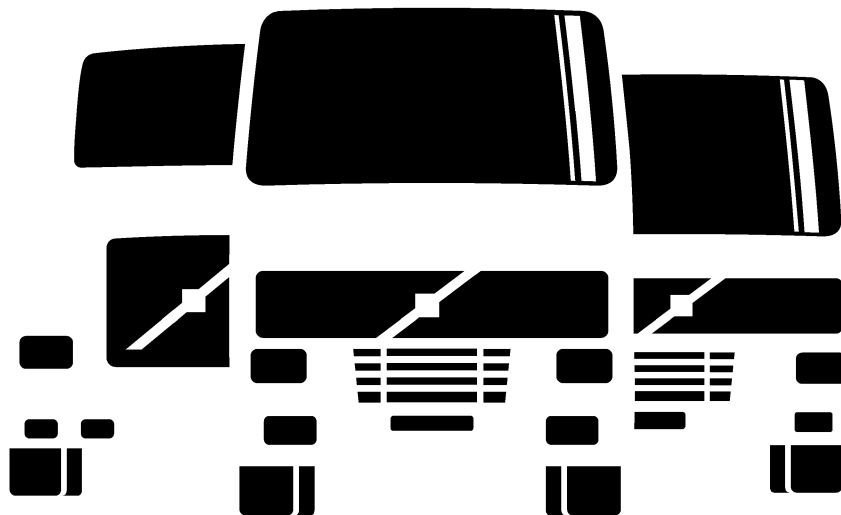


Service Manual Trucks

Group **38**

Release **01**

Fault codes tachograph
TAC-DIG, TAC-DIG2



Foreword

The descriptions and service procedures contained in this manual are based on designs and methods studies carried out up to April 2005.

The products are under continuous development. Vehicles and components produced after the above date may therefore have different specifications and repair methods. When this is judged to have a significant bearing on this manual, supplementary service bulletins will be issued to cover the changes.

The new edition of this manual will update the changes.

In service procedures where the title incorporates an operation number, this is a reference to V.S.T. (Volvo Standard Times).

Service procedures which do not include an operation number in the title are for general information and no reference is made to V.S.T.

The following levels of observations, cautions and warnings are used in this Service Documentation:

Note: Indicates a procedure, practice, or condition that must be followed in order to have the vehicle or component function in the manner intended.

Caution: Indicates an unsafe practice where damage to the product could occur.

Warning: Indicates an unsafe practice where personal injury or severe damage to the product could occur.

Danger: Indicates an unsafe practice where serious personal injury or death could occur.

Volvo Truck Corporation
Göteborg, Sweden

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Feedback

Specifications

Tachograph

Data

Make	Siemens VDO
Model name	DTCO 1381
Measurement range	0-220km/h
Display	2 lines of 16 characters each. Display that can be inverted.
Pulse area	4000 - 25000 pulses/km
Weight	~ 1200g

Tolerances

Speed	± 1km/h
Mileage	± 1 %
Time (displayed)	± 2 seconds/24 hours

Electrical data

Operating voltage	20 -32 V
Maximum current consumption in normal operation	5 A
Back-up battery	$\frac{1}{2}$ AA 3 V Lithium cell

Speedometer sensor

Operating voltage, U_E	6.5 - 9 V DC
Power consumption	max 15 mA
Shape of curve (connection 3)	Square
Frequency range	1 Hz - 2000 Hz
Output signal (connection 3)	Real time signal $U_{L\max} = 0.8\text{ V}$, at 250 μA
.....	$U_{H\min} = U_E - 1.5\text{ V}$, at 150 μA

Tachograph, signal descriptions

Measurement between tachograph and cable harness, connectors A, B, C and D

U = DC (direct current) in volts (V)

U_{bat} = battery voltage

f = frequency in Hertz (Hz)

Conditions:

- Ignition key in drive position
- Tachograph connected

Conn.	Signal type	Measurement points	Expected value	Remarks
A1	Power supply	A1-A5	$U \approx U_{bat}$	UADR
			$U \approx U_{bat}$ minus 5 V	ADR
A2	Instrumentation lighting	A2-A5	$U \approx U_{bat}$	FL6 Parking lights activated
A3	Voltage supply (kl DR)	A3-A5	$U \approx U_{bat}$ (starter key in drive position)	
			$U \approx 0$ V (starter key in stop position)	
A4	SAE J1939 CAN 2	A4 - Earth	$U \approx 2.5$ V	
A5	Ground connection	A5 - Earth	$U \approx 0$ V	
A6	Ground connection	A6-Earth	$U \approx 0$ V	
A8	SAE J1939 CAN 2	A8 - Earth	$U \approx 2.45$ V	
B1	Voltage feed, sensor	B1-Earth	$U \approx 8.63$ V	
B2	Earth connection, sensor	B2-Earth	$U \approx 0$ V	
B3	Real time signal, sensor	B3-Earth	$U \approx 7.18$ V	
B4	Cryptic signal, sensor	B4-Earth	$U \approx 7.85$ V	
B6	Speed information, radio (Possibly also change other control units)	B6-Earth	$U \approx 0.2$ V	0 km/h
			$U \approx 1.8$ V	50 km/h
			$U \approx 3.0$ V	80 km/h
			$U \approx 4.5$ V	120 km/h
B7	Vehicle speed	B7 - ground	$U \approx 2.3$ V	See fault code 10 tachograph
C2	Ground connection	C2 - ground	$U \approx 0$ V	FL6
C3	Rpm, signal	C3 - ground	Square wave signal $f \approx 220$ Hz (≈ 700 rpm) $U \approx 13.85$ V	FL6 Engine running (idling)
D8	Dynafleet, serial statys output (Driver 1)	D8 - ground	High $U \approx 9.3$ V Low $U \approx 6.0$ V	Multimeter set at min/max

Measurement against cable harness, connectors A, B, C and D

U = DC (direct current) in volts (V)

R = resistance in ohms (Ω)

U_{bat} = battery voltage

f = frequency in Hertz (Hz)

Conditions:

- Tachograph disconnected
- Start key in the stop position, unless otherwise stated
- Test pins 9990008 are to be used when measuring against the cable harness

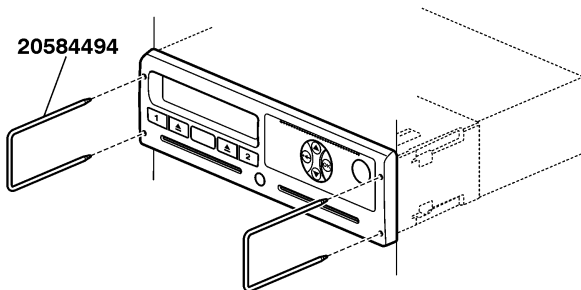
Conn.	Signal type	Measurement points	Expected value	Remarks
A1	Power supply	A1-A5	$U \approx U_{bat}$	UADR
			$U \approx U_{bat}$ minus 5 V	ADR
A2	Instrumentation lighting	A2-A5	$U \approx U_{bat}$	FL6 Parking lights activated
A3	Voltage supply (kl DR)	A3-A5	$U \approx U_{bat}$ (starter key in drive position)	
			$U \approx 0$ V (starter key in stop position)	
A4	SAE J1939 CAN 2	A4 - Earth	$U \approx 2.87$ V	Starter key in drive position.
A5	Ground connection	A5 - Earth	$R \approx 0$ Ω	
A6	Ground connection	A6-Earth	$R \approx 0$ Ω	
A8	SAE J1939 CAN 2	A8 - Earth	$U \approx 2.12$ V	Starter key in drive position.
B1				No relevant measurement
B2				No relevant measurement
B3				No relevant measurement
B4				No relevant measurement
B6				No relevant measurement
B7	Vehicle speed			See fault code 10 tachograph
C2	Ground connection	C2-Earth	$R \approx 0$ Ω	FL6

Conn.	Signal type	Measurement points	Expected value	Remarks
C3	Rpm, signal	C3-Earth	Square wave signal $f \approx 220 \text{ Hz} (\approx 700 \text{ rpm})$ $U \approx 13.85 \text{ V}$	FL6 Engine running (idling)
D8	Dynafleet, serial status output (Driver 1)	D8 - Ground		See fault code MID 203

Tools

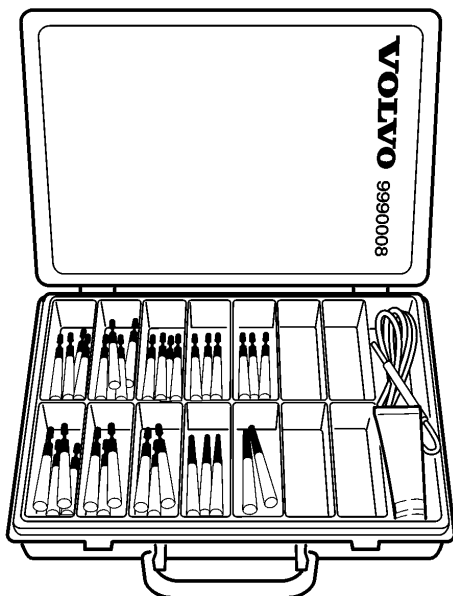
Special tools

The following special tools will be required when working on the tachograph. The tools can be ordered from Volvo Parts.



Pullers (two required) **20584494**.

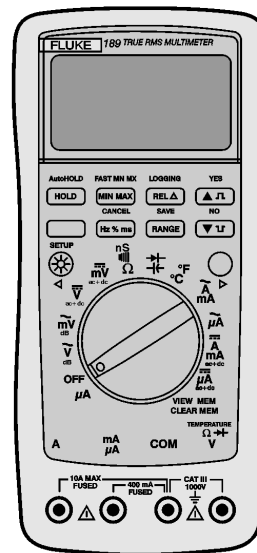
T3018154



9990008

Set with test pins **9990008**.

T3015505

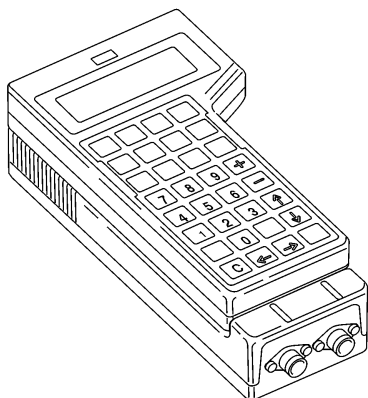


T0011649

Multimeter **9812519**.

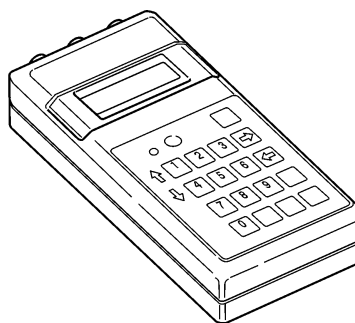
Other special equipment

Note: For more information on the programming tool, please contact the importer.



T3014262

Example of programming tool



T3015768

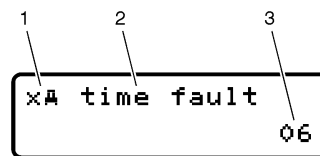
Example of programming tool

Malfunction

Tachograph, fault codes, general information

When there is an fault in the tachograph system, a fault code is normally stored in the tachograph unit. When the fault is active, this is shown in the tachograph display.

Note: The tachograph does not handle fault codes in the same way as the vehicle's other control units. Fault codes are displayed as illustrated.



T3017893

Error messages for fault codes are shown as follows:

- 1 Pictograms or pictogram combinations (specified in accordance with legal requirements)
- 2 Informative text
- 3 Fault code number

The background flashes for 30 seconds or until a button is pressed.

Note: Tachograph fault codes are shown on the tachograph display. However, the driver is made aware of any messages and warnings by a warning lamp.



T3017898

Note: The fault codes are used as indicators when troubleshooting. This does not mean that the tachograph needs automatically to be changed if there are fault codes stored.

Tachograph, fault code table

The table below shows all fault codes available in the tachograph.

Fault codes table			
Code	Display text	Remarks	Pictogram
02, 03	Internal fault.	"02, 03 Internal error" page 12	
04	Internal fault.	"04 Internal fault" page 13	
05	Internal fault.	"05 Internal fault" page 14	
06	Time fault	"06 Timing fault" page 15	
07	Display fault.	"07 Display fault" page 16	
08	Internal fault.	"08 Internal fault" page 17	
09	Calibration fault.	"09 Calibration fault." page 18	
10	Internal fault.	"10 Internal fault" page 19	
11	Internal fault.	"11 Internal fault" page 20	
12	Download fault.	"12 Transfer fault." page 21	
13	Internal fault.	"13 Internal fault" page 22	
14	Internal fault.	"14 Internal fault" page 23	
15	Internal fault.	"15 Internal fault" page 24	
16	Sensor fault.	"16 Sensor fault." page 25	
17	Security breach.	"17 Security infringement." page 26	
18	Security breach.	"18 Security infringement." page 27	
19	Power interruption.	"19 Voltage failure." page 28	
20	Sensor fault.	"20 Sensor fault." page 29	
21	Sensor fault.	"21 Sensor fault." page 30	
22	Sensor fault.	"22 Sensor fault." page 31	
23	Security breach.	"23 Security infringement." page 32	
24	Security breach.	"24 Security infringement." page 33	
25	Security breach.	"25 Security infringement." page 34	
26	Security breach.	"26 Security infringement." page 35	
27	Security breach.	"27 Security infringement." page 36	
28	Driving without card.	"28 Journey without card." page 37	
29	Cards conflict.	"29 Card conflict." page 38	
30	Overspeed.	"30 Overspeed" page 39	
31	Power interruption.	"31 Voltage failure." page 40	
32		"32" page 41	
33		"33" page 42	
34	Ejection not possible.	"34 Card cannot be taken out." page 43	
35	Process delayed.	"35 Process delayed." page 44	
36	Printout not possible.	"36 Printout not possible." page 45	
37	Printout delayed.	"37 Delayed printout" page 46	
38	Drawer open.	"38 Printer drawer open." page 47	
39	No paper.	"39 Out of paper." page 48	
40	Internal fault.	"40 Internal fault" page 49	

41	Card fault.	"41 Card fault" page 50	
42	Security breach.	"42 Security infringement." page 51	
43	Security breach.	"43 Security infringement." page 52	
44	Card not closed.	"44 Card is not closed." page 53	
45	Time overlap.	"45 Time overlap" page 54	
46	Insertion while driving.	"46 Card inserted while travelling." page 55	
47	Security breach.	"47 Security infringement." page 56	
48	Card not valid.	"48 Card not valid." page 57	
49	Recording inconsistent.	"49 Recording inconsistent." page 58	
50	Card error.	"50 Faulty card." page 59	
51	Wrong card type.	"51 Invalid card." page 60	
52	Card locked.	"52 Card closed." page 61	
53	Internal fault.	"53 Internal fault" page 62	
56	Break! 1.04h15 00h15	"56 Rest period 1.04h15 00h15" page 63	
57	Break! 1.04h30 00h30	"57 Rest period! 1.04h15 00h30" page 64	
	Wrong entry	"Error entered." page 65	
	Please enter.	"Enter data." page 66	

02, 03 Internal error

Fault code

02, 03

Internal fault.

Conditions for fault code:

- A serious fault has occurred in the tachograph, or there is a communication fault between the tachograph and the programming tool.

Possible causes of faults:

- The position of the starter key has been changed during calibration.

- Interruption of the feed voltage to the tachograph or the programming tool.
- Loose connections or fault in the wiring between the tachograph and the programming tool.

Appropriate action:

- Check the programming tool connector and wiring.
- Check the power supply to the tachograph and the programming tool.

If the fault code remains, without apparent cause, change the tachograph.

04 Internal fault

Fault code

04

Internal fault.

Conditions for fault code:

- The tachograph has detected an internal fault.

Possible causes of faults:

- An internal fault in the tachograph.

Appropriate action:

If the fault code remains, without apparent cause, change the tachograph.

05 Internal fault

Fault code

05

Internal fault.

Conditions for fault code:

- A communication fault has arisen between the programming tool and the tachograph during calibration.

Possible causes of faults:

- The position of the starter key has been changed during calibration.

- Loose connections or fault in the wiring between the tachograph and the programming tool.
- Interruption of the feed voltage to the tachograph or the programming tool.

Appropriate action:

- Check the connector and wiring to the programming tool.

06 Timing fault

Fault code 06

06

Timing fault

Conditions for fault code:

- If timing fault has been detected in the tachograph, the times are not plausible.

Possible causes of faults:

- The clock has stopped or is running incorrectly.
- The tachograph time is not plausible.

Appropriate action:

- Check the UTC time in the tachograph and if necessary correct it using the programming tool.
- Check the time function in the tachograph.

If the fault code remains, without apparent cause, change the tachograph.

Comments:

- Neither the driver card nor the company card are accepted, with the aim of preventing the storage of incorrect data.

07 Display fault

Fault code 07

07

Display fault.

Conditions for fault code:

- Display fault (the display sometimes disappears).

Possible causes of faults:

- Fault in the internal transfer to the display.
- Defective display.

Appropriate action:

If the fault code remains, without apparent cause, change the tachograph.

08 Internal fault

Fault code 08

08

Internal fault.

Conditions for fault code:

- A fault has been detected in the button set. One or more buttons has jammed or has remained depressed for more than three minutes.

Possible causes of faults:

- One or more buttons has jammed or has remained depressed for more than three minutes.

Appropriate action:

- Check the buttons, release any buttons that may have jammed.

If the fault code remains, without apparent cause, change the tachograph.

09 Calibration fault.

Fault code 09

09

Calibration fault

Conditions for fault code:

- The checksum for a calibration calculation is incorrect.

Possible causes of faults:

- Internal fault.

Appropriate action:

- If the fault code remains, without apparent cause, change the tachograph.

10 Internal fault

Fault code 10

10

Internal fault.

Conditions for fault code:

- No speed signal pulses from the speed signal output (connection B7). The tachograph continuously monitors the speed signals to the Vehicle Electronic Control Unit.

Possible causes of faults:

- Loose connections, contact resistance or oxidation in the tachograph or Vehicle Electronic Control Unit connectors.
- Break in the signal line, short circuit to ground or feed voltage.
- Internal fault in the Vehicle Electronic Control Unit signal input (connection PB6).

- Internal fault in the tachograph signal output (connection B7).

Appropriate action:

- Check the tachograph and Vehicle Electronic Control Unit connectors.
- Check the signal line (connector B7) between the tachograph and the Vehicle Electronic Control Unit for breakage, short circuit to ground or incorrect voltage.
- Check the Vehicle Electronic Control Unit signal input (connection PB6).

Appropriate check:

- For a detailed fault tracing description of the wiring and connector, refer to the separate Service Information, Function Group 371, information type diagnostics, "Wiring and connector, fault tracing".

11 Internal fault

Fault code 11

11

Internal fault.

Conditions for fault code:

- A fault has been detected in the printer.

Possible causes of faults:

- The internal power supply to the printer unit is faulty.
- The print head temperature is outside the specified limit.

Appropriate action:

- After a long period of printing, the print head can become too hot. Wait for a while until it cools.
- Restart the printer by disconnecting the printer supply (connector A1) for a few seconds.

If the fault code remains, without apparent cause, change the tachograph.

12 Transfer fault.

Fault code 12

12

Transfer fault.

Conditions for fault code:

- A communication fault has occurred while downloading data from a card or the tachograph memory.

Appropriate action:

- Repeat the downloading procedure.
- Check the wiring connections.
- Check the tachograph connections.
- Check the downloading station.

13 Internal fault

Fault code 13

13

Internal fault.

Note: This type of fault normally generates fault codes in the Vehicle Electronic Control Unit. It may give rise to other symptoms than those described below, e.g. no speedometer indication and/or odometer update in the instrument panel.

Conditions for fault code:

- A CAN message indicates that the Vehicle Electronic Control Unit is not answering or activated during starting.

Possible causes of faults:

- Power feed to the Vehicle Electronic Control Unit is missing.
- Power feed to the Vehicle Electronic Control Unit is missing with the key in the drive position.

Appropriate action:

- Check the Vehicle Electronic Control Unit fault codes and take appropriate action if necessary.
- Check the power supply to the Vehicle Electronic Control Unit.

Appropriate check:

- Fault trace the data link, refer to Function Group 3711, information type diagnostics, "Fault tracing data links".

Comments:

- The fault codes will disappear after the ignition has been switched on for 10 seconds.
- The tachograph may not necessarily be the reason for the fault code.

14 Internal fault

Fault code 14

14

Internal fault.

Note: This type of fault normally generates fault codes in the Vehicle Electronic Control Unit. It may give rise to other symptoms than those described below, e.g. no speedometer indication and/or odometer update in the instrument panel.

Conditions for fault code:

- Link fault, no message sent on SAE J1939 CAN2.

Possible causes of faults:

- Break in J1939 CAN2-länken.

- Short circuit to voltage or ground by J1939 CAN2.

Appropriate check:

- For a detailed fault tracing description of the wiring and connector, refer to the separate Service Information, Function Group 371, information type diagnostics, "Wiring and connector, fault tracing".
- Fault trace the data link, refer to Function Group 3711, information type diagnostics, "Fault tracing data links".

Comments:

- The tachograph may not necessarily be the reason for the fault code.

15 Internal fault

Fault code 15

15

Internal fault.

Conditions for fault code:

- Fault or open-circuit communication between the tachograph and the programming tool.

Possible causes of faults:

- Interruption of the feed voltage to the Vehicle Electronic Control Unit or the instrument panel.
- Loose connections, contact resistance or oxidation in the tachograph, Vehicle Electronic Control Unit or instrument panel connectors.

- Incorrect configuration of the tachograph.

Appropriate action:

- Check the power supply to the Vehicle Electronic Control Unit and the instrument panel.
- Check the tachograph, Vehicle Electronic Control Unit and instrument panel connectors for loose connections, contact resistance and oxidation.
- Check the tachograph calibrated data using a programming tool.

Appropriate check:

- Fault trace the data link, refer to Function Group 3711, information type diagnostics, "Fault tracing data links".

16 Sensor fault.

Fault code 16

16

Sensor fault.

Conditions for fault code:

- Road speed sensor indicates an internal fault after self-testing.

Possible causes of faults:

- Defective road speed sensor.

Appropriate action:

- Check the road speed sensor.

Change the road speed sensor if necessary.

17 Security infringement.

Fault code 17

17

Security breach.

Conditions for fault code:

- Deficient data reliability. Internal sensor fault, road speed sensor indicates incomplete data.

Possible causes of faults:

- Road speed sensor defective or alternatively tampered with.

Appropriate action:

- Check the road speed sensor.

Change the road speed sensor if necessary.

18 Security infringement.

Fault code 18

18

Security breach.

Conditions for fault code:

- Fault in the match between the road speed sensor and the tachograph has been detected. The road speed sensor indicates an internal fault.

Possible causes of faults:

- The road speed sensor has not matched up with the tachograph.
- Defective road speed sensor.

Appropriate action:

- Check the road speed sensor.
- Use a programming tool to match up the road speed sensor to the tachograph.

Change the road speed sensor if necessary.

19 Voltage failure.

Fault code 19

19

Voltage failure.

Conditions for fault code:

- A break in the road speed sensor power feed has been detected.

Possible causes of faults:

- Loose connections, contact resistance or oxidation in the road speed sensor or tachograph connectors.
- Open or short circuit in the wiring between the road speed sensor and the tachograph.
- Interruption or short circuit to ground of the feed voltage to the road speed sensor.
- Voltage variations in the tachograph power feed during starting.

- Defective road speed sensor.

Appropriate action:

- Check the connectors between the road speed sensor and the tachograph for loose connections, resistance and oxidation.
- Check the power supply line and the ground line to the road speed sensor for open circuits and short circuits to ground.
- Check the power supply to the tachograph when starting.

Appropriate check:

- For a detailed fault tracing description of the wiring and connector, refer to the separate Service Information, Function Group 371, information type diagnostics, "Wiring and connector, fault tracing".

20 Sensor fault.

Fault code 20

20

Sensor fault.

Conditions for fault code:

- Fault in the communications between the tachograph and the road speed sensor. Signal from the road speed sensor to the tachograph missing (connection B4).

Possible causes of faults:

- Loose connections, contact resistance or oxidation in the road speed sensor or tachograph connectors.
- Open or short circuit in the wiring between the road speed sensor and the tachograph.
- Defective road speed sensor.

Appropriate action:

- Check the connectors between the road speed sensor and the tachograph for loose connections, contact resistance and oxidation.
- Check the signal line between the road speed sensor and the tachograph (connector B4) for loose connections, open circuits, short circuits to ground or incorrect voltage.

Appropriate check:

- For a detailed fault tracing description of the wiring and connector, refer to the separate Service Information, Function Group 371, information type diagnostics, "Wiring and connector, fault tracing".

21 Sensor fault.

Fault code 21

21

Sensor fault.

Conditions for fault code:

- Fault in the communications to the road speed sensor. Real time signal from the road speed sensor to the tachograph connection B3 missing.

Possible causes of faults:

- Loose connections, contact resistance or oxidation in the road speed sensor or tachograph connectors.
- Open or short circuit in the wiring between the road speed sensor and the tachograph.
- Defective road speed sensor.

Appropriate action:

- Check the connectors between the road speed sensor and the tachograph for loose connections, resistance and oxidation.
- Check the signal line between the road speed sensor and the tachograph connector B3 for loose connections, open circuits, short circuits to ground or incorrect voltage.

Appropriate check:

- For a detailed fault tracing description of the wiring and connector, refer to the separate Service Information, Function Group 371, information type diagnostics, "Wiring and connector, fault tracing".

22 Sensor fault.

Fault code 22

22

Sensor fault.

Conditions for fault code:

- A fault in the communications between the tachograph and the road speed sensor has been detected. Pulses from the road speed sensor are missing or incorrect.

Possible causes of faults:

- Loose connections, contact resistance or oxidation in the road speed sensor or tachograph connectors.
- Open or short circuit in the wiring between the road speed sensor and the tachograph.
- Defective road speed sensor.
- Damaged teeth in the transmission.

Appropriate action:

- Check the connectors between the road speed sensor and the tachograph for loose connections, resistance and oxidation.

- Check the signal line between the road speed sensor and the tachograph connector B3 for loose connections, open circuits, short circuits to ground or incorrect voltage.
- Check the signal line between the road speed sensor and the tachograph connector B4 for loose connections, open circuits, short circuits to ground or incorrect voltage.
- Check the power supply line and the ground line to the road speed sensor for loose connections, open circuits and short circuits to ground.
- Check the road speed sensor.
- Check that the transmission teeth are not damaged.

Appropriate check:

- For a detailed fault tracing description of the wiring and connector, refer to the separate Service Information, Function Group 371, information type diagnostics, "Wiring and connector, fault tracing".

23 Security infringement.

Fault code 23

23

Security breach.

Conditions for fault code:

- Fault in the identification of the road speed sensor.

Possible causes of faults:

- Loose connections, contact resistance or oxidation in the road speed sensor or tachograph connectors.
- Open or short circuit in the wiring between the road speed sensor and the tachograph.
- The road speed sensor has not matched up with the tachograph.
- Defective road speed sensor.

Appropriate action:

- Check the connectors between the road speed sensor and the tachograph for loose connections, resistance and oxidation.

- Check the signal line between the road speed sensor and the tachograph connector B3 for loose connections, open circuits, short circuits to ground or incorrect voltage.
- Check the signal line between the road speed sensor and the tachograph connector B4 for loose connections, open circuits, short circuits to ground or incorrect voltage.
- Check the power supply line and the ground line to the road speed sensor for loose connections, open circuits and short circuits to ground.
- Check the road speed sensor.
- Use a programming tool to match up the road speed sensor to the tachograph.

Appropriate check:

- For a detailed fault tracing description of the wiring and connector, refer to the separate Service Information, Function Group 371, information type diagnostics, "Wiring and connector, fault tracing".

24 Security infringement.

Fault code 24

24

Security breach.

Conditions for fault code:

- Fault in the comparison of the road speed sensor serial number.

Possible causes of faults:

- The road speed sensor has not matched up with the tachograph.

- Road speed sensor defective or alternatively tampered with.

Appropriate action:

- Check the road speed sensor seal.
- Check the road speed sensor.
- Use a programming tool to match up the road speed sensor to the tachograph.

25 Security infringement.

Fault code 25

25

Security breach.

Conditions for fault code:

- Fault in the data memory. The tachograph data can no longer be relied upon, due to a fault in the data memory.

Possible causes of faults:

- Defective tachograph.

Appropriate action:

If the fault code remains, without apparent cause, change the tachograph.

26 Security infringement.

Fault code 26

26

Security breach.

Conditions for fault code:

- The tachograph housing has been opened.

Possible causes of faults:

- The tachograph housing is open or has been opened.

Appropriate action:

- Check the tachograph housing and seal.

If the fault code remains, without apparent cause, change the tachograph.

27 Security infringement.

Fault code 27

27

Security breach.

Conditions for fault code:

- Incorrect signals from the programming tool to the tachograph. Signals will be blocked until there is a request for the PIN code (workshop card inserted).

Possible causes of faults:

- Fault in the programming tool wiring or connector.

- Defective programming tool.

Appropriate action:

- Check the programming tool wiring and connector.
- Take out and insert the workshop card and repeat the procedure.
- Check the programming tool.
- Change defective components.

28 Journey without card.

Fault code 28

28

Journey without card.

Conditions for fault code:

- Journey without card or without a valid driver or workshop card in card reader 1.

Appropriate action:

- Check that a valid driver or workshop card is inserted into card reader 1, if necessary insert a card.
- Check if a workshop or check card is inserted into the card reader, if so, remove it.

29 Card conflict.

Fault code 29

29

Card conflict.

Conditions for fault code:

- Incorrect card combination in the card readers. These card types may not be inserted at the same time.

Appropriate action:

- Check the card combination that is inserted into the tachograph (refer to the table).

		Card position 1				
		No card.	Driver card	Check card	Workshop card	Company card
Card position 2	No card.	V	V	V	V	V
	Driver card	V	V	V	x	V
	Check card	V	V	x	x	x
	Workshop card	V	x	x	x	x
	Company card	V	V	x	x	x

V = Approved combination

x = combination not approved

30 Overspeed

Fault code 30

30

Overspeed.

Conditions for fault code:

- The programmed maximum speed has been exceeded for more than 60 seconds.

Appropriate action:

- Lower the speed.

31 Voltage failure.

Fault code 31

31

Voltage failure.

Conditions for fault code:

- The supply voltage to the tachograph is either above or below the normal voltage range.

Possible causes of faults:

- Loose connections, contact resistance or oxidation in the tachograph connectors.
- Interruption of the feed voltage to the tachograph.
- Drop in voltage while the starter motor is in operation.

- Terminal connection to the battery has become loose.
- Battery rapid charging in progress.

Appropriate action:

- Check the tachograph connectors for loose connections, contact resistance and oxidation.
- Check the voltage feed to the tachograph, also with the starter motor operating.
- Check the tachograph ground connection for loose connection, contact resistance and oxidation.
- Check the condition of the batteries.
- Change defective components.

32

Fault code 32

32

Conditions for fault code:

- A calibration fault has been detected.
After completion of calibration, important parameters have been assigned incorrect values.
Calibration completed and no values will be saved.

Possible causes of faults:

- Fault in the programming tool wiring or connector.
- Defective programming tool.

Appropriate action:

- Check the programming tool wiring and connector.
- Check the programming tool.
- Change any faulty components and perform a new calibration.

33

Fault code 33

33

Conditions for fault code:

- The tachograph has detected pulses from the road speed sensor with the starter key in its stop position.

Possible causes of faults:

- The vehicle is moving or the tachograph is reporting "journey".
- Loose connections, contact resistance or oxidation in the road speed sensor or tachograph connectors.
- Open or short circuit in the wiring between the road speed sensor and the tachograph.
- Fault in the feed voltage to the tachograph.

Appropriate action:

- Check if the vehicle is moving or the tachograph is reporting "journey". If necessary stop the vehicle.
- Check the road speed sensor and tachograph connectors for loose connections, contact resistance and oxidation.
- Check the wiring harness between the tachograph and the road speed sensor.
- Check the power supply to the tachograph at pin DR (connection A3).

Appropriate check:

- For a detailed fault tracing description of the wiring and connector, refer to the separate Service Information, Function Group 371, information type diagnostics, "Wiring and connector, fault tracing".

34 Card cannot be taken out.

Fault code 34

34

Card cannot be taken out.

Conditions for fault code:

- Card cannot be taken out. Feed-out of card denied.
- *Possible causes of faults:*
- The vehicle is moving.
- Data is in the process of being downloaded.

- The starter key is in the stop position.

Appropriate action:

- Check that the starter key is in the drive position.
- Check that the tachograph reports "journey", stop the vehicle and try again.
- Check whether data is being downloaded, try again after completion of downloading.

If the fault code remains, without apparent cause, change the tachograph.

35 Process delayed.

Fault code 35

35

Process delayed.

Conditions for fault code:

- Processing of a card on insertion or during another request became delayed.

Possible causes of faults:

- Change of day (according to UTC time).

Appropriate action:

- No action is necessary.

36 Printout not possible.

Fault code 36

36

Printout not possible.

Conditions for fault code:

- Printout not possible at the moment. All current print jobs will be cancelled and new printouts denied.

Possible causes of faults:

- The vehicle is moving.
- The starter key is in the stop position.
- The print head is overheated.

- Too high or too low voltage feed to the tachograph.

Appropriate action:

- Printing out is only possible when the vehicle is stationary and the starter key is in the drive position. Stop the vehicle and turn the starter key to the driving position.
- After a long period of printing, the print head can become too hot. Wait until it has cooled down.
- Check the tachograph feed voltage.

If the fault code remains, without apparent cause, change the tachograph.

37 Delayed printout

Fault code 37

37

Printout delayed.

Conditions for fault code:

- A printout becomes delayed or cancelled. The printout will continue automatically when the temperature regains the specified value.

Possible causes of faults:

- The print head is overheated.
- Too high or too low voltage feed to the tachograph.

Appropriate action:

- After a long period of printing, the print head can become too hot. Wait until it has cooled down.
- Check the power supply to the tachograph.

If the fault code remains, without apparent cause, change the tachograph.

38 Printer drawer open.

Fault code 38

38

Printer drawer open.

Conditions for fault code:

In the following conditions it is found that the printer drawer is open:

- Feed-out of card.
- Request for printout
- Printout in progress.

Possible causes of faults:

- The printer drawer is open.

Appropriate action:

- Check to see if the printer drawer is open and if so, close it.

If the fault code remains, without apparent cause, change the tachograph.

Comments:

- Card is not fed out until the printer drawer is closed. A printout in progress will be cancelled and new printouts denied.

39 Out of paper.

Fault code 39

39

Out of paper.

Conditions for fault code:

- The paper supply to the printer has run out during printing or when a printout is requested. A printout in progress will be cancelled and new printouts denied.

Possible causes of faults:

- There is no paper in the printer.

- The paper in the printer has run out.

Appropriate action:

- Check if there is paper in the printer and if necessary insert a new roll.

If the fault code remains, without apparent cause, change the tachograph.

Comments:

- After a new roll has been inserted, the interrupted printout will automatically continue.

40 Internal fault

Fault code 40

40

Internal fault.

Conditions for fault code:

- Mechanical fault in the tachograph card reader. The card will be ejected.

Possible causes of faults:

- Card will not stay locked in the tachograph.

- Fault in tachograph card reader.

Appropriate action:

- Inspect the card visually for signs of damage.
- Insert the card again.
- Break the power feed to the tachograph so that it restarts.

If the fault code remains, without apparent cause, change the tachograph.

41 Card fault

Fault code 41

41

Card fault.

Conditions for fault code:

- A communication fault occurred while data was being written to or read from card reader 1.

Possible causes of faults:

- The card contact surfaces are dirty or damaged.
- Card defective.

Appropriate action:

- Check the card contact surfaces.
- Check the card.
- Check the tachograph by inserting another card.
- Check by inserting the card again.

Comments:

As long as the fault code remains, the card will be ejected.

42 Security infringement.

Fault code 42

42

Security breach.

Conditions for fault code:

- Security infringement during identification of a card or fault when performing a security check of the data.

Possible causes of faults:

- Fault when checking the card identity.
- Fault when checking the data security.
- Multiple (x 5) incorrect entries of a workshop card PIN code.

Appropriate action:

- Check the card.
- Check the workshop card, enter the correct PIN code.

43 Security infringement.

Fault code 43

43

Security breach.

Conditions for fault code:

- The tachograph no longer recognises any card in the card reader (car reader 1).

Possible causes of faults:

- After a loss of power, an identity check determines that the most recently inserted card is missing or has been replaced by another card.

- The card has not been properly inserted.

Appropriate action:

- Check that the card has been properly inserted.
- Take out the card and insert it again.

If the fault code remains, without apparent cause, change the tachograph.

44 Card is not closed.

Fault code 44

44

Card is not closed.

Conditions for fault code:

- When a workshop or driver card is read by card reader 1 it is determined that the card was not ejected properly from the previous vehicle or that data was not saved in the correct manner.

Possible causes of faults:

- Fault in the ejection process of the card from the previous vehicle.

- Defective workshop or driver card.

Appropriate action:

- Check the card.
- Check the previous tachograph into which the card was inserted.

Comments:

- The source of the fault is not in the current tachograph.

45 Time overlap

Fault code 45

45

Time overlap

Conditions for fault code:

- Minus time in relation to the previous vehicle.

Possible causes of faults:

- The UTC time in the previous vehicle, that the card had been inserted into, was ahead of the time in the current tachograph.

Appropriate action:

- Check the UTC time in the tachograph, and if necessary use a programming tool to set the correct UTC time.
- Check the UTC time in the tachograph into which the card had previously been inserted, and if necessary use a programming tool to set the correct UTC time.

46 Card inserted while travelling.

Fault code 46

46

Card inserted while travelling.

Conditions for fault code:

- A card has been inserted after beginning the journey.

Possible causes of faults:

- Pulses from the road speed sensor before the correct read-in of the card has been performed.

Appropriate action:

- Only insert a card while the vehicle is stationary.

47 Security infringement.

Fault code 47

47

Security breach.

Conditions for fault code:

- Security infringement during identification of a card or fault when performing a security check of the data.

Possible causes of faults:

- Fault when checking the card identity.
- Fault when checking the data security.
- Multiple (x 5) incorrect entries of a workshop card PIN code.

Appropriate action:

- Check the card.
- Check the workshop card, enter the correct PIN code.

48 Card not valid.

Fault code 48

48

Card not valid.

Conditions for fault code:

- The card in the card reader (card reader 1) is not valid or is defective.

Possible causes of faults:

- An invalid or defective card has been inserted.

- On changing the day it has been determined that the card that was inserted is no longer valid.

Appropriate action:

- Check the card and its period of validity.

Comments:

When the vehicle stops the respective data is written to the card and it is ejected.

49 Recording inconsistent.

Fault code 49

49

Recording inconsistent.

Conditions for fault code:

- On reading in the card data in card reader 1 the data for the date was incorrect.

Possible causes of faults:

- Defective card.

Appropriate action:

- Check the card.

50 Faulty card.

Fault code 50

50

Faulty card.

Conditions for fault code:

- The card in card reader 1 cannot be read from or written to.

Possible causes of faults:

- The card has not been inserted properly.

- Card defective.

Appropriate action:

- Check that the card is valid.
- Check that the card has been inserted correctly.
- Check the card.
- Check if a different card can be read correctly.

51 Invalid card.

Fault code 51

51

Invalid card.

Conditions for fault code:

- The card in card reader 1 is not a tachograph card.

Possible causes of faults:

- Incorrect type of card.

- Defective card.

Appropriate action:

- Check that the card is valid.
- Check that the card has been inserted correctly.
- Check the card.

52 Card closed.

Fault code 52

52

Card closed.

Conditions for fault code:

- The workshop card in card reader 1 is closed.

Possible causes of faults:

- The workshop card has been closed after five incorrect PIN code entries.
- The workshop card is defective.

Appropriate action:

- Check the workshop card.
- Insert a valid (not closed) workshop card.

53 Internal fault

Fault code 53

53

Internal fault.

Conditions for fault code:

- The inserted card is not accepted and will be ejected.

Possible causes of faults:

- The time on the tachograph does not match when the card is inserted.

Appropriate action:

- Check the UTC time in the tachograph and if necessary set the correct UTC time using the programming tool.

If the fault code remains, without apparent cause, change the tachograph.

56 Rest period 1.04h15 ||00h15

Fault code 56

56

Rest period! 1.04h15 ||00h15

Conditions for fault code:

- After continuous driving for 4 hours and 15 minutes the tachograph warns that it is necessary to take a rest.

Appropriate action:

- Find a suitable place to stop and take the required rest.

57 Rest period! 1.04h15 ||00h30

Fault code 57

57

Rest period! 1.04h15 ||00h30

Conditions for fault code:

- After continuous driving for 4 hours and 30 minutes the tachograph warns that it is necessary to take a rest.

Appropriate action:

- Find a suitable place to stop and take the required rest.

Error entered.

Fault code

Error entered.

Conditions for fault code:

- An incorrect PIN code has been entered for the workshop card.

Appropriate action:

- Enter again or cancel the PIN code entry.

Enter data.

Fault code

Enter data.

Appropriate action:

- Continue entering.

Conditions for fault code:

- This request comes up if no entry has been made during the entry procedure for the PIN code.

Feedback

One of our objectives is that workshop personnel should have access to correct and appropriate service manuals where it concerns fault tracing, repairs and maintenance of Volvo vehicles.

In order to maintain the high standards of our literature, your opinions and experience when using this manual would be greatly appreciated.

If you have any comments or suggestions, make a copy of this page, write down your comments and send them to us, either via telefax or mailing directly to the address listed below.

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From

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Comments/proposals

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Concerns Service Manual:

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Volvo Truck Corporation

Göteborg, Sweden