Module 14: Motor Vehicles, Mechanized Equipment and Marine Operations; Rollover Protective Structures and Overhead Protection; and

Signs, Signals, and Barricades

Page 333-342

- Page 333-342

Page 333-342

Module 14: Motor Vehicles, Mechanized Equipment and Marine Operations; Rollover Protective Structures and Overhead Protection; and Signs, Signals and Barricades

Module Description

This module is intended for workers who need to know about motor vehicles, mechanized equipment, marine operations, rollover protective structures, overhead protection, signs, signals, and barricades.

We will be discussing motor vehicles, mechanized equipment, marine operations, rollover protective structures, overhead protection, signs, signals, and barricades in detail. This course will also cover the topics included in OSHA 29 CFR 1926 Subparts O-Motor Vehicles; W-Rollover Protection; and G-Signs, Signals, and Barricades.

Module Learning Objectives

At the conclusion of this module, you should be able to:

- Identify OSHA standards for Motor Vehicle Safety.
- Demonstrate machine and equipment handling according to OSHA standards.
- Describe how industrial tractors are regulated by OSHA.
- Discuss the purpose of signs and barricades.

Lesson 1: Subpart O-Motor Vehicles

Lesson Focus

This lesson focuses on the following topics:

- General Requirements
- Material Handling Equipment
- Access Roadways and Grades
- Brakes
- Audible Alarms

General Requirements

Introduction

Motor vehicles covered by Subpart O of the OSHA regulations are those vehicles that operate within an off-highway jobsite which is not open to public traffic.

Braking Systems

All vehicles must have a service brake system, an emergency brake system, and a parking brake system. These systems can utilize common components, and they always must be maintained in operable condition.

Headlights and Taillights

Whenever visibility conditions warrant additional light, all vehicles or combinations of vehicles in use, must be equipped with at least two operable headlights and taillights.

Brake Lights

All vehicles, or combinations of vehicles, must have brake lights in operable condition regardless of light conditions.

Audible Warning Devices

All vehicles must be equipped with adequate audible warning devices at the operator's station. These devices must be kept operational.

Obstructed View to the Rear

No employer shall use any motor vehicle equipment having an obstructed view to the rear unless:

- The vehicle has a reverse signal alarm audible above the surrounding noise levels.
- The vehicle is backed up only when an observer signals that it is safe to do so.

Windshields

- All vehicles with cabs must be equipped with windshields and powered wipers.
- Cracked and broken glass must be replaced.
- Vehicles operating in areas, or under conditions, that cause windshields to fog or frost must be equipped with operable defogging and defrosting devices.

Cab Shield

All haulage vehicles with pay loads loaded by cranes, power shovels, loaders, or similar equipment, must have a cab shield and/or canopy adequate to protect the operator from shifting or falling materials.

Transporting Tools and Materials

Tools and materials must be secured to prevent movement when transported in the same compartment with employees.

Transporting Employees

Vehicles used to transport employees must have seats firmly secured and adequate for the number of employees to be carried.

Trucks with Dump Bodies

Trucks with dump bodies must be equipped with positive means of support. The supports must be permanently attached and capable of being locked into position to prevent accidentally lowering a worker during maintenance or inspection work.

Operating Levers

Operating levers controlling hoisting or dumping devices on haulage units must be equipped with latches or other devices that will prevent accidental startup or tripping of the mechanism.

Dump Truck Trip Handles

Trip handles for dump truck tailgates must be installed so the operator can stay clear during dumping.

Mud Flaps

Mud flaps may be used in lieu of fenders whenever motor vehicle equipment is not designed for fenders.

Vehicle Inspection

All vehicles must be checked at the start of each shift to ensure that parts, equipment, and accessories are in safe operating condition and are free of apparent damage that could cause failure while in use. These components include:

- Service brakes-including trailer brake connections.
- Parking system (hand brakes).
- Emergency stopping system (brakes).
- Tires.
- Horn.
- Steering mechanism.
- Coupling devices.
- Seat belts.
- Operating controls.
- Safety devices.

All defects must be corrected before the vehicles are placed in service.

Note: These requirements also apply to equipment such as the following, where the equipment is necessary:

- Lights
- Reflectors
- Windshield wipers
- Defrosters
- Fire extinguishers

Material Handling Equipment

Seat Belts

Scrapers, loaders, crawler or wheel tractors, bulldozers, off-highway trucks, graders, agricultural and industrial tractors, and similar equipment must be equipped with seat belts.

- Seat belts need not be provided for equipment which is designed only for standup operation.

- Seat belts need not be provided for equipment which does not have rollover protective structure (ROPS) or adequate canopy protection.

Access Roadways and Grades

No employer must move or cause construction equipment or vehicles to be moved on any access roadway or grade, unless the access roadway or grade is constructed and maintained to safely accommodate such movement.
Every emergency access ramp and beam used by an employer must be constructed to restrain and control runaway vehicles.

Brakes

All earth-moving equipment must have a service braking system capable of stopping and holding the fully loaded equipment.

Audible Alarms

- All bidirectional machines, such as rollers, compacters, front-end loaders, bulldozers, and similar equipment, must be equipped with horns, distinguishable from the surrounding noise levels.
- These horns must be operated as needed when machines are moved in either direction. They always must be kept operational.
- No employer shall permit earthmoving or compacting equipment which is limited by an obstructed rear view to be used in reverse gear, unless the equipment has a reverse signal alarm in operation that is distinguishable from the surrounding noise levels, or an employee signals that it is safe to do so.

Lesson Summary

All vehicles must be checked at the start of each shift to ensure that parts, equipment, and accessories are in safe operating condition and are free of apparent damage that could cause failure while in use. All defects must be corrected before the vehicles are placed in service.

Vehicles used to transport employees must have seats firmly secured and adequate for the number of employees to be carried. Tools and materials must also be secured to prevent movement when transported in the same compartment with employees.

All haulage vehicles with pay loads loaded by cranes, power shovels, loaders, or similar equipment, must have a cab shield and/or canopy adequate to protect the operator from

shifting or falling materials. No employer shall use any motor vehicle equipment having an obstructed view to the rear unless:

- The vehicle has a reverse signal alarm audible above the surrounding noise levels.
- The vehicle is backed up only when the observer signals that it is safe to do so.

All vehicles must be equipped with adequate audible warning devices at the operator's station. These devices must be kept operational, and whenever visibility conditions warrant additional light, all vehicles or combinations of vehicles in use, must be equipped with at least two operable headlights and taillights.

All vehicles must have a service brake system, an emergency brake system, and a parking brake system. These systems can utilize common components, and they always must be maintained in operable condition.

Lesson 2: Subpart W-Rollover Protective Structures for Material Handling (ROPS)

Lesson Focus

This lesson focuses on the following topics:

- Introduction
- Design of ROPS
- Labeling

Introduction

All rubber-tired, self-propelled scrapers; rubber-tired front-end loaders; rubber-tired dozers; wheel-type agricultural and industrial tractors; crawler tractors; crawler type loaders; and motor graders, with or without attachment that are used in construction work, must have rollover protective structures (ROPS).

> **More Information:** This requirement does not apply to side boom pipe laying tractors.

Design of ROPS

Strength

Rollover protective structures and supporting attachments must be designed, fabricated, and installed in a manner that supports, based on the ultimate strength of the metal, at least two times the weight of the prime mover applied at the point of impact.

Overturn

The design objective must be to minimize the likelihood of a complete overturn and, thereby, minimize the possibility of the operator being crushed as a result of a rollover or upset.

The design must provide a vertical clearance of at least 52 inches from the work deck to the ROPS, at the point of ingress or egress.

Labeling

Each ROPS must have the following information permanently affixed to the structure:

- Manufacturer's or fabricator's name and address.
- ROPS model number, if any.
- Machine make, model, or series number that the structure is designed to fit.

Lesson Summary

The design objective of scrapers, loaders, dozers, tractors, crawlers, and graders discussed, must be to minimize the likelihood of a complete overturn and, thereby, minimize the possibility of the operator being crushed as a result of a rollover or upset. For this reason, rollover protective structures and supporting attachments must be designed, fabricated, and installed in a manner that supports, based on the ultimate strength of the metal, and at least two times the weight of the prime mover applied at the point of impact.

Lesson 3: Subpart G-Signs, Signals, and Barricades

Lesson Focus

This lesson focuses on the following topics:

- Accident Prevention Signs and Tags
- Danger Signs
- Caution Signs
- Exit Signs
- Safety Instruction Signs
- Directional Signs
- Accident Prevention Tags

Accident Prevention Signs and Tags

Signs and symbols shall be visible at all times when work is being performed and must be removed or covered promptly when the hazards no longer exist.

Danger Signs

A danger sign must be used only where an immediate hazard exists.

Each danger sign must have red as the dominant color for the upper panel, black outline on the borders, and a white lower panel for additional sign wording.

Caution Signs

Caution signs must be used only to warn against potential hazards or to caution against unsafe practices.

Every caution sign must have yellow as the dominant color, a black upper panel and borders with yellow lettering of the word "caution" on the black panel, and a lower yellow panel for additional sign wording. Black lettering must be used for additional wording.

The standard color of the background shall be yellow and the panel must be black with yellow letters. Any additional wording must be in black letters on a yellow background.

Exit Signs

Exit signs, when required, must be lettered in legible red letters, not less than six inches high, on white fields with principal letter strokes of at least three-fourths of an inch in width.

Safety Instruction Signs

Safety instruction signs, when used, must be white with green upper panels, using white letters to convey principal messages. Any additional wording on the signs must be in black letters on white backgrounds.

Directional Signs

Directional signs, other than automotive traffic signs, shall be white with a black panel and a white directional symbol. Any additional wording on the sign must be in black letters on the white background.

Traffic Signs

Construction areas must be posted with legible traffic signs at points of hazard.

Accident Prevention Tags

Accident prevention tags must be used as a temporary means of warning employees of an existing hazard, such as defective tools, equipment, etc. They must not be used in place of, or as a substitute for, accident prevention signs.

Lesson Summary

Signs and symbols must be visible at all times when work is being performed and must be removed or promptly covered when the hazards no longer exist. For instance, directional signs, other than automotive traffic signs, are white with a black panel and a white directional symbol. Any additional wording on the sign must be in black letters on the white background.