Ag Equipment (Vehicle) Braking

- Future Revision to ASABE S365
- Status: Q1 of 2016
Origins

• “Off-shoot” of Ag Eq. Roadway Initiative
  – Braking requirements evaluation
    • Increase braking
      – Mass
      – Speed
      – Trains
    • Global consistency
  – 15 Year old ASAE braking performance standard
Identified Concerns

• No Provisions for:
  – Light Ag vehicle w/o brakes >32kph (20 mph)
  – Commodity trailers vs fixed transport loads
  – Brake interfaces / compatibility
  – Brake failure alerts
  – Combination brakes (hydrostatic / friction)
  – Mass ratio interpretation / implementation
Identified Concerns (Cont.)

- No clear guidance for implement trains
- Requirements for Complex Electronic Control Systems
- Alignment with other regulatory requirements
Current Standards and Regulations

• North American Standard
  – ASAE S365.9 Braking System Test & Performance Standard

• EU Regulations - effective as of Jan 1, 2016
  – Tractor Mother Regulation (EU)167/2013
  – RVBR (Regarding Vehicle Braking Requirements) EU 2015/68
  – New vehicles EU type approval compliance Jan 2018
Ag Braking Working Group (ABWG)

• 17 Industry Experts
  – 16 Meetings since 2014
• In-depth review of ASAE S365.9.
  – How to comply AND compete globally
  – Gap analysis of ASAE S365.9 vs EU Regulations
  – Consider content of RVBR
Highlights of Proposed S365.10

• Scope limited to 50 km/h. (31 mph)
• New classifications for tractors (including track laying tractors), towed vehicles and self propelled vehicles.
  • Self Propelled vehicle stopping performance is largely unchanged from S365.9
• Performance requirements defined for:
  • Service brake
  • Secondary brake
  • Park brake
• Construction and fitting requirements for:
  • Air trailer brakes
  • Dual-line hydraulic trailer brakes
• New tractor and towed vehicle brake performance requirements for:
  • Deceleration
  • Stopping distance
  • Response time
• Towing and towed vehicle brake performance is aligned across all vehicle classes.
• Towed vehicle brake requirements based on mass and speed only.
<table>
<thead>
<tr>
<th>Event (Location) / Dates (2016)</th>
<th>Group</th>
<th>JAN</th>
<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
<th>JUL</th>
<th>AUG</th>
<th>SEP</th>
<th>OCT</th>
<th>NOV</th>
<th>DEC</th>
<th>Deliverable or Action/Assignment</th>
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</thead>
<tbody>
<tr>
<td>Ag Product Safety &amp; Compliance Council (WebEx Mtg)</td>
<td>AEM</td>
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<td>1-hour WebEx meeting before end of January 2016 to inform APSCC on status of ABWG work/Ron S (AGCO) to present.</td>
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<td>AETC Session 5 (Louisville, KY)</td>
<td>ASABE</td>
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<td>Less-descriptive presentation outlining S365.9 shortcomings/ Ron S (AGCO) to present.</td>
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<tr>
<td>Ag Tech &amp; Safety Leadership Group (Louisville, KY)</td>
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<td>This would be a full presentation. Needs to be added to the agenda./Karl K (CNHi) and Bruce H (Deere) to present.</td>
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<tr>
<td>AEM Ag Sector Board of Directors (DC)</td>
<td>AEM</td>
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<td>Anita S (AEM) would be asked to make a presentation. Maximum of 5 slides in an executive summary format. ABWG to prepare presentation.</td>
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<tr>
<td>Ag Product Safety &amp; Compliance Council Spring Meeting (Schiller Park, IL)</td>
<td>AEM</td>
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<td>This would be a full presentation. Needs to be added to the agenda./Karl K (CNHi) and Ron S (AGCO) to present. Proposed draft to be displayed for reference.</td>
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<tr>
<td>Spring Conference (Clearwater, FL)</td>
<td>FEMA</td>
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<td>Presentation to FEMA’s Tillage Product Council (Doug Bruce from Osmunson is Chair). Presentation by Duane R (Titan) with support from Scott C (ASABE).</td>
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<td>Virtual/Phone Suppliers</td>
<td>Suppliers</td>
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<td>Opportunity to make contact with AEM member suppliers (US based) of brake components to update them on potential future needs.</td>
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<tr>
<td>Ag Braking Working Group Meeting (WebEx Mtg)</td>
<td>ABWG</td>
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<td>Meeting to be set-up the week of 02 May 2016. Location and host to be determined./Dan M (AEM) to survey dates and locations.</td>
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<tr>
<td>Western Canada Farm Progress Show (Regina, SK)</td>
<td>AMC</td>
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<td>Presentation to be given./Presenter to be determined.</td>
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<tr>
<td>Annual International Meeting (Orlando, FL)</td>
<td>ASABE</td>
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<td>Anticipated NWIP launch date: 2016-06-01 with further discussion at ASABE MS 23/4/5 meeting.</td>
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<tr>
<td>Ag Product Safety &amp; Compliance Council Fall Meeting (Schiller Park, IL)</td>
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<td>Update on ballot results and next steps.</td>
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<tr>
<td>Fall Conference (San Diego, CA)</td>
<td>FEMA</td>
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<td>Update on ballot results and next steps.</td>
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<tr>
<td>Annual Meeting (Calgary, AB)</td>
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</tbody>
</table>
Path Forward

• Goals
  – Develop consensus
  – Update braking standard
  – Global alignment
  – Submit changes in June
Agricultural Roadways Initiative
Risks Created by Implements of Husbandry (I-O-H)
• Axle Weights, Spacing and Footprint
• Machine Dimensions
• Implement Trains
• Braking Systems
  – Tow Vehicle
  – Towed Vehicles
• Lighting and Marking
• Hitching Systems
• Hydraulic Coupling Systems
• Electrical Connections
Implements of Husbandry – Standards Work

- Michael Senneff, Technical Resource
  - Applicable standards
  - Gap analysis
  - Shepherd improvements
- AEM and FEMA survey
  - Provide insight:
    - 80% important
    - 66% need improvements
Members ranked the following as the top 4 concerns:
- Lighting and Marking
- Equipment Dimensions
- Braking Systems
- Trains of Towed Equipment
## Issues Chart (Mike Senneff)

<table>
<thead>
<tr>
<th>Technical issue</th>
<th>Problem statement</th>
<th>Actions taken to date (stds/regs)</th>
<th>Current status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine definition</td>
<td>Establishment of appropriate machine description/definition</td>
<td>ASAE S390.5, ISO 12934</td>
<td>Published, Published</td>
</tr>
<tr>
<td>Machine properties: - dimensions - mass (weight) - speed</td>
<td>Overall machine or imp. train total mass, Tracked machines</td>
<td>None, None</td>
<td>Weighing and possible permitting, Exempted in WI law</td>
</tr>
<tr>
<td>Lighting &amp; Marking</td>
<td>Visibility of equipment to other traffic on the road</td>
<td>ASAE S279.17, AMISA</td>
<td>Published, USDOT rulemaking</td>
</tr>
</tbody>
</table>
## Issues Chart

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<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Implement trains</td>
<td>Multiple, sometimes large, towed equipment traveling at higher road speeds</td>
<td>ASAE S338.5</td>
<td>Published</td>
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<td>ASABE Hitch Pin Standard</td>
<td>Draft</td>
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<tr>
<td>Mechanical hitching</td>
<td>Need for standardization for hitching towed equipment and considerations for implement trains</td>
<td>ASAE S338.5</td>
<td>Published</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ASABE Hitch Pin Standard</td>
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<tr>
<td>Functional coupling</td>
<td>Robustness of electrical, hydraulic and pneumatic connections between towing vehicle and towed equipment</td>
<td>None</td>
<td>Limited AEF work on High Voltage Connector</td>
</tr>
<tr>
<td>Braking</td>
<td>Stopping towing (tractor), s-p and implement trains in regard to larger and faster road travel speeds</td>
<td>ASAE S365.9, EU Delegated Acts (RVBR)</td>
<td>Published, Draft</td>
</tr>
</tbody>
</table>
Mike Senneff - Current Work Projects

• Machine Definitions
  – North American
  – International Adoption
• High Speed Vehicles
  – Machine systems impacted
• Lighting and Marking
  – A video compilation resource
THANK YOU