

RURAL

Safety and Health

ROADWAY SAFETY: LIGHTING & MARKING OF AGRICULTURAL EQUIPMENT

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THIS FACT SHEET COVERS

- Preventing Collisions
- Protecting Yourself
- Complying with the Law
- Lighting
- Marking
- Reflective Materials
- ASAE Recommendations
- NY State Law
- SMV Signs
- Operator's Responsibilities

What do you need to know?

Help to Prevent Collisions

You play a vital role in helping to prevent roadway collisions by insuring that your equipment is as visible as possible to other motorists. The more visible you are, the less likely you are to be involved in a collision. Protecting yourself and others can make the difference between life and death.

Protect Yourself

According to the National Safety Council, approximately 15,000 farm vehicles are involved in highway crashes annually. Studies of collisions between slow moving vehicles and motor vehicles conclude that nearly 90 percent occur on dry roads during daylight hours and two-thirds are rear-end collisions.

When a fatality occurs, the victim is usually the tractor operator.

Tractors, with or without trailed equipment, and self-propelled implements are large enough to be clearly visible on the highway, especially during daylight hours. *So, why are there so many accidents involving farm vehicles?*

Many rural residents have no experience with farming, yet they share the roads with tractors and implements. Lack of familiarity with farm equipment may be responsible for their poor judgment when gauging distances and speeds of slow moving vehicles. Additionally, the recognition of "something different" on the roadway may not be apparent due to poor lighting and marking. Tractors generally travel at less than 20 miles per hour (mph), compared with cars cruising at 55+ mph. A typical driver does not instantly recognize this difference in speed and may apply the brakes too late to avoid a collision.

Motor vehicle drivers need to be able to identify slow moving vehicles in time to react safely. Protect yourself by installing the proper lighting and marking to your agricultural equipment. A small investment in materials and time can help to prevent

common roadway collisions.

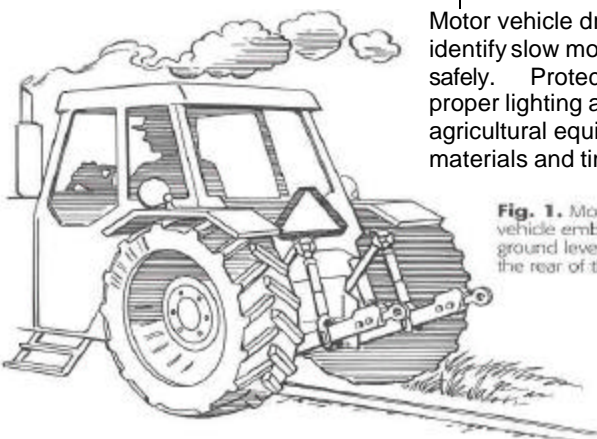


Fig. 1. Mount slow moving vehicle emblem 2-6 feet from ground level in the center of the rear of the vehicle.

Follow the law

All self-propelled vehicles (tractors, combines, haybines, etc.) operated on public roadways in NY State after dark have to comply with the lighting specified in Table I. These lighting requirements are in addition to the SMV emblem requirements and do not replace those requirements. It should be noted that while it is recommended to utilize the specified lighting at all times throughout the day, NY requirements only apply when the agricultural equipment is used on the public roadways from one-half hour after sunset to one-half hour before sunrise. At other times, no lighting equipment is required on agricultural equipment in NY.

How to Comply?

Lighting

Extrmity lighting and reflective material marking combined can be a very effective guard against roadway collisions. Used together, other motorists can quickly and accurately identify that a large, slow moving piece of equipment is on the road. Without this type of effective protection farm equipment operators may be more at risk of injury or even death. The lighting requirements of both NY state law and ASAE S279.11 can be found in Table I. ASAE recommendations should be followed whenever possible since these include some safety components that are not included as part of the NYS law. These additional recommendations are standardized through a national consensus and have been adopted by new equipment manufacturers. It should be noted that when rearward facing work lamps or general service lamps are present, that they should be aimed downward and that they shall not be illuminated during highway travel. Motorists can be blinded and confused by the illumination of rearward facing white lights, thus becoming a detriment to safety.

Marking

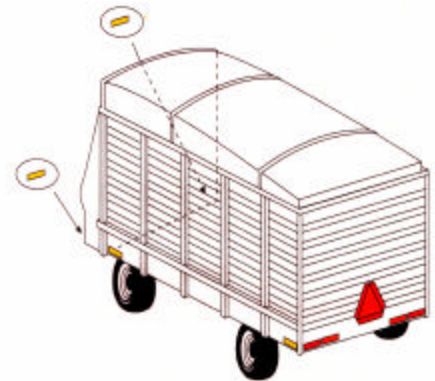
Reflective marking material is a low cost effective tool to identifying agricultural equipment. Properly placed reflective material helps the equipment **stand out** on the roadway. This conspicuous feature leads the naming of this material to be called "conspicuity material". Ideally, agricultural equipment on the roadway should be conspicuous since other motorists will notice the equipment immediately and have sufficient time to avoid a collision.

Reflective materials can include:

Fluorescent material which is visible in both daytime and low-light conditions. The fluorescent orange material in the center of the new ASAE standard SMV emblems is visible at twice the distance as the former material. Fluorescent color materials are comprised of fluorescent dyes which are bright, but unfortunately decompose and lose their brilliance (fading) over time. Fluorescent materials, such as the center of SMV emblems, should be replaced when their brilliance fades thus reducing their effectiveness.

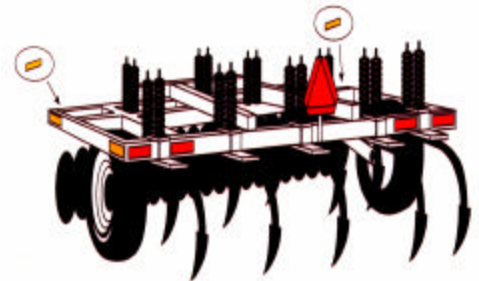
Retroreflective material is designed to redirect light directly back towards its' source. In the case of an SMV sign, the triangular border is made of red retroreflective tape that reflects the light of motorists' headlights directly back, creating a visible warning effect. The retroreflective border of the new SMV signs is over 10 times brighter than the design of the older SMV signs. Typically the older style SMV reflective tape was only visible from a few hundred feet where as the new retroreflective tape used on SMV emblems is visible for over a mile. Retroreflective tape can also be used as reflectors and conspicuity material to meet ASAE standard recommendations at the equipment extremities. This retroreflective material is very durable and generally more weather resistant than the fluorescent materials.

Silage Wagon Diagram:



Note proper location of SMV sign, Red Retroreflective tape at rear corners, and Orange Fluorescent tape inside next to Red Retroreflective tape. Side and Front corners have Yellow Retroreflective tape.

Tillage Implement Diagram:



Note proper location of SMV and Marking tape as diagram above, although the location on Tillage implement is directly to frame member.

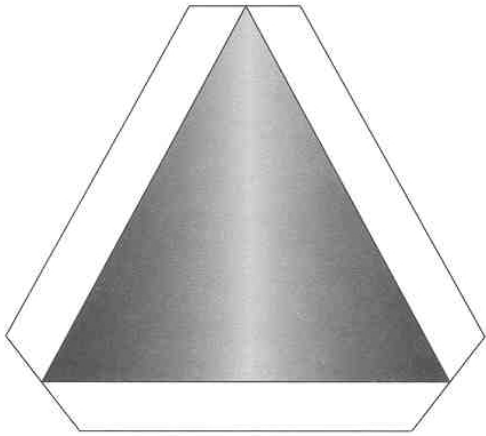
Note: Diagrams courtesy of Gempler's

**Table I: ASAE Recommendations and New York State Requirements
Lighting and Marking of Agricultural Equipment for Travel on Public Roads**

Item	ASAE Recommendations #279.11 & S276.5			NEW YORK Requirements
	#	Color	Mounting	
Headlights	2	White	On either side of vehicle centerline at same height.	Same as ASAE recommendation ¹
Tail lights	2	Red	Symmetrically mounted to rear between 3.3' & 10' high from 2' to 5' on left & right of machine center	1 Red as far to left as possible
Hazard Flashers	2 or more	Amber	3.3' to 12' high & spaced as widely apart as practicable to be visible from front & rear.	Combined hazard, warning, and turn signal lamps. 2 amber, at least 42" high, at same level, as far apart as practicable and visible front & rear.
Turn Indicators	2	Amber & Red	Hazard flashers to also function as turn signals.	
SMV Emblem	1	Fluorescent orange for daylight & red retroreflective border for night	On rear center or rear left for maximum visibility of 600' day or night; 2' to 10' above ground.	All implements of husbandry designed to operate at 25 mph or less shall display the SMV on rear of vehicle at all times on highways
Reflectors which may be part of tail lamp lens or conspicuity material	2	Red on rear of machine	Size to be 2" wide by 4.5" long for machines =6.7' wide. Size to increase to 2" by 9" for wider machines.	2 Red On rear, same level, as far apart as practicable.
	2	Yellow on front of machine		
Conspicuity material to better define size and to increase visibility.	Red retro-reflectors & fluorescent markers on rear corners & =6' apart on rear. Front: change color to yellow ²	Red retro-reflective & re-orange fluorescent Yellow retro-reflective.	Visible to rear Horizontal & in line as practicable Visible to front Reflectors to be within 16" of outside corners and fluorescent material within 25" of outer corners.	SMV only, but additional recommended.

¹between sunset & sunrise & during reduced visibility

²for trailing equipment >16.4' behind hitch point, display amber/yellow reflectors spaced <16.4' apart on sides.



- SIZE:** 16 inches wide and 14 inches high
- SHAPE:** Equilateral triangle, one point up, points cut off and slightly rounded, smooth edges
- BORDER:** 1 3/4 inches, dark red, highly reflective material
- CENTER:** 12 1/4-inch triangle of yellow-orange fluorescent material
- BACKING:** 0.04-inch aluminum sheet, 0.03-inch 22-gauge galvanized steel, 0.08-inch ABS plastic
- MOUNTING:** Emblem point up, 2 to 6 feet high, in the center of the "r" rear of the vehicle.

Slow Moving Vehicle (SMV) Emblem

New York State requires that slow moving vehicle emblems meet the manufacturing standards recommended by the American Society of Agricultural Engineers (ASAE). Emblems meeting these standards are stamped with an ASAE certification number. There are less expensive emblems that do not meet the ASAE standards, but they frequently fade quickly, and are less reflective even when new.

The approved emblem is a fluorescent red-orange center and red retroreflective border triangle. Triangles can be recognized better from a distance than other shapes, and the fluorescent center is highly visible. If the fluorescent triangle fades, it becomes less visible to motor vehicle drivers. The emblem should be replaced before it loses its effectiveness as a warning device.

A recent study, by Cornell University, of approximately 7,000 tractors and implements on New York State farms showed that only 20% had a SMV emblem present, in good condition, and placed correctly. *Is your equipment part of the 20% that was adequately protected or part of the 80% that was in need of a new SMV?*

According to New York State law, all tractors, self-propelled equipment, road construction and maintenance machinery, and animal drawn vehicles designed to operate at 25 mph or less must display a slow moving vehicle emblem on the rear of the vehicle when traveling on public highways.

The size, design, and mounting specifications must conform to ASAE specifications. The state-mandated emblem must be displayed in addition to any lighting devices, flags, or other equipment currently required by law.

The use of slow moving vehicle symbols on stationary objects on highways or as clearance markers on wide machinery is prohibited. If a motorist's view of the emblem is obstructed by a trailed implement, another emblem should be mounted on the rear of the implement.

Recap of Responsibilities:

- Inspect machinery for proper lights and reflective materials.
- Retrofit older equipment with new retroreflective tape, extremity lighting, and new SMV signs.
- Be certain that every slow moving vehicle and piece of trailed equipment has a properly placed slow moving vehicle emblem that is clean and not faded. Replace worn, damaged, and faded emblems as soon as possible.
- Do not use SMV emblems for stationary markers, such as for a driveway or mailbox; it is illegal and can cause confusion and collisions. Extended misuse can cause the symbols to lose their effectiveness as a warning device.
- Anticipate problems that motorists might have because of their limited experience with slow moving vehicles and give them extra room on the roadway.

For additional information:

- Cornell Agricultural Health & Safety Program. 1-877-257-9777, <http://www.diaglab.vet.cornell.edu/aghealth/>
- Refer to the ASAE standard 279.11, Lighting and Marking of Agricultural Equipment on Highways and ASAE S276.5, Slow-Moving Vehicle Identification Emblem. 1-269-429-0300, <http://www.asae.org/>
- Contact your local New York State Police, Troop Traffic Division.
- Gempler's 1-800-382-8473



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