Safety and Health
Tech Tips

USDA United States Department of Agriculture
Forest Service
Technology & Development Program
June 2010
6700 1067–2314P–MTDC

Catch Cargo With a Barrier

Mary Ann Davies, Project Leader

Highlights...

- Unsecured cargo may become projectiles that can cause injuries or fatalities during a vehicle accident or sudden stop.
- Forest Service regulations require cargo to be secured in the passenger compartment of vehicles and in the beds of pickup trucks.
- Barriers can cost from $20 to $1,200.

Figure 1—Flying objects can make an accident much worse. Use a cargo barrier and store all your gear behind it.

Loose objects (figure 1) in a vehicle's passenger compartment or in the bed of a pickup truck can become deadly projectiles during a vehicle accident or sudden stop. Forest Service and Bureau of Land Management Employees can see the dangers of unsecured objects in a 60-second safety tip at <http://www.fs.fed.us/pubs/videos/wmv/08672V02/safety_cargo.fsweb.mtdc.wo.wmv>.

Donald Crompton of the Wallowa-Whitman National Forest asked the Missoula Technology and Development Center (MTDC) to see whether cargo barriers used in Forest Service fleet vehicles meet Forest Service safety requirements. Safety requirements include:

- The Forest Service's Driver-Operator Guide (EM-7130-2). "Do not carry loose objects, such as tools or instruments, in vehicle passenger compartments unless passengers are shielded by a mesh divider or other protective devices. Keep dash and floor clear of objects."
- The Forest Service Health and Safety Code Handbook (FSH 6709.11). The handbook directs employees to secure all objects inside the cab and cargo areas(s).

MTDC contacted Forest Service regional fleet managers and fleet equipment specialists across the Nation to ask about cargo barriers being used in sport utility vehicles, vans, pickup trucks, vehicles with side airbags, and gas/electric hybrid vehicles.

Findings

Using partitions in Forest Service vehicles is critical for ensuring the safety of vehicle occupants. Employees may need to carry hardhats, digging or cutting tools, briefcases, cameras, and lunch boxes to the jobsite. Containing these objects behind a partition or cargo barrier will prevent them from flying forward, which can cause harm or serious injury.

The Forest Service's Driver-Operator Guide and the Health and Safety Code Handbook do not dictate what type of barrier needs to be installed. This decision is left to the discretion of fleet managers. This tech tip describes different types of barriers that are available.

For additional information, contact: *Mary Ann Davies, project leader; USDA Forest Service, MTDC; 5785 Hwy. 10 West; Missoula, MT 59808–9361. Phone: 406–329–3981; fax: 406–329–3719; email: mdavies@fs.fed.us*

Partitions

Some manufacturers design partitions that fit specific vehicles. The following are some of the choices available:

Commercial Products

Pro-gard Products LLC
<http://www.progard.com>

Pro-gard manufactures cargo partitions for Chevrolets (Suburbans and Tahoes) and Fords (Expeditions, Explorers, and F150s) with and without side curtain airbags. Prices range from $376 for a 7-gauge wire partition to $435 for a polycarbonate window.

Pros:

- Partitions are compatible with side curtain airbags.
- The polycarbonate window gives the driver an unobstructed view out the back.
- Some windows slide open.

Cons:

- Installation requires drilling into the vehicle body.
- Partitions only fit specific models and years.

Setina Manufacturing Co., Inc.
<http://www.setina.com>

Setina manufactures vehicle partitions for Chevrolets (Suburbans and Tahoes), Dodges (Durangos and Magnums), and Fords (Expeditions and Explorers). Partitions also are available for a variety of vans. Setina has partition installation instructions for a Toyota Prius gas/electric hybrid and will help with other gas/electric hybrids when asked. Prices range from $415 to $589. Window options are 11-gauge expanded metal or polycarbonate (impact-resistant) plastic (figure 2).

Pros:

- Partitions are compatible with side curtain airbags.
- Partitions are laboratory tested.
- Partitions can be mounted in gas/electric hybrid vehicles.
- Some windows can slide or fold down.

Cons:

- Installation requires drilling into the vehicle body.
- Partitions only fit specific models and years.

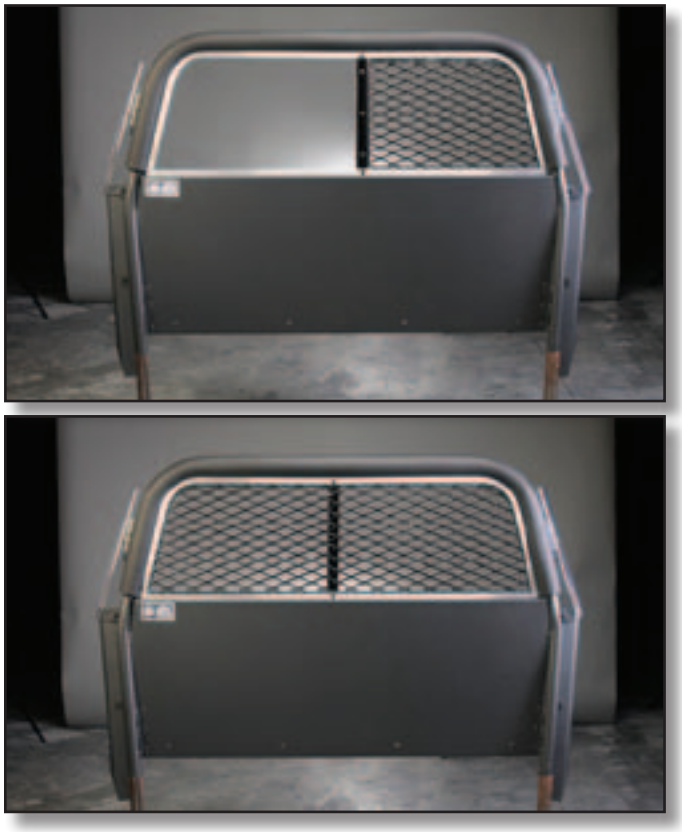

Figure 2—Manufactured partitions usually include a metal panel with a window. Both the polycarbonate window (top photo) and the expanded metal window (bottom photo) provide good protection. The polycarbonate window may offer better visibility.
—Courtesy of Setina Manufacturing Co., Inc.

Troy Products
<http://www.troyproducts.com>

Troy Products manufactures partitions for a variety of Ford, General Motors (GM), and Dodge vehicles with and without side curtain airbags. Prices average around $370. Window options are 75 percent polycarbonate/25 percent wire mesh or 50 percent polycarbonate/50 percent wire mesh.

Pros:

- Partitions are available for many vehicle models.
- Troy Products has a General Services Administration (GSA) contract.
- Some windows slide open.

Cons:

- Installation requires drilling into the vehicle body.
- Partitions only fit specific models and years.

Custom-Welded Partitions

Many fleet managers have a local metal fabricator or welding shop weld expanded metal partitions for specific vehicles (figure 3). The partitions usually cost $300 to $400.

Pros:

- Partitions are custom fit to each vehicle.
- Partitions can be modified to fit into another vehicle.

Cons:

- Partitions can't be easily adjusted.
- Partitions can obscure the driver's view out the rear window.

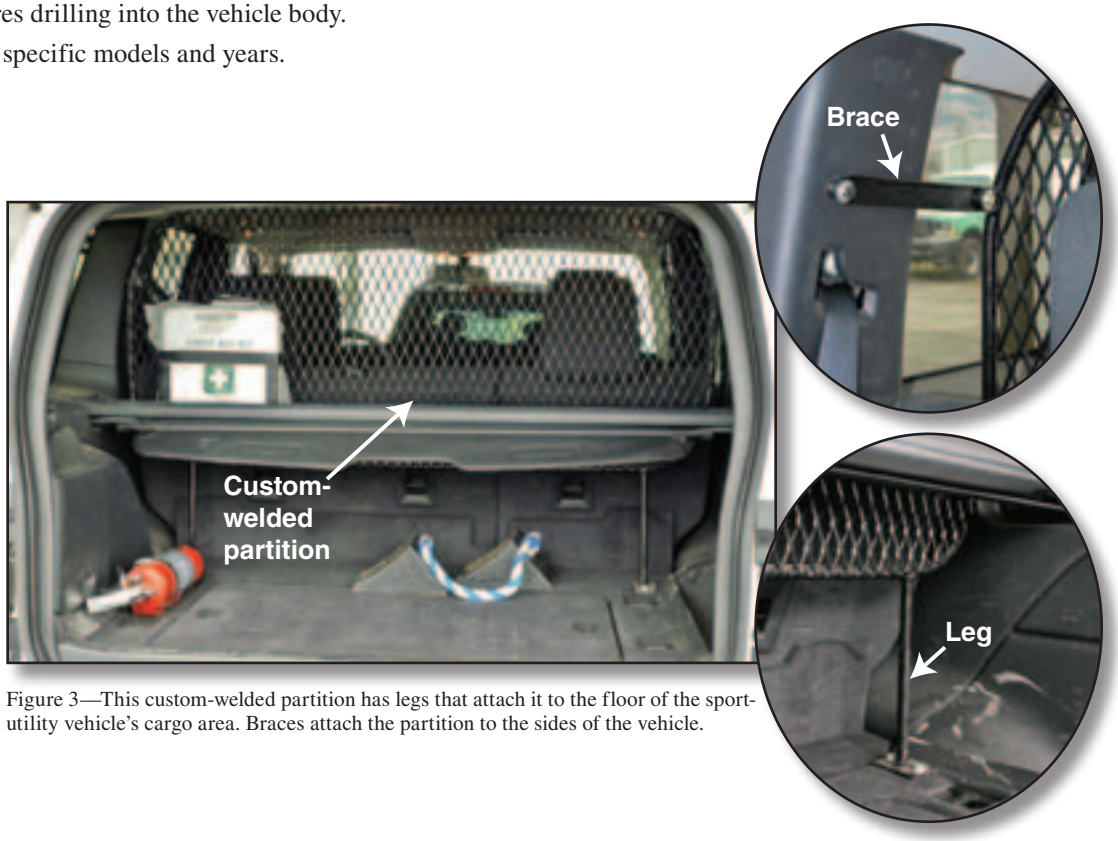

Figure 3—This custom-welded partition has legs that attach it to the floor of the sport-utility vehicle's cargo area. Braces attach the partition to the sides of the vehicle.

Pet Barriers

Pet barriers can be used in Forest Service vehicles to contain tools and other equipment.

Metal

Kennel-Aire, LLC
<http://www.kennel-aire.com>

Pet stores sell 12-gauge wire mesh barriers. This barrier's width expands from 36 inches to 70 inches. Wingnuts turned on a threaded rod at the bottom of the mesh barrier apply tension to the vehicle's headliner, holding the barrier in place. Prices average about $70.

Pro:

- Barriers are inexpensive.

Con:

- Barriers are not secured to the vehicle frame.

Nylon Mesh

Pet stores sell mesh pet barriers that come in many varieties, often with 1- by 1-inch nylon mesh. Some barriers come in four sizes that fit most vehicles and one size for minivans. Prices range from $35 to $75.

Pros:

- Barriers are available in several sizes.
- Barriers are inexpensive.

Cons:

- Barriers usually are attached with hook and loop tape (Velcro) to the vehicle's molding.
- Barriers can obscure the driver's view out the rear window.

Cargo Nets

Many sizes of cargo nets are available, with prices ranging from $20 to $75.

Pros:

- Cargo nets installed in passenger compartments can hold personal items, paperwork, and laptop computers.
- Cargo nets attached inside the bed of a pickup truck can hold tools.

Cons:

- Cargo nets must be attached with hook and loop tape or other fasteners to the vehicle's interior or to the bed of a pickup.
- Cargo nets are not appropriate for large, heavy equipment.

Pickup Bed Covers

Tonneau Covers World
<http://www.tonneaucoversworld.com>

Tonneau stocks a variety of pickup bed covers for Ford, GM, Dodge, and Jeep trucks. Covers may be made from a soft fabric-like material or from hard material such as fiberglass, aluminum, or plastic. Prices range from $200 to $1,200.

Pros:

- Pickup bed covers keep items clean and dry.
- Styles are available for pickup beds with toolboxes.

Cons:

- Covers may not stop heavy items during an accident.
- Soft covers can be easily vandalized.

Conclusions

When vehicle safety requirements are met, injuries or fatalities to Forest Service employees can be prevented. Using cargo barriers in Forest Service vehicles is critical for ensuring the safety of vehicle occupants.

Most employees neglect to secure personal items such as water bottles, thermoses, and other smaller items in the passenger compartment. Small cargo bags that attach to the sides of doors or to passenger seats could store these items safely. Rooftop carriers, commonly called rocket boxes (figure 4), are another way to ensure that items won't create a hazard in a vehicle's passenger compartment.

The proper cargo barrier depends on the types of items that will be in the vehicle's passenger compartment or the bed of a pickup truck. No certification tests guarantee the strength or crashworthiness of barriers. Fleet managers and fleet specialists have a variety of options to choose from. Safety is paramount—use the appropriate barrier for your vehicle based on the cargo you are transporting.

Figure 4—Rocket boxes are another way to store some types of cargo safely.

Acknowledgments

Thanks to all the regional fleet managers and fleet specialists for taking the time to describe the partitions and other cargo barriers they use to secure items transported in Forest Service vehicles. Also, thanks for the frank discussions about the challenges of trying to install partitions in some of the newer gas/electric hybrid vehicles and in the variety of makes and models of vehicles in each region's fleet.

About the Author

Mary Ann Davies received a bachelor's degree in mechanical engineering with a minor in industrial and management engineering from Montana State University. She worked in the Pacific Northwest Region as a facility engineer and as a tramway engineer. Davies has worked in fire management as a crewmember and as a crewboss. She worked for 5 years with the Rocky Mountain Research Station in the fire chemistry and fire behavior groups before coming to MTDC in 1999.

Library Card

Davies, Mary Ann. 2010. Catch cargo with a barrier. Tech Tip 1067–2314P–MTDC. Missoula, MT: U.S. Department of Agriculture, Forest Service, Missoula Technology and Development Center. 6 p.

Forest Service regulations require cargo be secured in the passenger compartment of vehicles and in the beds of pickup trucks. Unsecured cargo can become projectiles during sudden stops or accidents. The Missoula Technology and Development Center contacted Forest Service fleet managers to learn more about the types of barriers that were being used to protect passengers from loose cargo.

Keywords: accidents, nets, partitions, pickup trucks, restraints, rocket boxes, safety at work, vehicles

For additional information about cargo barriers, contact Mary Ann Davies at MTDC:

USDA Forest Service
Missoula Technology and Development Center
5785 Hwy. 10 West
Missoula, MT 59808-9361
Phone: 406–329–3981
Email: mdavies@fs.fed.us

Electronic copies of MTDC's documents are available on the Internet at:

http://www.fs.fed.us/eng/pubs

Forest Service and Bureau of Land Management employees can search MTDC's documents, CDs, DVDs, and videos on their internal computer networks at:

http://fsweb.mtdc.wo.fs.fed.us/search/

The Forest Service, United States Department of Agriculture (USDA), has developed this information for the guidance of its employees, its contractors, and its cooperating Federal and State agencies and is not responsible for the interpretation or use of this information by anyone except its own employees. The use of trade, firm, or corporation names in this document is for the information and convenience of the reader and does not constitute an endorsement by the Department of any product or service to the exclusion of others that may be suitable.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.