



LIPPERT
COMPONENTS®

RHINOTM
BOX



Rhino BoxTM Pin Box Installation and Owner's Manual (For Aftermarket Applications)

Rhino Box Pin Box

Part #	Description
2020044233	Standard Rhino Pin Box 21K
2020044404	Extended Rhino Pin Box 16.8K

Introduction

The Rhino BoxTM pin box is utilized on the Space Saver Upper Deck (Fig.1). This chassis design gives the 5th Wheel additional floor space and minimizes the large step commonly seen in front of cabinetry or inside walk-in closets in today's 5th Wheel.

NOTE: The Extended Rhino Pin Box has been developed to provide additional clearance on certain tow vehicle models (please consult with your dealer or contact LCI Care Center).

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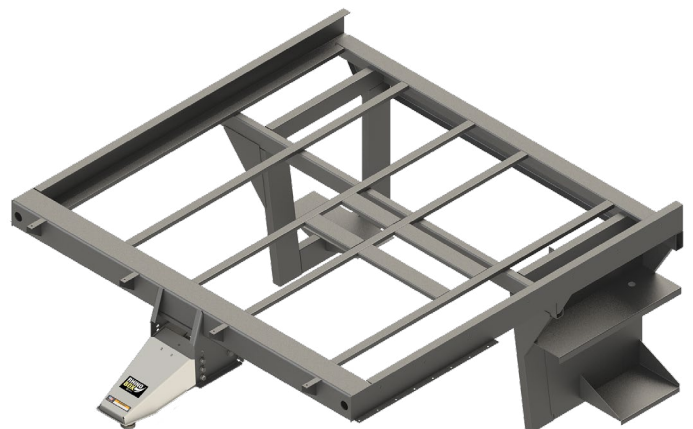


Fig.1



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The Rhino Box™ Pin Box utilizes high-strength low-alloy (HSLA) steel and features a load rating of 21,000 pounds (GVWR) for the standard pin box and 16,800 pounds for the extended pin box.

Additional information about this product can be obtained from lci1.com/support or by using the myLCI app. Replacement kits can be ordered from <https://store.lci1.com/> or by using the myLCI app.

The myLCI app is available for free on iTunes® for iPhone® and iPad® and also on Google Play™ for Android™ users.

iTunes®, iPhone®, and iPad® are registered trademarks of Apple Inc.

Google Play™ and Android™ are trademarks of Google Inc.

Safety

Read and understand all instructions before installing or operating this product. Adhere to all safety labels. This manual provides general instructions. Many variables can change the circumstances of the instructions, i.e., the degree of difficulty, operation and ability of the individual performing the instructions. This manual cannot begin to plot out instructions for every possibility, but provides the general instructions, as necessary, for effectively interfacing with the device, product or system. Failure to correctly follow the provided instructions may result in death, serious personal injury, severe product and/or property damage, including voiding of the LCI limited warranty.

⚠ WARNING

THE "WARNING" SYMBOL ABOVE IS A SIGN THAT AN INSTALLATION PROCEDURE HAS A SAFETY RISK INVOLVED AND MAY CAUSE DEATH, SERIOUS PERSONAL INJURY OR SEVERE PRODUCT AND/OR PROPERTY DAMAGE IF NOT PERFORMED SAFELY WITHIN PARAMETERS SET FORTH IN THIS MANUAL.

⚠ WARNING

THE TRAILER MUST BE SUPPORTED PER MANUFACTURER'S RECOMMENDATIONS BEFORE WORKING UNDERNEATH. FAILURE TO DO SO MAY RESULT IN DEATH OR SERIOUS PERSONAL INJURY.

⚠ WARNING

FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN DEATH OR SERIOUS INJURY.

⚠ CAUTION

THE "CAUTION" SYMBOL ABOVE IS A SIGN THAT A PROCEDURE HAS A RISK INVOLVED THAT MAY CAUSE PERSONAL INJURY OR PROPERTY DAMAGE IF NOT PERFORMED SAFELY AND WITHIN THE PARAMETERS SET FORTH WITHIN THIS MANUAL.

⚠ CAUTION

FAILURE TO CHECK AND FOLLOW TOW RATINGS COULD RESULT IN TOW VEHICLE DAMAGE OR TOW VEHICLE AND TRAILER SEPARATION WHILE TOWING. TRAILER AND ITS CONTENTS MUST NOT EXCEED TOW VEHICLE, HITCH AND/OR TRAILER TOW RATINGS.

⚠ CAUTION

MOVING PARTS CAN PINCH, CRUSH OR CUT. KEEP CLEAR AND USE CAUTION.

NOTE: Images used in this document are for reference only when assembling, installing and/or operating this product. Actual appearance of provided and/or purchased parts and assemblies may differ.



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Parts List



Resources Required

- Two to three people, depending on task
- Cordless or electric drill or screw gun
- Appropriate drive bits
- Torque wrench
- Impact wrench or ratchet
- Sockets
- Drift/centering pin
- Second drift/centering pin (optional)
- Hammer (optional)
- Tape measure

Letter	PN	Description	Qty
A	719277	Standard Pin Box 2020 21K Assy Tapered Rhino (Not shown)	1
	852275	Extended Pin Box 16.8K Tapered Rhino	

NOTE: Part numbers are shown for identification purposes only. Not all parts are available for individual sale. All parts with a link to the Lippert Store can be purchased.

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Preparation

⚠ WARNING

THE TRAILER MUST BE SUPPORTED PER MANUFACTURER'S RECOMMENDATIONS BEFORE WORKING UNDERNEATH. FAILURE TO DO SO MAY RESULT IN DEATH OR SERIOUS INJURY.

⚠ CAUTION

DUE TO THE WEIGHT OF THE PIN BOX, IT IS RECOMMENDED THAT AT LEAST TWO PEOPLE INSTALL THIS SYSTEM.

⚠ CAUTION

MOVING PARTS CAN PINCH, CRUSH OR CUT. KEEP CLEAR AND USE CAUTION.

Unhitching Procedure

1. Be sure to park the trailer on solid, level ground.
2. Clear jack landing locations of debris and obstructions. Locations should also be free of depressions.
3. Disconnect electrical cables and harnesses between the tow vehicle and the trailer.
4. Chock the trailer wheels.
5. Open the jaw on the 5th wheel head. Refer to the manufacturer's instructions for proper 5th wheel unhitching procedures.
6. Using trailer landing gear, raise pin box to clear hitch.
7. Pull away tow vehicle.

Removal of Factory Pin Box

1. Level the 5th wheel front to back.
2. Measure the distance from the bottom of the factory-installed pin box's kingpin plate (Fig.2A) to a flat surface directly below (Fig.2B).



Fig.2

3. Make note of the bolt hole locations of the factory-installed pin box and the mounting frame. The new pin box system will be remounted in the same hole settings.
4. Properly support the pin box assembly.

NOTE: The pin box assembly weighs several hundred pounds and a minimum of two people are required to complete the removal and installation of the pin box. A forklift may be used to lift the pin box into position.

NOTE: Make sure pin box is sufficiently and properly supported before removing mounting hardware. Prior to new pin box installation, make sure air bag on new pin box, if equipped, is not overinflated.

5. Remove fasteners that hold the original pin box in place. Retain fasteners for reinstallation.
6. Remove factory pin box from the mounting frame.



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Installation

Install New Pin Box

1. Hoist the new pin box into place.
2. Use a second person to line up the pin box to the bolt holes in the mounting plate.
3. Using a drift/centering pin (or screwdriver), center the holes and install at least one bolt on the roadside of the trailer and at the rear of the mounting plate (**Fig.3A**).
4. Install at least one bolt on the curbside of the trailer at the front of the pin box in the same holes the factory pin box bolts were located (**Fig.4A**)



Fig.3

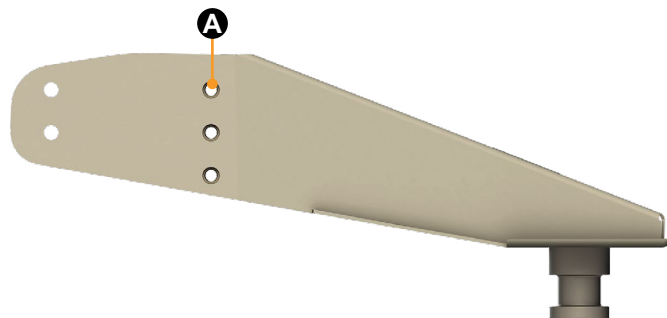


Fig.4

5. For the Rhino Pin boxes once the pin box is aligned, that measurement should be equal to the ground-to-plate measurement taken in step 2 during Removal of the Pin Box (**Fig.5**).

NOTE: The pin box height can be adjusted by moving the fasteners up or down in the sets of holes in the wings. This is to ensure the pin box is within 1/2" of the ground-to-plate measurement.

6. Install previously-removed fasteners with bolts and washers on the outside of the pin box and lock washers and nuts on the inside of the pin box.
7. With a torque wrench, torque nuts to 110 to 125 ft-lbs.



Fig.5



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Operation

Hitching Procedure

NOTE: To assist with the hitching procedure, grease may be applied around the kingpin and on the skid plate surface. See the Maintenance section for recommended grease specifications.

⚠ WARNING

WORKING BETWEEN THE TOW VEHICLE AND TRAILER CAN BE DANGEROUS. FAILURE TO PROPERLY SECURE THE TOW VEHICLE AND TRAILER FROM MOVEMENT CAN RESULT IN SERIOUS PERSONAL INJURY OR DEATH AND SERIOUS PRODUCT DAMAGE. MAKE SURE TOW VEHICLE AND TRAILER ARE SECURED FROM MOVEMENT. MAKE SURE ALL SAFETY PRECAUTIONS ARE FOLLOWED TO PREVENT PERSONAL INJURY OR PRODUCT DAMAGE.

1. Place chocks firmly against the front and rear of each trailer wheel to prevent possible movement forward or backward.

2. If necessary, lower the tow vehicle's tailgate.

NOTE: Clearance of the lowered tailgate to the trailer needs to be monitored during hookups, since some combinations of tow vehicle and trailer have little or no clearance.

⚠ CAUTION

DO NOT ATTEMPT TO HITCH THE TRAILER BY USING TRAILER JACKS TO LOWER THE TRAILER AND KINGPIN ONTO THE HITCH OPENING. THIS COULD RESULT IN THE KINGPIN COMING TO REST ON TOP OF THE SKID PLATE INSTEAD OF WITHIN THE HITCH OPENING. ATTEMPTING THE HITCHING PROCEDURE WHILE THE KINGPIN IS IN THIS POSITION MAY RESULT IN DAMAGE TO THE TOW VEHICLE AND/OR THE TRAILER.

3. Using the trailer landing gear, adjust trailer height per the manufacturer's recommendation so the bottom of the trailer's pin box (Fig.6A) is 1/2" to 1" below the top portion hitch skid plate. (Fig.6B).

NOTE: During the hitching maneuver, the bottom of the trailer's pin box should come into contact with the hitch skid plate ramp.

4. Open the jaw on the 5th Wheel head. Refer to the manufacturer's instructions for proper 5th Wheel hitch latch operation.

5. Back the tow vehicle slowly toward the trailer until the tow vehicle's hitch contacts the bottom of the pin box and the kingpin slides into the receiver.

6. Latch 5th Wheel hitch in closed position per the instructions of the 5th Wheel hitch manufacturer.

7. With the trailer wheels still chocked, make sure:

- A. The landing gear is resting on firm, level ground.
- B. The landing gear fully supports the trailer's weight.
- C. The tow vehicle is stationary and in park with the emergency brake on.
- D. The bottom of the pin box is resting on top of the hitch.
- E. There is no space between the mating surfaces.

8. If space exists between the pin box and hitch, the trailer has not been properly hitched. Do not tow the trailer. Instead, repeat the hitching steps 1-7 until the trailer is properly hitched.

9. Reconnect the electrical cables between the tow vehicle and trailer.

10. Raise the tailgate of the truck.

11. Do not tow the trailer until a Pull Test has been conducted. Go to the Pull Test section in the manual.

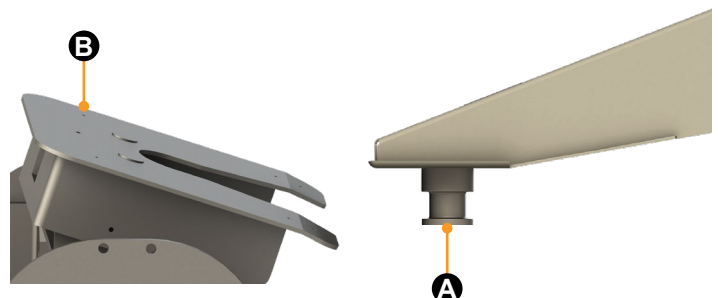


Fig.6



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Pull Test

⚠ WARNING

FAILURE TO PERFORM A PULL TEST MAY RESULT IN SEVERE PROPERTY DAMAGE, SERIOUS PERSONAL INJURY OR DEATH. FAILURE TO SECURE TOW VEHICLE AND TRAILER FROM MOVEMENT DURING PROCEDURE COULD RESULT IN SEVERE PROPERTY DAMAGE, SERIOUS PERSONAL INJURY OR DEATH. MAKE SURE TOW VEHICLE AND TRAILER ARE PROPERLY SECURED AGAINST MOVEMENT DURING THE PROCEDURE.

1. Make sure the trailer wheels are chocked, the trailer landing gear is resting on firm ground to support the trailer and the tow vehicle is in park with the emergency brake engaged.
2. Return to the cab of the tow vehicle, release the emergency brake and then apply the trailer brakes.
3. Slowly pull the trailer forward with the tow vehicle.
 - A. If the tow vehicle is properly hitched, the wheel chocks and trailer brakes should keep the truck from moving forward.
 - B. If the trailer is not properly hitched, the trailer will separate from the hitch and the truck will move forward while leaving the trailer behind. If this happens, repeat the Hitching Procedure.
4. After successfully performing the Pull Test, fully raise the landing gear per manufacturer's recommendations.
5. Check and inspect all electrical circuits for proper operation, including clearance lights, turn signals and stop lights.
6. Remove and store all trailer wheel chocks.

Troubleshooting

What is happening	Why?	What should be done?
Trailer not level.	Adjustment needed.	Adjust pin box or hitch accordingly.
Excessive bottoming of skid pad assembly. Chucking in tow vehicle.	Operational, mechanical issues.	Inspect the rubber compression bumpers to make sure they are in place. Check the trailer brakes for proper operation. NOTE: If the above items are satisfactory, it may be necessary to install a shear spring with a different spring rate.
Skid pad assembly does not return to neutral position when disconnected from the tow vehicle.	Spring loose or damaged.	Check for loose or torn rubber shear spring.
Excessive noise from pin box area.	Attachment and/or hitch issues.	Verify that the pin box is securely attached to the 5th Wheel. If the kingpin is excessively worn, the skid pad will need to be replaced. Hitch mechanisms can also cause noise. Verify that unwanted noise is not coming from the hitch. The hitch manufacturer can provide guidelines for this check.



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Maintenance

1. Inspect kingpin for excessive wear (annually).
2. Inspect the skid pad to ensure a neutral (centered) position. When the trailer is disconnected from the tow vehicle, an equal gap of approximately 1 ¼" should be observed between the lip of the skid pad and the rubber compression bumpers. It is normal to be able to slightly move and twist the skid pad assembly with hand force.
3. Inspect the retainment rods for excessive wear. The retainment rods may show surface scratch marks as an indication of occasional contact, but the scratches, if present, should be minimal.
4. Inspect the plastic glide pads for excessive wear. The glide pad thickness should be no less than ¾".
5. Periodically check the torque values of all bolts.
6. On the Air Ride and Flex Air pin boxes, periodically check the recessed area on top of the pin box for standing water. Drain water and remove debris as needed.
7. Also, the air bags on the Air Ride and Flex Air pin boxes can lose air over time. Before traveling, check the pin box and determine if the trailer is level. Adjust air bag pressure as necessary to achieve proper ride height.
8. Check bearing and grease once per season. If more grease is needed, add it to the bearing assembly. Use any of the recommended brands listed.

⚠ WARNING

DO NOT MIX LITHIUM, CALCIUM, SODIUM OR BARIUM COMPLEX GREASES. MIXING OF THESE INCOMPATIBLE COMPOUNDS CAN CREATE A CORROSIVE AND/OR TOXIC CHEMICAL WITH FUMES THAT CAN RESULT IN A SERIOUS HEALTH RISK IF EXPOSED TO SKIN OR LUNGS. WHEN CONVERTING FROM ONE GREASE TO ANOTHER, MAKE SURE ALL OLD GREASE IS REMOVED COMPLETELY PRIOR TO APPLYING NEW GREASE.

Approved Sources - Bearing Grease

Mobil Oil	Mobilgrease HP
Exxon/Standard	Ronex MP
Kendall Refining Co.	Kendall L-427
Ashland Oil Co.	Valvoline Val-plex EP Grease
Pennzoil	Premium Wheel Bearing Grease 707L



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