

## Lighting and Marking Farm Equipment for Road Travel -- Summary of ASAE Standard S279.10<sup>1</sup>

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What are ASAE Standards?

The American Society of Agricultural Engineers (ASAE) is the professional society for those interested in engineering knowledge and technology for food and agriculture, and related industries and resources.

Standards are based on experience and research, and they are developed by committees that include qualified people from producer, consumer, and general interest groups.

This lighting and marking standard applies to all tractors, other self-propelled farm machinery, and towed machinery used for farm operations (for more details see standard ASAE S390.1) which might be driven or towed on any road that is also accessible to the public. Self-propelled machines and towed machines are considered separately in the standard.

The following is only a summary of ASAE Standard 279.10 DEC02 "Lighting and Marking of Agricultural Equipment on Highways"; consult the standard for exact details about the specific types of lights and their placement.



### I. General Recommendations for Lighting Self-propelled Equipment

The standard recommends six features related to lighting self-propelled equipment, which includes tractors. The standard defines the proper lateral and vertical placement of lights; in general, lights should be no lower than 3 feet from the ground or more than 10 feet high. The six recommended features are:

**Headlamps** -- Two standard headlamps should be mounted at the same height and spaced as far apart as possible, the same distance on either side of the centerline. The standard also defines how bright headlamps should be.

**Work lamps** -- The equipment should be fitted with work lamps. Rear-facing work lamps should not

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be used on the highway, but others should be used to illuminate the area near the equipment on its sides and front.

**Taillights** -- Two red taillights should be mounted at the same height, as far apart as possible, and the same distance on either side of the centerline. Taillights should be at least 3 feet from the ground and not more than ten feet.

**Warning Lights** -- Extra-wide vehicles (12 ft or more) should have flashing amber lights marking the sides of the vehicle to reduce the danger of sideswipes. The lamps should flash in unison at 60 to 85 flashes per minute.

**Turn Indicators** -- In addition to the red taillights, the equipment should carry turn indicators. When a turn indicator is on, the warning light on the side of the flashing turn signal should flash faster, up to 110 flashes per minute, while the warning light on the side opposite the turn should burn steady and not flash.

**Seven-terminal Receptacle** -- Machines commonly used with equipment should have a seven-terminal receptacle; details of the receptacle are defined in the standard. Towed equipment should have the matching seven-pin plug. The wiring of the plug and receptacle are described in the standard.

## II. General Recommendations for Marking Non-self-propelled Equipment

Marking refers to using reflectors, reflective materials, and specific signs to make the presence and the size of towed equipment obvious to other motorists. The general requirements for marking self-propelled equipment are:

**Rear Reflectors** -- Red reflectors visible to the rear up to a distance of 600 ft should be used to mark the outermost side extension of the equipment.

**Front Reflectors** -- Yellow reflectors visible to the front should mark the extreme left and right of equipment, especially if it is wider than the towing machine.

**Conspicuity Material** -- Two kinds of material visible to the rear should be used: 'retroreflective' material, which is material or a device that reflects back to the light source; and red-orange non-reflective, fluorescent material. Conspicuity material visible to the front should be yellow.

**Slow-moving Vehicle (SMV) Emblem** -- This triangular emblem should be visible to the rear of any slow-moving machinery. Remember: Point up!

### If Tractor Illumination Is Obscured

Towed equipment should carry any lighting that it obscures on the tractor. For example, if the towed equipment blocks a tractor's taillights from the view of following motorists, the towed equipment should carry taillights. The same is true for the tractor's flashing red warning lights and its turn indicators.

### If the Tractor's SMV Emblem Is Obscured

The SMV emblem must be visible to following motorists. If the equipment being towed obscures the SMV emblem on the tractor, then one must be mounted on the towed equipment

## III. Special Recommendations for Lighting and Marking Non-self-propelled Equipment

The non-self-propelled equipment that is towed by tractors should have its own lighting and marking. In many cases, the standard has special recommendations based on the width or length of the towed equipment. Towed equipment should be marked and lighted so that it is clearly visible from the rear and the side. It is important that the full width and length of the equipment be obvious to motorists who are approaching quickly from the rear or who are trying to pass slow-moving equipment.

1) The towed equipment extends more than 4 ft to the left of the tractor's centerline.

Special lighting requirements -- Covered in 'Vehicle Illumination Obscured.'

Special marking requirements -- At least one amber or yellow reflector visible to the front positioned to indicate as nearly as practicable the left projection of the equipment.

2) The towed equipment extends more than 4 ft from the tractor's centerline in either direction.

Special lighting requirements -- Covered in 'Vehicle Illumination Obscured.'

Special marking requirements -- In addition to the amber or yellow reflector required for equipment that extends more than four feet to the left of the machine centerline, at least two red reflectors visible to the rear and mounted to indicate as nearly as possible the extreme left and right projections of the equipment.

3) The towed equipment is more than 12 ft wide (or extends more than 6 ft from the centerline in either direction).

Special lighting requirements -- Extra-wide towed equipment should have flashing amber warning lights visible front and rear, red tail lamps, and turn indicators. The warning lights should flash in unison with the warning lights on the tractor.

Special marking requirements -- 1) Visible to the rear: Red retroreflective material and non-reflective red-orange fluorescent material. The retroreflective material should mark the left and right extremes of the equipment. Use enough reflective and non-reflective material so that there are no unmarked gaps of more than 6 ft. 2) Visible to the front: Two yellow reflectors as close as possible to the right and left extremes of the equipment.

4) The attached equipment is in front of the tractor.

Special lighting requirements -- None.

Special marking requirements -- 1) Visible to the rear: Red retroreflective material and non-reflective red-orange fluorescent material. The retroreflective material should mark the left and right extremes of the equipment. Use enough reflective and non-reflective material so that there are no unmarked gaps of more than 6 ft. 2) Visible to the front: Two yellow reflectors as close as possible to the right and left extremes of the equipment.

5) The towed equipment extends more than 4 ft behind the hitch point on the tractor.

Special lighting requirements -- Covered in 'Vehicle Illumination Obscured'

Special marking requirements -- This equipment requires an SMV emblem of its own, visible to the rear.

6) The towed equipment extends more than 16 ft behind the hitch point on the tractor.

Special lighting requirements -- covered in 'Vehicle Illumination Obscured'

Special marking requirements -- This equipment requires an SMV emblem of its own, visible to the rear. In addition, the sides of the equipment should be marked with amber or yellow reflectors, spaced every 16 ft maximum. A reflector should be placed as far to the rear on each side as possible.

7) The towed equipment extends more than 25 ft behind the hitch point on the tractor.

Special lighting requirements -- This equipment should have its own set of taillights, warning lights and turn indicators as described above.

Special marking requirements -- Covered in the previous section.

## For More Information

For more information about tractor safety, visit the Florida AgSafe Web site:

<http://www.flagsafe.ufl.edu>

The following publications are available at your county Extension office and at the EDIS Web site, <<http://edis.ifas.ufl.edu>>. (IFAS Publication Numbers are in parentheses after the titles. The second set of parentheses contains the Web address at which the publication can be viewed.)

- Getting Started on the Right Foot: Dangers of Bypass Starting (ABE299) (View this publication at: <http://edis.ifas.ufl.edu/AE172>.)

- When Two's a Crowd: Dangers of Extra Riders on Tractors (ABE 300) (View this publication at <http://edis.ifas.ufl.edu/AE173>)
- Filling Gas Cans Safely (ABE301) (View this publication at: <http://edis.ifas.ufl.edu/AE174>.)
- Lighting and Marking Farm Equipment for Road Travel -- Summary of ASAE Standard S279.10 (ABE302) (View this publication at: <http://edis.ifas.ufl.edu/AE175>.)
- Road Safety for Tractors and Farm Machinery (ABE303) (View this publication at: <http://edis.ifas.ufl.edu/AE176>.)
- Frequently Asked Questions (FAQs) about Rollover Protective Structures (ROPS) (ABE304) (View this publication at: <http://edis.ifas.ufl.edu/AE177>.)
- Avoid The Invisible Hazard: Know About Soil Shear Lines (ABE305) (View this publication at: <http://edis.ifas.ufl.edu/AE178>.)
- Shortcuts are Shortsighted! or Invest Seconds, Save Lives (ABE306) (View this publication at: <http://edis.ifas.ufl.edu/AE179>.)
- Ready or Not? Get Ready with a Tractor Operator Checklist (ABE307) (View this publication at: <http://edis.ifas.ufl.edu/AE180>.)
- Yee-Haa! Formula for a Successful Tractor Rodeo (ABE308) (View this publication at: <http://edis.ifas.ufl.edu/AE181>.)
- Hand-me-down Hazards: Dangers of Used Equipment (ABE309) (View this publication at: <http://edis.ifas.ufl.edu/AE182>.)
- Safety Tips for Tractor Loading and Towing (ABE310) (View this publication at: <http://edis.ifas.ufl.edu/AE183>.)
- Safer Tractor Operations for Agricultural Employers (Circular 1249) (View this publication at: <http://edis.ifas.ufl.edu/AE195>.)
- Safer Tractor Operations for Privately Owned and Operated Farms and Ranches (Circular 1250) (View this publication at: <http://edis.ifas.ufl.edu/AE196>.)
- Safer Tractor Operations for Acreages and Homeowners (Circular 1251) (View this publication at: <http://edis.ifas.ufl.edu/AE197>.)
- Safer Tractor Operations for Landscape Maintenance and Horticultural Industries (Circular 1252) (View this publication at: <http://edis.ifas.ufl.edu/AE198>.)
- Safer Tractor Operations for Emergency and Rescue Personnel (Circular 1253) (View this publication at: <http://edis.ifas.ufl.edu/AE199>.)
- Safer Tractor Operations for Farm Workers and Employees (Circular 1254) (View this publication at: <http://edis.ifas.ufl.edu/AE200>.)