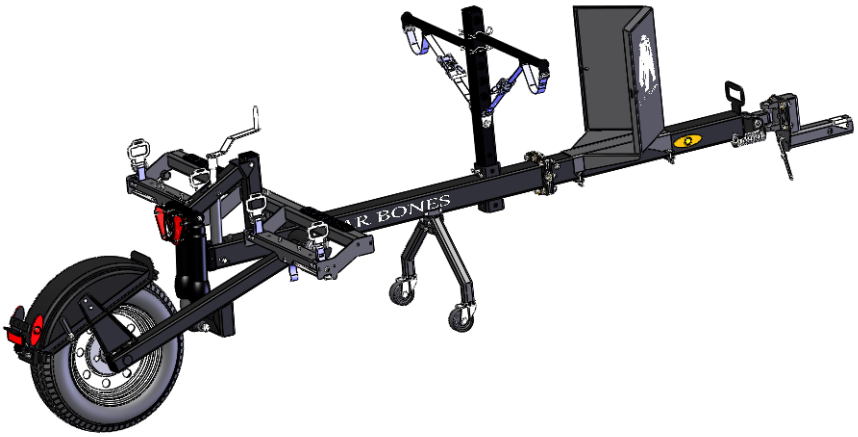
BEAR BONES SYSTEMS



Bear Bones Systems Motolev

User's Manual

⚠ WARNING

This User's Manual contains safety information and instructions for your trailer.

You must read this manual before loading or towing your trailer.

You must follow all safety precautions and instructions.

Bear-Bones.com

Table of Contents

1. MOTOLEV INTRODUCTION

2. STRATEGY CHASSIS USER'S MANUAL

3. LOAD TYPE AND LOAD RATING

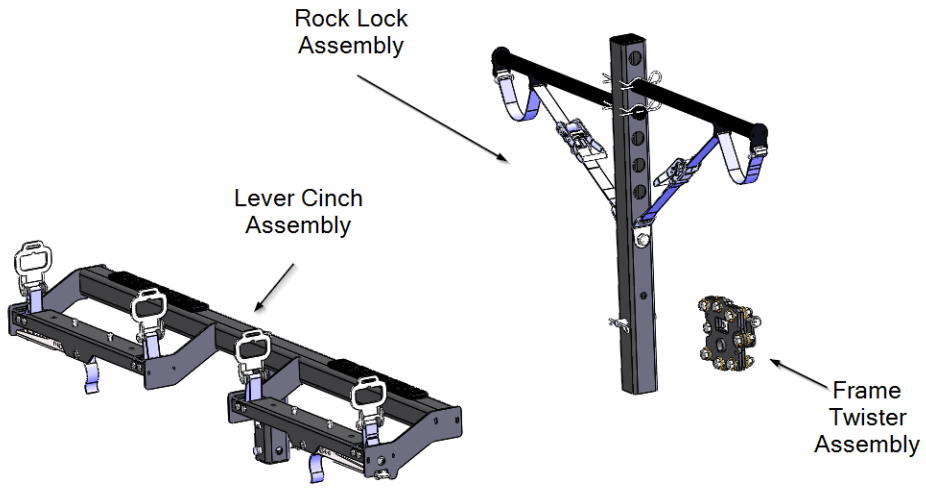
4. INSTALLING THE MOTOLEV DROP-IN
   - 4.1. INSTALLING THE FRAME TWISTER
   - 4.2. INSTALLING THE LEVER CINCH ASSEMBLY
   - 4.3. INSTALLING THE ROCK LOCK ASSEMBLY

5. MOTOLEV LOADING AND USE
   - 5.1. LOADING STEPS
   - 5.2. CARE AND MAINTENANCE

1. MOTOLEV INTRODUCTION

Bear Bones Systems is proud to present the Motolev Motorcycle Transport Drop-In which is part of the Bear Bones Systems family of products.

The Bear Bones System Motolev Drop-In consists of the Lever Cinch Assembly, Rock Lock Assembly and Frame Twister Assembly and works in conjunction with the Bear Bones Systems Strategy Chassis to function as a motorcycle transport trailer unlike any other.



Please read and understand the information in this User's Manual to avoid possible damage, injury or death that could result from failure to follow these instructions and heed these warning.

2. STRATEGY CHASSIS USER'S MANUAL

Before using this product it is critical that you read the Strategy Chassis Owner's Manual and understand the information and warnings presented there.

3. LOAD TYPE AND LOAD RATING

Not every motorcycle will work with The Motolev Drop-In. It is intended to be used for transporting off-road type motorcycles that have a lower frame that can support the bike's weight and sit stable when placed on a bike stand. The motorcycle's dimension from foot peg to front axle should be close to 36-3/4 inches and its weight should not exceed 300lbs. The Motolev Lever Cinch Assembly has a weight limit of 300lbs per side and 550lbs total. (500lbs when used with the Overland upgraded chassis)

4. INSTALLING THE MOTOLEV DROP-IN

4.1. INSTALLING THE FRAME TWISTER

Tools that will be needed to install the Frame Twister

- Some sort of stand to support the ¼ Chassis
- 5/8 box end or socket wrench X2
- Torque wrench capable of 52 ft*lbs.
- Permanent thread locker (Red)

The Frame Twister is installed in the bolted flange joint of the Strategy Chassis and is used to compensate for the natural torsional flex in the main frame tube. The torsional flex is necessary as it acts as a spring to absorb torsional shock loads but when a single motorcycle or motorcycles of significantly different weights are loaded on the trailer there is an imbalance that causes the trailer to lean to the heavy side. By twisting the frame (rotating the ¾ Chassis relative to the ¼ Chassis) to some degree in the opposite direction using the Frame Twister, the lean will be countered acted and the trailer and motorcycle/s will stand more vertical.

To install the Frame Twister, assuming the chassis is bolted together, start by placing a stand beneath the ¼ Chassis and use the lift mechanism to lower the ¼ Chassis until it is supported on the stand. See Figure 4.1a Remove the bolts from the corner locations and separate the joint. See Figure 4.1b. A little side to side motion may be helpful in releasing the alignment spring pins. Now carefully disconnect the electrical connector.

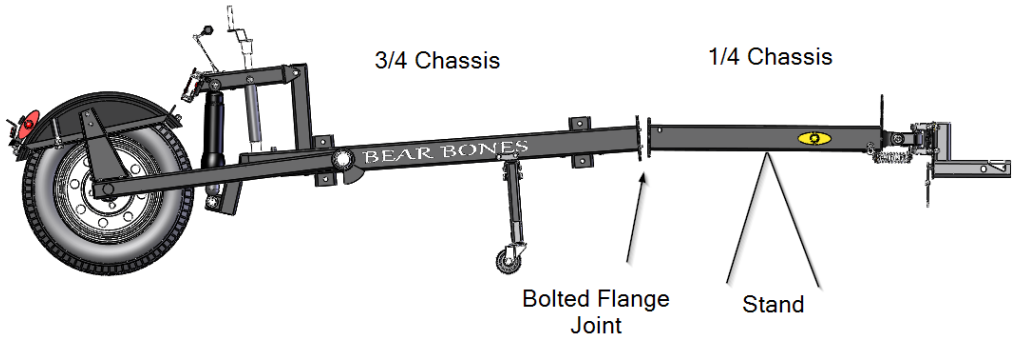


Figure 4.1a

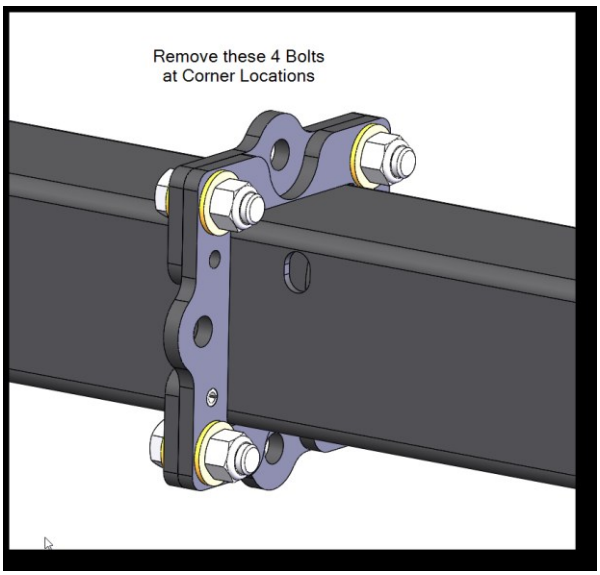


Figure 4.1b

Orient the Frame Twister with the windows up and align the spring pins of the Frame Twister with the pin holes in ¼ Chassis plate. Use two of the 7/16 x 1-1/4 inch bolts removed from the corner positons and install them in the horizontal holes as shown in Figure 4.1c.

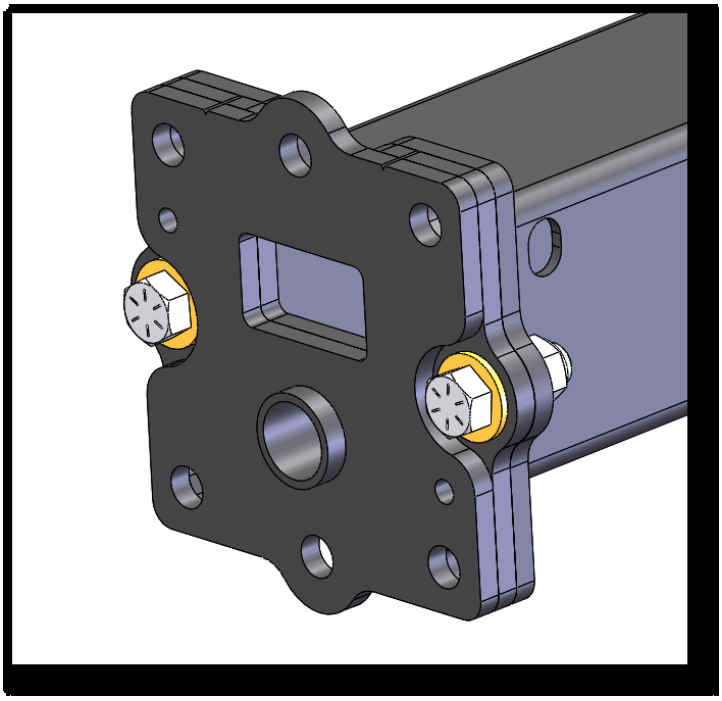


Figure 4.1c

Locate the 3/8-16 x 3-1/2 inch twister bolt and slip a washer onto it. Then insert it into one of the slots on the side of the frame tube and thread it through the cross dowl and out the other side of the tube. Place the other washer onto the protruding end of the twister bolt. Apply a drop or two of permanent thread locker (red) to the threads of the nut and twist it onto the nut until it bottoms out and then back it off a partial

turn or until the bolt can turn freely (turning the head end) but not so much that there is free play between the bolt and the frame tube. You only get one shot at this so it may be wise to pracitice before applying the thread locker. Allow the thread locker 24 hrs to set before attempting to turn the bolt. See Figure 4.1d. The ¼ Chassis tube is shown transparent for an inside view of the component relationships.

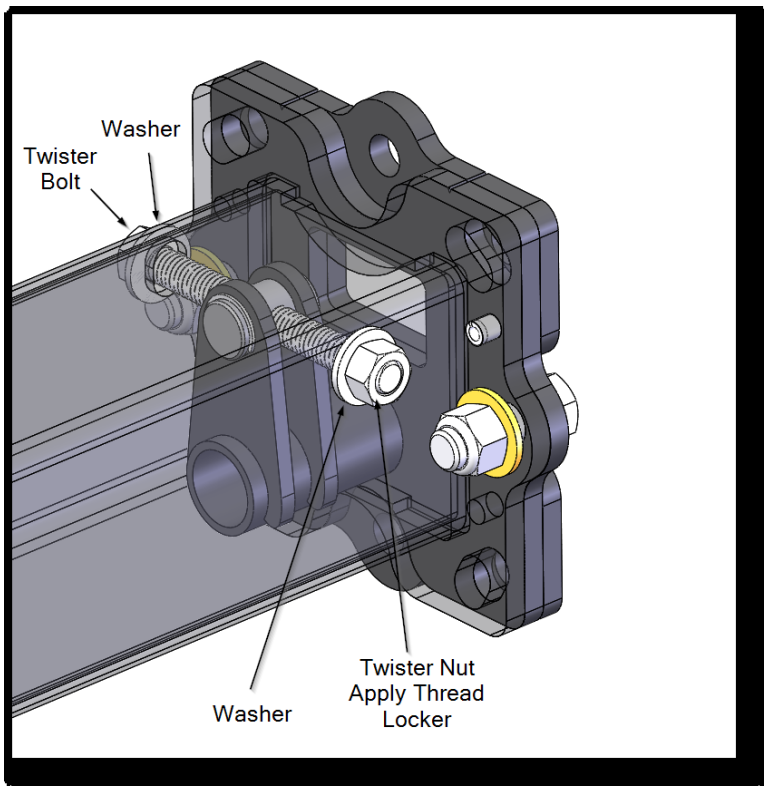


Figure 4.1d

Fish the electrical connecter through the windows of the Frame Twister and reconnect it with the mating connector in the ¾ Chassis. Align the spring pins of the ¾ Chassis with the alignment holes of the Frame Twister rear plate and bring the two assemblies together. Install the remaining two 7/16 x 1-1/4" bolts with nuts and washers removed from the corner positions previously into the vertical holes and the four 7/16 x 1-3/4" bolts with washers and nuts into the corner positions. Tighten the four 7/16 x 1-1/4 bolts to 52 ft*lbs and hand tighten the four corner bolts.

⚠ Notice

NOTICE: Never attempt to twist the frame with a motorcycle or any load of significant weight on the trailer. When using the Frame Twister to twist the frame, it is important to support the flange joint with one hand while turning the Twister Bolt to relieve the bind that the weight of the chassis assemblies create at the joint. The Frame Twister only twists the frame a

few degrees so when you notice increased resistance on the Twister Bolt stop turning.

Once the thread locker has set (24hrs) you can use the Frame Twister to twist the frame if necessary to compensate for an unbalanced load. If no unbalanced load is expected this time then turn the twister bolt to align the marks on the tops of the Frame Twister plates which indicate straight alignment of the ¾ and ¼ Chassis frames and tighten the four corner bolts to 52 ft*lbs.

To twist the frame in preparation for an unbalanced load, loosen the four corner bolts until the joint is free to pivot and while supporting the joint with one hand, turn the Twister Bolt so that the forward marks on top of the frame twister rotate towards the side that will carry the heavier load. The amount of twist required to compensate for an unbalance load will require some trial and error experimentation but as a starting point, one single motorcycle that weighs 275lbs -300lbs will likely require the full adjustment travel. It is not necessary that the trailer ride perfectly vertical. A little lean to the trailer may look a bit unnatural but is not cause for concern.

4.2. INSTALLING THE LEVER CINCH ASSEMBLY

Start by making sure the locking wedge is backed off and slide the Lever Cinch vertical tube into the rear receiver of the Strategy Chassis with the Lever Cinch mechanisms to the rear. Align the lower pin holes and insert the receiver pin through and out the other side. Secure the receiver pin with the safety pin.

Tighten the wedge bolt until snug with the magnet wrench that was included with the Strategy Chassis or another 9/16” wrench of similar length. See Figure 4.2

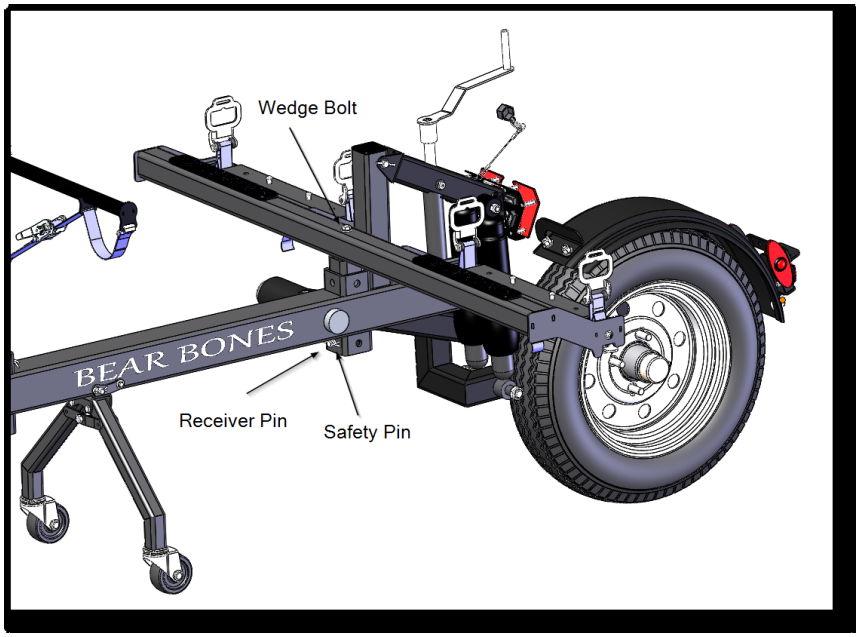


Figure 4.2

If when removing the Lever Cinch from the chassis, the wedge does not release, a light kick to front of the Lever Cinch support member near the end will usually do the trick. If not, a blow to the head of the wedge bolt with a plastic mallet or other object that produces the same effect without damaging the bolt should release it. Maintaining the wedge greased will reduce this tendency. Be careful not to overtighten the wedge bolt as this can cause wedge lockup and internal damage of the wedge mechanism.

4.3. INSTALLING THE ROCK LOCK ASSEMBLY

Insert the Rock Lock Tower into the front receiver tube in the Strategy Chassis with the Rock Lock Bars extended to the sides. Align the upper pin holes of the receiver with the pin holes of the Rock Lock Tower and insert the receiver pin then secure it with the safety pin. See Figure 4.3

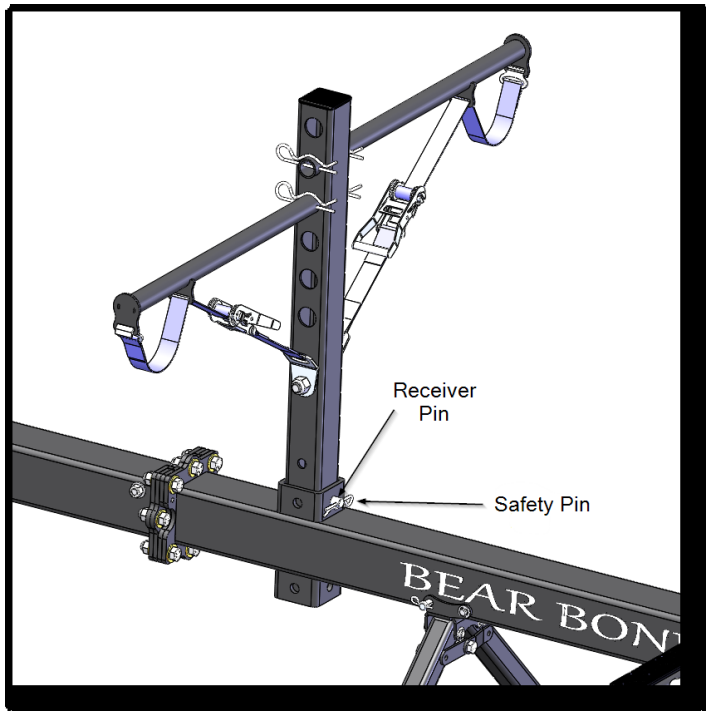


Figure 4.3

5. MOTOLEV LOADING AND USE

Because of the number of combinations of motorcycles and tow vehicles, the Motolev has some adjustability built in. Like any new way of doing something, it will likely require some trial and error to determine the best settings for your combination. Also because it is a new way of doing something, it may be seem awkward and cumbersome the first few times loading and unloading but with a little familiarization and practice with the process it will become simple and natural. When you do determine a configuration that works well, I suggest you pull out your cell phone and take a photo for later reference. In general, the

higher the hitch receiver of the tow vehicle, the lower the Rock Lock Bars will be positioned in the Tower. The goal being to have the bike/s sit close to level when the trailer is raised for travel. The vertical offset of the Rock Lock Bars should also be considered to avoid handlebar contact.

⚠ Notice

The underside of the dirt bike must be clean and dry. Any oil or mud on the bikes skid guard or frame where it sits on the motolev can cause the bike to slide out of position while traveling.

5.1. LOADING STEPS

This section is written as if loading a single bike but a second bike with a second person helping can be loaded at the same time in parallel following the same steps.

Before loading, make any necessary Frame Twister adjustment for the load you intend to carry as described in Section 4.1.

With the trailer coupled to a tow vehicle (because you remember that you never load a trailer without it being coupled to a tow vehicle) and parked on a level surface, remove the Rock Lock Bars and pre-inflate the air shocks to a pressure well above the ride pressure but not exceeding 150psi. 130-140 psi should be sufficient for 2 motorcycles.

Lower the trailer with the supplied hand crank. **If a powered drill motor is used remember that the lift screw stops abruptly at each end of travel so it is extremely important to turn the screw slowly and hold the drill with both hands to avoid hand, wrist, and arm injury and damage to the trailer.**

With the trailer lowered all the way, position the motorcycle so that it is centered on the pad and the foot pegs are positioned directly above the cinch lever cross member. While stabilizing the bike, raise the trailer until the front wheel of the motorcycle lifts off the ground. If the rear wheel lifts first, you may have the bike positioned too far forward and it may need repositioning. If it is positioned correctly but the rear wheel still lifts first don't worry you will just need to lift the front wheel by hand when the time comes. Now install the Rock Lock Bars in the desired tower holes and secure with the clevis pins. Continue to raise the trailer until the front wheel contacts the Rock Lock Bar and the rear wheel just leaves the ground. Adding a little weight to the rear of the bike with your hand may be necessary if the bike is front heavy. Once both bike wheels are off the ground, go to the front and while holding the front wheel against the Rock Lock Bar, feed the ratchet strap hook through the spokes and hook it to the end of the Rock Lock Bar with the hook opening away from the wheel as shown in Figure 5.1a

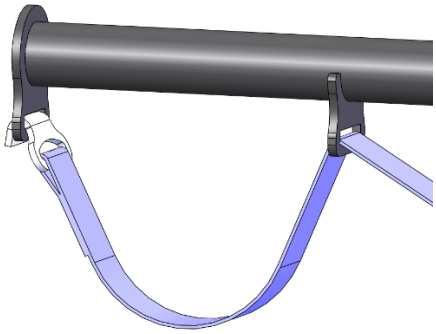


Figure 5.1a

Now thread the other end into the ratchet spool and ratchet the strap until tight.

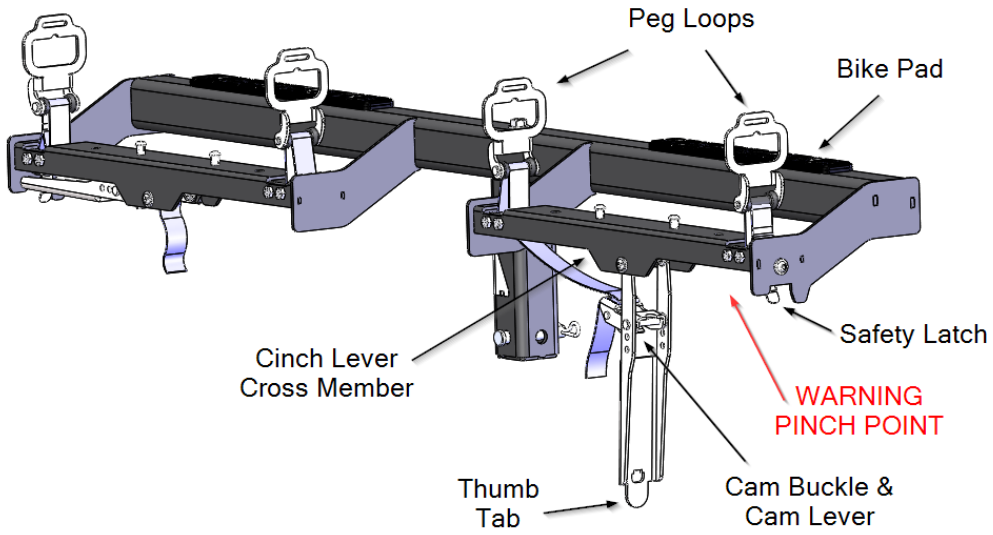


Figure 5.1b

Return to the side of the motorcycle and reach down and release the cinch lever by first pulling the safety latch tab underneath then pressing down on the thumb tab. Pinch the spring loaded cam lever to open it and pull most of the strap slack into the system. Slip the peg loops over the foot pegs and position them directly over the strap pulleys so they pull straight down. Ensure that the straps are centered in the pulley so they don't hang up on the shoulders when cinched. Now reach under and again pinching the spring loaded cam lever, pull the slack back out with the lever in the vertical position. Here a "half cinch" or partial pull of the lever may be necessary to pull any slack out of the system followed by again returning the lever to vertical, pinching the cam lever and pulling the remaining slack out. Then the final cinch to close the lever. Close the lever with an open palm to avoid pinching fingers between the cinch lever and the cinch lever cross member. Now check again to ensure the straps remained centered in

the strap pulleys. If not, release the lever, reposition the straps and close the lever. See Figure 5.1b above.

⚠ WARNING

WARNING: WHEN CLOSING CINCH LEVER, DO SO WITH AN OPEN PALM TO AVOID PINCHING FINGERS BETWEEN CINCH LEVER AND CINCH LEVER CROSS MEMBER

Note: The lever cinch uses a mechanical advantage to generate an amplified force pulling on the foot pegs. You want the cinch to be tight enough to securely tie the motorcycle to the trailer but over tightening can lead to damage of the motorcycle, trailer or both.

Raise the trailer the rest of the way and press the keeper cap onto the lift screw to keep it from turning while in transit. Give the bike/s a good shake to verify that they are securely attached to the trailer.

Note: Two bikes are best loaded by two people at the same time in a parallel operation following the steps above but it is possible for two bikes to be loaded by one person. To do so, fully load one bike first and then lower the trailer back down and continue lowering until the lift mechanism reaches the end of its travel which likely means the trailer wheel is off the ground and the weight of the trailer is supported by the first bike. Then position the second bike which may require putting a foot on the end of the lever cinch cross member and compressing the suspension of the first bike with your body weight until the second bike is in position. Then raise trailer until both bikes are again supported by the trailer and continue with the steps above.

With the bike/s loaded and the trailer raised, set the pressure in the shocks by letting a little air out at a time until the shocks settle a bit or pressing down lightly with you hand on the trailer or a bike causes the shocks to give a bit.

The trailer is now ready to roll. Remember that you must modify your driving behavior as explained in the Strategy Chassis User's Manual. Drive as if you are towing a fully loaded trailer because you are.

When it is time to unload the bike/s from the trailer, the steps are the reverse of the loading.

When the trailer is not being used it can be configured for storage by swapping the locations of the Lever Cinch and the Rock Lock assemblies and rotating them 90 degrees. In this configuration the trailer becomes slender enough to be stored in a garage alongside a car or easily maneuvered through a man door into a shed etc. See Figure 5.1c

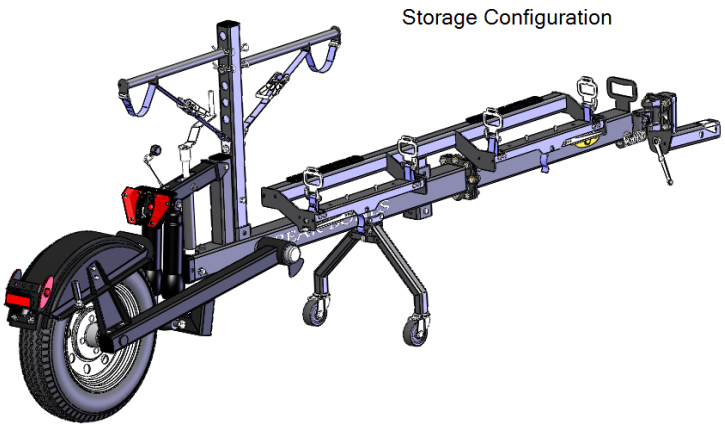


Figure 5.1c

5.2. CARE AND MAINTENTANCE

It is important to inspect, maintain and service your trailer and Motolev Drop-In regularly to ensure safe and reliable operation.

Motolev Straps -Inspect the lever cinch and rock lock straps before each use. Frayed, weathered or sun rotted straps can be significantly weakened and should be replaced to avoid catastrophic failure.

Structure and welds- The structure and welds should be inspected regularly. Cracks in steel components or welds should be repaired or the component replaced. Bent or otherwise damaged parts should be repaired or replaced.

Lubrication- The wedge sliding surfaces should be kept greased to facilitate function and avoid lockup. A thin application of grease or spray lubricant inside the receiver tubes may also make installation and removal of the Lever Cinch Assembly easier.

Happy Trailering.