated
4-3	Short circuit to supply in wheel speed sensor (F515) on pins B17 and B18 of the ECU	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated
4-4	Short circuit to earth in wheel speed sensor (F515) on pins B17 and B18 of the ECU	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated
4-5	Interruption in wheel speed sensor (F515) on pins B17 and B18 of the ECU	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated
4-6	Short circuit in wheel speed sensor (F515) on pins B17 and B18 of the ECU	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated
4-7	Incorrect sine-wave signal from wheel speed sensor (F515) on pins B17 and B18 of the ECU due to: - distorted wheel speed sensor ring - damaged wheel speed sensor ring	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated
4-8	Deviation of wheel speed sensor frequency (F515) on pins B17 and B18 of the ECU due to: - wheel slip of the right rear wheel	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated
4-9	Wiring of wheel speed sensor other than wheel speed sensor (F515) connected to pins B17 and B18 of the ECU	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated

Fault code	Fault code description with possible cause	Symptom
4-10	Unacceptable wheel speed sensor signal frequency (F515) on pins B17 and B18 of the ECU due to: - loose pole ring - wrong assessment by ECU	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated
4 -12	Frequency of wheel speed sensor signal (F515) on pins B17 and B18 of the ECU is too high due to: - unstable contact in wheel speed sensor wiring	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated
7-1	Interruption in ABS valve (B256) on pins B6 and B3 of the ECU	- ABS on front axle, left deactivated
7-3	Short circuit to supply in ABS valve (B256) on pins B6 and B3 of the ECU	- ABS on front and rear axles deactivated - ASR brake control deactivated
7-5	Interruption in ABS valve (B256) on pin B6 or B3 of the ECU	- ABS on front axle, left deactivated
7-6	Short circuit to earth in ABS valve (B256) on pins B6 and B3 of the ECU	- ABS on front axle, left deactivated
8-1	Interruption in ABS valve (B257) on pins B4 and B1 of the ECU	- ABS on front axle, right deactivated
8-3	Short circuit to supply in ABS valve (B257) on pins B4 and B1 of the ECU	- ABS on front and rear axles deactivated - ASR brake control deactivated
8-5	Interruption in ABS valve (B257) on pin B4 or B1 of the ECU	- ABS on front axle, right deactivated
8-6	Short circuit to earth in ABS valve (B257) on pins B4 and B1 of the ECU	- ABS on front axle, right deactivated
9-1	Interruption in ABS valve (B258) on pins B5 and B2 of the ECU	- ABS on rear axle, left deactivated
9-3	Short circuit to supply in ABS valve (B258) on pins B5 and B2 of the ECU	- ABS on front and rear axles deactivated - ASR brake control deactivated
9-5	Interruption in ABS valve (B258) on pin B5 or B2 of the ECU	- ABS on rear axle, left deactivated
9-6	Short circuit to earth in ABS valve (B258) on pins B5 and B2 of the ECU	- ABS on rear axle, left deactivated
10-1	Interruption in ABS valve (B259) on pins B9 and B8 of the ECU	- ABS on rear axle, right deactivated
10-3	Short circuit to supply in ABS valve (B259) on pins B9 and B8 of the ECU	- ABS on front and rear axles deactivated - ASR brake control deactivated
10-5	Interruption in ABS valve (B259) on pin B9 or B8 of the ECU	- ABS on rear axle, right deactivated
10-6	Short circuit to earth in ABS valve (B259) on pins B9 and B8 of the ECU	- ABS on rear axle, right deactivated
13-3	Short circuit to supply in wire "switch off exhaust brake when ABS is active" on pin A14 of the ECU	- "Exhaust brake control" deactivated
13-5	Interruption in wire "switch off exhaust brake when ABS is active" on pin A14 of the ECU, or interrupted resistance (B402) in fuse box	- "Exhaust brake control" deactivated

ABS-D AND ABS/ASR-E

ABS-D and ABS/ASR-E fault codes

DAVIE XD diagnostics manual

Fault code	Fault code description with possible cause	Symptom
13-6	Short circuit to earth in wire "switch off exhaust brake when ABS is active" on pin A14 of the ECU	- "Exhaust brake control" deactivated
14-4	Interruption or voltage "Diagonal 1" too low on pin A8 of the ECU	- ABS on front and rear axles, right deactivated - ASR brake/engine control deactivated
14-5	Interruption "Diagonal 1" on pin A4 and/or A9 of the ECU	- ABS on front and rear axles, right deactivated - ASR brake/engine control deactivated
18-3	Short circuit to supply in ASR valve (B237) on pin B16 of the ECU	- ASR brake control deactivated
18-5	Interruption in ASR valve (B237) on pin B7 and/or B16 of the ECU	- ASR brake control deactivated
18-6	Short circuit to earth in ASR valve (B237) on pin B7 and/or B16 of the ECU	- ASR brake control deactivated
23-5	Interruption or short circuit to earth in ABS warning indicator on pin A15 of the ECU	- No noticeable system response
231-5	No communication possible via V-CAN on pins A1 and A3 of the ECU due to: - open connection	- ASR brake/engine control deactivated
231-6	No communication possible via V-CAN on pins A1 and A3 of the ECU due to: - short circuit to earth	- ASR brake/engine control deactivated
231-9	CAN communication error on pins A1 and A3 due to: - time-out	- ASR engine control deactivated
231-12	CAN communication error on pins A1 and A3 due to: - internal ECU fault	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated
253-1	Incorrect ASR configuration due to: - unconnected (or incompletely connected) ASR components - incorrectly connected ASR components	- ASR brake/engine control deactivated
253-2	Incorrect ASR configuration due to: - internal ECU fault	- ASR brake/engine control deactivated
253-12	Incorrect ASR configuration due to: - internal ECU fault	- ASR brake/engine control deactivated
254-2	Internal ECU fault	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated
254-5	Interruption in central earth (G520), ABS valves	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated
254-8	Increased slip due to: - vehicle on test bench	- ABS on front and rear axles deactivated
254-9	ABS valve activated too long	- ABS on front and rear axles deactivated during the time that error is active
254-12	Internal ECU fault	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated

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2. SYSTEM INSPECTION WITH DAVIE XD

2.1 GENERAL

If DAVIE is being used to communicate with the ABS/ASR electronic unit, the following points need to be taken into account:

If ABS valve failures occur while driving, the fault lamp will go out after switching the vehicle ignition off and on if the fault is no longer active.

Should faults occur with the wheel speed sensors while driving, switch the vehicle ignition off and on; the fault lamp should then remain on if the fault is no longer present.

The fault lamp will not go out until the vehicle has reached a speed of at least 7 km/h.

If DAVIE XD has been used to erase faults from the memory of the electronic unit, the fault lamp will go out when the vehicle has reached a speed of at least 7 km/h.

In some "direct test" functions, it is possible to drive the vehicle while communications are taking place between DAVIE XD and the ABS/ASR unit. With the remaining "direct test" functions, communications between DAVIE XD and the electronic unit will be interrupted.

If a new ABS/ASR electronic unit is fitted, the unit will "recognise" whether the vehicle has an ASR system when the vehicle ignition is switched on.

If an electronic unit is subsequently fitted in a vehicle that does not have an ASR system, the unit will always output ASR error messages.

Whenever an ABS/ASR electronic unit is replaced, it is therefore important to reset the unit using DAVIE/XD.

ABS-D AND ABS/ASR-E

System inspection with DAVIE XD

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1. D3LC (ACH-EA) FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

D3LC (ACH-EA)

D3LC (ACH-EA) fault codes

DAVIE XD diagnostics manual

1.2 EXPLANATORY NOTES TO FAULT CODES D3LC (ACH-EA)

Fault code	Fault code description with possible cause	Symptom
0-0	Internal fault in ECU (D871) due to: <ul style="list-style-type: none">- defective ECU (D871)- insufficient battery voltage	- Cab heater does not start or fails during operation
0-1	Internal fault in ECU (D871) due to: <ul style="list-style-type: none">- defective internal temperature sensor in ECU (D871)	- Cab heater does not start or fails during operation
1-0	Fault when starting ACH-EA, no flame is detected within the start time due to: <ul style="list-style-type: none">- no or insufficient supply of fuel- insufficient supply of inlet air- clogged exhaust- defective flame sensor (F626)- defective glow filament (B168)	- Cab heater does not start. After 2 failed starts the cab heater switches off and generates a fault.
2-0	Flame extinguishes repeatedly during operation due to: <ul style="list-style-type: none">- no or insufficient supply of fuel- insufficient supply of inlet air- clogged exhaust- defective flame sensor (F626)	- Cab heater fails or emits smoke and supplies insufficient heat
3-1	Voltage (>30 V for at least 20 seconds) on pin A5 of the ECU (D871) is too high due to: <ul style="list-style-type: none">- excessive alternator/battery voltage	- Cab heater fails during operation
3-2	Voltage (<20 V for at least 20 seconds) on pin A5 of the ECU (D871) is too low due to: <ul style="list-style-type: none">- insufficient alternator/battery voltage- interruption on pin A5 of the ECU (D871)	- Cab heater does not start
4-0	Flame signalling when switching on due to: <ul style="list-style-type: none">- defective flame sensor (F626)- defective ECU (D871)	- Cab heater does not start
5-1	Short circuit to earth or short circuit to supply on pins FW1 and FW2 of the ECU (D871), flame sensor (F626)	- Cab heater does not start or fails during operation
5-2	Interruption on pin FW1 and/or FW2 of the ECU (D871), flame sensor (F626)	- Cab heater does not start or fails during operation
6-1	Short circuit to earth or short circuit to supply on pins A8 and A13 of the ECU (D871), temperature sensor (F509)	- Cab heater does not start or fails during operation
6-2	Interruption on pin A8 and/or A13 of the ECU (D871), temperature sensor (F509)	- Cab heater does not start or fails during operation
7-1	Short circuit to earth or short circuit to supply on pin A11 and/or A3 of the ECU (D871), fuel metering pump (B122)	- Cab heater does not start
	Internal fault in fuel metering pump (B122)	
7-2	Interruption on pin 4 and/or 9 of the ECU (D871), fuel metering pump (B122)	- Cab heater does not start
	Internal fault in fuel metering pump (B122)	

Fault code	Fault code description with possible cause	Symptom
8-1	Short circuit to earth or short circuit to supply on pins BM1 and BM2 of the ECU (D871), fan (B305) Internal fault in cab heater fan (B305)	- Cab heater does not start
8-2	Interruption on pin BM1 and/or BM2 of the ECU, fan (B305) Internal fault in cab heater fan (B305)	- Cab heater does not start
8-3	Cab heater fan (B305) speed deviation due to: - blocked fan (B305) - missing solenoid in electric motor - defective ECU (D871)	- Cab heater fails during operation
9-1	Short circuit to earth or short circuit to supply on pin A9 and/or A11 of the ECU (D871), glow filament (B168)	- Cab heater does not start
9-2	Interruption on pin A9 and/or A11 of the ECU (D871), glow filament (B168)	- Cab heater does not start
10-0	Cab heater gets overheated too often due to: - clogged hot air pipes - defective overheating sensor (F627) - insufficient supply of inlet air	- Cab heater fails during operation
10-4	ACH-EA safety function switched on as a result of: - too many overheatings	- The ECU is blocked
12-1	Short circuit to earth or short circuit to supply on pins A8, A13, A7 and/or A14 of the ECU (D871), thermostat unit (E566) Internal fault in thermostat unit (E566) or timer unit (E581)	- Cab heater does not start - Cab heater does not switch on or off at the desired temperature
12-2	Interruption on pin 10 and/or 11 of the ECU, thermostat unit (E566) Internal fault in thermostat unit (E566) or timer unit (E581)	- Cab heater does not start - Cab heater does not switch on or off at the desired temperature
13-1	Short circuit to earth or short circuit to supply on pins UF1 and UF2 of the ECU, overheating sensor (F627)	- Cab heater does not start or fails during operation
13-2	Interruption on pin UF1 and/or UF2 of the ECU, overheating sensor (F627)	- Cab heater does not start or fails during operation

D3LC (ACH-EA)

D3LC (ACH-EA) fault codes

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2. SYSTEM INSPECTION WITH DAVIE XD

2.1 GENERAL

Communication between DAVIE XD and the cab heater can only be established if the cab heater is switched on.

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1. EBS-2 FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

1.2 EXPLANATORY NOTES TO EBS-2 FAULT CODES

If there is an electrical fault in the EBS system, the symptom "open circuit in EBS pressure control" or "deactivation of EBS pressure control" may occur as a system reaction.

Open circuit in EBS pressure control

On application of the foot brake valve, the electronic unit will receive information on the desired vehicle deceleration from the brake pedal position sensor in the foot brake valve.

In the electronic unit, this vehicle deceleration command is converted into brake pressure to the brake cylinders.

If there is no feedback from the output pressure or wheel speed, there will be less accurate electronically controlled deceleration and brake force distribution.

Deactivation of EBS pressure control

The output pressure control in the brake cylinders is entirely pneumatic; i.e. there is no more electronically controlled deceleration and brake force distribution.

Fault code	Fault code description with possible cause	Symptom
11-18	Voltage on pin A8 of the EBS unit is too low due to: - contact resistance or poor connection to pin A8 of the EBS unit	- ABS on front axle deactivated - ASR brake control deactivated - EBS pressure control on front axle and drawn vehicle deactivated - VSC system deactivated
11-31	Extremely low voltage (<3 V) on pin A8 of the EBS unit due to: - excessive contact resistance on pin A8 of the EBS unit - interruption on pin A8 of the EBS unit	- ABS on front axle deactivated - ASR brake control deactivated - EBS pressure control on front axle and drawn vehicle deactivated - VSC system deactivated
12-18	Voltage on pin A9 of the EBS unit is too low due to: - contact resistance or poor connection to pin A9 of the EBS unit - short circuit to earth on pin B7 of the EBS unit	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated - VSC system deactivated
12-31	Extremely low voltage (<3 V) on pin A9 of the EBS unit due to: - excessive contact resistance on pin A9 of the EBS unit - interruption on pin A9 of the EBS unit	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated - VSC system deactivated
	Short circuit to earth on pin E4 or B7 of the EBS unit	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated - Pin B7 is internally switched to earth in the ECU and in addition the power supply to A9 and E4 is switched off internally. - VSC system deactivated

Fault code	Fault code description with possible cause	Symptom
13-18	Voltage on pin A7 of the EBS unit is too low due to: - contact resistance or poor connection to pin A7 of the EBS unit - interruption on pin A7 of the EBS unit	- No noticeable system limitation in EBS
14-32	Sensor supply voltage on pins D9, B13 or E1 of the EBS unit due is too low due to: - contact resistance or poor connection on specified connection points of the EBS unit - short circuit to earth on specified connection points of the EBS unit	- VSC system deactivated
14-33	Constant voltage, even if the ignition is turned off and the brake is not applied, on pin D9, B13 or E1 of the EBS unit due to: - short circuit to supply on specified connection points of the EBS unit	- VSC system deactivated
15-33	Constant voltage, even if the ignition is turned off and the brake is not applied, on pin B7 of the EBS unit due to: - short circuit to supply on pin B7 of the EBS unit	- No noticeable system limitation in EBS
16-11	Internal fault in EBS unit	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated - VSC system deactivated
16-12	Configuration parameters in the EBS unit incorrect due to: - incorrect programming - retrofitted components without identification card (oxford) change	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated - VSC system deactivated
16-15	Internal fault in EBS unit	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated - VSC system deactivated
16-17	Voltage (>32 V) on pins A7, A8 and A9 of the EBS unit is too high due to: - excessive alternator/battery voltage - inductive voltage of external component	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated - VSC system deactivated
16-18	Voltage on pins A7, A8 and A9 of the EBS unit at a speed of >2 km/h is too low due to: - insufficient battery voltage - poor earth connection to EBS unit	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated - VSC system deactivated
16-49	Unacceptable information from steering angle sensor (F701) due to: - incorrect mechanical adjustment of straight-ahead position of steering gear	- VSC system deactivated

Fault code	Fault code description with possible cause	Symptom
16-53	The difference in peripheral speed between the left and right wheel on the same axle exceeds 10%	<ul style="list-style-type: none"> - ABS on front and rear axles deactivated - ASR brake/engine control deactivated - VSC system deactivated
17-32	Voltage on pin B15 of the EBS unit at least 2.5 V lower than the voltage on pin A8 of the EBS unit due to: <ul style="list-style-type: none"> - short circuit to earth on pin B15 of the EBS unit 	<ul style="list-style-type: none"> - VSC system deactivated
17-33	When the ignition is switched on, voltage is already supplied to pin B15 of the EBS unit due to: <ul style="list-style-type: none"> - short circuit to supply on pin B15 of the EBS unit 	<ul style="list-style-type: none"> - VSC system deactivated
21-37	Interruption on pin C4 and/or C5 of the EBS unit, wheel speed sensor (F513)	<ul style="list-style-type: none"> - ABS on front axle, right deactivated - ASR brake/engine control deactivated - VSC system deactivated
21-38	Unacceptable wheel speed sensor frequency signal from wheel speed sensor (F513) on pins C4 and C5 of the EBS unit due to: <ul style="list-style-type: none"> - loose pole ring - wrong assessment by EBS unit 	<ul style="list-style-type: none"> - ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated - VSC system deactivated
21-41	Short circuit to earth on pin C4 and/or C5 of the EBS unit, wheel speed sensor (F513)	<ul style="list-style-type: none"> - ABS on front axle, right deactivated - ASR brake/engine control deactivated - VSC system deactivated
21-42	Short circuit to supply on pin C4 and/or C5 of the EBS unit, wheel speed sensor (F513)	<ul style="list-style-type: none"> - ABS on front axle, right deactivated - ASR brake/engine control deactivated - VSC system deactivated
21-44	Short circuit on pin C4 and/or C5 of the EBS unit, wheel speed sensor (F513)	<ul style="list-style-type: none"> - ABS on front axle, right deactivated - ASR brake/engine control deactivated - VSC system deactivated
21-45	Incorrect wheel speed sensor sine-wave signal from wheel speed sensor (F513) on pins C4 and C5 of the EBS unit due to: <ul style="list-style-type: none"> - distorted wheel speed sensor ring - damaged wheel speed sensor ring 	<ul style="list-style-type: none"> - ABS on front axle, right deactivated - ASR brake/engine control deactivated - VSC system deactivated
21-46	No uniformity (frequency changes) of wheel speed sensor signal from wheel speed sensor (F513) on pins C4 and C5 of the EBS unit due to: <ul style="list-style-type: none"> - heavy point due to brake disc wobble, for example 	<ul style="list-style-type: none"> - ABS on front axle, right deactivated - ASR brake/engine control deactivated - VSC system deactivated
21-47	Excessive oscillation of wheel speed sensor signal (maximum/minimum level) from wheel speed sensor (F513) on pins C4 and C5 of the EBS unit due to: <ul style="list-style-type: none"> - excessive wheel bearing play - incorrect mounting of wheel speed sensor ring 	<ul style="list-style-type: none"> - ABS on front axle, right deactivated - ASR brake/engine control deactivated - VSC system deactivated

Fault code	Fault code description with possible cause	Symptom
21-48	Minimum value of wheel speed sensor signal from wheel speed sensor (F513) on pins C4 and C5 of the EBS unit is too low due to: <ul style="list-style-type: none"> - too large an air gap between wheel speed sensor ring and wheel speed sensor - contact resistance on pin C4 and/or C5 of the EBS unit 	<ul style="list-style-type: none"> - ABS on front axle, right deactivated - ASR brake/engine control deactivated - VSC system deactivated
22-37	Interruption on pin D7 and/or D8 of the EBS unit, wheel speed sensor (F512)	<ul style="list-style-type: none"> - ABS on front axle, left deactivated - ASR brake/engine control deactivated - VSC system deactivated
22-38	Unacceptable wheel speed sensor frequency signal from wheel speed sensor (F512) on pins D7 and D8 of the EBS unit due to: <ul style="list-style-type: none"> - loose pole ring - wrong assessment by EBS unit 	<ul style="list-style-type: none"> - ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated - VSC system deactivated
22-41	Short circuit to earth on pin D7 and/or D8 of the EBS unit, wheel speed sensor (F512)	<ul style="list-style-type: none"> - ABS on front axle, left deactivated - ASR brake/engine control deactivated - VSC system deactivated
22-42	Short circuit to supply on pin D7 and/or D8 of the EBS unit, wheel speed sensor (F512)	<ul style="list-style-type: none"> - ABS on front axle, left deactivated - ASR brake/engine control deactivated - VSC system deactivated
22-44	Short circuit on pin D7 and/or D8 of the EBS unit, wheel speed sensor (F512)	<ul style="list-style-type: none"> - ABS on front axle, left deactivated - ASR brake/engine control deactivated - VSC system deactivated
22-45	Incorrect wheel speed sensor sine-wave signal from wheel speed sensor (F512) on pins D7 and D8 of the EBS unit due to: <ul style="list-style-type: none"> - distorted wheel speed sensor ring - damaged wheel speed sensor ring 	<ul style="list-style-type: none"> - ABS on front axle, left deactivated - ASR brake/engine control deactivated - VSC system deactivated
22-46	No uniformity (frequency changes) of wheel speed sensor signal from wheel speed sensor (F512) on pins D7 and D8 of the EBS unit due to: <ul style="list-style-type: none"> - heavy point due to brake disc wobble, for example 	<ul style="list-style-type: none"> - ABS on front axle, left deactivated - ASR brake/engine control deactivated - VSC system deactivated
22-47	Excessive oscillation of wheel speed sensor signal (maximum/minimum level) from wheel speed sensor (F512) on pins D7 and D8 of the EBS unit due to: <ul style="list-style-type: none"> - excessive wheel bearing play - incorrect mounting of wheel speed sensor ring 	<ul style="list-style-type: none"> - ABS on front axle, left deactivated - ASR brake/engine control deactivated - VSC system deactivated
22-48	Minimum value of wheel speed sensor signal from wheel speed sensor (F512) on pins D7 and D8 of the EBS unit is too low due to: <ul style="list-style-type: none"> - too large an air gap between wheel speed sensor ring and wheel speed sensor - contact resistance on pin D7 and/or D8 of the EBS unit 	<ul style="list-style-type: none"> - ABS on front axle, left deactivated - ASR brake/engine control deactivated - VSC system deactivated
23-37	Interruption on pin B1 and/or B2 of the rear axle modulator (D879), wheel speed sensor (F515)	<ul style="list-style-type: none"> - ABS on rear axle, right deactivated - ASR brake/engine control deactivated - VSC system deactivated

Fault code	Fault code description with possible cause	Symptom
23-38	Unacceptable wheel speed measured via the wheel speed sensor (F515)	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated - VSC system deactivated
23-41	Short circuit to earth on pin B1 and/or B2 of the rear axle modulator (D879), wheel speed sensor (F515)	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated - VSC system deactivated
23-42	Short circuit to supply on pin B1 and/or B2 of the rear axle modulator (D879), wheel speed sensor (F515)	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated - VSC system deactivated
23-44	Short circuit between pins B1 and B2 of the rear axle modulator (D879), wheel speed sensor (F515)	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated - VSC system deactivated
23-45	Incorrect wheel speed sensor sine-wave signal from wheel speed sensor (F515) on pins B1 and B2 of the rear axle modulator (D978) due to: - distorted wheel speed sensor ring - damaged wheel speed sensor ring	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated - VSC system deactivated
23-46	No uniformity (frequency changes) of wheel speed sensor signal from wheel speed sensor (F515) on pins B1 and B2 of the rear axle modulator (D978) due to: - excessive wheel bearing play - incorrect mounting of wheel speed sensor ring	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated - VSC system deactivated
23-47	Excessive oscillation of wheel speed sensor signal (maximum/minimum level) from wheel speed sensor (F515) on pins B1 and B2 of the rear axle modulator (D978) due to: - excessive wheel bearing play - incorrect mounting of wheel speed sensor ring	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated - VSC system deactivated
23-48	Minimum value of wheel speed sensor signal from wheel speed sensor (F515) on pins B1 and B2 of the rear axle modulator (D978) is too low due to: - too large an air gap between wheel speed sensor ring and wheel speed sensor - contact resistance on pin B1 and/or B2 of the rear axle modulator	- ABS on rear axle, right deactivated - ASR brake/engine control deactivated - VSC system deactivated
24-37	Interruption on pins C1 and C2 of the rear axle modulator (D978), wheel speed sensor (F514)	- ABS on rear axle, left deactivated - ASR brake/engine control deactivated - VSC system deactivated
24-38	Unacceptable wheel speed measured via the wheel speed sensor (F514)	- ABS on rear axle, left deactivated - ASR brake/engine control deactivated - VSC system deactivated
24-41	Short circuit to earth on pins C1 and C2 of the rear axle modulator (D978), wheel speed sensor (F514)	- ABS on rear axle, left deactivated - ASR brake/engine control deactivated - VSC system deactivated
24-42	Short circuit to supply on pins C1 and C2 of the rear axle modulator (D978), wheel speed sensor (F514)	- ABS on rear axle, left deactivated - ASR brake/engine control deactivated

Fault code	Fault code description with possible cause	Symptom
24-44	Short circuit between pins C1 and C2 of the rear axle modulator (D978), wheel speed sensor (F514)	<ul style="list-style-type: none"> - ABS on rear axle, left deactivated - ASR brake/engine control deactivated - VSC system deactivated
24-45	Incorrect wheel speed sensor sine-wave signal from wheel speed sensor (F514) on pins C1 and C2 of the rear axle modulator (D978) due to: <ul style="list-style-type: none"> - distorted wheel speed sensor ring - damaged wheel speed sensor ring 	<ul style="list-style-type: none"> - ABS on rear axle, left deactivated - ASR brake/engine control deactivated - VSC system deactivated
24-46	No uniformity (frequency changes) of wheel speed sensor signal from wheel speed sensor (F514) on pins C1 and C2 of the rear axle modulator (D978) due to: <ul style="list-style-type: none"> - excessive wheel bearing play - incorrect mounting of wheel speed sensor ring 	<ul style="list-style-type: none"> - ABS on rear axle, left deactivated - ASR brake/engine control deactivated - VSC system deactivated
24-47	Excessive oscillation of wheel speed sensor signal (maximum/minimum level) from wheel speed sensor (F514) on pins C1 and C2 of the rear axle modulator (D978) due to: <ul style="list-style-type: none"> - excessive wheel bearing play - incorrect mounting of wheel speed sensor ring 	<ul style="list-style-type: none"> - ABS on rear axle, left deactivated - ASR brake/engine control deactivated - VSC system deactivated
24-48	Minimum value of wheel speed sensor signal from wheel speed sensor (F514) on pins C1 and C2 of the rear axle modulator (D978) is too low due to: <ul style="list-style-type: none"> - too large an air gap between wheel speed sensor ring and wheel speed sensor - contact resistance on pin C1 and/or C2 of the rear axle modulator 	<ul style="list-style-type: none"> - ABS on rear axle, left deactivated - ASR brake/engine control deactivated - VSC system deactivated
31-16	Large deviation between the duty cycle signals from the foot brake valve (F628) on pins E2 and E5 of the EBS unit due to: <ul style="list-style-type: none"> - internal fault in foot brake valve 	<ul style="list-style-type: none"> - ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated - VSC system deactivated - Low voltage on connection point A9 inside EBS unit
31-52	Large deviation between the duty cycle signals from the foot brake valve (F628) on pins E2 and E5 of the EBS unit due to: <ul style="list-style-type: none"> - internal fault in foot brake valve 	<ul style="list-style-type: none"> - No noticeable system limitation in EBS
32-37	No signal from brake pedal position switch 1 in foot brake valve (F628) on pin E3 of the EBS unit due to: <ul style="list-style-type: none"> - defective switch in foot brake valve - interruption on pin E3 of the EBS unit 	<ul style="list-style-type: none"> - No noticeable system limitation in EBS
32-41	Brake pedal position switch 1 remains closed in foot brake valve (F628) or short circuit to earth on pin E3 of the EBS unit	<ul style="list-style-type: none"> - The actuating pressure control is active when the brake pedal is not applied; after a specified time (approx. 1 min.) the actuating pressure control will automatically disengage.

Fault code	Fault code description with possible cause	Symptom
33-37	No signal from brake pedal position switch 2 in foot brake valve (F628) on pin E6 of the EBS unit due to: <ul style="list-style-type: none"> - defective switch - interruption on pin E6 of the EBS unit - short circuit to supply on pin E6 of the EBS unit 	- No noticeable system limitation in EBS
33-41	Brake pedal position switch 2 remains closed in foot brake valve (F628) or short circuit to earth on pin E6 of the EBS unit	- The actuating pressure control is active when the brake pedal is not applied; after a specified time (approx. 1 min.) the actuating pressure control will automatically disengage.
34-41	Lower signal level from brake pedal position sensor 1 in foot brake valve (F628) on pin E2 of the EBS unit is too low during a specified period of time due to: <ul style="list-style-type: none"> - contact resistance on pin E2 of the EBS unit - internal fault in foot brake valve - short circuit to earth on pin E2 of the EBS unit 	- No noticeable system limitation in EBS
34-43	Upper signal level from brake pedal position sensor 1 in foot brake valve (F628) on pin E2 of the EBS unit is too high during a specified time or the pulse width of the signal is incorrect due to: <ul style="list-style-type: none"> - short circuit to supply on pin E2 of the EBS unit - internal fault in foot brake valve - interruption on pin E1 of the EBS unit - interruption on connection point E2 	- No noticeable system limitation in EBS
35-41	Lower signal level from brake pedal position sensor 2 in foot brake valve (F628) on pin E5 of the EBS unit is too low during a specified period of time due to: <ul style="list-style-type: none"> - contact resistance on pin E5 of the EBS unit - internal fault in foot brake valve - short circuit to earth on pin E5 of the EBS unit 	- No noticeable system limitation in EBS
35-43	Upper signal level from brake pedal position sensor 2 in foot brake valve (F628) on pin E5 of the EBS unit is too high during a specified time or the pulse width of the signal is incorrect due to: <ul style="list-style-type: none"> - short circuit to supply on pin E5 of the EBS unit - internal fault in foot brake valve - interruption on pin E4 of the EBS unit - interruption on pin E5 of the EBS unit 	- No noticeable system limitation in EBS
41-39	No CAN message "TCO1" received from the tachograph in relation to the vehicle speed No CAN message "CCVS" received from the engine management system with regard to the parking brake switch, clutch pedal switch or vehicle speed related to the wheel speed	- No noticeable system limitation in EBS

Fault code	Fault code description with possible cause	Symptom
41-58	No CAN message "ERC1" received within a specified period of time from the intarder in relation to the intarder braking torque	- No noticeable system limitation in EBS
41-59	No CAN message "CFG", "intarder configuration" received from the intarder within a specified period of time	- No noticeable system limitation in EBS
41-61	Communication via V-CAN on pins A1 and A3 of the EBS unit not possible when switching on ignition due to: <ul style="list-style-type: none"> - interruption on pin A1 of the EBS unit - short circuit to earth on pin A3 of the EBS unit - short circuit to supply on pin A1 and/or A3 of the EBS unit 	- ASR brake/engine control deactivated - VSC system deactivated
41-62	Unacceptable vehicle speed information via V-CAN compared with the vehicle speed measured via wheel speed sensors	- VSC system deactivated
41-63	Interrupted communication via V-CAN on pins A1 and A3 of the EBS unit due to: <ul style="list-style-type: none"> - interruption on pin A1 and/or A3 of the EBS unit - short circuit to earth on pin A3 of the EBS unit - short circuit to supply on pin A1 and/or A3 of the EBS unit 	- ASR brake/engine control deactivated - VSC system deactivated
41-65	No CAN message "ERC1" received within a specified period of time from the engine management system in relation to the engine braking torque	- No noticeable system limitation in EBS
41-66	No CAN message "EEC1" received within a specified period of time from the engine management system in relation to the engine torque and engine speed	- No noticeable system limitation in EBS
41-67	No CAN message "ETC1" received within a specified period of time from the gearbox (AS Tronic) if the drive line is activated	- No noticeable system limitation in EBS
41-68	No CAN message "CCVS" received within a specified period of time from the engine management system in relation to the parking brake status, vehicle speed and clutch status	- No noticeable system limitation in EBS
41-69	No CAN message "TCO1" received within a specified period of time from the tachograph in relation to vehicle speed	- No noticeable system limitation in EBS
41-71	No CAN message received from VIC within a specified period of time	- No noticeable system limitation in EBS
41-72	No CAN message "CFG", "DEB configuration" received from the engine management system within a specified period of time	- No noticeable system limitation in EBS
41-73	No CAN message "ERC1" received within a specified period of time from the engine management system in relation to the engine braking torque	- No noticeable system limitation in EBS

EBS-2

EBS-2 fault codes

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Fault code	Fault code description with possible cause	Symptom
41-74	No CAN message "CFG", "engine brake configuration" received from the engine management system within a specified period of time	- No noticeable system limitation in EBS
41-78	No CAN message "CFG", "engine configuration" received from the engine management system within a specified period of time	- No noticeable system limitation in EBS
41-86	No CAN message "EEC2" received within a specified period of time from the engine management system in relation to the position of the accelerator pedal/idling switch	- No noticeable system limitation in EBS
41-87	No CAN message "EEC3" received within a specified period of time from the engine management system in relation to the torque required to overcome frictional resistance	- No noticeable system limitation in EBS
41-89	No CAN message "ETC2" received within a specified period of time from the AS Tronic in relation to the engaged gear	- No noticeable system limitation in EBS
41-91	Unacceptable vehicle speed information via V-CAN from tachograph compared with the information from the sensors in the VSC module (F702)	- VSC system deactivated
42-16	EBS unit does not receive a correct CAN message from the rear axle modulator (D978) on pins B1 and B4	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated - VSC system deactivated
42-61	Interrupted CAN communication with the rear axle modulator (D978) via pins B1 and B4 of the EBS unit due to: <ul style="list-style-type: none"> - short circuit to earth on pin B4 of the EBS unit - short circuit to supply on pin B1 and/or pin B4 of the EBS unit - short circuit between pin B1 and pin B4 of the EBS unit 	- ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated - VSC system deactivated
43-61	CAN communication problem with the drawn vehicle ECU via pins B3 and B6 of the ECU	- No noticeable system limitation in EBS
43-63	Interrupted CAN communication, with a driving combination, with the drawn vehicle ECU via pins B3 and B6 of the ECU due to: <ul style="list-style-type: none"> - interruption on pins B3 and B6 of the EBS unit - short circuit between pin B3 and pin B6 of the EBS unit 	- No noticeable system limitation in EBS
43-75	Interrupted CAN communication, with a driving combination, with the drawn vehicle ECU via pin B3 (CAN-H) of the ECU due to: <ul style="list-style-type: none"> - interruption on pin B3 of the EBS unit - short circuit on pin B3 of the EBS unit 	- No noticeable system limitation in EBS

Fault code	Fault code description with possible cause	Symptom
43-76	Interrupted communication, with a driving combination, with the drawn vehicle ECU via pin B6 (CAN-L) of the EBS unit due to: - interruption on pin B6 of the EBS unit - short circuit on pin B6 of the EBS unit	- No noticeable system limitation in EBS
45-16	Interruption, short circuit to earth or short circuit to supply on pin A18 of the EBS unit	- No noticeable system limitation in EBS
51-21	Short circuit to earth on pin D11 of the EBS unit, ABS valve (B256)	- ABS on front axle, left deactivated - VSC system deactivated
51-22	Short circuit to supply on pin D11 of the EBS unit, ABS valve (B256)	- ABS on front axle deactivated - VSC system deactivated
51-23	Interruption on pin D12 of the EBS unit, ABS valve (B256)	- ABS on front axle, left deactivated - VSC system deactivated
51-24	Interruption on pin D11 of the EBS unit, ABS valve (B256)	- ABS on front axle, left deactivated - VSC system deactivated
51-25	Continuous actuation of ABS valve (B256) via pins D10 and D12 and/or D11 and D12 of the EBS unit due to: - internal short circuit in EBS unit	- ABS on front axle deactivated - EBS pressure control on front axle and drawn vehicle deactivated - VSC system deactivated
51-26	Interruption on pin D10 of the EBS unit, ABS valve (B256)	- ABS on front axle, left deactivated - VSC system deactivated
51-27	Short circuit to earth on pin D10 of the EBS unit, ABS valve (B256)	- ABS on front axle, left deactivated - VSC system deactivated
51-28	Short circuit to supply on pin D10 of the EBS unit, ABS valve (B256)	- ABS on front axle deactivated - VSC system deactivated
52-21	Short circuit to earth on pin C2 of the EBS unit, ABS valve (B257)	- ABS on front axle, right deactivated - VSC system deactivated
52-22	Short circuit to supply on pin C2 of the EBS unit, ABS valve (B257)	- ABS on front axle deactivated - VSC system deactivated
52-23	Interruption on pin C3 of the EBS unit, ABS valve (B257)	- ABS on front axle, right deactivated - VSC system deactivated
52-24	Interruption on pin C2 of the EBS unit, ABS valve (B257)	- ABS on front axle, right deactivated - VSC system deactivated
52-25	Continuous actuation of ABS valve (B257) via pins C1 and C3 and/or C2 and C3 of the EBS unit due to: - internal short circuit in ECU	- ABS on front axle deactivated - EBS pressure control on front axle and drawn vehicle deactivated - VSC system deactivated
52-26	Interruption on pin C1 of the EBS unit, ABS valve (B257)	- ABS on front axle, right deactivated - VSC system deactivated
52-27	Short circuit to earth on pin C1 of the EBS unit, ABS valve (B257)	- ABS on front axle, right deactivated - VSC system deactivated
52-28	Short circuit to supply on pin C1 of the EBS unit, ABS valve (B256)	- ABS on front axle deactivated - VSC system deactivated
53-32	Short circuit to earth on pin D12 or C3 of the EBS unit, ABS valve (B256 or B257)	- No noticeable system limitation in EBS
53-33	Short circuit to supply on pin D12 or C3 of the EBS unit, ABS valve (B256 or B257)	- ABS on front axle deactivated - VSC system deactivated

EBS-2

EBS-2 fault codes

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Fault code	Fault code description with possible cause	Symptom
55-12	Incorrect redundancy valve (B306) parameters due to: <ul style="list-style-type: none">- redundancy valve connected to the EBS unit without the EBS unit having been programmed for a redundancy valve	<ul style="list-style-type: none">- ABS on front and rear axles deactivated- ASR brake/engine control deactivated- EBS pressure control on front axle, rear axle and drawn vehicle deactivated- VSC system deactivated
55-31	Interruption in redundancy valve (B306), measured via pin B12 of the EBS unit	<ul style="list-style-type: none">- ABS on front and rear axles deactivated- ASR brake/engine control deactivated- EBS pressure control on rear axle deactivated- VSC system deactivated
55-32	Short circuit to earth in redundancy valve (B306), measured via pin B12 of the EBS unit	<ul style="list-style-type: none">- ABS on front and rear axles deactivated- ASR brake/engine control deactivated- EBS pressure control on rear axle deactivated- VSC system deactivated
55-33	Short circuit to supply in redundancy valve (B306), measured via pin B12 of the EBS unit	<ul style="list-style-type: none">- ABS on front axle deactivated- VSC system deactivated
57-12	Incorrect ASR cut-off valve (B309) parameters due to: <ul style="list-style-type: none">- ASR cut-off valve connected to the EBS unit without the EBS unit having been programmed for an ASR cut-off valve	<ul style="list-style-type: none">- ABS on front and rear axles deactivated- ASR brake/engine control deactivated- EBS pressure control on front axle, rear axle and drawn vehicle deactivated- VSC system deactivated
57-31	Interruption on pin C6 of the EBS unit, ASR cut-off valve (B309)	<ul style="list-style-type: none">- ASR brake control deactivated
57-32	Short circuit to earth on pin C6 of the EBS unit, ASR cut-off valve (B309)	<ul style="list-style-type: none">- ASR brake control deactivated
57-33	Short circuit to supply on pin C6 of the EBS unit, ASR cut-off valve (B309)	<ul style="list-style-type: none">- No noticeable system limitation in EBS
61-16	The current through the front axle modulator (B307) magnet coil measured via pins D1 and D2 of the EBS unit is incorrect due to: <ul style="list-style-type: none">- copper short circuit in the magnet coil- short circuit or contact resistance between pins D1 and D2 of the EBS unit	<ul style="list-style-type: none">- EBS pressure control on front axle deactivated- VSC system deactivated
61-55	Front axle modulator (B307) output pressure measured on pin D6 of the EBS unit is incorrect in relation to the current through the magnet coil due to: <ul style="list-style-type: none">- defective pressure sensor- too low a supply pressure	<ul style="list-style-type: none">- EBS pressure control on front axle deactivated- VSC system deactivated
62-42	Pressure sensor failure in front axle modulator (B307) due to: <ul style="list-style-type: none">- short circuit to supply on pin D6 of the EBS unit- interruption on pin D3 of the EBS unit- short circuit to supply on pin D3 of the EBS unit	<ul style="list-style-type: none">- Open circuit in EBS pressure control, front axle- VSC system deactivated

Fault code	Fault code description with possible cause	Symptom
62-43	With a nonactivated front axle modulator, the front axle modulator (B307) pressure sensor output signal on pin D6 of the EBS unit is too low or too high due to: <ul style="list-style-type: none"> - defective pressure sensor - no supply voltage or supply voltage too low on pin D9 of the EBS unit - interruption on pin D6 of the EBS unit - short circuit to earth on pin D6 of the EBS unit - air pressure at connection point 4 of the front axle modulator (B307) if the foot brake valve (F628) is not activated 	<ul style="list-style-type: none"> - Open circuit in EBS pressure control, front axle - VSC system deactivated
63-25	Permanent actuation of the front axle modulator (B307) due to: <ul style="list-style-type: none"> - short circuit to supply on one side and short circuit to earth on the other side 	<ul style="list-style-type: none"> - Brake remains applied to front axle - VSC system deactivated
63-32	Short circuit to earth on pin D1 of the EBS unit, front axle modulator (B307)	<ul style="list-style-type: none"> - EBS pressure control on front axle deactivated - VSC system deactivated
63-33	Short circuit to supply on pin D1 of the EBS unit, front axle modulator (B307)	<ul style="list-style-type: none"> - EBS pressure control on front axle deactivated - VSC system deactivated
63-34	Short circuit to earth on pin D2 of the EBS unit, front axle modulator (B307)	<ul style="list-style-type: none"> - EBS pressure control on front axle deactivated - VSC system deactivated
63-35	Short circuit to supply on pin D2 of the EBS unit, front axle modulator (B307)	<ul style="list-style-type: none"> - EBS pressure control on front axle deactivated - VSC system deactivated
63-36	Interruption on pin D1 and/or D2 of the EBS unit, front axle modulator (B307)	<ul style="list-style-type: none"> - EBS pressure control on front axle deactivated - VSC system deactivated
64-13	The ECU parameters for the rear axle modulator type do not correspond with the parameters in the rear axle modulator (D978)	<ul style="list-style-type: none"> - ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated - VSC system deactivated
64-14	The EBS unit detects a fault in the CAN message from the rear axle modulator (D978)	<ul style="list-style-type: none"> - ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated - VSC system deactivated
64-16	Fault in the solenoid valves of the rear axle modulator (D978)	<ul style="list-style-type: none"> - ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated - VSC system deactivated
64-51	Output pressure of the rear axle modulator (D978) is too high	<ul style="list-style-type: none"> - ABS on rear axle deactivated - VSC system deactivated

EBS-2

EBS-2 fault codes

DAVIE XD diagnostics manual

Fault code	Fault code description with possible cause	Symptom
64-52	Brake pressure signal difference between both pressure sensors in rear axle modulator (D978) is too high	<ul style="list-style-type: none"> - ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated - VSC system deactivated
64-54	No pressure sensor signal in rear axle modulator (D978) or signal is incorrect (too high/too low)	<ul style="list-style-type: none"> - ABS on front and rear axles deactivated - ASR brake/engine control deactivated - Open circuit in EBS pressure control, rear axle - VSC system deactivated
64-64	CAN communication problem of the EBS unit with the rear axle modulator (D879) via pins B1 and B4 of the EBS unit	<ul style="list-style-type: none"> - ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated - VSC system deactivated
	Supply voltage on pin B7 of the EBS unit interrupted	<ul style="list-style-type: none"> - ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated - VSC system deactivated - With an interruption on pin B7, connection points A9 and E4 inside the ECU will have a low voltage, causing brake pedal position sensor 2 to give no output signal, for instance. If the measurement is performed at B7, it will also turn out that B7 in this situation will be internally connected to earth in the ECU
	Interrupted earth connection or contact resistance in the earth connection of the rear axle modulator (D978)	<ul style="list-style-type: none"> - ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated - VSC system deactivated
64-77	The rear axle modulator (D978) has not received a CAN message from the VSC module within a specified period of time	<ul style="list-style-type: none"> - VSC system deactivated
64-83	The EBS unit establishes that the rear axle modulator (D978) has not sent the correct check message during a check phase	<ul style="list-style-type: none"> - ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on rear axle deactivated - VSC system deactivated
66-12	Incorrect drawn vehicle control valve (B308) parameters due to: <ul style="list-style-type: none"> - drawn vehicle control valve connected to the EBS unit without the EBS unit having been programmed for a drawn vehicle control valve 	<ul style="list-style-type: none"> - ABS on front and rear axles deactivated - ASR brake/engine control deactivated - EBS pressure control on front axle, rear axle and drawn vehicle deactivated - VSC system deactivated
66-16	The current measured by the drawn vehicle control valve (B308) magnet coil via pins B10 and B11 of the ECU is incorrect due to: <ul style="list-style-type: none"> - copper short circuit in the magnet coil - short circuit or contact resistance between pins B10 and B11 of the EBS unit 	<ul style="list-style-type: none"> - EBS pressure control on drawn vehicle deactivated - VSC system deactivated

Fault code	Fault code description with possible cause	Symptom
66-55	Drawn vehicle control valve (B308) output pressure measured on pin B14 of the EBS unit is incorrect in relation to the current through the magnet coil due to: - defective pressure sensor - too low a supply pressure	- EBS pressure control on drawn vehicle deactivated - VSC system deactivated
67-42	Pressure sensor fault in drawn vehicle control valve (B308) due to: - short circuit to supply on pin B14 of the EBS unit - interruption on pin D3 of the EBS unit - short circuit to supply on pin D3 of the EBS unit	- Open circuit in EBS pressure control, drawn vehicle - VSC system deactivated
67-43	With a nonactivated drawn vehicle control valve, drawn vehicle control valve (B308) pressure sensor output signal on pin B14 of the EBS unit is too low or too high due to: - defective pressure sensor - no or too low a supply voltage to pressure sensor	- Open circuit in EBS pressure control, drawn vehicle - VSC system deactivated
67-51	With a non-activated drawn vehicle control valve and a speed >30 km/hour, drawn vehicle control valve (B308) pressure sensor output signal on pin B14 of the EBS unit is too low or too high due to: - defective pressure sensor	- Open circuit in EBS pressure control, drawn vehicle - VSC system deactivated
68-25	Permanent actuation of the drawn vehicle control valve (B308) due to: - short circuit to supply on one side and short circuit to earth on the other side	- Brake remains applied to drawn vehicle - VSC system deactivated
68-32	Short circuit to earth on pin B10 of the EBS unit, drawn vehicle control valve (B308)	- EBS pressure control on drawn vehicle deactivated - VSC system deactivated
68-33	Short circuit to supply on pin B10 of the EBS unit, drawn vehicle control valve (B308)	- EBS pressure control on drawn vehicle deactivated - VSC system deactivated
68-34	Short circuit to earth on pin B11 of the EBS unit, drawn vehicle control valve (B308)	- EBS pressure control on drawn vehicle deactivated - VSC system deactivated
68-35	Short circuit to supply on pin B11 of the EBS unit, drawn vehicle control valve (B308)	- EBS pressure control on drawn vehicle deactivated - VSC system deactivated
68-36	Interruption on pin B10 and/or B11 of the EBS unit, drawn vehicle control valve (B308)	- EBS pressure control on drawn vehicle deactivated - VSC system deactivated
73-15	If a drawn vehicle with EBS sends a CAN message to the ECU of the prime mover, indicating that the "serious drawn vehicle failure" needs to be activated on DIP, this fault code will be stored in the prime mover ECU.	
74-11	Internal fault in the VSC module (F702)	- VSC system deactivated
74-12	Incorrect parameters of the VSC module (F702)	- VSC system deactivated

EBS-2

EBS-2 fault codes

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Fault code	Fault code description with possible cause	Symptom
74-13	Incorrect software version in the VSC module (F702) or rear axle modulator (D978) for the VSC control	- VSC system deactivated
74-14	The EBS unit detects a fault in the CAN message from the VSC module (F702)	- VSC system deactivated
74-15	Internal fault in the VSC module (F702)	- VSC system deactivated
74-16	Sensor fault in the VSC module (F702)	- VSC system deactivated
74-18	Insufficient supply voltage on VSC module (F702) due to: - contact resistance or poor connection	- VSC system deactivated
74-49	Unacceptable information from steering angle sensor (F701) due to: - incorrect mechanical adjustment of steering gear - damaged/defective steering angle sensor	- VSC system deactivated
74-64	CAN communication problem of the EBS unit with the VSC module (F702) via pins B2 and B5 due to: - short circuit between pin B2 and pin B5 of the EBS unit	- VSC system deactivated
74-77	The EBS unit has not received a CAN message from the VSC module (F702) and steering angle sensor (F701) within a specified period of time due to: - interruption on pin B2 and/or B5 of the EBS unit - short circuit to earth on pin B5 of the EBS unit - short circuit to supply on pin B2 and/or pin B5 of the EBS unit	- VSC system deactivated
74-81	Sensor information from VSC module (F702) does not correspond with the steering performance of the vehicle due to: - wrong installation of VSC module	- VSC system deactivated
74-82	The VSC calibration is still active	- VSC system deactivated
74-83	The EBS unit establishes that the VSC module (F702) has not sent the correct check message during a check phase	- VSC system deactivated
74-85	Bar codes in EBS unit and VSC module (F702) do not correspond due to: - delay in calibration after replacement of the EBS ECU and/or VSC module and/or modification of parameter setting	- VSC system deactivated
75-12	EBS unit receives CAN messages from the steering angle sensor (F701), with the EBS unit having been programmed in such a way that there is no VSC system fitted in the vehicle	- VSC system deactivated
75-13	The software version of the steering angle sensor (F701) is not detected/accepted by the EBS unit	- VSC system deactivated
75-14	The EBS unit detects a fault in the CAN message from the steering angle sensor (F701)	- VSC system deactivated

Fault code	Fault code description with possible cause	Symptom
75-16	Internal fault in the steering angle sensor (F701)	- VSC system deactivated
75-18	Insufficient supply voltage on steering angle sensor (F701) due to: - contact resistance or poor connection - interruption	- VSC system deactivated
75-43	The steering angle sensor signal via CAN, from the steering angle sensor (F701), is not correct or not available	- VSC system deactivated
75-63	No messages via CAN on pins B2 and B5 of the EBS unit	- VSC system deactivated
75-77	The EBS unit has not received a CAN message from the steering angle sensor (F701) and VSC module (F702) within a specified period of time due to: - interruption on pin B15 of the EBS unit	- VSC system deactivated
75-84	The parameters stored in the EBS unit and covering the relation between the steering wheel angular displacement and the wheel deflection deviate from the current values measured while the vehicle is being driven due to: - incorrect or other mechanical adjustment of the steering gear	- VSC system deactivated

2. EBS-2 CUSTOMER PARAMETERS

2.1 INTRODUCTION

Customer parameters

Customer parameters are the settings of an electronic system. The customer parameters permit adapting control functions of a system to the customer's particular wishes and/or needs within certain limits. The customer parameters are stored in a list in the memory of the electronic unit. Customer parameters can be modified using the programming feature of DAVIE XD. Programming using DAVIE XD is only possible if the logged-in user has been registered as a "Master Technician".

Note:

Erroneous settings of customer parameters may affect the action of control functions to such an extent that they function erratically or not at all. After modification of the settings the (modified) customer parameters must be stored in the electronic unit using the programming function in the customer parameter overview.

Customer parameter names and codes

Each customer parameter in a system has its own name and code. The following explanation of the customer parameters includes only the codes. The availability of a customer parameter in a system depends on the programmed software in the electronic unit. The programmed software depends on the vehicle configuration/identity card data.

Standard values

Standard values, options and setting ranges may vary according to the software variants of DAVIE XD and the system. This is why they have not been included in the following explanation of the customer parameters.

2.2 EXPLANATORY NOTES TO EBS-2 CUSTOMER PARAMETERS

EBS Customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
3-01	This is a comfort parameter setting which determines the pulsing "P-inshot" to the drawn vehicle.	0 bar	3.5 bar	<p>The pressure pulse activation "P inshot" is only available on FT vehicles and is only active if a drawn vehicle without EBS system is coupled.</p> <p>This setting can be changed if:</p> <ul style="list-style-type: none"> - there is a complaint relating to the towing of the drawn vehicle when braking is started.

3. SYSTEM INSPECTION WITH DAVIE XD

3.1 GENERAL

If the vehicle has been modified and the configuration changed, the electronic unit may have to be re-programmed.

3.2 VSC CALIBRATION

Using DAVIE, the VSC calibration must be activated after the following operations:

- replacing EBS-2 electronic unit
- replacing VSC module
- changes to parameter setting

The slip indicator on the instrument panel will be activated while the VSC is being calibrated and will go off when VSC calibration has been successfully completed.

When VSC calibration is active, a calibration error code can also be displayed by means of DAVIE.

Note:

- The slip indicator is not activated during VSC calibration on vehicles with production date <2004-21. On these vehicles the fact that the calibration error code is no longer present on DAVIE indicates that calibration has been successfully completed.
- VSC calibration takes place automatically and is completed when the vehicle has been driven a total of approximately 250 m in the straight-ahead position. This distance of 250 m in the straight-ahead position does not have to be covered in one go: the steering wheel can be turned from time to time.
- VSC control functions cannot be activated while calibration is being carried out.

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1. ECAS-3 FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

1.2 EXPLANATORY NOTES TO ECAS-3 FAULT CODES

Fault code	Fault code description with possible cause	System response
10-80	Internal fault in ECU	- No chassis height control
10-82	Internal fault in ECU due to: - specific data	- No chassis height control
10-83	Internal fault in ECU due to: - parameter fault	- No chassis height control
10-84	Internal fault in ECU due to: - height sensor calibration data	- No chassis height control
10-88	Internal fault in ECU due to: - Wabco data	- No noticeable system limitation
11-90	Interruption of power supply before contact on pin 5 of the ECU	- No noticeable system limitation - No communication with DAVIE
30-21	Short circuit to earth on pin 21 of the ECU, 3/2 way valve admitting air to or exhausting air from rear axle (B250)	- No chassis height control - The remote control can only be used to lower the chassis (exhausting bellows)
30-24	Short circuit to supply or open connection on pin 21 of the ECU, 3/2 way valve admitting air to or exhausting air from rear axle (B250)	- No chassis height control - The remote control can only be used to raise the chassis (admitting air to bellows)
31-21	Short circuit to earth on pin 8 of the ECU, 2/2 way valve, driven axle left (B250)	- No chassis height control - The system does not respond to the remote control
31-24	Short circuit to supply or open connection on pin 8 of the ECU, 2/2 way valve, driven axle left (B250)	- No chassis height control - The system does not respond to the remote control
32-21	Short circuit to earth on pin 20 of the ECU, 2/2 way valve, driven axle right (B250)	- No chassis height control - Normal driving level function does not work
32-24	Short circuit to supply or open connection on pin 20 of the ECU, 2/2 way valve, driven axle right (B250)	- No chassis height control - Normal driving level function does not work
35-21	Short circuit to earth on pin 10 of the ECU, 2/2 way valve, front axle (B166)	- No chassis height control - The system does not respond to the remote control
35-24	Short circuit to supply or open connection on pin 10 of the ECU, 2/2 way valve, front axle (B166)	- Chassis height at front axle follows rear axle
36-21	Short circuit to earth in internal relay valves	
36-24	Short circuit to supply or open connection in internal relay valves	- No chassis height control - System does not respond to the remote control
40-41	Short circuit to earth on pin 19 of the ECU, height sensor left, driven axle (F612)	- No chassis height control, rear left
40-43	Value outside range on pin 19 of the ECU, height sensor left, driven axle (F612)	- No chassis height control - Normal driving level function does not work
40-44	Short circuit to supply or open connection on pin 19 of the ECU, height sensor left, driven axle (F612)	- No chassis height control, rear left
41-41	Short circuit to earth on pin 7 of the ECU, height sensor right, driven axle (F613)	- No chassis height control, rear right

Fault code	Fault code description with possible cause	System response
41-43	Value outside range on pin 7 of the ECU, height sensor right, driven axle (F613)	- No chassis height control - Normal driving level function does not work
41-44	Short circuit to supply or open connection on pin 7 of the ECU, height sensor right, driven axle (F613)	- No chassis height control, rear right
42-41	Short circuit to earth on pin 6 of the ECU, height sensor, front axle (F614)	- No chassis height control, front axle
42-43	Value outside range on pin 6 of the ECU, height sensor, front axle (F614)	- No chassis height control - Normal driving level function does not work
42-44	Short circuit to supply or open connection on pin 6 of the ECU, height sensor, front axle (F614)	- No chassis height control, front axle
55-42	Short circuit to supply or open connection on pin 12 of the ECU, speed signal	- No chassis height control - ECAS responds immediately to height level changes (unstable handling)

2. ECAS-3 CUSTOMER PARAMETERS

2.1 INTRODUCTION

Customer parameters

Customer parameters are the settings of an electronic system. The customer parameters permit adapting control functions of a system to the customer's particular wishes and/or needs within certain limits. The customer parameters are stored in a list in the memory of the electronic unit. Customer parameters can be modified using the programming feature of DAVIE XD. Programming using DAVIE XD is only possible if the logged-in user has been registered as a "Master Technician".

Note:

Erroneous settings of customer parameters may affect the action of control functions to such an extent that they function erratically or not at all. After modification of the settings the (modified) customer parameters must be stored in the electronic unit using the programming function in the customer parameter overview.

Customer parameter names and codes

Each customer parameter in a system has its own name and code. The following explanation of the customer parameters includes only the codes. The availability of a customer parameter in a system depends on the programmed software in the electronic unit. The programmed software depends on the vehicle configuration/identity card data.

Standard values

Standard values, options and setting ranges may vary according to the software variants of DAVIE XD and the system. This is why they have not been included in the following explanation of the customer parameters.

2.2 EXPLANATORY NOTES TO ECAS-3 CUSTOMER PARAMETERS

ECAS-3 customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
4-01	With this parameter the protection for empty bellows can be switched on or off.			When the protection is switched off, there is no residual pressure in the air bellows so that 'pleating' of the bellows is no longer prevented.
4-02	This parameter makes it possible to increase the tolerance field (hysteresis) of the sensor sensitivity.			This is a solution if a customer complains about unstable regulation by ECAS-3. If a larger tolerance field is chosen, the height change of the chassis must be increased to allow ECAS to make a correction.
4-03	This parameter enables a certain vehicle slant to be reduced or increased.			Reduction makes the vehicle stand straighter (if the calibration is correct, i.e. the same height left and right). Increase will make the vehicle slant further, thereby enabling unstable horizontal settings to be prevented.
4-04	The time of the delay setting can be lengthened with this parameter.			
4-05	This parameter relates to the storage of faults in the electronic unit on the action of admitting air to or exhausting air from the air bellows.			A fault is identified if the height sensor reading does not change during the programmed time while it should have done because of the desired action. This time can be lengthened with this parameter. The ECAS system then waits longer before storing the fault because the height sensor reading has not changed.

3. SYSTEM INSPECTION WITH DAVIE XD

3.1 CALIBRATING THE SENSORS

The sensors must be calibrated if the height sensors or the ECAS unit are replaced.

Note:

Calibration should be carried out with due care to avoid physical injury and material damage.

When calibrating, the maximum **desired** chassis height at the rear axle and the maximum **desired** chassis height at the front axle must be calibrated.

Notes to sensor calibration

1. Place the gauges between the driven axle and the chassis.
2. Lower the chassis using DAVIE until it rests on the gauges.

Note:

- On vehicles with an air-sprung front axle a gauge must also be placed between the axle and the chassis.

3. Now bring the chassis to the desired maximum height at the front axle. Then bring the chassis to the desired maximum height at the rear axle.

Note:

The maximum height of the chassis is limited by the mechanical stop of the shock absorber.

The shock absorber of the non-driven axle may reach its stop before the shock absorber of the driven axle.

3.2 INSPECTION OF HEIGHT SENSORS

1. Admit air to the bellows. The value indicated by DAVIE must now show a linear increase.
2. Exhaust air from the bellows. The value indicated by DAVIE must now show a linear decrease.

Note:

If two height sensors are used, these two sensors, with the vehicle at the driving level, may give a different reading (caused, for example, by play in the linkage). This may result in the vehicle not being level. This can be solved by recalibrating the sensors.

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1. AGS FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

1.2 EXPLANATORY NOTES TO AGS (DIAPHRAGM VERSION) FAULT CODES

Fault code	Fault code description with possible cause	Symptom
01-33	No pressure build-up detected by the pressure switch during the pumping time cycle due to: <ul style="list-style-type: none"> - insufficient amount of grease in the reservoir - open connection in the main pipe of the greasing system - air in the system - interrupted pressure switch - interruption on pin 2 of the ECU 	<ul style="list-style-type: none"> - No grease is supplied to the lubricating points - AGS warning on the display is activated
01-34	Pressure build-up detected by the pressure switch before the pumping time cycle is started due to: <ul style="list-style-type: none"> - closed pressure switch - short circuit to earth on pin 2 of the ECU 	<ul style="list-style-type: none"> - No grease is supplied to the lubricating points
02-03	Short circuit to supply in automatic lubrication pump due to: <ul style="list-style-type: none"> - short circuit to supply on pin 4 of the ECU 	<ul style="list-style-type: none"> - Pump remains continuously active - Insufficient grease is supplied to the lubricating points
02-05	Interruption in automatic lubrication pump due to: <ul style="list-style-type: none"> - interruption on pin 4 of the ECU - interruption on pin 9 of the ECU 	<ul style="list-style-type: none"> - No grease is supplied to the lubricating points
03-04	Short circuit to earth at AGS warning light due to: <ul style="list-style-type: none"> - short circuit to earth on pin 5 of the ECU 	<ul style="list-style-type: none"> - AGS warning is not activated
03-05	Interruption in AGS warning light due to: <ul style="list-style-type: none"> - interruption on pin 5 of the ECU 	<ul style="list-style-type: none"> - AGS warning is not activated

1.3 EXPLANATORY NOTES TO AGS (BELLOWS VERSION) FAULT CODES

Fault code	Fault code description with possible cause	Symptom
01-33	No pressure build-up detected by the integrated pressure switch during the pumping time cycle due to: <ul style="list-style-type: none"> - insufficient amount of grease in the reservoir - open connection in the main pipe of the greasing system - air in the system - interrupted integrated pressure switch 	<ul style="list-style-type: none"> - No grease is supplied to the lubricating points - AGS warning on the display is activated
01-34	Pressure build-up detected by the integrated pressure switch before the pumping time cycle is started due to: <ul style="list-style-type: none"> - closed integrated pressure switch 	<ul style="list-style-type: none"> - No grease is supplied to the lubricating points
02-03	Internal short circuit to supply in automatic lubrication pump	<ul style="list-style-type: none"> - Pump remains continuously active - Insufficient grease is supplied to the lubricating points
02-05	Internal interruption in automatic lubrication pump	<ul style="list-style-type: none"> - No grease is supplied to the lubricating points
03-04	Short circuit to earth in AGS warning light due to: <ul style="list-style-type: none"> - short circuit to earth on pin 4 of the ECU 	<ul style="list-style-type: none"> - AGS warning is not activated
03-05	Interruption in AGS warning light due to: <ul style="list-style-type: none"> - interruption on pin 4 of the ECU 	<ul style="list-style-type: none"> - AGS warning is not activated

2. AGS CUSTOMER PARAMETERS

2.1 INTRODUCTION

Customer parameters

Customer parameters are the settings of an electronic system. The customer parameters permit adapting control functions of a system to the customer's particular wishes and/or needs within certain limits. The customer parameters are stored in a list in the memory of the electronic unit. Customer parameters can be modified using the programming feature of DAVIE XD. Programming using DAVIE XD is only possible if the logged-in user has been registered as a "Master Technician".

Note:

Erroneous settings of customer parameters may affect the action of control functions to such an extent that they function erratically or not at all. After modification of the settings the (modified) customer parameters must be stored in the electronic unit using the programming function in the customer parameter overview.

Customer parameter names and codes

Each customer parameter in a system has its own name and code. The following explanation of the customer parameters includes only the codes. The availability of a customer parameter in a system depends on the programmed software in the electronic unit. The programmed software depends on the vehicle configuration/identity card data.

Standard values

Standard values, options and setting ranges may vary according to the software variants of DAVIE XD and the system. This is why they have not been included in the following explanation of the customer parameters.

2.2 EXPLANATORY NOTES TO AGS CUSTOMER PARAMETERS

AGS customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
5-01	Pause time; setting that can be used to determine the pause between the lubricating cycles	30 minutes	5 hours	The time can be adjusted in one-minute steps. Depending on how the vehicle is being used, the pause time can be set to approximately 2 hours for driving on unpaved roads or approximately 1.5 hours for construction vehicles (building excavation).
5-02	Pumping time; setting that can be used to determine how long pressure is being built up in the main pipe	1 minute	30 minutes	The time can be adjusted in one-minute steps.
5-03	Activation time of the AGS warning in case of a defective fuse; only applicable if a diaphragm version is involved	0	255	0 means that the warning is not activated. 254 means that the warning is activated for 254 seconds. 255 means that the warning is activated constantly.
5-04	Activation time of the AGS warning	0	255	0 means that the warning is not activated. 254 means that the warning is activated for 254 seconds. 255 means that the warning is activated constantly.
5-05	For exhausting air from the system/system testing a specific system activation time may be selected here			
5-06	For exhausting air from the system/system testing a specific system activation time may be selected here in which the system pulsates			

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1. ZF INTARDER EST42 FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

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1.2 EXPLANATORY NOTES TO FAULT CODES FOR ZF-INTARDER EST 42

Fault code	Fault code description with possible cause	Symptom
11-11	Short circuit to earth in air supply valve (B089): - pin 2	<ul style="list-style-type: none"> - Delayed activation of intarder - No noticeable system limitation
	Short circuit to earth in air supply valve output: - pin 1 of intarder unit (D902)	
	Short circuit in air supply valve outputs - pins 1 and 34 of intarder unit (D902)	
11-12	Short circuit to supply in air supply valve (B089): - pin 2	<ul style="list-style-type: none"> - Delayed activation of intarder - No noticeable system limitation
	Short circuit to supply in air supply valve output: - pin 1 of intarder unit (D902)	
11-13	Interruption in air supply valve (B089): - pin 2	<ul style="list-style-type: none"> - Delayed activation of intarder - No noticeable system limitation
	Interruption in air supply valve output: - pin 1 of intarder unit (D902)	
	Interruption in air supply valve output: - pin 34 of intarder unit (D902)	
13-11	Short circuit to earth in "intarder active" function indication output: - pin 29 of intarder unit (D902)	<ul style="list-style-type: none"> - No "intarder active" function indication on DIP when intarder is activated - No noticeable system limitation
13-12	Short circuit to supply in "intarder active" function indication output: - pin 29 of intarder unit (D902)	<ul style="list-style-type: none"> - No "intarder active" function indication on DIP when intarder is activated - No noticeable system limitation
13-13	Interruption in "intarder active" function indication output: - pin 29 of intarder unit (D902)	<ul style="list-style-type: none"> - No "intarder active" function indication on DIP when intarder is activated - No noticeable system limitation
15-11	Short circuit to earth in brake light relay (G036) output: - pin 2 of intarder unit (D902)	<ul style="list-style-type: none"> - No noticeable system limitation
15-12	Short circuit to supply in brake light relay (G036) output: - pin 2 of intarder unit (D902)	<ul style="list-style-type: none"> - No noticeable system limitation
16-11	Short circuit to earth in "intarder warning" function indication input: - pin D24 of VIC unit (D900)	<ul style="list-style-type: none"> - No noticeable system limitation
	Short circuit to earth in "intarder warning" function indication output: - pin 52 of intarder unit (D902)	
16-12	Short circuit to supply in "intarder warning" function indication input: - pin D24 of VIC unit (D900)	<ul style="list-style-type: none"> - Normal braking effect of the intarder if the steering column switch is in position 1. - Reduced braking effect of the intarder if the steering column switch is in position 2 or 3. (Current through proportional valve is restricted to 250 mA max.)
	Short circuit to supply in "intarder warning" function indication output: - pin 52 of intarder unit (D902)	
16-13	Interruption in "intarder warning" function indication input: - pin D24 of VIC unit (D900)	<ul style="list-style-type: none"> - No noticeable system limitation
	Interruption in "intarder warning" function indication output: - pin 52 of intarder unit (D902)	

Fault code	Fault code description with possible cause	Symptom
18-11	Short circuit to earth in supply voltage input for steering column switch: - pin B11 of steering column switch (C831)	<ul style="list-style-type: none"> - No braking effect of intarder possible in any position of steering column switch - No "intarder active" function indication on DIP when intarder is activated - No speed indication on DIP if V-constant function is activated - No V-constant function possible
	Short circuit to earth in supply voltage output for steering column switch - pin 30 of intarder unit (D902)	
18-12	Short circuit to supply in supply voltage input for steering column switch (C831): - pin B11	<ul style="list-style-type: none"> - No noticeable system limitation
	Short circuit to supply in supply voltage output for steering column switch: - pin 30 of intarder unit (D902)	
19-11	Short circuit to earth in proportional solenoid valve input: - pin 4 of intarder unit (D902)	<ul style="list-style-type: none"> - No braking effect of intarder possible in any position of steering column switch - No speed indication on DIP if V-constant function is activated - No V-constant function possible
	Short circuit in proportional solenoid valve inputs - pins 4 and 3 of intarder unit (D902)	
19-12	Short circuit to supply in proportional solenoid valve input: - pin 4 of intarder unit (D902)	<ul style="list-style-type: none"> - No braking effect of intarder possible in any position of steering column switch - No speed indication on DIP if V-constant function is activated - No V-constant function possible
19-13	Interruption in proportional solenoid valve output (B088): - pin 1 or 2	<ul style="list-style-type: none"> - No braking effect of intarder possible in any position of steering column switch - No speed indication on DIP if V-constant function is activated - No V-constant function possible
	Interruption in proportional solenoid valve output: - pin 3 or 4 of intarder unit (D902)	
19-14	Circuit resistance for proportional solenoid valve (B088) is not within the specifications	<ul style="list-style-type: none"> - No braking effect of intarder possible in any position of steering column switch - No speed indication on DIP if V-constant function is activated - No V-constant function possible
21-11	Short circuit to earth in proportional solenoid valve output (B088): - pin 1 or 2	<ul style="list-style-type: none"> - No braking effect of intarder possible in any position of steering column switch - No speed indication on DIP if V-constant function is activated - No V-constant function possible
	Short circuit to earth in proportional solenoid valve input (B088): - pin 3 of intarder unit (D902)	
21-12	Short circuit to supply in proportional solenoid valve output (B088): - pin 1 or 2	<ul style="list-style-type: none"> - No braking effect of intarder possible in any position of steering column switch - No speed indication on DIP if V-constant function is activated - No V-constant function possible
	Short circuit to supply in proportional solenoid valve input (B088): - pin 3 of intarder unit (D902)	
23-16	Internal fault in intarder unit (D902)	<ul style="list-style-type: none"> - No braking effect of intarder possible in any position of steering column switch - No speed indication on DIP if V-constant function is activated - No V-constant function possible
23-17	Internal fault in intarder unit (D902)	<ul style="list-style-type: none"> - No braking effect of intarder possible in any position of steering column switch - No speed indication on DIP if V-constant function is activated - No V-constant function possible

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Fault code	Fault code description with possible cause	Symptom
31-15	Incorrect or missing vehicle speed signal via message on CAN network due to: <ul style="list-style-type: none"> - interruption on pin 22 - short circuit to earth on pin 49 - short circuit to supply on pin 22 and/or 49 - Incorrect CAN message from MTCO unit 	<ul style="list-style-type: none"> - Normal braking effect of the intarder if the steering column switch is in position 1. - Reduced braking effect of the intarder if the steering column switch is in position 2 or 3. (Current through proportional valve is restricted to 250 mA max.) - No speed indication on DIP if V-constant function is activated - No V-constant function possible
32-11	Short circuit to earth or supply in intarder coolant temperature sensor output (F544): <ul style="list-style-type: none"> - pin 1 	<ul style="list-style-type: none"> - Normal braking effect of the intarder if the steering column switch is in position 1. - Reduced braking effect of the intarder if the steering column switch is in position 2 or 3. (Current through proportional valve is restricted to 250 mA max.)
	Short circuit to earth or supply in intarder coolant temperature sensor input: <ul style="list-style-type: none"> - pin 9 of intarder unit (D902) 	
	Short circuit in intarder coolant temperature sensor inputs: <ul style="list-style-type: none"> - pins 9 and 37 of intarder unit (D902) 	
32-13	Interruption in intarder coolant temperature sensor output (F544) <ul style="list-style-type: none"> - pin 9 or 37 	<ul style="list-style-type: none"> - Normal braking effect of the intarder if the steering column switch is in position 1. - Reduced braking effect of the intarder if the steering column switch is in position 2 or 3. (Current through proportional valve is restricted to 250 mA max.)
	Interruption in intarder coolant temperature sensor input: <ul style="list-style-type: none"> - pin 9 or 37 of intarder unit (D902) 	
33-18	Short circuit to supply in supply voltage input for position 2 of steering column switch: <ul style="list-style-type: none"> - pin 42 of intarder unit (D902) 	<ul style="list-style-type: none"> - Normal braking effect of the intarder if the steering column switch is in position 1. - Reduced braking effect of the intarder if the steering column switch is in position 2 or 3. (Current through proportional valve is restricted to 250 mA max.) - No V-constant function possible
	Short circuit to supply in supply voltage input for position 3 of steering column switch: <ul style="list-style-type: none"> - pin 16 of intarder unit (D902) 	
	Short circuit in supply voltage inputs for positions 2 and 3 of steering column switch: <ul style="list-style-type: none"> - pins 16 and 42 of intarder unit (D902) 	
41-19	Incorrect or missing accelerator pedal position signal via message on CAN network due to: <ul style="list-style-type: none"> - interruption on pin 22 - short circuit to earth on pin 49 - short circuit to supply on pin 22 and/or 49 - incorrect message from UPEC unit 	<ul style="list-style-type: none"> - The V-constant function is not deactivated when the accelerator pedal is operated - No noticeable system limitation
42-19	Incorrect or missing vehicle speed signal via message on CAN network due to: <ul style="list-style-type: none"> - interruption on pin 22 - short circuit to earth on pin 49 - short circuit to supply on pin 22 and/or 49 - incorrect message from MTCO unit 	<ul style="list-style-type: none"> - Intarder is not deactivated if there is an ABS intervention in the ABS/EBS system - No noticeable system limitation
43-19	Overloaded CAN communication system between all vehicle systems. Not all CAN messages can be sent in the same cycle. This may be caused by: <ul style="list-style-type: none"> - short circuit to supply on pin 22 - defective CAN terminating resistance 	<ul style="list-style-type: none"> - Actuation of exhaust brake not possible during temperature-dependent reduction of the braking effect of the intarder. - AS Tronic gearbox does not shift down automatically when the intarder is activated.
44-15	No CAN communication between any vehicle systems due to: <ul style="list-style-type: none"> - interruption on pin 22 - short circuit to earth on pin 49 - short circuit to supply on pin 22 and/or 49 	<ul style="list-style-type: none"> - Actuation of exhaust brake not possible during temperature-dependent reduction of braking effect. - AS Tronic gearbox does not shift down automatically when the intarder is activated.

Fault code	Fault code description with possible cause	Symptom
46-15	No CAN communication possible between any vehicle systems due to problems with the V-CAN: <ul style="list-style-type: none"> - interruption on pin 49 or 22 or - defective CAN terminating resistance 	<ul style="list-style-type: none"> - Normal braking effect of the intarder if the steering column switch is in position 1. - Reduced braking effect of the intarder if the steering column switch is in position 2 or 3. (Current through proportional valve is restricted to 250 mA max.) - No speed indication on DIP if V-constant function is activated - No V-constant function possible
47-19	Incorrect or missing engine speed signal via message on CAN network due to: <ul style="list-style-type: none"> - interruption on pin 22 - short circuit to earth on pin 49 - short circuit to supply on pin 22 and/or 49 - defective CAN terminating resistance - incorrect message from UPEC unit 	<ul style="list-style-type: none"> - Maximum braking effect of intarder restricted to 350 kW - AS Tronic gearbox does not shift down automatically when the intarder is activated.
48-19	Incorrect or missing vehicle speed signal via message on CAN network due to: <ul style="list-style-type: none"> - interruption on pin 22 - short circuit to earth on pin 49 - short circuit to supply on pin 22 and/or 49 - defective CAN terminating resistance - incorrect message from MTCO unit 	<ul style="list-style-type: none"> - Normal braking effect of the intarder if the steering column switch is in position 1. - Reduced braking effect of the intarder if the steering column switch is in position 2 or 3. (Current through proportional valve is restricted to 250 mA max.) - No speed indication on DIP if V-constant function is activated - No V-constant function possible - Intarder does not function during third brake integration braking
49-19	Incorrect or missing cruise control speed signal via message on CAN network due to: <ul style="list-style-type: none"> - interruption on pin 22 - short circuit to earth on pin 49 - short circuit to supply on pin 22 and/or 49 - defective CAN terminating resistance - incorrect message from UPEC unit 	<ul style="list-style-type: none"> - V-constant function not available
51-19	Incorrect or missing current intarder braking torque signal via message on CAN network due to: <ul style="list-style-type: none"> - interruption on pin 22 - short circuit to earth on pin 49 - short circuit to supply on pin 22 and/or 49 - defective CAN terminating resistance - incorrect message from UPEC unit 	<ul style="list-style-type: none"> - If the engine brake is switched on by foot while the V-constant function is activated, the intarder will not be automatically set to the last selected current braking torque once the engine brake is switched off.
64-19	Incorrect or missing CAN extension box signal via message on CAN network due to: <ul style="list-style-type: none"> - interruption on pin 22 - short circuit to earth on pin 49 - short circuit to supply on pin 22 and/or 49 - defective CAN terminating resistance - incorrect message from CAN extension box 	<ul style="list-style-type: none"> - No intarder braking effect possible via CAN extension box
71-13	No supply voltage before ignition for intarder unit (D902) due to: <ul style="list-style-type: none"> - short circuit to earth, interruption on pin 54 or 55 - defective fuse E199 	<ul style="list-style-type: none"> - No noticeable system limitation

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Fault code	Fault code description with possible cause	Symptom
72-16	Incorrect supply voltage after ignition on pin 31 or 53 of intarder unit (D902) due to: - overvoltage > 36 V	<ul style="list-style-type: none">- No braking effect of intarder possible in any position of steering column switch- No "intarder active" function indication on DIP when intarder is activated- No speed indication on DIP if V-constant function is activated- No V-constant function possible
72-17	Incorrect supply voltage after ignition on pin 31 or 53 of intarder unit (D902) due to: - undervoltage < 16 V	<ul style="list-style-type: none">- No braking effect of intarder possible in any position of steering column switch- No "intarder active" function indication on DIP when intarder is activated- No speed indication on DIP if V-constant function is activated- No V-constant function possible
84-15	Internal fault in intarder unit (D902)	<ul style="list-style-type: none">- No braking effect of intarder possible in any position of steering column switch- No speed indication on DIP if V-constant function is activated- No V-constant function possible

2. SYSTEM INSPECTION WITH DAVIE XD

2.1 GENERAL

If the tyre size is changed or if the vehicle is adjusted in such a way that the configuration is changed, the electronic unit may have to be re-programmed.

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1. ALS-S FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

2. EXPLANATORY NOTES TO ALS-S FAULT CODES

2.1 EXPLANATORY NOTES TO ALS-S FAULT CODES

Fault code	Fault code description with possible cause	Symptom
17-19	Internal fault in VIC unit due to: - short circuit to supply on pin B16 of the ALS-S unit	- Incorrect or no actuation of hazard warning lights - Alarm system cannot be activated
17-20	No signal to siren due to: - short circuit to earth on pin B3 of the ALS-S unit	- Alarm system cannot be activated
17-98	Interruption of power supply to ALS-S unit due to: - faulty fuse E023 - short circuit to earth on pin A2 of the ALS-S unit	- Alarm system cannot be activated - Alarm signal after closing doors with remote control - Interior detection cannot be deactivated - Loadspace detection cannot be deactivated - No read-out on LED unit - No alarm signal when tilting the cab
33-81	Siren backup battery discharged due to: - internal fault	- No siren signal
33-97	Interruption of power supply to siren due to: - interruption on pin 2 (B338) of siren	- Alarm signal when closing doors with remote control
33-113	No siren signal due to: - internal fault in siren unit B388	- No siren signal
49-65	No interior detection due to: - internal fault in ultrasonic unit D909 - internal fault in ultrasonic sensor D604 (receiver) - internal fault in ultrasonic sensor D605 (transmitter)	- No alarm signal by interior detection
65-49	No loadspace detection due to: - short circuit to earth on pin B4 of the ALS-S unit - short circuit to supply on pin B4 of the ALS-S unit - interruption on pin B4 of the ALS-S unit	- No alarm signal by loadspace detection
97-49	No alarm signal from cab locking sensor due to: - interruption on pin B5 of the ALS-S unit - short circuit to supply on pin B5 of the ALS-S unit	- No alarm signal by cab locking sensor
99-49	No loadspace detection due to: - short circuit to supply on pin B6 of the ALS-S unit - interruption on pin B6 of the ALS-S unit	- No alarm signal by loadspace detection
100-49	No alarm signal by driver's side door switch: - short circuit to supply on pin B10 of the ALS-S unit - short circuit to supply on pin B11 of the ALS-S unit	- No alarm signal when opening doors
	- Interruption on pin A6 of the ALS-S unit	- Alarm signal when closing doors with remote control

ALS-S

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Fault code	Fault code description with possible cause	Symptom
100-65	No alarm signal by driver's side door switch due to: - interruption on pin B16 of the ALS-S unit - short circuit to earth on pin B16 of the ALS-S unit	- Alarm system cannot be activated
	- Short circuit to supply on pin B16 of the ALS-S unit	- Alarm system active when the ignition is on
	- Interruption on pin A2 of the ALS-S unit	- Alarm system cannot be activated - Alarm signal when closing doors with remote control
	- Interruption on pin B10 of the ALS-S unit	- Alarm signal when opening co-driver's door while driver's door is open
101-49	No alarm signal by co-driver's side door switch due to: - short circuit to supply on pin B11 of the ALS-S unit - short circuit to supply on pin B10 of the ALS-S unit	- No alarm signal when opening co-driver's side door - No alarm signal when opening driver's side door
113-49	No interior detection due to: - short circuit to supply on pin B13 of the ALS-S unit	- No alarm signal by radar sensor - No alarm signal by ultrasonic sensors
113-50	No loadspace detection due to: - short circuit to supply on pin B2 of the ALS-S unit	- No alarm signal by loadspace detection

3. SYSTEM INSPECTION WITH DAVIE XD

3.1 INSPECTION OF RADAR SENSOR

To test the radar sensor, the DAVIE XD connection transmitter (VCI) must be hung out of the window.

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1. ECS-DC3 FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

1.2 EXPLANATORY NOTES TO ECS-DC3 FAULT CODES

Fault code	Fault code description with possible cause	Symptom
84 - 2	No CAN message from VIC (D900) relating to vehicle speed signal present due to: <ul style="list-style-type: none"> - faulty vehicle speed sensor (F533) - communication problems with VIC (D900) - faulty MTCO (B525) 	Maximum engine speed is limited to a lower value. Vehicle speed limiter, engine speed control and cruise control cannot be activated.
91 - 3	Voltage on pin B83 of the ECU for accelerator pedal sensor (F671) is too high due to: <ul style="list-style-type: none"> - faulty accelerator pedal sensor - short circuit to supply on pin B83 of the ECU - interruption on pin B81 of the ECU - short circuit between pin B83 and pin B55 of the ECU 	Indistinct response to accelerator pedal. When the accelerator pedal is depressed the idling speed of the engine increases gradually.
91 - 4	Voltage on pin B83 of the ECU for accelerator pedal sensor (F671) is too low due to: <ul style="list-style-type: none"> - faulty accelerator pedal sensor - interruption on pin B55 and/or pin B83 of the ECU - short circuit to earth on pin B55 and/or pin B83 of the ECU - short circuit between pin B55 and pin B81 of the ECU - short circuit between pin B83 and pin B81 of the ECU 	Indistinct response to accelerator pedal. When the accelerator pedal is depressed the idling speed of the engine increases gradually.
94 - 0	As a result of the output signal of the fuel pump control solenoid valve (B334) the fuel rail pressure sensor (F648) pressure signal is considerably higher than the calculated fuel rail pressure due to: <ul style="list-style-type: none"> - faulty/jammed fuel pump control solenoid valve (B334) - faulty rail pressure sensor 	Possibly reduced engine output.
94 - 16	Fuel rail pressure sensor (F648) pressure signal on pin A27 of the ECU is too high for the calculated engine load due to: <ul style="list-style-type: none"> - faulty/jammed fuel pump control solenoid valve (B334) - faulty rail pressure sensor 	Limitation of maximum engine torque and maximum engine speed. Possibly loud combustion knocking.
94 - 18	Fuel rail pressure sensor (F648) pressure signal on pin A27 of the ECU is too low for the calculated engine load due to: <ul style="list-style-type: none"> - internal/external fuel rail fuel leakage/high-pressure line/injector lines - high resistance in wiring of fuel rail pressure sensor (F648) 	Possibly reduced engine output.

Fault code	Fault code description with possible cause	Symptom
100 - 1	<p>In the case of engine oil pressure and temperature sensor (F647): Engine oil pressure signal on pin A33 of the ECU is too low due to:</p> <ul style="list-style-type: none"> - incorrect supply voltage on engine oil pressure and temperature sensor - too little engine oil in the oil sump - wrong/faulty engine oil pressure and temperature sensor - high engine load with low engine speeds; if this is the case the oil pressure may fall below the threshold value of the engine protection system if the engine is in poor mechanical condition 	Limitation of maximum engine torque and maximum engine speed.
	<p>In the case of control switch for engine oil pressure (F011): Engine oil pressure signal on pin A15 of the ECU is too high (engine oil pressure is low) due to:</p> <ul style="list-style-type: none"> - faulty control switch for engine oil pressure - short circuit between pin A09 and pin A15 of the ECU - short circuit to supply on pin A15 of the ECU - too little engine oil in the oil sump 	Limitation of maximum engine torque and maximum engine speed.
100 - 3	<p>Voltage on signal pin A33 of the ECU for the engine oil pressure and temperature sensor (F647) is higher than expected due to:</p> <ul style="list-style-type: none"> - faulty engine oil pressure and temperature sensor - short circuit to supply on pin 33 of the ECU - interruption on pin A19 of the ECU - short circuit between pin A09 and pin A33 of the ECU - wrong/faulty engine oil pressure and temperature sensor 	The ECU continues its calculations with a default replacement value for the lubricating oil pressure.

Fault code	Fault code description with possible cause	Symptom
100 - 4	<p>In the case of engine oil pressure and temperature sensor (F647): Low voltage on signal pin A33 of the ECU for the engine oil pressure and temperature sensor due to:</p> <ul style="list-style-type: none"> - faulty engine oil pressure and temperature sensor - interruption on pin A09 and/or pin A33 of the ECU - short circuit to earth on pin A09 and/or pin A33 of the ECU - short circuit between pin A09 and pin A19 of the ECU - short circuit between pin A33 and pin A19 of the ECU - wrong/faulty engine oil pressure and temperature sensor (F647) 	The ECU continues its calculations with a default replacement value for the lubricating oil pressure.
	<p>In the case of control switch for engine oil pressure (F011): Voltage on signal pin A15 of the ECU for control switch for engine oil pressure is low (engine oil pressure is high) while the engine is not running, due to:</p> <ul style="list-style-type: none"> - faulty control switch for engine oil pressure - incorrect supply voltage on control switch for engine oil pressure (F011) - interruption on pin A09 and/or A15 of the ECU - short circuit to earth on pin A09 and/or pin A15 of the ECU 	No noticeable system limitation in ECS-DC3.
100 - 18	<p>In the case of engine oil pressure and temperature sensor (F647): Engine oil pressure signal on pin A33 of the ECU is below the threshold value of the engine protection system due to:</p> <ul style="list-style-type: none"> - incorrect supply voltage on engine oil pressure and temperature sensor - high engine load with low engine speeds; if this is the case the oil pressure may fall below the threshold value of the engine protection system if the engine is in poor mechanical condition - too little engine oil in the oil sump 	Limitation of maximum engine output and maximum engine speed.
	<p>In the case of control switch for engine oil pressure (F011): Engine oil pressure signal on pin A15 of the ECU is too high (engine oil pressure is low) due to:</p> <ul style="list-style-type: none"> - faulty control switch for engine oil pressure - short circuit between pin A09 and pin A15 of the ECU - short circuit to supply on pin A15 of the ECU - too little engine oil in the oil sump 	Limitation of maximum engine torque and maximum engine speed.

Fault code	Fault code description with possible cause	Symptom
102 - 2	Boost pressure sensor signal (F649), the signal on pin A28 of the ECU, is high while other engine parameters (e.g. speed and load) indicate that it should be low, due to: <ul style="list-style-type: none"> - incorrect supply voltage on inlet air boost pressure and temperature sensor - interruption(s) or contact resistance(s) in the wiring between the inlet air boost pressure and temperature sensor and the ECU - oil in intercooler and/or defective turbocompressor oil seals 	Reduced engine output.
102 - 3	Voltage on pin A28 of the ECU for boost pressure sensor (F649) is too high due to: <ul style="list-style-type: none"> - incorrect supply voltage on inlet air boost pressure and temperature sensor - short circuit to supply on pin A28 of the ECU - interruption on pin A21 of the ECU - short circuit between pin A10 and pin A28 of the ECU - incorrectly installed turbocompressor 	Reduced engine output.
102 - 4	Voltage on signal pin A28 of the ECU for boost pressure sensor (F649) is too low due to: <ul style="list-style-type: none"> - incorrect supply voltage on inlet air boost pressure and temperature sensor - interruption on pin A10 and/or A28 of the ECU - short circuit to earth on pin A10 and/or A28 of the ECU - short circuit between pin A10 and pin A21 of the ECU - short circuit between pin A28 and pin A21 of the ECU - incorrectly installed turbocompressor 	Possibly reduced engine output.
105 - 0	Inlet air temperature signal, the signal on pin A29 of the ECU, indicates that the inlet air temperature is above the threshold value of the engine protection system due to: <ul style="list-style-type: none"> - contaminated intercooler - wrong/faulty inlet air boost pressure and temperature sensor (F649) 	Limitation of maximum engine output and maximum engine speed.
105 - 3	Voltage on pin A29 of the ECU for inlet air temperature is too high due to: <ul style="list-style-type: none"> - wrong/faulty inlet air boost pressure and temperature sensor (F649) - interruption in wiring on pin A21 and/or pin A29 of the ECU - short circuit between pin A10 and pin A29 of the ECU 	The ECU continues its calculations with a default replacement value for the inlet air temperature.
105 - 4	Low voltage or short circuit to earth on signal pin A29 of the ECU for inlet air temperature due to: <ul style="list-style-type: none"> - wrong/faulty inlet air boost pressure and temperature sensor (F649) - short circuit to earth on pin A29 of the ECU - short circuit between pins A21 and A29 of the ECU 	ECU switches to default replacement value.

Fault code	Fault code description with possible cause	Symptom
105 - 16	Inlet air temperature value, the signal on pin A29 of the ECU, is above the threshold value of the engine protection system due to: <ul style="list-style-type: none"> - contaminated intercooler - wrong/faulty inlet air boost pressure and temperature sensor (F649) 	Limitation of maximum engine torque and maximum engine speed.
108 - 11	Incorrect atmospheric air pressure sensor signal due to: <ul style="list-style-type: none"> - internal fault in ECU (D903); the atmospheric air pressure sensor is in the ECU 	Blacker exhaust smoke. Limitation of maximum engine torque and maximum engine speed.
110 - 0	Coolant temperature signal, the signal on pin A36 of the ECU, is above the threshold value of the engine protection system due to: <ul style="list-style-type: none"> - fouled radiator - faulty thermostat 	Possible limitation of maximum engine torque and maximum engine speed.
110 - 3	Voltage on pin A36 of the ECU for engine coolant temperature sensor (F566) is too high due to: <ul style="list-style-type: none"> - faulty engine coolant temperature sensor - interruption in wiring of pin A18 and/or A36 of the ECU 	Longer start time before engine fires. No temperature indication on coolant temperature gauge on DIP.
110 - 4	Voltage on signal pin A36 of the ECU for engine coolant temperature sensor (F566) is too low due to: <ul style="list-style-type: none"> - faulty engine coolant temperature sensor - short circuit to earth on pin A36 of the ECU - short circuit between pin A36 and pin A18 of the ECU 	Longer start time before engine fires. No temperature indication on coolant temperature gauge on DIP.
110 - 16	Engine coolant temperature signal (F566), via pin A36 of the ECU, is way above the threshold value of the engine protection system due to: <ul style="list-style-type: none"> - faulty engine coolant temperature sensor - fouled radiator - faulty thermostat 	Limitation of maximum engine output and maximum engine speed.
157 - 3	Voltage on signal pin A27 of the ECU for fuel rail pressure sensor (F648) is too high due to: <ul style="list-style-type: none"> - faulty rail pressure sensor - short circuit to supply on pin A27 of the ECU - interruption on pin 20 of the ECU - short circuit between pin A12 and pin A27 of the ECU 	Limitation of maximum engine output and maximum engine speed. Loud combustion knocking.
157 - 4	Low voltage or short circuit to earth on signal pin A27 of the ECU for fuel rail pressure sensor (F648) due to: <ul style="list-style-type: none"> - faulty rail pressure sensor - interruption on pin A12 and/or A27 of the ECU - short circuit to earth on pin A12 and/or A27 of the ECU - short circuit between pin A12 and pin A20 of the ECU - short circuit between pin A27 and pin A20 of the ECU 	Limitation of maximum engine output and maximum engine speed. Loud combustion knocking.

Fault code	Fault code description with possible cause	Symptom
167 - 18	ECU supply voltage before ignition, pin B01, B07, B12, B13, is too low due to: - alternator voltage adjusted too low (A513) - contact resistance(s) in the wiring between the alternator (A513) and the ECU	No noticeable system limitation in ECS-DC3.
168 - 16	ECU supply voltage before ignition is too high due to: - faulty alternator (A513)	No noticeable system limitation in ECS-DC3.
168 - 18	ECU supply voltage before ignition, pin B01, B07, B12, B13, is too high or is disturbed due to: - bad or discharged battery - poor battery connections - many start attempts	No noticeable system limitation in ECS-DC3.
174 - 0	Fuel temperature, via signal pin A34 of the ECU, is above the threshold value of the engine protection system due to: - faulty fuel temperature sensor (F565) - warm fuel due to return fuel as a result of low fuel level	Limitation of maximum engine speed.
174 - 3	Voltage on fuel temperature sensor (F565), signal pin A34 of the ECU, is too high due to: - faulty fuel temperature sensor - interruption in wiring on pin A34 and/or pin A17 of the ECU	No noticeable system limitation in ECS-DC3.
174 - 4	Voltage on fuel temperature sensor (F565), signal pin A34 of the ECU, is too low due to: - faulty fuel temperature sensor - short circuit to earth on pin 34 of the ECU - short circuit between pin A34 and pin A17 of the ECU	No noticeable system limitation in ECS-DC3.
174 - 15	High fuel temperature found on fuel temperature sensor (F565), signal pin A34 of the ECU, due to: - faulty fuel temperature sensor - warm fuel due to return fuel as a result of low fuel level	Reduced engine output.
175 - 3	Voltage on engine oil temperature sensor (F647), signal pin A35 of the ECU, is too high due to: - wrong/faulty engine oil pressure and temperature sensor - interruption in wiring on pin A19 and/or pin A35 of the ECU	No noticeable system limitation in ECS-DC3.
175 - 4	Voltage on engine oil temperature sensor, signal pin A35 of the ECU, is too low due to: - wrong/faulty engine oil pressure and temperature sensor (F647) - short circuit to earth on pin A35 of the ECU - short circuit between pin A19 and pin A35 of the ECU	No noticeable system limitation in ECS-DC3.
190 - 0	Engine speed has exceeded the maximum speed due to: - possibly incorrect shifting of the gearbox	No noticeable system limitation in ECS-DC3.

Fault code	Fault code description with possible cause	Symptom
190 - 2	No signal from crankshaft sensor (F552) due to: <ul style="list-style-type: none"> - faulty/soiled crankshaft sensor - too large an air gap between crankshaft sensor and sensor wheel (= poly V-belt pulley) - short circuit, short circuit to supply, short circuit to earth, contact resistance(s) or interruption in wiring on pin A25 and/or pin A24 	Irregular engine running and reduced engine output. Engine starts but there is a delay before it fires. Longer start time before engine fires.
441-15	Intelligent cooling control activated because coolant temperature is too high.	Reduced engine output.
558 - 2	Voltage applied too long to both idling-active and idling-inactive switch of the accelerator pedal (F671) due to: <ul style="list-style-type: none"> - interruption in wiring of pin B50 and/or pin B72 and/or pin B73 of the ECU - faulty accelerator pedal 	No noticeable system limitation in ECS-DC3.
558 - 4	No voltage on both idling-active and idling-inactive switch of the accelerator pedal (F671) for too long due to: <ul style="list-style-type: none"> - short circuit between pin B50 and pin B72 and/or pin B73 of the ECU - short circuit to earth in wiring to B72 and/or pin B73 of the ECU - short circuit to supply on pin B50 of the ECU - faulty accelerator pedal 	The engine can only idle.
558 - 13	Conflict between idling-active/inactive switches of the accelerator pedal (F671) and the potentiometer due to: <ul style="list-style-type: none"> - short circuit, short circuit to earth, short circuit to supply or contact resistances in the wiring to pins B55, B81, B83, B72, B50 or B73 - faulty accelerator pedal 	The engine can only idle.
620 - 3	High voltage on power supply wire of engine oil pressure and temperature sensor (F647) or control switch for engine oil pressure (F011), pin A09 of the ECU, due to: <ul style="list-style-type: none"> - short circuit to supply on pin A09 of the ECU 	No noticeable system limitation in ECS-DC3.
620 - 4	Low voltage on power supply wire of engine oil pressure and temperature sensor (F647) or control switch for engine oil pressure (F011), pin A09 of the ECU, due to: <ul style="list-style-type: none"> - faulty engine oil pressure and temperature sensor or control switch for engine oil pressure - short circuit to earth on pin A09 of the ECU - short circuit to earth on pin A15 or pin A33 of the ECU - short circuit between pin A09 and pin A19 of the ECU 	No noticeable system limitation in ECS-DC3.

Fault code	Fault code description with possible cause	Symptom
625 - 9	No communication with immobiliser when switching on the ignition, or immobiliser code does not correspond with ECS-DC3 code due to: <ul style="list-style-type: none"> - defective immobiliser - ignition key not adjusted to the immobiliser - immobiliser not matched to ECS-DC3 ECU <p>Communication problem via V-CAN on pin B52 and/or pin B53 of the ECU due to:</p> <ul style="list-style-type: none"> - interruption on pin B52 and/or pin B53 of the ECU - short circuit to supply on pin B52 of the ECU - short circuit to supply on pin B53 of the ECU 	Motor starts but does not fire or it does fire but stalls at once.
627 - 2	All information gathered by the ECU (e.g. fault codes, trip information etc.) after last ignition on, is lost at ignition off due to: <ul style="list-style-type: none"> - faulty fuse E160 and/or E118 - bad or discharged battery - poor battery connections - failure of the constant voltage before the voltage on connection point B39 of the ECU is lost 	No noticeable system limitation in ECS-DC3.
628 - 31	Internal ECU software fault due to: <ul style="list-style-type: none"> - internal ECU (D903) software fault 	Irregular engine running and reduced engine output. Engine starts but will not fire.
629 - 12	ECU is not switched off after ignition off due to: <ul style="list-style-type: none"> - internal ECU (D903) software fault 	When the vehicle is stationary for a long period, the high current consumption of the ECU will empty the vehicle batteries.
	Internal ECU hardware fault due to: <ul style="list-style-type: none"> - internal ECU (D903) hardware fault 	Irregular engine running and reduced engine output. Engine starts but will not fire.
	ECU supply voltage fault due to: <ul style="list-style-type: none"> - moisture in ECU connectors (poor contacts) - poor power supply and/or earth connections to the ECU (D903) 	Irregular engine running and reduced engine output. Engine starts but will not fire.
630 - 12	Internal ECU hardware fault due to: <ul style="list-style-type: none"> - internal ECU (D903) hardware fault 	Irregular engine running and reduced engine power Engine starts but will not fire.
639 - 2	CAN communication interrupted before complete message has been sent due to: <ul style="list-style-type: none"> - faulty CAN wiring - fault in other ECU connected to the V-CAN 	System reaction depending on the missing V CAN data.
639 - 9	CAN communication is not fast enough due to: <ul style="list-style-type: none"> - faulty CAN wiring - fault in other ECU connected to the V-CAN 	System reaction depending on the missing V CAN data.
651 - 5	Measured current strength from cylinder 1 injector (B131) is too low. This is the current between pins C09 and C13 of the ECU, caused by: <ul style="list-style-type: none"> - interruption in injector wiring - bad connection point at injector 	Irregular engine running and reduced engine output.

Fault code	Fault code description with possible cause	Symptom
651 - 7	Incorrect mechanical response from cylinder 1 injector (B131) due to: <ul style="list-style-type: none"> - faulty injector - internal fuel leakage - leakage in fuel supply system (high pressure) to injector 	Longer start time before engine fires. Irregular engine running and reduced engine output.
651 - 11	Short circuit in injector(s) of cylinder row #1, cylinders 1, 3 and 5 in case of a CE engine, cylinders 1 and 3 in case of a BE engine, due to: <ul style="list-style-type: none"> - short circuit to earth or short circuit in the injector wiring - engine having been switched off at an engine speed over 1300 rpm 	Longer start time before engine fires. Irregular engine running and reduced engine output. Cylinder row is deactivated as long as the ignition is still on. When the cause has been removed, the cylinder row is only activated again when the ignition has been switched off for about 10 seconds.
651 - 13	Injection time is too long due to: <ul style="list-style-type: none"> - fuel pressure too low 	Irregular engine running and reduced engine output. Engine starts but will not fire.
652 - 5	Measured current strength from cylinder 2 injector (B132) is too low. This is the current between: BE: pins C10 and C15 of the ECU, CE: pins C03 and C06 of the ECU, caused by: <ul style="list-style-type: none"> - interruption in injector wiring - bad connection point at injector 	Irregular engine running and reduced engine output.
652-7	Incorrect mechanical response from cylinder 2 injector (B132) due to: <ul style="list-style-type: none"> - faulty injector - internal fuel leakage - leakage in fuel supply system (high pressure) to injector 	Longer start time before engine fires. Irregular engine running and reduced engine output.
653 - 5	Measured current strength from cylinder 3 injector (B133) is too low. This is the current between: BE: pins C11 and C16 of the ECU, CE: pins C04 and C12 of the ECU, caused by: <ul style="list-style-type: none"> - interruption in injector wiring - bad connection point at injector 	Irregular engine running and reduced engine output.
653-7	Incorrect mechanical response from cylinder 3 injector (B133) due to: <ul style="list-style-type: none"> - faulty injector - internal fuel leakage - leakage in fuel supply system (high pressure) to injector 	Longer start time before engine fires. Irregular engine running and reduced engine output.
654 - 5	Measured current strength from cylinder 4 injector (B134) is too low. This is the current between: BE: pins C04 and C12 of the ECU, CE: pins C05 and C14 of the ECU, caused by: <ul style="list-style-type: none"> - interruption in injector wiring - bad connection point at injector 	Irregular engine running and reduced engine output.

Fault code	Fault code description with possible cause	Symptom
654 - 7	Incorrect mechanical response from cylinder 4 injector (B134) due to: <ul style="list-style-type: none"> - faulty injector - internal fuel leakage - leakage in fuel supply system (high pressure) to injector 	Longer start time before engine fires. Irregular engine running and reduced engine output.
654 - 11	Short circuit in injector(s) of cylinder row #2, cylinders 2, 4 and 6 in case of a CE engine, cylinders 2 and 4 in case of a BE engine, due to: <ul style="list-style-type: none"> - short circuit to earth or short circuit in the injector wiring - engine having been switched off at an engine speed over 1300 rpm 	Longer start time before engine fires. Irregular engine running and reduced engine output. Cylinder row is deactivated as long as the ignition is still on. When the cause has been removed, the cylinder row is only activated again when the ignition has been switched off for about 10 seconds.
654 - 13	Pre-injection overlaps the beginning of main injection due to: <ul style="list-style-type: none"> - defective ECU (D903) 	Loud combustion knocking.
655 - 5	Measured current strength from cylinder 5 injector (B135) is too low. This is the current between pins C11 and C16 of the ECU, caused by: <ul style="list-style-type: none"> - interruption in injector wiring - bad connection point at injector 	Irregular engine running and reduced engine output.
655-7	Incorrect mechanical response from cylinder 5 injector (B135) due to: <ul style="list-style-type: none"> - faulty injector - internal fuel leakage - leakage in fuel supply system (high pressure) to injector 	Longer start time before engine fires. Irregular engine running and reduced engine output.
656 - 5	Measured current strength from cylinder 6 injector (B136) is too low. This is the current between pins C10 and C15 of the ECU, caused by: <ul style="list-style-type: none"> - interruption in injector wiring - bad connection point at injector 	Irregular engine running and reduced engine output.
656-7	Incorrect mechanical response from cylinder 6 injector (B136) due to: <ul style="list-style-type: none"> - faulty injector - internal fuel leakage - leakage in fuel supply system (high pressure) to injector 	Longer start time before engine fires. Irregular engine running and reduced engine output.
723 - 2	No signal from camshaft sensor due to: <ul style="list-style-type: none"> - faulty/soiled camshaft sensor (F558) - too large an air gap between camshaft sensor and camshaft gear - short circuit, short circuit to supply, short circuit to earth, contact resistance(s) or interruption in wiring on pin A23 and/or pin A30 	Longer start time before engine fires.
723 - 7	Crankshaft sensor and camshaft sensor signals do not correspond due to: <ul style="list-style-type: none"> - incorrect timing - short circuit or interruption in wiring - faulty/soiled crankshaft/camshaft sensor (F552/F558) 	<ul style="list-style-type: none"> - Engine starts but will not fire. - Longer start time before engine fires. - Irregular engine running and reduced engine output.

Fault code	Fault code description with possible cause	Symptom
729 - 11	Fault in glow element circuit due to: <ul style="list-style-type: none"> - short circuit, short circuit to earth, short circuit to supply, contact resistance(s) or interruption in wiring to pin B16 of the ECU - faulty glow relay (G014) 	Depending on the cause: <ul style="list-style-type: none"> - glow function cannot be activated - glow function is permanently activated
854-4	Low voltage or short circuit to earth on signal pin B18 of the ECU for fuel heating (B182) due to: <ul style="list-style-type: none"> - faulty fuel heating element - short circuit to earth on pin B18 of the ECU - short circuit between pin B02 and pin B18 of the ECU 	Fuel heating is not activated.
974 - 3	Voltage on remote throttle circuit, signal pin B85, is too high due to: <ul style="list-style-type: none"> - faulty remote throttle potentiometer - short circuit to supply on pin B85 of the ECU - interruption on pin B50 of the ECU - short circuit between pin B85 and pin B68 of the ECU 	Possibly the engine does not respond to remote throttle operation.
974 - 4	Short circuit to earth on remote throttle circuit, signal pin B85, or voltage is too low due to: <ul style="list-style-type: none"> - faulty remote throttle potentiometer - interruption on pin B85 and/or pin B68 of the ECU - short circuit to earth on pin B85 and/or pin B68 of the ECU - short circuit between pin B50 and pin B68 of the ECU - short circuit between pin B50 and pin B85 of the ECU 	Possibly the engine does not respond to remote throttle operation.
1073 - 11	Fault in exhaust brake circuit due to: <ul style="list-style-type: none"> - short circuit or interruption in wiring to pin B11 of the ECU - short circuit or interruption in the coil of exhaust brake valve (B192) 	<ul style="list-style-type: none"> - Exhaust brake cannot be activated. - Exhaust brake is permanently activated.
1077 - 14	Fuel rail pressure cannot be maintained at maximum pump output (fuel pump control solenoid valve fully opened) due to: <ul style="list-style-type: none"> - external fuel leakage of the fuel system's high-pressure circuit - internal leakage of the fuel system's high-pressure circuit due to: <ul style="list-style-type: none"> - bad sealing of rail pressure limiting valve - injector(s) with excessive internal leakage - leaking fuel supply line(s) to the injector(s) - jammed plunger of fuel pump control solenoid valve (B334) - defective fuel pump (capacity too low) 	<ul style="list-style-type: none"> - Engine starts but will not fire. - Longer start time before engine fires. - Possibly a delayed engine response when operating the accelerator pedal when much power is required.

Fault code	Fault code description with possible cause	Symptom
1079 - 3	Voltage on inlet air boost pressure and temperature sensor (F649) supply wire, pin A10, is too high due to: <ul style="list-style-type: none"> - short circuit to supply on wiring to pin A10 of the ECU or the power supply to the remote throttle potentiometer, pin B68, of the ECU - incorrect ECU (D903) power supply 	Reduced engine output. The engine does not respond to remote throttle operation, if applicable.
1079 - 4	Voltage on inlet air boost pressure and temperature sensor (F649) supply wire, pin A10, is too low due to: <ul style="list-style-type: none"> - short circuit to earth on wiring to pin A10 of the ECU or the power supply to the remote throttle potentiometer, pin B68, of the ECU - incorrect ECU (D903) power supply - short circuit to earth in inlet air boost pressure and temperature sensor (F649) - short circuit to earth in remote throttle potentiometer 	Reduced engine output. The engine does not respond to remote throttle operation, if applicable.
1080 - 3	Voltage on fuel rail pressure sensor (F648) supply wire, pin A12, is too high due to: <ul style="list-style-type: none"> - short circuit to supply on pin A12 of the ECU - incorrect ECU (D903) power supply 	Reduced engine output.
1080 - 4	Voltage on fuel rail pressure sensor (F648) supply wire, pin A12, is too low due to: <ul style="list-style-type: none"> - faulty rail pressure sensor - short circuit to earth on pin A12 of the ECU - incorrect ECU (D903) power supply 	Reduced engine output.
1081 - 3	Voltage on accelerator pedal (F671) power supply, pin B55 of the ECU, is too high due to: <ul style="list-style-type: none"> - faulty accelerator pedal position sensor - short circuit to supply in wiring to pin B55 of the ECU - incorrect ECU (D903) power supply 	Indistinct or no response to accelerator pedal.
1081 - 4	Voltage on accelerator pedal (F671) power supply, pin B55 of the ECU, is too low due to: <ul style="list-style-type: none"> - faulty accelerator pedal position sensor - short circuit to earth in wiring to pin B55 of the ECU - incorrect ECU (D903) power supply 	Indistinct or no response to accelerator pedal.
1347 - 5	Current measured in the fuel pump control solenoid valve (B334) circuit is too low due to: <ul style="list-style-type: none"> - interruption in wiring to pin B05 and/or pin B07 of the ECU - fuel pump control solenoid valve connector connected incorrectly or not at all - interruption in magnet coil of fuel pump control solenoid valve 	Irregular engine running and reduced engine output. Loud combustion knocking.
1347 - 6	Current measured in the fuel pump control solenoid valve (B334) circuit is too high due to: <ul style="list-style-type: none"> - short circuit to earth in wiring to pin B05 and/or pin B07 of the ECU - short circuit in wiring to pin B05 and/or pin B07 of the ECU - short circuit in magnet coil of fuel pump control solenoid valve 	<ul style="list-style-type: none"> - Engine starts but will not fire. - Longer start time before engine fires. - Reduced engine output.

2. ECS-DC3 CUSTOMER PARAMETERS

2.1 INTRODUCTION

Customer parameters

Customer parameters are the settings of an electronic system. The customer parameters permit adapting control functions of a system to the customer's particular wishes and/or needs within certain limits. The customer parameters are stored in a list in the memory of the electronic unit. Customer parameters can be modified using the programming feature of DAVIE XD. Programming using DAVIE XD is only possible if the logged-in user has been registered as a "Master Technician".

Note:

Erroneous settings of customer parameters may affect the action of control functions to such an extent that they function erratically or not at all. After modification of the settings the (modified) customer parameters must be stored in the electronic unit using the programming function in the customer parameter overview.

Customer parameter names and codes

Each customer parameter in a system has its own name and code. The following explanation of the customer parameters includes only the codes. The availability of a customer parameter in a system depends on the programmed software in the electronic unit. The programmed software depends on the vehicle configuration/identity card data.

Standard values

Standard values, options and setting ranges may vary according to the software variants of DAVIE XD and the system. This is why they have not been included in the following explanation of the customer parameters.

2.2 EXPLANATORY NOTES TO ECS-DC3 CUSTOMER PARAMETERS

ECS-DC3 customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
Settings relating to "limiting functions"				
2-01	Adaptation of control characteristic for normal use (accelerator pedal) and remote throttle. Does not apply to engine speed control.			RQ = Control characteristic that tries to keep the engine speed constant at a specific accelerator pedal position. RQV = Control characteristic that tries to keep the engine torque constant at a specific accelerator pedal position.
2-02	Set value of the maximum vehicle speed in the "vehicle speed limiting" control function.	higher than 2-12		A default value was programmed during production. This value can be changed here. Password-protected.
2-03	The number of revolutions of the driven axle per km or mile.			The value depends on the tyre size. This value is necessary to have the cruise control function operate correctly.
2-04	The number of pulses per revolution of the gearbox output shaft.			This value depends on the type of gearbox. This value is necessary to have the cruise control function operate correctly.
2-05	The ratio of the highest gear.			This value is necessary to have the cruise control function operate correctly. The number must be entered as *100 (0.79 is entered as 79) so that no points or commas are necessary.
2-06	The ratio of the highest gear but one.			This value is necessary to have the cruise control function operate correctly. The number must be entered as *100 (0.79 is entered as 79) so that no points or commas are necessary.
2-07	Setting of engine idling speed (at operating temperature).			

ECS-DC3 customer parameter code	Explanation	Dependencies:		Notes
		Minimum value to be set:	Maximum value to be set:	
2-08	Setting to activate or deactivate the "variable vehicle speed limiting" control function. This control function has to be switched on and off via the steering column switch and the accelerator pedal.			From ECS-DC3 software version 1583 applies for the CF65 that when "active" is set, the "variable vehicle speed limiting" control function can be activated; this is not possible when "not active" is set. For the time being this control function does not apply to the LF45/55, irrespective of the setting of this customer parameter.
2-09	Setting to activate or deactivate the "vehicle speed limiting application" control function. This control function has to be switched on and off via a switch on or fitted to the superstructure.			This vehicle speed limitation functions only from ECS-DC3 software version 1565. When "active" has been set, the "vehicle speed limiting application" control function can be activated; this is not possible when "not active" has been set. Application example: foot board protection with refuse collection vehicles.
2-10	Setting of the maximum vehicle speed in the "vehicle speed limiting application" control function.			This vehicle speed limitation functions only from ECS-DC3 software version 1575. Condition is that 2-09 is activated. Application example: foot board protection with refuse collection vehicles.
2-11	Setting of the maximum vehicle speed at which engine speed control is possible.			The engine speed control will be deactivated when the vehicle exceeds the set speed.
2-12	Setting of the maximum vehicle speed for the cruise control function.		lower than 2-02	Above this value the cruise control cannot be activated. Also, when the cruise control is activated, it is not possible to accelerate to a speed above this value.
2-13	This can be used to switch the "+" and "-" functions of the steering column switch.			If necessary, the "+" and "-" functions of the steering column switch can be changed. Default value: "Set / Accel".
Settings relating to "engine speed control"				

ECS-DC3 customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
2-14	Setting of the maximum engine speed in the "engine speed control" control function.	higher than the highest value of (2-16, 2-17, 2-27, 2-28, 2-29).		In the "engine speed control" function it is not possible to accelerate to an engine speed above this value. Activation of the engine speed control when the engine speed is above this value results in an immediate decrease in engine speed to this set value, even if the accelerator pedal "asks for" a higher speed.
2-15	Setting of the minimum engine speed in the "engine speed control" control function.		lower than the lowest value of (2-16, 2-17, 2-27, 2-28, 2-29)	In the "engine speed control" function it is not possible to decelerate to an engine speed below this value. Activation of the engine speed control when the engine speed is below this value results in an immediate increase in engine speed to the value of 2-15.
2-16	Setting of the desired control engine speed that is reached by briefly operating the "Set+" switch on the steering column.	higher than 2-15	lower than 2-14	
2-17	Setting of the desired control engine speed that is reached by briefly operating the "Res-" switch (LF45/55) or the "Set-" switch (CF65) on the steering column.	higher than 2-15	lower than 2-14	
2-21	Setting of the maximum engine torque in the "engine speed control" control function.			The electronic unit calculates the current engine torque on the basis of the measured and calculated values. The moment it exceeds the set value, the engine speed control will be switched off.
2-22	Setting of the decrease/increase in engine speed during changes to the desired engine speed in the "engine speed control" control function.			This applies only to changes in engine speed as a result of commands with "+" and "-" switches on the steering column.
2-27	Setting of the desired engine speed that is reached upon actuation of "n1" of the engine speed control application connector (A068).	higher than 2-15	lower than 2-14	NB! The combined engine speed control switching on and switching off conditions have to be set in VIC via the engine speed control application connector (A068).
2-28	Setting of the desired engine speed that is reached upon actuation of "n2" of the engine speed control application connector (A068).	higher than 2-15	lower than 2-14	NB! The combined engine speed control switching on and switching off conditions have to be set in VIC via the engine speed control application connector (A068).

ECS-DC3 customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
2-29	Setting of the desired engine speed that is reached upon actuation of "n3" of the engine speed control application connector (A068).	higher than 2-15	lower than 2-14	NB! The combined engine speed control switching on and switching off conditions have to be set in VIC via the engine speed control application connector (A068).
Settings relating to the "engine speed control" switching on and switching off conditions				
2-30	This enables setting whether or not the electronic unit must be capable of responding to the accelerator pedal when in the "engine speed control" control function.			When "active" has been set, acceleration in the engine speed control function is possible using the accelerator pedal. In that case the engine speed can only be controlled between the actual control speed of the engine speed control and the value of 2-31 using the accelerator pedal. When "not active" has been set, the accelerator pedal is ignored when in the engine speed control function.
2-31	Setting of the maximum engine speed that can be reached during the "engine speed control" control function, if the accelerator pedal is operated as well and 2-30 is set to accelerator pedal use in the engine speed control function.	higher than 2-15		Recommendation: set this value not below the lowest value of (2-16, 2-17, 2-27, 2-28, 2-29).
2-32	Setting of the parking brake as switching on and switching off condition for the "engine speed control" control function.			If "not active" has been selected, the parking brake is ignored. If "active" has been selected, the engine speed control is switched off as soon as the parking brake is put in the driving position. It is impossible to activate the engine speed control function when the parking brake is in the driving position. This setting only relates to engine speed control via the steering column switch. For engine speed control via the engine speed control application connector (A068) this setting has to be made in VIC.

ECS-DC3 customer parameter code	Explanation	Dependences:		Notes
		Minimum value to be set:	Maximum value to be set:	
2-33	Setting of the brake pedal as switching on and switching off condition for the "engine speed control" control function.			If "not active" has been selected, the brake pedal signal is ignored. If "active" has been selected, the engine speed control is switched off the moment the brake pedal is depressed. The engine speed control function cannot be switched on if the brake pedal is depressed. This setting only relates to engine speed control via the steering column switch. For engine speed control via the engine speed control application connector (A068) this setting has to be made in VIC.
2-34	Setting of the clutch pedal as switching on and switching off condition for the "engine speed control" control function.			If "not active" has been selected, the clutch pedal is ignored. If "active" has been selected, the engine speed control is switched off the moment the clutch pedal is depressed. The engine speed control function cannot be switched on if the clutch pedal is depressed. This setting only relates to engine speed control via the steering column switch. For engine speed control via the engine speed control application connector (A068) this setting has to be made in VIC.

3. SYSTEM INSPECTION WITH DAVIE XD

3.1 GENERAL

If the vehicle has been modified and the configuration changed, the electronic unit may have to be re-programmed.

If the electronic unit is replaced, new ECS-DC3 software must be loaded into the unit using DAVIE.

If the vehicle is equipped with an immobiliser, the immobiliser code will be automatically "read" when the ignition is switched on so as to enable fuel release.

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1. IMMOBILISER FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

IMMOBILISER

Immobiliser fault codes

DAVIE XD diagnostics manual

1.2 EXPLANATORY NOTES TO IMMOBILISER FAULT CODES

Fault code	Fault code description with possible cause	Symptom
1-1	Wrong or faulty transponder	Poor or no connection between transponder and immobiliser unit
1-2	Wrong or faulty transponder	Poor or no connection between transponder and immobiliser unit
1-4	No transponder recognition due to: - short circuit to supply on pin 1 of the immobiliser unit	Engine will not start
1-8	Wrong or faulty transponder	Poor or no connection between transponder and immobiliser unit
1-16	Maximum number of keys programmed	No keys can be programmed.
1-32	Key has already been programmed for another immobiliser	Key cannot be programmed
2-2	Immobiliser has not been released due to: - faulty transponder in key - short circuit to supply on pin 1 of the immobiliser unit	Engine will not fire No LED signal
2-3	Immobiliser and engine management system incorrectly programmed	
2-4	Immobiliser and engine management system incorrectly programmed	

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1. CDM FAULT CODES

1.1 INTRODUCTION

If the electronic unit detects a system fault, this fault is usually stored in the memory of the electronic unit as a fault code.
Most system faults will also generate a warning.

1.2 EXPLANATORY NOTES TO CDM FAULT CODES

Fault code	Fault code description with possible cause	Symptom
01-02	Internal communication fault due to: - defective CDM	- No communication with CDM
02-12	Internal fault due to: - defective CDM	- No communication with CDM
03-12	Internal fault due to: - defective CDM	- No communication with CDM
04-12	Internal fault due to: - defective CDM	- No communication with CDM
05-03	Voltage (> 360 V) on pin A1 of the ECU is too high due to: - excessive alternator/battery voltage	- No communication between semi-trailer CDM and tractor CDM - Fleet management system cannot receive data
05-04	Voltage (< 16 V) on pin A1 of the ECU is too low due to: - alternator voltage too low - interruption on pin A1 of the ECU	- No communication between semi-trailer CDM and tractor CDM - Fleet management system cannot receive data
06-03	Voltage (> 36 V) on pin A2 of the ECU is too high due to: - excessive alternator/battery voltage	- No communication between semi-trailer CDM and tractor CDM - Fleet management system cannot receive data
07-09	Sporadic failure of the V-CAN due to: - interruption on pin A12 of the ECU - interruption on pin A09 of the ECU - short circuit in CAN-H and CAN-L - short circuit to supply or to earth in CAN-H - short circuit to supply in CAN-L	- No communication with CDM
08-09	FMS-CAN failure due to: - interruption on pin B03 of the ECU - interruption on pin B06 of the ECU - short circuit in CAN-H and CAN-L - short circuit to earth in CAN-H - short circuit to supply in CAN-L	- Fleet management system cannot receive data
09-09	Failure of V-CAN CAN-L due to: - short circuit to earth in CAN-L	- No noticeable system limitations
10-09	Trailer CAN failure due to: - short circuit in CAN-H and CAN-L	- No communication with CDM
32-09	Trailer CAN-L failure due to: - interruption on pin C02 of the ECU - short circuit to supply in CAN-L	- No communication with CDM
33-09	Trailer CAN-H failure due to: - interruption on pin C03 of the ECU	- No communication with CDM

2. SYSTEM INSPECTION WITH DAVIE XD

2.1 GENERAL

Communication between DAVIE XD and the CAN data manager is only possible if the ignition is switched on and there is no failure in the V-CAN.