Tire Check in Seconds

Toipics:

Ventech

Product Overview

How does PNEUSCAN ATM work?

PNEUSCAN ID

Installation

Benefits

Outlook on PNEUSCAN PRO

...metrology in motion...

Company

- **VENTECH GmbH** established in **February 2006**
- High **competence** in **Measurement** & **System-Technology**
- International **Patents** and **Brands**

...metrology in motion...

Product Overview

PNEUSCAN ATM

Automatic tire inflation check

PNEUSCAN ID

Identification by license plate

PNEUSCAN PRO

Automatic tread check

All PNEUSCAN products can be installed in combination.

...metrology in motion...

Overview

...metrology in motion...

PNEUSCAN ATM - TRUCK

...metrology in motion...

Installation @ BVG

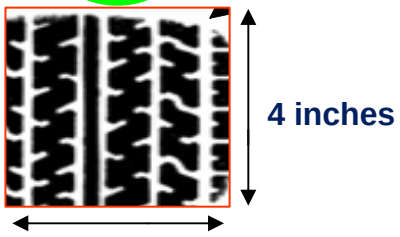
...metrology in motion...

How does it work?

Pressure (PSI) = Force / Area

$$20\ \text{psi} = \frac{800\ \text{lbs}}{40\ \text{inches}^2}$$

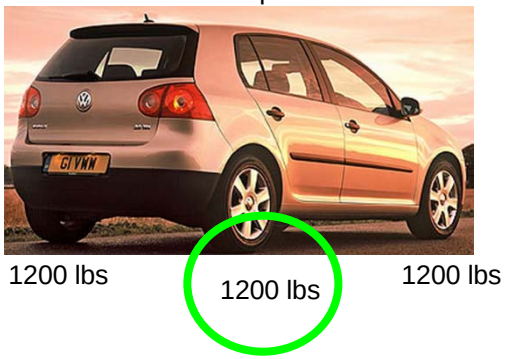
Example: A car has a Load of **800 lbs** on each tire with a tire pressure of **20 psi.**

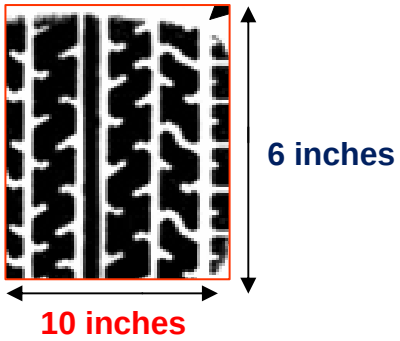


100 PSI = 100 lbs / Inch²

$$20\ \text{psi} = \frac{1{,}200\ \text{lbs}}{60\ \text{inches}^2}$$

Example: When the Load on each tire is extended from **800 lbs** to **1200 lbs**, the contact area grows at the same tire pressure.

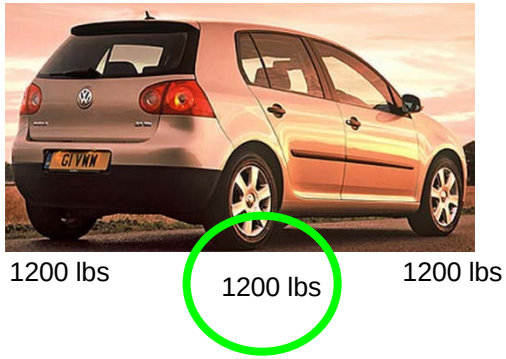


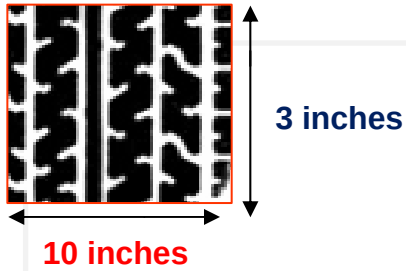


The Contact Area extends proportional to the Load and reverse proportional to the Tire Pressure.

$$40\ \text{psi} = \frac{1{,}200\ \text{lbs}}{30\ \text{inches}^2}$$

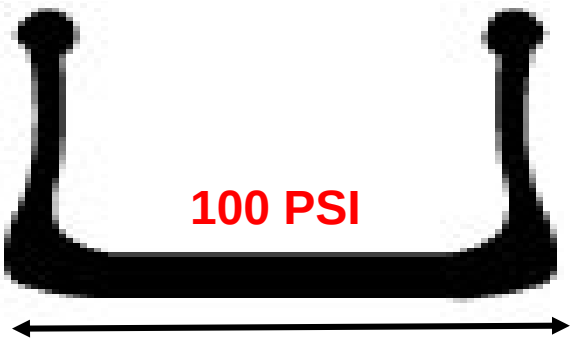
Example: When the tire pressure is extended to **40 psi**, the contact area is reduced proportional.



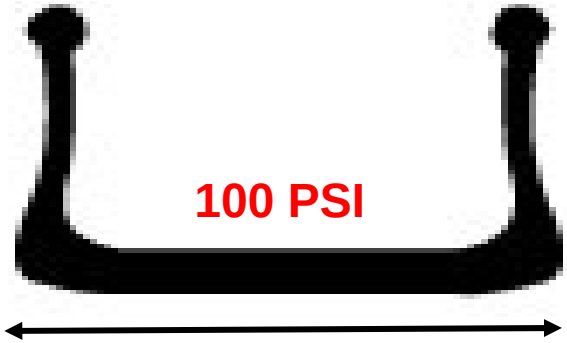


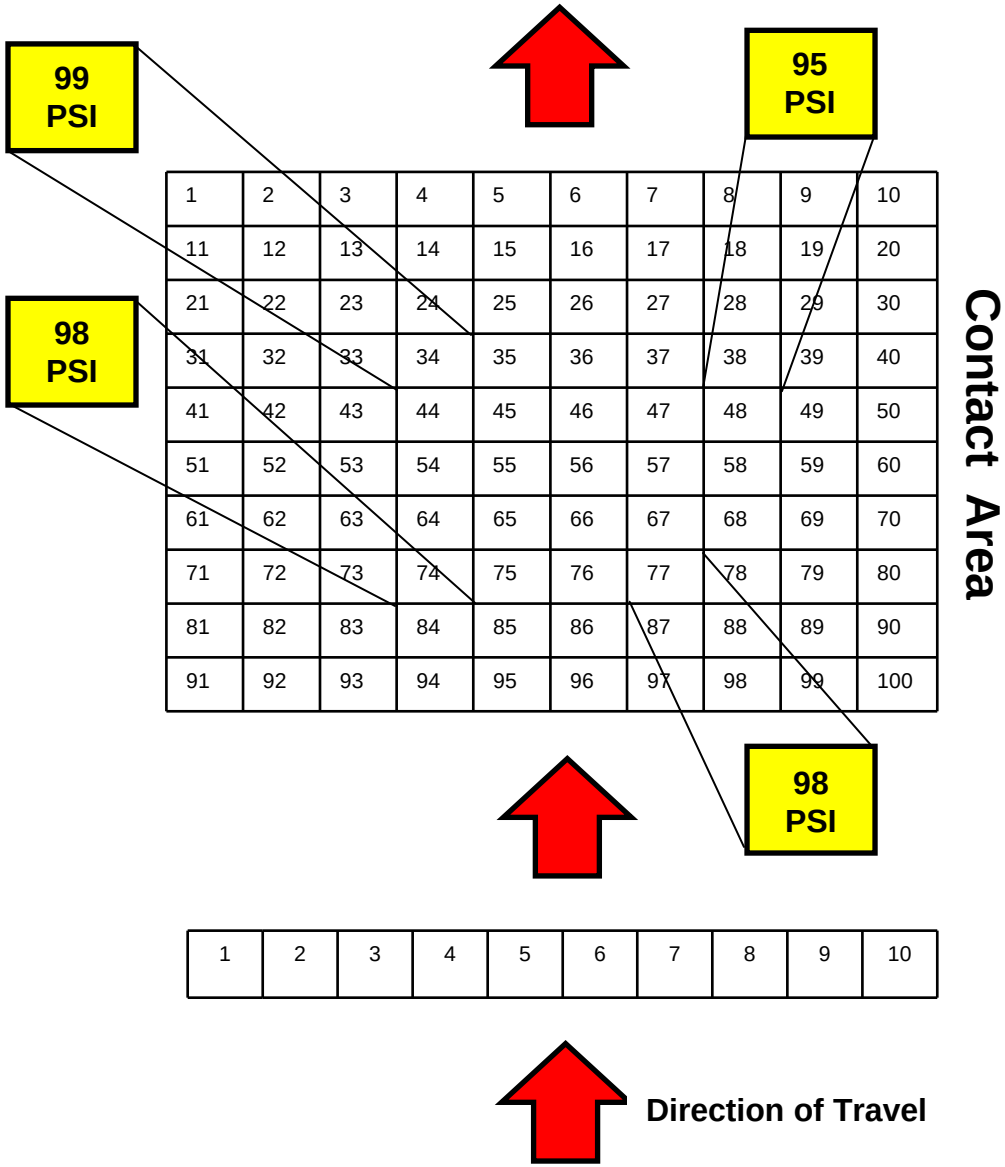
How does it work?

Load = 10,000 lbs



Load = 1,000 lbs

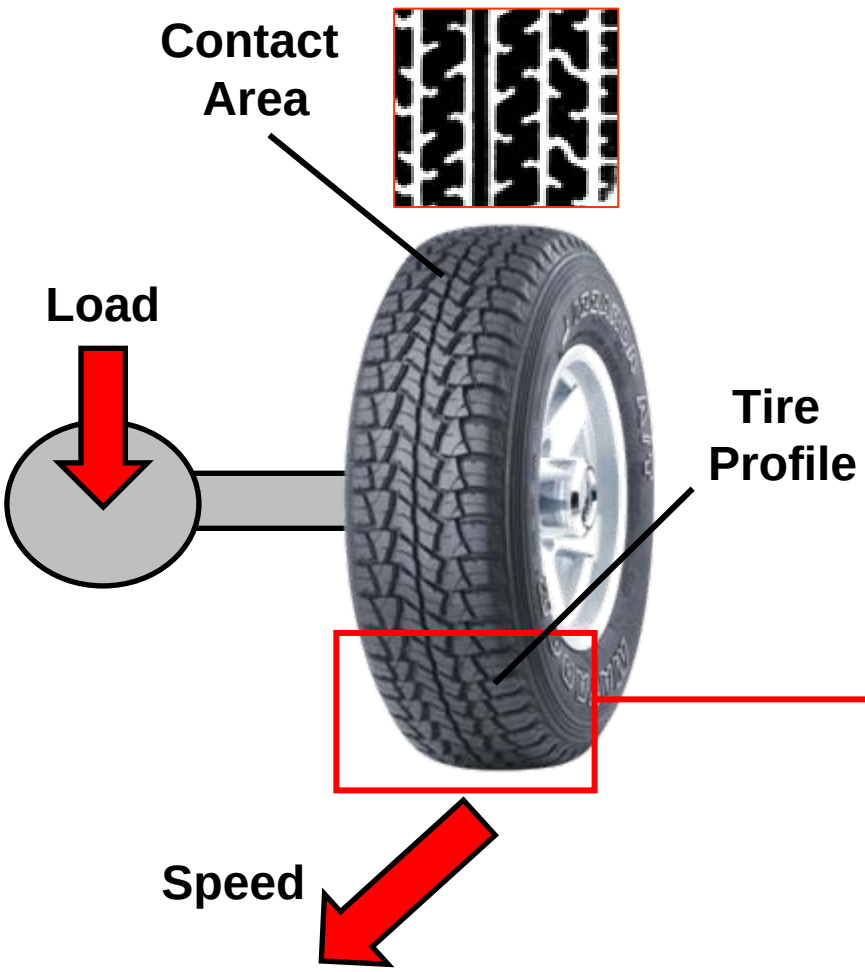


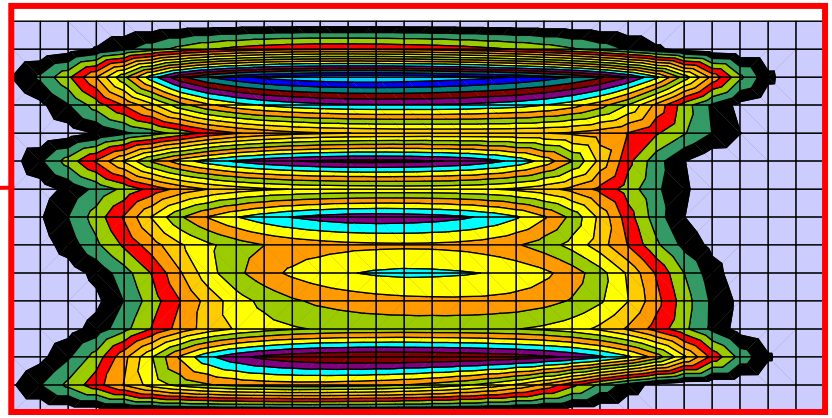


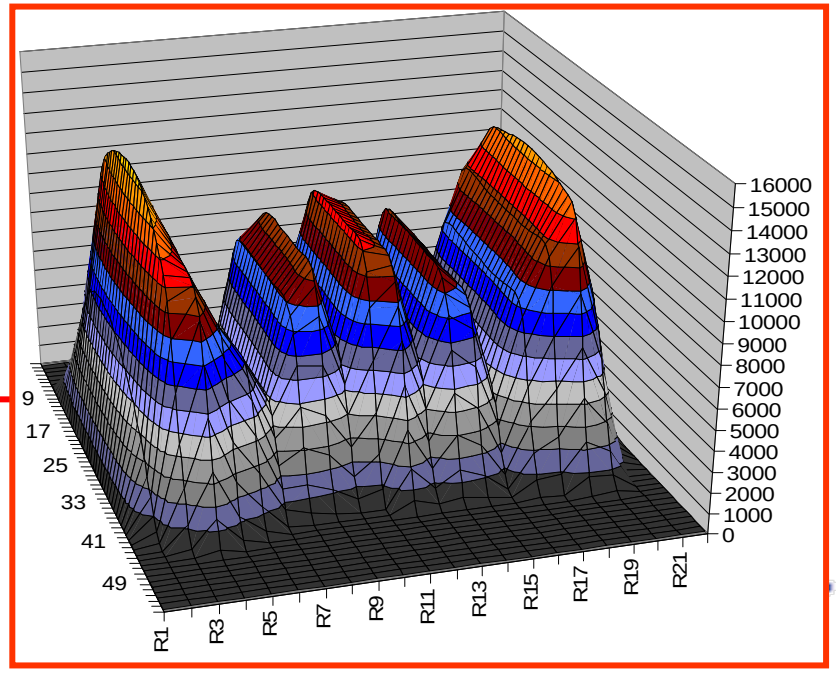
Pressure (PSI) = Force / Area

How does it work?

Each Tire leaves a Footprint!

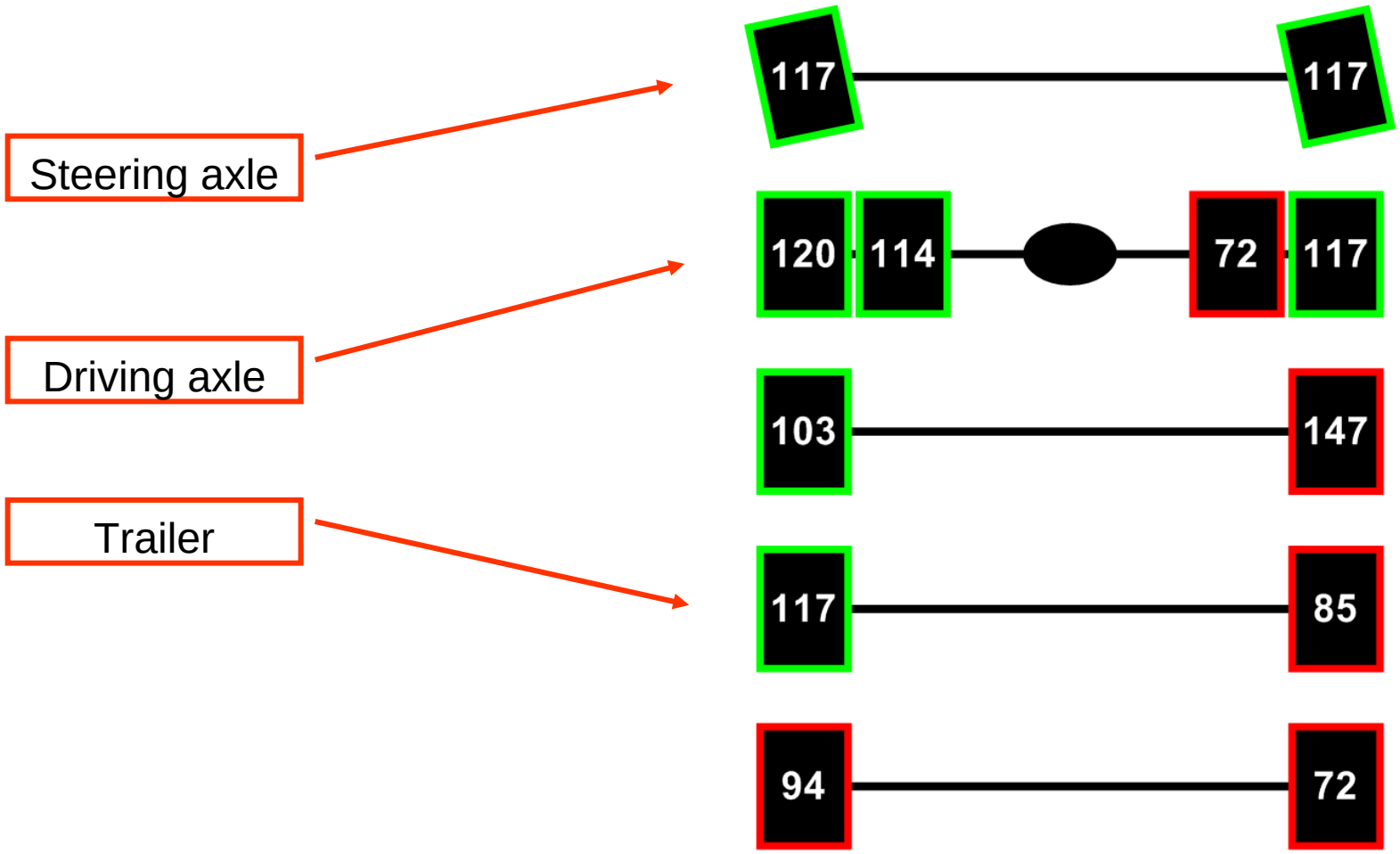






How does it work?

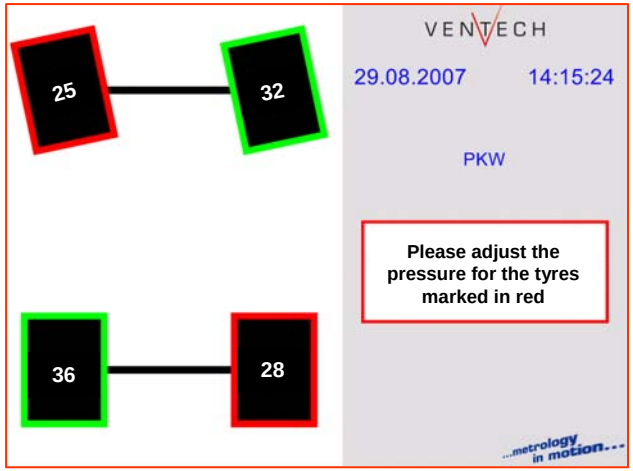
Result → Tire Pressure!



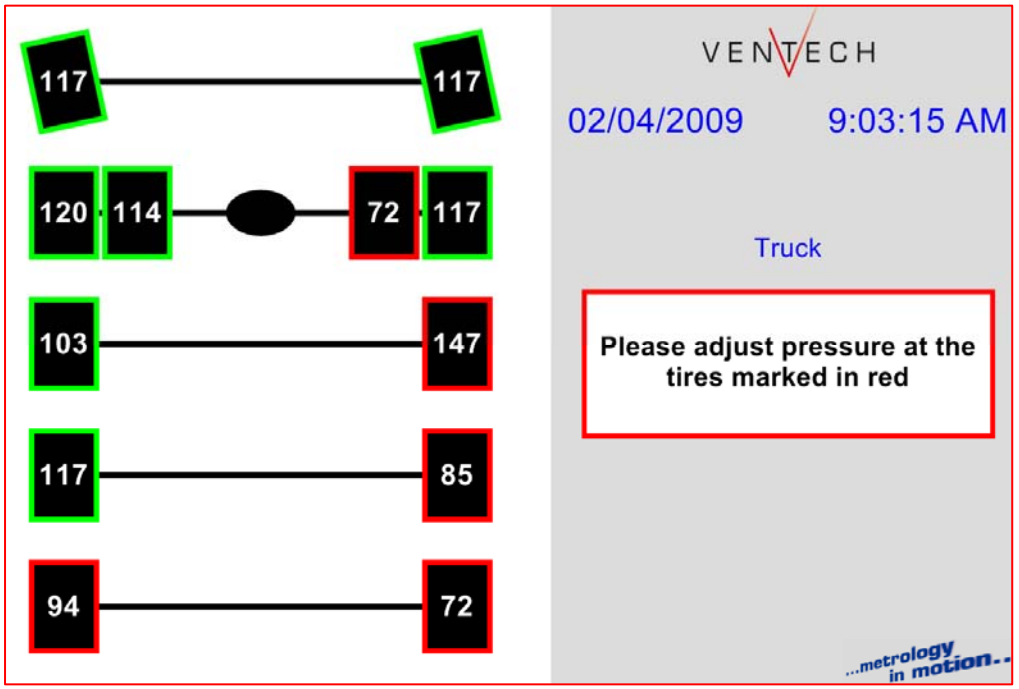
How does it work?

Detecting the type of vehicle

- The **amount** of axles and tires
- **Structure** of the axles and the tires
- **Results** can be assigned to each axle or tire of a vehicle type



Car



EU Truck

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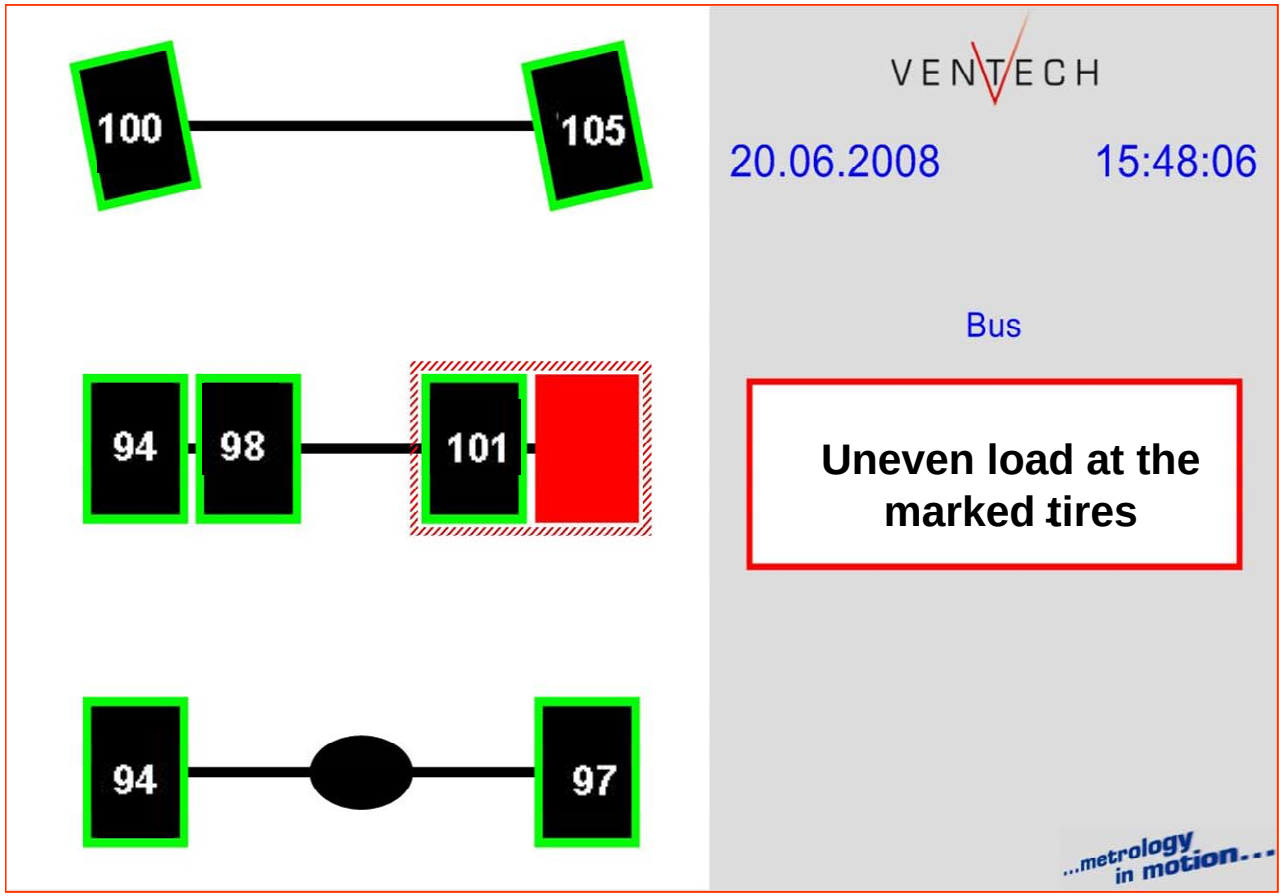
How does it work?

Warning in case of Irregular Combination of Twin Tires



Articulating Bus

Print-Out

VENTECH

Tire Inflation Check

10/10/2009 2:56 p.m.

	left		right
Axle 1	99		95
Axle 2	97	100	112	110
Axle 3	94	107	99	80

Please adjust the pressure at the marked tires manually!

Transfer Data via Ethernet

Tire Pressure Log

PNEUSCAN ATM - Tyre Pressure Monitoring VENTECH

Date	Time	Licence number	Vehicle number	Vehicle type	Tyre	Pressure ACTUAL	Pressure TARGET	Pressure TARGET MAX	Pressure TARGET MIN	Deviatation TARGET	Pressure ok
5/8/2009	12:00:12 AM	LN 51 DVR	41441	Bus_24_Old	L-1-1	100	95	104	86	5	ok
5/8/2009	12:00:12 AM	LN 51 DVR	41441	Bus_24_Old	R-1-1	94	95	104	86	-1	ok
5/8/2009	12:00:12 AM	LN 51 DVR	41441	Bus_24_Old	L-2-1	83	80	88	72	3	ok
5/8/2009	12:00:12 AM	LN 51 DVR	41441	Bus_24_Old	L-2-2	77	80	88	72	-3	ok
5/8/2009	12:00:12 AM	LN 51 DVR	41441	Bus_24_Old	R-2-1	84	80	88	72	4	ok
5/8/2009	12:00:12 AM	LN 51 DVR	41441	Bus_24_Old	R-2-2	82	80	88	72	2	ok
5/8/2009	12:04:17 AM	LK 53 FCC	11024	Bus_244	L-1-1	128	131	145	118	-3	ok
5/8/2009	12:04:17 AM	LK 53 FCC	11024	Bus_244	R-1-1	124	131	145	118	-7	ok
5/8/2009	12:04:17 AM	LK 53 FCC	11024	Bus_244	L-2-1	119	101	111	91	18	not ok
5/8/2009	12:04:17 AM	LK 53 FCC	11024	Bus_244	L-2-2	104	101	111	91	3	ok
5/8/2009	12:04:17 AM	LK 53 FCC	11024	Bus_244	R-2-1	110	101	111	91	9	ok
5/8/2009	12:04:17 AM	LK 53 FCC	11024	Bus_244	R-2-2	104	101	111	91	3	ok
5/8/2009	12:04:17 AM	LK 53 FCC	11024	Bus_244	L-3-1	139	114	126	110	25	not ok
5/8/2009	12:04:17 AM	LK 53 FCC	11024	Bus_244	L-3-2	129	114	126	110	15	not ok
5/8/2009	12:04:17 AM	LK 53 FCC	11024	Bus_244	R-3-1	125	114	126	110	11	ok
5/8/2009	12:04:17 AM	LK 53 FCC	11024	Bus_244	R-3-2	121	114	126	110	7	ok
5/8/2009	12:04:51 AM	YX 58 FPY	44058	Bus_24_New	L-1-1	111	111	124	100	0	ok
5/8/2009	12:04:51 AM	YX 58 FPY	44058	Bus_24_New	R-1-1	111	111	124	100	0	ok
5/8/2009	12:04:51 AM	YX 58 FPY	44058	Bus_24_New	L-2-1	108	105	113	92	3	ok
5/8/2009	12:04:51 AM	YX 58 FPY	44058	Bus_24_New	L-2-2	108	105	113	92	3	ok
5/8/2009	12:04:51 AM	YX 58 FPY	44058	Bus_24_New	R-2-1	112	105	113	92	7	ok

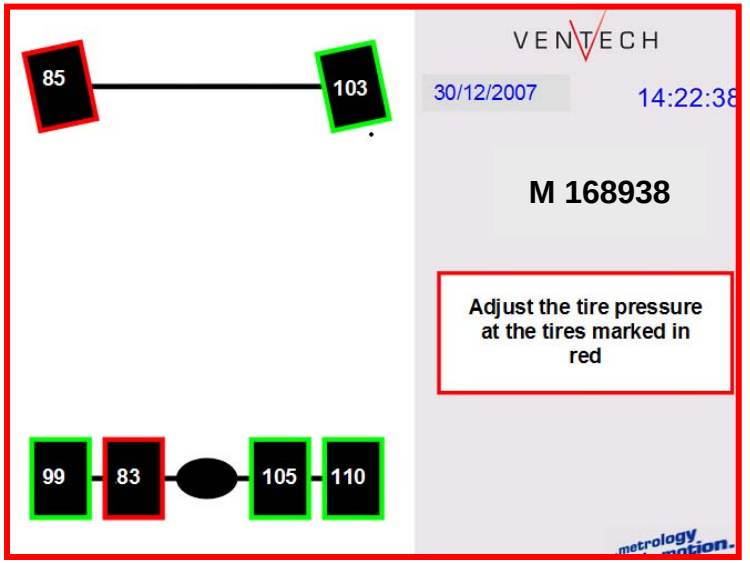
Analysis

- **Print-out** of the **Current Result (Printer)**
- **Print-out** of the **Critical Tires** or all **Tires** of the **Last XXX Hours** with **ID** of the vehicle
- **Export** the **Data** to **Excel** (e.g. Includes the Set Pressures, Tolerances and Abnormalities)

PNEUSCAN ID

Vehicle Identification

- Individual identification by reading the Licence Plate
- The results can be assigned to the individual vehicle
- Detection of Creeping Inflation



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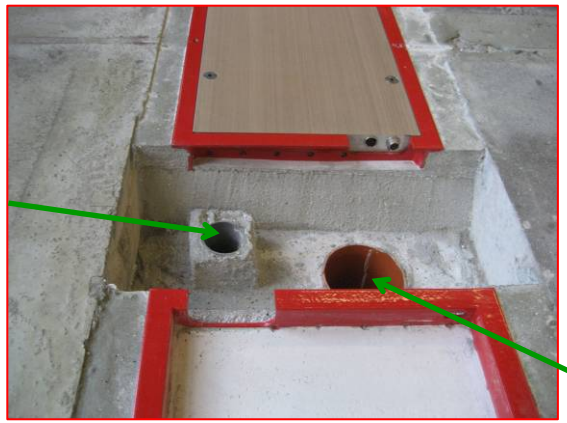
Sensor Installation

Sensor

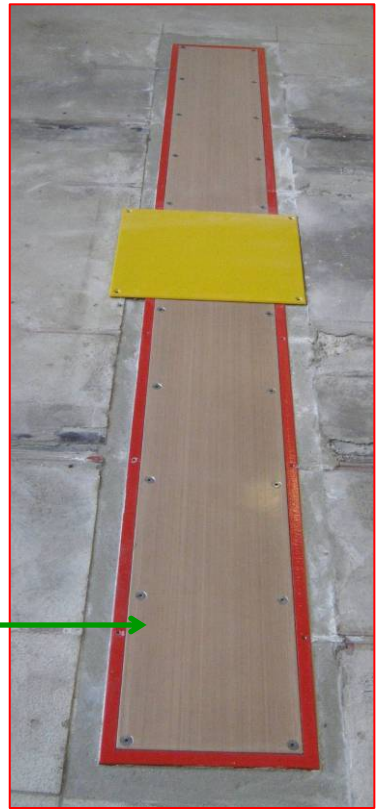
We recommend to mount the sensor flatly into the ground

- Higher accuracy
- Passing with a higher speed
- Less material wear
- Higher acceptance by the driver



Tube for cables

Drainage



Passing speed up to 25 km/h (15m/h)

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Sensor Installation

...metrology in motion...

System Unit (Dispay) Installation

System with Display	LC-Display, illuminated
Width of the sensitive area on left and right side	ca. 48“ inch
Accuracy	**+/- 9** psi (95% of all test measurements) When cross-checking, the accuracy of the measurement is to be taken into consideration
Power supply	110 Volt, < 1,5 kVA, 50 - 60 Hz
Speed	3 to 16 miles/h
Ambient temperature	+14℉ to +113℉ (protect sensor and display against intensive sunlight and heating up above 120°F)
Average load capacity of the sensor plate	1,000 axles per day
Minimum load per tire	Tire 275/70 R 22,5 - min. 1500 lbs Tire 385/65 R 22,5 - min. 1700 lbs Other tire types on request

Ventech reserves the right to modify these data specifications without notice.

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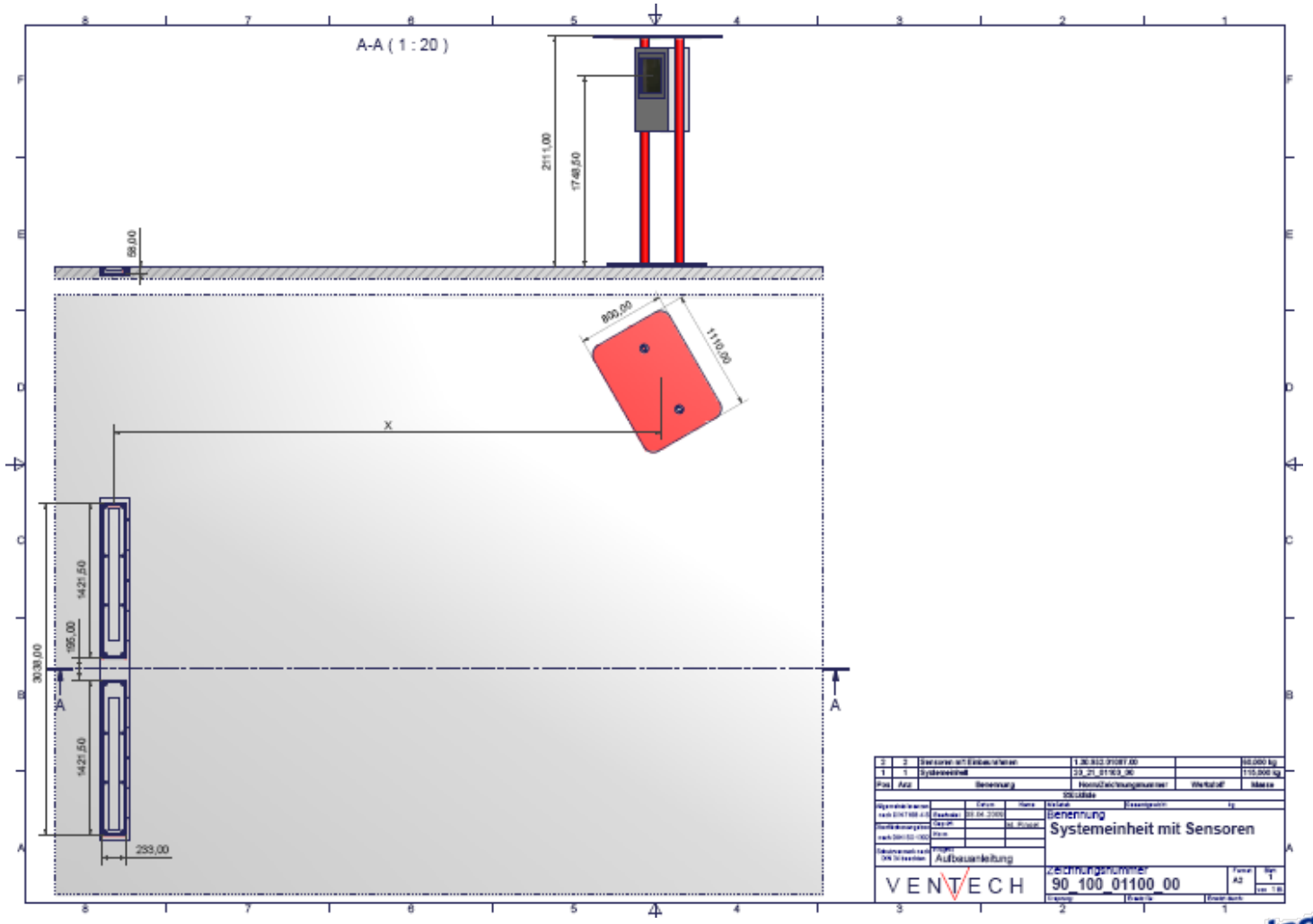
System Unit (Dispay)
Installation



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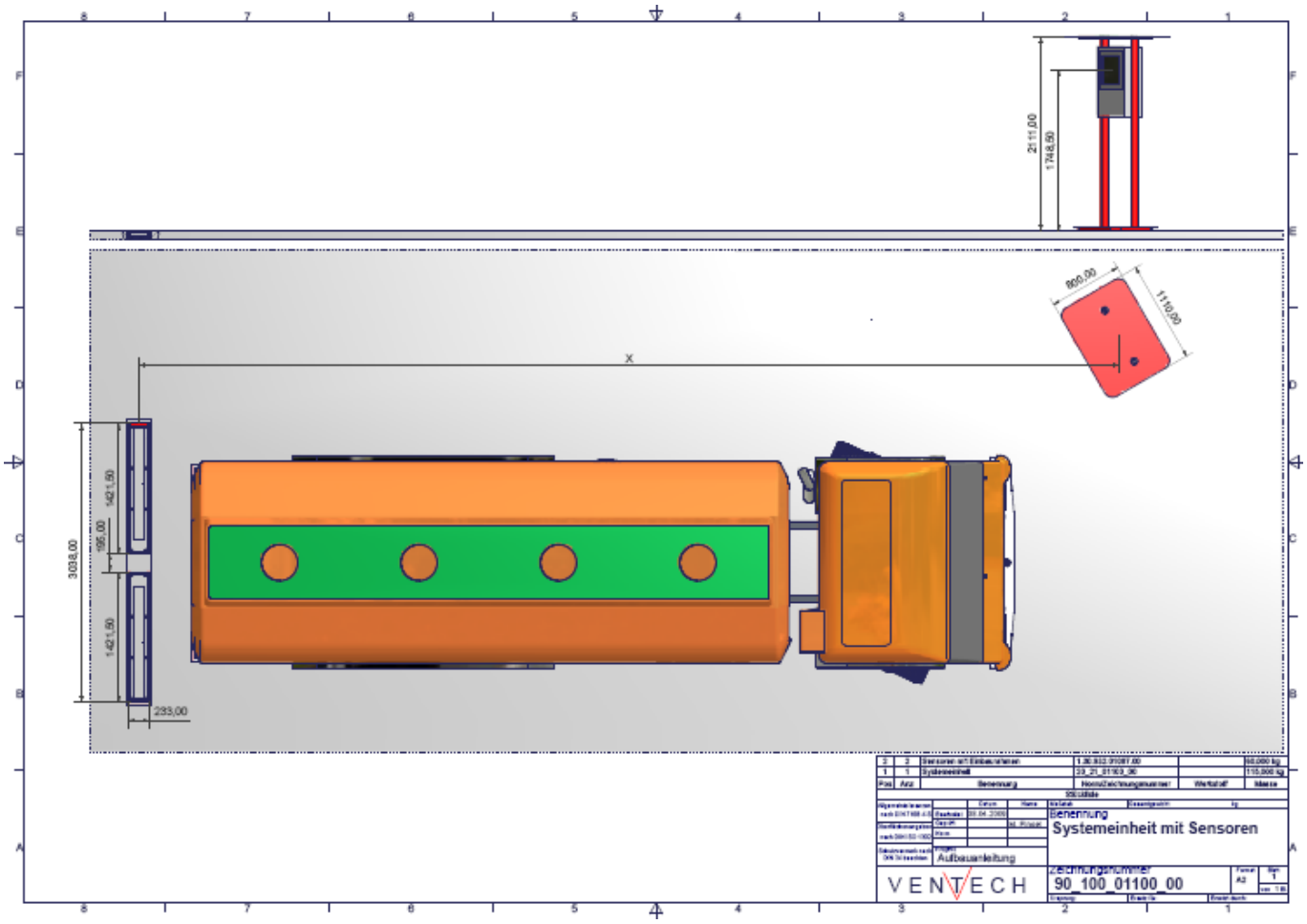
System Unit (Dispay)
Installation



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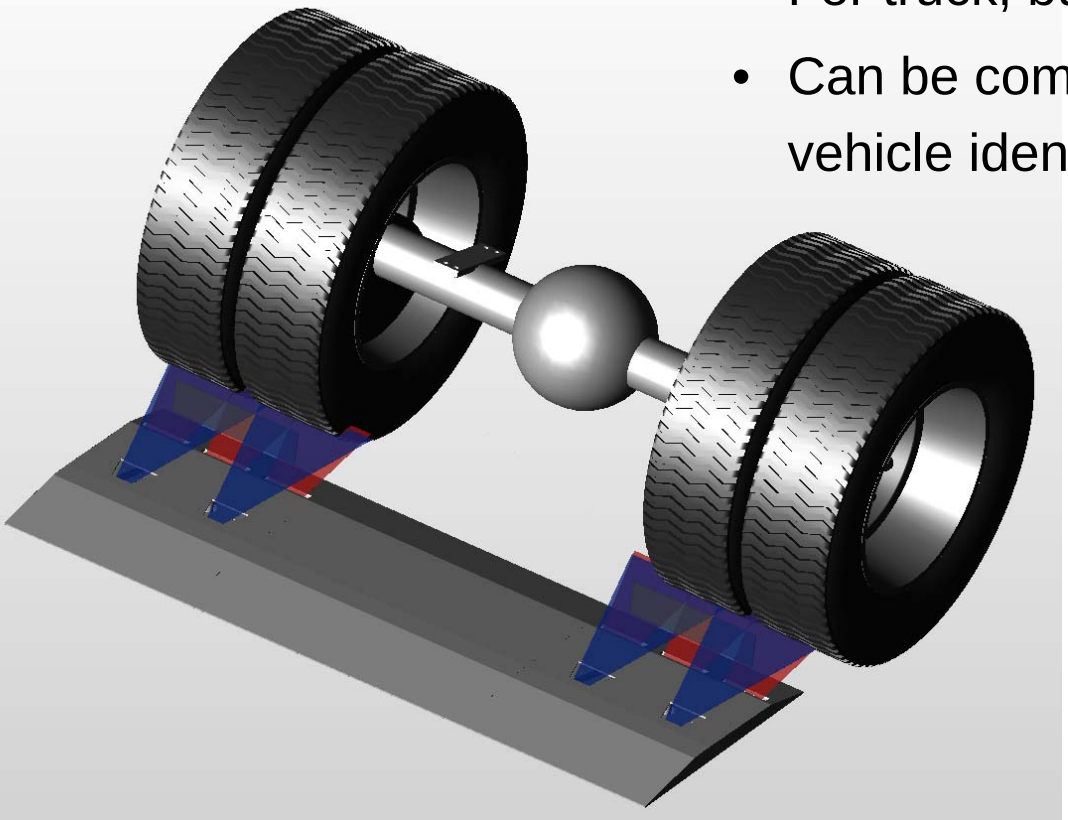
System Benefits

- Increased Reliability
  - Reduction of Breakdowns
  - Higher Safety Level
- Fully automatic measurement
  - Daily inspection of tire pressure
  - Manual action only in case of wrong tire pressure
- Reduction of fuel consumption
- Extended tire life
- Reduction of CO_2 Emission

PNEUSCAN PRO

Tread Check

- Available Q3 2009
- Optical check by passing sensors
- For truck, buses and cars
- Can be combined with tire inflation check and vehicle identification



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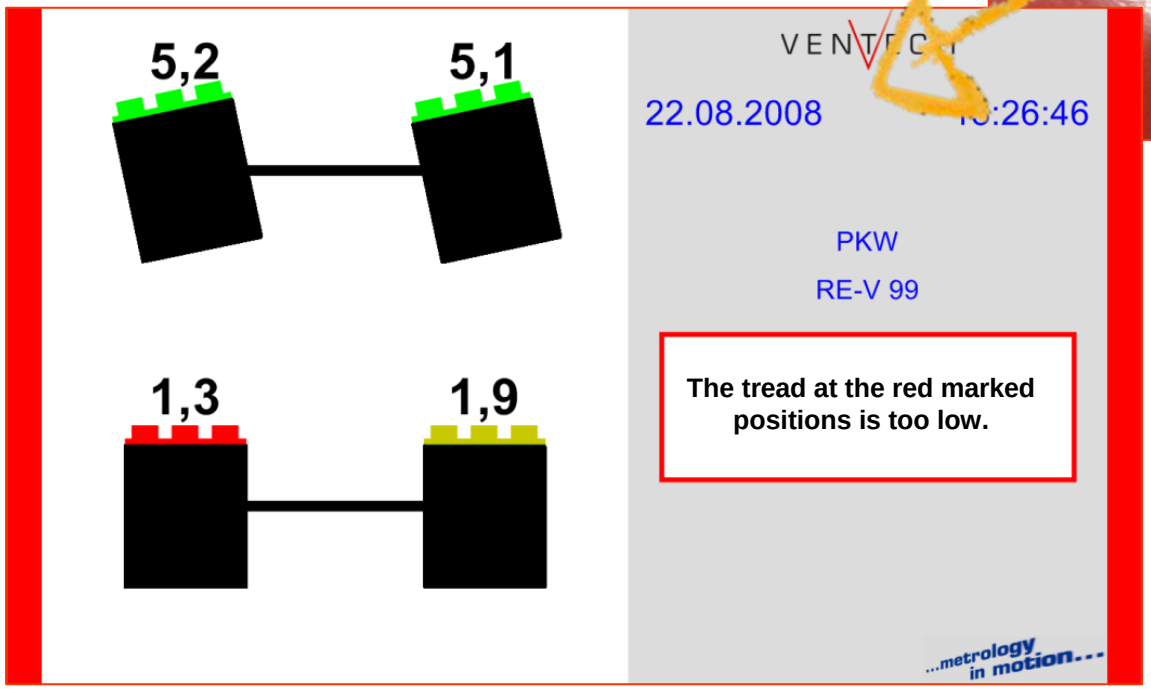
PNEUSCAN PRO



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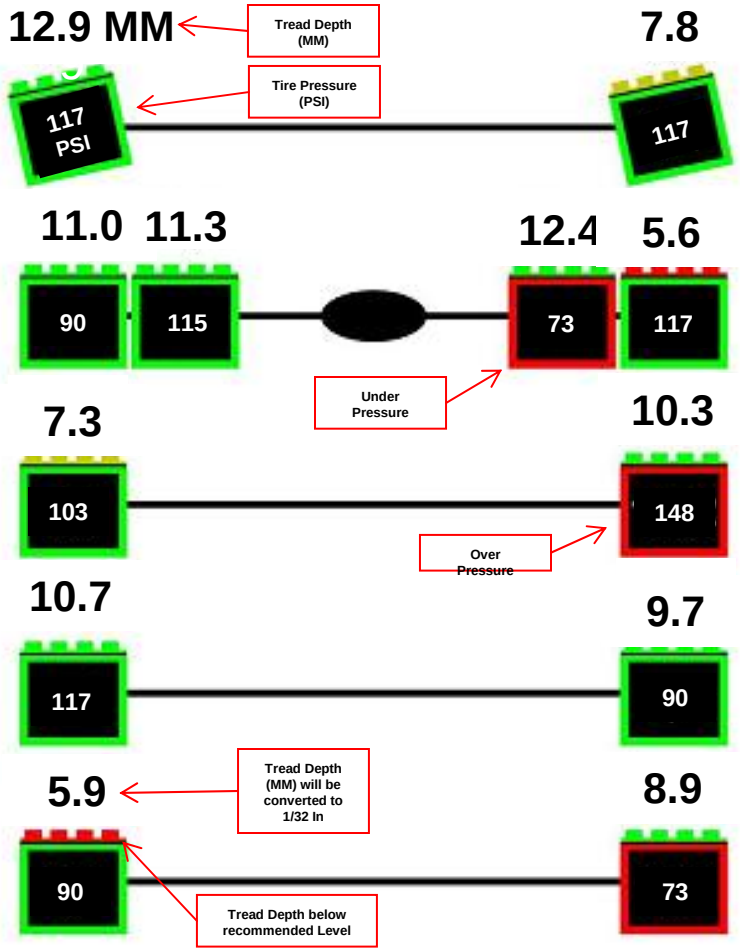

VENTECH

Thank you very much for your interest and your attention!

Ventech GmbH

...metrology in motion...

Demo Site

VENTECH

...metrology in motion...

Benefit (ROI Model)

Estimation Of Possible Savings Calculator			
Number of vehicles	**250**	#	
% of Vehicles with Natural Gas	**0.00%**	**%**	
Time to Inspect Vehicle (e.g. Minutes)	**20**	Minutes	**Ave. Time Per/Vehicle** = 20 Minutes
Checking Interval Today in Days	**30**	Days	**Typical Inspection Interval** = 7 Days
Cost of Service Personal $ Per/Hour	**$40.00**	$ US	**Typical Cost** = $23 + 75% Overhead
Miles Per/Vehicle Per/Year	**42,000**	Miles/Per/Vehicle	**Typical Bus** = 35,000 to 60,000 Miles
Vehicle Mileage	**3.0**	Miles/Per/Gallon	
Price Per/Gallon (Diesel)	**$3.00**	$US/Per/Gallon	**Typical Diesel Cost** = $3.00 to $3.80
Price Per/Gallon (e.g. Compressed) Natural Gas	**$0.00**	**$US/Per/Gallon**	
Fuel Saving Due to Improved Tire Pressure	**2.00%**	**%**	**Typical Fuel Savings = 1% to 3%**
# of Tires Per/Vehicle (e.g. Average)	**18**	#	**Typical # of Tires:** **STD. Bus** = 6 Tires, **Articulating Bus** = 8 Tires, **Double Decker Bus** = 10, **Truck** = 18 Tires & **Heavy Lift** = 96
Cost Per/Tire	**$400**	$ US	**Typical Tire Cost** = $300.00
Tire Life in Miles	**50,000**	Miles	**Typical Tire Life** = 50,000
Savings on Tires	**5.00%**	**%**	**Typical Savings on Tires = 6%**
Total Miles Per/Year	**10,500,000**	Miles Per/Year	
Total Diesel Consumption	**3,500,000**	Gallons Per/Year	
Total Natural Gas Consumption	**0**	Gallons Per/Year	
Cost of Fuel Per/Year	**$10,500,000.00**	$ US Per/Year	
Total Cost of Tires	**$1,512,000.00**	$ US Per/Year	
Potential Savings on Personel Cost (e.g. Man Hours)	**$40,000.00**	$ US Per/Year	
Potential Savings on Fuel	**$210,000.00**	$ US Per/Year	
Potential Savings on Tire Wear	**$75,600.00**	$ US Per/Year	
Total Potential Savings	**$325,600.00**	$ US Per/Year	
Expected Total Investment	**$80,000.00**	**$ US**	**Not including the cost to prepare site**
Payback Period	**2.9**	**Months**	