Operating Instructions





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Edition 1

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Symbo	ols used	5
Introd	uction	6
Syste	m requirements	7
Conne	ection diagram	8
Softwa	are	9
Functi	ion	10
6.1	Diagnostics	10
6.2	Tools	10
6.2.1	Resetting the ODR (deleting)	10
6.2.2	ODR password management	11
6.2.3	Limit Value Data Editor	12
6.3	Settings	13
6.4	Help	14
ODR E	Evaluation	15
7.1	Overview	15
7.2	Trip recorder	16
7.3	Histograms	19
7.4	Event Recorder	20
7.5	Brake lining	22
7.6	Long-/Short-term comparison	23
	Symbol Introd System Conne Softwa 6.1 6.2 6.2.1 6.2.1 6.2.2 6.2.3 6.3 6.3 6.4 ODR E 7.1 7.2 7.3 7.4 7.5 7.6	Symbols used Introduction System requirements Connection diagram Software Function 6.1 Diagnostics 6.2 Tools 6.2.1 Resetting the ODR (deleting) 6.2.2 ODR password management 6.2.3 Limit Value Data Editor 6.3 Settings 6.4 Help ODR Evaluation 7.1 Overview 7.2 Trip recorder 7.3 Histograms 7.4 Event Recorder 7.5 Brake lining 7.6 Long-/Short-term comparison



1

1 Symbols used

	Imminent hazard situation which can cause serious personal injury or death if the safety instruction is not observed.
WARNING	Potential hazard situation which can cause serious personal injury or death if the safety instruction is not observed.
	Potential hazard situations that can cause minor or moderate personal injury if the safety instruction is not observed.
!	Important instructions, information or tips that you should always observe.
	List Action step
	– Step

➔ Result of an action

2 Introduction



WABCO is also offering a software with the release of the Trailer EBS E generation, the so-called ODR-Tracker.

ODR stands for the Operating Data Recorder integrated in the TEBS modulator.

A Tracker is the "log book", which shows the conditions that the trailer was operated under.

Every vehicle that is equipped with a trailer EBS of the D generation (as of production week 01/2004) or the new E generation, has this integrated operating data recorder.

This data is used for analyzing the vehicle usage and the evaluation of the towing vehicle used.

The ODR-Tracker is a self-contained program that enables an evaluation and analysis directly on the vehicle or on the desk - without the TEBS diagnostic software.



3 System requirements

- PC with operating system Windows 98, 2000, ME, NT, XP or Vista*)
- at least 64 MB main memory
- approx. 30 MB free hard drive space
- Colour display with resolution of min. 800x600 pixels (Recommended: 1024x768)
- 1 free COM interface (9-pin) or resp. USB connection

*) The Diagnostic Interface 446 301 001 0 of set 446 301 022 0 (with USB connection) can only be used under Windows systems that support USB (98, 2000, ME, XP, Vista).



4 Connection diagram

	Diagnosis TEBS E	
	Option 1	
Diagnostic Interface with USB Interface 446 301 022 0	Diagnostic cable 446 300 361 0	Connection adapter ISO 7638 with CAN socket 446 300 360 0
	Option 2	
Diagnostic Interface with serial interface 446 301 021 0	CAN Converter 446 300 470 0	Connection adapter ISO 7638 with CAN socket 446 300 360 0
	Option 3	
Diagnostic Interface 446 301 021 0 or Diagnostic Interface with USB interface 446 301 022 0	Diagnostic cable 446 300 361 0	Diagnostic Connection with yellow cap 449 611 0

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5 Software

ODR-Tracker program is orderable on the USB stick and has the WABCO order number 446 301 692 0.

The software is installed on a PC with the Windows operating system (Windows 98, 2000, ME, NT, XP and Vista) with the WABCO installation program and is started via the respective Icon from the WABCO program group or from the Start menu.

Installing the ODR-Tracker program

Open file *setup.exe* on the USB stick to install the program. Now enter the user identification.

Activation

Enter the registration data and request the activation code online, by fax, email, data exchange or telephone.

Demo function

The program is equipped with demo functionality. This can be called up with parameter *DEMO*: *Start menu* => *DEMO* - *ODR*-*Tracker*

A connection for starting the program in DEMO mode is provided in the program group. A connection to the ECU is not required in this mode and all dialogs can be opened.

Copy-protection

The Diagnostic software has a copy-protection that binds the software to a single PC hardware and limits the activation on a PC to one license.

After the installation on a target system, the software can be used without any restrictions for a short period but must be activated afterward.



6 Function

After the program is started, the diagnostics connection to the controller is established and the vehicle-specific data is read and displayed.

The ODR-Tracker software contains the following displayed functions.

When the program starts with automatic initialisation, the last used diagnostic interface is used.

If the connection cannot be established, a respective error message appears with the capability of selecting another diagnostic interface.

In Offline mode, a file with operation data can be loaded and saved.

6.1 Diagnostics

Start	
	A connection to the ECU can be established. A selection then appears showing which diagnostics connection should be used for the communication (CAN 5 V, CAN 24 V or K-Line).
	If a valid ECU has been detected, the ODR data memory is read automatically and the ODR evaluation is started and displayed.
End	
	A connection to the ECU is closed.
Read from ECU	
	If a connection to the ECU has already been established, the ODR data memory can be read again (e. g. after deleting individual ODR data areas).
Read from file	
	A stored data record is read on the PC. The selected file is checked for its data content. If valid data exists, the evaluation is started and displayed.
Write to file	
	A valid data record from an ECU can be stored in a file. The file name derived from a compilation of the vehicle license number and the current kilometre reading is recommended.
	When storing the data, the vehicle license number can be entered.
Print	
	Print evaluation: The evaluation that is being displayed is printed as a log. The report is then shown in a preview window and can be printed from there.
	Exit: The program is ended, any possible connection with the ECU is closed automatically.

6.2 Tools

6.2.1 Resetting the ODR (deleting)

The following areas of the ODR can be deleted:

Overview, histogram and trip accumulator

- ABS accumulator
- RSS accumulator

6.2.2 ODR password management

ODR password management Define a password to protect acce the ODR should be made acces deleted in th	ess to the ODR of this control unit. If sible again, the password must be ne control unit.
Define ODR password	ODR permanently accessible
A password for the ODR is stored in the ECU. Subsequently, access is only possible after entering the password.	The password in the ECU is deleted. The ODR can be accessed at any time.
Enter password Repeat password	Delete password in ECU
Store password in ECU	If the password is forgotten, register with the WABCO hotline to enable the password to be reset.
	KCancel

Access to the ODR can be password protected. A password is then required for read access.

The password can be changed or deleted again in the ODR Password window (see figure).

6.2.3 Limit Value Data Editor

Limit value data editor It is possible to load and overview	edit files o v values (or create nev min. max. va	w files that represer alues).	<u>-□></u> nt the
Darka analiastiana	Min.	Max.	Description	
Brake applications	0	100000	Example	
Braking frequency	0	1.5		
Average aggregate load	0	27		
Average aggregate load (%)	0	100		
Average control pressure	0	2.5		
Drives with overload	0	0		
Braking with stop light power supply	0	0		
Brake action with hand brake	0	100000		
Braking with anti-jackknifing brake	0	0		
Brake actions without CAN presettings	0	100000		
BSS interventions stage 1	0	100		
RSS interventions, stage 2	0	10		
Read from file	_rite to file		<u> </u>	<u>IK</u>

An evaluation of the values read can be performed in the evaluation on the overview page. The relevant limit values can be set and stored in a file in this case. This data can be selected in the overview.

The limit values specified by WABCO should be maintained to the greatest degree possible.

6

6.3 Settings

4	Settings	×
	Serial port Data file location Program options User data	
	Please enter the user data and serial number for your diagnostic software:	
	Company WABCO	
	User name	
	Serial number 01220010100 - 0000000	
	· · · · · · · · · · · · · · · · · · ·	
	<u>D</u> K Ca <u>n</u> cel <u>A</u> ccept	
V s T	/arious settings for program behaviour, such as settings for the serial interfactor storage, program options or user information can be made on tabs in this win The information is stored in the ODR-Tracker file.	e, file dow.
Serial interface		
T D	This tab can be used for setting the serial interface (USB or COM port) to whi Diagnostic Interface is connected.	ch the
Data file location		
T Des messes sufficies	The setting for the read and write directory can be changed on this tab.	
Programme options T • •	This tab can be used for defining settings for program behaviour, such as: Start in full-screen mode Direct diagnosis start-up upon program start Display of help text	
User data		
T	This tab can be used for changing user information such as company, user na and serial number, even after the installation, see figure.	ame

6.4 Help

Supported ECUs

upported ECUs							
This Diagnostic Software supports the following ECUs and diagnostic identifiers. Newer ECUs with identical diagnostic identifiers are also supported.							
WABCO device number	Diagnostics identifier						
480 102 030 0 - 480 102 088 0	OB 02 00 00						
480 102 010 0	0B 02 02 02						
480 102 010 0	0B 02 02 03						
480 102 010 0	0B 02 03 03						
480 102 014 0	0B 02 02 02						
480 102 014 0	0B 02 02 03						
480 102 014 0	OB 02 03 03						
480 102 015 0	OB 02 02 02						
480 102 015 0	OB 02 02 03						
480 102 015 0	OB 02 03 03						

All of the ECUs supported by this program are listed in window Supported ECUs.

About

The version of the diagnostic software, the registered user and the serial number are shown in window *About*. The name and program version in the Diagnostic Interface are also shown.



7 ODR Evaluation

Evaluating the ODR is displayed over several screen pages, which are explained in the following pages. The data is partially shown in tables and the respective graphic.

7.1 Overview

Ø ODR Tracker (en) ¥1.	01 246 30	1 692 0 🔵					
jagnosis <u>T</u> ools Options	Help						
🕒 🔊 餐		,	DAT (TEI	A SOURC 3S-E) Data	E a from ECU		
Overview Trip Histog	rams Ever	nt recorder	Brake lining	Long-term/S	hort-term compari	son	
Vehicle data							
Current kilometre reading			60046.9 km			/ehicle ident. no.	012345678901234567
ODR deleted at kilometre	e reading:		0.0 km			Manufacturer	WABCO
Kilometres relevant for an	nalysis		60046.9 km			Туре	Demo
Operating hours relevant	for analysis		1045h 20min			/ehicle production date	2007 W26
Reading-out date			2007-06-28 0	9:37:41		Device number	480 102 030 0
Total number of trips			631			Serial number (ECU)	099013410600
Evaluated trips			200		· · ·	/ehicle identification	0-DR 10
ODR values							
Notation C No (de	ormalised nu escription rela	merical value ative to 10,00	JOkm)	Abs	olute numerical v	alue Min, max limit values	: Default
Description		Value	Unit	Min	Max	Comment	
Brake applications	0	19632		0	100000	Number of brake application	s with service brake
Braking frequency	٢		1/km	0	1.5	Number of brake application	s per km
Average aggregate load	٢	8.3	t	0	27	Average aggregate load valu	ue
Average aggregate load (%)	٢	46.2	%	0	100	Average value of the aggreg	gate load percentage (relative to the maximum aggregate load)
Average control pressure	٢	1.72	bar	0	2.5	Average value of the control	I pressure pm at the yellow coupling head
Drives with overload	٢	0		0	0	Number of drives with more t	than 10% overload (in relation to the parameterised axle load laden)
Braking with stop light power supply	٢	0		0	0	Braking with stop light supply	y on failure of the power supply via ISO7638
Brake action with hand brake	٢	3841		0	100000	Number of parking brake act	tuations in the towing vehicle
Braking with anti-jackknifing brake	٢	0		0	0	Number of braking actions w detected in EBS vehicles)	rith anti-jackknifing brake, sole pneumatic braking of the trailer vehicle (only
Brake actions without CAN presettings	٢	0		0	100000	Number of brake actions beh	hind towing vehicle without CAN communication
RSS interventions, stage 1	٢	174		0	100	Number of RSS test brake a	pplications
RSS interventions, stage 2	٢	2		0	10	Number of RSS deceleration	1 brakings
							COM1 <-> CAN 24V

Vehicle data

Tab *Overview* shows *Vehicle data* or the ECU, e. g. *Current kilometre reading* for evaluating the relevant kilometres or hours of operation, *Total number of trips*, etc.

ODR values

The ODR values can be shown as an *Absolute numerical value* or a *Normalised numerical value* (description relative to 10,000km).

The limits that apply for the evaluation can be loaded individually from the file of the vehicle to be analyzed.

Characteristics	Comment
Brake applications	Number of brake applications with ser- vice brake
Braking frequency	Number of brake applications per km
Average aggregate load	Average aggregate load value (all axles combined) with 3-axle low-bed semi-trailer e. g. 3 x 8000 kg
Average aggregate load (%)	Average value of the aggregate load percentage (relative to the maximum aggregate load)

7

Characteristics	Comment
Average control pressure	Average value of the control pressure pm at the yellow coupling head
Drives with overload	Number of drives with more than 10% overload (in relation to the parameter- ised axle load laden)
Braking with stop light power supply	Braking with stop light on failure of the power supply via ISO7638
Brake actuations with hand brake	Number of parking brake actuations in towing vehicle The recognition is made only on towing vehicles with a CAN connection be- cause only the pneumatic braking de- sire of the driver exists with the applied hand brake
Braking with anti-jackknifing brake	Number of braking actions with anti- jackknifing brake, sole pneumatic brak- ing of the trailer vehicle (only detected in EBS vehicles) Recognition only with towing vehicles braked with EBS
Brake actions without CAN presetting	Number of brake actions behind towing vehicles without CAN communication
RSS interventions, stage 1	<i>Number of RSS test brake applications</i> (with RSS stage 1)
RSS interventions, stage 2	<i>Number of RSS deceleration brakings</i> (with RSS stage 2)

7.2 Trip recorder

Definition of Trip: A trip has a travel distance of at least 5 km and a minimum speed of 30 km/h and the ignition must be switched on at the time.

In the trip recorder of the Trailer EBS E Modulator, the data of the last 200 trips are stored.



7

ionioni I ID I Histogramo Eventi	reserves [Protoci	Fining I Long ton	- /Charl tarm an	na arisan 1							
in information	lecolder blake i	ining congreat	in/shoreenincoi	npanson							
able Crashing											
Description	Unit	1	2	2	4	5	6	7	0	0	10
Description		25050.4	25007.1	30000 7	4 20522.0	00007.0	000054.0	20072.4	00001.0	30722.0	202
alometres at start or unve	KIII	30303.4	33307.1	30003.7	30332.0	30037.0	30034.2	30072.4	30031.3	30723.0	307
istance driven in kilometres	- KM	22.0	30.2	446.3	C01h 00min	17.1 C226-12-size	10.2 C224 40ada	10.3 C224 E0.4	32.4 C24h 2Carin	COEh Amin	23.
perating nours at start or drive	n		2007.05.14	2007.05.10	63Th 30min	633h Tamin	633h 40min	633h 59min	634h 26min	630n 4min	635
vate at staff of drive 1)		2007-00-11	2007-05-14	2007-05-16							
ime at start of drive 1j		12:08	10:43	12:04	11.00.1		0.10			01.10.1	01.1
riving hours	h	Uh 33min	Th 28min	6h 10min	Th 20min	Uh 24min	Uh 19min	Uh 21min	Uh 38min	Uh 12min	Uh 3
aximum speed	km/h	1/1	89	94	91	86	86	76	86	85	86
verage speed	km/h	40.6	65.1	12.1	11.2	41.7	56.6	50.4	50.6	33.5	58.
verage control pressure	bar	1.70	1.90	1.70	1.70	1.80	1.70	1.40	1.65	1.75	1.6
rake actuations		23	23	42	16	24	11	21	25	13	7
raking frequency	1/km	1.01	0.24	0.09	0.16	1.40	0.60	1.15	0.77	1.81	0.2
ggregate load at beginning of trip	t	6.3	9.2	9.0	9.0	7.0	7.1	7.1	6.2	6.1	15.
lin. aggregate load per trip	t	6.1	8.7	8.7	8.7	6.7	6.7	6.7	5.6	5.6	14.3
ax. aggregate load per trip	t	6.7	9.7	10.8	9.2	7.2	7.2	7.2	6.7	6.1	15.
BS brake actions		0	0	0	0	0	0	0	0	0	0
ISS interventions, stage 1		0	0	1	1	0	0	0	0	1	0
ISS interventions, stage 2		0	0	0	0	0	0	0	0	0	0
		-									
		•									•
The data for date and time are only a	available if the con	responding infor	mation is availab	le (e.q. from Sr	nartBoard), othe	wise the operat	ng hours are dis	played.			-

Table

The data of the present trip is shown. Data can be displayed as a graphic or in a table.

Characteristics	TEBS D	TEBS E without SmartBoard	TEBS E with Smart- Board
Kilometres at start of drive	х	x	Х
Distance driven in kilometres	х	x	X
Operating hours at start of drive	x	x	
Hours of opera- tion at trip start with date			x
Driving hours	x	x	х
Maximum speed	х	x	х
Average speed	х	х	Х
Average control pressure	х	x	Х
Brake actuations	х	х	Х
Braking fre- quency	х	x	Х
Aggregate load at beginning of trip	x	x	Х

Characteristics	TEBS D	TEBS E without SmartBoard	TEBS E with Smart- Board
Display of min. and max. power unit load, in order to e. g. recognise added load on a dumper with the ignition switched on.		x	X
ABS brake ac- tions	х	x	X
RSS interven- tions, stage 1	x (with RSS variant only)	х	x
RSS interven- tions, stage 2	x (with RSS variant only)	X	Х

Graphic



The stored trips in the trip memory can be displayed as a graphic on the tab *Graphic*.

- Driven distance and time
- Maximum and average speed
- ABS RSS (-control)
- Power unit load
- Braking frequency
- Control pressure

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Buttons <-- older trips and newer trips --> can also be used with TEBS D to show up to 30 trips and with TEBS E up to 200 trips.

7.3 Histograms

Definition of a Histogram: A histogram represents the distribution of events as they occur over the operating time of the vehicle.

The values of the histogram are shown in individual classes.

Table

<u>•</u>		(TEBS-E) Data fro	m ECU			
view	Trip Histograms Event reco	order Brake lining Long-term/Short	-term comp	parison		
togra	ams					
le	Graphics					
ance	travelled vs. aggregate load		Distance	travelled vs. axle load		
SS	Aggregate load in %	Distance travelled in km	Class	Axle load in %	Distance travelled in km	
	0 - 20 %	580	1	0 - 20 %	580	
	20 - 50 %	33110	2	20 - 50 %	31930	
	50 - 80 %	23420	3	50 - 80 %	24500	
	80 - 90 %	2010	4	80 - 90 %	2080	
	90 - 100 %	400	5	90 - 100 %	430	
	100 - 110 %	90	6	100 • 110 %	90	
	110-120%	0	1/	110 - 120 %	0	
	> 120 %	0	18	> 120 %	0	
Der o	f brake actions vs. control pressure	e,	Braking ti	me vs. control pressure		
SS	Control pressure in bar	Number of brake actions	Class	Control pressure in bar	Braking time in seconds	
	0.0 · 1.0 bar	1422	1	0.0 · 1.0 bar	735	
	1.0 - 1.2 bar	1240	2	1.0 - 1.2 bar	869	
	1.2 · 1.4 bar	2330	3	1.2 · 1.4 bar	2085	
	1.4 • 1.7 bar	5190	4	1.4 - 1.7 bar	5542	
	1.7 - 2.0 bar	4308	5	1.7 - 2.0 bar	5152	
	2.0 - 2.5 bar	3393	6	2.0 · 2.5 bar	4007	
	2.5 - 4.5 bar	1584	7	2.5 - 4.5 bar	1564	
	<4.5 bar	23	18	<4.5 bar	/	

The following values are available under the tab Table:

- Distance travelled vs. aggregate load (only available for TEBS E)
- Distance travelled vs. axle load
- Number of brake actions vs. control pressure
- Braking time vs. control pressure (only available for TEBS E)

Aggregate load (sum of all axles): This histogram stores how many kilometres were driven for each combined multi-axle class.

Axle load (axle load for one axle): This histogram stores how many kilometres were driven for each combined multi-axle class.

Control pressure: This histogram stores how many brake actions were performed for each class. The maximum pressure that occurred is also saved.

Graphic



The values shown under the *Table* are shown as a graphic representation here. Individual graphics can be either shown or hidden.

7.4 Event Recorder

•	P 🔊 🕅	P	DATA SOURCE (TEBS-E) Data from ECU					
viev	+ Trip Histograms	vent recorder Brake lin	ing Long-term/Short-term comparis	ion				
ent spla	(27) ♥ ABS ctrl inte (50) ♥ RSS test br (2) ♥ RSS decele	erventions aking actions ration brakings	 (47) ✓ Warning lamp on (1) ✓ Brake pad worn (2) ✓ Tyre pressure too low 	(0) (0) (0)	✓ GIO-FKA () ✓ GIO-FKD () ✓ Other	All On All Off		
٩o.	Type	Odometer reading	Operating hours/Da	Speed	Control pressure	Aggregate load Kil	ometre reading (e	Operating hours/Da
_	RSS test braking acti	50691.0 km	887h 41min	37 km/h	0.00 bar	6.7 t	50691.0 km	887h 41rr
	RSS test braking acti	50986.5 km	893h 06min	20 km/h	0.80 bar	6.1 t	50986.5 km	893h 06m
	Warning lamp on	639.6 km	10h 46min	12 km/h	0.00 bar	3.1 t	640.0 km	10h 48m
	RSS test braking acti	51000.4 km	893h 22min	34 km/h	0.00 bar	6.1 t	51000.5 km	893h 22n
	Warning lamp on	1982.5 km	34h 39min	10 km/h	0.65 bar	3.1 t	1982.5 km	34h 39n
	Warning lamp on	2147.7 km	39h 03min	8 km/h	0.55 bar	11.3 t	2147.8 km	39h 03n
	Warning lamp on	2147.8 km	39h 04min	12 km/h	0.00 bar	11.3 t	2148.8 km	39h 07n
	RSS test braking acti	52963.7 km	927h 23min	40 km/h	0.00 bar	8.2 t	52963.7 km	927h 23n
	RSS test braking acti	54327.6 km	948h 26min	33 km/h	0.00 bar	9.2 t	54327.7 km	948h 26n
	RSS test braking acti	54878.6 km	957h 53min	33 km/h	0.00 bar	5.6 t	54878.7 km	957h 53m
0	ABS control	2892.0 km	52h 43min	7 km/h	0.00 bar	13.8 t	2892.1 km	52h 43m
1	RSS test braking acti	57467.7 km	998h 42min	30 km/h	0.00 bar	6.7 t	57467.8 km	998h 42m
2	RSS test braking acti	58057.3 km	1008h 58min	32 km/h	0.00 bar	6.1 t	58057.3 km	1008h 58m
3	RSS test braking acti	58062.1 km	1009h 07min	35 km/h	0.00 bar	6.1 t	58062.1 km	1009h 07n
4	RSS test braking acti	58332.6 km	1014h 18min	48 km/h	0.00 bar	9.7 t	58332.6 km	1014h 18n
5	RSS test braking acti	58939.4 km	1024h 37min	47 km/h	0.00 bar	9.2 t	58939.4 km	1024h 37n
6	Warning lamp on	3430.8 km	61h 32min	2 km/h	0.00 bar	3.1 t	3430.8 km	61h 32m
7	Warning lamp on	3430.9 km	61h 32min	4 km/h	1.00 bar		3430.9 km	61h 38m
8	RSS test braking acti	59052.8 km	1026h 13min	23 km/h	0.00 bar	8.7 t	59052.9 km	1026h 13m
9	Warning lamp on	4064.3 km	73h 25min	14 km/h	0.00 bar	5.1 t	4064.3 km	73h 25m
0	RSS test braking acti	59124.5 km	1027h 17min	44 km/h	0.00 bar	8.7 t	59124.5 km	1027h 17m
1	Warning lamp on	4718.0 km	84h 45min	6 km/h	0.00 bar	3.1 t	4718.1 km	84h 45m
2	Warning lamp on	5342.8 km	95h 57min	18 km/h	0.00 bar	2.6 t	5342.8 km	95h 57n
3	Warning lamp on	5342.9 km	95h 57min	13 km/h	1.85 bar	3.1 t	5342.9 km	95h 57n
4	RSS test braking acti	59126.9 km	1027h 41min	39 km/h	0.00 bar	12.8 t	59126.9 km	1027h 41m
5	Warning lamp on	6026.4 km	107h 14min	14 km/h	0.00 bar	3.1 t	6026.7 km	107h 16m
6	RSS test braking acti	59342.1 km	1030h 33min	37 km/h	0.00 bar	13.3 t	59342.1 km	1030h 33n
7	RSS test braking acti	59923.9 km	1040h 08min	36 km/h	0.00 bar	10.8 t	59924.0 km	1040h 08m
8	Warning lamp on	6704.4 km	118h 32min	16 km/h	0.00 bar	2.6 t	6704.7 km	118h 33m
9	Warning lamp on	7918.4 km	138h 53min	10 km/h	0.00 bar	5.1 t	7918.6 km	139h 16m
0	ABS control	7982.6 km	141h 49min	1 km/h	7.20 bar	4.1 t	7982.6 km	141h 49m
1	Warning lamp on	8539.5 km	151h 11min	9 km/h	0.00 bar	5.6 t	8540.1 km	151h 38m
2	RSS test braking acti	59964.2 km	1040h 40min	45 km/h	0.00 bar	10.8 t	59964.3 km	1040h 40n
3	RSS test braking acti	59985.0 km	1040h 58min	45 km/h	0.00 bar	10.2 t	59985.0 km	1040h 58n
1	10001 11 12 12 1	00070 01	0001 50 1	001 1	0.001		00070.01	2001 52 0

The events recorded while traveling are displayed in a table.

The filter function can be used to change the display so that only individual event types are displayed.

The following events are displayed:

- ABS ctrl interventions
- RSS test brake actions
- RSS decelaration brakings
- Warning lamp on (only available for TEBS E)
- Brake pad worn (only available for TEBS E)
- Tyre pressure too low (only available for TEBS E)
- GIO-FKA () (FKA = freely configurable analogue input) Function (only available for TEBS E)
- GIO-FKD () (FKD = freely configurable digital input) Function (only available for TEBS E)
- Other (only available for TEBS E)

Detailed information is available for every event. This information can be displayed (if available, otherwise "---") as:

- (Event-)Type
- Odometer reading (at event start)
- Operating hours/Date (at event start)
- Speed
- Control pressure
- Aggregate load
- Kilometre reading (End) at event end
- Opterating hours/Date (End) at event end

7.5 Brake lining

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Overvi	Overview Trip Histograms Event recorder Brake liming Long-term/ShotNetm comparison ,										
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				Lining set							
			Norking life	brake lining 📃 Distance wit	h residual lining						
	Vorking life brake lining										
Linit	ng set	Operating hours	Odometer reading	Distance with residual lining	Working life brake lining set	Status					
Linir 1	ng set	Operating hours 176h 40min	Odometer reading 10761 km	Distance with residual lining 10761 km	Working life brake lining set	Status Pad wom					
Linir 1	ng set	Operating hours 176h 40min 195h 05min	Odometer reading 10761 km 11983 km	Distance with residual lining 10761 km	Working life brake lining set 1223 km	Status Pad worn Pad changed					
Linir 1 1 2	ng set	Operating hours 176h 40min 195h 05min 384h 19min	Odometer reading 10761 km 11983 km 23916 km	Distance with residual lining 10761 km 11933 km	Working life brake lining set	Status Pad worn Pad changed Pad worn					
Lini 1 1 2 2	ng set	Operating hours 176h 40min 195h 05min 384h 19min 426h 44min 920 47	0 dometer reading 10761 km 11983 km 23916 km 25708 km	Distance with residual lining 10761 km 11933 km 2520 L	Working life brake lining set 1223 km 2792 km	Status Pad worn Pad changed Pad worn Pad nanged					
Linir 1 2 2 3	ig set	Operating hours 176h 40min 195h 05min 384h 19min 426h 44min 833h 47min 932h 47min	Odometer reading 10761 km 11983 km 23916 km 26708 km 52104 km	Distance with residual lining 10761 km 11933 km 25396 km	Working life brake lining set	Status Pad worn Pad changed Pad worn Pad changed Pad worn Pad worn					
Lini 1 2 2 3 3	ıg set	Dperating hours 176h 40min 195h 05min 384h 13min 426h 44min 833h 47min 937h 77min 937h 70min	0dometer reading 10761 km 11983 km 26708 km 52104 km 52104 km 51122 km	Distance with residual lining 10761 km 11933 km 25396 km 2018 km	Working life brake lining set 	Status Pad worn Pad changed Pad changed Pad changed Pad worn Pad changed Pad worn					
Linir 1 2 2 3 3 4 4	ig set	Operating hours 176h 40min 196h 05min 384h 13min 426h 44min 833h 47min 833h 47min 937h 03min 949h 31min	0dometer reading 10751 km 11983 km 23916 km 26708 km 52104 km 52104 km 54122 km 54122 km	Distance with residual lining 10761 km 25336 km 2018 km 2018 km	Working life brake lining set	Status Pad wom Pad changed Pad wom Pad changed Pad wom Pad changed Pad wom Pad changed					
Linir 1 2 2 3 3 4 4 5	ng set	Operating hours 175h 40min 195h 05min 384h 19min 425h 44min 833h 47min 833h 47min 937h 09min 949h 31min 1012h 31min	0 dometer reading 10751 km 11983 km 23916 km 52104 km 52104 km 54513 km 54513 km	Distance with residual lining 10751 km 11933 km 25396 km 2018 km 5187 km	Working life brake lining set	Status Pad wern Pad changed Pad wern Pad changed Pad wern Pad changed Pad wern Pad changed Pad wern					
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Linir 1 2 3 3 4 4 5 5	ig set	Operating hours 178h 40min 197h 05min 384h 15min 425h 44min 833h 47min 833h 47min 937h 05min 949h 31min 1012h 31min 1040h 33min	0doneter reading 10751 km 11933 km 25708 km 52104 km 52104 km 54513 km 54513 km 54500 km	Distance with residual lining 10751 km 11333 km 25336 km 2016 km 	Working life baske lining set 223 km 275 km 0 km 31 km 345 km	Status Pad wom Pad changad Pad wom Pad changad Pad wom Pad changad Pad wom Pad changad Pad wom Pad changad					
Linir 1 2 2 3 3 4 4 5 5	ig set	Operating hours 175h 40min 195h 05min 384h 19min 425h 44min 833h 47min 833h 47min 937h 09min 949h 31min 1012h 31min 1040h 39min	Odoneter reading 10761 km 11983 km 23916 km 25704 km 52104 km 52104 km 54122 km 54133 km 60045 km	Distance with residual lining 10761 km 	Working life brake lining set 1223 km 1223 km 0 km 391 km 345 km	Status Pad vom Pad changed Pad wom Pad changed Pad wom Pad changed Pad wom Pad changed Pad wom Pad changed					
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Lini 1 1 2 2 3 3 4 4 4 5 5	ig sel	Operating hours 175h 40min 195h 40min 384h 19min 435h 47min 833h 47min 837h 47min 937h 09min 949h 31min 1012h 31min 1040h 33min	Odometer reading 10751 km 11930 km 23915 km 23916 km 52104 km 52104 km 54122 km 5413 km 59700 km 60045 km	Distance with residual lining 10761 km 	Working life brake lining set 1223 km 2732 km 0 km 391 km 345 km	Status Pad wom Pad hanged Pad wom Pad hanged Pad wom Pad hanged Pad wom Pad wom Pad wom Pad wom Pad wom					
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Brake lining history

The last 5 documented brake lining changes are shown under the tab Brake lining.

The kilometres that have been driven are shown in a table to indicate the hours of operation elapsed when the brake linings were worn or changed. This data is then used to determine and show the stationary and driving time with residual lining.

The stationary and driving times with residual thicknesses for the brake lining are shown graphically for every lining set.

7.6 Long-/Short-term comparison

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Overvie	w Trip Histograms Event recorder	Brake lining	Long-term/	Short-term cor	omparison	
-Long-	erm/Short-term comparison					-1
A	verage control pressure	Braking frequ	ency	A	ABS interventions RSS interventions, stage 1 RSS interventions, stage 2	
Jag Long- Short	0,3 0,25 0,2 0,25 0,15 0,1 0,05 0 0 Long-term □ Short-term 0 term : Data on the vehicle service life term : Data on trips			4 		
	Description	Long-term	Short-term	Unit	Comment	
1	Average control pressure	1.72	1.16	bar	Average value of the control pressure pm at the yellow coupling head	
2	Braking frequency	0.33	0.33	1/km	Number of brake applications per km	
3	ABS interventions	4.50	4.98	1/10000km	Number of ABS interventions	
4	RSS interventions, stage 1	28.98	24.49	1/10000km	n Number of RSS test brake applications	
5	RSS interventions, stage 2	0.33	0.83	1/10000km	n Number of RSS deceleration brakings	
					COM1 <-> CAN 24V	

A comparison of the long-term data (total lifespan of the ECU) is made with the short-term data (recording period of the trip recorder) under the tab *Long-/Short-term comparison*.

The following values are shown as tables and graphically:

- Average control pressure
- Braking frequency
- ABS interventions
- RSS interventions, stage 1
- RSS interventions, stage 2



WABCO Vehicle Control Systems, is one of the world's leading providers of electronic braking, stability, suspension and transmission control systems for heavy duty commercial vehicles. WABCO products are also increasingly used in luxury cars and sport utility vehicles (SUVs). Customers include the world's leading commercial truck, trailer, bus and passenger car manufacturers. Founded in the U.S. in 1869 as Westinghouse Air Brake Company, WABCO was acquired by American Standard in 1968 and spun off in 2007. Headquartered in Brussels, Belgium, the business today employs more than 7,000 people in 34 offices and production facilities worldwide. In 2006, total sales were \$2 billion. WABCO is a publicly traded company and is listed on the New York Stock Exchange with the stock symbol WBC.

www.wabco-auto.com

