

SLIDEOUT ROOMS

This month's article is an excerpt from a recent service bulletin to our dealers covering the installation and operation of the various slideout rooms available in Winnebago and/or Itasca vehicles. Slideouts are a common topic of conversation, and many of the questions we receive concern their basic components and function. The following is intended to answer many of these questions and to offer a general explanation as to how these rooms work.

Two-Cylinder Slideout Rooms

General Information

The STOREMORE™ slideout room uses two ram assemblies bolted directly to the basement steel framework. Each ram operates independently of the other, yet they extend and retract together by way of a hydraulic synchronizing cylinder mounted to the chassis frame rail.

There are two types of StoreMore slideout room systems:

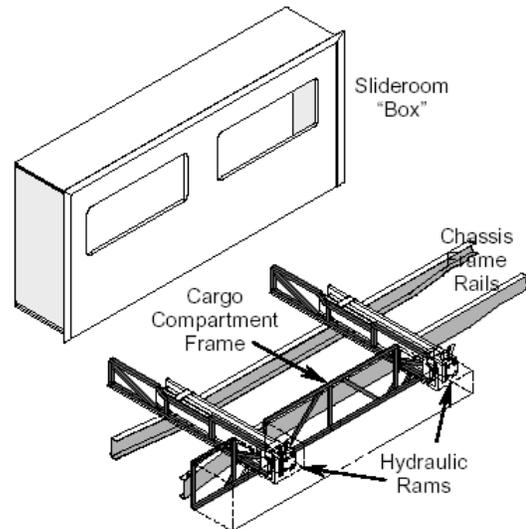
Standard – has fixed, two-piece, telescoping tube ram assemblies that extend straight outward.

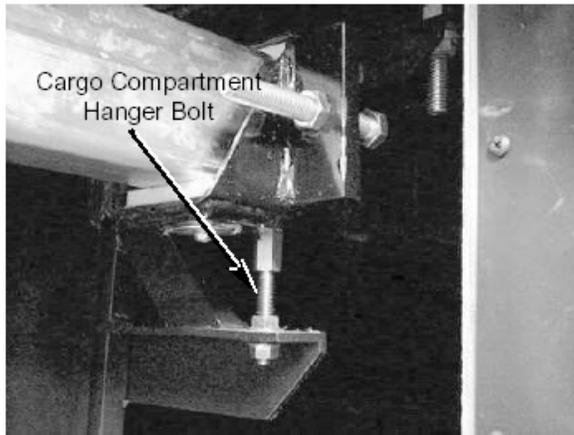
Flat-Floor – has three-piece telescoping ram assemblies with inclining mechanisms that lower the slideout floor to coach floor level when extended and raise it back up during retraction.

Synchronizing Cylinder

The "sync" cylinder has three fluid chambers. There are two fixed-volume chambers, each one connected to a ram assembly. A separate actuating chamber is connected directly to the hydraulic pump. As the pump is operated, the sync cylinder pushes an equal amount of fluid from these fixed volume chambers through hydraulic hoses of equal length and diameter to each hydraulic cylinder, similar to the master cylinder pushing fluid to the wheel cylinders in a hydraulic brake system. Since fluids can't be compressed, the synchronizing cylinder can precisely control the speed and the timing of the rams.

In the STOREMORE™ design, the storage compartment extends and retracts along with the slideroom, acting as a single unit. The door side of the compartment is fastened directly to the slideroom floor framework, while the back end of the compartment is suspended from a unique hanger assembly mounted to the bottom of the ram. This installation allows easy access to the cargo compartment with the room extended or retracted, without having to duck under an extended slideout room.





Basic Installation

Standard: In this installation, the slideroom “box” sits directly on the interior floor of the coach. The weight of the room is distributed between the coach floor and the basement steel structure by way of the hydraulic ram assemblies.

Flat Floor: In the Flat Floor slideout installation, the weight of the entire slideroom box and the storage compartment is carried by a combination of the slideroom glide strips and the hydraulic rams. The support ratio changes, depending if the room is retracted or extended, because of the unique design and function of the flat floor ram assembly.

Glide Strips

Glide strips fastened to the bottom of the slideroom near the aisle-side edge of the floor distribute the weight of the room across the room’s entire width. The glide strip construction depends on the type of floor covering the room must travel over.

In carpeted areas of the coach floor the glide strip consists of an aluminum rail with a curved insert of polyethylene plastic.

Glide strips used over vinyl and tile flooring have changed design several times since initial slideroom production started. Early versions used a combination of the same aluminum rail and plastic strip wrapped in a thin carpet. A double layer of lauan plywood was added as a shim to compensate for the flooring height difference between the carpeted and smooth surfaces. Beginning in January of 2000 the design changed from the shimmed and wrapped aluminum strip to a beveled $\frac{3}{4}$ inch \times 3 inch wooden strip wrapped with a heavy felt-like material.

Ram Assemblies

The balance of the room weight that is not carried by the glide strips is shared by the two telescoping hydraulic rams. The slideroom bolts directly to the ram pivot/flange assembly at the slideroom outer frame.

Flat Floor: The flat floor ram assembly is a three-piece telescoping unit consisting of the base unit with the two extending tubes and the hydraulic cylinder. The extending tubes in the ram assembly are staged – the first stage and second stage extend sequentially using an interlocking mechanism (commonly referred to as “the flippers”) to couple or interlock the tubes at a specific location in the tube’s travel. This unique feature allows the slideroom floor to lower to the same level as the coach floor. This is accomplished using an inclined surface inside the ram assembly and a cross-member or support tube which is mounted to the second stage extension tubes of each ram.

In a retracted position, the weight of the slideroom is distributed between the coach floor and the basement steel structure by way the hydraulic rams. As the slideroom is extended, the weight of the slideroom that has been carried over the coach floor on the glide strips will transfer from the coach floor to the support tube.

Weather Seals

The weather is held out by a combination of rubber wiper seals, bulb seals and design features in the construction of the room. The room endwalls are cut with a 7mm taper, so the top is slightly narrower than the bottom. When the room is extended or retracted, the top seal will contact the coach sidewall first, making the top seal tighter to provide a better seal against leaks.

Important: Some adjustments made to the slideroom can change the amount of pressure against the top bulb seal. Compressing the seal too tightly may damage the seal and not tightly enough can allow leakage. Normally, bulb seal compression near the bottom of the room isn't affected unless a hydraulic cylinder has been replaced or the travel limits adjusted.

A simple ramp is another mechanical method used to improve sealing of this slideroom. The ramps currently in use are shown in the photos.

- Extruded ABS plastic ramp
- Bevel-edged plywood ramp

They are fastened to the outer edge of the coach floor in the sidewall opening for the slideroom. The beveled edge of the ramp points inward. The lifting action of the slideroom occurs when the glide-strip on the bottom of the slideout room makes contact and climbs onto the top of the rampstrip. Although only a small amount of lifting occurs this effectively forces the slideroom roof skin tighter against the top wiper seal creating a water-tight seal at the point where it's needed most.

There have been several ramp designs used since production of the first slideouts. Coaches built from 1997 through December 1999 used square-shouldered wooden strip with the floor carpet stapled over the top, resembling a wide carpet tack strip. As slideout rooms were made larger they became heavier and the wooden ramp design was changed to a beveled shoulder. This modification made extension of the room more smooth.

The additional weight of galley slideout rooms brought yet another design change. The wooden ramp was replaced by an ABS plastic ramp in areas with vinyl flooring surfaces beginning in January of 2000.



Four-Cylinder Slideout (Rear Wardrobe)

Basic Installation

This room features four 9/16" diameter, double-acting hydraulic cylinders mounted to each corner of a steel framework around the opening in the coach sidewall. The rod end of each cylinder extends through the frame and attaches to the perimeter flange of the slideroom. The cylinders simply push and pull the slideout room in and out of the frame and are equalized by a synchronizing cylinder. The bottom cylinders do most of the work, pushing and pulling, while the top cylinders provide stability for smooth operation.

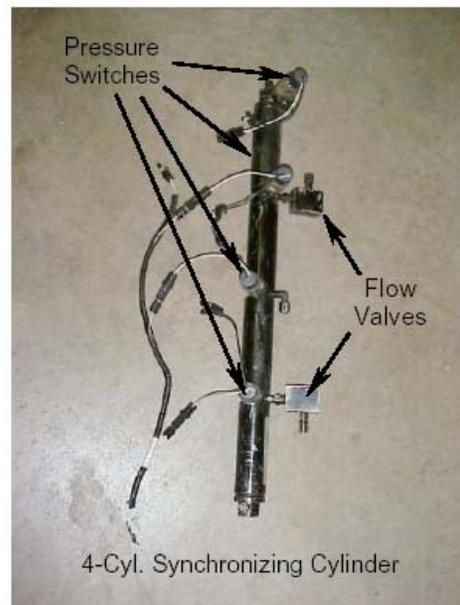
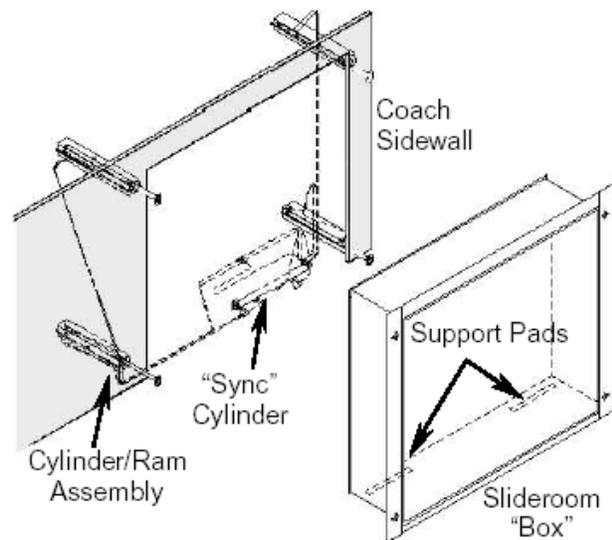
The frame assembly has two support pads on the bottom section located approximately 17" in from each end of the slideroom box. (In November 2000, a third pad was added to the center of the room.) These adjustable pads carry the majority of the weight of the slideout assembly when retracted, but a significant amount transfers to the four cylinders as the room is extended.

Synchronizing Cylinder

The "sync" cylinder has five fluid chambers. There are four fixed-volume chambers, each one connected to one of the four ram cylinders. A separate actuating chamber is connected directly to the hydraulic pump. As the pump is operated, the sync cylinder pushes and equal amount of fluid from these fixed volume chambers through hydraulic hoses of equal length and diameter to each hydraulic cylinder, similar to the master cylinder pushing fluid to the wheel cylinders in a hydraulic brake system. Since fluids can't be compressed, the synchronizing cylinder can precisely control the speed and timing of the rams.

The pressure switches monitor the fluid pressure in each chamber of the sync cylinder. These switches will shut down the pump to protect the system from overload in the event of pressure multiplication – a condition that can occur in a five-chambered synchronizing cylinder system. (To avoid pressure lock-up, always extend the room completely before retracting.)

Flow valves control the fluid delivery to the top cylinders for smoother operation.

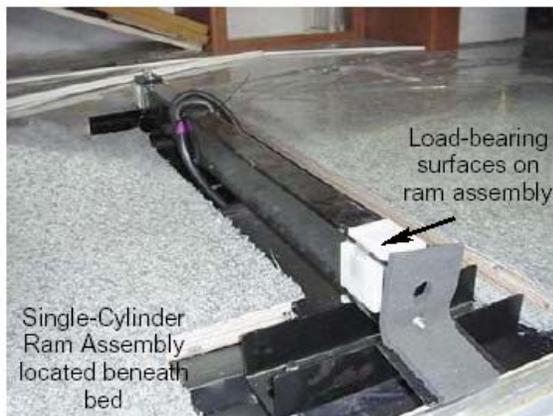
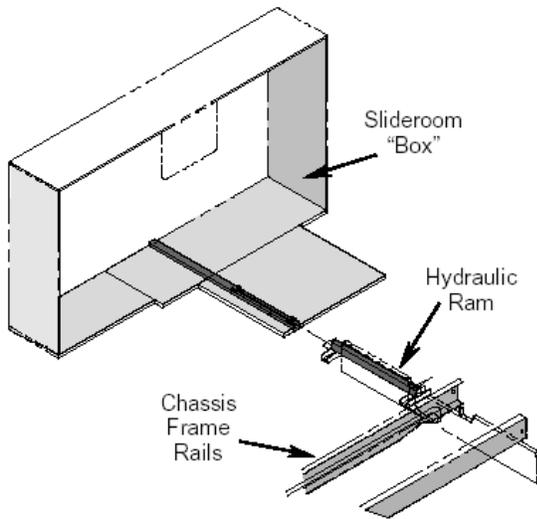




Single Cylinder (Bedroom) Slideout

Basic Installation

This room features a single hydraulic ram assembly mounted on the top side of the coach floor beneath the rear bed. The weight of the slideroom is shared between the ram assembly and the coach floor. Glide strips are fastened to the bottom of the slideroom. (See photos in StoreMore section.) These glide strips ride directly on the carpeted coach floor, allowing the room to slide easily while spreading the weight across its entire width. As the room is extended, weight transfers gradually to the outer pad on the ram assembly and the elevation support pads mounted into the coach sub-floor.



We hope the information we provided in this article will help you understand the basic operation of your slideout room. Should you encounter any functional problems with the room, please do not attempt to make any adjustments by yourself. Please contact your dealer for his assistance with any corrections your room may require.