Technical presentation on:

The new European brake regulation: *What can we expect?*

Erich Guggisberg, Technical Director, member of the Executive Board, 2017
Brake systems in agricultural and forestry vehicles

As of August 2016 eg/wva
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1. Purpose of the new regulations

To improve the **safety** of agricultural and forestry vehicles on the **roads**.

The regulations will be implemented **throughout all of Europe** for each of the vehicle categories concerned.

Brake system requirements are **documented** in detail.

The requirements for pneumatic and hydraulic brake systems are **identical**.
2. EU regulations as a basis

**Regulation (EU) No. 167/2013**

on the **approval** and **market surveillance** of agricultural and forestry vehicles

- applies to homologations and type tests

**Regulation (EU) 2015/68**

supplementing Regulation (EU) No 167/2013 with regard to **vehicle braking requirements** for the **approval** of agricultural and forestry vehicles

- applies to technology and functionality
3. Legal framework in Switzerland

The EU Regulation has been included in its unamended form in the “Regulation on the technical requirements for road vehicles” (VTS 741.41 – as of June 2015), and generally speaking, is already valid in Switzerland.

The Federal Roads Office ASTRA is the Swiss authority for the infrastructure of roads and individual road traffic.

The road traffic offices of each of the cantons, with the help of the asa (Swiss association of road traffic offices) will be required to enforce the new regulation, as well as inspect the vehicles concerned.
4. How will vehicles change from a technical point of view?

Three brake systems on vehicles:
• Service brakes
• New auxiliary brakes (emergency brake system)
• Parking brakes

Dual-circuit brake systems for trailers
(pneumatic or hydraulic use)

Automatic load-dependent braking system (ALB)
Brake performance is determined by braking curves (from 30 km/h)

- pneumatic or hydraulic brakes
- trailers loaded and empty

At the same brake pressure, new vehicles brake **harder** than older ones!
The minimum braking performance of service brakes for trailers is defined as follows:

- Vehicles moving at \( v_{\text{max}} \):
  - \( \leq 30 \text{ km/h} \) → 35\% at 6.5 or 116 bar
  - \( > 30 \text{ km/h} \) → 50\% at 6.5 or 116 bar

Further provisions apply to:
- Operational safety
- System monitoring
- Response time, swivel time, braking time
- Labelling
- Control elements

- The guidelines and equipment to be used when inspecting a vehicle’s brake system are defined in the new regulation.
5. New dual-circuit pneumatic brake system

Applies to: Operational safety, system monitoring, response time, etc.

1. Air compressor
2. Pressure regulator
3. Anti-freeze pump
4. Main brake cylinder brake pedal
5. Air reservoir
6. Dual-circuit trailer control valve
7. Single-circuit trailer control valve
8. Supply coupling head
9. Brake coupling head
10. Single-circuit coupling head
5. New dual-circuit pneumatic brake system

Applies to: Operational safety, system monitoring, etc.
5. New dual-circuit pneumatic brake system

Example on a R3a pivot plate vehicle

1. Trailer brake valve
2. Air reservoir
3. Brake cylinder
4. ALB controller
5. Supply coupling head with line filter
6. Brake coupling head with line filter

ALB on trailers
6. New dual-circuit hydraulic brake system

Brake line
P = 0 - 150 bar

Additional line
Constant pressure
P = 15 - 35 bar

hydraulic dual-circuit trailer brake valve on the tractor
6. New dual-circuit hydraulic brake system

- **HYDRAULIC PILOT**
- **PUMP**
- **TANK**
- **CONSTANT PRESSURE**
- **Electric signal**
- **OTHER SERVICES**
- **ABS plug**
- **Brake line**
- **Additional line**
6. New dual-circuit hydraulic brake system

Example on a R3a tandem vehicle

1. Hydraulic dual-circuit emergency brake valve with ALB & reservoir
2. Displacement transducer for ALB (automatic load-dependent braking system)
3. Brake line and additional line for the 2nd trailer
4. Electrical system monitoring with ABS plug 7638-2
5. Mechanical emergency brake
6. New dual-circuit hydraulic brake system

ALB controller

Reservoir

NBV16  Dual-circuit emergency brake valve with ALB & reservoir: Compatible with single or dual circuit hydraulic brake systems
# 7. Transitional provisions and deadlines

*Pneumatic* brake systems (as per EU regulation)

<table>
<thead>
<tr>
<th>Brake system</th>
<th>In use since</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
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<td>EU – until now</td>
<td>DL 38% curve</td>
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<td>EU - new</td>
<td>DL 50% curve</td>
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<td><strong>Trailers</strong></td>
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<td>EU - new</td>
<td>ECE R13, DL 50% curve</td>
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7. Transitional provisions and deadlines

*Hydraulic* brake systems (as per EU regulation)

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<th>In use since</th>
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<td>CH – until now</td>
<td>with/without LB</td>
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<td>Single-circuit hydraulic system – 38% curve</td>
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<tr>
<td>CH – until now</td>
<td>40 km/h with EBV (emergency brake valve)</td>
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<td><strong>EU - new</strong></td>
<td>EBV16</td>
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8. Compatibility

Pneumatic brake systems (40 km/h)

Towing vehicle

Trailers

EC – until now
DL – 38% curve

EU - new
DL – 50% curve & ALB & ECE R13 for lorries / highspeed vehicles

EU – Lorries without ALB
DL – 50% curve
### 8. Compatibility

*Hydraulic* brake systems (40 km/h)

#### Towing vehicles

<table>
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<th>Region</th>
<th>System Type</th>
<th>Curve</th>
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<tbody>
<tr>
<td>CH – until now</td>
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<td>EU – new</td>
<td>Dual-circuit hydraulic system</td>
<td>50% curve &amp; ALB</td>
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#### Trailers

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EU – new

Dual-circuit hydraulic system – 50% curve and compatibility with single-circuit hydraulic systems – 38% curve with manual & automatic transmission.
9. Summary

- The new regulations apply to EU-type approved vehicles.
- Grace periods for pneumatic brake devices are short, but they are significantly longer for hydraulic systems.
- At the same brake pressure, new vehicles brake significantly harder than older ones. Compliance with ECR R13 for lorries travelling at least 30 km/h.
- The safety requirements are the same for both pneumatic and hydraulic brake systems.
- Trailers: automatic load-dependent braking system (ALB)
9. Summary

- New towing vehicles with dual-circuit hydraulic brake systems will come with intelligent trailer brake valves which can be coupled and safely used with a trailer’s existing single-circuit hydraulic brake system.

- New trailers equipped with a hydraulic dual-circuit emergency brake valve (EBV16) can also be safely towed by towing vehicles having just one brake connector.

- When investing in trailers, it is recommended that you pay special attention to the strength of the brake axles.
Thank you very much for your attention

Please feel free to contact us with any questions regarding brake systems in agricultural and forestry vehicles.

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All information is subject to change