

3.4.2 Fault displays

Faults in the overall MDEC system are indicated at the devices of the MCS-5 sub-system as follows:

- Fault code numbers (generated inside Engine Control Unit ECU) on a 4-figure 7-segment display in PIM A 511
- Plain text fault display in the form of text messages on display DIS (option)



CAUTION

Rectify faults as soon as possible even if they would appear to be insignificant in order to avoid impairing operation of the plant or system failure.

Always check the following points first if a fault occurs when the overall system is switched on:

- Is it a phantom fault (e.g. because the system is in Local mode)?
- Have all the necessary requirements for the operating procedure, or for the control procedure of a superordinate system, during which the fault occurs been fulfilled?
- Does a fault message appear on the display in PIM A 511 ?
If so, countermeasures can be determined by consulting the appropriate fault code table.

Table

The number of the fault code on the display is listed in the first column "No." in the table.

The precise text message is listed in the second column "Fault display" in the table. This corresponds with the fault code displayed on the DIS display (option).

The message is explained in the third column "Meaning/cause" and the reason for the message is explained.

The fourth column "Counteraction" in the table lists measures which can be taken on-site by the operator or other information about how to proceed.

The last two columns indicate which fault can appear for which series.

Malfunctions which may be caused by mechanical fault are referenced to the engine documentation with "▶ Engine documentation".

"▶ Electronics service" indicates that further testing and rectification are a matter for trained service personnel or experienced users with access to the appropriate documents (e.g. wiring diagrams).

Note: "▶ Engine documentation" refers to the "Operating instructions for engine series 2000", Part E and Part G.

1.4.2 Display functions

1.4.2.1 Display functions of fault code display FCB in PIM A 511

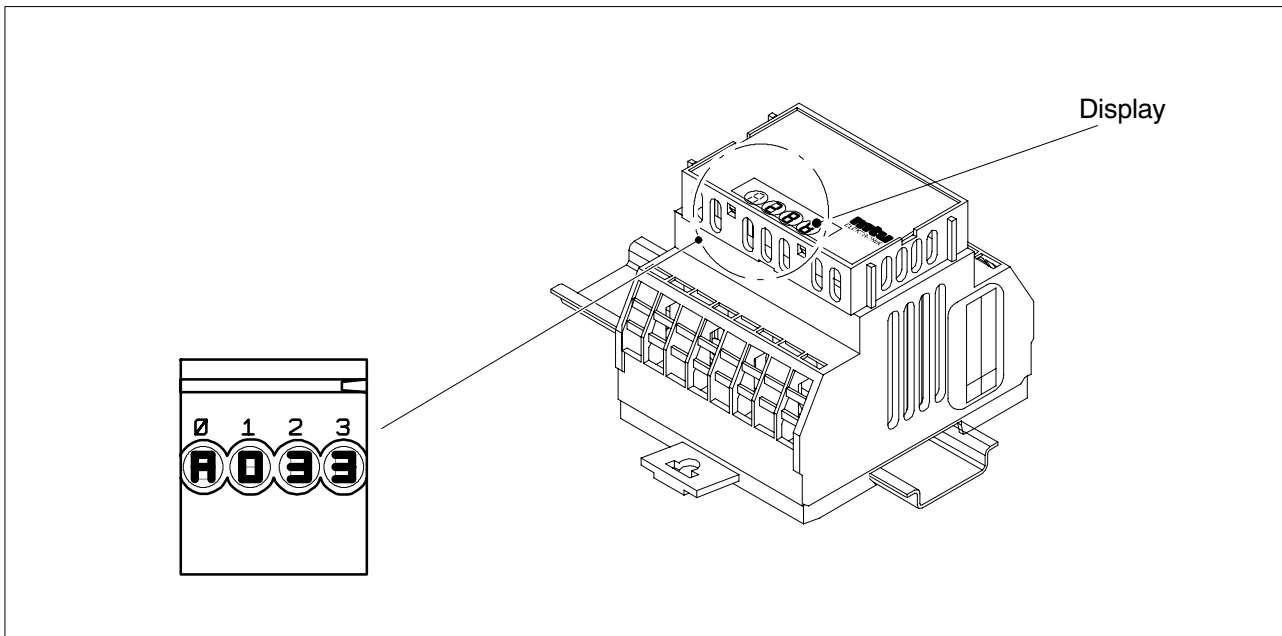


Fig. 21 : Display on printed circuit board FCB in Peripheral Interface Module PIM A 511

The fault codes generated by the ECU are shown on the display in PIM A 511 (see fig. 21).

The four digits indicating faults related to the ECU concerned have the following meaning:

- The first digit indicates that a fault has occurred (in the example in fig. 21: **A**).
The meaning of the letters is as follows:
 - A** The fault is new.
 - B** The fault is no longer new, it occurred within the last operating hour.
 - C** The fault occurred between one and four operating hours ago.
 - D** The fault occurred between four and twelve operating hours ago.
- The second to fourth digits on the display indicate the three-figure fault code (see table in part 3 of this manual, example in fig. 21: **033**).

Note: Faults which occurred more than twelve hours ago are deleted automatically.

No.	Fault display	Meaning/cause	Counteraction	2000	4000
000	(Not used)				
001	(Not used)				
002	(Not used)				
003	(Not used)				
004	(Not used)				
005	L1 T-CHARGE AIR	Charge air temperature too high (first limit value overshoot)	▶ Engine documentation	✓	✓
006	L2 T-CHARGE AIR	Charge air temperature too high (second limit value overshoot)	▶ Engine documentation	✓	✓
007	(Not used)				
008	(Not used)				
009	L1 T-INTERCOOLER	Charge air coolant temperature too high (Limit1 overshoot)	▶ Engine documentation	✓	✓
010	(Not used)				
011	(Not used)			✓	
012	(Not used)				
013	(Not used)				
014	(Not used)				
015	L1 P-LUBE OIL	Lube oil pressure too low (first limit value undershoot)	▶ Engine documentation	✓	✓
016	L2 P-LUBE OIL	Lube oil pressure too low (second limit value undershoot) → engine stop	▶ Engine documentation	✓	✓
017	(Not used)				
018	(Not used)				
019	(Not used)				
020	(Not used)				
021	(Not used)				
022	(Not used)				

No.	Fault display	Meaning/cause	Counteraction	2000	4000
023	L1 COOLANT LEVEL	Coolant level too low, message appears simultaneously with no. 24	Check coolant level in expansion tank ◆ Engine documentation	✓	✓
024	L2 COOLANT LEVEL	Coolant level too low, message appears simultaneously with no. 23	Check coolant level in expansion tank ◆ Engine documentation	✓	✓
025	<i>(Not used)</i>				
026	<i>(Not used)</i>				
027	<i>(Not used)</i>				
028	<i>(Not used)</i>				
029	<i>(Not used)</i>				
030	ENGINE OVERSPEED	Engine overspeed → emergency stop	Restart the engine, eliminate cause of overspeeding	✓	✓
031					
032	<i>(Not used)</i>				
033	L1 P-FUELFILTER DIFF	Fuel differential pressure too high	Check filter ◆ Engine documentation	✓	
034	<i>(Not used)</i>				
035	<i>(Not used)</i>				
036	<i>(Not used)</i>				
037	<i>(Not used)</i>				
038	<i>(Not used)</i>				
039	<i>(Not used)</i>				
040	<i>(Not used)</i>				
041	<i>(Not used)</i>				
042	<i>(Not used)</i>				
043	<i>(Not used)</i>				
044	L1 LEVEL INTER-COOLER	Charge air coolant level too low, message appears simultaneously with no. 45	Check coolant level ◆ Engine documentation		✓
045	L2 LEVEL INTER-COOLER	Charge air coolant level too low, message appears simultaneously with no. 44	Check coolant level ◆ Engine documentation		✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
046	(Not used)				
047	(Not used)				
048	(Not used)				
049	(Not used)				
050	(Not used)				
051	L1 T-LUBE OIL	Lube oil temperature too high (first limit value overshoot)	▶ Engine documentation	✓	✓
052	L2 T-LUBE OIL	Lube oil temperature too high (second limit value overshoot)	▶ Engine documentation	✓	✓
053	(Not used)				
054	(Not used)				
055	(Not used)				
056	(Not used)				
057	(Not used)				
058	(Not used)				
059	(Not used)				
060	(Not used)				
061	(Not used)				
062	(Not used)				
063	(Not used)				
064	(Not used)				
065	L1 P-FUEL	Fuel infeed pressure too low (first limit value undershoot)	Check low pressure fuel side ▶ Engine documentation		✓
066	L2 P-FUEL	Fuel infeed pressure too low (second limit value undershoot)	Check low pressure fuel side ▶ Engine documentation		✓
067	L1 T-COOLANT	Coolant temperature too high (first limit value overshoot); warning	▶ Engine documentation	✓	✓
068	L2 T-COOLANT	Coolant temperature too high (second limit value overshoot); shutdown	▶ Engine documentation	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
069	L1 T-EXTERN 1	Alarm 'First limit value violated' for ext. temperature channel 1	The measured value is read in via the CAN. The alarm is handled in MDEC.	✓	✓
070	L2 T-EXTERN 1	Alarm 'Second limit value violated' for ext. temperature channel 1	The measured value is read in via the CAN. The alarm is handled in MDEC.	✓	✓
071	L1 T-EXTERN 2	Alarm 'First limit value violated' for ext. temperature channel 2	The measured value is read in via the CAN. The alarm is handled in MDEC.	✓	✓
072	L2 T-EXTERN 2	Alarm 'Second limit value violated' for ext. temperature channel 2	The measured value is read in via the CAN. The alarm is handled in MDEC.	✓	✓
073	L1 P-EXTERN 1	Alarm 'First limit value violated' for ext. pressure channel 1	The measured value is read in via the CAN. The alarm is handled in MDEC.	✓	✓
074	L2 P-EXTERN 1	Alarm 'Second limit value violated' for ext. pressure channel 1	The measured value is read in via the CAN. The alarm is handled in MDEC.	✓	✓
075	L1 P-EXTERN 2	Alarm 'First limit value violated' for ext. pressure channel 2	The measured value is read in via the CAN. The alarm is handled in MDEC.	✓	✓
076	L2 P-EXTERN 2	Alarm 'Second limit value violated' for ext. pressure channel 2	The measured value is read in via the CAN. The alarm is handled in MDEC.	✓	✓
077	LIM EXT. COOLANT LEV.	Alarm from external coolant level monitor	The measured value is read in via the CAN. The alarm is handled in MDEC.	✓	✓
078	LIM INTERCOOLER LEV.	Alarm from external charge air coolant level monitor	The measured value is read in via the CAN. The alarm is handled in MDEC.	✓	✓
079	L Bin-EXTERN 3	Alarm from external binary channel 3 (plant)	The measured value is read in via the CAN. The alarm is handled in MDEC.	✓	✓
080	L Bin-EXTERN 4	Alarm from external binary channel 4 (plant)	The measured value is read in via the CAN. The alarm is handled in MDEC.	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
081	RAIL LEAKAGE	Low pressure gradient on starting or high pressure gradient on stopping	High pressure system leaking, air in the system ▶ Engine documentation		✓
082	RAIL PRESSURE HIGH	Rail pressure above set value → DBR reduction, injection start later	Interface transformer malfunction or interface transformer wiring B48 ▶ Engine documentation		✓
083	RAIL PRESSURE LOW	Rail pressure below set value → DBR reduction	Interface transformer faulty or leakage in the high pressure system ▶ Engine documentation Message also appears when very large generators are in use and the rundown time exceeds 20 s ▶ Fault irrelevant		✓
084	<i>(Not used)</i>				
085	<i>(Not used)</i>				
086	<i>(Not used)</i>				
087	<i>(Not used)</i>				
088	<i>(Not used)</i>				
089	ENGINE SPEED LOW	Engine speed has fallen below 200 rpm → engine stop		✓	✓
090	IDLE SPEED LOW	Fault message during starting, idling speed not reached within the time defined in MP 169.05 (counting starts when speed limit in MP 170.04 is exceeded) → start termination	Check for further messages	✓	✓
091	RUN UP SPEED LOW	Fault message during starting, runup speed (MP 170.04) not reached within the time defined in MP 169.04 (counting starts on exceeding the speed limit 80 rpm) → start termination	Check for further messages	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
092	START SPEED LOW	Start error message, starter speed (MP 169.02) not reached within the time defined in MP 169.03 (counting starts when the starter is activated) → start termination	Check for further messages	✓	✓
093	PREHEAT TEMP. LIMIT2	Coolant preheating temperature too low (second limit value undershot) → start termination when MP 170.19 "No Start Break Preheat" is not set	Preheating temperature not reached	✓	✓
094	PREHEAT TEMP. LIMIT1	Coolant preheating temperature too low (first limit value undershot)	Preheating temperature not reached	✓	✓
095	<i>(Not used)</i>				
096	<i>(Not used)</i>				
097	<i>(Not used)</i>				
098	<i>(Not used)</i>				
099	DUMMY FAILURE	Dummy			✓
100	EDM NOT VALID	Measuring point data checksum error in EDM	▶ Electronics service	✓	✓
101	IDM NOT VALID	Measuring point data checksum error in IDM	▶ Electronics service	✓	✓
102	INVALID FUEL CONS. 1	Accumulated fuel consumption checksum error in EDM (redundant data record 1)	▶ Electronics service	✓	✓
103	INVALID FUEL CONS. 2	Accumulated fuel consumption checksum error in EDM (redundant data record 2)	▶ Electronics service	✓	✓
104	OP HOURS1 NOT VALID	Operating hours counter checksum error in EDM	▶ Electronics service	✓	✓
105	OP HOURS2 NOT VALID	Operating hours counter checksum error in IDM	▶ Electronics service	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
106	ERR REC1 NOT VALID	Fault memory checksum error in EDM (redundant data record 1)	▶ Electronics service	✓	✓
107	ERR REC2 NOT VALID	Fault memory checksum error in EDM (redundant data record 2)	▶ Electronics service	✓	✓
108	<i>(Not used)</i>				
109	<i>(Not used)</i>				
110	<i>(Not used)</i>				
111	<i>(Not used)</i>				
112	<i>(Not used)</i>				
113	<i>(Not used)</i>				
114	<i>(Not used)</i>				
115	<i>(Not used)</i>				
116	<i>(Not used)</i>				
117	<i>(Not used)</i>				
118	L1 SUPPLY VOLT. LOW	If the supply voltage is below set lower limit value 1 (MP 101.01) the value calculated from the DBR curve is multiplied by 0.8 and injection start is delayed by 5°	Check battery/generator	✓	✓
119	L2 SUPPLY VOLT. LOW	If the supply voltage is below set lower limit value 2 (MP 101.03) the value calculated from the DBR curve is multiplied by 0.8 and injection start is delayed by 5°	Check battery/generator	✓	✓
120	L1 SUPPLY VOLT. HIGH	If the supply voltage is above set upper limit value 1 (MP 102.01) the value calculated from the DBR curve is multiplied by 0.8 and injection start is delayed by 5°	Check battery/generator	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
121	L2 SUPPLY VOLT. HIGH	If the supply voltage is above the set upper limit value 2 (MP 102.03) the engine is stopped, if configured (in MP 102.14 = T)	Check battery/generator	✓	✓
122	L1 T-ELECTRONIC	ECU temperature too high (first limit value exceeded)	Check electronics environment (heat accumulation)	✓	✓
123	(Not used)				
124	(Not used)				
125	(Not used)				
126	(Not used)				
127	(Not used)				
128	(Not used)				
129	(Not used)				
130	(Not used)				
131	(Not used)				
132	(Not used)				
133	(Not used)				
134	15V POS ECU DEFECT	Internal electronics failure → engine stop due to electronics failure	Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
135	(Not used)				
136	15V NEG ECU DEFECT	Internal electronics failure → engine stop due to electronics failure	Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
137	L1 5V BUFFER TEST	This fault can have various causes: 1. Pressure sensor fault 2. Sensor wiring 3. Internal electronics failure	Fault analysis for internal electronic fault: Disconnect connectors X2 and X3, ECU is faulty if fault message remains. Fault analysis of pressure sensors: Disconnect pressure sensors one after the other and pinpoint which sensor causes the fault. If both measures prove unsuccessful the fault lies in the cable harness.	✓	✓
138	SENSORPOWERDEFECT	This fault can have various causes: 1. Pressure sensor fault 2. Sensor wiring 3. Internal electronics failure	Fault analysis for internal electronic fault: Disconnect connectors X2 and X3, ECU is faulty if fault message remains. Fault analysis of pressure sensors: Disconnect pressure sensors one after the other and pinpoint which sensor causes the fault. If both measures prove unsuccessful the fault lies in the cable harness.	✓	✓
139	L1 TE BUFFER TEST	Internal electronics failure → Sensor defect - alarm for dependent sensors, temperature values are set to default values	1. Sensor defect ▶ Electronics service 2. Electronics faulty Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
140	TE BUF. ECU DEFECT	Internal electronics failure → Sensor defect - alarm for dependent sensors, temperature values are set to default values	1. Sensor defect ▶ Electronics service 2. Electronics faulty Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
141	<i>(Not used)</i>				

No.	Fault display	Meaning/cause	Counteraction	2000	4000
142	BANK1 ECU DEFECT	Internal electronics failure → engine does not start, electronics faulty, test with engine at standstill only	Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
143	<i>(Not used)</i>				
144	BANK2 ECU DEFECT	Internal electronics failure → engine does not start, electronics faulty, test with engine at standstill only	Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
145	15V_GOOD ECU DEFECT	Internal electronics fault → engine stop due to electro- nics failure	Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
146	<i>(Not used)</i>				
147	AD-TEST1 ECU DEFECT	Internal electronics failure → engine stop due to elec- tronics failure	Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
148	<i>(Not used)</i>				
149	AD-TEST2 ECU DEFECT	Internal electronics failure → engine stop due to elec- tronics failure	Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
150	<i>(Not used)</i>				
151	AD-TEST3 ECU DEFECT	Internal electronics failure → engine stop due to elec- tronics failure	Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
152	<i>(Not used)</i>				
153	<i>(Not used)</i>				
154	<i>(Not used)</i>				
155	<i>(Not used)</i>				
156	<i>(Not used)</i>				
157	<i>(Not used)</i>				
158	<i>(Not used)</i>				
159	<i>(Not used)</i>				
160	<i>(Not used)</i>				

No.	Fault display	Meaning/cause	Counteraction	2000	4000
161	(Not used)				
162	(Not used)				
163	(Not used)				
164	(Not used)				
165	(Not used)				
166	(Not used)				
167	(Not used)				
168	(Not used)				
169	(Not used)				
170	MI MODULE FAIL	Module in maintenance indicator faulty or missing	Check whether the MI is properly installed ▶ Electronics service	✓	✓
171	MI NOT ACTIVE	Maintenance indicator no longer active	Check whether the MI is properly installed ▶ Electronics service	✓	✓
172	(Not used)				
173	MODULE WRITE LIMIT	EEPROM write limit reached	▶ Electronics service	✓	✓
174	(Not used)				
175	(Not used)				
176	(Not used)				
177	(Not used)				
178	(Not used)				
179	(Not used)				
180	CAN1 NODE LOST	At least one Alive PDU on CAN 1 monitored by the ECU is missing → connected device out of order		✓	✓
181	CAN2 NODE LOST	At least one Alive PDU on CAN 2 monitored by the ECU is missing → connected device out of order		✓	✓
182	(Not used)				

No.	Fault display	Meaning/cause	Counteraction	2000	4000
183	CAN NO PU-DATA	A CAN mode is selected in which communication is initialized with the help of the PU data module. However, the required PU data module is missing or invalid.	Test the devices connected to the CAN Download again via BDM ▶ Electronics service	✓	✓
184	CAN PU-DATA EE-FAIL	A programming error occurred in one or both modules on attempting to copy a received PU data module in both EEPROM modules.	▶ Electronics service	✓	✓
185	CAN LESS MAILBOXES	Insufficient receiving mailboxes ready on one or both CAN controllers on initializing the receiving identifiers.	▶ Electronics service	✓	✓
186	CAN1 BUS OFF	CAN controller 1 in bus off state → automatic switching to CAN 2	Causes are e.g. short-circuit, major disruptions or baud rate incompatibility	✓	✓
187	CAN1 ERROR PASSIVE	CAN controller 1 has signalled a warning	Causes are e.g. missing nodes, minor disruptions or temporary bus overloading	✓	✓
188	CAN2 BUS OFF	CAN controller 2 in bus off state → automatic switching to CAN 1	Causes are e.g. short-circuit, major disruptions or baud rate incompatibility	✓	✓
189	CAN2 ERROR PASSIVE	CAN controller 2 has signalled a warning	Causes are e.g. missing nodes, minor disruptions or temporary bus overloading	✓	✓
190	<i>(Not used)</i>				
191	<i>(Not used)</i>				
192	<i>(Not used)</i>				
193	<i>(Not used)</i>				
194	<i>(Not used)</i>				
195	<i>(Not used)</i>				
196	<i>(Not used)</i>				

No.	Fault display	Meaning/cause	Counteraction	2000	4000
197	(Not used)				
198	(Not used)				
199	(Not used)				
200	(Not used)				
201	SD T-COOLANT	Sensor defect (coolant temperature)	Short-circuit or wire breakage, check sensor and wiring to B6 ▶ Electronics service	✓	✓
202	SD T-FUEL	Sensor defect (fuel temperature)	Short-circuit or wire breakage, check sensor and wiring to B33 ▶ Electronics service	✓	✓
203	SD T-CHARGE AIR	Sensor defect (charge air temperature)	Short-circuit or wire breakage, check sensor and wiring to B9 ▶ Electronics service	✓	✓
204	(Not used)				
205	SD T-COOLANT INTERC.	Sensor defect (charge air coolant temperature)	Short-circuit or wire breakage, check sensor and wiring to B26 ▶ Electronics service	✓	✓
206	(Not used)				
207	(Not used)				
208	SD P-CHARGE AIR	Sensor defect (charge pressure)	Short-circuit or wire breakage, check sensor and wiring to B10 ▶ Electronics service	✓	✓
209	(Not used)				
210	(Not used)				
211	SD P-LUBE OIL	Sensor defect (lube oil pressure)	Short-circuit or wire breakage, check sensor and wiring to B5 ▶ Electronics service	✓	✓
212	(Not used)				
213	(Not used)				
214	(Not used)				

No.	Fault display	Meaning/cause	Counteraction	2000	4000
215	SD P-RAIL FUEL	Sensor defect (Rail pressure) → high pressure governor emergency operation	Short-circuit or wire breakage, check sensor and wiring to B48 ▶ Electronics service		✓
216	SD T-LUBE OIL	Sensor defect (lube oil temperatur)	Short-circuit or wire breakage, check sensor and wiring to B7 ▶ Electronics service	✓	✓
217	<i>(Not used)</i>				
218	<i>(Not used)</i>				
219	<i>(Not used)</i>				
220	SD COOLANT LEVEL	Sensor defect (coolant level)	Short-circuit or wire breakage, check sensor and wiring to F33 ▶ Electronics service Note: If a sensor cable connector has been temporarily disconnected and then reconnected (e.g. next to the ECU), this fault message is signalled for a further approx. 60 min. The fault can be immediately cleared by switching the system off and back on.	✓	✓
221	<i>(Not used)</i>				
222	<i>(Not used)</i>				
223	SD LEVEL INTER-COOLER	Sensor defect (charge air coolant level)	Short-circuit or wire breakage, check sensor and wiring to F57 ▶ Electronics service Note: If a sensor cable connector has been temporarily disconnected and then reconnected (e.g. next to the ECU), this fault message is signalled for a further approx. 60 min. The fault can be immediately cleared by switching the system off and back on.		✓
224	<i>(Not used)</i>				

No.	Fault display	Meaning/cause	Counteraction	2000	4000
225	(Not used)				
226	(Not used)				
227	(Not used)				
228	(Not used)				
229	SD ENG.SPEED SENSORS	Sensor defect crankcase speed and sensor defect camshaft speed	Compare alarms 230 and 231	✓	✓
230	SD CRANKSHAFT SPEED	Sensor defect (crankshaft speed)	Short-circuit or wire breakage, check sensor and wiring to B13 ▶ Electronics service	✓	✓
231	SD CAMSHAFT SPEED	Sensor defect (camshaft speed)	Short-circuit or wire breakage, check sensor and wiring to B1 ▶ Electronics service	✓	✓
232	(Not used)				
233	(Not used)				
234	(Not used)				
235	(Not used)				
236	(Not used)				
237	(Not used)				
238	(Not used)				
239	(Not used)				
240	SD P-FUEL	Sensor defect (fuel pressure)	Short-circuit or wire breakage, check sensor and wiring to B34 ▶ Electronics service		✓
241	(Not used)				
242	(Not used)				
243	(Not used)				
244	(Not used)				

No.	Fault display	Meaning/cause	Counteraction	2000	4000
245	SD POWER SUPPLY	Internal ECU failure	Electronics faulty Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
246	SD T-ELECTRONIC	Internal ECU failure	Electronics faulty Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
247	<i>(Not used)</i>				
248	<i>(Not used)</i>				
249	<i>(Not used)</i>				
250	SD CAN SPEED DEMAND	Sensor defect CAN (Speed Demand) → no set speed signal, the speed is either set to a fault value (MP 180.05) or remains set to the actual speed depending on the setting at MP 180.14.		✓	✓
251	<i>(Not used)</i>				
252	<i>(Not used)</i>				
253	<i>(Not used)</i>				
254	<i>(Not used)</i>				
255	<i>(Not used)</i>				
256	<i>(Not used)</i>				
257	<i>(Not used)</i>				
258	<i>(Not used)</i>				
259	<i>(Not used)</i>				
260	<i>(Not used)</i>				
261	<i>(Not used)</i>				
262	<i>(Not used)</i>				
263	<i>(Not used)</i>				
264	<i>(Not used)</i>				

No.	Fault display	Meaning/cause	Counteraction	2000	4000
265	(Not used)				
266	SD SPEED DEMAND AN.	Sensor defect (analog speed setting) → speed is set to a fault value or remains set to the actual speed (adjustable, MP 180.14)	Short-circuit or wire breakage, check set speed transmitter and wiring ◆ Electronics service	✓	✓
267	SD SP.DEM.TEST BENCH	Used in test stand mode only: Sensor defect (analog speed setting) → speed is set to a fault value or remains set to the actual speed (adjustable, MP 180.14)	Short-circuit or wire breakage, check set speed transmitter and wiring ◆ Electronics service	✓	✓
268	(Not used)				
269	(Not used)				
270	(Not used)				
271	SD T-EXTERN 1	Missing Data CAN (T-EXTERN 1)	◆ Electronics service (external device faulty)	✓	✓
272	SD T-EXTERN 2	Missing Data CAN (T-EXTERN 2)	◆ Electronics service (external device faulty)	✓	✓
273	SD P-EXTERN 1	Missing Data CAN (P-EXTERN 1)	◆ Electronics service (external device faulty)	✓	✓
274	SD P-EXTERN 2	Missing Data CAN (P-EXTERN 2)	◆ Electronics service (external device faulty)	✓	✓
275	SD EXT.COOLANT LEVEL	Missing Data CAN (EXT.COOLANT LEVEL)	◆ Electronics service (external device faulty)	✓	✓
276	SD INTERCOOLER LEVEL	Missing Data CAN (charge air coolant level)	◆ Electronics service (external device faulty)	✓	✓
277	SD BIN-EXTERN 3	Missing Data CAN (BIN-EXTERN 3)	◆ Electronics service (external device faulty)	✓	✓
278	SD BIN-EXTERN 4	Missing Data CAN (BIN-EXTERN 4)	◆ Electronics service (external device faulty)	✓	✓
279	(Not used)				
280	(Not used)				
281	(Not used)				
282	(Not used)				
283	(Not used)				

No.	Fault display	Meaning/cause	Counteraction	2000	4000
284	(Not used)				
285	(Not used)				
286	(Not used)				
287	(Not used)				
288	(Not used)				
289	(Not used)				
290	(Not used)				
291	(Not used)				
292	(Not used)				
293	(Not used)				
294	(Not used)				
295	(Not used)				
296	(Not used)				
297	(Not used)				
298	(Not used)				
299	(Not used)				
300	(Not used)				
301	TIMING CYLINDER A1	Cylinder A1: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
302	TIMING CYLINDER A2	Cylinder A2: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
303	TIMING CYLINDER A3	Cylinder A3: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ or -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
304	TIMING CYLINDER A4	Cylinder A4: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
305	TIMING CYLINDER A5	Cylinder A5: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
306	TIMING CYLINDER A6	Cylinder A6: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
307	TIMING CYLINDER A7	Cylinder A7: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
308	TIMING CYLINDER A8	Cylinder A8: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
309	TIMING CYLINDER A9	Cylinder A9: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
310	TIMING CYLINDER A10	Cylinder A10: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
311	TIMING CYLINDER B1	Cylinder B1: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
312	TIMING CYLINDER B2	Cylinder B2: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
313	TIMING CYLINDER B3	Cylinder B3: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
314	TIMING CYLINDER B4	Cylinder B4: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
315	TIMING CYLINDER B5	Cylinder B5: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
316	TIMING CYLINDER B6	Cylinder B6: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
317	TIMING CYLINDER B7	Cylinder B7: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
318	TIMING CYLINDER B8	Cylinder B8: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
319	TIMING CYLINDER B9	Cylinder B9: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
320	TIMING CYLINDER B10	Cylinder B10: -FPGA fault status = 2 -Time-of-flight $t < 600 \mu\text{s}$ -Time-of-flight $t > 1400 \mu\text{s}$	Replace solenoid valve if this occurs frequently ◆ Engine documentation	✓	✓
321	WIRING CYLINDER A1	Cabling fault cylinder A1 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
322	WIRING CYLINDER A2	Cabling fault cylinder A2 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
323	WIRING CYLINDER A3	Cabling fault cylinder A3 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
324	WIRING CYLINDER A4	Cabling fault cylinder A4 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
325	WIRING CYLINDER A5	Cabling fault cylinder A5 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
326	WIRING CYLINDER A6	Cabling fault cylinder A6 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
327	WIRING CYLINDER A7	Cabling fault cylinder A7 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
328	WIRING CYLINDER A8	Cabling fault cylinder A8 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
329	WIRING CYLINDER A9	Cabling fault cylinder A9 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
330	WIRING CYLINDER A10	VCabling fault cylinder A10 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
331	WIRING CYLINDER B1	Cabling fault cylinder B1 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
332	WIRING CYLINDER B2	Cabling fault cylinder B2 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
333	WIRING CYLINDER B3	Cabling fault cylinder B3 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
334	WIRING CYLINDER B4	Cabling fault cylinder B4 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
335	WIRING CYLINDER B5	Cabling fault cylinder B5 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
336	WIRING CYLINDER B6	Cabling fault cylinder B6 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
337	WIRING CYLINDER B7	Cabling fault cylinder B7 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
338	WIRING CYLINDER B8	Cabling fault cylinder B8 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
339	WIRING CYLINDER B9	Cabling fault cylinder B9 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ▶ Engine documentation	✓	✓
340	WIRING CYLINDER B10	Cabling fault cylinder B10 → misfiring	SV short-circuit or +SV line shorted to electronic ground (Requirement: Engine block grounded) Replace solenoid valve or cable harness ▶ Engine documentation	✓	✓
341	OPEN_LOAD CYL. A1	Fault (interruption) in cabling of cylinder A1 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ▶ Engine documentation	✓	✓
342	OPEN_LOAD CYL. A2	Fault (interruption) in cabling of cylinder A2 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ▶ Engine documentation	✓	✓
343	OPEN_LOAD CYL. A3	Fault (interruption) in cabling of cylinder A3 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ▶ Engine documentation	✓	✓
344	OPEN_LOAD CYL. A4	Fault (interruption) in cabling of cylinder A4 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ▶ Engine documentation	✓	✓
345	OPEN_LOAD CYL. A5	Fault (interruption) in cabling of cylinder A5 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ▶ Engine documentation	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
346	OPEN_LOAD CYL. A6	Fault (interruption) in cabling of cylinder A6 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
347	OPEN_LOAD CYL. A7	Fault (interruption) in cabling of cylinder A7 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
348	OPEN_LOAD CYL. A8	Fault (interruption) in cabling of cylinder A8 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
349	OPEN_LOAD CYL. A9	Fault (interruption) in cabling of cylinder A9 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
350	OPEN_LOAD CYL. A10	Fault (interruption) in cabling of cylinder A10 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
351	OPEN_LOAD CYL. B1	Fault (interruption) in cabling of cylinder B1 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
352	OPEN_LOAD CYL. B2	Fault (interruption) in cabling of cylinder B2 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
353	OPEN_LOAD CYL. B3	Fault (interruption) in cabling of cylinder B3 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
354	OPEN_LOAD CYL. B4	Fault (interruption) in cabling of cylinder B4 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
355	OPEN_LOAD CYL. B5	Fault (interruption) in cabling of cylinder B5 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
356	OPEN_LOAD CYL. B6	Fault (interruption) in cabling of cylinder B6 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
357	OPEN_LOAD CYL. B7	Fault (interruption) in cabling of cylinder B7 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
358	OPEN_LOAD CYL. B8	Fault (interruption) in cabling of cylinder B8 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓
359	OPEN_LOAD CYL. B9	Fault (interruption) in cabling of cylinder B9 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ◆ Engine documentation	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
360	OPEN_LOAD CYL. B10	Fault (interruption) in cabling of cylinder B10 → misfiring	Check cabling and solenoid valve for interruption Replace solenoid valve or cable harness ▶ Engine documentation	✓	✓
361	POWER STAGE FAIL 1	Internal electronics failure (if fault permanently applied) → possible quantity limitation	PA circuit faulty or free-wheeling transistor short-circuit Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
362	POWER STAGE FAIL 2	Internal electronics failure (if fault permanently applied) → possible quantity limitation	PA circuit faulty or free-wheeling transistor short-circuit Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
363	STOP POWER STAGE 1	Internal electronics failure (FPGA messages 4,5,9,11,12) → engine stop	1. SV line shorted to electronic ground by resistance less than 1 Ohm (engine block applied to electronic ground) Replace cable harness ▶ Engine documentation 2. Electronics faulty Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
364	STOP POWER STAGE 2	Internal electronics failure (FPGA messages 4,5,9,11,12) → engine stop	1. SV line shorted to electronic ground by resistance less than 1 Ohm (engine block applied to electronic ground) Replace cable harness ▶ Engine documentation 2. Electronics faulty Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
365	STOP MV-WIRING	Solenoid valve wiring fault → engine stop	SV line shorted to electronic ground (engine block applied to electronic ground) Replace cable harness ▶ Engine documentation	✓	✓
366	(Not used)				
367	(Not used)				
368	(Not used)				
369	(Not used)				
370	(Not used)				
371	(Not used)				
372	(Not used)				
373	(Not used)				
374	(Not used)				
375	(Not used)				
376	(Not used)				
377	(Not used)				
378	(Not used)				
379	(Not used)				
380	(Not used)				
381	TRAN.OUT1 PLANT DEF	TAA1 faulty	1. Wire breakage or short-circuit Replace cable harness ▶ Engine documentation 2. Electronics faulty Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
382	TRAN.OUT2 PLANT DEF	TAA2 faulty	1. Wire breakage or short-circuit Replace cable harness ▶ Engine documentation 2. Electronics faulty Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
383	TRAN.OUT3 PLANT DEF	TAA3 faulty	1. Wire breakage or short-circuit Replace cable harness ▶ Engine documentation 2. Electronics faulty Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
384	TRAN.OUT4 PLANT DEF	TAA4 faulty	1. Wire breakage or short-circuit Replace cable harness ▶ Engine documentation 2. Electronics faulty Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
385	TRAN.OUT5 PLANT DEF	TAA5 faulty	1. Wire breakage or short-circuit Replace cable harness ▶ Engine documentation 2. Electronics faulty Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓

No.	Fault display	Meaning/cause	Counteraction	2000	4000
386	TRAN.OUT6 PLANT DEF	TAA6 faulty	1. Wire breakage or short-circuit Replace cable harness ▶ Engine documentation 2. Electronics faulty Replace Engine Control Unit ECU See ID: T-E-G24-0001 Page 40	✓	✓
387	<i>(Not used)</i>				
388	<i>(Not used)</i>				
389	<i>(Not used)</i>				
390	<i>(Not used)</i>				
391	<i>(Not used)</i>				
392	<i>(Not used)</i>				
393	<i>(Not used)</i>				
394	<i>(Not used)</i>				
395	<i>(Not used)</i>				
396	<i>(Not used)</i>				
397	<i>(Not used)</i>				
398	<i>(Not used)</i>				
399	<i>(Not used)</i>				