History of ASAE S279

Evolution – "Drivers" of Changes to the Standards

Presented by:
Michael Weber - AEM
Manager, Technical & Safety Services

Statistics prepared by:
Timothy Ice - CNH
Sr. Electrical Designer

Tony Kajewski -
Deere & Company
Product Engineer

Mike Senneff
Deere & Company
Manager, Product Safety and Compliance

ASAE S213
Safety Lighting for Combinations of Farm Tractors and Implements

- 1952 - National Committee on Uniform Traffic Laws and Ordinances established first regulation for safety lighting on farm tractors and implements on highway at night.

- February 1954 – S213 was adopted by American Society of Agricultural Engineers (ASAE) as voluntary standard.

ASAE S213
Safety Lighting for Combinations of Farm Tractors and Implements

- Minimum requirements for tractors:
  - Safety lamp that is red to the rear and amber to the front
  - Rear facing red reflectors
  - SAE standard electrical connecter socket for implement connections

ASAE S213
Safety Lighting for Combinations of Farm Tractors and Implements

- ASAE S213 - first standard to place burden of lighting implements on the tractor manufactures
- Minimum requirements for **Implement Manufacturer's**:
  - Mounting bracket for a light and two reflectors
- **Tractor Manufacturers** "made available:"
  - Light with standard SAE plug
  - 22 feet of electrical cable
  - Carrying means for cable

ASAE S213 replaced by ASAE S279

- **<u>December 1964</u>:**

  ASAE S279 - Lighting and Marking of Agricultural Field Equipment on Highways adopted by ASAE.

  – Farm and Industrial Equipment Institute (FIEI) (now AEM), Engineering Committee, proposed need for lighting and marking during daylight operation

ASAE S279
Lighting and Marking of Agricultural Field Equipment on Highways

- When traveling on public roads during **daylight**:
  - Required flashing warning lamp meeting SAE J575 showing amber to the front and rear
  - Farm equipment without electric lighting required a Slow Moving Vehicle (SMV) emblem
    - Alternate solution:
      - 15" by 18" **bright red** or **blazing orange** flag

ASAE S279
Lighting and Marking of Agricultural Field Equipment on Highways

- When traveling on public roads at **night**:
  - Tractor requirements:
    - At least two single beam headlamps
      - Intensity “to reveal persons and vehicles” 75 feet away when traveling at 15 MPH
    - One tail lamp
    - One flashing warning lamp
    - Provisions for switching “Off” rear work lamps, or converting the rear work lamps to red for travel on public roads

ASAE S279.4
Lighting and Marking of Agricultural Equipment on Highways

- **December 1969:**

Name changed to:

Lighting and Marking of Agricultural Equipment on Highways

ASAE S279.4
Lighting and Marking of Agricultural Equipment on Highways

- S279.4 introduced new **Roading** requirements:
  - Separated the work lights from road lights eliminating rearward facing white lights
  - Required two tail lights instead of just one
  - Added upper mounting height for flashing amber lights
  - Turn signals made standard instead of optional
  - Added additional flashing lamps to enhance turn signaling
  - Made SMV standard equipment, ASAE S276 SMV Sign

ASAE S279.4
Lighting and Marking of Agricultural Equipment on Highways

- S279.4 introduced new **Roading** requirements:
  - Width requirement changed to be more inline with Highway Vehicle Codes for trucks
    - To match the actual width of a single lane of most rural roads
  - Added reflective material (tape) to better define the equipment size and for daytime operation
  - Added reflective material to the front extremities to increase visibility in low light conditions

ASAE S279.6
Lighting and Marking of Agricultural Equipment on Highways

- **November 1976**:
  - Approved by:
    - American National Standards Institute (ANSI) as an American National Standard

ASAE S279.9
Lighting and Marking of Agricultural Equipment on Highways

- **<u>July 1992</u>**:
  - Ohio State University began a two-year research project of Equipment Lighting and Marking
  - Under the direction of Professor Thomas L. Bean, Ph.D. the $240,694 project was jointly funded by OSU and EMI (now AEM)
  - This study included:
    - Visibility testing of proposed SMV materials
    - Visibility of the SMV with different background colors

ASAE S279.10
Lighting and Marking of Agricultural Equipment on Highways

- **April 1998**:
  - EMI Lighting and Marking Committee began development of a major revision to the standard.
  - Incorporate certain findings of the OSU study.
  - Four objectives sought in the new standard:
    - Improved recognition of a machine signaling a turn.
    - Improved nighttime recognition of wide equipment.
    - Improved daytime recognition of wide equipment.
    - Improved recognition of a slow moving machine.

ASAE S279.10
Lighting and Marking of Agricultural Equipment on Highways

- **April 1998**:
  - Introduction of 2” x 9” red, yellow and fluorescent orange ‘reflective’ material for all equipment wider than 12 ft.
  - Enhanced turn signal requirement.
  - High performance SMV emblem (from major revision of ASAE S276 ‘ Slow moving vehicle emblem)
  - Introduction of side marking of long towed equipment

ASAE S279.11
Lighting and Marking of Agricultural Equipment on Highways

- **February 2001**:
  - Further clarification of retro-reflective and reflex reflective materials
  - Increased visibility of reflective materials at night, to 1,000 feet
  - Redefined exterior durability of reflective materials
  - Changed tractor/implement interface receptacle to be able to operate Brake Lights

ASAE S279.13
Lighting and Marking of Agricultural Equipment on Highways

- **February 2005**:
  - Addressed High Speed (over 25 MPH) Agricultural Equipment
  - Required Brake Lights for equipment that could travel at speeds over 25 MPH
  - Required a Speed Identification Symbol for equipment as defined by ASABE S584
  - Aligned Standard with ISO Standard 16154

ASAE S279.14
Lighting and Marking of Agricultural Equipment on Highways

- **<u>February 2009</u>**:
  - Added Lighting Information on CAN Buss Connector to Implement

ASAE S279.XX
Lighting and Marking of Agricultural Equipment on Highways

- **2009 Discussions**:
  - Long term investigations include:
    - Uses of Rotating Beacon Lights and Strobe Lights
    - LED lights for tail lights, head lights, turn signals and flashing lights
    - HID headlights and/or work lights
    - Self-Canceling and/or Tel-Tale Alarm for turn signals

U.S. States that have adopted S279 as a requirement for new agricultural machinery

- Ohio
- Illinois
- Indiana
- Wisconsin
- Michigan

An Illustration of the Key Provisions of the Wisconsin Lighting and Marking Bill

Mike Senneff
Chairman
AEM Lighting and Marking Committee

August 11, 2005

Assembly Bill 340 will have these effects when new agricultural equipment is operated on Wisconsin public roadways:

- Improved recognition of slow moving equipment.
- Improved night and daytime recognition of equipment.
- Improved recognition of wide equipment.
- Improved recognition of a machine about to make a turn.

Assembly Bill 340 will require these provisions on new agricultural tractors and self-propelled equipment

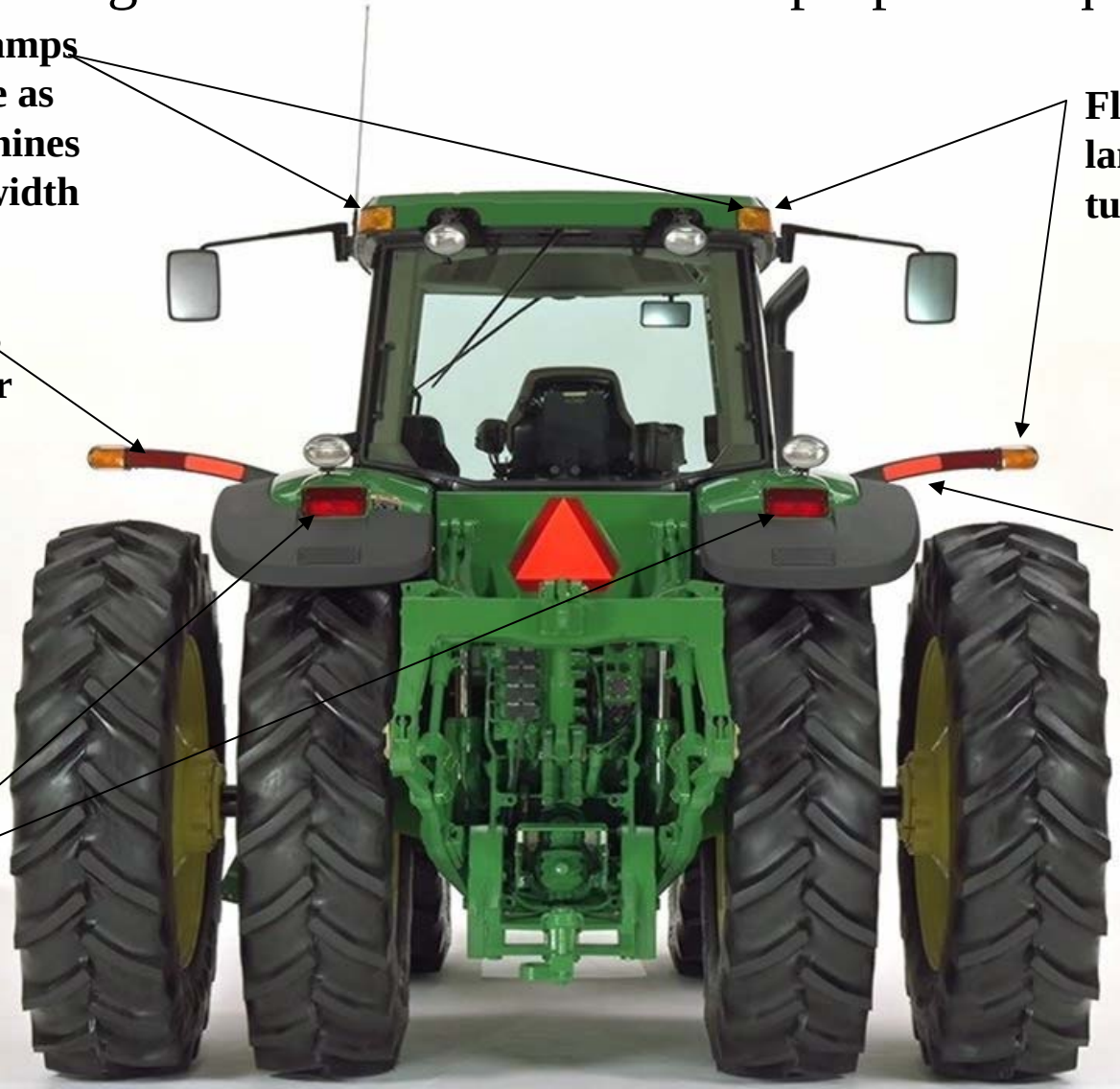
Flashing amber lamps positioned as wide as practical for machines 12 feet or less in width

Flashing amber lamps also serve as turn signals

2 x 9 red reflectors and flashing amber lights within 16 inches of the machine extremity if machine width is greater than 12 feet.

2 x 9 florescent reflector within 25 inches of the machine extremity if machine width is greater than 12 feet.

Two red tail lamps



Assembly Bill 340 will require these provisions on new agricultural tractors and self-propelled equipment

Flashing amber lamps positioned as wide as practical for machines 12 feet or less in width.

Flashing amber lamps also serve as turn signals

2 x 9 yellow reflectors and flashing amber lights within 16 inches of the machine extremity if width is greater than 12 feet.

Two headlamps

Assembly Bill 340 will require towed and mounted implements to have the same provisions as tractors and self-propelled machines

Red and florescent reflective material

Tail lamps, flashing amber lamps, turn signals

Forward facing flashing amber lamps, turn signals and yellow reflective material.

Assembly Bill 340 will require towed and mounted implements to have the same provisions as tractors and self-propelled machines

Conclusions:

- Participants from the remaining 45 states are encouraged to contact their state legislators and follow the leads of Ohio, Illinois, Indiana, Wisconsin and Michigan.

- The AEM and ASABE Lighting & Marking Committees will continue to maintain a strong partnership in maintaining lighting and marking standards for Ag machinery that have technical provisions that are practical, reflect the state of the art and provide genuine value to both the public motorists and the operator’s of Ag machinery.

ASAE S279.14
Lighting and Marking of Agricultural Equipment on Highways

Handout includes Normative References currently in ASAE S279.14

ASAE S279
Lighting and Marking of Agricultural Equipment on Highways

Thanks for listening!

Questions?