



Auto Service

Choose certainty.  
Add value.

# Periodic Technical Inspection for Roadworthiness of HDV

presented by Murat Dambali

TÜV SÜD

Technical Director International Projects

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Born	1965
Place of birth	Bursa / Turkey
Residence	Munich / Germany
Actual residence	Tehran / Iran
Profession	Degreed engineer, Automotive
Company	TÜV SÜD
Postion	Technical Director International Projects Technical Director Automotive Iran





TÜV SÜD Company Introduction



PTI in Germany



New Technologies for Inspection

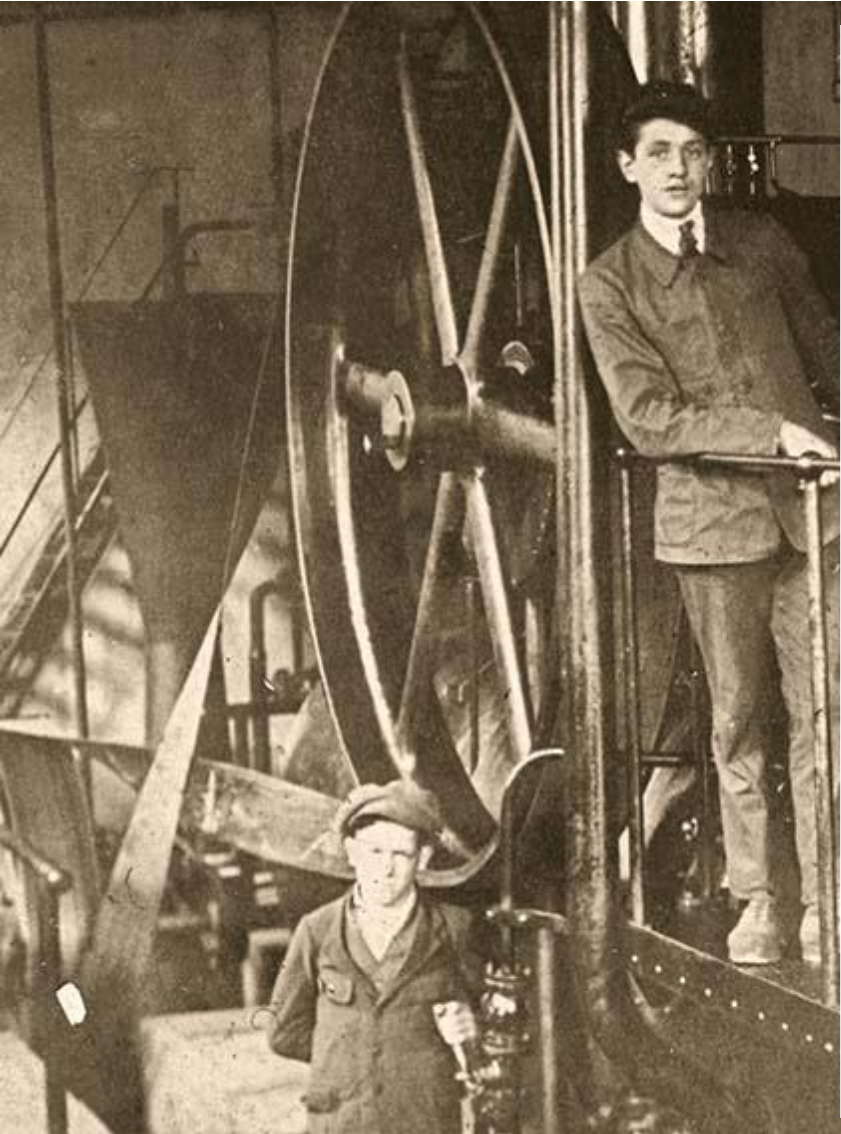


TÜVTÜRK Project



Outlook HDV Safety Features





- 1866** ● On 6 January, 22 industrialists united to establish the Steam Boiler Inspection Association Baden in Mannheim.
- 1881** ● The first binding standards related to boiler safety were agreed, paving the way for uniform technical inspections.
- 1906** ● Our first vehicle periodic technical inspection was carried out.
- 1951** ● TÜV organisations were tasked with performing regular inspections of all motorised vehicles.
- 1989** ● TÜV Product Service GmbH was launched, pioneering the concept of worldwide approvals.
- 1996** ● The TÜVs from Germany's southern states united to form TÜV SÜD.
- 2001** ● The TÜV SÜD octagon certification mark became the official company logo.
- Today** ● TÜV SÜD continues to pursue a strategy of internationalisation and growth.

# TÜV SÜD in numbers: Growing from strength to strength



1

One-stop technical solution provider

150

years of experience

850

locations worldwide

2,220

million Euro in sales revenue for 2015

24,000

employees worldwide as of February 2016\*




Note: Figures have been rounded off.


\*As of 29.02.2016: Inclusive of acquisition in January 2016.



 **Global Headquarters**  
Munich, Germany

**Legend:**

 Countries with TÜV SÜD offices

 Regional headquarters

Note: Figures have been rounded off, as of 31.12.2015.

GERMANY	INTERNATIONAL
<b>Euro 1,283 mio</b> <b>11,600 staff</b>	<b>Euro 939 mio</b> <b>10,800 staff</b>



# Adding value through quality, safety and sustainability solutions across the 3 Strategic Business Segments



## MOBILITY



**Ensure 100 years in safe mobility:**

- Periodical Technical Inspections
- Car business services
- Fleet management
- Automotive

## INDUSTRY



**Maximise reliability, safety & efficiency for:**

- Chemical, oil & gas
- Power & energy
- Manufacturing & industrial machinery
- Rail
- Real estate and infrastructure

## CERTIFICATION



**Achieve market access for:**

- Manufacturing & industrial machinery
- Consumer products & retails
- Healthcare & medical devices
- Telecommunications & IT
- Transportation (Automotive, Aerospace and Marine Component)

## MOBILITY



- **Employees:** 5,539
- **Sales Revenue:** € 638.8 million
  - **Auto Service:** 100.0 %

## INDUSTRY



- **Employees:** 8,164
- **Sales Revenue:** € 945.4 million
  - **Industry Service:** 63.6 %
  - **Real Estate Service & Infrastructure:** 36.4%

## CERTIFICATION



- **Employees:** 6,061
- **Sales Revenue:** € 556.7 million
  - **Product Service:** 74.8 %
  - **Management Service:** 25.2 %





## Testing & product certification

Chemical, physical, mechanical, electrical and environmental testing and product certification.



## Inspection

Product, system, building, plant and infrastructure inspection.



## Auditing & system certification

Audits system certification in a variety of fields including quality, safety, energy, IT security, social compliance and environment.



## Knowledge services

Safety, quality, risk, environmental protection and regulatory advisory.



## Training

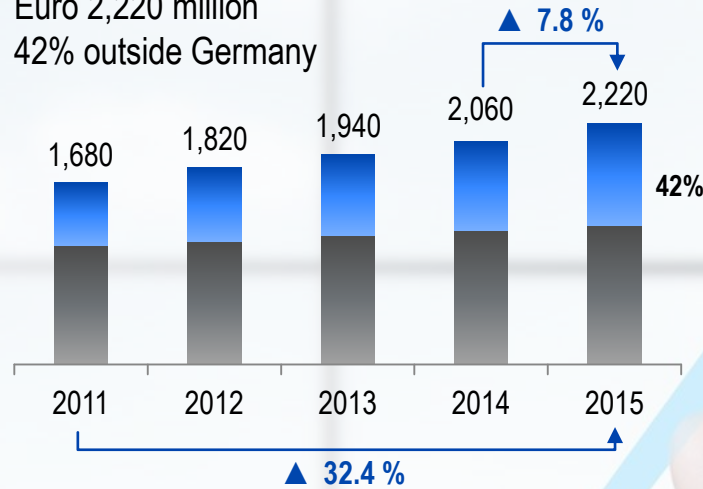
Training in work safety, technical skills, management systems and executive programs.



<b>1</b>	One-stop technical solution provider
<b>150</b>	years of experience
<b>850</b>	locations worldwide
<b>2,220</b>	million Euro in sales revenue 2014
<b>24,000</b>	employees worldwide as of February 2016*

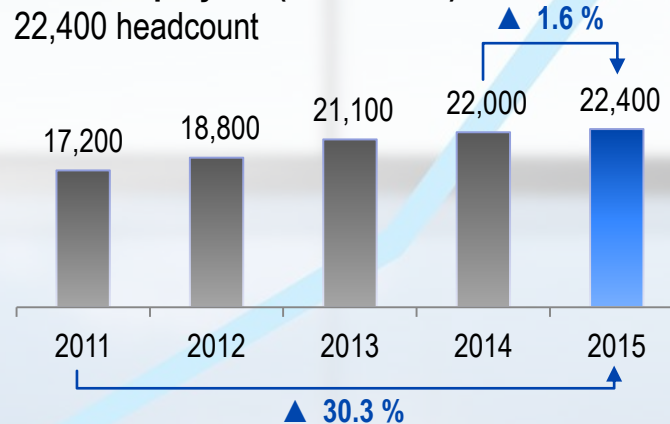
## Sales revenue (2011 - 2015)

Euro 2,220 million  
42% outside Germany



## No. of employees (2011 - 2015)

22,400 headcount



Note: Figures have been rounded off and percentages may differ due to rounding differences.

\*As of 29.02.2016: Inclusive of acquisition in January 2016.



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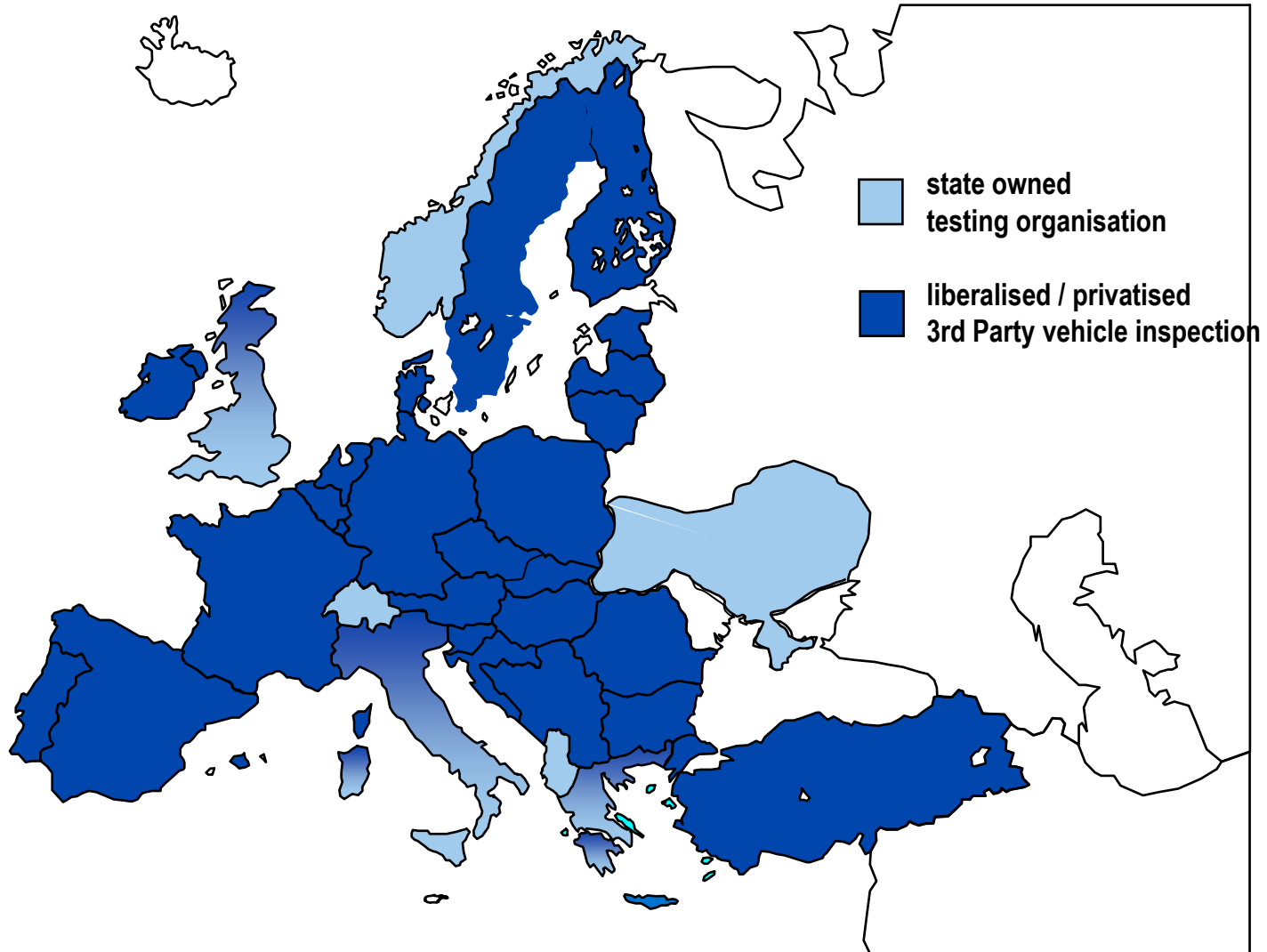
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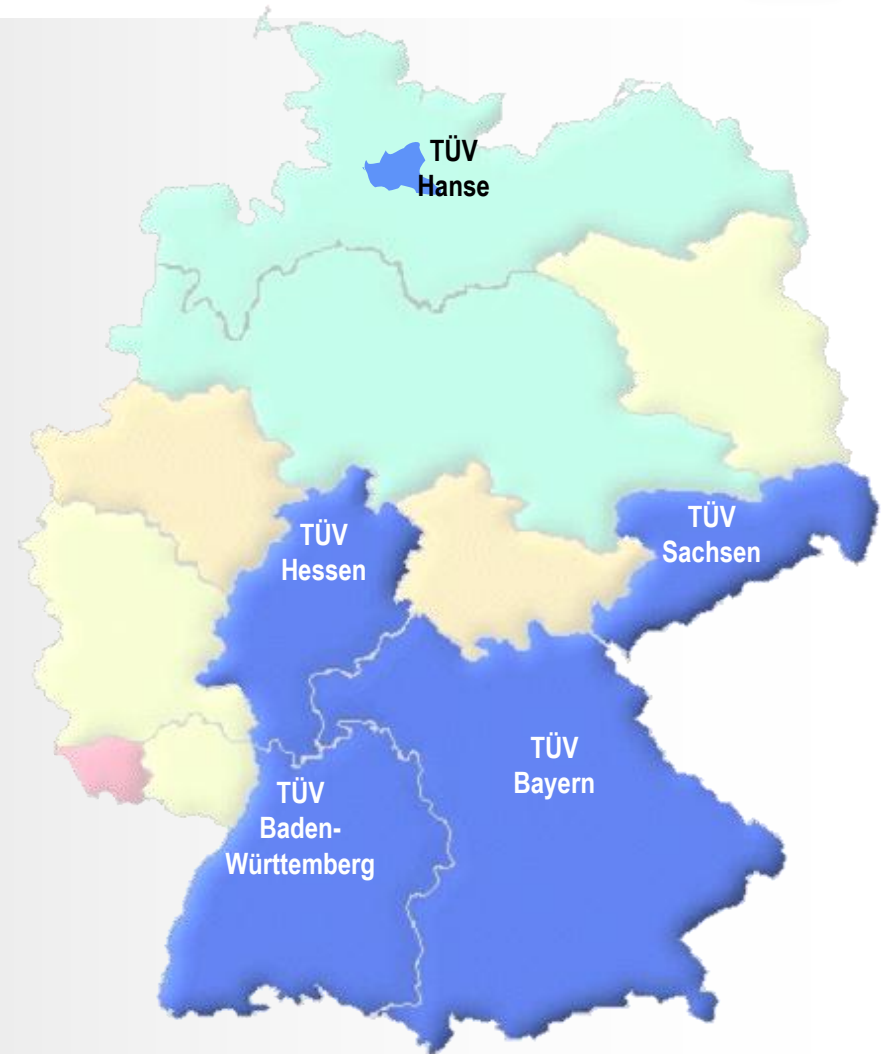
Outlook HDV Safety Features

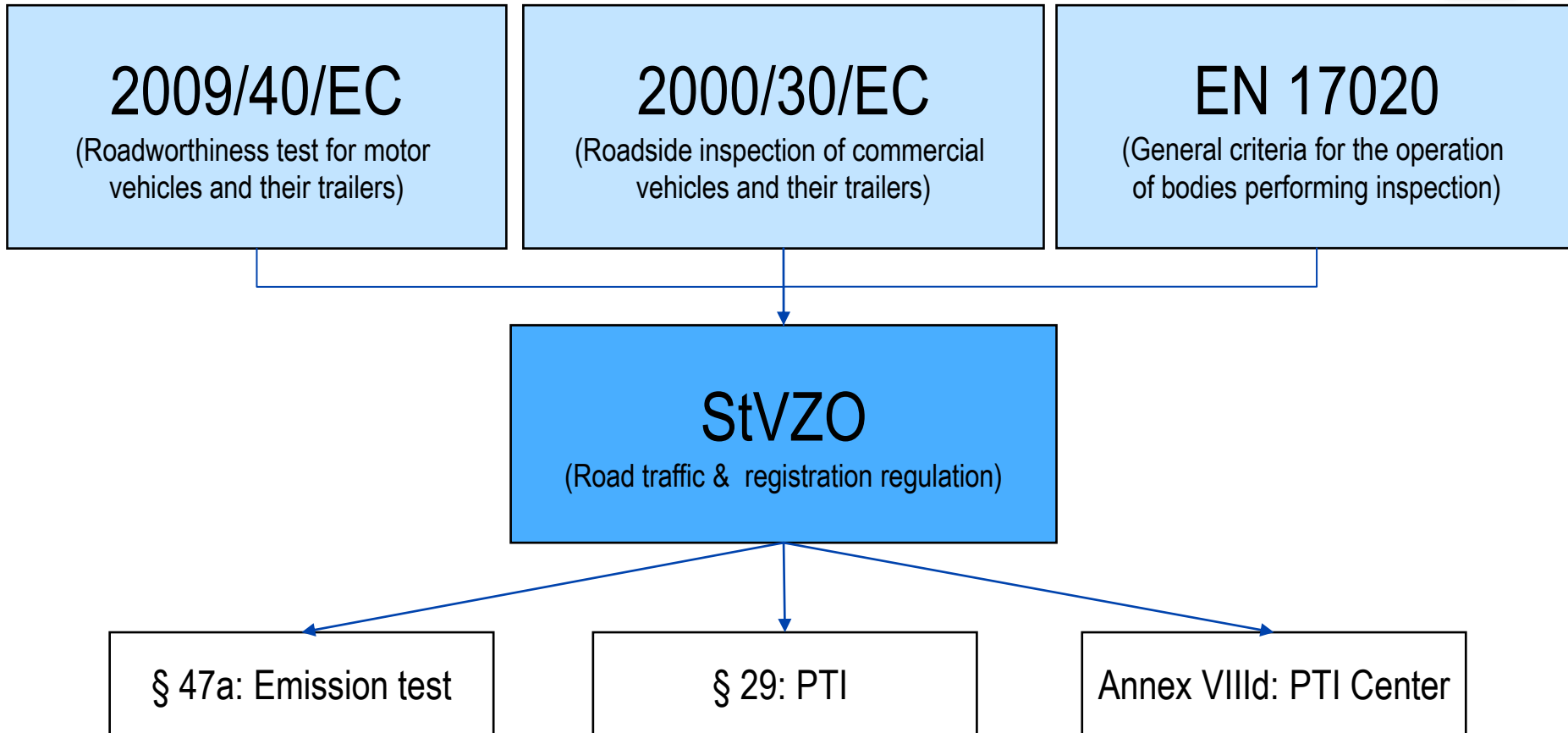


# PTI Situation in Europe



- 5 regions in Bavaria, Baden-Württemberg, Saxony, TÜV Hessen and TÜV Hanse
- 48 branch offices
- 350 TÜV SÜD Service centres
- 16.000 supported repair shops
- 5.3 million periodical vehicle inspections
- 3 million periodical emission inspections
- 1 million modification inspections
- 550.000 vehicle assessment reports
- 750.000 driver`s license tests
- 5.500 employees
- 113 TÜV SÜD Auto Partner





1. Untersuchungsverfahren für Kraftfahrzeuge mit Fremdzündungsmotor:

Untersuchungsverfahren Fremdzündungsmotor	Fremdzündungsmotor allgemein			Krafträder		Maßeinheit	Hinweise
	ohne Kat. mit U-Kat	mit G-Kat	mit OBD-System <sup>1)</sup>	ohne Kat. mit U-Kat	mit G-Kat		
<b>Sollmaten:</b>							
Motortemperatur	X <sup>1)</sup>	X <sup>1)</sup>	X <sup>1)</sup>	X <sup>1)</sup>	X <sup>1)</sup>	°C	Motoröl, Kühlmittel oder Motorbleie
	[a 60 bezogen auf]	[a 60 bezogen auf]	[Kühlmittel]	[a 60 bezogen auf]	[a 60 bezogen auf]		
Zündzeitpunkt	X	(X)	-	-	-	*Kw	vornach OT bzw. -/
Schleifwinkel	X	-	-	-	-	*Kw	auch als %
Leertourehzahl		X <sup>1)</sup>		X	-	min <sup>-1</sup>	

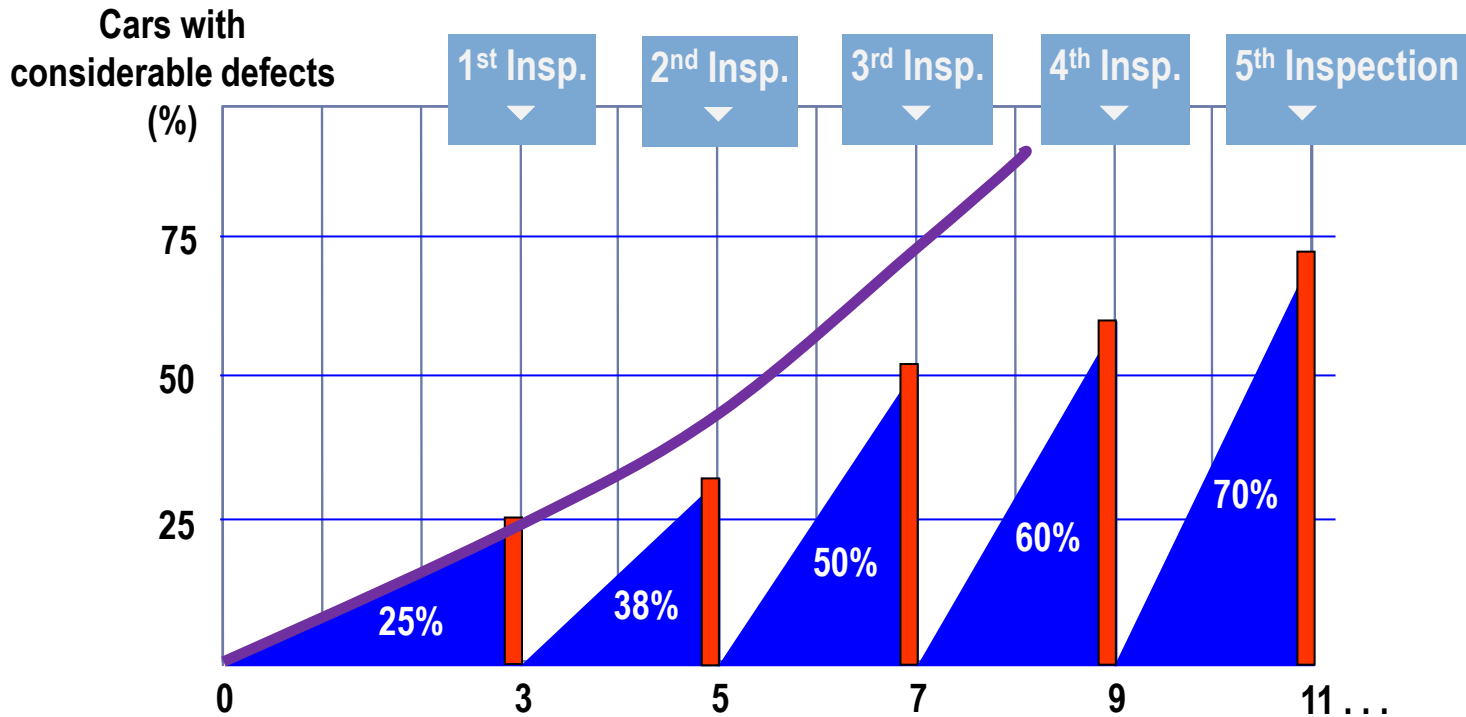
1 Bremsanlage

Nr.	Hauptbezeichnung	Hauptklasse		
		GH	EH	WV
100	GESAMTANLAGE BREMSE Vorgaben nicht eingehalten		X	X
101	BETRIEBSEINLAGE		X	X
102	Wirkung ungenügend, über nicht eingetragene, überwert überstrichen		X	X
103	BETRIEBSEINLAGE - Einseitige keine Wirkung, einseitig ohne Wirkung		X	X
104	BETRIEBSEINLAGE - ABSTUFBARKEIT/ ZEITNORMALEN		X	X
105	BETRIEBSEINLAGE - DICHTHEIT		X	X
106	Wirkung ungenügend		X	X
107	FESTSTELLERANLAGE		X	X

Anstattung und bauliche Gegebenheiten von Untersuchungsstellen.  
Messe- und Prüfgeräte zu Nummer 3

Untersuchungsstellen Anforderungen	1	2	3	Anerkannte Kraftfahrzeugwerkstätten zur Durchführung von			
				SP	AU	AUK	GW
I. Grundstück	Lage und Größe müssen so beschaffen sein, dass die Durchführung einer PKAUSP an zu untersuchenden Fahrzeugen innerhalb eines Betriebes nicht erschwert werden.	Fläche und Größe müssen so beschaffen sein, dass die Durchführung einer PKAUSP an zu untersuchenden Fahrzeugen innerhalb eines Betriebes nicht erschwert werden.	Geegnetes Platz zur Durchführung einer PKAUSP an zu untersuchenden Fahrzeugen innerhalb eines Betriebes nicht erschwert werden.	Mindestgröße ergibt sich aus 2.	Mindestgröße ergibt sich aus 2.	Mindestgröße ergibt sich aus 2.	Mindestgröße ergibt sich aus 2.





**A. Safety-related defects increase with age**

**B. Hazard potential is repeatedly reset to zero**



- Accreditation of the testing bodies with fix and neutrally applied standards
- Accredited testing bodies are responsible for the entire inspection process
- Neutrality and integrity of the testing body and their experts
- Defined process steps
- Defined quality standards for all process steps
- Continuous control of testing process by an independent control body
- Uniform and necessary sanctions for non-compliance with quality standards

## Way of Inspection

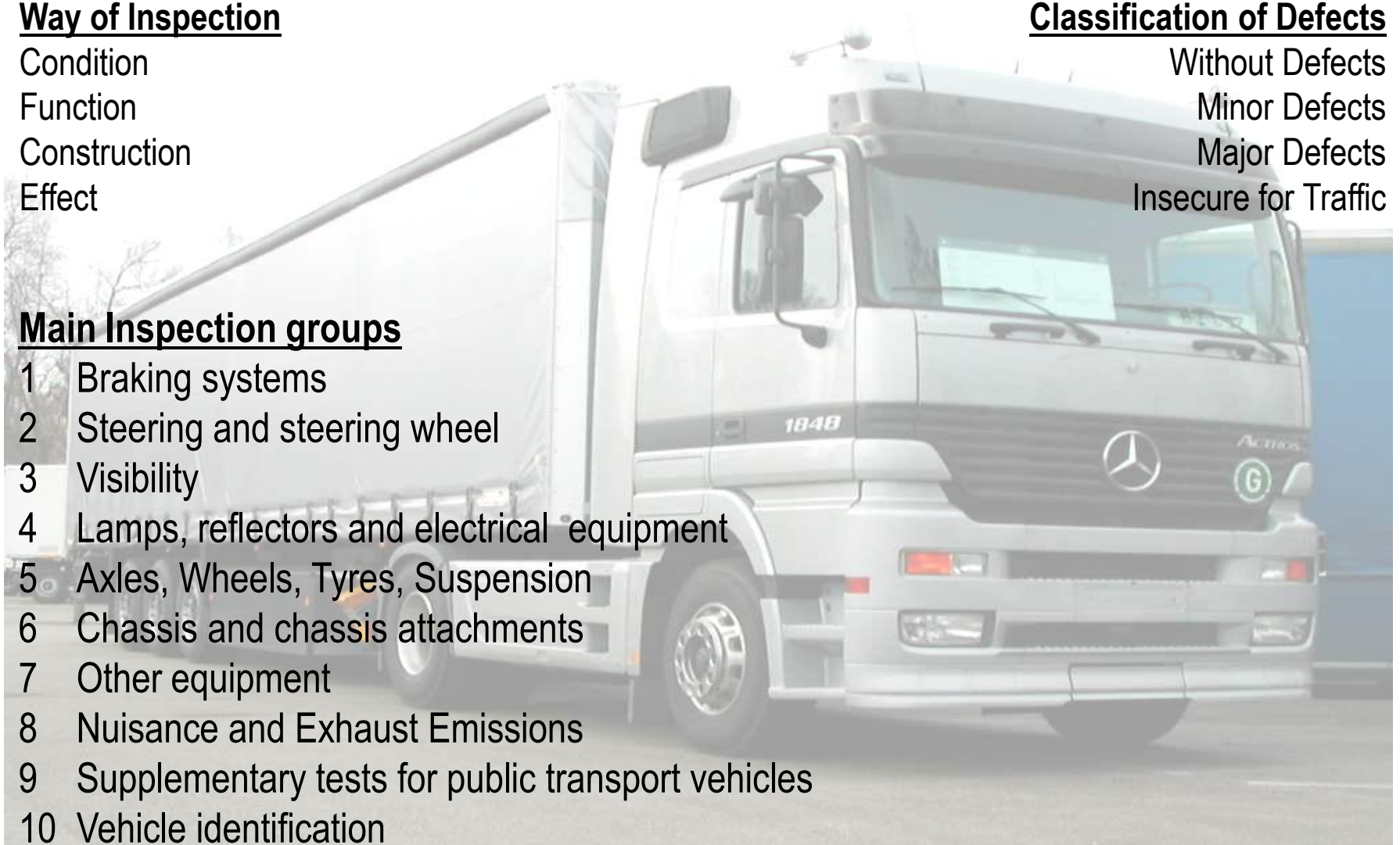
Condition  
Function  
Construction  
Effect

## Classification of Defects

Without Defects  
Minor Defects  
Major Defects  
Insecure for Traffic

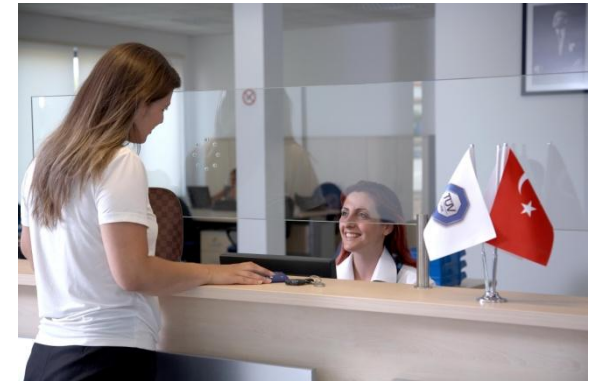
## Main Inspection groups

- 1 Braking systems
- 2 Steering and steering wheel
- 3 Visibility
- 4 Lamps, reflectors and electrical equipment
- 5 Axles, Wheels, Tyres, Suspension
- 6 Chassis and chassis attachments
- 7 Other equipment
- 8 Nuisance and Exhaust Emissions
- 9 Supplementary tests for public transport vehicles
- 10 Vehicle identification





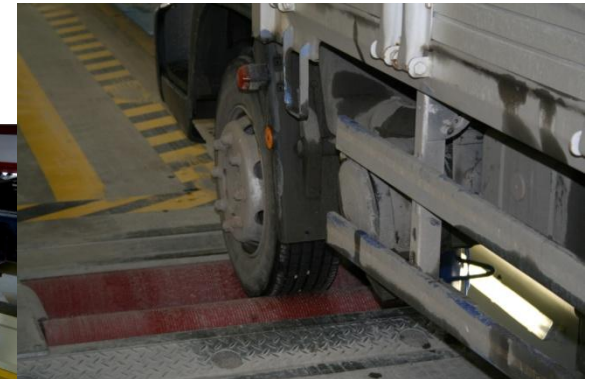
- **Friendly welcome of customer** and ideally **direct service with no waiting time**
- Acceptance of the vehicle registration papers
- No check of tax issues, insurance issues
- Payment
- Handover of keys
- Offer a seat in the **waiting area** (TV, newspapers, magazines, refreshments)
- Processing order into a filing system, printout of operating sheet



- Vehicle registration document, operating sheet and keys are handed over to the expert
- The expert locates the vehicle and the corresponding service in his handheld and checks the provided information (FSD, typical defect, information about position of VIN, type plate, OBD-interface, etc.)



- Pick up vehicle
- Control number plates, VIN, comparison with documents
- Drive to the lane
  - Indicator lights
  - Speedometer
  - Horn
  - Fan
  - Rear view mirrors
  - Windshield
- Break test
  - HDV with radio controlled pressure devices
  - Today with PTI Adapter and OBD Interface
- No customer involved





# PTI – Step 4 On the lift

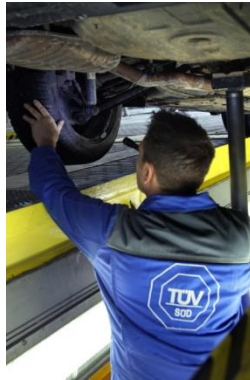


- Lift is down:
  - Inside visual checks, belts, airbags, glazing
  - Electronic System with PTI Adapter
  - Outside checks, condition of lights, body, trunk, first aid kit
- Lift is half up, wheels are free
  - Wheels, bearings
  - Steering, rods
  - Play in the axle
  - Suspension
  - Springs
  - Tires, tire depth



- Lift is full up, wheels are free:

- Wheels, bearings
- Steering, rods
- Play in the axle
- Suspension, springs
- Tires
- Underbody
- Hoses
- Emission system, silencer



- Lift is full up, wheels are down:

- Gaps with axle play detector





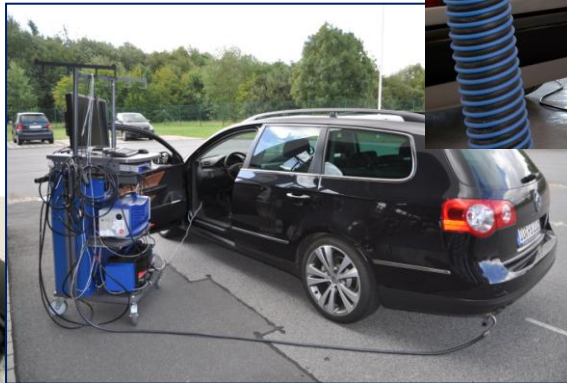
# PTI – Step 5 Engine Bay & Light Test



- Engine bay
  - Brake master cylinder
  - Brake servo
  - Radiator
  - Hoses, pipes
  - Cables
  - Fluids
- Light test
  - Low beam
  - Hi beam
  - Fog lamps
  - Indicators
  - Rear fog lamps
  - Reflectors
  - Number plate
  - Walk around
  - Mirrors

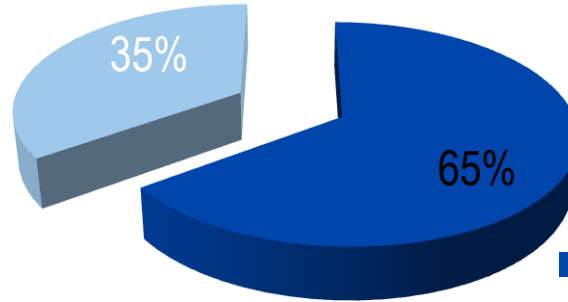


- Emission Test
  - Stationary, not dynamic
  - Benzine
  - Diesel
  - Passenger Car
  - Heavy Duty Vehicles
  - Motorcycles



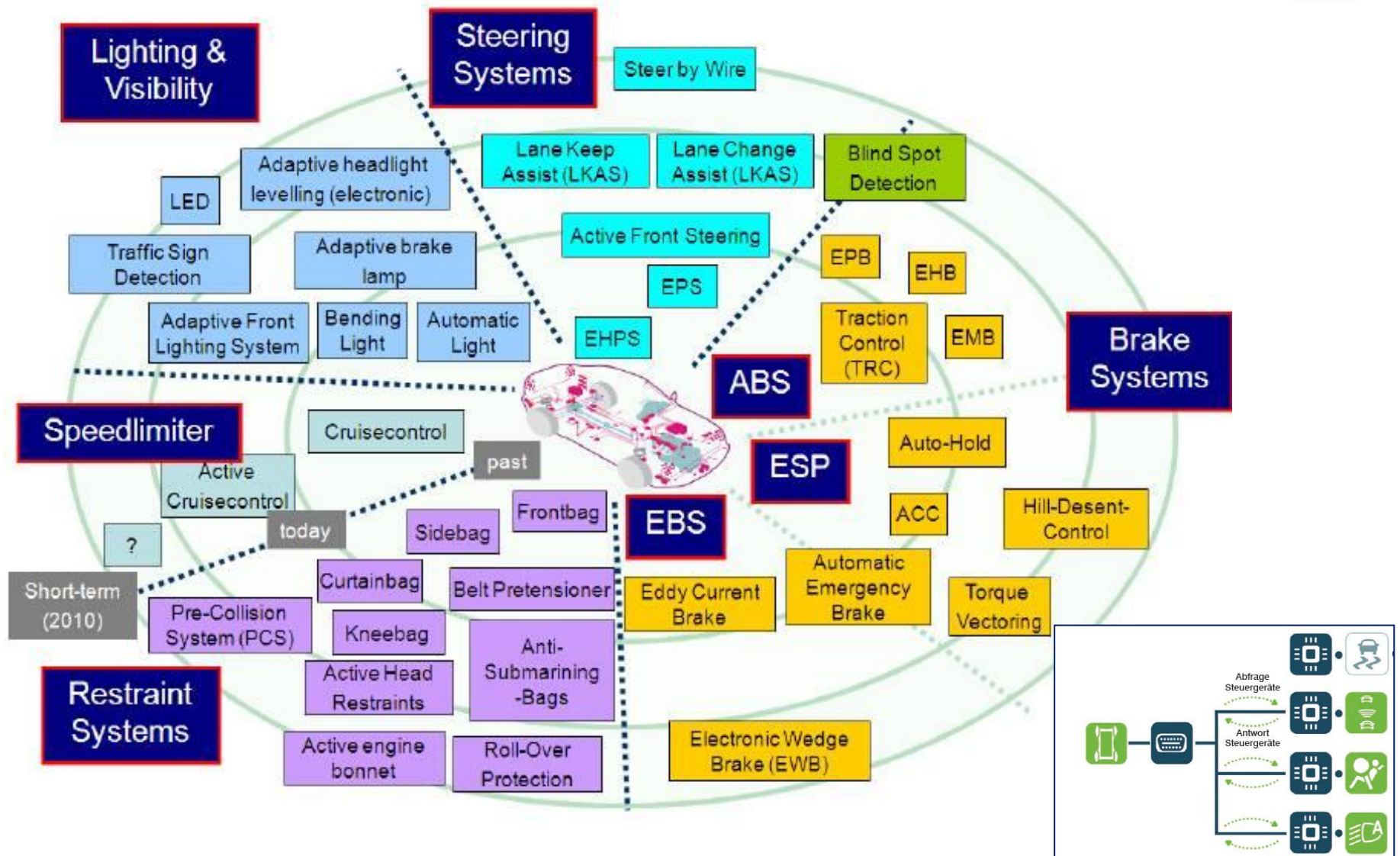


# PTI – Visual and Electronic System Tests



- Visual Check
- Electronic System Test







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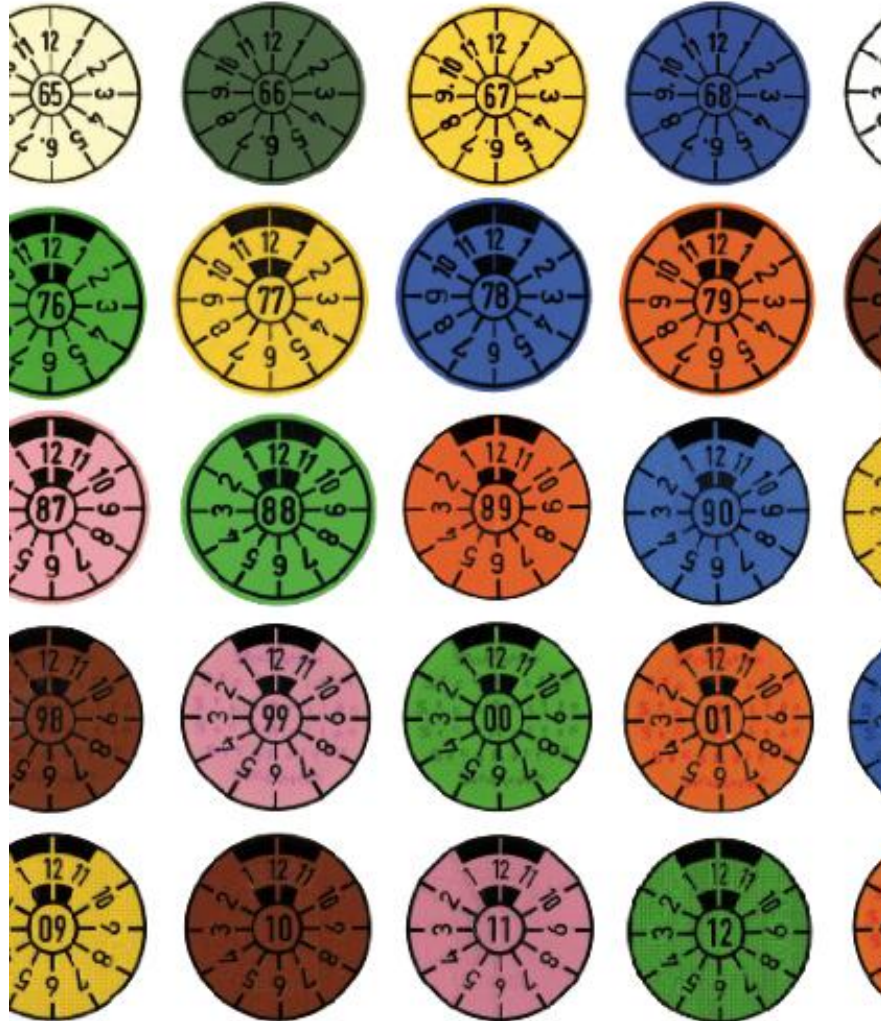


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## Our Service

### Periodical Technical Inspection

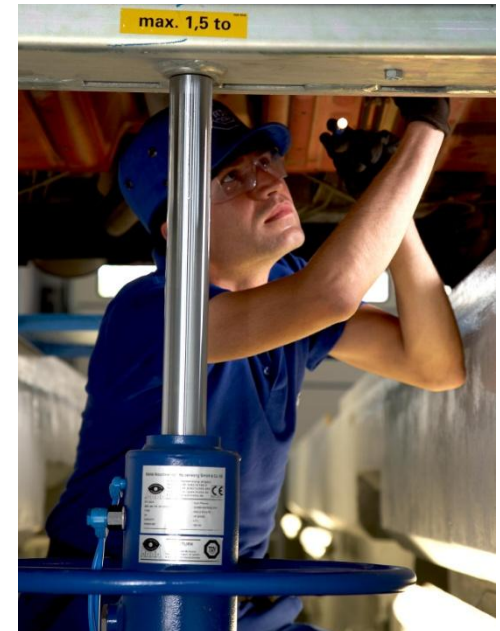
### Your Benefit

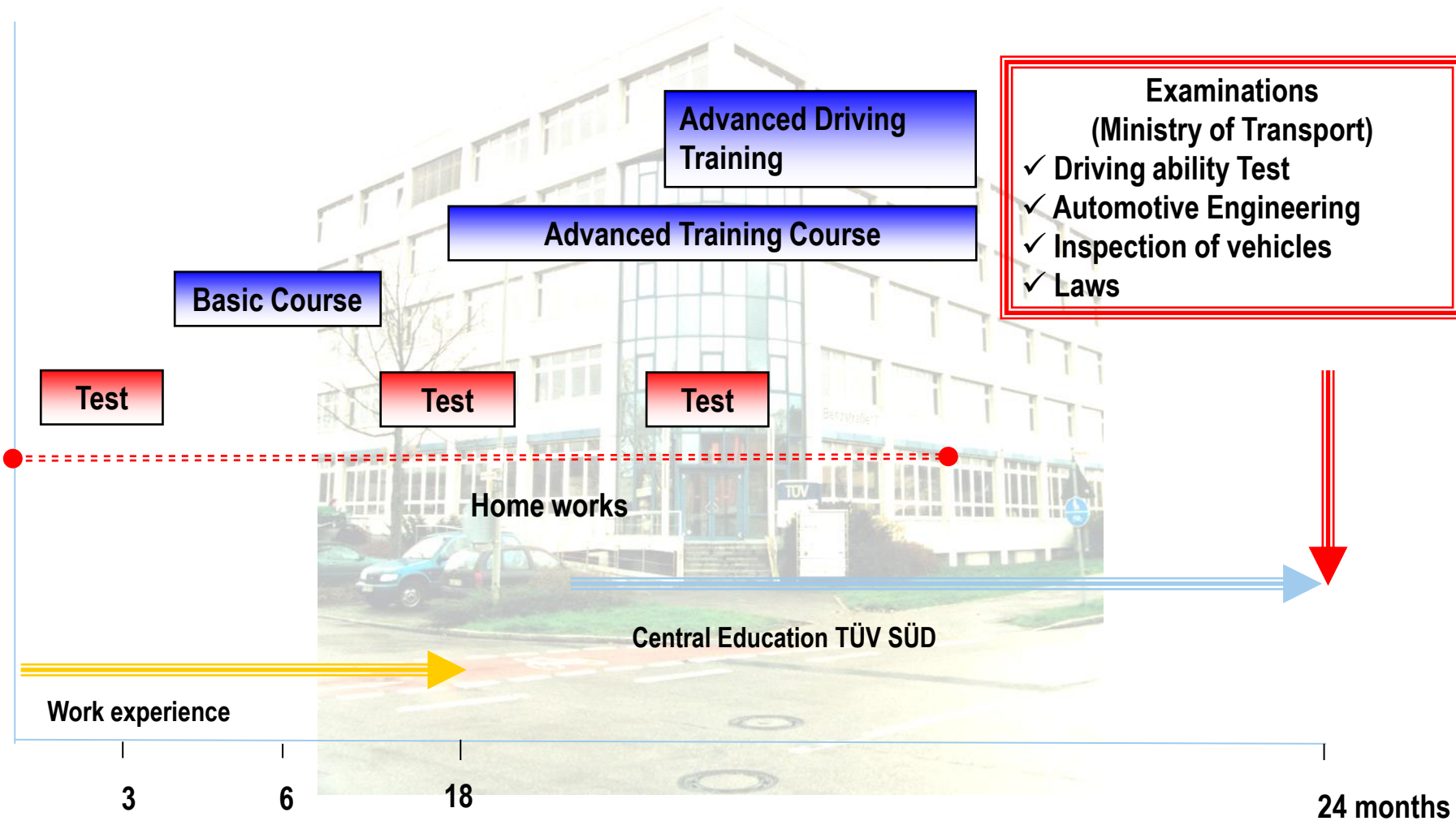
Safe mobility

### Challenge

To adapt our testing methods to the increasing number of electronic systems in modern vehicles

- Age min. 24 years
- Health certificate
- Good-conduct certificate
- Engineer / Master automotive degree
- 18 months work experience as engineer / master
- Driving licences for Cars, Motor Cycles , HDV
- 6 months calssroom and on site training







# PTI – International Operations







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## Autonomes Fahren

# "In zehn Jahren werden keine Lkw-Fahrer mehr benötigt"

Selbstfahrende Lastwagen dürften bald kommen - alle großen Hersteller arbeiten daran. Technisch sollen sie in wenigen Jahren startklar sein - mit gravierenden Folgen für die 500.000 Brummifahrer in Deutschland.

*Von manager-magazin.de-Redakteur Nils-Viktor Sorge*



DPA

Selbstständig fahrender Lastwagen von Daimler

Source: Spiegel Online, 19.09.2016





E-Mobility and Truck Lanes





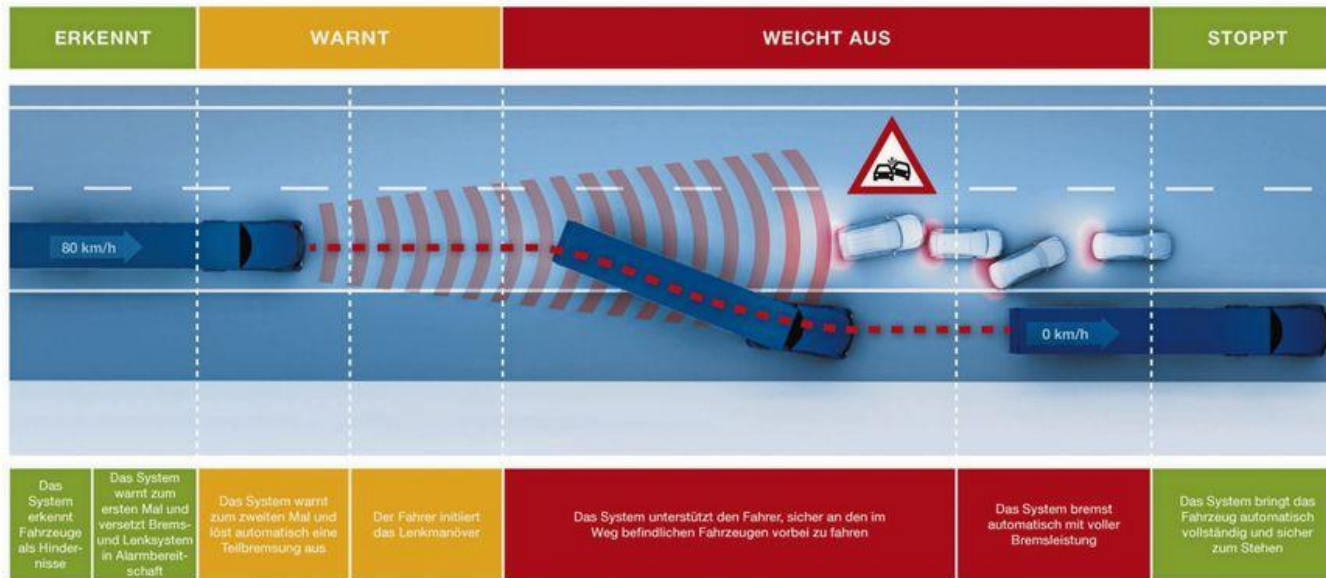
## **Knorr-Bremse: Field testing of truck platooning in North America**

Knorr-Bremse is working on a system for truck platooning and will shortly be testing it on US highways with a view to gauging driver acceptance and assessing the feasibility of fully networked truck convoys.



## Der Ausweichassistent

Kombination von Bremse und Lenkung zur Kollisionsvermeidung



Evasive Maneuver Assist-EMA

