

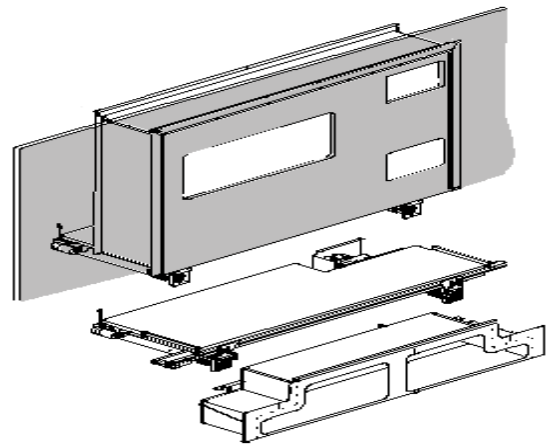
Kwikee® 2-Arm Electric Slideout

Introduction

The 2-cylinder electric slideout installation utilizes two ram assemblies bolted directly to the steel framework of the basement. The ram assembly is a simple telescoping "tube in a tube" design and is actuated by an electric motor and acme screw mechanism. Each ram assembly is complete (i.e., both rams contain an electric motor/gear reduction transmission and worm gear assembly, encoders, mounting hardware, stop devices, etc., and are completely independent of each other, yet they must team up and operate together).

Operation

A control module monitors each ram assembly using a hall-effect switch or what Kwikee identifies as the "encoder." The encoder is mounted on the end of the electric motor assembly and couples to the drive screw shaft. The encoder generates a signal or "pulse" eight times per revolution of the drive screw. The module counts these pulses and compares the signal received from each ram assembly and synchronizes the travel of the slideroom by controlling power to the motor that is turning too fast. It is **normal** to see the "faster" end of the room stop momentarily while the "slower" end of the room catches up. Synchronizing the ram assemblies ensures the slideroom will extend and retract evenly without binding or "racking."



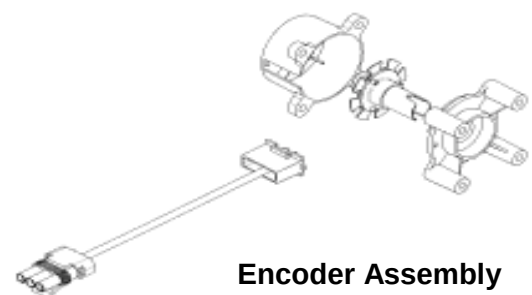
Top View of Arm Assembly



Side View of Arm Assembly



Computer Module



Encoder Assembly

Slideroom Installation

In this installation, the interior floor and the ram assemblies of the coach share the weight of the slideroom "box" assembly. The slideroom travels across the coach floor on "glide strips" fastened to the bottom side of the slideroom. The purpose of a glide strip is to distribute the weight of the slideroom across the coach floor, limit wear and tear on the coach floorcoverings, and maintain levelness.

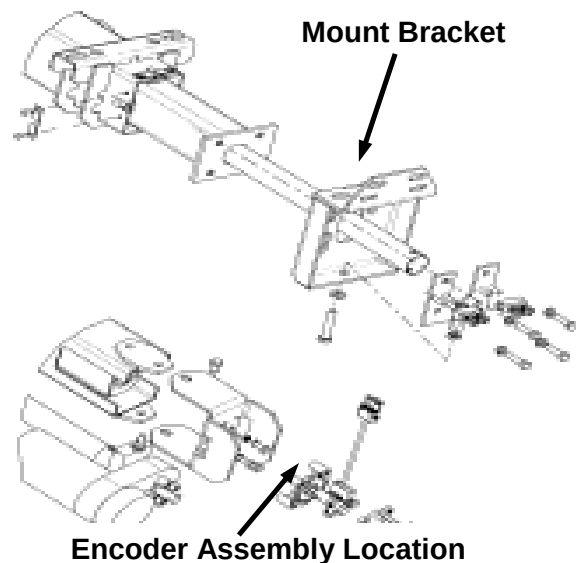
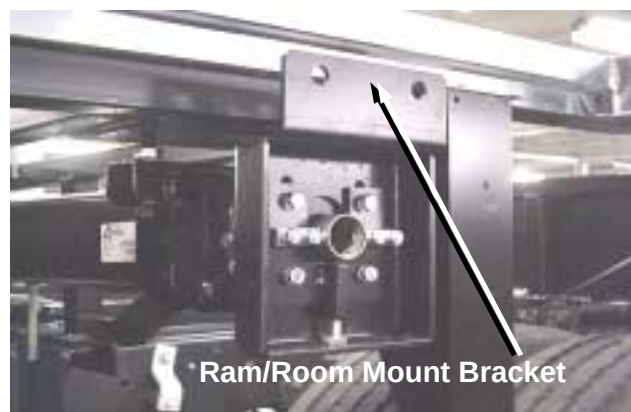
Glide strip design is based on the type of floorcovering the room travels across. For example, glide strips used on carpeted areas of the coach consist of an aluminum extrusion containing an insert made of polyethylene plastic. The smooth plastic surface glides easily across a carpeted surface. Glide strips used over linoleum surfaces consist of a beveled $\frac{3}{4}$ " x 3" wooden strip wrapped with a heavy felt material.

It is common for slideroom installations to have a portion of the room sliding across carpet and another portion on a linoleum surface. The glide strip "thickness" or overall height is a very important factor in a design of a slideroom. Having just one corner of the room riding too high or too low will cause the room to "torque" or twist and results in the slideroom making unequal bulb seal contact at the top of the room.

The ram/room mount bracket assembly attaches the room to the rams at the outer edge of the slideroom. The brackets are unique because they provide a point to adjust the horizontal and lateral position of the room in the coach sidewall opening and also contain an interlock device that anchors one end of the drive screw mechanism of the ram.

Adjustments

It is logical to assume that a slideroom extends and retracts in the same horizontal plane as the coach floor. This would be a reasonable thought because the room traverses in direct contact with the floor, which is flat, and the ram assemblies appear to be bolted to the substructure parallel to each other and to the floor. The reality is - the room is designed to travel in a slight "downhill" attitude and this has a purpose. Unlike the bottom of the slideroom, the top of the room does not receive sufficient force from the rams to get good compression on the upper bulb seals. Because the attachment point of the ram is at the outboard bottom edge of the slideroom, extending the room in a downhill direction forces the top of the room to rotate outward and the glide strip serves as the fulcrum point. This rotating action effectively increases the pressure applied to the upper bulb seals. To further enhance bulb seal compression, the end walls of the slideroom are cut with a slight taper - narrower at the top and widening toward the bottom. Simply, the shape of the slideroom helps ensure the top bulb seal contact the sidewall prior to the bottom of the room reaching the full-extend or the full-retract stops. Observe the slideroom as it is being extended or retracted. You should see the top seal of the slideroom making initial contact with the coach sidewall while the



bottom continues traveling another 5 to 7 mm before contacting the stops. It is the combination of the bulb and wiper seals, the shape of the slideroom, the inclination of the ram, and properly adjusted stops that results in a weather-tight slideroom installation.

IMPORTANT: Minor adjustments made to the slideroom can cause a substantial change in the amount of pressure applied against the flanges of the slideroom and the coach sidewall. Compressing the seal too tight can damage the seals and other parts and not tight enough will allow leakage. Proper room adjustment should be verified by observing the slideroom movement while extending and retracting the room. The compression of the bulb seal should be verified along both sides and across the top of the room in the extended and retracted positions.

In/Out Travel (Extend/Retract)

The ram assemblies have more "stroke" or travel than is required to fully extend or retract the slideroom. Because of this, each ram assembly is equipped with mechanical stops to limit the rams or more importantly - the travel limits of the slideroom.

Retract Adjustment

The "in-stop" position of the slideroom is adjusted at a threaded stop bolt located on the outboard end of the fixed housing of the ram assembly. The stop bolt is adjusted by turning the bolt "in or out" until the outside flange of the slideroom seals against the coach sidewall. When properly adjusted, the bulb seal mounted to the backside of the seal carrier flange of the slideroom should be slightly compressed between the flange and the exterior sidewall of the motor home.

Extend Adjustment

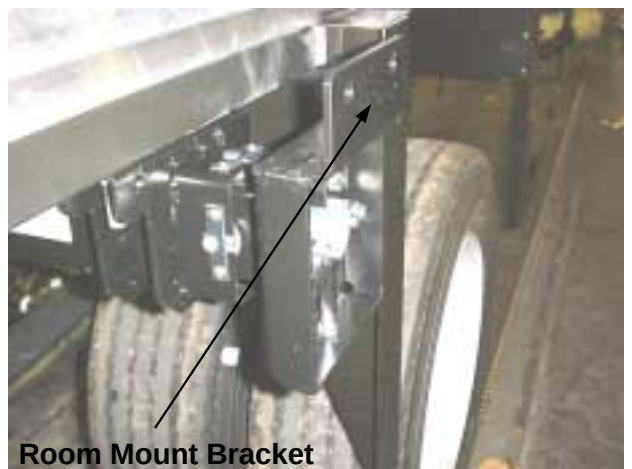
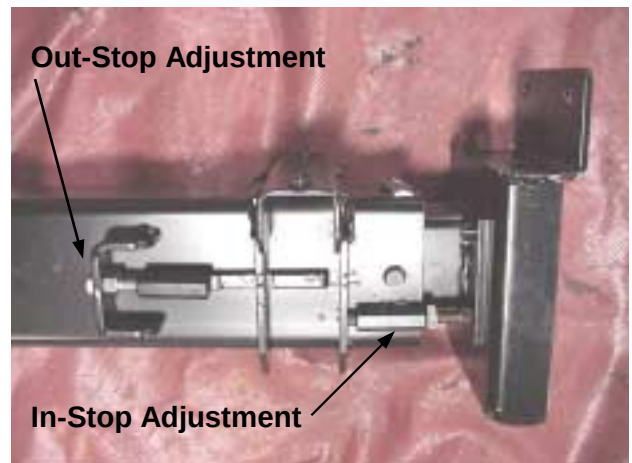
The "out-stop" position of the slideroom is also adjusted at a threaded stop bolt located on the outboard end of the ram assembly. The stop bolt is adjusted by advancing the bolt "in or out" until the inside flange of the slideroom seals against the coach sidewall. When properly adjusted, the bulb seal mounted to the backside of the seal carrier flange of the slideroom should be slightly compressed between the flange and the interior sidewall of the motor home.

Lateral "Front/Rear" Adjustment

Centering of the slideroom inside the coach sidewall opening is performed at the ram assembly/slideroom mount brackets. The brackets have horizontally slotted bolt holes permitting side-to-side movement of the slideroom. It is important to measure the clearance between the coach wall and the forward and rear walls of the slideroom at the floor line and at the top of the room. It may be necessary to "cheat" the position of the slideroom somewhat to optimize the contact of the wiper seal at both the top of the room and the bottom.

Up/Down (Vertical Adjustment/Leveling)

Vertical centering of the slideroom inside the coach sidewall opening can be performed at two different locations. There are reasons to consider which one will produce the desired result and the pros and cons of each will be discussed.



Elevation Bolt Assembly

Located at the outer end of the extension tube of the ram assembly is the room attachment bracket assembly. The design of this mounting bracket assembly provides a point for lateral movement and elevation adjustments. The elevation adjustment is performed at the threaded bolt arrangement at the end of the ram assembly. There is a pair of steel plates - one plate welded to the extension tube of the ram and the other plate attached to the slideroom mount bracket. The plates sandwich together with four "position locking" bolts passing through elongated slots in each plate. One end of the elevation bolt mechanism attaches to each plate and turning the bolt clockwise or counterclockwise shifts the plates vertically. This adjustment provides a compensation point for installation variances between the ram assemblies (i.e., for ram assemblies installed at different suspended heights or positions in respect to the coach floor).

IMPORTANT: Use caution when making vertical adjustments at this location. Adjustment made at this point will affect the paint scheme or graphics alignment of the coach with the paint or graphics of the slideout room plus the alignment of the feature strip (sometimes called the belt-line molding) will change. Technicians usually make their initial adjustment at this point and compound the existing problem. Vertical adjustments made at this point should be avoided if the graphics, paint, or the feature strip moldings are in alignment. Also, if raising the room is required, use a jack or another lifting device to do the heavy lifting and adjust the elevation bolt to retain the position then torque the four lock bolts. This lessens any damage potential to the threads on the elevation bolt.

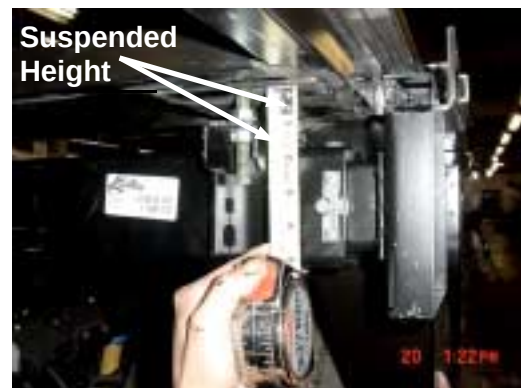
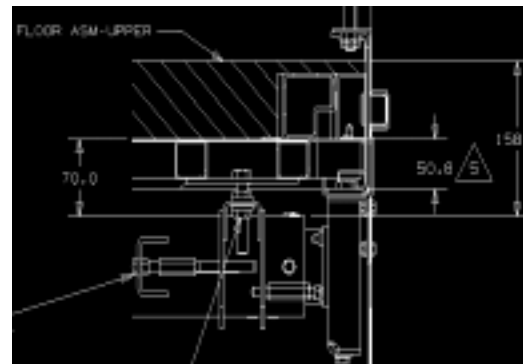
Ram Installation

The preferred method of altering the vertical position of the slideroom is by raising or lowering the ram assembly position in the basement structure. Each ram assembly is suspended from the steel framework of the basement with four mounting bolts. Each of these mount bolts has adjusting nuts and jamming nuts to locate and retain the position of the ram assembly. This design allows easy access and precise 4-corner leveling of each ram assembly. An important item to consider prior to making any slideroom adjustments would be to inspect the installation of each ram assembly and measure each to verify a similar "ride height." This measurement should be taken at the basement frame/tube and the mount brackets of the ram assembly.

Ram alignment is the foundation for proper room operation. From a top view perspective, the rams should be parallel with each other or binding will occur. Viewing ram alignment from a profile or side view, it is reasonable to expect that both ram assemblies would again be parallel with each other - and they usually are. However, it is acceptable to have some variation in the suspended positions or in the inclination between the two rams.

Tip In/Tip Out Adjustment

If the slideroom is completely extended or retracted and the top bulb seal makes insufficient contact at



one or both top corners, the slideroom is referred to as being "tipped in or tipped out" of the coach sidewall opening. As explained previously, the combination of the tapered cut to the front and rear walls of the slideroom and the inclination of the rams should ensure the top bulb seal consistently makes first contact. Anything else results from a problem directly associated with an unlevelled slideroom - a glide strip/carpet/linoleum installation issue or a ram adjustment that is forcing the room to travel with excessive upward or downward pitch relative to the coach floor.

Remember, the tapered cut exists on both the interior and the exterior edges of the walls of the slideroom so gapping or insufficient seal compression conditions can occur in either the extended position or the retracted position.

Tipping is usually the result of the outside edge of the slideroom being too high or too low at the attachment point to the ram assembly. A mismatch between adjacent glide strips can cause tipping, but glide strips are fastened to the bottom of the slideroom prior to the initial installation of the room and cannot go out of adjustment. Glide strips are adjusted by shimming and this requires access to the bottom of the slideroom. Fortunately, most bulb seal contact problems can be resolved with a simple adjustment to the ram assembly. More precisely, at the inboard mount bracket location of the ram assembly.

The mounts of the ram are paired with two near the sidewall and an inboard set near the centerline of the motor home. Raising or lowering the ram ride height at the inboard mount bracket pivots the entire ram assembly at the sidewall/outboard mounting point like an inverted seesaw - with the long end of the seesaw attached to the outer edge of the slideroom. The up or down force the ram applies to the slideroom rotates or "tips" the slideroom accordingly. Adjust one ram and only one corner of the room is affected. Adjust both rams equally and the room movement is uniform.

Extended Room Scenario: To increase pressure on the top bulb seal located inside the motor home, it is necessary to raise the inboard mounting point of the ram. This lowers the outside edge of the slideroom and rotates the room outward. This effectively lessens the distance between the inside flange of the slideroom and the inside sidewall of the coach and increases compression on the bulb seal.

Retracted Room Scenario: To increase pressure on the top bulb seal on the outside of the motor home, it is necessary to lower the inboard mounting point of the ram. This raises the outside edge of the slideroom and rotates the room inward. This effectively lessens the gap between the outside flange of the slideroom and the outside sidewall of the coach and increases compression on the bulb seal.

CAUTION: Do not make adjustments to the outboard mount points of the ram assembly or to the vertical adjustment bolts of the ram assembly/slideroom mounting bracket. This will only raise or lower the position of the slideroom in the sidewall opening of the coach. It will not effectively tilt the slideroom at the top flange.