

# Safety Spotlight

## ***Preventing Worker Injuries and Deaths from Moving Refuse Collection Vehicles<sup>1</sup>***

### ***Regulations and Standards***

Current OSHA regulations do not specifically address refuse collection vehicles. However, the American National Standards Institute (ANSI) has published Safety Standards for Mobile Refuse Collection and Compaction Equipment, which addresses safe operation and construction of the equipment and includes recommendations for rider and pedestrian safety. These standards recommend that workers:

- ride only in the vehicle cab or on steps specifically designed for riding;
- remain inside the vehicle cab until the vehicle is completely stopped;
- ensure that no riders are using the riding steps when the vehicle is backing, exceeding 10 miles per hour, or traveling more than 0.2 mile; and
- ensure that no one rides on the loading sills or in hoppers.

The ANSI standards also address the design and construction of the vehicle in relation to rider and pedestrian safety by recommending the following:

- Riding steps should provide a self-cleaning, slip-resistant surface that is at least 220 square inches and capable of supporting 500 pounds. The steps should be at least 8 inches deep, mounted behind the rearmost axle of the vehicle, and not more than 24 inches above the road surface.
- Grab handles capable of withstanding a 500-pound pull should be provided along with the riding steps.
- Warning signs should be posted above the riding steps to prohibit their use when traveling at speeds above 10 miles per hour or when backing.
- The vehicle should be equipped with an audible warning device that activates when the vehicle is operated in reverse.

The National Solid Waste Management Association (NSWMA) has developed comprehensive safety practices for workers engaged in solid waste collection. The NSWMA Manual of Recommended Safety Practices contains detailed procedures for backing safely, acting as a spotter during backing, and working around mobile equipment. These procedures include the following:

- Maintaining visual contact between the driver and workers on foot when working close to the vehicle and when backing
- Checking both side mirrors repeatedly when backing
- Using a reliable spotter positioned to see both the driver and any blind spots behind the vehicle when backing

<sup>1</sup> "Preventing Worker Injuries and Deaths From Moving Refuse Collection Vehicles." Centers for Disease Control and Prevention, Centers for Disease Control and Prevention, 6 June 2014, [www.cdc.gov/niosh/docs/97-110/default.html](http://www.cdc.gov/niosh/docs/97-110/default.html).



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- Using standard hand signals when backing
- Stopping the truck if the spotter must change positions
- Immediately stopping the maneuver if visual contact with the spotter is lost
- Remaining clear of the rear of the vehicle when the backup lights are on or the alarm is sounding

### Recommendations

NIOSH recommends that employers:

- develop and implement safe work procedures for riding on and working near moving refuse collection vehicles; and
- train workers in these procedures. In addition, NIOSH recommends that employers and manufacturers of refuse collection vehicles carefully evaluate the design, selection, and equipment of these vehicles.

Workers should be trained to adopt the procedures described in the following subsections.

### Hazardous Area

- Drivers and collectors should be trained to recognize the hazardous area around a refuse collection vehicle.
- The size of this hazardous area depends on the boundaries of the driver's blind spot and the distance needed to stop the vehicle gradually, without throwing a step rider from the steps.

### Safe Riding Procedures

- Riding Position
  - » Collectors should ride in the vehicle cab when traveling to or between collection routes. When adequate seating is not available inside the cab, collectors should be transported to and from the collection route by a separate vehicle.
  - » Riding steps should be used only when moving forward for short distances (0.2 mile or less) at slow speeds (10 miles per hour or less).
  - » When the riding steps are in use, drivers and crew members should be alert for obstructions such as poles and tree limbs, parked vehicles, and tight clearances that could injure step riders.
  - » Collectors should not ride the steps when the vehicle is backing.



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- Boarding and Dismounting from Riding Steps
  - » Collectors should step—not jump—on or off riding steps.
  - » Collectors should board or dismount from these steps only when the vehicle is completely stopped and the driver is aware of the collector's location.
  - » Drivers should wait for the collector to signal before moving. The collector can signal the driver by hand/with a buzzer mounted for easy activation by step riders.
  - » Signals should be uniform throughout the department or firm to avoid confusion.
- Sudden Stops
  - » Avoid sudden stops that could cause step riders to be thrown from the vehicle.

### Safe Backing Procedures

- Before backing, drivers should
  - » turn on the vehicle's hazard lights,
  - » roll down the window,
  - » turn off all but two-way radios,
  - » make sure that no one is on the riding steps, and
  - » visually locate workers on foot to make sure that they are clear of the vehicle's path.
- When backing, drivers should
  - » stop backing immediately if visual contact is lost with workers on foot,
  - » resume backing only after visual contact is restored with workers on foot,
  - » use a coworker as a spotter, and
  - » use agreed upon hand signals to communicate with the spotter.
- Other crew members should
  - » step off the riding steps before the driver begins to back,
  - » remain inside the vehicle cab unless needed to act as a spotter, and
  - » never cross/step behind vehicle when it is backing or when backup lights are on.
- Spotters should
  - » remain visible in the driver's mirrors,
  - » maintain a clear view of the hazard area (driver's blind spot) behind the vehicle,
  - » stay clear of the vehicle's path,
  - » avoid walking backward,
  - » use agreed upon hand signals to communicate with the driver,
  - » be sure no one is on the riding steps/behind the vehicle before signaling driver to start backing,
  - » immediately signal driver to stop if any person/object enters the area behind the truck, and
  - » signal the driver to stop if spotter must change positions when vehicle is backing; the spotter should then move to the new position and signal driver to continue.

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### Safety Equipment

#### Clothing

- Refuse collectors should wear highly visible colors to help vehicle operators visually locate the collectors' positions during backing. If collectors are required to work during non-daylight hours, they should be issued and required to wear light-reflective clothing.

#### Footwear

- Refuse collectors should wear slip-resistant footwear to protect against slips and falls from riding steps. Shoes with cleated, self-cleaning soles are appropriate for muddy conditions often found at landfills. However, collectors should avoid shoes with very narrow cleats or spikes that might get caught in open mesh riding steps or make walking on pavement difficult.

#### Audible Alarms

- To warn workers and pedestrians of backing, refuse collection vehicles should be equipped with audible alarms that can be distinguished from the surrounding noise level. ANSI requires such alarms to have a minimum output of 87 decibels. Because the effectiveness of a backup alarm depends on the worker's ability to hear it and remove himself from the danger zone, these alarms should be designed and installed so that they are activated before the vehicle moves, when the transmission is shifted to reverse.

### Riding Facilities

Refuse collection vehicles should be equipped with enough seating space inside the cab for all members of a collection crew. If refuse collectors are permitted to ride the riding steps while on the collection route, the steps should be as follows:

- Constructed of perforated floor materials to prevent accumulation of debris
- Constructed of slip-resistant materials and large enough to accommodate the worker
- Located so that workers can easily board and dismount from them
- Located behind the rearmost axle of the vehicle
- Slip-resistant handholds should be readily accessible.

### Existing Technology

Though technology is not a substitute for safe work practices, it can improve the safety of workers near moving vehicles. Employers, equipment manufacturers, and suppliers of refuse collection equipment should evaluate the applicability of the following equipment and devices for improving worker safety.



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### Personal Warning Devices

- Small compressed gas horns worn on the belt can be sounded if the worker trips or falls in the path of backing vehicles.

### Radio Communications

- Refuse collectors can use two-way radios to communicate with vehicle drivers. Radio communication shouldn't replace visual contact between drivers and spotters, but it can improve safety by maintaining communication if visual contact is lost.

### Rearview Mirrors

- Additional convex mirrors can be mounted at the rear corners of some vehicles to provide vision across the back. These devices supplement the rearview mirrors traditionally mounted on each side of the vehicle at the cab windows.

### Closed-Circuit Television

- Currently used on some vehicles to monitor the blind spot behind the vehicle.

### Sensor Technology

- Infrared or ultrasonic sensing units can detect persons or other objects in the path of a backing vehicle and activate an alarm inside the cab. These devices are being used successfully on school buses to alert drivers of children who enter the blind spots; the devices have already been installed on refuse collection vehicles in some areas. Although sensor technology is not applicable to all vehicle designs, it is improving and should be considered when buying new equipment.

### Guarding of Equipment

Refuse collection vehicles should be equipped with strategically-placed guards or extended bodywork to prevent workers from falling into the path of the wheels.

These guards might not prevent the actual fall, but they could significantly reduce the injury by deflecting the victim from the path of the wheels.

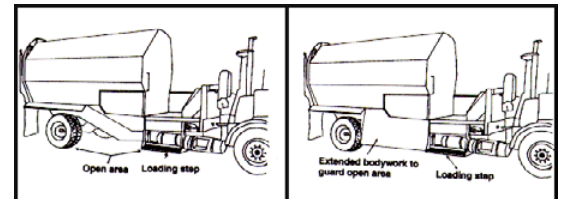


Figure 1. Typical side-loading refuse collection vehicle with an open area between the loading step and the rear wheels.

Figure 2. Typical side-loading refuse collection vehicle with extended bodywork to guard the open area between the loading step and the rear wheels.

This concept may have limited application if the vehicle is required to travel over uneven terrain. However, this type of bodywork could be put in place at the time of manufacture or retrofitted to vehicles operating over fairly even terrain.

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