

## 5.3 Error codes

### General

An error code indicates that there is some malfunction in the machine. The error codes must be used by operators and service technicians to identify the problem and to select a suitable action.

In case of an error code indication, it is very important to identify the error code and to perform an action to correct the problem.

### Actions with error codes



## WARNING

**Stop alarms indicate a malfunction in the machine which may affect safety of the operator and others in the vicinity or may cause a breakdown. – Read off the error code, Switch off the engine and carry out actions according to the error code table.**

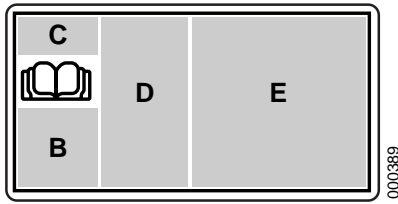
**Warning and information alarms indicate malfunctions of such character that work does not have to be stopped. The machine's capacity may be limited and certain functions may not work. – Carry out actions according to the error code table as soon as possible.**

- 1 Stop the machine and identify the error code level and special error code number, see section *Error code indication page 107*. Stop the engine in the event of a Stop alarm or let the engine run in the event of Warning or Information alarms.

### NOTE

*In the event of a serious malfunction, the engine will be emergency stopped. After an emergency stop it is possible to restart the engine for approx. 25 seconds to move the machine from an unsuitable position.*

*If several error codes come from the engine, these are shown rolling, that is, all active error codes are displayed in the same field at approx 1s intervals.*



- 2 The error code is shown automatically on the display.

Note all error codes. For explanation, see *Display figure for error code information page 108*.

Scroll between the error codes using the right or left arrow keys. Error code information disappears once its cause has been remedied.

Deactivate display of error codes by pressing the Reset (R) function key:

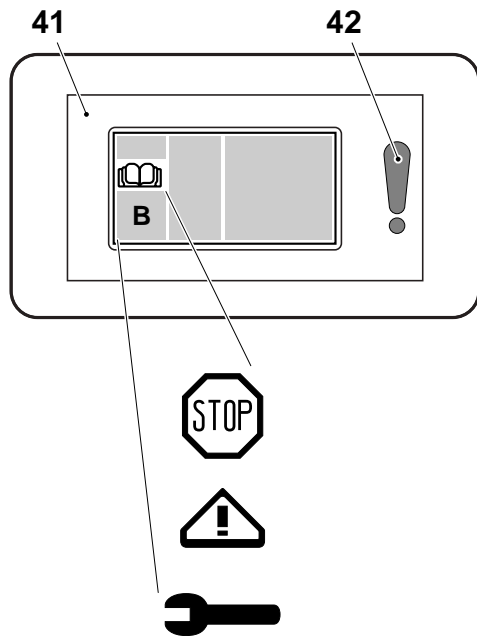
- In the event of Stop: If the cause of the error code remains, the error code will reappear within one minute.
- In the event of Warning or Information: If the cause of the error code remains, the error code will reappear within three minutes.
- If the cause of the error code is gone, error code display will automatically deactivate within 30 seconds.

- 3 Park the machine in a suitable location.

For error code level “STOP” – Stop the engine.

For error code level “WARNING” or “INFORMATION” – Leave the engine running or switch the machine off.

- 4 Read the information for the error code/error codes in the error code table and perform the recommended actions.
  - *Error codes Control unit EDU 795 (KCS display) page 112*
  - *Error codes control unit ECU 790 page 112*
  - *Error codes control unit ECU 796 page 114*
  - *Error codes control unit ECU 792 page 117*
  - *Error codes engine page 118*
  - *Error codes transmission page 130*
- 5 Restart the engine and check in the display that error codes are gone according to step 2.



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B. Error code level symbol

41. Display for the control and monitoring system (KCS)

42. Indicator for the control and monitoring system (KCS)

### 5.3.1 Error code indication

#### General

An error code is indicated by a lit indicator for active error codes (position 42). Error codes are classified into three levels based on severity.

The error code levels are indicated as follows:

- STOP is indicated with a STOP sign on the display, together with continuous red light from the indicator control and monitoring system (position 42).

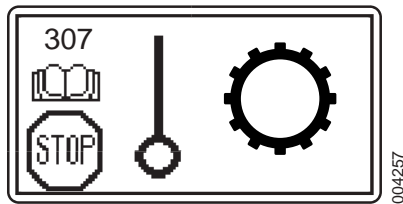
Error code with level Stop is shown automatically on the display.

- Warning is indicated by a warning triangle in the display together with a steady red glow from the indicator for the control and monitoring system (position 42).

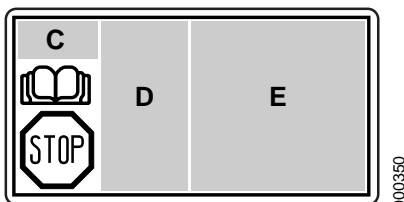
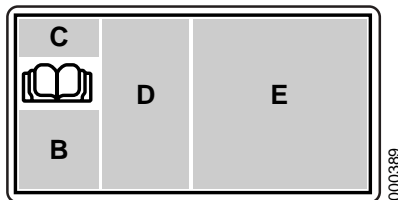
Error code with level Warning is shown automatically on display.

- Information is indicated by a spanner in the display together with a constant red light from the indicator for the control and monitoring system (position 42).

Error code with level Information is shown automatically in the display.



Example figure, automatic display figure



## 5.3.2 Error code information in display

### Error code display

Error code information is shown with display figures and symbols that indicate what error has occurred.

The error codes and images can be temporarily removed using the Reset (R) function key, at which time they disappear from the display. If the error code is active, it reappears in the display within 1-3 minutes.

### NOTE

*If error code disappears automatically, it may be due to the following:*

- *the output signal that generated the error code is no longer active, e.g. the control lever has been released or the engine is off.*
- *loose connection.*

### Display figure for error code information

The control and monitoring system's display is divided into four fields where the information is shown (see figure to the left).

- Field B: Error code level is shown with a symbol.
- Field C: Shows error code.
- Field D: Shows type of error.
- Field E: Indicates which function is affected by the error code.
- The book symbol means that information is available in the Operator's manual.

### Field B: Error code level

The control and monitoring system gives error code information in three levels, which are indicated with a symbol in the lower left corner (B) on the display unit.

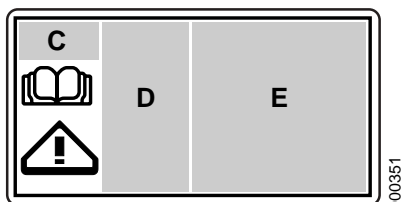
### STOP

Indicates a serious malfunction that may affect operator safety or cause machine breakdown. The error code must be rectified immediately. Stop working with the machine and call a service technician as soon as possible.

The error code is shown automatically in the display.

### Actions at STOP:

- A. Park the machine immediately.  
Note the error code number.
- B. Switch off the engine.
- C. Contact service.



### WARNING

Indicates a malfunction in the machine that should be attended to as soon as possible. A service technician should be called as soon as possible after finished work shift.

The error code is shown automatically in the display.

#### Actions at Warning:

- A. Rectify the error code as soon as possible but work with the machine can continue safely.
- B. See information in error code table
  - *Error codes Control unit EDU 795 (KCS display) page 112*
  - *Error codes control unit ECU 790 page 112*
  - *Error codes control unit ECU 796 page 114*
  - *Error codes control unit ECU 792 page 117*
  - *Error codes engine page 118*
  - *Error codes transmission page 130*

If the error code number is not in the error code table, rectify according to step C.
- C. Contact service, for example after a completed shift.

### INFORMATION

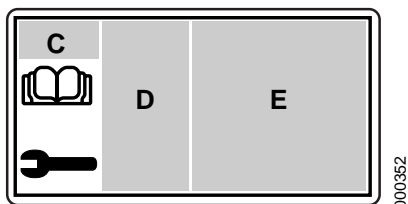
Information for the operator that something should be attended to, for example, low fuel level. Take appropriate action to eliminate error code condition as soon as possible. See chapter 6 *Inspection and maintenance*.

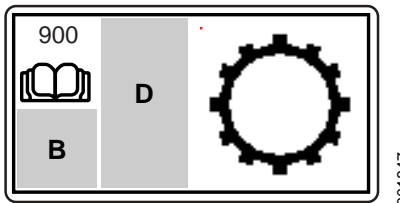
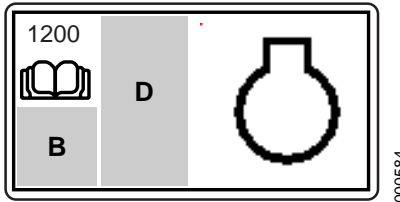
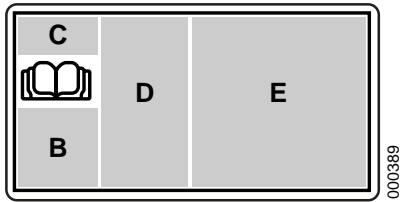
The error code is shown automatically in the display.

#### Actions at information

- A. Continued work with the machine.
- B. At a suitable point, see information in error code table
  - *Error codes Control unit EDU 795 (KCS display) page 112*
  - *Error codes control unit ECU 790 page 112*
  - *Error codes control unit ECU 796 page 114*
  - *Error codes control unit ECU 792 page 117*
  - *Error codes engine page 118*
  - *Error codes transmission page 130*

If the error code number is not in the error code table, rectify according to step C.
- C. Contact service, for example after a completed shift.





**Field C: Error code number**

The control and monitoring system generates error codes from three sub-systems:

- Machine:  
Shown with error code XXX in the display, see *Error codes Control unit EDU 795 (KCS display) page 112*, *Error codes control unit ECU 790 page 112*, *Error codes control unit ECU 796 page 114* and *Error codes control unit ECU 792 page 117*.

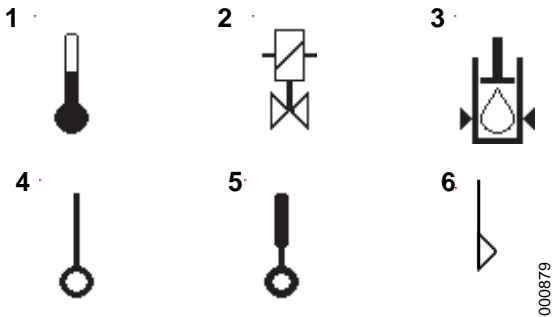
- Engine  
Shown with code 1200 and error code number X.X.X (position D) in display, see *Error codes engine page 118*.

**NOTE**

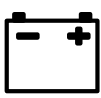




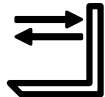

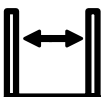
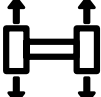



















*If several error codes come from the engine, these are shown rolling, that is, all active error codes are displayed in the same field at approx 1s intervals.*

- Transmission:  
Shown with code 900 and error code number (position D) and error code level (position B) in the display. If more error codes are generated by the transmission they are displayed as rolling at approx 1s intervals. For error code table, see *Error codes transmission page 130*.

**Field D: Type of error**



1. Too high/too low temperature.
2. Incorrect signal to solenoid.
3. Incorrect hydraulic pressure
4. Incorrect sensor signal.
5. Incorrect signal from control.
6. Too high/too low level.

|    |   |    |   |    |   |  |
|----|---|----|---|----|---|--|
| 1  |    | 2  |    | 3  |    | Field E: Indicates which function is affected by the error code. |
| 4  |    | 5  |    | 6  |    | 1. Battery voltage.  |
| 7  |    | 8  |    | 9  |    | 2. Hydraulic functions.  |
| 10 |    | 11 |    | 12 |    | 3. Communication.  |
| 13 |    | 14 |    | 15 |    | 4. ECU hardware defect.  |
| 16 |   | 17 |   | 18 |   | 5. Lift up/down.   |
| 19 |  | 20 |  | 21 |  | 6. Forks tilt.   |
| 22 |  | 23 |  | 24 |  | 7. Forks side shift.   |
| 25 |  | 26 |  | 27 |  | 8. Forks spreading.  |
| 28 |  |    |   |    |   | 9. Levelling.  |

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### 5.3.3 Error code tables

#### General

Error codes are arranged in numerical order. The error code tables contain the following information:

- Code –shows error code.
- Description – Gives description of error code and any limits to the machine that occur in connection with the relevant error code.
- Action - Shows STOP/WARNING/INFORMATION for action according to the error code level, with or without detailed information.

If the error code is not in the tables, contact service.

#### Error codes Control unit EDU 795 (KCS display)

Table 1. Error codes for EDU 795

| Code | Description   | Action      |
|------|---|-------------|
| 1    | Time for service interval has been exceeded.  | INFORMATION |
| 10   | Communication error ECU 790. Impossible to continue operation.                              | STOP!       |
| 11   | Communication, defective cable ECU 790 - EDU 795. Impossible to continue operation.         | WARNING!    |
| 12   | Communication error ECU 793.  | STOP!       |
| 13   | Communication error ECU 794.  | STOP!       |
| 14   | Communication ECU 796, no reply.  | STOP!       |
| 15   | Communication, defective cable ECU 795 - ECU 796.   | WARNING!    |
| 16   | Communication, defective cable ECU 796 - ECU 790.   | WARNING!    |
| 17   | Memory error, check sum EDU 795. Impossible to continue operation, display not functioning. | WARNING!    |
| 18   | Communication ECU 792, no reply.  | STOP!       |

#### Error codes control unit ECU 790

Table 2. Error codes ECU 790

| Code | Description  | Action   |
|------|--|--|
| 301  | Power supply error ECU 790. Reduction of engine rpm.           | STOP: Check fuses according to the Operator's manual, and the battery voltage and acidity. Contact service if the fault remains. |
| 303  | Reference voltage error, 5V, ECU 790. Reduction of engine rpm. | STOP!  |
| 304  | Sensor malfunction for electric scales.                        | WARNING!   |
| 305  | Speed sensor malfunction. Reduction of engine rpm.             | STOP!  |
| 306  | Engine rpm sensor malfunction. Reduction of engine rpm.        | STOP!  |



| Code | Description  | Action  |
|------|--|---|
| 307  | Gear selector malfunction. Reduction of engine rpm.  | STOP!   |
| 320  | Sensor malfunction hydrostatic operating pressure (forward). Reduction of engine rpm.                      | STOP!   |
| 321  | Sensor malfunction hydrostatic operating pressure (reverse). Reduction of engine rpm.                      | STOP!   |
| 322  | Malfunction of lift lever's hydraulic pressure sensor. Engine rpm does not increase when using lift lever. | WARNING!  |
| 323  | Short-circuit or open circuit, output signal EDC valve pump (forward). Reduction of engine rpm.            | STOP!   |
| 324  | Short-circuit or open circuit, output signal EDC valve pump (reverse). Reduction of engine rpm.            | STOP!   |
| 325  | Short-circuit or open circuit, output signal PDC valve hydraulic motor. Reduction of engine rpm.           | STOP!   |
| 350  | Battery voltage low.   | WARNING!  |
| 351  | Battery voltage high.  | WARNING!  |
| 352  | Fuel level low. Possible to continue operation.  | INFORMATION! Fill with fuel.  |
| 353  | Sensor malfunction fuel level. Possible to continue operation.   | INFORMATION!  |
| 354  | Coolant level low. Reduction of engine rpm.  | STOP! Fill with coolant.  |
| 355  | Hydraulic oil temperature high.  | WARNING! Do not use hydraulic functions until the hydraulic oil temperature falls below 70°C. Contact service if the fault remains.   |
| 356  | Sensor error, hydraulic oil temperature. Possible to continue operation.                                   | INFORMATION!  |
| 357  | Brake system, accumulator pressure low. Reduction of engine rpm.   | STOP! The pressure in the accumulator, that is, the brake pressure is too low and the service brake capacity is limited.<br><br>Check the accumulators' sealing if the pressure does not build up and is not maintained, see chapter 6 <i>Inspection and maintenance</i> . Contact service. |
| 370  | Particle filter engine. Clean within 30 minutes.   | INFORMATION! Clean particle filter within 30 minutes. See section 5.4.9 <i>Stopping machine - parking</i> or see separate manual for particle filter.   |
| 371  | Particle filter engine. Clean immediately. Reduction of engine rpm.  | STOP! Clean particle filter. See section 5.4.9 <i>Stopping machine - parking</i> or see separate manual for particle filter.  |

| Code | Description  | Action   |
|------|--|--|
| 372  | Particle filter engine. High pressure. Reduction of engine rpm.  | STOP! Clean particle filter. See section 5.4.9 <i>Stopping machine - parking</i> or see separate manual for particle filter. |
| 380  | Error, accelerator pedal (Left Front). Reduction of engine rpm.  | STOP!  |
| 381  | Error, accelerator pedal (Right Front). Reduction of engine rpm.   | STOP!  |
| 382  | Error, accelerator pedal LR (Left Rear). Reduction of engine rpm.  | STOP!  |
| 383  | Error, accelerator pedal RR (Right Rear). Reduction of engine rpm.   | STOP!  |
| 384  | Error, servo motor for injector pump engine. Reduction of engine rpm.                                      | STOP!  |
| 390  | Error on valve for variable pump for Optimum speed/Optimum rev, short-circuit or open circuit at terminal. | WARNING!   |
| 400  | Reversible driver's seat. Defective sensor. Only forward operation is possible.                            | WARNING! Stop the machine. Turn the driver's seat to position for forward operation. Contact service.                        |
| 401  | Overload lift and tilt. Reduction of speed.  | WARNING!   |
| 402  | Parking brake error. The parking brake cannot be released.   | STOP!  |
| 404  | Defective coolant level sensor.  | WARNING!   |
| 405  | Defective position sensor for seat reversing. Limitation of function.                                      | WARNING!   |
| 406  | Signal error from power cell stub axle or tilt cylinder Overload protection does not work.                 | WARNING!   |

### Error codes control unit ECU 796

Table 3. Error codes ECU 796

| Code | Description  | Action  |
|------|--|---|
| 601  | Voltage feed error, ECU 796.   | STOP!   |
| 602  | Memory error, check sum ECU 796.                                     | STOP! Restart ECU 796 by switching the ignition off and on, load the program. Contact service if the fault remains.               |
| 603  | Reference voltage 10 V error, ECU 796.                               | STOP!   |
| 604  | Voltage feed error PWM outputs, ECU 796. Hydraulics not functioning. | INFORMATION! Turn off the hydraulic functions. For electric servo, check if the breaker switch for load handling is pressed down. |
| 605  | Communication error XA-PWM, K2. Hydraulic functions not functioning. | INFORMATION! Restart ECU 796 by switching the ignition on and off. Contact service if the fault remains.                          |

| Code | Description   | Action   |
|------|---|--|
| 606  | Communication error XA-PWM, K3. Hydraulic functions not functioning.  | INFORMATION! Restart ECU 796 by switching the ignition on and off. Contact service if the fault remains. |
| 610  | Input signal from lever for hydraulic function 1 error. Hydraulic function 1 not functioning.                                   | INFORMATION! Do not use hydraulic function 1.  |
| 611  | Input signal from lever for hydraulic function 2 error. Hydraulic function 2 not functioning.                                   | INFORMATION! Do not use hydraulic function 2.  |
| 612  | Input signal from lever for hydraulic function 3 error. Hydraulic function 3 not functioning.                                   | INFORMATION! Do not use hydraulic function 3.  |
| 613  | Input signal from lever for hydraulic function 4 error. Hydraulic function 4 not functioning.                                   | INFORMATION! Do not use hydraulic function 4.  |
| 614  | Input signal from lever for hydraulic function 5 error. Hydraulic function 5 not functioning.                                   | INFORMATION! Do not use hydraulic function 5.  |
| 615  | Short-circuit or open-circuit for steering valve hydraulic function 1A at terminal K2:3. Hydraulic function 1 not functioning.  | INFORMATION! Do not use hydraulic function 1.  |
| 616  | Short-circuit or open-circuit for steering valve hydraulic function 1B at terminal K2:4. Hydraulic function 1 not functioning.  | INFORMATION! Do not use hydraulic function 1.  |
| 617  | Short-circuit or open-circuit for steering valve hydraulic function 2A at terminal K2:5. Hydraulic function 2 not functioning.  | INFORMATION! Do not use hydraulic function 2.  |
| 618  | Short-circuit or open-circuit for steering valve hydraulic function 2B at terminal K2:6. Hydraulic function 2 not functioning.  | INFORMATION! Do not use hydraulic function 2.  |
| 619  | Short-circuit or open-circuit for steering valve hydraulic function 3A at terminal K2:7. Hydraulic function 3 not functioning.  | INFORMATION! Do not use hydraulic function 3.  |
| 620  | Short-circuit or open-circuit for steering valve hydraulic function 3B at terminal K2:8. Hydraulic function 3 not functioning.  | INFORMATION! Do not use hydraulic function 3.  |
| 621  | Short-circuit or open-circuit for steering valve hydraulic function 4A at terminal K2:11. Hydraulic function 4 not functioning. | INFORMATION! Do not use hydraulic function 4.  |
| 622  | Short-circuit or open-circuit for steering valve hydraulic function 4B at terminal K2:12. Hydraulic function 4 not functioning. | INFORMATION! Do not use hydraulic function 4.  |
| 623  | Short-circuit or open-circuit for steering valve hydraulic function 5A at terminal K2:13. Hydraulic function 5 not functioning. | INFORMATION! Do not use hydraulic function 5.  |
| 624  | Short-circuit or open-circuit for steering valve hydraulic function 5B at terminal K2:14. Hydraulic function 5 not functioning. | INFORMATION! Do not use hydraulic function 5.  |
| 626  | Sensor error for vertical hold. Vertical hold not functioning.  | INFORMATION: Turn off vertical hold.   |
| 627  | Sensor error for pre-selected lift height. Lifting height pre-selection not functioning.  | INFORMATION! Switch off lifting height pre-selection.  |
| 628  | CTX communication error. Clamping control not responding. Only manual clamping function possible.                               | WARNING! CTX clamping unit not functioning. Select manual clamping control.                              |

| Code | Description   | Action   |
|------|---|--|
| 630  | Defective pressure sensor P1, Clamping attachment. The selected attachment pressure is approximate. WARNING! No automatic pressure increase if the attachment pressure drops. | WARNING! No automatic pressure increase if the attachment pressure drops.                  |
| 631  | Defective pressure sensor P2, Clamping attachment. The selected attachment pressure is approximate. WARNING! No automatic pressure increase if the attachment pressure drops. | WARNING! No automatic pressure increase if the attachment pressure drops. Contact service. |
| 632  | Short-circuit or open circuit in hydraulic function steering valve at terminal K3:3. Hydraulic function clamping attachment not working.                                      | WARNING! Do not use hydraulic function clamping attachment.                                |
| 633  | Short-circuit or open circuit for steering valve attachment pressure ON/OFF. Hydraulic function clamping attachment not working.  | WARNING! Do not use hydraulic function clamping attachment.                                |
| 634  | Short-circuit or open circuit for steering valve left arm ON/OFF. Hydraulic function left arm not working.  | WARNING! Do not use hydraulic function left arm.   |
| 635  | Short-circuit or open circuit for steering valve right arm ON/OFF. Hydraulic function right arm not working.  | WARNING! Do not use hydraulic function right arm.  |
| 636  | Short-circuit or open circuit for steering valve upper left arm ON/OFF. Hydraulic function upper left arm not working.  | WARNING! Do not use hydraulic function upper left arm.                                     |
| 637  | Short-circuit or open circuit for steering valve middle right arm ON/OFF. Hydraulic function middle right arm not working.  | WARNING! Do not use hydraulic function right arm.  |
| 638  | Short-circuit or open circuit for steering valve middle left arm ON/OFF. Hydraulic function middle left arm not working.  | WARNING! Do not use hydraulic function left arm.   |
| 639  | Short-circuit or open circuit for steering valve upper right arm ON/OFF. Hydraulic function upper right arm not working.  | WARNING! Do not use hydraulic function upper right arm.                                    |
| 642  | Pressure sensor clamping attachment opening, defective. Hydraulic function clamping attachment not working.   | WARNING! Do not use hydraulic function clamping attachment.                                |
| 643  | Pressure sensor clamping attachment closing, defective. Hydraulic function clamping attachment not working.   | WARNING! Do not use hydraulic function clamping attachment.                                |
| 644  | Breaker right/left arm defective. Do not use shut-off right/left arm.   | WARNING! Shut-off right/left arm not working.  |
| 645  | Max. load exceeded. Max. speed 1 km/h.  | WARNING! Lower the load.   |
| 646  | Upper left by-pass valve on clamping attachment not working. Hydraulic function clamping attachment left-hand side not working.   | WARNING!   |
| 647  | Middle left by-pass valve on clamping attachment not working. Hydraulic function clamping attachment left-hand side not working.  | WARNING!   |
| 648  | Left sequence valve on clamping attachment not working. Hydraulic function clamping attachment left-hand side not working.  | WARNING!   |
| 650  | Upper right by-pass valve on clamping attachment not working. Hydraulic function clamping attachment right-hand side not working.   | WARNING!   |
| 651  | Middle right by-pass valve on clamping attachment not working. Hydraulic function clamping attachment right-hand side not working.  | WARNING!   |
| 652  | Right sequence valve on clamping attachment not working. Hydraulic function clamping attachment right-hand side not working.  | WARNING!   |

| Code | Description  | Action  |
|------|--|---|
| 654  | Pressure sensor P3 left long arm on clamping attachment defective. Hydraulic function clamping attachment left-hand side not working.    | WARNING!  |
| 655  | Pressure sensor P3 left short arm on clamping attachment defective. Hydraulic function clamping attachment left-hand side not working.   | WARNING!  |
| 656  | Pressure sensor P3 right long arm on clamping attachment defective. Hydraulic function clamping attachment right-hand side not working.  | WARNING!  |
| 657  | Pressure sensor P3 right short arm on clamping attachment defective. Hydraulic function clamping attachment right-hand side not working. | WARNING!  |
| 658  | Fault in switch for selecting clamping pressure. Clamping pressure one is selected.  | WARNING!  |
| 659  | Pressure sensor P1 left arm on clamping attachment defective. No automatic increment of the clamping pressure.                           | WARNING!  |
| 660  | Pressure sensor P2 left arm on clamping attachment defective. No automatic increment of the clamping pressure.                           | WARNING!  |
| 661  | Pressure sensor P1 right arm on clamping attachment defective. No automatic increment of the clamping pressure.                          | WARNING!  |
| 662  | Pressure sensor P3 right arm on clamping attachment defective. No automatic increment of the clamping pressure.                          | WARNING!  |
| 900  | Error code from control unit transmission.   | WARNING! See <i>Error codes transmission page 130</i> . |
| 1200 | Error code from control unit engine.   | WARNING! See <i>Error codes engine page 118</i> .       |

### Error codes control unit ECU 792

Table 4. Error codes ECU 792


| Code | Description  | Action  |
|------|--|---|
| 1501 | Sensor error, steering with feedback. Alternative steering switches off automatically.                                   | STOP! Use standard steering.  |
| 1502 | Joystick error. Alternative steering switches off automatically.   | STOP! Use standard steering.  |
| 1503 | Mini-wheel potentiometer error. Alternative steering switches off automatically.   | STOP! Use standard steering.  |
| 1504 | Short-circuit or open circuit, output signal for right steering valve. Alternative steering switches off automatically.  | STOP! Use standard steering.  |
| 1505 | Short-circuit or open circuit on output signal for left steering valve. Alternative steering switches off automatically. | STOP! Use standard steering.  |
| 1506 | Power supply error, ECU 792. Reduction of engine rpm.  | STOP! Check fuses according to the Operator's manual. Contact service if the fault remains. |
| 1507 | Reference voltage error 5V, ECU 792. Reduction of engine rpm.  | STOP!   |


### Error codes engine

Use the SPN/FMI code when contacting the engine suppliers.

- Display shows error code according to SAE J1939  
SPN/FMI
- J1587 indicates error codes according to SAE J1587 (at Volvo: Vodia).  
PID or SID / FMI (P indicates PID, S indicates SID).

Table 5. Error codes Volvo TAD650VE and TAD750VE

|  |         | Description   | Action  |
|---|---------|---|---|
| SPN/FMI   | J1587   |   |   |
| 94  | PID 94  | Fuel pressure sensor short circuited to positive (+) / minus (-) or open circuit or feed pressure too low.  | WARNING!  |
| 97  | PID 97  | Water in fuel or short-circuit, open circuit, error in indicator.   | WARNING! Drain fuel pre-filter  |
| 100   | PID 100 | Oil pressure sensor short circuited to positive (+) / minus (-) or open circuit or oil pressure too low.  | WARNING! Check the oil level  |
| 102   | PID 102 | Boost pressure sensor short circuited to positive (+) / minus (-) or open circuit. Alternatively for high boost pressure  | WARNING!  |
| 105   | PID 105 | Charge air temperature sensor short circuited to positive (+) / minus (-) or open circuit or coolant temperature too high.  | WARNING! Check the coolant level                                      |
| 106   | PID 106 | Boost pressure sensor short circuited to positive (+) / minus (-) or open circuit. Alternatively for high boost pressure  | WARNING!  |
|   | PID 107 | Air filter sensor short circuited to positive (+) / minus (-) or open circuit.  | WARNING!  |
| 110   | PID 110 | Coolant temperature sensor short circuited to positive (+) / minus (-) or open circuit or coolant temperature too high.   | WARNING! Check the coolant level                                      |
| 111   | PID 111 | Low coolant level   | STOP! Check the coolant level and the coolant level warning function. |
| 111   | PID 111 | Coolant sensor short circuited to positive (+) or fault in sensor.  | WARNING!  |
| 158   | PID 158 | Battery voltage EMS, fault in the alternator, battery or battery cables alternatively battery voltage EMS, short-circuited to minus (-) or fault in the alternator, battery or battery cables | WARNING!  |

|  |                  | Description  | Action                     |
|---|------------------|--|----------------------------|
| SPN/FMI   | J1587            |  |                            |
| 164   | PID 164          | Injection pressure, fault in the fuel supply or in the fuel pump alternatively fault in the cable harnesses or sensor.   | WARNING! Check fuel filter |
| 172   | PID 172          | Air temperature sensor, inlet, short circuited to minus (-) or open circuit.   | WARNING!                   |
| 190   | PID 190          | Engine speed too high  | WARNING!                   |
| 626   | PID 45           | Preheating relay short circuited to positive (+) / minus (-) or open circuit.  | WARNING!                   |
| 629   | SID 254          | Fault in control unit, CIU. Fault in the EEPROM, CIU or flash memory, CIU or fault in the CIU control unit alternatively internal fault in the EMS control unit. | WARNING!                   |
| 636   | SID 21           | RPM sensor, cam wheel, no signal, abnormal frequency or fault in the sensor.   | WARNING!                   |
| 637   | SID 21           | RPM sensor, flywheel, no or intermittent signal from the sensor, abnormal frequency or fault in the sensor.  | WARNING!                   |
| 639   | SID 231          | Fault in data link (CAN), CIU  | WARNING!                   |
| 639   | SID 240          | Memory fault in EMS, memory fault in the EMS engine control module:  | WARNING!                   |
| 639<br>2017   | PSID 231         | Data link (CAN), EMS 2, internal fault in the control module.  | WARNING!                   |
| 651   | SID 1            | Injector cylinder #1, electrical fault or alternatively fault in the compression or injector.  | WARNING!                   |
| 652   | SID 2            | Injector cylinder #2, electrical fault or alternatively fault in the compression or injector.  | WARNING!                   |
| 653   | SID 3            | Injector cylinder #3, electrical fault or alternatively fault in the compression or injector.  | WARNING!                   |
| 654   | SID 4            | Injector cylinder #4, electrical fault or alternatively fault in the compression or injector.  | WARNING!                   |
| 655   | SID 5            | Injector cylinder #5, electrical fault or alternatively fault in the compression or injector.  | WARNING!                   |
| 656   | SID 6            | Injector cylinder #6, electrical fault or alternatively fault in the compression or injector.  | WARNING!                   |
| 677   | SID 39<br>PPID 3 | Start output/Starter motor relay short circuited to positive (+) / minus (-) or activated too long.  | WARNING!                   |
| 679   | SID 42           | Injection pressure, regulator, fault in the cable harnesses or in the actuator.  | WARNING!                   |





|  |         | Description  | Action   |
|---|---------|--|----------|
| SPN/FMI   | J1587   |  |          |
| 679   | PSID 97 | Pressure valve, leakage in PRV (pressure release valve) or PRV has jammed in open/closed position. | WARNING! |
| 729   | SID 70  | Preheating sensor, fault in the cable harnesses or in preheating relay.                            | WARNING! |
| 970   | PPID 6  | Start input CIU, short circuited to minus (-), open circuit or activated too long.                 | WARNING! |
| 1239  | PSID 96 | Pressure in fuel rail, leakage in high pressure fuel system or in high pressure pipe to injector.  | WARNING! |
| 2791  | PPID 19 | Internal EGR, fault in cable harnesses (boost pressure sensor) or mechanical fault in IEGR.        | WARNING! |
| 520195  | PPID 6  | Stop input EMS, short circuited to minus (-) or open circuit.                                      | WARNING! |


Table 6. Error codes Cummins QSB6.7


|  |  | Description   | Action   |
|---|--|---|----------|
| SPN/FMI   |  |   |          |
| 84 / 10   |  | Circuit sensor, engine speed – Abnormally large variations  | WARNING! |
| 84 / 2  |  | Sensor circuit, engine speed - Incorrect, uneven or jerky.  | WARNING! |
| 91 / 0  |  | Position sensor accelerator pedal - Abnormal frequency, pulse width or period time.                           | WARNING! |
| 91 / 1  |  | Position sensor accelerator pedal - Abnormal frequency, pulse width or period time.                           | WARNING! |
| 91 / 19   |  | SAE J1939 multiplexing, system error accelerator sensor - CAN bus data error.                                 | WARNING! |
| 91 / 2  |  | Position sensor accelerator pedal   | WARNING! |
| 91 / 3  |  | Position sensor accelerator pedal, circuit fault- Abnormally high voltage or short circuit to higher voltage. | WARNING! |
| 91 / 4  |  | Position sensor accelerator pedal, circuit fault - Abnormally low voltage or short-circuit to higher voltage. | WARNING! |
| 94 / 1  |  | Fuel pump feed pressure fault - Data applicable, but below normal operating range.                            | WARNING! |
| 94 / 18   |  | Fuel pump feed pressure fault - Data applicable, but below normal operating range.                            | WARNING! |
| 94 / 2  |  | Fuel pressure sensor - Incorrect, uneven or jerky.  | WARNING! |




|  | Description   | Action              |
|---|---|---------------------|
| SPN/FMI   |   |                     |
| 97 / 15   | Water in fuel, indicator high - Data applicable, but above normal operating range.                      | WARNING!            |
| 97 / 3  | Sensor circuit water in fuel- Abnormally high voltage or short-circuit to higher voltage.               | WARNING!            |
| 97 / 4  | Sensor circuit water in fuel- Abnormally low voltage or short-circuit to lower voltage.                 | WARNING!            |
| 100 / 1   | Engine oil pressure low - Data applicable, but above normal operating range.                            | STOP! Very serious! |
| 100 / 18  | Engine oil pressure low - Data applicable, but below normal operating range.                            | WARNING!            |
| 100 / 2   | Pressure sensor engine oil, circuit error - Incorrect, uneven or jerky.                                 | WARNING!            |
| 100 / 3   | Pressure sensor, engine oil, circuit fault- Abnormally high voltage or short-circuit to higher voltage. | WARNING!            |
| 100 / 4   | Pressure sensor, engine oil, circuit fault - Abnormally low voltage or short-circuit to lower voltage.  | WARNING!            |
| 102 / 2   | Pressure sensor circuit inlet manifold - Incorrect, uneven or jerky                                     | WARNING!            |
| 102 / 3   | Pressure sensor inlet manifold - Abnormally high voltage or short-circuit to higher voltage.            | WARNING!            |
| 102 / 4   | Pressure sensor inlet manifold - Abnormally low voltage or short-circuit to lower voltage.              | WARNING!            |
| 103 / 10  | Turbo speed – Abnormally large variations.  | WARNING!            |
| 103 / 16  | Turbo #1 high speed - Data applicable, but above normal operating range.                                | WARNING!            |
| 103 / 18  | Turbo #1 low speed - Data applicable, but below normal operating range.                                 | WARNING!            |
| 105 / 0   | Circuit temperature sensor inlet manifold - Data applicable, but above normal operating range.          | STOP! Very serious! |
| 105 / 15  | Temperature inlet manifold high - Data applicable, but above normal operating range.                    | WARNING!            |
| 105 / 3   | Temperature sensor inlet manifold - Abnormally high voltage or short-circuit to higher voltage.         | WARNING!            |
| 105 / 4   | Temperature sensor inlet manifold - Abnormally low voltage or short-circuit to lower voltage.           | WARNING!            |
| 108 / 2   | Air pressure sensor - Incorrect, uneven or jerky.   | WARNING!            |
| 108 / 3   | Sensor air pressure - Abnormally high voltage or short-circuit to higher voltage.                       | WARNING!            |
| 108 / 4   | Sensor air pressure - Abnormally low voltage or short-circuit to lower voltage.                         | WARNING!            |
| 110 / 0   | Engine coolant temperature high - Data applicable, but above normal operating range.                    | STOP! Very serious! |
| 110 / 15  | Engine coolant temperature high - Data applicable, but above normal operating range.                    | WARNING!            |

|  | Description   | Action              |
|---|---|---------------------|
| SPN/FMI   |   |                     |
| 110 / 16  | Engine coolant temperature high - Data applicable, but above normal operating range.                            | WARNING!            |
| 110 / 2   | Engine coolant sensor, circuit error. - Incorrect, uneven or jerky.   | WARNING!            |
| 110 / 3   | Sensor coolant engine, circuit fault- Abnormally high voltage or short-circuit to higher voltage.               | WARNING!            |
| 110 / 4   | Sensor coolant engine, circuit fault- Abnormally low voltage or short-circuit to lower voltage.                 | WARNING!            |
| 111 / 1   | Coolant level engine low - Data applicable, but below normal operating range.                                   | STOP! Very serious! |
| 111 / 3   | Level sensor coolant circuit - Abnormally high voltage or short-circuit to higher voltage.                      | WARNING!            |
| 111 / 4   | Level sensor coolant circuit - Abnormally low voltage or short-circuit to lower voltage.                        | WARNING!            |
| 157 / 0   | Fuel pressure high - Data applicable, but above normal operating range.   | WARNING!            |
| 157 / 16  | Measurement injection pressure bank 1, high pressure - Data applicable, but above normal operating range.       | WARNING!            |
| 157 / 18  | Measurement injection pressure bank 1, low pressure - Data applicable, but above normal operating range.        | WARNING!            |
| 157 / 2   | Fuel pressure sensor error - Incorrect, uneven or jerky.  | WARNING!            |
| 157 / 3   | Measuring injection pressure bank 1, circuit fault- Abnormally high voltage or short-circuit to higher voltage. | WARNING!            |
| 157 / 4   | Measuring injection pressure bank 1, circuit fault - Abnormally low voltage or short-circuit to lower voltage.  | WARNING!            |
| 167 / 1   | Generator low voltage - Data applicable, but below normal operating range.                                      | STOP! Very serious! |
| 167 / 16  | Generator high voltage - Data applicable, but above normal operating range.                                     | WARNING!            |
| 167 / 18  | Generator low voltage - Data applicable, but below normal operating range.                                      | WARNING!            |
| 168 / 16  | Battery #1 voltage high - Data applicable, but above normal operating range.                                    | WARNING!            |
| 168 / 18  | Battery #1 voltage low - Data applicable, but below normal operating range.                                     | WARNING!            |
| 171 / 3   | Ambient temperature sensor, circuit fault- Abnormally high voltage or short-circuit to higher voltage.          | WARNING!            |
| 171 / 4   | Ambient temperature sensor, circuit fault - Abnormally low voltage or short-circuit to lower voltage.           | WARNING!            |
| 190 / 0   | Engine over-revs - Data applicable, but above normal operating range.   | STOP! Very serious! |
| 190 / 2   | Main Rpm sensor fault - incorrect, uneven or jerky.   | WARNING!            |
| 190 / 2   | Rpm/position sensor - Incorrect, uneven or jerky.   | WARNING!            |

|  | Description  | Action   |
|---|--|----------|
| SPN/FMI   |  |          |
| 251 / 2   | Real-time clock, power supply interruption - Incorrect, uneven or jerky.   | WARNING! |
| 441 / 3   | Reserve temperature sensor circuit - Abnormally high voltage or short-circuit to higher voltage.                               | WARNING! |
| 441 / 4   | Reserve temperature sensor circuit - Abnormally low voltage or short-circuit to lower voltage.                                 | WARNING! |
| 558 / 13  | Idle validation circuit accelerator pedal- Values outside calibration values.  | WARNING! |
| 558 / 2   | Idle validation circuit accelerator pedal - Incorrect, uneven or jerky.  | WARNING! |
| 558 / 4   | Idle validation circuit accelerator pedal - Abnormally low voltage or short-circuit to lower voltage.                          | WARNING! |
| 611 / 2   | Power take-off switch - Incorrect, uneven or jerky.  | WARNING! |
| 611 / 3   | Power supply no. 4, sensor - Abnormally high voltage or short-circuit to higher voltage.                                       | WARNING! |
| 611 / 4   | Power supply no. 3, sensor - Abnormally low voltage or short circuit to lower voltage.   | WARNING! |
| 611 / 4   | Power supply no. 4, sensor - Abnormally low voltage or short circuit to lower voltage.   | WARNING! |
| 612 / 2   | The engine speed and position sensor circuit has lost the input signals from the magnetic sensor - Incorrect, uneven or jerky. | WARNING! |
| 627 / 2   | Power supply interrupted despite ignition in ON position - Incorrect, uneven or jerky.   | WARNING! |
| 627 / 2   | Power supply interrupted despite ignition in ON position - Incorrect, uneven or jerky.   | WARNING! |
| 629 / 12  | Engine control module internal fault – Defective unit or component.  | WARNING! |
| 629 / 12  | Power supply injectors – Defective unit or component.  | WARNING! |
| 630 / 2   | Engine control module, memory error. - Incorrect, uneven or jerky.   | WARNING! |
| 630 / 31  | Engine control module, RAM memory error – Not available  | WARNING! |
| 633 / 31  | Fuel valve, circuit fault – Not available  | WARNING! |
| 639 / 13  | SAE J1939 multiplexing configuration error – Values outside calibration values.  | WARNING! |
| 639 / 9   | SAE J1939 multiplexing PGN time limitation exceeded – Abnormal update speed.   | WARNING! |
| 641 / 3   | Variable Turbo Geometry valve circuit - Abnormally high voltage or short-circuit to higher voltage.                            | WARNING! |
| 641 / 4   | Variable Turbo Geometry valve circuit - Abnormally low voltage or short-circuit to lower voltage.                              | WARNING! |
| 644 / 2   | External speed sensor input - Incorrect, uneven or jerky.  | WARNING! |

| <br><b>SPN/FMI</b> | <b>Description</b>   | <b>Action</b> |
|---|--|---------------|
| 647 / 3   | Circuit fault switch cooling fan - Abnormally high voltage or short-circuit to higher voltage.                                   | WARNING!      |
| 647 / 4   | Circuit fault switch cooling fan - Abnormally low voltage or short-circuit to lower voltage.                                     | WARNING!      |
| 651 / 5   | Injector solenoid cylinder # 1 circuit - Abnormally low current or open circuit.   | WARNING!      |
| 651 / 7   | Injector cylinder #1 – Incorrect reply from mechanical system.   | WARNING!      |
| 652 / 5   | Injector solenoid cylinder # 2 circuit - Abnormally low current or open circuit.   | WARNING!      |
| 652 / 7   | Injector cylinder #2 – Incorrect reply from mechanical system.   | WARNING!      |
| 653 / 5   | Injector solenoid cylinder # 3 circuit - Abnormally low current or open circuit.   | WARNING!      |
| 653 / 7   | Injector cylinder #3 – Incorrect reply from mechanical system.   | WARNING!      |
| 654 / 5   | Injector solenoid cylinder # 4 circuit - Abnormally low current or open circuit.   | WARNING!      |
| 654 / 7   | Injector cylinder #4 – Incorrect reply from mechanical system.   | WARNING!      |
| 655 / 5   | Injector solenoid cylinder # 5 circuit - Abnormally low current or open circuit.   | WARNING!      |
| 655 / 7   | Injector cylinder #5 – Incorrect reply from mechanical system.   | WARNING!      |
| 656 / 5   | Injector solenoid cylinder # 6 circuit - Abnormally low current or open circuit.   | WARNING!      |
| 656 / 7   | Injector cylinder #6 – Incorrect reply from mechanical system.   | WARNING!      |
| 677 / 3   | Starter relay circuit - Abnormally high voltage or short-circuit to higher voltage.  | WARNING!      |
| 677 / 4   | Starter relay circuit - Abnormally low voltage or short-circuit to lower voltage.  | WARNING!      |
| 697 / 3   | External PWM driver circuit 1 - Abnormally high voltage or short-circuit to higher voltage.                                      | WARNING!      |
| 697 / 4   | External PWM driver circuit 1 - Abnormally low voltage or short-circuit to lower voltage.  | WARNING!      |
| 703 / 11  | Sensor secondary equipment input #3 (OEM) – Unidentifiable fault.  | WARNING!      |
| 723 / 2   | Engine rpm/position camshaft synchronizing fault - Incorrect, uneven or jerky  | WARNING!      |
| 723 / 2   | Engine rpm sensor (camshaft) fault – Incorrect, uneven or jerky  | WARNING!      |
| 723 / 2   | Engine rpm/position sensor - Incorrect, uneven or jerky.   | WARNING!      |
| 723 / 7   | Engine speed (rpm) sensor incorrectly set mechanically between camshaft and crankshaft – Incorrect reply from mechanical system. | WARNING!      |
| 729 / 3   | Air preheating element circuit - Abnormally high voltage or short-circuit to higher voltage.                                     | WARNING!      |
| 729 / 4   | Air preheating element circuit - Abnormally low voltage or short circuit to lower voltage.                                       | WARNING!      |

|  | Description  | Action   |
|---|--|----------|
| SPN/FMI   |  |          |
| 974 / 19  | SAE J1939 multiplexing, value error remote accelerator sensor – Received data incorrect.                           | WARNING! |
| 974 / 3   | Position sensor accelerator pedal, circuit fault- Abnormally high voltage or short circuit to higher voltage.      | WARNING! |
| 974 / 4   | Position sensor accelerator pedal, circuit fault - Abnormally low voltage or short-circuit to higher voltage.      | WARNING! |
| 1043 / 3  | Power supply circuit accelerator pedal or lever - Abnormally high voltage or short-circuit to higher voltage.      | WARNING! |
| 1043 / 4  | Sensor power supply circuit engine rpm/position sensor - Abnormally low voltage or short-circuit to lower voltage. | WARNING! |
| 1043 / 4  | Power supply circuit accelerator pedal or lever - Abnormally low voltage or short-circuit to lower voltage.        | WARNING! |
| 1072 / 3  | Signal engine brake circuit #1 - Abnormally high voltage or short circuit to higher voltage.                       | WARNING! |
| 1072 / 4  | Signal engine brake circuit #1 - Abnormally low voltage or short circuit to lower voltage.                         | WARNING! |
| 1073 / 3  | Signal engine brake circuit #2 - Abnormally high voltage or short circuit to higher voltage.                       | WARNING! |
| 1073 / 4  | Signal engine brake circuit #2 - Abnormally low voltage or short circuit to lower voltage.                         | WARNING! |
| 1075 / 3  | Fuel suction pump circuit - Abnormally high voltage or short-circuit to higher voltage.                            | WARNING! |
| 1075 / 4  | Fuel suction pump circuit - Abnormally low voltage or short-circuit to lower voltage.                              | WARNING! |
| 1079 / 3  | Sensor power supply circuit #1 - Abnormally high voltage or short-circuit to higher voltage.                       | WARNING! |
| 1079 / 4  | Sensor power supply circuit #1 - Abnormally low voltage or short circuit to lower voltage.                         | WARNING! |
| 1080 / 3  | Sensor power supply circuit #2 - Abnormally high voltage or short-circuit to higher voltage.                       | WARNING! |
| 1080 / 4  | Sensor power supply circuit #2 - Abnormally low voltage or short circuit to lower voltage.                         | WARNING! |
| 1172 / 3  | Turbocharger temperature sensor circuit - Abnormally high voltage or short-circuit to higher voltage.              | WARNING! |
| 1172 / 4  | Turbocharger temperature sensor circuit - Abnormally low voltage or short-circuit to lower voltage.                | WARNING! |





|  | Description   | Action            |
|---|---|-------------------|
| SPN/FMI   |   |                   |
| 1347 / 3  | High pressure fuel valve circuit - Abnormally high voltage or short-circuit to higher voltage.    | WARNING!          |
| 1347 / 4  | High pressure fuel valve circuit - Abnormally low voltage or short-circuit to lower voltage.      | WARNING!          |
| 1347 / 7  | Fuel pump – Incorrect reply from mechanical system.   | WARNING!          |
| 1347 / 7  | High pressure fuel valve no. 1 – Incorrect reply from mechanical system.                          | WARNING!          |
| 1377 / 2  | Switch circuit multiple synchronising unit - Incorrect, uneven or jerky.                          | WARNING!          |
| 1378 / 31   | Change oil and oil filter, conditions exist – Not available                                       | WARNING! Service. |
| 1388 / 3  | External pressure sensor input - Abnormally high voltage or short-circuit to higher voltage.      | WARNING!          |
| 1388 / 4  | External pressure sensor input - Abnormally low voltage or short-circuit to lower voltage.        | WARNING!          |
| 2623 / 3  |   | WARNING!          |
| 2623 / 4  |   | WARNING!          |
| 2629 / 15   | Boost pressure temperature output calculated - Data applicable, but above normal operating range. | WARNING!          |
| 2789 / 15   | Boost pressure temperature input calculated - Data applicable, but above normal operating range.  | WARNING!          |


Table 7. Error codes Caterpillar C6.6


|  | Description   | Action   |
|---|---|----------|
| SPN/FMI   |   |          |
| 91/02   | Secondary position sensor accelerator pedal - Incorrect, uneven or jerky.                                 | WARNING! |
| 91/03   | Secondary position sensor accelerator pedal - Abnormally high voltage or short circuit to higher voltage. | WARNING! |
| 91/04   | Secondary position sensor accelerator pedal - Abnormally low voltage or short-circuit to lower voltage.   | WARNING! |
| 91/08   | Secondary position sensor accelerator pedal – Abnormal frequency  | WARNING! |
| 91/02   | Position sensor accelerator pedal - Incorrect, uneven or jerky.   | WARNING! |
| 91/03   | Position sensor accelerator pedal - Abnormally high voltage or short circuit to higher voltage.           | WARNING! |

|  | Description   | Action  |
|---|---|---|
| SPN/FMI   |   |   |
| 91/04   | Position sensor accelerator pedal - Abnormally low voltage or short-circuit to lower voltage.   | WARNING!  |
| 91/08   | Position sensor accelerator pedal – Abnormal frequency  | WARNING!  |
| 91/12   | Position sensor accelerator pedal – Defective unit or component.                                | WARNING!  |
| 91/12   | Secondary position sensor accelerator pedal – Defective unit or component.                      | WARNING!  |
| 100/01  | Low engine oil pressure.  | STOP!   |
| 100/03  | Engine oil pressure sensor - Abnormally high voltage or short-circuit to higher voltage.        | WARNING!  |
| 100/04  | Engine oil pressure sensor - Abnormally low voltage or short-circuit to lower voltage.          | WARNING!  |
| 100/10  | Engine oil pressure sensor – Abnormally large variations.                                       | WARNING!  |
| 100/17  | Low engine oil pressure.  | WARNING! Check the oil level in the engine, see <i>6.2.6 Engine oil</i> |
| 100/18  | Low engine oil pressure.  | WARNING! Check the oil level in the engine, see <i>6.2.6 Engine oil</i> |
| 102/10  | Pressure sensor inlet manifold – Abnormally large variations                                    | WARNING!  |
| 102/16  | Pressure sensor inlet manifold - High inlet pressure.   | WARNING!  |
| 102/18  | Pressure sensor inlet manifold - Low inlet pressure.  | WARNING!  |
| 105/03  | Temperature sensor inlet manifold - Abnormally high voltage or short-circuit to higher voltage. | WARNING!  |
| 105/04  | Temperature sensor inlet manifold - Abnormally low voltage or short-circuit to lower voltage.   | WARNING!  |
| 105/15  | High temperature inlet manifold.  | WARNING!  |
| 105/16  | High temperature inlet manifold.  | WARNING!  |
| 106/03  | Pressure sensor inlet manifold - Abnormally high voltage or short-circuit to higher voltage.    | WARNING!  |
| 106/04  | Pressure sensor inlet manifold - Abnormally low voltage or short-circuit to lower voltage.      | WARNING!  |
| 106/10  | Pressure sensor circuit inlet manifold – Inlet pressure sensor 5V Power supply open circuit.    | WARNING!  |
| 107/15  | Clogged air filter.   | WARNING!  |

|  | Description   | Action  |
|---|---|---|
| SPN/FMI   |   |   |
| 110/00  | High coolant temperature engine.  | STOP! Check the coolant level, see 6.2.5 <i>Cooling system</i> .    |
| 110/03  | Sensor coolant engine - Abnormally high voltage or short-circuit to higher voltage.     | WARNING!  |
| 110/04  | Sensor coolant engine - Abnormally low voltage or short-circuit to lower voltage.       | WARNING!  |
| 110/15  | High coolant temperature engine.  | WARNING! Check the coolant level, see 6.2.5 <i>Cooling system</i> . |
| 110/16  | High coolant temperature engine.  | WARNING! Check the coolant level, see 6.2.5 <i>Cooling system</i> . |
| 157/16  | High pressure high pressure pipe.   | WARNING!  |
| 157/18  | Low pressure high pressure pipe.  | WARNING!  |
| 157/03  | Fuel rail pressure sensor - Abnormally high voltage or short-circuit to higher voltage. | WARNING!  |
| 157/04  | Fuel rail pressure sensor - Abnormally low voltage or short-circuit to lower voltage.   | WARNING!  |
| 158/02  | Ignition switch - Incorrect, uneven or jerky.   | WARNING!  |
| 168/00  | Engine control module- Battery voltage too high.  | WARNING!  |
| 168/01  | Engine control module- Battery voltage too low.   | WARNING!  |
| 168/02  | Engine control module, - Incorrect, uneven or jerky.                                    | WARNING!  |
| 190/08  | Engine speed – Abnormal frequency.  | WARNING!  |
| 190/15  | Engine speed - Engine overspeed   | WARNING!  |
| 558/2   | Position sensor accelerator pedal - Incorrect, uneven or jerky.                         | WARNING!  |
| 558/2   | Secondary position sensor accelerator pedal - Incorrect, uneven or jerky.               | WARNING!  |
| 630/02  | Parameter error - Incorrect, uneven or jerky.   | WARNING!  |
| 631/02  | Engine software - Incorrect, uneven or jerky.   | WARNING!  |
| 637/11  | Primary/Secondary speed signal - Error cannot be identified                             | WARNING!  |
| 637/13  | Primary/Secondary speed signal - Calibration necessary.                                 | WARNING!  |
| 639/9   | J1939 CAN buss error. Abnormal updating speed.  | WARNING!  |
| 646/05  | Turbo pressure release valve - Low current.   | WARNING!  |
| 646/06  | Turbo pressure release valve - High current.  | WARNING!  |
| 651/02  | Cylinder #1 Injector - Incorrect, uneven or jerky.                                      | WARNING!  |




|  | Description  | Action   |
|---|--|----------|
| SPN/FMI   |  |          |
| 651/05  | Injector cylinder #1 – Injector low current.   | WARNING! |
| 651/06  | Injector cylinder #1 – Injector high current.  | WARNING! |
| 651/07  | Injector cylinder #1 – Incorrect reply from mechanical system.                                       | WARNING! |
| 652/02  | Cylinder #2 Injector - Incorrect, uneven or jerky.   | WARNING! |
| 652/05  | Injector cylinder #2 – Injector low current.   | WARNING! |
| 652/06  | Injector cylinder #2 – Injector high current.  | WARNING! |
| 652/07  | Injector cylinder #2 – Incorrect reply from mechanical system.                                       | WARNING! |
| 653/02  | Cylinder #3 Injector - Incorrect, uneven or jerky.   | WARNING! |
| 653/05  | Injector cylinder #3 – Injector low current.   | WARNING! |
| 653/06  | Injector cylinder #3 – Injector high current.  | WARNING! |
| 653/07  | Injector cylinder #3 – Incorrect reply from mechanical system.                                       | WARNING! |
| 654/02  | Cylinder #4 Injector - Incorrect, uneven or jerky.   | WARNING! |
| 654/05  | Injector cylinder #4 – Injector low current.   | WARNING! |
| 654/06  | Injector cylinder #4 – Injector high current.  | WARNING! |
| 654/07  | Injector cylinder #4 – Incorrect reply from mechanical system.                                       | WARNING! |
| 655/02  | Cylinder #5 Injector - Incorrect, uneven or jerky.   | WARNING! |
| 655/05  | Injector cylinder #5 – Injector low current.   | WARNING! |
| 655/06  | Injector cylinder #5 – Injector high current.  | WARNING! |
| 655/07  | Injector cylinder #5 – Incorrect reply from mechanical system.                                       | WARNING! |
| 656/02  | Cylinder #6 Injector - Incorrect, uneven or jerky.   | WARNING! |
| 656/05  | Injector cylinder #6 – Injector low current.   | WARNING! |
| 656/06  | Injector cylinder #6 – Injector high current.  | WARNING! |
| 656/07  | Injector cylinder #6 – Incorrect reply from mechanical system.                                       | WARNING! |
| 676/05  | Relay preheating element - Low current.  | WARNING! |
| 676/06  | Relay preheating element - High current.   | WARNING! |
| 678/03  | 8V Power supply, control module ECU794 - Abnormally high voltage or short-circuit to higher voltage. | WARNING! |
| 678/04  | 8V Power supply, control module ECU794 - Abnormally low voltage or short-circuit to lower voltage.   | WARNING! |
| 723/08  | Secondary speed sensor – Abnormal frequency.   | WARNING! |
| 1079/03   | 5V power supply - Abnormally high voltage or short-circuit to higher voltage.                        | WARNING! |


|  | Description   | Action   |
|---|---|----------|
| SPN/FMI   |   |          |
| 1079/04   | 5V power supply - Abnormally low voltage or short circuit to lower voltage. | WARNING! |
| 1188/07   | Turbo pressure release valve – Incorrect reply from mechanical system.      | WARNING! |
| 1347/05   | High pressure pump – Injector low current.                                  | WARNING! |
| 1347/06   | High pressure pump – Injector high current.                                 | WARNING! |
| 1347/07   | High pressure pump – Incorrect reply from mechanical system.                | WARNING! |
| 2789/15   | High exhaust temperature.   | WARNING! |


### Error codes transmission


Error codes from control unit ECU 793 for the transmission have general error code level “WARNING”, but fault codes from the transmission can indicate another error code level according to the action column in table 9 below.


Table 8. Error codes Dana TE13000 and TE17000


|  | Description  | Action   |
|---|--|----------|
| Code  |  |          |
| 00.50   | Memory problem internal in CPU. Transmission in locked neutral position (“shut down”).   | STOP!    |
| 00.51   | Memory problem internal in CPU. Transmission in locked neutral position (“shut down”).   | STOP!    |
| 00.52   | Memory problem external to CPU. Transmission in locked neutral position (“shut down”).   | STOP!    |
| 00.53   | Problem with flash memory. Transmission in locked neutral position (“shut down”).  | STOP!    |
| 20.60   | “Pressure feedback” signal. Indicates low oil pressure when there should be pressure. Transmission in locked neutral position (“shut down”).       | STOP!    |
| 20.61   | “Pressure feedback” signal. Indicates normal oil pressure when there should be no pressure. Transmission in locked neutral position (“shut down”). | STOP!    |
| 30.04   | Battery voltage too low.   | STOP!    |
| 30.05   | Battery voltage too high.  | WARNING! |
| 31.00   | Voltage supply to sensor: Vsense (8V) not within approved range -> too low.  | WARNING! |


| <br><b>Code</b> | <b>Description</b>   | <b>Action</b>  |
|--|--|--|
| 31.01  | Voltage supply to sensor: Vsense (8V) not within approved range -> too high.   | WARNING!   |
| 40.06  | Incorrect direction from gear selector. Transmission in neutral position.  | WARNING!   |
| 40.08  | The direction of the driver's seat was changed when: the Parking brake was not activated, and/or the gear selector was not in neutral position and /or the machine was not stationary. Transmission in neutral position.   | INFORMATION! Stop the machine, move the gear selector to neutral position and activate the parking brake until the fault disappears.   |
| 41.06  | Incorrect gear selection from gear selector. The control unit does not permit changing shift range, the machine can be operated however.   | WARNING!   |
| 42.04  | Actual gear ratio too low. One or more clutches slips.   | STOP! or WARNING!  |
| 42.05  | Actual gear ratio too high. One or more clutches slips.  | STOP! or WARNING!  |
| 43.03  | The torque converter's temperature is outside the temperature sensor's range.  | WARNING!   |
| 43.07  | Torque converter's temperature above 100 °C.   | WARNING! Note the error, stop and allow the temperature in the torque converter to fall or try to reduce the temperature by smoother driving.  |
| 43.08  | Torque converter's temperature above 125 °C.<br>The control unit protects the transmission and does not allow the temperature in the torque converter to exceed the parameter. Transmission in neutral position, and if the engine is also checked the engine power is reduced to 50%. | WARNING! Stop the machine, select neutral and accelerate fully (limited to 50 %) in order to cool the transmission oil so that the temperature falls below 100 °C (error code 43.03 disappears).<br>When the temperature in the torque converter is below 100 °C, start operating the machine again. |
| 44.10  | No EEC2 message from the engine control unit in time. Position accelerator pedal, message from engine control unit.  | WARNING!   |
| 45.06  | Incorrect logic from digital inputs to speed limiting. Control unit reduces the power to reduced speed.  | INFORMATION!   |
| 50.00  | Analogue input 0 (lead A11) related error: analogue input short-circuited to ground. Control unit transmission activates "limp home".  | STOP!  |
| 50.01  | Analogue input 0 (lead A11) related error: analogue input is not connected. Control unit transmission activates "limp home".   | STOP!  |

|  | Description  | Action       |
|---|--|--------------|
| Code  |  |              |
| 51.00   | Analogue input 1 (lead A28) related error: analogue input short-circuited to ground. The control unit limits the monitoring of the transmission temperature to the lowest of the set values, this results in poor temperature compensation.                      | WARNING!     |
| 51.01   | Analogue input 1 (lead A28) related error: analogue input is not connected. The control unit limits the monitoring of the transmission temperature to the lowest of the set values, this results in poor temperature compensation.                               | WARNING!     |
| 52.00   | Analogue input 2 (lead A29) related error: analogue input short-circuited to ground. The control unit indicates the fault and uses the lowest set value.   | INFORMATION! |
| 52.01   | Analogue input 2 (lead A29) related error: analogue input is not connected. The control unit indicates the fault and uses the lowest set value.  | INFORMATION! |
| 53.00   | Analogue input 3 (lead B17) related error: analogue input short-circuited to ground. The control unit indicates the fault and uses the lowest set value.   | INFORMATION! |
| 53.01   | Analogue input 3 (lead B17) related error: analogue input is not connected. The control unit indicates the fault and uses the lowest set value.  | INFORMATION! |
| 54.00   | Analogue input 4 (lead B02) related error: analogue input short-circuited to ground. The control unit indicates the fault, the control unit uses the analogue input ANI4 as a reference for the current supply to the analogue inputs ANI2, ANI3, ANI5 and ANI6. | WARNING!     |
| 54.01   | Analogue input 4 (lead B02) related error: analogue input is not connected. The control unit indicates the fault, the control unit uses the analogue input ANI4 as a reference for the current supply to the analogue inputs ANI2, ANI3, ANI5 and ANI6.          | WARNING!     |
| 55.00   | Analogue input 5 (lead B04) related error: analogue input short-circuited to ground. The control unit indicates the fault and uses the lowest set value.   | INFORMATION! |
| 55.01   | Analogue input 5 (lead B04) related error: analogue input is not connected. The control unit indicates the fault and uses the lowest set value.  | INFORMATION! |
| 56.00   | Analogue input 6 (lead B06) related error: analogue input short-circuited to ground. The control unit indicates the fault and uses the lowest set value.   | INFORMATION! |
| 56.01   | Analogue input 6 (lead B06) related error: analogue input is not connected. The control unit indicates the fault and uses the lowest set value.  | INFORMATION! |


|  | Description  | Action  |
|---|--|---|
| Code  |  |   |
| 60.00   | “Drum speed” channel 0 (lead A22) related error: speed channel is short-circuited to ground. If several speed signals or engine speed signals are incorrect, the transmission control unit activates “limp home”.                | STOP! or WARNING!   |
| 60.01   | “Drum speed” channel 0 (lead A22) related error: speed channel is not connected. If several speed signals or engine speed signals are incorrect, the transmission control unit activates “limp home”.                            | STOP! or WARNING!   |
| 61.00   | “Output speed” channel 1 (lead A24) related error: speed channel is short-circuited to ground. If several speed signals or engine speed signals are incorrect, the transmission control unit activates “limp home”.              | STOP! or WARNING!   |
| 61.01   | “Output speed” channel 1 (lead A24) related error: speed channel not connected. If several speed signals or engine speed signals are incorrect, the transmission control unit activates “limp home”.                             | STOP! or WARNING!   |
| 62.00   | “Engine speed” channel 2 (lead A26) related error: speed channel is short circuited to ground. If several speed signals or engine speed signals are incorrect the transmission control unit activates “limp home”.               | STOP! or WARNING!   |
| 62.01   | “Engine speed” channel 2 (lead A26) related error: speed channel not connected. If several speed signals or engine speed signals are incorrect, the transmission control unit activates “limp home”.                             | STOP! or WARNING!   |
| 63.00   | “Turbine speed” channel 3 (lead B11) related error: speed channel is short circuited to ground. If several speed signals or engine speed signals are incorrect the transmission control unit activates “limp home”.              | STOP! or WARNING!   |
| 63.01   | “Turbine speed” channel 3 (lead B11) related error: speed channel not connected. If several speed signals or engine speed signals are incorrect, the transmission control unit activates “limp home”.                            | STOP! or WARNING!   |
| 70.00   | Analogue output signal 0 (lead A02 and A03) related error: output signal lines twisted, or sensor lead is connected to battery (+), or positive lead short-circuited to ground. Control unit transmission activates “limp home”. | <p>STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode “Limp Home”. If not, the opposite travel direction to the original choice must be selected for the transmission to work.</p> <p>Contact service.</p> |

|  | Description  | Action   |
|---|--|--|
| Code  |  |  |
| 70.01   | Analogue output signal 0 (lead A02 and A03) related error: output signal not connected or short-circuited to battery. Control unit transmission activates "limp home".   | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode "Limp Home". Opposite travel direction than the original choice must be selected for the transmission to work.<br>Contact service. |
| 70.02   | Analogue output signal 0 (lead A02 and A03) related error: output signal exceeds 1400 mA. Control unit transmission activates "limp home".   | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode "Limp Home". Opposite travel direction than the original choice must be selected for the transmission to work.<br>Contact service. |
| 70.03   | Analogue output signal 0 (lead A02 and A03) related error: current value for output signal is not within approved range. Incorrect impedance. Control unit transmission activates "limp home".                                   | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode "Limp Home". Opposite travel direction than the original choice must be selected for the transmission to work.<br>Contact service. |
| 71.00   | Analogue output signal 1 (lead A04 and A05) related error: output signal lines twisted, or sensor lead is connected to battery (+), or positive lead short-circuited to ground. Control unit transmission activates "limp home". | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode "Limp Home".<br>Contact service.   |
| 71.01   | Analogue output signal 1 (lead A04 and A05) related error: output signal not connected or short-circuited to battery. Control unit transmission activates "limp home".   | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode "Limp Home".<br>Contact service.   |
| 71.02   | Analogue output signal 1 (lead A04 and A05) related error: output signal exceeds 1400 mA. Control unit transmission activates "limp home".   | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode "Limp Home".<br>Contact service.   |
| 71.03   | Analogue output signal 1 (lead A04 and A05) related error: current value for output signal is not within approved range. Incorrect impedance. Control unit transmission activates "limp home".                                   | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode "Limp Home".<br>Contact service.   |

|  | Description  | Action   |
|---|--|--|
| Code  |  |  |
| 72.00   | Analogue output signal 2 (lead A06 and A07) related error: output signal lines twisted, or sensor lead is connected to battery (+), or positive lead short-circuited to ground. Control unit transmission activates "limp home". | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode "Limp Home". If not, the opposite travel direction to the original choice must be selected for the transmission to work.<br><br>Contact service. |
| 72.01   | Analogue output signal 2 (lead A06 and A07) related error: output signal not connected or short-circuited to battery. Control unit transmission activates "limp home".   | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode "Limp Home". If not, the opposite travel direction to the original choice must be selected for the transmission to work.<br><br>Contact service. |
| 72.02   | Analogue output signal 2 (lead A06 and A07) related error: output signal exceeds 1400 mA. Control unit transmission activates "limp home".   | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode "Limp Home". If not, the opposite travel direction to the original choice must be selected for the transmission to work.<br><br>Contact service. |
| 72.03   | Analogue output signal 2 (lead A06 and A07) related error: current value for output signal is not within approved range. Incorrect impedance. Control unit transmission activates "limp home".                                   | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode "Limp Home". If not, the opposite travel direction to the original choice must be selected for the transmission to work.<br><br>Contact service. |
| 73.00   | Analogue output signal 3 (lead A08 and A09) related error: output signal lines twisted, or sensor lead is connected to battery (+), or positive lead short-circuited to ground. Control unit transmission activates "limp home". | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode "Limp Home".<br><br>Contact service.   |
| 73.01   | Analogue output signal 3 (lead A08 and A09) related error: output signal not connected or positive lead connected to battery (+). Control unit transmission activates "limp home".   | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode "Limp Home".<br><br>Contact service.   |

|  | Description  | Action   |
|---|--|--|
| Code  |  |  |
| 73.02   | Analogue output signal 3 (lead A08 and A09) related error: output signal exceeds 1400 mA. Control unit transmission activates “limp home”.   | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode “Limp Home”.<br>Contact service. |
| 73.03   | Analogue output signal 3 (lead A08 and A09) related error: current value for output signal is not within approved range. Incorrect impedance. Control unit transmission activates “limp home”. | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode “Limp Home”.<br>Contact service. |
| 74.00   | Analogue output signal 4 (lead B01) related error: output signal short-circuited to ground.  | WARNING!   |
| 74.01   | Analogue output signal 4 (lead B01) related error: output signal not connected or short-circuited to battery.  | WARNING!   |
| 74.02   | Analogue output signal 4 (lead B01) related error: output signal exceeds 1400 mA.  | WARNING!   |
| 74.03   | Analogue output signal 4 (lead B01) related error: current value for output signal is not within approved range. Incorrect impedance.  | WARNING!   |
| 75.00   | Analogue output signal 5 (lead B03) related error: output signal short-circuited to ground.  | WARNING!   |
| 75.01   | Analogue output signal 5 (lead B03) related error: output signal not connected or short-circuited to battery.  | WARNING!   |
| 75.02   | Analogue output signal 5 (lead B03) related error: output signal exceeds 1400 mA.  | WARNING!   |
| 75.03   | Analogue output signal 5 (lead B03) related error: current value for output signal is not within approved range. Incorrect impedance.  | WARNING!   |
| 76.00   | Analogue output signal 6 (lead B05) related error: output signal short-circuited to ground.  | STOP!  |
| 76.01   | Analogue output signal 6 (lead B05) related error: output signal not connected or short-circuited to battery.  | STOP!  |
| 76.02   | Analogue output signal 6 (lead B05) related error: output signal exceeds 1400 mA.  | STOP!  |
| 76.03   | Analogue output signal 6 (lead B05) related error: current value for output signal is not within approved range. Incorrect impedance.  | STOP!  |
| 80.00   | Digital output signal 0 (lead A10) related error: output signal short-circuited to ground. Transmission in locked neutral position (“shut down”).  | STOP!  |




|  | Description   | Action   |
|---|---|--|
| Code  |   |  |
| 80.01   | Digital output signal 0 (lead A10) related error: output signal not connected or short-circuited to battery. Transmission in locked neutral position ("shut down"). | STOP!  |
| 81.00   | Digital output signal 1 (lead A15) related error: output signal short-circuited to ground. Control unit transmission activates "limp home".                         | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode "Limp Home".<br>Contact service. |
| 81.01   | Digital output signal 1 (lead A15) related error: output signal not connected or short-circuited to battery. Control unit transmission activates "limp home".       | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode "Limp Home".<br>Contact service. |
| 82.00   | Digital output signal 2 (lead A16) related error: output signal short-circuited to ground. Control unit transmission activates "limp home".                         | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode "Limp Home".<br>Contact service. |
| 82.01   | Digital output signal 2 (lead A16) related error: output signal not connected or short-circuited to battery. Control unit transmission activates "limp home".       | STOP! Stop the machine, select neutral and then select travel direction reverse. If it works the transmission will work but in mode "Limp Home".<br>Contact service. |
| 83.00   | Digital output signal 3 (lead A20) related error: output signal short-circuited to ground. Transmission in locked neutral position ("shut down").                   | STOP!  |
| 83.01   | Digital output signal 3 (lead A20) related error: output signal not connected or short-circuited to battery. Transmission in locked neutral position ("shut down"). | STOP!  |
| 90.xx - 99.xx   | System error. Transmission in locked neutral position ("shut down").  | STOP! or INFORMATION!  |
| 99.90   | Incorrect software is loaded in FLASH memory. Transmission in locked neutral position ("shut down").  | STOP!  |
| 99.95   | High CAN bus load detected: APC200 cannot handle all incoming messages because of too many CAN messages.  | INFORMATION!   |


<sup>1</sup> Figure in KCS display (position D) or ECU 793.


For serious transmission errors, the control unit uses two modes with reduced functionality to protect the transmission from damage. These are:


- “Limp home”, GPOS / CPOS in display indicates the letters LH.  
In this mode the operator can use the transmission's two first gears in both directions. If the malfunction occurs in a higher gear the operator has to downshift manually to first or second to continue. The control unit uses standard values for modulating clutches.
- “Shut down”, GPOS / CPOS in display indicates the letters Sd.  
In this mode the transmission is permanently in neutral as there is no oil pressure to enable gear selection.


Table 9. Error codes ZF 3WG161


|  |               | Description  | Action   |
|---|---------------|--|--|
| SPN/FMI   | ZF code (hex) |  |  |
| 5000/12   | 11            | Logic error on the signal from the gear selector and gear selection 1-2. Transmission locked in neutral (“transmission shut down”).  | STOP!  |
| 5010/12   | 12            | Logic error on the signal from the gear selector for the selected gear direction forward, neutral or reverse. Transmission in locked neutral position (“transmission shut down”).  | STOP!  |
| 5020/12   | 13            | Logic error on the signal from the engine's power limitation system.   | WARNING! Restart ECU 793 by switching the ignition on and off. Contact service if the fault remains. |
| 5040/12   | 15            | Logic error on the signal from the extra gear selector for the selected gear direction forward, neutral or reverse. Transmission in locked neutral position (“transmission shut down”) when extra gear selector is used. | WARNING!   |
| 5050/12   | 16            | Logic error on the signal from axle connection.  | WARNING!   |
| 5110/3  | 25            | Signal input for temperature sensor gearbox sump - Abnormally high voltage or short-circuit to higher voltage.   | WARNING!   |
| 5110/4  | 26            | Signal input for temperature sensor gearbox sump - Abnormally low voltage or short-circuit to lower voltage.   | WARNING!   |
| 5120/3  | 27            | Signal input for temperature sensor torque converter's oil temperature - Abnormally high voltage or short-circuit to higher voltage.   | WARNING!   |
| 5120/4  | 28            | Signal input for temperature sensor torque converter's oil temperature - Abnormally low voltage or short-circuit to lower voltage.   | WARNING!   |
| 5130/3  | 29            | Signal input for parking brake sensor - Abnormally high voltage or short-circuit to higher voltage.  | WARNING!   |


|  |               | Description  | Action   |
|---|---------------|--|--|
| SPN/FMI   | ZF code (hex) |  |  |
| 5130/4  | 2A            | Signal input for parking brake sensor - Abnormally low voltage or short-circuit to lower voltage.  | WARNING!   |
| 5135/3  | 2C            | Signal input for DLM control module in cab - Abnormally high voltage or short-circuit to higher voltage.   | WARNING!   |
| 5135/4  | 2D            | Signal input for DLM control module in cab - Abnormally low voltage or short-circuit to lower voltage.   | WARNING!   |
| 5137/3  | 2E            | Signal input for DLM steering angle sensor - Abnormally high voltage or short-circuit to higher voltage.   | WARNING!   |
| 5137/4  | 2F            | Signal input for DLM steering angle sensor - Abnormally low voltage or short-circuit to lower voltage.   | WARNING!   |
| 5313/12   | 2B            | Signal from inching pedal incorrect. Inching not functioning.  | WARNING!   |
| 5140/3  | 31            | Engine rpm - Abnormally high voltage or short-circuit to higher voltage. Transmission limited according to "Substitute clutch control".  | WARNING!   |
| 5140/4  | 32            | Engine rpm - Abnormally low voltage or short-circuit to lower voltage. Transmission limited according to "Substitute clutch control".  | WARNING!   |
| 5140/12   | 33            | Engine rpm - Logic error. Transmission limited according to "Substitute clutch control".   | WARNING! Restart ECU 793 by switching the ignition on and off. Contact service if the fault remains. |
| 5150/3  | 34            | Turbine speed - Abnormally high voltage or short-circuit to higher voltage. Transmission limited according to "Substitute clutch control", on output tachometer sensor error, the transmission control unit activates "limp home". | WARNING!   |
| 5150/4  | 35            | Turbine speed - Abnormally low voltage or short-circuit to lower voltage. Transmission limited according to "Substitute clutch control", on output tachometer sensor error, the transmission control unit activates "limp home".   | WARNING!   |
| 5150/12   | 36            | Internal speed - Logic error. Transmission limited according to "Substitute clutch control", on output tachometer sensor error, the transmission control unit activates "limp home".   | WARNING! Restart ECU 793 by switching the ignition on and off. Contact service if the fault remains. |
| 5160/3  | 37            | Internal speed - Abnormally high voltage or short-circuit to higher voltage. Transmission limited according to "Substitute clutch control".  | WARNING!   |

|  |               | Description   | Action   |
|---|---------------|---|--|
| SPN/FMI   | ZF code (hex) |   |  |
| 5160/4  | 38            | Internal speed - Abnormally low voltage or short-circuit to lower voltage. Transmission limited according to "Substitute clutch control".   | WARNING!   |
| 5160/12   | 39            | Internal speed - Logic error. Transmission limited according to "Substitute clutch control".  | WARNING! Restart ECU 793 by switching the ignition on and off. Contact service if the fault remains. |
| 5170/3  | 3A            | Output speed - Abnormally high voltage or short-circuit to higher voltage. Transmission limited according to "Substitute clutch control", on turbine speed sensor error the transmission control unit activates "limp home".        | WARNING!   |
| 5170/4  | 3B            | Output speed - Abnormally low voltage or short-circuit to lower voltage. Transmission limited according to "Substitute clutch control", on turbine speed sensor error the transmission control unit activates "limp home".          | WARNING!   |
| 5170/12   | 3C            | Output speed - Logic error. Transmission limited according to "Substitute clutch control", on turbine speed sensor error the transmission control unit activates "limp home".   | WARNING! Restart ECU 793 by switching the ignition on and off. Contact service if the fault remains. |
| 5180/2  | 3E            | Speed from the propeller shaft does not correspond with other tachometer sensors. Transmission limited according to "Substitute clutch control", on turbine speed sensor error the transmission control unit activates "limp home". | WARNING! Restart ECU 793 by switching the ignition on and off. Contact service if the fault remains. |
| 5260/9  | 54            | Timeout for CAN message DCT1 from the display unit.   | WARNING!   |
| 5270/9  | E5            | Timeout for CAN message DISPID1 from the display unit. Control unit transmission activates "limp home".   | WARNING!   |
| 5390/2  | 61            | AEB calibration signal. CAN signal for start of calibration of clutch plates is incorrect.  | WARNING!   |
| 5480/3  | 71            | Clutch K1 - Abnormally high voltage or short-circuit to higher voltage. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown".             | STOP!  |
| 5480/4  | 72            | Clutch K1 - Abnormally low voltage or short-circuit to lower voltage. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown".               | STOP!  |


|  |               | Description   | Action |
|---|---------------|---|--------|
| SPN/FMI   | ZF code (hex) |   |        |
| 5480/5  | 73            | Clutch K1 - Abnormally low current or open circuit. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown".                     | STOP!  |
| 5490/3  | 74            | Clutch K2 - Abnormally high voltage or short-circuit to higher voltage. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown". | STOP!  |
| 5490/4  | 75            | Clutch K2 - Abnormally low voltage or short-circuit to lower voltage. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown".   | STOP!  |
| 5490/5  | 76            | Clutch K2 - Abnormally low current or open circuit. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown".                     | STOP!  |
| 5500/3  | 77            | Clutch K3 - Abnormally high voltage or short-circuit to higher voltage. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown". | STOP!  |
| 5500/4  | 78            | Clutch K3 - Abnormally low voltage or short-circuit to lower voltage. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown".   | STOP!  |
| 5500/5  | 79            | Clutch K3 - Abnormally low current or open circuit. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown".                     | STOP!  |
| 5510/3  | 81            | Clutch K4 - Abnormally high voltage or short-circuit to higher voltage. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown". | STOP!  |
| 5510/4  | 82            | Clutch K4 - Abnormally low voltage or short-circuit to lower voltage. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown".   | STOP!  |
| 5510/5  | 83            | Clutch K4 - Abnormally low current or open circuit. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown".                     | STOP!  |

|  |               | Description   | Action   |
|---|---------------|---|----------|
| SPN/FMI   | ZF code (hex) |   |          |
| 5520/3  | 84            | Clutch KV - Abnormally high voltage or short-circuit to higher voltage. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown". | STOP!    |
| 5520/4  | 85            | Clutch KV - Abnormally low voltage or short-circuit to lower voltage. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown".   | STOP!    |
| 5520/5  | 86            | Clutch KV- Abnormally low current or open circuit. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown".                      | STOP!    |
| 5530/3  | 87            | Clutch KR - Abnormally high voltage or short-circuit to higher voltage. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown". | STOP!    |
| 5530/4  | 88            | Clutch KR - Abnormally low voltage or short-circuit to lower voltage. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown".   | STOP!    |
| 5530/5  | 89            | Clutch KR - Abnormally low current or open circuit. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown".                     | STOP!    |
| 5535/3  | 8B            | DLM transverse output - Abnormally high voltage or short-circuit to higher voltage.   | WARNING! |
| 5535/4  | 8A            | DLM transverse output - Abnormally low voltage or short-circuit to lower voltage.   | WARNING! |
| 5536/3  | 8E            | DLM indicator lamp - Abnormally high voltage or short-circuit to higher voltage.  | WARNING! |
| 5536/5  | 8F            | DLM indicator lamp - Abnormally low current or open circuit.  | WARNING! |
| 5545/3  | D8            | DLM longitudinal output - Abnormally high voltage or short-circuit to higher voltage.   | WARNING! |
| 5545/4  | D7            | DLM longitudinal output - Abnormally low voltage or short-circuit to lower voltage.   | WARNING! |
| 5560/5  | 93            | Relay reversing alarm - Abnormally low current or open circuit.   | WARNING! |

|  |               | Description  | Action   |
|---|---------------|--|--|
| SPN/FMI   | ZF code (hex) |  |  |
| 5570/3  | 95            | Relay reversing alarm - Abnormally high voltage or short-circuit to higher voltage.  | WARNING!   |
| 5570/4  | 94            | Relay start interlock - Abnormally low voltage or short-circuit to lower voltage.  | WARNING!   |
| 5570/5  | 96            | Relay start interlock - Abnormally low current or open circuit.  | WARNING!   |
| 5620/3  | A6            | Output for warning signal - Abnormally high voltage or short-circuit to higher voltage.  | WARNING!   |
| 5620/4  | A4            | Output for warning signal - Abnormally low voltage or short-circuit to lower voltage.  | WARNING!   |
| 5620/5  | A5            | Output for warning signal - Abnormally low current or open circuit.  | WARNING!   |
| 5660/2  | B1            | Clutch K1 slips. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown". | STOP!  |
| 5665/2  | B2            | Clutch K2 slips. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown". | STOP!  |
| 5670/2  | B3            | Clutch K3 slips. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown". | STOP!  |
| 5675/2  | B4            | Clutch K4 slips. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown". | STOP!  |
| 5680/2  | B5            | Clutch KV slips. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown". | STOP!  |
| 5685/2  | B6            | Clutch KR slips. Control unit transmission activates "limp home". With an ongoing error on another gear, the transmission control unit activates "TCU shutdown". | STOP!  |
| 5700/0  | B7            | High oil temperature in the oil sump.  | WARNING! Stop and allow the temperature to fall or try to reduce the temperature by smoother driving. Check the oil level in the transmission. |
| 5730/0  | BA            | Oil filter. Voltage to differential pressure switch outside of permitted limit value.  | WARNING! Check the oil filter.   |
| 5720/0  | B9            | Maximum speed engine.  | WARNING!   |

|  |               | Description  | Action   |
|---|---------------|--|--|
| SPN/FMI   | ZF code (hex) |  |  |
| 5745/15   | BC            | Maximum speed output.  | WARNING!   |
| 5751/0  | C0            | Engine torque or output too high.  | WARNING!   |
| 5752/0  | C1            | Output transmission torque too high.   | WARNING!   |
| 5755/15   | C2            | Input transmission torque too high.  | WARNING!   |
| 5760/0  | C3            | High oil temperature in torque converter.  | WARNING! Stop and allow the temperature to fall or try to reduce the temperature by smoother driving. Check the oil level in the transmission. |
| 5770/3  | C4            | Joystick status indicator - Abnormally high voltage or short-circuit to higher voltage.                    | WARNING!   |
| 5770/4  | C5            | Joystick status indicator - Abnormally low voltage or short-circuit to lower voltage.                      | WARNING!   |
| 5770/5  | C6            | Joystick status indicator - Abnormally low current or open circuit.  | WARNING!   |
| 5810/3  | D1            | Power supply to sensor - Abnormally high voltage or short-circuit to higher voltage.                       | WARNING!   |
| 5810/4  | D2            | Power supply to sensor - Abnormally low voltage or short circuit to lower voltage.                         | WARNING!   |
| 5820/3  | D4            | High battery voltage. Transmission control unit activates "TCU shutdown"                                   | STOP!  |
| 5820/4  | D3            | Low battery voltage. Transmission control unit activates "TCU shutdown"                                    | STOP!  |
| 5830/2  | D5            | Error on valve power supply VPS1. Transmission control unit activates "TCU shutdown"                       | STOP!  |
| 5840/2  | D6            | Error on valve power supply VPS2. Transmission control unit activates "TCU shutdown"                       | STOP!  |
| 5860/3  | E3            | Display output - Abnormally high voltage or short-circuit to higher voltage.                               | WARNING!   |
| 5860/4  | E4            | Display output - Abnormally low voltage or short-circuit to lower voltage.                                 | WARNING!   |
| 5880/2  | E6            | Prohibited ID request via CAN. Transmission in neutral. Transmission control unit activates "TCU shutdown" | STOP!  |
| 5890/2  | F1            | General EEPROM error.  | WARNING!   |
| 5900/13   | F2            | Configuration lost. Transmission control unit activates "TCU shutdown"                                     | STOP!  |



|  |               | Description   | Action   |
|---|---------------|---|----------|
| SPN/FMI   | ZF code (hex) |   |          |
| 5910/13   | F3            | Application error. Transmission control unit activates "TCU shutdown"                             | STOP!    |
| 5930/7  | F5            | Clutch error. Transmission control unit activates "TCU shutdown"                                  | STOP!    |
| 5930/13   | F6            | Calibration value from inching pedal or clutch modulation not in memory. Inching not functioning. | WARNING! |

For serious transmission errors, the control unit uses four modes with reduced functionality to protect the transmission from damage. These are:

- "Substitute clutch control".

In this state the driver can use the machine as normal. However, gear shifting and change of travel direction does not take place under the control of normal modulation. The control unit uses standard values for modulating clutches.

- "Limp home".

In this state the driver can use one of the transmission gears in each direction, and in some cases only in one direction. To continue driving with a fault and the limitation "Limp home" active, the machine must be stopped, coming to a standstill, the gear selector moved to neutral before a gear can be selected again.

- "Transmission shut down".

In this state the transmission is permanently in neutral as the solenoid valves for the clutches and parts of the power supply to the transmission are shutoff. Park the machine and switch off the engine.

- "TCU shut down".

In this state the transmission is permanently in neutral as all the solenoid valves and all power supplies to the transmission are shutoff. Park the machine and switch off the engine.

## Error codes ECC



Table 10. Error codes ECC

| Error code             | Description   | Recommended action  |
|------------------------|---|---|
| Heater valve Open      | Open circuit in water valve or in cables between ECC control unit and water valve.  | Contact service.  |
| Heater valve Short     | Short-circuit in water valve or in cables between ECC control unit and water valve.   | Contact service.  |
| Heater valve Stuck     | The water valve has got stuck or has been blocked by a foreign body.  | Contact service.  |
| Inside sensor Open     | Open circuit in sensor, cabin temperature, or cables between the ECC control unit and the sensor, cabin temperature.        | Contact service.  |
| Inside sensor Short    | Short-circuit in sensor, cabin temperature, or cables between the ECC control unit and the sensor, cabin temperature.       | Contact service.  |
| Outside sensor Open    | Open circuit in sensor, outside temperature, or cables between the ECC control unit and the sensor, outside temperature.    | Contact service.  |
| Outside sensor Short   | Short-circuit in sensor, outside temperature, or cables between the ECC control unit and the sensor, outside temperature.   | Contact service.  |
| De-icing sensor Open   | Open circuit in sensor, de-icing, or cables between the ECC control unit and the sensor, de-icing.                          | Contact service.  |
| De-icing sensor Short  | Short-circuit in sensor, de-icing, or cables between the ECC control unit and the sensor, de-icing.                         | Contact service.  |
| Aftercoil sensor Open  | Open circuit in sensor, after heat exchanger, or cables between the ECC control unit and the sensor, after heat exchanger.  | Contact service.  |
| Aftercoil sensor Short | Short-circuit in sensor, after heat exchanger, or cables between the ECC control unit and the sensor, after heat exchanger. | Contact service.  |
| AC system failure      | Probably abnormal pressure in refrigerant circuit.  | <p>The fault may be temporary and if so, it can be rectified by re-setting the ECC.</p> <p>Reset the ECC by switching off the ignition and re-starting the truck. Go to the fault indication menu on the ECC and press the button to reduce the fan speed for a few seconds, see section <i>Error codes ECC page 146</i>.</p> <p>If the fault remains after re-starting, contact service.</p> |