Control Manual

SE5000 Digital Tachograph

Stoneridge Electronics

Ready to
drive

Stoneridge

Stoneridge

Important

The Stoneridge tachograph SE5000 has full type approval for use in the European Union according with Commission Regulation (EC) No. 1360/2002 of 13 June 2002 and other related legislatives.

The Approval Certificate number is e5-0002. This number will be indicated on all Stoneridge tachographs.

The tachograph fulfils the requirements of EU Commission Directive 72/245/EEC, last amended by Directive 2006/96/EC, certificate No 03 0289, in respect of electromagnetic compatibility.

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Symbols

⚠	Warning
!	Important information
ⓘ	Tip, Note
▶	Action required
▷ page	Page reference
Display	Messages in the display

Information on the Internet

Further information about Stoneridge digital tachograph SE5000 and about
Stoneridge Electronics AB can be found at:

www.stoneridgeelectronics.info

Copyright

Contents

Introduction

This manual concerns the control mode of operation. However, knowledge of the operational mode of the unit is also required in case of driving a tachograph fitted vehicle.

A Stoneridge tachograph can be operated in one of four modes of operation:

- Operational (driver card or no card inserted)
- Control (control card inserted)
- Calibration (workshop card inserted)
- Company (company card inserted)

If any combination of workshop, control and company cards are inserted into a tachograph at the same time, then the operational mode will be set.

Company Lock-in/Lock-out details can be used to identify the true owners of blocks of stored tachograph data. Enforcement officers should encourage companies to Lock-in tachograph data as it not only identifies their company as the owner of the data, but also prevents third party company card owners from viewing or downloading their data.

Also, when transferring ownership of a tachograph to another company, the current tachograph owner must Lock-out the data before transfer of the tachograph. Thus any future data stored after the Lock-out would be clearly identified as not applying to them.

Due to data protection laws, care must be taken to ensure that the tachograph data is not downloaded and passed on to third parties without the permission of the tachograph owner.

The control card can be inserted in either of the trays. If control cards are inserted in both trays the card in tray 1 will be used for the control operation and the card in tray 2 will be ignored.

The Control Card:

- Must be obtained via an application to the relevant authorities.
- Is valid for 2 years only.
- Will only be issued to enforcement officers or enforcement authorities.
- Are personal to the enforcement officer and authority and is not transferable.
- Allows read-only access to data stored in the driver card or in the tachographs internal memory respectively.
- Can store a minimum of 230 records of displaying and/or printing and/or VU downloading and/or card downloading. The maximum number of records is dependent on the card type. When the upper limit is reached the oldest data will be overwritten.

ⓘ

Extra care must be taken to ensure that only the authorised owner of a control card has access to it at all times.

System Overview

101808/001R01
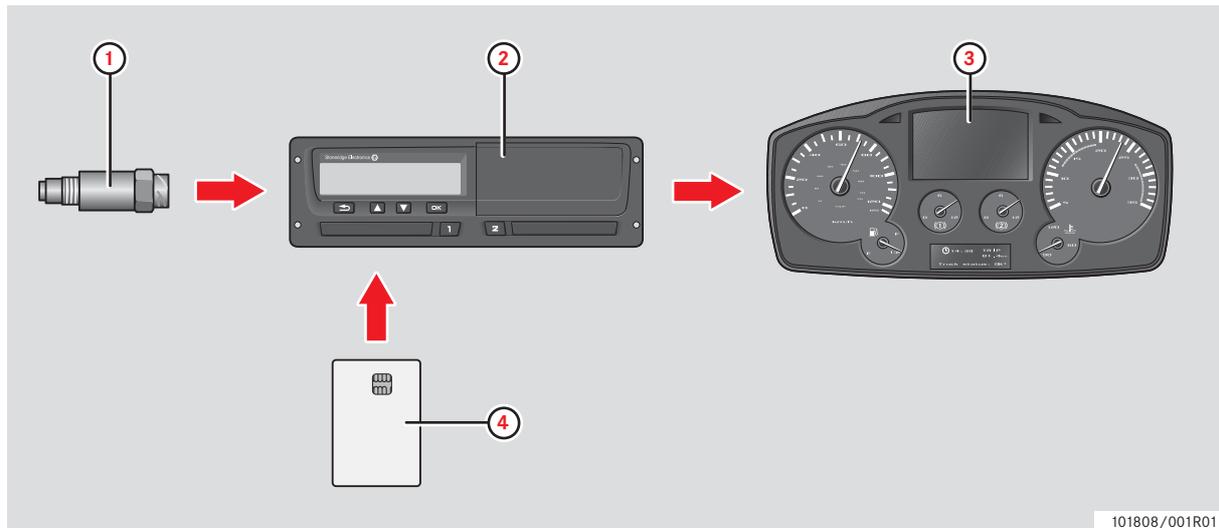
1	Encrypted motion sensor
2	Digital tachograph, with integrated display and printer
3	Display in vehicle's instrument cluster
4	Card

Encrypted Motion Sensor (1)

Used to provide the tachograph with speed signal pulses from the vehicle gearbox. To ensure the integrity of the speed sensor signal, the speed signal is transferred between the sensor and the tachograph in an encrypted form. Encrypting the speed signal ensures that any tampering with the signal will be detected and recorded.

Digital Tachograph (2)

The tachograph records and stores various data:

- Workshop or driver card data.

- Warnings and malfunctions relating to the tachograph, the driver, the company and the workshop.

- Vehicle information, odometer data and detailed speed.

- Tampering with the tachograph.

Display in Instrument Cluster (3)

The display in the instrument cluster can be used to display information passed from the tachograph, such as speed and distance travelled.

Control or Driver Card (4)

The following cards dedicated for specific usage can be used in the tachograph:

- Driver card - records the drivers activities.

- Control card - authority control and inspection.

- Workshop card - calibration mode.

- Company card - hauliers and vehicle owners, down loading and storage of data.

User Interface

The tachograph detailed within this manual comprises two card tray mechanisms, a printer, an LCD display, a calibration/download interface and user controls, located in an ISO standard radio enclosure.

The tachograph has been designed to comply with EU Regulations and thus displays and records speed and distance in metric units (kilometres per hour and kilometres respectively).

The tachograph also incorporates an internal clock, which is used to indicate the current time on the tachograph display.

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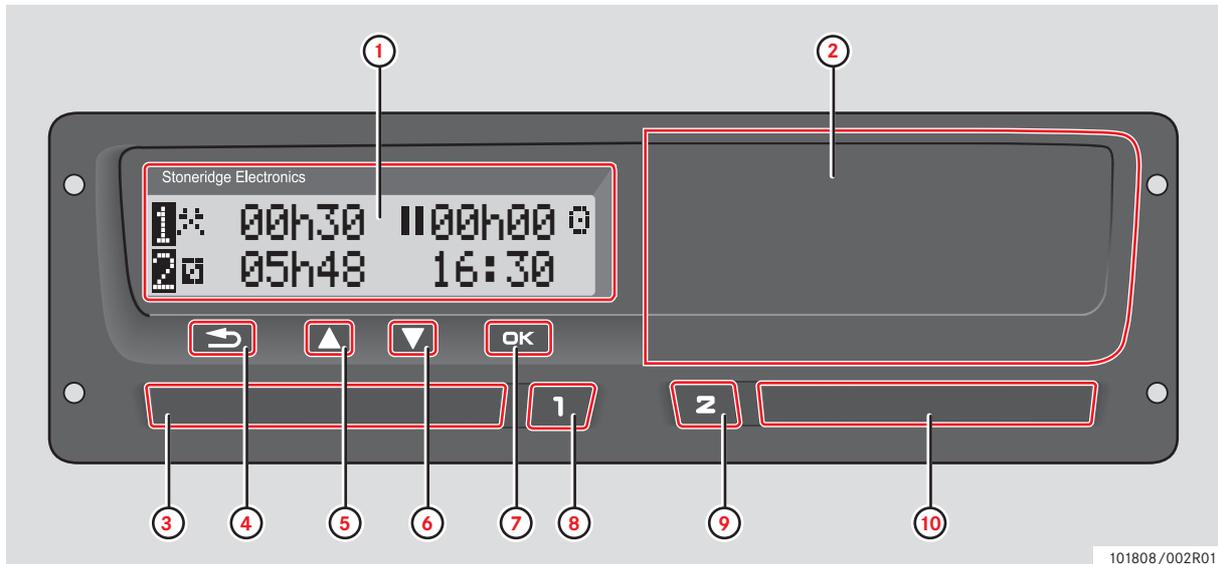
1	Display	**6**	Down button
2	Printer, 6-pin connector, behind the paper cassette	**7**	Enter button
		8	Driver button
3	Card tray 1	**9**	Co-driver button
4	Cancel button	**10**	Card tray 2
5	Up button		

Downloading Data

General

An enforcement officer can download data from a digital tachograph system. Downloading means the copying, together with a security digital signature, of a partial or a complete set of data that is stored in the memory of a tachograph or on a driver card.

The download must be done to aid investigations into "Drivers Hours" legislation checks and to aid determination of the validity of the digital tachograph systems. When carrying out "Drivers Hours" investigations, care must be taken to identify the true owners of blocks of stored tachograph data.

Dedicated download equipment or a valid control card is essential for the downloading of the data stored in the tachograph or on the driver card.

Download equipment

Behind the paper cassette is an 6-pin connector located. This is where the required downloading equipment is connected.
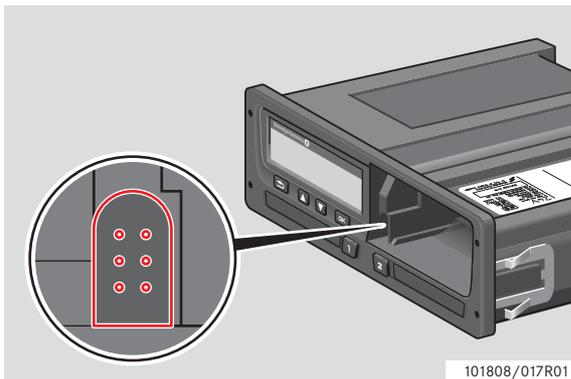
101808/017R01

Control Card

A valid control card is required to download or to view driving data stored on either an inserted driver card or in the tachographs data memory. The control card provides read-access to the entire tachograph data memory contents whether or not the data has been company locked using a valid company card.

Inserting a Control Card

Insert the control card in either of the trays.

▶ Press and hold the **1** button for tray 1 or the **2** button for tray 2 to open the tray.

▶ Insert the card with the chip facing upwards.
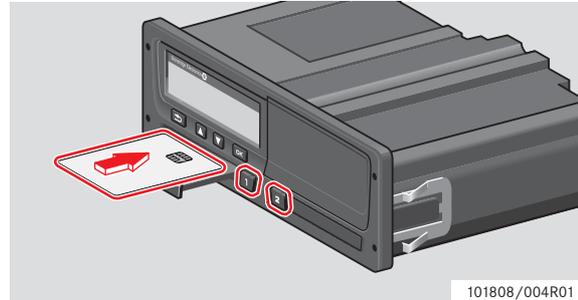
101808/004R01

▶ The control card must be inserted to identify the controller/user.

▶ Close the tray by pushing it in carefully. The tachograph now processes the control card data.

▶ If the control card authentication fails, see page 32 LÄNK.

▶ The card tray is locked when the vehicle is in motion, while the tachograph is busy processing the control card and if the power supply to the tachograph is interrupted.

Ejecting a Control Card

▶ Press and hold the **1** button to open the driver card tray or the **2** button to open the co-driver card tray.

▶ Enter the country you are at present in.

▶ Remove the control card.
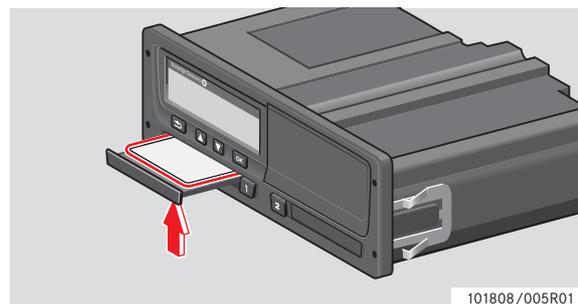
101808/005R01

▶ Close the tray by pushing it carefully forward.

ⓘ

Withdrawal of the Control Card is possible in Main-Menu.

Storing Data

When a control card is inserted into a tachograph in order to perform a control activity, a record of the control activity is stored on the control card and in the tachograph as described below. The type of controls that can be performed are displaying, downloading or printing data from the tachograph and/or the card.

Stored Data on the Control Card

A control card has stored a single record containing the following card and card holder information:

▶ The card number.

▶ The issuing Member state, issuing authority name and the issue date.

▶ The card validity date.

▶ The control body name and address.

▶ The surname and forename of the card holder.

▶ The preferred language.

Each time a control card is used to carry out a control activity the following data is stored on the control card:

▶ The date and time of the control activity.

▶ The type of control activity performed.

▶ The period downloaded, if applicable.

▶ The VRN (Vehicle Registration Number) and Member State registering authority of the controlled vehicle.

▶ The card number and card issuing Member State, in case of controlling a card.

Stored Control Activity in the Tachograph

Each time a control card is used to carry out a control activity a record of the activity is stored in the tachograph. The data in each record is:

▶ Date and time of the control.

▶ The control card number and card issuing Member State.

▶ The type of control.

ⓘ

In case of downloading, the date of the oldest and most recent days downloaded must also be recorded.

Downloading Data

To download data do the following:

▶ Remove the paper cassette.

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101808/008R01
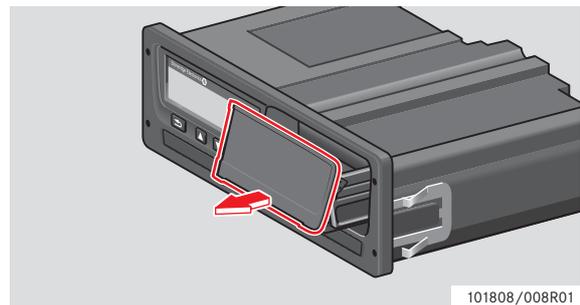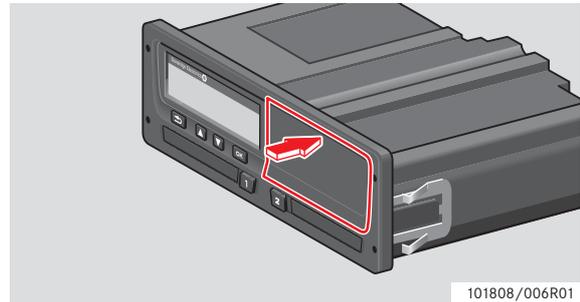
▶ Attach the download equipment to the tachograph through the 6-way front download connector.

▶ Start downloading data according to the instruction on the download equipment.

When the download is completed, the message "`Downloading completed`" will be displayed.

If the download process has failed and is incomplete the message "`Downloading failed`" will be displayed.

If the download fails:

▶ Remove the control card.

▶ Check the connections.

▶ Check the download equipment.

▶ Re-inserted the control card and redo the process until downloading is made.

If the data download cannot be completed and the message "`Downloading fault`" is displayed and the tachograph is found to be the cause or if it is unsure whether the card or the tachograph is faulty, the vehicle must be taken to a Tachograph Workshop for investigation.

System Inspection

General

The control function involves a number of different functions associated with the digital tachograph system. A tachograph inspection is done to ensure that it still meets the EU legislation requirements.

For example, downloading and checking the data stored on either the driver card or in the tachographs internal memory, and an inspection of the tachograph system.

101808/125R01

1   Predetermined breakpoint.

ⓘ

If any unit fails the inspection the vehicle must be taken to a Workshop for further investigation.

Visual Check

▶ Ensure that there is no damage to or drill holes in the entire exterior casing including underneath rubber acorn, which would imply a tampering attempt.

▶ Check for evidence of tampering with the seals and labels.

▶ Check for additional seals and labels that do not

▶ belong to the tachograph, as they might cover drill holes. There should only be one label on top of the tachograph.Check that the heat seals is present.

▶ Check the tachograph type approval mark.

▶ Check that the predetermined breakpoints are unbroken.

▶ Check that all tachograph system seals are intact.

▶ Confirm the presence of the installation plaque.

▶ Check that the label and Stoneridge logotype hologram is present and in one piece. The position of the label is shown in the illustration below. Two different seals are used.
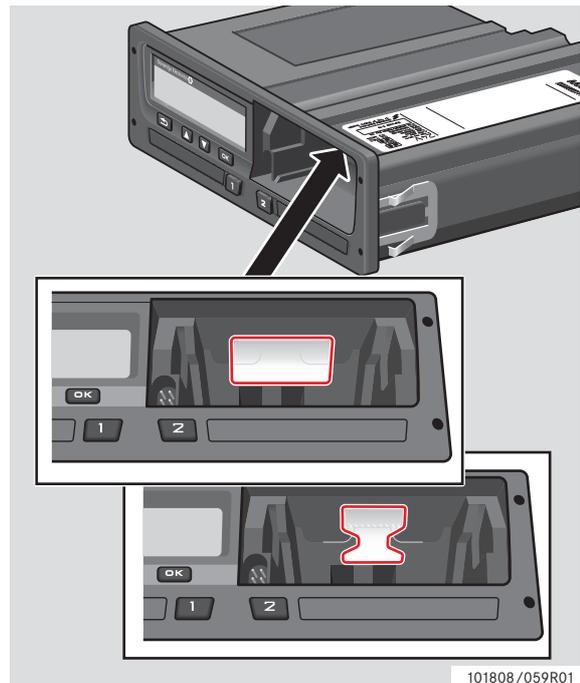
101808/059R01

Inspection Procedure

Follow this procedure to confirm that the function of the recording equipment is correct:

▶ Check that the operation of the recording equipment including data storage on cards is satisfactory.

▶ Determine that the tachograph operates within maximum tolerances for both speed and distance.

▶ Compare that the actual circumference and tyre size corresponds with the information on the installation plaque.

▶ Check the internally stored calibration factors according to the installation plaque with a tecnical printout.

▶ Check the internally stored vehicle parameters, VIN (Vehicle Identification Number) and VRN (Vehicle Registration Number) and compare to the actual vehicle data with a tecnical printout

▶ Check the correctness of the UTC time.

ⓘ

If the UTC time is inaccurate by more than 20 minutes, the vehicle must be taken to a workshop for recalibration.

Installation Plaque

The installation plaque must be clearly visible and easily accessible:

▶ Constant of the tachograph, K factor (imp/km).

▶ Effective circumference of the wheel tyres, L factor (mm).

▶ Characteristic coefficient of the vehicle, W factor (imp/km).

▶ Tyre size.

▶ Vehicle Identification Number (VIN).

▶ Name, address or trade name of the approved fitter or workshop.

▶ Date for passed calibration.

Tachograph
Installation
Plaque

K Factor=5000 imp/km
L Factor=3500 mm
W Factor=5000 imp/km
Tyre Size=12/R15
VIN=Vehicle ID
VU Serial No=VU S/N

Workshop=Workshop Name

Address=Workshop, 10 High Street,
Middlesex, England

Technician ID=Robert Andersson

Date of Calibration=05 May 2003

101808/040R01

Pictograms

Symbols

The symbols shown in the display and on the printouts represent persons, activities or processes of the tachograph.

Symbol	Description
⊖	Function not available while driving or in extreme cold.
1, ☐	Driver
2, ☐	Co-driver
☐	Card
⏏	Eject
✕	Work
⊙	Driving, operational mode
⊢	Rest
▣	Available
⚓	Ferry / train journey
OUT	"Out of scope", i.e. no recording is required
●	Location
▮▶	Start of work
▶▮	End of work
▮▮	Break
→	From or to
▼	Printout
ℓ	Paper
☐	Display
⌛	Processing, please wait
⊙	Time
UTC	UTC time
LOC	Local time in printout
24h	Daily
I	One week
I I	Two weeks
Σ	Cumulative./summary
›	Speed
»	Overspeeding
✕	Message, warning or malfunction
!	Events
?	Unknown activity

Symbol	Description
⊤	Workshop, Calibration mode
⛁	Company, Company mode
⬚	Enforcement authority, Control Mode
☐	Non activated unit
✓	Finished
⬚	Security
⬚	External storage
ꭥ	Buttons
⬚	Company lock
⬚	Tachograph (VU)
✦	Tyre size
�Π	Sensor
⊥	Power supply
🖶	Print
⚊c	Settings
o⚊⟨	Places
o➤o	Places

Pictogram Combinations

Symbol	Description
● ▮▶	Country in which work started
▶▮ ●	Country in which work ended
▣ ➔	Start time (UTC time)
➔ ▣	End time (UTC time)
● ▣	Local time
⊙ |	Driving time for one week
⊙ | |	Driving time for two weeks
OUT ➔	Start of"Out of scope"
➔ OUT	End of "Out of scope"
↓ ○	Printer Low temperature
↑ ○	Printer High temperature
▯ ––	No card
⊙ ▯	Driver card
T ▯	Workshop card
⬠ ▯	Company card
▯ ▯	Control card
▯ ●	Control location
▯ ➔	Data from the tachograph

The symbol combinations shown in the display and on the printouts represent persons, activities or processes of the tachograph.

Printouts

A tachograph has the ability to supply various types of printout relating to the unit itself and to inserted card. The following sections describe how to create a printout, the different types available and some examples of printouts.

For more information of printouts, see the tachographs Driver & Company Manual.

How to Create a Printout:

▶ Press the ⬛ button to enter the tachograph menu.
▶ Press the ⬛ or ⬛ button until the Print menu appears, and then press ⬛.
▶ Select one of the printouts shown in the table below.
▶ Use the ⬛ or ⬛ button to select whether to print out the data on paper (printout) or to show it in the tachograph display and then press ⬛.

How to stop a Printout:

▶ Press and hold the ⬛ button.

Types of Printout

Menu item	Type of printout	Description
24h ▣ ▼ 24h card ⬍	Driver activities from card, daily printout. (legal requirement)	List of all activities for any of the dates with activities stored on the driver card or co-driver card in UTC-time.
24h ▣ ▼ 24h vehicle ⬍	Driver activities from vehicle unit, daily printout. (legal requirement)	List of all activities stored in the tachograph for the selected date, in UTC time: ▶ If no card is inserted, select either the current day or any of the eight recent days. ▶ When a card is inserted, select any day stored in the tachograph, out of a maximum of typically the recent 28 days. ▶ If no data is available for the selected date, the printout will not be initiated.
!X▣ ▼ events card ⬍	Events and faults printout from card. (legal requirement)	List of all warnings and malfunctions stored on a driver card.
!X▣ ▼ event vehicle ⬍	Events and faults printout from vehicle unit. (legal requirement)	List of all warnings and malfunctions stored in the tachograph.
T▣ ▼ technical data ⬍	Technical data.	List of the parameter settings in the tachograph.
≫ ▼ overspeeding ⬍	Overspeeding data.	List of all overspeeding warnings.
man entry sheet ⬍	Manual entries sheet printout	Printout for filling in manual entries manually using a pen.
man entry confirmation ⬍	Manual entries printout	Printout for manually entered activities in tachograph.
vehicle speed ⬍	Vehicle speed (km/h).	List of vehicle speed bands in km/h.

Types of Printout

Menu item	Type of printout	Description
engine speed	Engine speed (rpm)	List of engine speed bands in rpm.
status D1/D2	D1/D2.	List of changes in status for rear connector D1 and D2. The output options for connectors D1 and D2 are company specific.
24h card local	Daily activities from the driver card, in local time.	List of all activities for any of the dates with activities stored on the driver card, in local time.
24h vehic. local	Daily activities from the tachograph (VU), in local time.	List of all activities stored in the tachograph for the selected date, in local time: ▶ If no card is inserted, select either the current day or any of the eight recent days. ▶ When a card is inserted, select any day stored in the tachograph, out of a maximum of typically the recent 28 days. If no data is available for the selected date, the printout will not be initiated. ▶ The name of the card holder is included on the printout.

Technical Printout

```
           Stoneridge
① ── ▼ 11/05/2007 08:41 (UTC)
② ── T⊡▼─────────▼─────────
     T Johansson and sons
③ ──      123 45 BROMMA
     T⊡S /12345678901012 1 0
           ─────────⊕─────────
④ ── ⊞ ABCD1E2345678910
⑤ ── NL /AA-BB-12
           ─────────⊟─────────
⑥ ── ⊟ Stoneridge Electronics
       Gårdsfogdevägen  18A
       S-168 66 Bromma
⑦ ──   900208R7.0/30R01
⑧ ──   e50002
⑨ ──   1234567890/1106/06/A2
⑩ ──   2006
⑪ ──   v    I6R6    05/12/2006
           ─────────⊿─────────
⑫ ── ⊿ 1234567890/1006/07/A1
⑬ ──   e1-888
⑭ ──   08/01/2007
           ─────────T─────────
⑮ ── T STONERIDGE ELECTRONICS
⑯ ──   168 66 BROMMA
⑰ ── T⊡S /12345678901012 1 0
⑱ ──   21/10/2007
⑲ ── T 08/01/2007  (1)
⑳ ── ⊞ ABCD1E2345678910
㉑ ──      NL/AA-BB-12
㉒ ── w 9  150  Imp/km
㉓ ── k 9  150  Imp/km
㉔ ── l 3  331   mm
㉕ ── ✿ 315/80  R22.5
㉖ ── ❯ 89  km/h
㉗ ──       15 km;    15 km
     ─────────────────────────
     T STONERIDGE ELECTRONICS
       168 66 BROMMA

     T⊡S /12345678901012 1 0
       21/10/2007
㉘ ── T 09/01/2007  (2)
㉙ ── ⊞ ABCD1E2345678910
㉚ ── NL /AA-BB-12
     w 9  150  Imp/km
     k 9  150  Imp/km
     l 3  331   mm
     ✿ 315/80  R22.5
     ❯ 89  km/h
           15 km;    15 km
           ─────────⊕─────────
㉛ ── !⊕ 09/01/2007 10:40
㉜ ── ⊕ 09/01/2007 10:41
     T Johansson and Sons
       123 45 BROMMA

     T⊡S /12345678901012 1 0
     ───────── !x⊞─────────
㉝ ── !   11/05/2007 08:40
㉞ ── x   11/05/2007 08:40
```
I01808/018R01

1	Date and time of printout.
2	Technical data printout.
3	Cardholder ID.
4	Vehicle Identification Number (VIN).
5	Vehicle Registration Number (VRN) and country of registration
6	Tachograph manufacturer.
7	Tachograph part number.
8	Tachograph approval number.
9	Tachograph serial number, date of manufacture, type of equipment and code of manufacturer.
10	Year of manufacture.
11	Software version and installation date.
12	Motion sensor serial number.
13	Motion sensor approval number.
14	Date of first installation of motion sensor.
15	Workshop having performed the calibration.
16	Workshop address.
17	Workshop card identification.
18	Workshop card expiry date.
19	Calibration date and purpose.
20	VIN.
21	VRN (shown as question marks before registered) and country of registration.
22	Characteristic coefficient of vehicle.
23	Constant of the recording equipment.
24	Effective circumference of wheel tyres.
25	Size of tyres.
26	Authorized speed setting.
27	Old and new odometer values.
28	Calibration date and purpose.
29	VIN.
30	VRN and country of registration.
31	Old date and time.
32	New date and time.
33	Most recent event date time.
34	Most recent fault date time.

Events and Faults VU Printout

101808/020R01

1   Date and time of the printout.

2   Events and faults from VU printout.

3   Card inserted.

4   Vehicle Identification Number (VIN)
Vehicle Registration Number (VRN) and country of registration.

5   Card conflict (event).

6   Driving without valid card (event).

7   Card inserted while driving (event).

8   Last card session not correctly closed (event).

9   Power supply interruption (event).

10   Data integrity error (event).

11   Card fault (fault).

12   Sensor fault (fault).

13   Control place.

14   Controller signature.

15   Driver signature.

Detailed view of Events and Faults Printout

101808/019R02
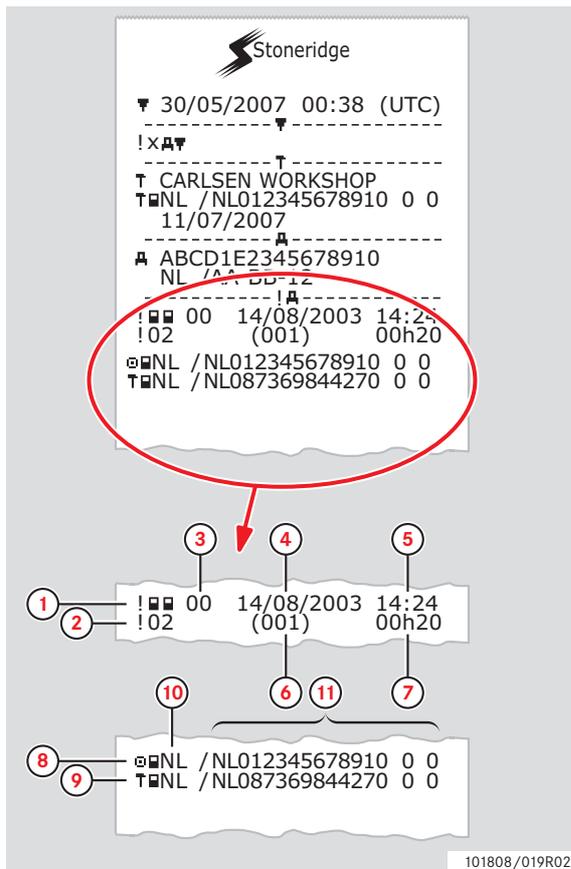
1 Type of event or fault (card conflict).

2 Event or fault code (card conflict).

3 Event or fault record purpose:
00 - one of the 10 most recent (or last) events or faults.
01 - the longest event for one of the last 10 days of occurrence.
02 - one of the 5 longest events over the last 365 days.
03 - the last event for one of the last 10 days of occurrence.
04 - the most serious event for one of the last 10 days of occurrence.
05 - one of the 5 most serious events over the last 365 days.
06 - the first event or fault having occurred after the last calibration.
07 - an active/on-going event or fault.

4 Date of event or fault.

5 Start time of event or fault.

6 Number of events of the same type during the day.

7 Duration of event or fault.

8 Card inserted in slot 1 at the beginning of event or fault (Driver card).

9 Card inserted in slot 2 at the end of the event or fault (Workshop card).

10 Card issue country.

11 Card number (shown with every second number replaced with a space if not in calibration or company mode, control mode or if no card is inserted).

Event and Faults Card Printout

101808/400R01
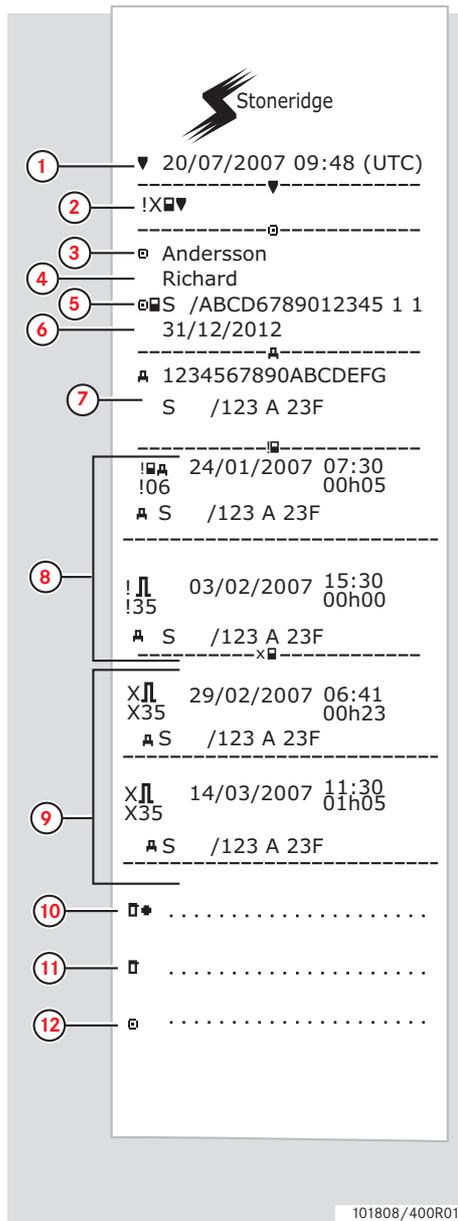
1   Date and time (UTC time).

2   Type of printout. (event and faults, card).

3   Card holder's surname.

4   Card holder's first name.

5   Card and country identification number.

6   Expiry date of the driver card.

7   Vehicle identification. VIN, registering member state and VRN.

8   List of all events stored on the card.

9   List of all faults stored on the card.

10   Control place.

11   Controller´s signature.

12   Driver´s signature.

24

24 h Driver Card

101808/200R01

1 Print out date and time (UTC time).

2 Type of printout. (24h, card).

3 Card holder's surname.

4 Card holder's first name.

5 Card and country identification number.

6 Expiry date of the driver card.

7 Vehicle identification. VIN, registering member state and VRN.

8 Tachograph manufacturer.

9 Tachograph part number.

10 Workshop responsible for last calibration.

11 Workshop card number.

12 Date of last calibration.

13 Last control the inspected driver has been subjected to.

14 Enquiry date and daily card presence counter.

15 Manually entered activity.

16 Driver card in card tray 1.

17 VRN, Vehicle Registration Number, for the vehicle where the driver card is inserted.

18 Total distance at driver card insertion time.

19 Activities with driver card inserted. (*means rest period of at least one hour.)

20 Total distance and trip distance at card withdrawal time.

21 Begin and end details (time, place and odometer), daily summary of activities.

(Continuing on next page) ▷▷

```
----------!X▯-----------
X⅂        14/07/2007  08:57
X35                   01h05
 ▯ 1234567890ABCDEFG
!⅂▯        14/07/2007  08:57
!11                   01h05
 ▯ 1234567890ABCDEFG
X⅂        14/07/2007  17:22
X35                   00h15
 ▯ 1234567890ABCDEFG
!⅂▯        14/07/2007  09:31
!11                   00h22
  ▯ 1234567890ABCDEFG
!▯▯        15/07/2007  11:07
!05                   01h05
 ▯ 1234567890ABCDEFG
----------!X▯----------
!▯▯        14/07/2007  11:07
!04                   01h05
 ▯ 1234567890ABCDEFG
!▯▯        15/07/2007  12:39
!05                   01h05
 ▯ 1234567890ABCDEFG
!▯▯        15/07/2007  16:20
!04                   02h37
 ▯ 1234567890ABCDEFG
!▯▯        16/07/2007  09:42
!05                   04h23
 ▯ 1234567890ABCDEFG

▯●  . . . . . . . . . . . . . . . . . . . .

▯   . . . . . . . . . . . . . . . . . . . .

▯   . . . . . . . . . . . . . . . . . . . .
```

101808/201R01

22   Last five events and faults from the driver card.

23   Last five events and faults from the VU.

24   Control place.

25   Controller´s signature.

26   Driver´s signature.

24 h Vehicle Unit

```
              Stoneridge

  ▼ 20/07/2007 09:48 (UTC)
 -----------▼-------------
 24h ♠▼
 -----------◎-------------
 ◎ Andersson
   Richard
 ◎▪S /ABCD6789012345 1 1
   31/12/2012
 -----------♠-------------
 ♠ 1234567890ABCDEFG
   S    /123 A 23F
 -----------⊟-------------
 ⊟ Stoneridge Electronics
   SE5000900208E7.0/R01
 -----------T-------------
 T Johansson and Sons
 T▪S /WSABC479328651 1 1
 T 15/01/2007
 -----------⊓-------------
 ⊓▪S /CBC584852762 2 2
   19/07/2007 ▼▪
 -----------◎-------------
      19/07/2007 10
 -----------1-------------
 ◎ Andersson
   Richard
 ◎▪S /ABCD6789012345 1 1
   31/12/2012
 ♠ S/DEFG4567
   18/07/2007  07:15

              0 541 269 km
  ✗ 07:33 08:03 00h30
  ◎ 08:04 11:00 02h56
  �O 11:00 14:39 03h39   *
  ◎ 14:39 15:32 00h53
  ⊠ 15:32 15:53 00h53
  �O 15:53 17:10 01h17   *
  ◎ 17:10 17:15 00h05
  ⊢ 17:15 17:29 00h14
  ◎ 17:29 17:33 00h04
```
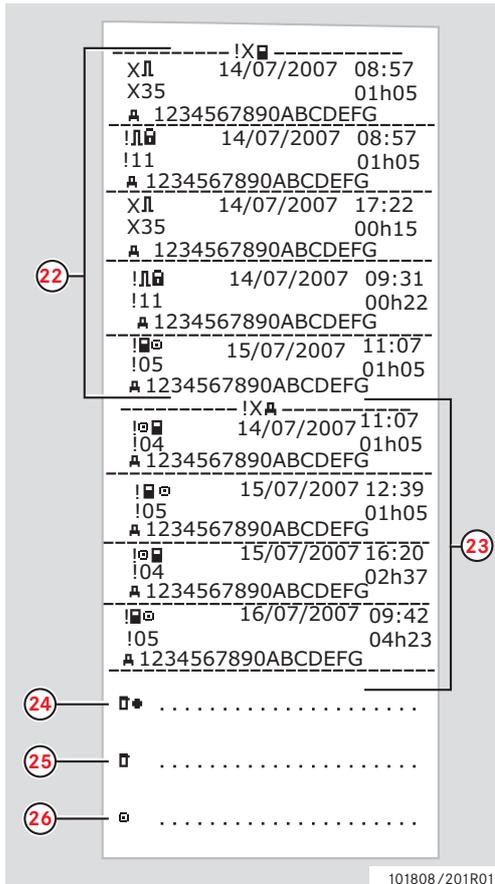
101808/300R01

1 Date and time (UTC time).

2 Type of printout. (24h, vehicle unit).

3 Card holder´s surname.

4 Card holder´s first name.

5 Card and country identification number.

6 Expiry date of the driver card.

7 Vehicle identification. VIN, registering member state and VRN.

8 Tachograph manufacturer.

9 Tachograph part number.

10 Workshop responsible for last calibration.

11 Workshop card number.

12 Date of last calibration.

13 Last control the inspected driver has been subjected to.

14 Enquiry date and daily card presence counter.

15 Card holder's surname.

16 Card holder's first name.

17 Card and country identification number.

18 Expiry date of the driver card.

19 Odometer at insertion and activities in this period. (*means rest period of at least one hour.)
Note! Period when no card inserted and activities in slot 2 omitted in illustration.

20 Activities with driver card inserted. (*means rest period of at least one hour.)

```
-----------Σ-----------
▶◾07:33 S
         510 km
●� ▶17:33 S
         570 km
🖳03h58  60km
✖00h30        ⊠ 00h53
ꟻ01h31        ? 02h03
🖳🖳00h00
```

㉑

```
-----------!X🅰-----------
!🖳🖳          14/07/2007 11:07
!04                     01h05
🅰1234567890ABCDEFG
-----------------------------
!🖳🖳          15/07/2007 12:39
!05                     01h05
🅰1234567890ABCDEFG
-----------------------------
!🖳🖳          15/07/2007 16:20
!04                     02h37
🅰1234567890ABCDEFG
-----------------------------
!🖳🖳          16/07/2007 09:42
!05                     04h23
🅰1234567890ABCDEFG
-----------------------------
            19/07/2007 10:00
                       00h30
🖳🖳S  /CBC584852762 2 2
-----------------------------
```

㉒

㉓   🖳✦ . . . .

㉔   🖳   . . . .

㉕   🖳➡ . . . .

㉖   ➡🖳 . . . .

㉗   🖳 . . . .

101808/301R01
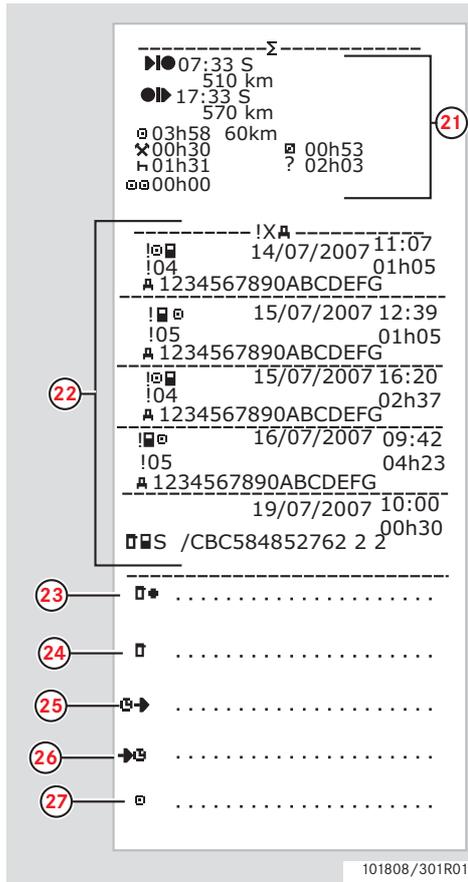
21   Begin and end details (time, place and odometer), daily summary of activities.

22   Last five events and faults from the VU.

23   Control place.

24   Controller´s signature.

25   From time.

26   To time.

27   Driver´s signature.

Overspeeding Printout

```
            Stoneridge
      ▼ 20/07/2007 09:48 (UTC)
   ----------▼-----------
    ≫ ▼ 89
   ----------⊡------------
    ⊡ Andersson
       Richard
    ⊡▪S /ABCD6789012345 1 1
       31/12/2012
   ----------д-----------
    д 1234567890ABCDEFG
       S    /123 A 23F

   -----------≫т-----------
    ≫ 12/02/2007  19:24 00h05
       98 km/h  94 km/h
    ⊡ Andersson
       Richard
    ⊡▪S /ABCD6789012345 1 1
       31/12/2012
   -----------≫365----------
    ≫ 09/02/2007  11:31  00h10
       99 km/h    97 km/h
    ⊡ Svensson
       Bertil
    ⊡▪S /EFGH123456786 2 2
       31/12/2012
   -----------≫10----------
    ≫ 12/02/2007  19:24  00h05
       98 km/h  94 km/h
    ⊡ Andersson
       Richard
    ⊡▪S /ABCD6789012345 1 1
       31/12/2012
   --------------------------
    ≫ 12/02/2007  19:24    00h10
       99 km/h    97 km/h
    ⊡ Svensson
       Bertil
    ⊡▪S /EFGH123456786 2 2
       30/11/2011
   --------------------------
    ▯✳ . . . . . . . . . . . . . . . . . . . .
    ▯  . . . . . . . . . . . . . . . . . . . .
    ⊡  . . . . . . . . . . . . . . . . . . . .
```

101808/500R01

1 Date and time (UTC time).

2 Type of printout. (overspeeding). 89 is pre setted speed authorised.

3 Card holder's surname.

4 Card holder's first name.

5 Card and country identification number.

6 Expiry date of the driver card.

7 Vehicle identification. VIN, registering member state and VRN.

8 First overspeeding after the last calibration.
Date time and duration.
Max and average speed.
Driver and drivers card identification.

9 Five most serious overspeeding over the last 365 days.
Date time and duration.
Max and average speed.
Driver and drivers card identification.

10 Most serious overspeeding events over the last ten days.
Date time and duration.
Max and average speed.
Driver and drivers card identification.

11 Control place.

12 Controller´s signature.

13 Driver´s signature.

Messages, Warnings and Malfunctions

The information shown on the tachograph display is separated into three types of notifications, depending on the seriousness of a specific occurrence:

▶ Messages
▶ Warnings
▶ Malfunctions

If a display is triggered only when a control card is inserted this is explained as [Control card] in the description text.

Messages

A message informs for example about completed processes or problems with the a card.

Messages are not stored and cannot be printed.

To clear a message:
▶ Press the **OK** button.

Warnings

Warnings appear in the event of law infringements, such as overspeeding, or if tachograph data cannot be recorded for various reasons.

Warnings pop up and flash on the display.

Warnings are stored and can be printed out on paper or to the display.

To clear a warning:

▶ Press the **OK** button twice.

Malfunctions

Malfunctions are displayed in case of tachograph, sensor or card malfunctions or if tampering with this equipment is detected.

Malfunctions are stored and can be printed on paper or on the display.

To acknowledge a malfunction:

▶ Press the **OK** button.

Display	Type	Unit	Description	Action
⊖	Message	Tacho-graph	Function not available while driving.	▶ Stop the vehicle and retry the entry. ▶ If the symbol still is present when vehicle stopped, disconnect and reconnect the tachograph and retry. ▶ If the symbol still is present after reconnect, tachograph must be decommisioned.
⊟ Activation ▬▬▬▭▭	Message	Tacho-graph	The tachograph is being activated for use. [Workshop card]	▶ Wait until the automatic activation is completed.
⊟✓ Activation complete	Message	Tacho-graph	The tachograph activation process has been completed successfully. [Workshop card]	▶ The tachograph activation process has been completed successfully.
⊟✗ Activation failed	Message	Tacho-graph	The tachograph activation process has failed. [Workshop card]	▶ Remove the workshop card from the tachograph. ▶ Check system connections. ▶ Re-insert workshop card to retry activation. ▶ Disconnect the tachograph for 30 seconds and retry, ▶ If tachograph will not activate it must be decommissioned.
Already in calibration mode	Malfunction	Card	Two workshop cards inserted at the same time. The second card will be ejected without being authenticated.	
✗ ▪1 Card 1 fault	Malfunction	Card	Error on the driver card in tray 1. (2 if tray 2.)	▶ Withdraw and examine the card. ▶ Check the tachograph with a functional card.
!⊙⊙1 Card 1 time overlap	Warning	Tacho-graph	The last withdrawal time of the inserted driver card, as read from the inserted card, is later than the UTC time of the tachograph.	▶ Check the UTC time of the tachograph. ▶ Wait for the overlap period to elapse. ▶ If UTC time differs more than 20 minutes, a calibration has to be performed.
!▪▪1 Card auth. failure	Malfunction	Card 1 or 2	The inserted card cannot be authenticated by the tachograph.	▶ Check that the inserted card is valid and correctly inserted. ▶ Check if the card works in another tachograph. ▶ Try to insert another card.

Display	Type	Unit	Description	Action
! ▯ ▯ Card conflict	Warning	Card	An invalid card combination has been detected. For example a company and a workshop card.	▶ Withdraw the offending card.
! ▯ ← ▯2 Card data integrity error	Malfunction	Card	Corrupt data has been detected when rading data from the card in tray 2 (1 if tray 1) to the tachograph.	▶ Clean the card with a soft damp cloth and try again. ▶ In case of faulty card, contact the responsible authority in the country in which you are located in.
! ▯ → ✕2 Card eject without saving	Message	Card	Data could not be stored on the card withdrawn from tray 2 ("1" if tray 1) due to an error.	▶ Clean the card with a soft damp cloth and try again. ▶ In case of faulty card, contact the responsible authority in the country in which you are located in.
⊙ ▯1 Card expired	Message	Card	The card inserted in tray 1 ("2" if tray 2) has expired.	▶ Eject the card and replace it with a valid one.
1 Card expires in xx days	Warning	Card	The card inserted in tray 1 ("2" if tray 2) expires in xx days, where xx is a number between 0 and 30.	▶ Contact the responsible authority to get a new card. The message disappears automatically after 5 seconds or when a button is pushed.
! ▯ ⊙ Card ins. while driving	Warning 05	Card	A tachograph card is inserted in any slot while driving.	▶ No further action required.
! ▯ ⊿/⊿ Data integrity error	Malfunction 15	Tachograph	Corrupted files has been detected in the tachograph. These files will not have a valid signature when downloaded.	▶ Check for evidence of tampering with the tachograph. If there is evidence of tampering the tachograph must be decommissioned and replaced.
⤓Downloading busy	Message	Tachograph	The tachograph is downloading data. [Workshop card]	▶ Wait for the download procedure to complete.
⤓ ✓ ⤓Download complete	Message	Tachograph	The tachograph download process has been completed successfully. [Workshop card]	▶ No further action required.
⤓ ✕ ⤓Download failed	Malfunction	Tachograph	The tachograph download process has failed and is incomplete. [Workshop card]	▶ Retry the download. ▶ Check the connections and the download equipment. ▶ Re-insert the card and retry the download. ▶ Replace or repair the download equipment if required. ▶ If the tachograph is faulty beyond repair it must be decommissioned and replaced.

Display	Type	Unit	Description	Action
⊙▮/▯✕ Driving can't open slot	Message	Tachograph	An attempt was made to open the card tray (slot) while the vehicle was in motion.	▶ Stop the vehicle. The card tray can be opened only when the vehicle is stationary.
!⊙▯ Driving w/o valid card	Warning	Card	Driving without a valid card or with an invalid card combination.	▶ Stop and insert a valid card and/or remove inappropriate card.
fn✕ Function not possible	Message	Tachograph	The desired function cannot be carried out.	▶ No further action required.
!▯ ⚒ Hardware sabotage	Malfunction	Tachograph	Authenticated card has been removed by force or a tampering with the hardware has been detected.	▶ Check for evidence of tampering with the tachograph. If there is evidence of tampering the tachograph must be decommissioned and replaced.
!▯ Insertion of a non valid card	Warning	Card	A non-valid card has been inserted into a slot.	▶ Withdraw the non-valid card. ▶ Check that the card has not been inserted upside down or is expired.
!▯ ⚒2 Last sess. not closed ok	Warning	Card	The tachograph detects that the previous card session has not been correctly closed. The card in tray 2 ("1" if tray 1) has been withdrawn before all relevant data have been stored on the card.	▶ Eject the card and check it visually. ▶ Clean the card with a soft damp cloth and try again. ▶ In case of faulty card, contact the responsible authority in the country in which you are at present in.
M.....! Memory full!	Message	Tachograph	Manual entries memory full.	▶ Remove the manual entries so that the total number of manual entries is less.
New time? ● ⊕03:01 YES	Message	Tachograph	Daylight saving time changes.	▶ Answer "Yes" to start or end daylight saving time. ▶ Answer "No" or press the ⏎ button to cancel.
!⊙/T▯ No driver/ workshop card	Message	Card	A function has been selected that requires an inserted driver or workshop card.	▶ Insert a driver or workshop card.
!▯ Ⓜ? No further details	Malfunction	Sensor	Internal sensor error.	▶ Replace the motion sensor.
>> Over speeding	Warning	Tachograph	The speed of the vehicle has exceeded the highest speed allowed for the vehicle. This has been active during at least 60 seconds.	▶ Find out the the maximum speed allowed is for the vehicle.

Display	Type	Unit	Description	Action
`>>? Overspeeding pre-warning`	Message	Tachograph	Overspeeding, pre-warning.	▶ Driver related message. Observe the speed limit.
`Ⅱ→Ꙥ...✓ Pairing complete`	Message	Tachograph, Sensor	The motion sensor - tachograph pairing process has been completed successfully. [Workshop card]	▶ No further action required.
`Ⅱ→Ꙥ...✕ Pairing failed`	Message	Tachograph, sensor	The motion sensor - tachograph pairing process has failed. [Workshop card]	▶ Remove the workshop card from the tachograph. ▶ Check the system connections. ▶ Re-insert the workshop card to retry pairing. ▶ Replace the sensor if required. ▶ If the message is shown repeatedly the tachograph might be faulty beyond repair and must be decommissioned and replaced.
`PIN?`	Message	Tachograph	Enter a PIN code to: - activate a tachograph - enter the tachograph calibration mode [Workshop card]	▶ Enter a valid PIN code.
`!╪Power supply interruption`	Warning	Tacho-graph	The power supply to the tachograph has been interrupted for more than 200 milli-seconds. Cranking voltage should not cause this event. The event is not generated in calibration mode.	▶ Check the vehicle and tachograph power supply levels. ▶ Check the power supply cables. ▶ Check the vehicle´s battery and replace if necessary.
`▼↑o Printer high temperature`	Message	Printer	The printing could not start, or the ongoing printing has been interrupted because the temperature of the printer is too high.	▶ Wait until the printer temperature is within allowable range and try to print again.
`▼↓o Printer low temperature`	Message	Printer	The printing could not start because the temperature of the printer is too low.	▶ Wait until the printer temperature is within allowable range and try to print again.
`▼↓╪ Printer low power`	Message	Printer	The ongoing printing has been interrupted because the tachograph input voltage is too low.	▶ Check the vehicle battery voltage, wiring, etc. ▶ If the printer still fails the tachograph must be decommissioned and replaced.

Display	Type	Unit	Description	Action
▼ ℓ × Printer out of paper	Message	Printer	Printer paper is out.	▶ Insert a new paper roll. ▶ If fault remains active for no apparent reason the tachograph must be decommissioned and replaced.
▼ × ▼ Printing cancelled	Message	Printer	The current printing has been cancelled.	▶ No further action required.
>4 1/2h? Quarter left reminder	Message	Tachograph	The driver has 15 minutes left until the legal continuous driving time of 4 1/2 hours will be exceeded.	▶ Find a suitable place to take a break in the next 15 minutes.
!▣ Ⅱ ▣ Sensor auth. failure	Malfunction	Sensor	An unsuccessful authentication attempt of the motion sensor has been detected.	▶ Check motion sensor operation and all wiring. ▶ Check for evidence of tampering. ▶ Pair the motion sensor and tachograph again. ▶ Perform a new calibration of the tachograph system. ▶ Replace the sensor if found faulty.
!Ⅱ =0 Sensor cable fault	Warning	Sensor	Motion sensor data error.	▶ Check the motion sensor operation and wiring. ▶ Replace the motion sensor if necessary.
!Ⅱ >0 Sensor cable fault	Warning	Sensor	Motion sensor data error.	▶ Check the motion sensor operation and wiring. ▶ Replace the motion sensor if necessary.
× Ⅱ. × Sensor comms error	Malfunction	Sensor	Motion sensor communication error.	▶ Check the motion sensor operation and wiring. ▶ Replace motion sensor if necessary.
!Ⅱ Sensor data error	Warning	Sensor	Motion sensor data error	▶ Check the motion sensor operation and all wiring, replace the sensor if faulty. ▶ Check for evidence of tampering ▶ If the error remains active for no apparent reason, decommission and replace the tachograph.
× Ⅱ Sensor fault	Malfunction	Sensor	A data link error between the speed sensor and the tachograph.	▶ Check the motion sensor operation and all wiring. - replace sensor if faulty ▶ Check for evidence of tampering. ▶ Pair the motion sensor and the tachograph again.

Display	Type	Unit	Description	Action
`!🔒 Л⁄Л Sensor data integrity error`	Malfunction	Sensor	Internal sensor error, stored data integrity failure	▶ Replace the motion sensor if necessary.
`✕ Л ✓ ✕ Sensor no acknowledge`	Malfunction	Sensor	Motion sensor communication error.	▶ Check the motion sensor operation and wiring. ▶ Replace the motion sensor if necessary.
`✕ Л ← Л ✕ Sensor no answer`	Malfunction	Sensor	Motion sensor communication error.	▶ Check the motion sensor operation and wiring. ▶ Replace the motion sensor if necessary.
`Л → ♣...Sensor pairing`	Message	Tachograph, sensor	The motion sensor and tachograph are in the process of pairing.	▶ Wait until the automatic pairing process is complete.
`✕ ♣ Л ÷ ↑ Sensor power high`	Malfunction	Sensor	Sensor power too high.	▶ Check the vehicle battery voltage, wiring, etc. ▶ Replace the motion sensor if necessary.
`✕ Л ÷ ↓ Sensor power low`	Malfunction	Sensor	Sensor power too low.	▶ Check the vehicle battery voltage, wiring, etc. ▶ Replace the motion sensor if necessary.
`! Л ÷ Sensor power no signal`	Malfunction	Sensor	Sensor has no power.	▶ Check the vehicle battery voltage, wiring, etc. ▶ Replace the motion sensor if necessary.
`♣ → T? Service pre-warning`	Message	Tachograph	Next calibration, pre-warning.	▶ Calibrate the tachograph.
`>4 1⁄2h Time for break reminder`	Message	Tachograph	The legally maximized continuous driving time of 4 1/2 hours has elapsed.	▶ Stop the vehicle at the earliest opportunity and take a break for 45 minutes.
`! ♣ → T Time for service`	Message	Tachograph	Calibration error, time for periodic inspection.	▶ Perform a calibration.
`■ → ⌚ Timeout no key pressed`	Message	Tachograph	The tachograph is waiting for input.	▶ Press the appropriate buttons and complete the process.
`✕ 1⁄2 ✓ ✕ Unable to open slot`	Message	Tachograph	The card tray (slot) cannot be opened.	▶ Check the tray for correct operation. ▶ If the tray still fails the tachograph must be decommissioned and replaced.

Display	Type	Unit	Description	Action
!🔒♊️ Unauth. change of sensor	Malfunction	Sensor	The sensor has been changed since last pairing.	▶ Check motion sensor operation and all wiring. ▶ Check for evidence of tampering. ▶ Pair the motion sensor and tachograph again. ▶ Perform a new calibration of the tachograph system. ▶ Replace the sensor if found faulty.
!UTC Time adjust not allowed	Message	Tachograph	UTC time adjustment more than +/- 1 minute once a week is not allowed, when not in calibration mode.	▶ If the UTC time in the tachograph has deviated by more than 20 minutes, the tachograph must be re-calibrated by a workshop for tachographs.
✕🅰 VU internal fault	Malfunction	Tachograph	Internal fault in the tachograph	▶ Decommission and replace the tachograph.
! Wrong PIN! Attempts left:2	Message	Card	Wrong PIN entered but still attempts left. [Workshop card]	▶ Press OK and try again.
✕1 Wrong PIN! Card locked1	Message	Card	Wrong PIN entered and no attempts left. [Workshop card]	▶ Eject the card and replace it with a valid one.

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