

Guidelines for the Safe Transportation of Individuals Who Rely Upon Stretchers and Personal Mobility Devices in Vehicles Other than an Ambulance

Washington State Department of Health
Office of Community Health Systems

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Guidelines for the Safe Transportation of Individuals on Stretchers in Vehicles Other than Licensed Ambulances

Introduction

RCW 18.73.180 requires that an ambulance transport patients on a stretcher. The exception to this requirement is when a person with disabilities does not need medical care or monitoring. He or she must also own or lease a personal mobility device. That allows an individual with disabilities to carry out activities of daily living such as shopping and/or attending social functions. However, the requirement to own or lease the device creates problems for mobility. If the device cannot be safely secured in a vehicle, the person can not be transported in that vehicle.

In 2007, the Washington State Legislature directed the Department of Health (DOH) to develop guidelines to address transport in vehicles other than ambulances. These guidelines:

- Identify when vehicles other than an ambulance may provide transportation services.
- Direct how companies provide safe transportation to passengers who are in a lying down position.

Guideline 1. Appropriate Situations for Use of Non-Ambulance Vehicles

The attached decision-making tool (Appendix A) identifies when it is appropriate to transport an individual on a stretcher in an ambulance or when another vehicle may be used.

Most conditions that identify a patient are provided in the algorithm. If someone presents with any of the listed conditions, then an ambulance must be used to transport the person. There are two situations when a vehicle other than an ambulance may perform the transport. They are:

- If an individual requests transportation to attend school, a social event, a pre-scheduled medical appointment or other activity of daily living.
- When a person could be transported in a wheelchair. When that person is limited to a lying down position, then the service may be provided by a vehicle other than an ambulance.

Guideline 2. Public School Transportation Services

School bus operations described in RCW 46.61.380 are exempt from these standards and must comply with all provisions in RCW 46.61.380 when transporting students in a lying down position.

Guideline 3. Initial Responsibilities of the Transportation Provider

When it is determined that a vehicle other than an ambulance can provide the transportation service, the vehicle operator has the following responsibilities:

- Identify the type of mobility device the person uses.
- Identify the type of equipment needed to provide the service.
- If the mobility device is commercially built, follow the restraint system manufacturer's recommendation.
- If device is a non-standard device, (i.e., no engineering specifications) meet with the person to assess their equipment.
- Ask the person for information about securing the device.
- Identify physical limitations of the individual. Does his or her physical size require additional staff?
- Work with the person to determine the best means of securing them on the stretcher and any physical limitations to being restrained.
- If the person's mobility device cannot be safely used to provide the service, identify how the device can go with them to their destination.

Guideline 4. General Safety Guidelines

Whether the person is transported in their own device or one owned by the transport provider, the following apply:

- When transporting a person in a lying down position, staffing of the vehicle shall include a driver and at least one attendant. Those employees shall have completed all training outlined in the personnel requirement guidelines. The attendant must ride in the compartment of the vehicle where the individual and the device are located. Exception: If a passenger's device is self powered and can be loaded into the vehicle using standard equipment, then only one person is required.
- Infection control procedures must be used to eliminate transferring bloodborne and airborne pathogens. This includes one-time use of sheets and pillow cases as well as use of personal protective equipment by the vehicle staff, when appropriate.
- At any time, the individual being transported (or his or her personal attendant) may choose to discontinue the transportation.

- In the event of a medical emergency, the vehicle operator will immediately contact the 9-1-1 system for response.
- In the clinical setting (e.g., hospital, nursing home), a physician or physician extender must approve the method of transportation.

Guideline 5. Device Owned by the Individual vs. Device Owned by the Transportation Provider

In some instances, the person's own device may not be capable of being safely secured in the transportation vehicle. In those cases, the transportation provider may use a device owned by the provider. To determine whether or not the individual's device can be used, consider the following:

- Can the device be safely secured in the transport vehicle?
- If the device cannot be used, how will the individual's mobility restrictions be addressed at the destination?
- Can the individual's device be transported with the individual in a safe manner?
- How will the individual be moved from their own device to the provider's device?

Guideline 6. Securing a Device Owned by the Individual

A person's mobility device must be safely secured in the transporting vehicle using the vehicle's hard-mounted securing system. Whenever possible, this option will be considered first. When the person's own device is used, the following guidelines apply. Each securing system:

- Must never consist solely of the device's wheel-locking system.
- Each device must be individually secured in the vehicle and consistent with AMD 004, "Litter Restraint System."
- In an emergency, must allow for release of both the device and its occupant within 60 seconds, without the use of tools.
- Shall allow loading of the device and individual lengthwise, with the individual's head either facing to the rear or front of the vehicle.
- Be designed so that securing of the device is accomplished by the securing system only. The device's occupant restraint system is not considered sufficient.
- Shall eliminate free movement of the device when the vehicle is moving. When fully secured, the system will allow free movement of the device, not to exceed two inches.
- Shall include hardware that is mounted to the vehicle and to which securing straps are connected.
- Straps used to secure devices should be made of webbing material not less than 1.8 inches wide. The webbing material should have a breaking strength of not less than 6,000 lbs.

- Provide four-point connection to the device at non-welded points on the device to prevent breaking at weak-point welds, or according to manufacturer’s restraint specifications.

Guideline 7. Mobility Device Owned by the Transportation Company

When an individual has written approval from his or her physician that it is safe to transfer the individual from a personal mobility aid to a stretcher owned by the transportation provider, the following standards shall apply:

- The transportation provider must use a commercially manufactured transport stretcher designed for the transport of individuals in a lying down position.
- The device restraint system must be consistent with AMD 004 “Litter Restraint Systems.”
- The transport stretcher must include the manufacturer’s recommended occupant safety restraint system. All manufacturer-recommended restraints must be used during the transport.
- The minimum safety restraint system is a three-point restraining system. This system must provide for restraint of the person at the chest, pelvis and knees.

The transport stretcher will use a manufacturer-recommended stretcher securing system. The base plates of this system shall be hard-mounted to the vehicle. The system will include, at a minimum, a hard mounted side-bar to prevent lateral movement. The system shall also include a means of preventing forward movement of the stretcher during normal driving conditions.

Guideline 8. Personnel Requirements for Vehicle Operators and Staff

Vehicle drivers must meet the following requirements:

- Have and maintain a current Washington State Driver License or valid driver license from their state of residency.
- Must have a minimum of seven years driving experience.
- Must undergo a driving record screening and have no more than one moving violation in the past three years. Drivers must not have any DUI or DWI convictions.
- Must successfully complete Washington State Patrol and fingerprint-based federal criminal background checks. Criminal background checks must reveal no felony conviction, child or adult abuse order and any crimes listed on the Secretary of the Department of Social and Health Service’s list of crimes and negative actions.
- Successfully complete a defensive driving course.
- Successfully complete training on driver sensitivity such as Passenger Assistance Safety and Securement (PASS) or the equivalent.
- Successfully complete training in the knowledge of the geographic service area.

Both the Driver and Attendant of the transport vehicle must meet the following requirements. (These guidelines do not apply when the attendant is the individual’s own

care provider):

- Maintain current certification in First Aid and Cardio-Pulmonary Resuscitation.
- Receive training in fire suppression techniques.
- Receive customer service training
- Complete a DOH-approved blood and airborne pathogens training course.
- Complete training in child safety restraints and legal requirements for the restraint of children in a vehicle.
- Successfully complete training in the use and movement of mobility devices, including stretchers.
- Successfully complete training in movement of the individual in a lying down position. This includes body mechanics, transfer from one device to another, and loading and unloading a stretcher from the vehicle.
- Be aware of the types and features of stretcher-type mobility devices.
- Successfully complete training in the operation of lifts used to move the person into the vehicle.
- Successfully complete training in the securing of stretcher-type mobility devices.
- Successfully complete training in securing individuals on the mobility device.
- Successfully complete training in evacuation techniques and emergency procedures.
- Receive training in the performance of vehicle safety checks including securement and lift equipment.
- Receive training on the use of and responsibilities for service animals.

Guideline 9. Vehicle and Equipment

Vehicles used to provide transportation service to people limited to a lying down position must meet the standards identified in this section. School bus operations under RCW 46.61.380 are exempt from these standards.

Vehicles used to transport people with disabilities must comply with the following standards:

- Comply with the *ADA Accessibility Guidelines for Transportation Vehicles*. These guidelines are attached as Appendix B.
- Extended Vans custom-made for transporting people with disabilities are recommended. Mini-vans and box vans are not considered appropriate.
- The inside measurement of the vehicle's passenger compartment must be at least 71" (h) x 54" (w) x 96" (l). When transporting a stretcher, the stretcher will be centered within a 96" footprint.
- A required safety barrier between the driver and passenger compartments that allows the vehicle operator to watch the passenger and attendant. The safety barrier may be a metal screen or plexiglass.
- Door openings will follow the guidelines established in *AMD Standard 002 "Body Door Retention Components Test and AMD Standard 004 "Litter Retention*

System.” AMD 002 and 004 are attached as Appendix C. Vehicles purchased after Sept. 30, 2008, must comply with those standards.

- All vehicles used to transport people in a lying down position will have a vehicle maintenance program that complies with manufacturer minimum preventive maintenance period. This applies to both the vehicle and all accessory equipment (i.e., lifts, ramps, etc.).
- Must be in compliance with Washington State Department of Transportation guidelines relating to transportation of individuals with disabilities.
- Vehicles will comply with applicable Federal Motor Vehicle Standards.

Guidelines for the Safe Transportation of Individuals on Stretchers in Vehicles Other than Licensed Ambulances

Appendices

Appendix A – Decision-Making Tool

**Appendix B – ADA Accessibility Guidelines for Transportation
Vehicles**

**Appendix C – AMD Standard 002 Body Door Retention
Components Test and AMD Standard 004 Litter
Retention System**

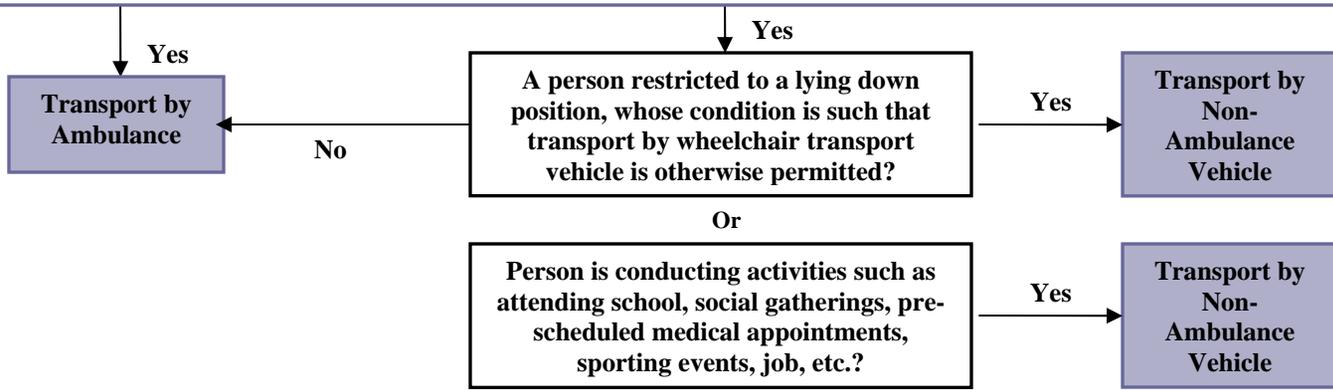
Appendix A

Decision-Making Tool

Ambulance vs. Non Ambulance Vehicle Transportation Decision Tool

Transport involves one or a combination of the following:

- Request received directly by a 9-1-1 or other Emergency Call Center.
- Individual requires ongoing medical monitoring of pulse, blood pressure, airway, respiratory status or level of consciousness by a certified EMS provider.
- Someone receiving intravenous fluids except when conducting activities of daily living (e.g., shopping, social functions, attending school, etc.).
- Someone who has received medication within the past two (2) hours that prevents caring for self (e.g., pain medication, etc.).
- Someone who requires or may require oxygen unless the patient’s physician has prescribed oxygen as a self-administered therapy.
- Someone who requires or may require suctioning of the airway except when conducting activities of daily living (e.g., shopping, social functions, attending school, etc.).
- Someone who has sustained an injury and has not yet been evaluated by a physician.
- Someone experiencing an acute condition or worsening of a chronic condition.
- Someone requiring transport from one hospital to another hospital for a higher level of care not available at the original hospital.
- Someone undergoing care in an emergency department and must be transported to another facility for diagnostic tests not available at the sending emergency department’s hospital.
- Physician, physician extender, nurse practitioner, or registered nurse determines if patient condition warrants medical care by certified EMS provider.
- Patient preference for transport by ambulance.
- Person being transported in a non-ambulance vehicle whose condition worsens.



Appendix B

ADA Accessibility Guidelines for Transportation Vehicles

- (1) *Comply with* means meet one or more specification of these guidelines.
- (2) *If, or if...then* denotes a specification that applies only when the conditions described are present.
- (3) *May* denotes an option or alternative.
- (4) *Shall* denotes a mandatory specification or requirement.
- (5) *Should* denotes an advisory specification or recommendation and is used only in the appendix to this part.

Subpart B-Buses, Vans and Systems

§1192.21 General.

(a) New, used or remanufactured buses and vans (except over-the-road buses covered by subpart G of this part), to be considered accessible by regulations issued by the Department of Transportation in **49 CFR part 37**, shall comply with the applicable provisions of this subpart.

(b) If portions of the vehicle are modified in a way that affects or could affect accessibility, each such portion shall comply, to the extent practicable, with the applicable provisions of this subpart. This provision does not require that inaccessible buses be retrofitted with lifts, ramps or other boarding devices.

§1192.23 Mobility aid accessibility.

(a) *General.* All vehicles covered by this subpart shall provide a level-change mechanism or boarding device (e.g., lift or ramp) complying with paragraph (b) or (c); of this section and sufficient clearances to permit a wheelchair or other mobility aid user to reach a securement location. At least two securement locations and devices, complying with paragraph (d) of this section, shall be provided on vehicles in excess of 22 feet in length; at least one securement location and device, complying with paragraph (d) of this section, shall be provided on vehicles 22 feet in length or less.

(b) *Vehicle lift.* - (1) *Design load.* The design load of the lift shall be at least 600 pounds. Working parts, such as cables, pulleys, and shafts, which can be expected to wear, and upon which the lift depends for support of the load, shall have a safety factor of at least six, based on the ultimate strength of the material. Nonworking parts, such as platform, frame, and attachment hardware which would not be expected to wear, shall have a safety factor of at least three, based on the ultimate strength of the material.

(2) *Controls.* - (i) *Requirements.* The controls shall be interlocked with the vehicle brakes, transmission, or door, or shall provide other appropriate mechanisms or systems, to ensure that the vehicle cannot be moved when the lift is not stowed and so the lift cannot be deployed unless the interlocks or systems are engaged. The lift shall deploy to all levels (i.e., ground, curb, and intermediate positions) normally encountered in the operating environment. Where provided, each control for deploying, lowering, raising, and stowing the lift and lowering the roll-off barrier shall be of a momentary contact type requiring continuous manual pressure by the operator and shall not allow improper lift sequencing when the lift platform is occupied. The controls shall allow reversal of the lift operation sequence, such as raising or lowering a platform that is part way down, without allowing an occupied platform to fold or retract into the stowed position.

(ii) *Exception.* Where the lift is designed to deploy with its long dimension parallel to the vehicle axis

and which pivots into or out of the vehicle while occupied (i.e., "rotary lift"), the requirements of this paragraph prohibiting the lift from being stowed while occupied shall not apply if the stowed position is within the passenger compartment and the lift is intended to be stowed while occupied.

(3) *Emergency operation.* The lift shall incorporate an emergency method of deploying, lowering to ground level with a lift occupant, and raising and stowing the empty lift if the power to the lift fails. No emergency method, manual or otherwise, shall be capable of being operated in a manner that could be hazardous to the lift occupant or to the operator when operated according to manufacturer's instructions, and shall not permit the platform to be stowed or folded when occupied, unless the lift is a rotary lift and is intended to be stowed while occupied.

(4) *Power or equipment failure.* Platforms stowed in a vertical position, and deployed platforms when occupied, shall have provisions to prevent their deploying, falling, or folding any faster than 12 inches/second or their dropping of an occupant in the event of a single failure of any load carrying component.

(5) *Platform barriers.* The lift platform shall be equipped with barriers to prevent any of the wheels of a wheelchair or mobility aid from rolling off the platform during its operation. A movable barrier or inherent design feature shall prevent a wheelchair or mobility aid from rolling off the edge closest to the vehicle until the platform is in its fully raised position. Each side of the lift platform which extends beyond the vehicle in its raised position shall have a barrier a minimum 1-1/2 inches high. Such barriers shall not interfere with maneuvering into or out of the aisle. The loading-edge barrier (outer barrier) which functions as a loading ramp when the lift is at ground level, shall be sufficient when raised or closed, or a supplementary system shall be provided, to prevent a power wheelchair or mobility aid from riding over or defeating it. The outer barrier of the lift shall automatically raise or close, or a supplementary system shall automatically engage, and remain raised, closed, or engaged at all times that the platform is more than 3 inches above the roadway or sidewalk and the platform is occupied. Alternatively, a barrier or system may be raised, lowered, opened, closed, engaged, or disengaged by the lift operator, provided an interlock or inherent design feature prevents the lift from rising unless the barrier is raised or closed or the supplementary system is engaged.

(6) *Platform surface.* The platform surface shall be free of any protrusions over 1/4 inch high and shall be slip resistant. The platform shall have a minimum clear width of 28-1/2 inches at the platform, a minimum clear width of 30 inches measured from 2 inches above the platform surface to 30 inches above the platform, and a minimum clear length of 48 inches measured from 2 inches above the surface of the platform to 30 inches above the surface of the platform. (See Fig. 1)

(7) *Platform gaps.* Any openings between the platform surface and the raised barriers shall not exceed 5/8 inch in width. When the platform is at vehicle floor height with the inner barrier (if applicable) down or retracted, gaps between the forward lift platform edge and the vehicle floor shall not exceed 1/2 inch horizontally and 5/8 inch vertically. Platforms on semi-automatic lifts may have a hand hold not exceeding 1-1/2 inches by 4-1/2 inches located between the edge barriers.

(8) *Platform entrance ramp.* The entrance ramp, or loading-edge barrier used as a ramp, shall not exceed a slope of 1:8, measured on level ground, for a maximum rise of 3 inches, and the transition from roadway or sidewalk to ramp may be vertical without edge treatment up to 1/4 inch. Thresholds between 1/4 inch and 1/2 inch high shall be beveled with a slope no greater than 1:2.

(9) *Platform deflection.* The lift platform (not including the entrance ramp) shall not deflect more than 3 degrees (exclusive of vehicle roll or pitch) in any direction between its unloaded position and its position when loaded with 600 pounds applied through a 26 inch by 26 inch test pallet at the centroid of the platform.

(10) *Platform movement.* No part of the platform shall move at a rate exceeding 6 inches/second during lowering and lifting an occupant, and shall not exceed 12 inches/second during deploying or stowing. This requirement does not apply to the deployment or stowage cycles of lifts that are

manually deployed or stowed. The maximum platform horizontal and vertical acceleration when occupied shall be 0.3g.

(11) *Boarding direction.* The lift shall permit both inboard and outboard facing of wheelchair and mobility aid users.

(12) *Use by standees.* Lifts shall accommodate persons using walkers, crutches, canes or braces or who otherwise have difficulty using steps. The platform may be marked to indicate a preferred standing position.

(13) *Handrails.* Platforms on lifts shall be equipped with handrails on two sides, which move in tandem with the lift, and which shall be graspable and provide support to standees throughout the entire lift operation. Handrails shall have a usable component at least 8 inches long with the lowest portion a minimum 30 inches above the platform and the highest portion a maximum 38 inches above the platform. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1 1/4 inches and 1 1/2 inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than 1/8 inch. Handrails shall be placed to provide a minimum 1-1/2 inches knuckle clearance from the nearest adjacent surface. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the vehicle.

(c) *Vehicle ramp.* - (1) *Design load.* Ramps 30 inches or longer shall support a load of 600 pounds, placed at the centroid of the ramp distributed over an area of 26 inches by 26 inches, with a safety factor of at least 3 based on the ultimate strength of the material. Ramps shorter than 30 inches shall support a load of 300 pounds.

(2) *Ramp surface.* The ramp surface shall be continuous and slip resistant; shall not have protrusions from the surface greater than 1/4 inch high; shall have a clear width of 30 inches; and shall accommodate both four-wheel and three-wheel mobility aids.

(3) *Ramp threshold.* The transition from roadway or sidewalk and the transition from vehicle floor to the ramp may be vertical without edge treatment up to 1/4 inch. Changes in level between 1/4 inch and 1/2 inch shall be beveled with a slope no greater than 1:2.

(4) *Ramp barriers.* Each side of the ramp shall have barriers at least 2 inches high to prevent mobility aid wheels from slipping off.

(5) *Slope.* Ramps shall have the least slope practicable and shall not exceed 1:4 when deployed to ground level. If the height of the vehicle floor from which the ramp is deployed is 3 inches or less above a 6-inch curb, a maximum slope of 1:4 is permitted; if the height of the vehicle floor from which the ramp is deployed is 6 inches or less, but greater than 3 inches, above a 6-inch curb, a maximum slope of 1:6 is permitted; if the height of the vehicle floor from which the ramp is deployed is 9 inches or less, but greater than 6 inches, above a 6-inch curb, a maximum slope of 1:8 is permitted; if the height of the vehicle floor from which the ramp is deployed is greater than 9 inches above a 6-inch curb, a slope of 1:12 shall be achieved. Folding or telescoping ramps are permitted provided they meet all structural requirements of this section.

(6) *Attachment.* When in use for boarding or alighting, the ramp shall be firmly attached to the vehicle so that it is not subject to displacement when loading or unloading a heavy power mobility aid and that no gap between vehicle and ramp exceeds 5/8 inch.

(7) *Stowage.* A compartment, securement system, or other appropriate method shall be provided to ensure that stowed ramps, including portable ramps stowed in the passenger area, do not impinge on a passenger's wheelchair or mobility aid or pose any hazard to passengers in the event of a sudden stop or maneuver.

(8) *Handrails.* If provided, handrails shall allow persons with disabilities to grasp them from outside the vehicle while starting to board, and to continue to use them throughout the boarding process, and shall have the top between 30 inches and 38 inches above the ramp surface. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1 1/4 inches and 1 1/2 inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than 1/8 inch. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the vehicle.

(d) *Securement devices.* - (1) *Design load.* Securement systems on vehicles with GVWRs of 30,000 pounds or above, and their attachments to such vehicles, shall restrain a force in the forward longitudinal direction of up to 2,000 pounds per securement leg or clamping mechanism and a minimum of 4,000 pounds for each mobility aid. Securement systems on vehicles with GVWRs of up to 30,000 pounds, and their attachments to such vehicles, shall restrain a force in the forward longitudinal direction of up to 2,500 pounds per securement leg or clamping mechanism and a minimum of 5,000 pounds for each mobility aid.

(2) *Location and size.* The securement system shall be placed as near to the accessible entrance as practicable and shall have a clear floor area of 30 inches by 48 inches. Such space shall adjoin, and may overlap, an access path. Not more than 6 inches of the required clear floor space may be accommodated for footrests under another seat provided there is a minimum of 9 inches from the floor to the lowest part of the seat overhanging the space. Securement areas may have fold-down seats to accommodate other passengers when a wheelchair or mobility aid is not occupying the area, provided the seats, when folded up, do not obstruct the clear floor space required. (See Fig. 2)

(3) *Mobility aids accommodated.* The securement system shall secure common wheelchairs and mobility aids and shall either be automatic or easily attached by a person familiar with the system and mobility aid and having average dexterity.

(4) *Orientation.* In vehicles in excess of 22 feet in length, at least one securement device or system required by paragraph (a) of this section shall secure the wheelchair or mobility aid facing toward the front of the vehicle. In vehicles 22 feet in length or less, the required securement device may secure the wheelchair or mobility aid either facing toward the front of the vehicle or rearward. Additional securement devices or systems shall secure the wheelchair or mobility aid facing forward or rearward. Where the wheelchair or mobility aid is secured facing the rear of the vehicle, a padded barrier shall be provided. The padded barrier shall extend from a height of 38 inches from the vehicle floor to a height of 56 inches from the vehicle floor with a width of 18 inches, laterally centered immediately in back of the seated individual. Such barriers need not be solid provided equivalent protection is afforded.

(5) *Movement.* When the wheelchair or mobility aid is secured in accordance with manufacturer's instructions, the securement system shall limit the movement of an occupied wheelchair or mobility aid to no more than 2 inches in any direction under normal vehicle operating conditions.

(6) *Stowage.* When not being used for securement, or when the securement area can be used by standees, the securement system shall not interfere with passenger movement, shall not present any hazardous condition, shall be reasonably protected from vandalism, and shall be readily accessed when needed for use.

(7) *Seat belt and shoulder harness.* For each wheelchair or mobility aid securement device provided, a passenger seat belt and shoulder harness, complying with all applicable provisions of 49 CFR part 571, shall also be provided for use by wheelchair or mobility aid users. Such seat belts and shoulder harnesses shall not be used in lieu of a device which secures the wheelchair or mobility aid itself.

§1192.25 Doors, steps and thresholds.

(a) *Slip resistance.* All aisles, steps, floor areas where people walk and floors in securement locations

shall have slip-resistant surfaces.

(b) *Contrast.* All step edges, thresholds, and the boarding edge of ramps or lift platforms shall have a band of color(s) running the full width of the step or edge which contrasts from the step tread and riser, or lift or ramp surface, either light-on-dark or dark-on-light.

(c) *Door height.* For vehicles in excess of 22 feet in length, the overhead clearance between the top of the door opening and the raised lift platform, or highest point of a ramp, shall be a minimum of 68 inches. For vehicles of 22 feet in length or less, the overhead clearance between the top of the door opening and the raised lift platform, or highest point of a ramp, shall be a minimum of 56 inches.

§1192.27 Priority seating signs.

(a) Each vehicle shall contain sign(s) which indicate that seats in the front of the vehicle are priority seats for persons with disabilities, and that other passengers should make such seats available to those who wish to use them. At least one set of forward-facing seats shall be so designated.

(b) Each securement location shall have a sign designating it as such.

(c) Characters on signs required by paragraphs (a) and (b) of this section shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10, with a minimum character height (using an upper case "X") of 5/8 inch, with "wide" spacing (generally, the space between letters shall be 1/16 the height of upper case letters), and shall contrast with the background either light-on-dark or dark-on-light.

§1192.29 Interior circulation, handrails and stanchions.

(a) Interior handrails and stanchions shall permit sufficient turning and maneuvering space for wheelchairs and other mobility aids to reach a securement location from the lift or ramp.

(b) Handrails and stanchions shall be provided in the entrance to the vehicle in a configuration which allows persons with disabilities to grasp such assists from outside the vehicle while starting to board, and to continue using such assists throughout the boarding and fare collection process. Handrails shall have a cross-sectional diameter between 1 1/4 inches and 1 1/2 inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than 1/8 inch. Handrails shall be placed to provide a minimum 1-1/2 inches knuckle clearance from the nearest adjacent surface. Where on-board fare collection devices are used on vehicles in excess of 22 feet in length, a horizontal passenger assist shall be located across the front of the vehicle and shall prevent passengers from sustaining injuries on the fare collection device or windshield in the event of a sudden deceleration. Without restricting the vestibule space, the assist shall provide support for a boarding passenger from the front door through the boarding procedure. Passengers shall be able to lean against the assist for security while paying fares.

(c) For vehicles in excess of 22 feet in length, overhead handrail(s) shall be provided which shall be continuous except for a gap at the rear doorway.

(d) Handrails and stanchions shall be sufficient to permit safe boarding, on-board circulation, seating and standing assistance, and alighting by persons with disabilities.

(e) For vehicles in excess of 22 feet in length with front-door lifts or ramps, vertical stanchions immediately behind the driver shall either terminate at the lower edge of the aisle-facing seats, if applicable, or be "dog-legged" so that the floor attachment does not impede or interfere with wheelchair footrests. If the driver seat platform must be passed by a wheelchair or mobility aid user entering the vehicle, the platform, to the maximum extent practicable, shall not extend into the aisle or vestibule beyond the wheel housing.

(f) For vehicles in excess of 22 feet in length, the minimum interior height along the path from the lift to the securement location shall be 68 inches. For vehicles of 22 feet in length or less, the minimum interior height from lift to securement location shall be 56 inches.

§1192.31 Lighting.

(a) Any stepwell or doorway immediately adjacent to the driver shall have, when the door is open, at least 2 foot-candles of illumination measured on the step tread or lift platform.

(b) Other stepwells and doorways, including doorways in which lifts or ramps are installed, shall have, at all times, at least 2 foot-candles of illumination measured on the step tread, or lift or ramp, when deployed at the vehicle floor level.

(c) The vehicle doorways, including doorways in which lifts or ramps are installed, shall have outside light(s) which, when the door is open, provide at least 1 foot-candle of illumination on the street surface for a distance of 3 feet perpendicular to the bottom step tread or lift outer edge. Such light(s) shall be shielded to protect the eyes of entering and exiting passengers.

§1192.33 Fare box.

Where provided, the farebox shall be located as far forward as practicable and shall not obstruct traffic in the vestibule, especially wheelchairs or mobility aids.

§1192.35 Public information system.

(a) Vehicles in excess of 22 feet in length, used in multiple-stop, fixed-route service, shall be equipped with a public address system permitting the driver, or recorded or digitized human speech messages, to announce stops and provide other passenger information within the vehicle.

(b) [Reserved]

§1192.37 Stop request.

(a) Where passengers may board or alight at multiple stops at their option, vehicles in excess of 22 feet in length shall provide controls adjacent to the securement location for requesting stops and which alerts the driver that a mobility aid user wishes to disembark. Such a system shall provide auditory and visual indications that the request has been made.

(b) Controls required by paragraph (a) of this section shall be mounted no higher than 48 inches and no lower than 15 inches above the floor, shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2 N).

§1192.39 Destination and route signs.

(a) Where destination or route information is displayed on the exterior of a vehicle, each vehicle shall have illuminated signs on the front and boarding side of the vehicle.

(b) Characters on signs required by paragraph (a) of this section shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10, with a minimum character height (using an upper case "X") of 1 inch for signs on the boarding side and a minimum character height of 2 inches for front "heads signs", with "wide" spacing (generally, the space between letters shall be 1/16 the height of upper case letters), and shall contrast with the background, either dark-on-light or light-on-dark.

Appendix C

AMD Standard 002 Body Door Retention Components Test

AMD Standard 004 Litter Retention System

AMD STANDARD 002

BODY DOOR RETENTION COMPONENTS TEST

- S1. SCOPE. This standard shall establish requirements for the testing of all body door retention components on the entry doors, whether side or rear, as installed in the vehicle body framework.
- S2. PURPOSE. The purpose of this standard is to minimize the possible failure of the door(s) to remain closed and latched when subjected to the adverse forces that can result from a vehicle impact.
- S3. APPLICABILITY. This standard shall apply to Type I and III ambulances only.
- S4. DEFINITIONS.
- S4.1 "Side Entry Door" shall be defined as the body door on the right side of the ambulance body that provides entry into the patient compartment and through which patients may be loaded/unloaded.
- S4.2 "Rear Door" means the door(s) at the rear of the body used to load patients into the patient compartment including but not limited to a two-part door.
- S4.3 "Fully Latched Position" is defined as the last or fully closed position on the striker(s).
- S4.4 "Secondary Latched Position" is defined as the first latched or partially closed position on the striker assembly.
- S4.5 "Striker" means a mechanical device with which the latch engages on the opposing member of the body framework.
- S4.6 "Latch" means a mechanical device used to position the door in a closed position relative to the body framework with provision for controlled release (or operation).
- S4.7 "Force Application Brackets" shall be defined as the bracket(s) used to apply the prescribed force to the door(s), latch(es) and hinge(s).
- S4.8 "Transverse Load" means a test to determine the ability of the door, latch striker, and hinge to withstand the forces specified in the direction of the door opening.
- S4.9 "Longitudinal Load" means a test to determine the ability of the door, latch, striker, and hinge to withstand the forces specified in a direction horizontal and a right angle to that of the door opening.
- S5. REQUIREMENTS. Each door shall be capable of withstanding the transverse and longitudinal loads specified in Table 1 of this section. During these tests the door(s) or its retention components shall not:
- Open at any time during the test procedure.
 - Fail at the latch, striker(s), hinge or their points of attachment to the door or the body framework.

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Table I: TEST LOAD POUNDS				
Applied to	Side Door		Rear Door	
	Transverse Load	Longitudinal Load	Transverse Load	Longitudinal Load
Fully Latched Position	2,500	2,500	2,500	2,500
Secondary Latched Position	1,500	1,500	1,500	1,500
Hinge	2,500	2,500	2,500	2,500

- S6. TEST PROCEDURES. Test forces shall be applied in all required directions and/or positions after the installation of associated body door retention components.
- S6.1 Force shall be applied as specified in Table I of S5 to force application bracket(s) properly applied to the door structure. Care must be used to position the bracket so that as the load is applied it will be equally distributed and as near the latch or hinge being tested as possible.
- S6.2 Test devices used to apply loads to the force application brackets shall be suitably installed within the body in such a manner that the opposing forces will be supported by the body structure.
- S6.3 Forces shall be applied to a continuous hinge so that the load will be distributed equally from top to bottom. When individual (strap type) hinges are used the force shall be applied in such a manner that the load specified in Table I of S5 is distributed proportionally on all the hinges used.
- S7. TEST CONDITIONS. The following conditions shall apply to the requirement as specified in Table I of S5.
- S7.1 The ambulance body shall be positioned on a level horizontal surface or mounted on a chassis parked on a level surface with the transmission in the "park" position and emergency brake set.
- S7.2 The ambulance body must be structurally completed up to but not including the interior panel or cabinet installation.
- S7.3 Components and/or assemblies used with this test must be replaced by the ambulance manufacturer prior to the completion and sale of this unit.
- S7.4 The ambient temperature during this test shall be within the range from 0 degrees Fahrenheit (-17.8 degrees Celsius) to 100 degrees Fahrenheit (37.8 degrees Celsius).
- S8. All hinged passenger door latches and striker assemblies must meet Federal Motor Vehicle Safety Standard (FMVSS) 206 as tested under SAE Recommended Practice J839.¹
- S8.1 Latch and striker assembly must be tested using test fixture prescribed in SAE J839 for longitudinal load, transverse load and inertia load.² See Figure 1

¹ Test can be performed by latch and striker manufacturer if single source and a letter of compliance is supplied to the body builder stating that the assembly as furnished meets FMVSS 206.

² If striker and latch assembly is furnished by two different manufacturers, or if there is a modification to the single source manufacturer's assembly, the assembly must be tested by the body builder in accordance with SAE J839.

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AMD STANDARD 004

LITTER RETENTION SYSTEM

- S1. PURPOSE AND SCOPE. This standard establishes requirements for the litter retention system and its installation to minimize possibility of its failure by forces acting upon it as a result of vehicle crashes and/or sudden driving maneuvers.
- S2. APPLICABILITY. This standard applies to all ambulances.
- S3. DEFINITIONS.
- S3.1 "Litter Retention System" – Means a system that provides means for securing a litter by the posts and wheels to the floor and/or side wall of an ambulance.
- S3.2 "Litter" – Means a wheeled cot (elevating) and/or a wheeled cot-bench (non-elevating).
- S4. REQUIREMENTS. Each litter retention system shall be capable of meeting requirements set forth under this standard when tested in accordance with test procedures outlined in S6.
- S4.1 The litter retention system, anchorages, and litter fastener(s) shall not fail or release when subjected to a force of 2,200 pounds applied in the longitudinal, lateral, and vertical direction. (Note: These are three individual tests.)
- S5. TEST CONDITIONS. The following conditions apply:
- S5.1 The ambulance floor shall be in a horizontal plane.
- S5.2 If multiple locations, the litter retention system shall be tested in each location.
- S5.3 The testing device is a structure of appropriate design used for locking onto the hook(s) (or other litter securing means) of the litter retention system (similar to the cot frame). Force is applied through a pivot located 15 inches above the floor, at a point representing the center of the litter.
- S6. TEST PROCEDURE
- S6.1 Install the test device in the litter retention system in such a manner that will preclude contact friction with the floor or cabinet surfaces.
- S6.2 Attach a cable with a calibrated, in-line strain gauge to the test device pivot and apply an initial vertical upward load to the device.
- S6.3 As rapidly as possible apply the full force required in S4.1 to the device.
- S6.4 Record strain gauge readings and observe any deformation of floor, cabinets or retention mechanism.
- S6.5 Release applied load.
- S6.6 If any deformation has occurred in the retention mechanism, (hooks, antlers or side bars) replace damaged parts.
- S6.7 Reinstall test fixture and repeat steps S6.1 through S6.5 in the longitudinal direction and again in the lateral direction.
- S6.8 Record all resultant data.

Note: Rotation or deformation of retention mechanisms does not constitute failure.

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