

# Hands-off detection warning time for B1-systems

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International Organization of Motor Vehicle Manufacturers  
*Organisation Internationale des Constructeurs d'Automobiles*

# Hands-off detection warning time for B1-systems

## Following issues should be considered:

- Technology neutrality
- Steering input are difficult to measure/identify
  - on road segments in very good conditions
  - at low speeds
  - if drivers will have a relaxed attitude on holding the steering wheel

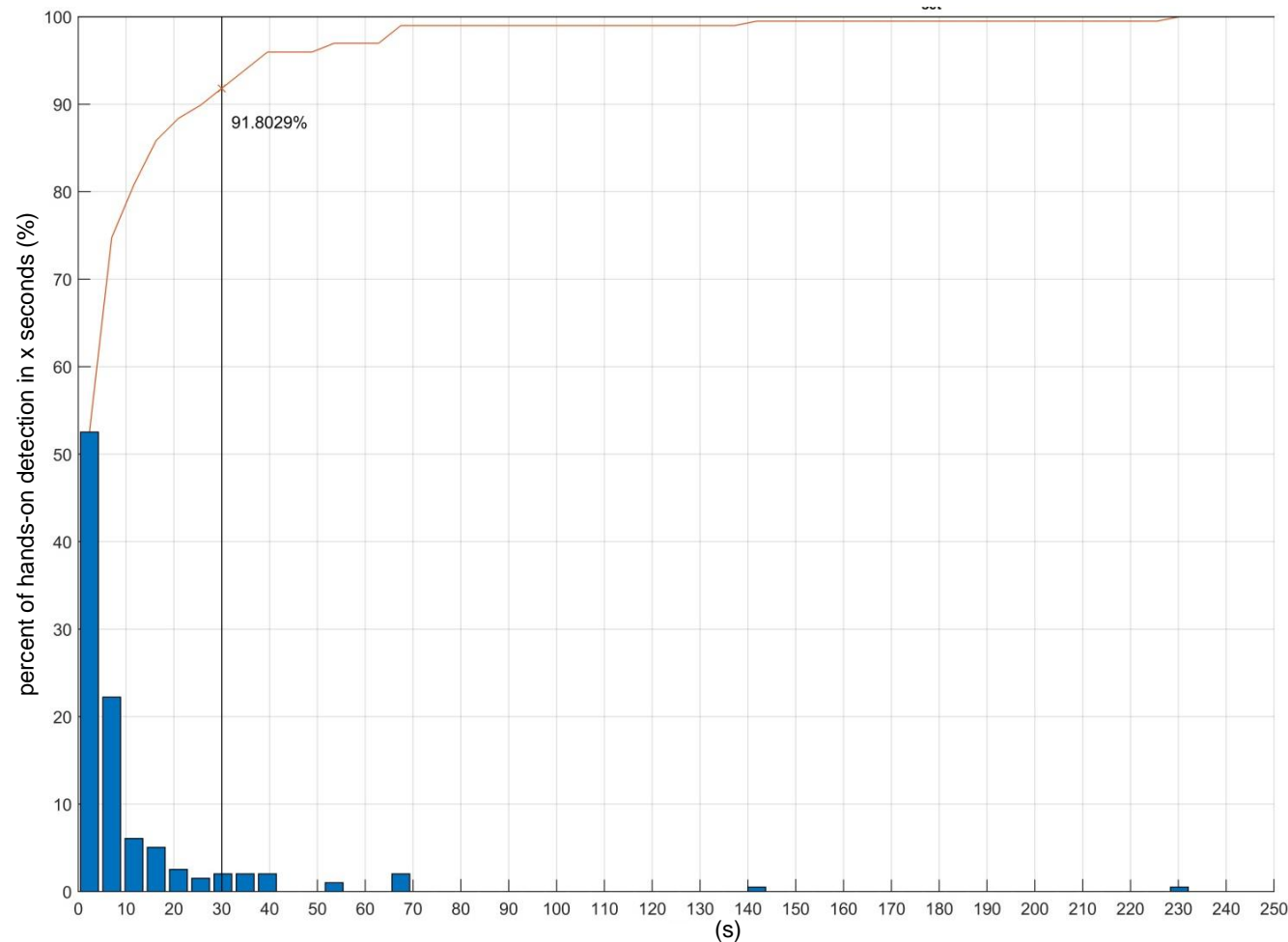
## The balance for the detection:

1. „Hands-off-the steering wheel“ interpreted as „hands-on“  
=> avoiding due to safety aspects
2. „Hands-on-the-steering-wheel“ interpreted as „hands-off“.  
=> avoiding to attain a high acceptance of the systems

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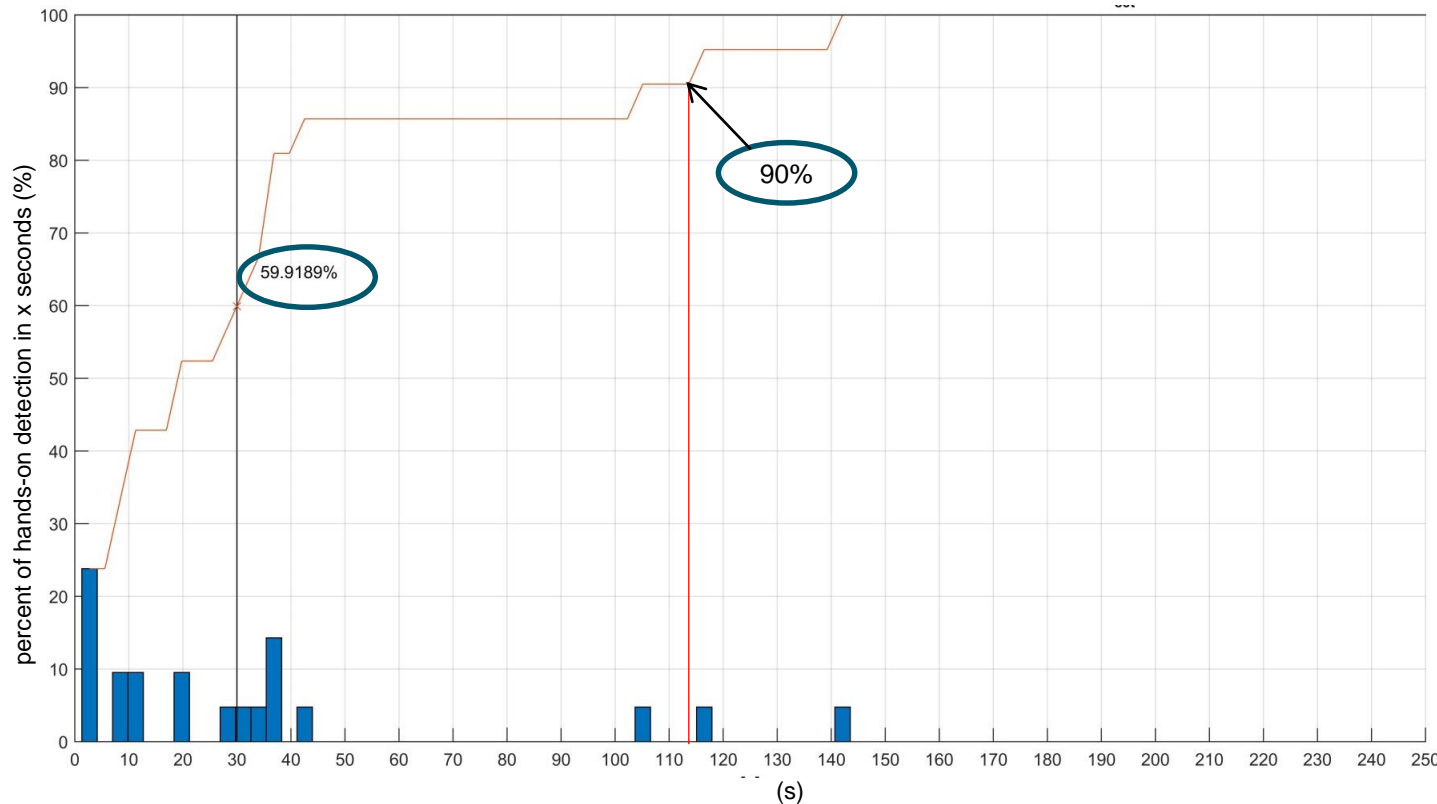
# Hands-off detection warning time for B1-systems



Brown Line:  
Summary of the detected “hands-on”  
situations by time sequence

**Vset = 85 km/h**  
highway with good surface and  
low traffic situation  
Tractor-trailer combination

# Hands-off detection warning time for B1-systems



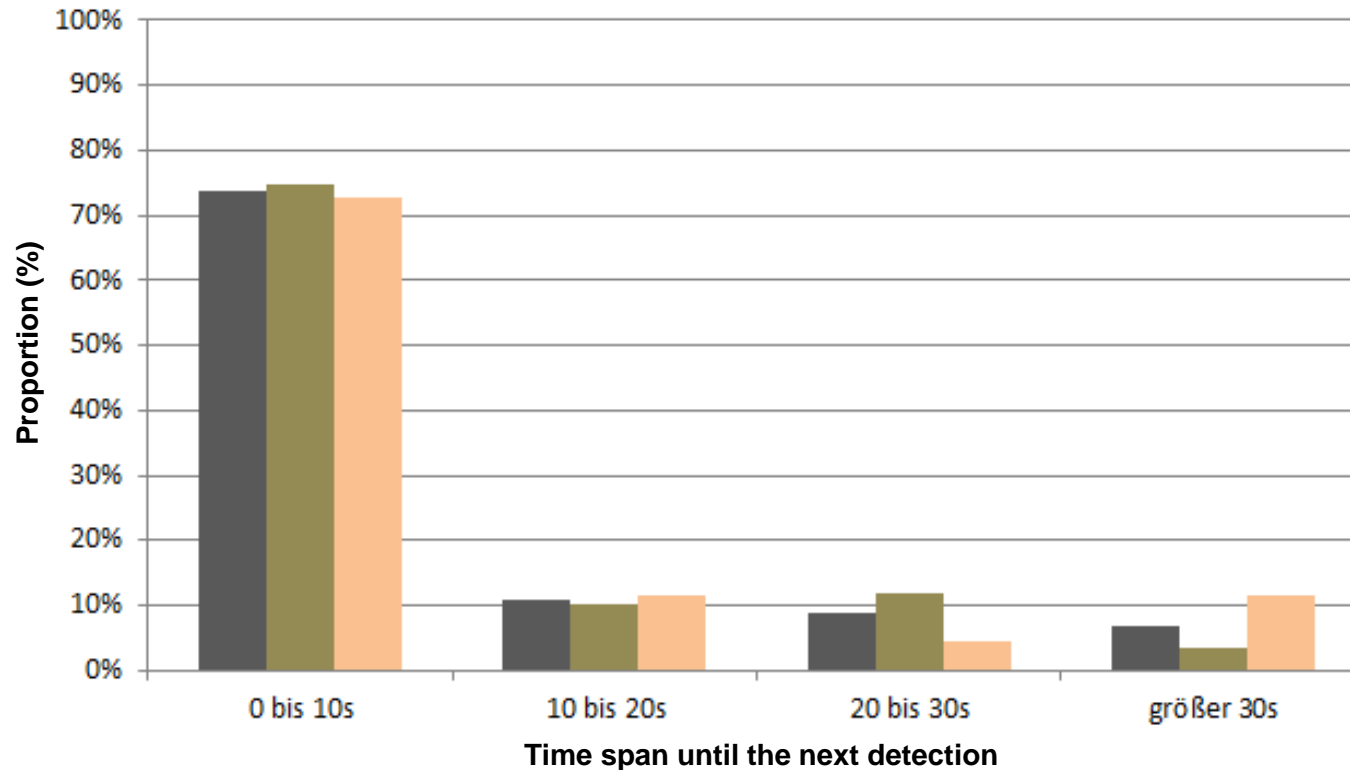
Brown Line:  
Summary of the detected “hands-on”  
situations by time sequence

**Vset = 35 km/h**  
highway with good surface and  
high traffic situation (stop-and-go)  
Tractor-trailer combination

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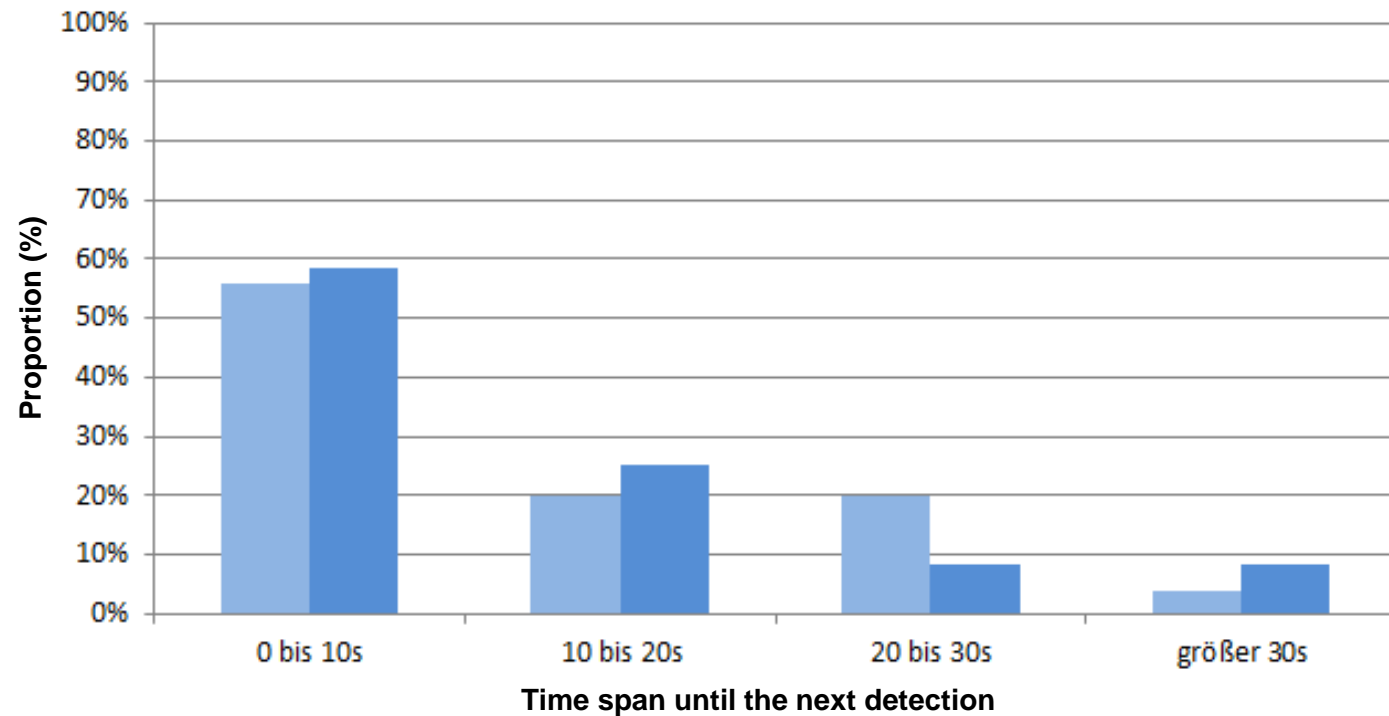
positive „hands-on“  
detection  
proportion of all routes

- All roads
- ORK: Oval round course  
(long, straight road in high quality)
- DLK: Endurance course  
(long, straight road with small part of curves, average quality)

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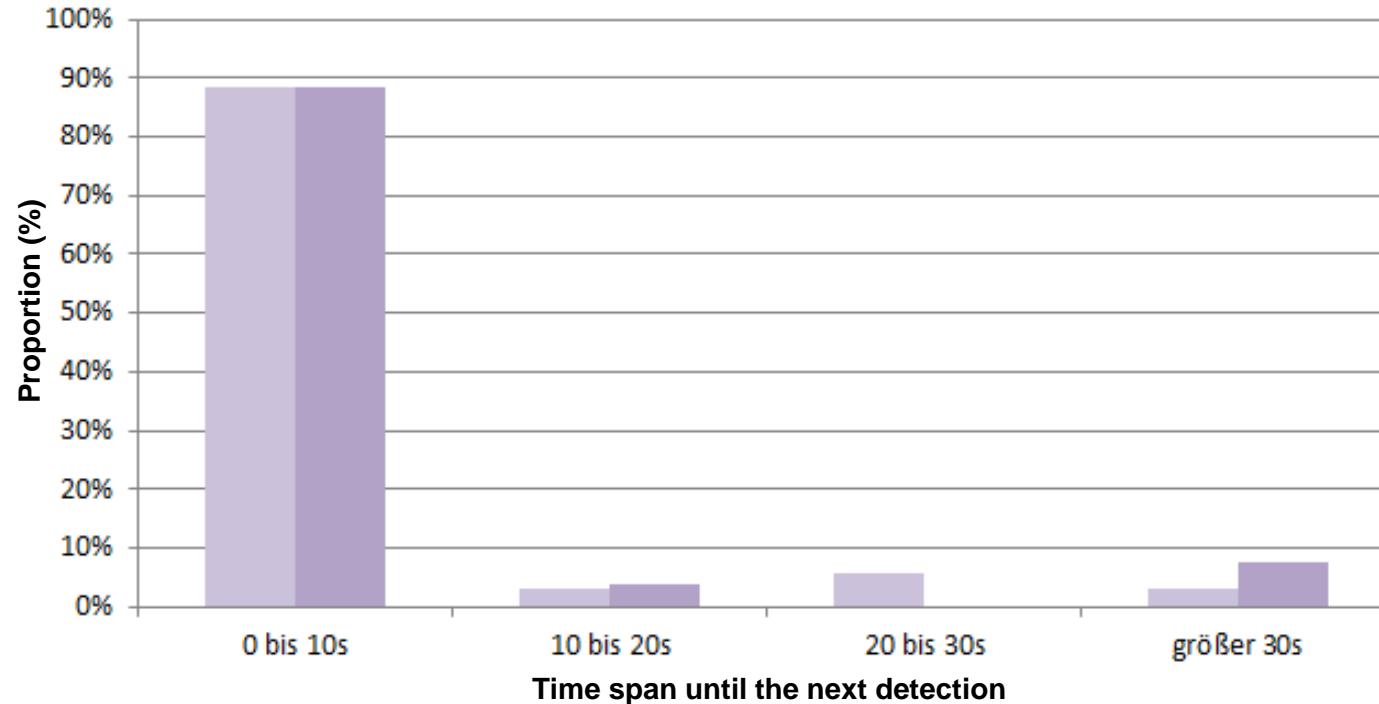
**positive „hands-on“  
detection**  
proportion on straight routes

- **ORK: Oval round course**  
(long, straight road in high quality)
- **DLK: Endurance course**  
(long, straight road with small part of curves, average quality)

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# Hands-off detection warning time for B1-systems



**positive „hands-on“  
detection**  
proportion on **curves**

- **ORK: Oval round course**  
(long, straight road in high quality)
- **DLK: Endurance course**  
(long, straight road with small part of curves, average quality)

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# Conclusions

## Summary of technical rationales:

- ❑ **110s at 35 km/h** gives the **same reliability** of the hands-off detection as **30s at 85km/h** (slides 3 & 4)
- ❑ The distribution of timespan between two positive hands-on detection is very much influenced by the profile of the road:
  - on a straight road: ~57% of measured timespan are below 10s
  - in curves: ~90% of measured timespan are below 10s

## Recommendation:

- ❑ A detection time higher than 30s is recommended at lower speed, in order to avoid too frequent false warnings, leading to low driver acceptance, while preserving the same level of safety

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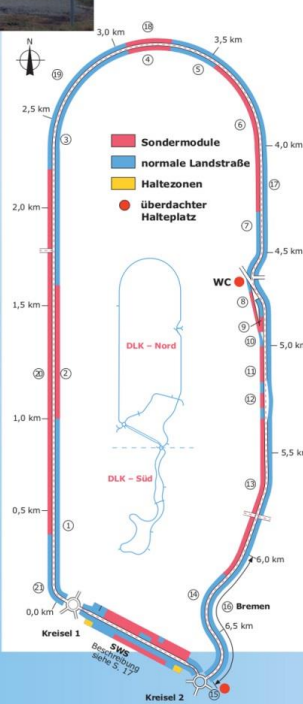
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# Backup

## Detailansicht Dauerlaufkurs Nord (DLK-Nord)



- Rundkurs mit einer Gesamtlänge von 12,4 km
- Unterteilung in DLK-Nord (6,9 km Länge), DLK-Süd (4,8 km Länge) und SWS (0,7 km Länge)
- verschiedene Sonderstrecken

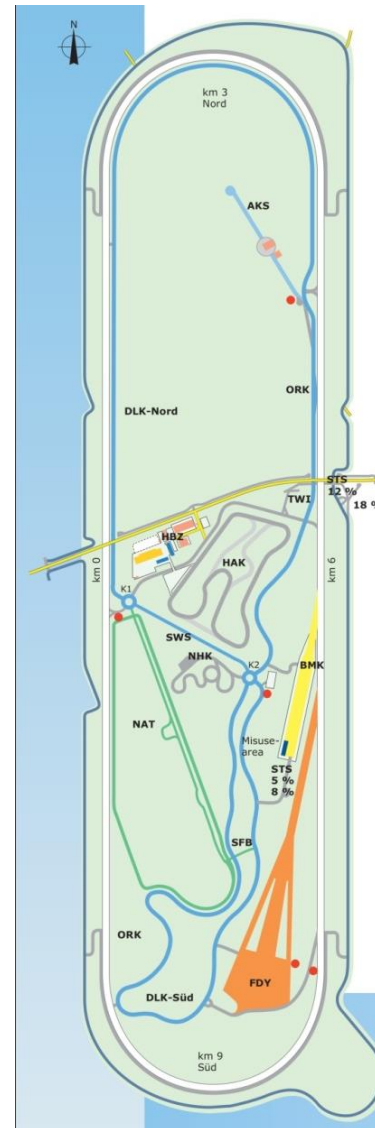


### Innere Fahrbahn: Reihenfolge in Fahrtrichtung ab Kreisel 1 im Uhrzeigersinn

Ereignis	Länge
① Normale Landstraße	975,13 m
② Querneigungsänderung	662,50 m
③ Normale Landstraße	1.397,30 m
④ Lenkungsstoß	188,00 m
⑤ Normale Landstraße	273,00 m
⑥ Langwellige Einzelhindernisse	750,00 m
⑦ Normale Landstraße	660,00 m
⑧ „Bypass“ Freigangstrecke	179,24 m
⑨ Mochsenke	34,00 m
⑩ Normale Landstraße	56,00 m
⑪ Kleinamplitudige, wechselseitige, langwellige Anregung	239,12 m
⑫ Kuppe	84,58 m
⑬ Kleinamplitudige, wechselseitige, langwellige Anregung	934,88 m
⑭ Normale Landstraße	614,01 m

### Außere Fahrbahn: Reihenfolge in Fahrtrichtung ab Kreisel 2 gegen Uhrzeigersinn

Ereignis	Länge
① Normale Landstraße	25,50 m
② Bremen	774,11 m
③ Normale Landstraße	3.828,00 m
④ Lenkungsstoß	188,00 m
⑤ Normale Landstraße	794,59 m
⑥ Spurrillen	1.869,06 m
⑦ Normale Landstraße	371,85 m



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