



**Thunderstone**  
**manufacturing** LLC

# GRAIN CART TARP SYSTEM INSTALLATION AND OPERATION MANUAL

## Grain Carts KITS

Thunderstone Manufacturing, LLC.

3400 West O Street

Lincoln, NE 68528

402-435-4249

(Fax) 402-438-3918

[www.thunderstonemfg.com](http://www.thunderstonemfg.com)

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## **Aluminum tarp cap installation.**

1. Installing the front and rear caps.
  - a) Place the gussets inside of the tarp cap according to the drawing and mark the holes. Drill 13/32" holes where marked, then install the gussets using 3/8" x 1" carriage bolts, nuts, and washers. The bolt heads must be to the outside of the cap to prevent damaging the tarp. (Cap detail)
  - b) Put bushing over four of the 3/8" self-tapping screws and using a drill or impact wrench insert into the ridge strap mount plates welded in each of the caps. When tight back off 1 to 2 turns. These will be used to install the ridge straps.
  - c) Line up the side of the cap on the low side of the cart so it is 1/2" to 1" from the edge of the cart.
  - d) The high side of the cap should be 1/2" from the edge of the cart. If it is closer to the edge remove the weather stripping and trim off the extra. Grind the edge smooth and replace the weather stripping to prevent the edge from damaging the tarp.
  - e) Using the existing holes in the tarp cap as a guide, mark and drill 5/16" holes in the front of the cart.
  - f) Use the 3/8" x 1" thread cutting screws to attach the cap to the cart. If the nuts and washers are needed to secure the cap drill a 13/32" hole instead of a 5/16" hole.
  - g) Line up the interior cap support with the edge of the cap and mark where you want to drill the holes on both the side of the cart and the underside of the tarp cap.
  - h) Drill 13/32" holes in both the tarp cap and the side of the cart. Bolt in place using the 3/8" x 1" bolts, nuts, and washers.

## **Tarp bows and the ridge strap installation.**

2. Installing the tarp bows.
  - a) On the high side of the cart measure 39" from the inside of the front and rear of the cart and mark. This will mark the centerline of the bracket.
  - b) Hold the bracket so it is centered on the mark and mark where the holes will be. Drill 13/32" holes and install the brackets using 3/8" x 1" bolts, nuts, and washers.
  - c) Measure the distance between the brackets and divide by the number of tarp bows plus 1. This will give you the number of spaces between brackets. This measurement should be between 45" and 65". Mark the center line of the brackets.
  - d) Hold each bracket so it is centered on the mark and repeat step b for each bracket.
  - e) Repeat steps a. – d. on the low side of the cart to finish the bow bracket installation.
  - f) Insert a tarp bow into each of the brackets on the low side of the cart and a tarp bow pin into each of the brackets on the high side of the cart. If the tarp bow overlaps the tarp bow pin too much mark and cut the tarp bow to fit.
  - g) Clamp a vise grip pliers to the tarp bow pin so it butts up against the tarp bow to hold it in place. Either weld the tarp bow to the tarp bow pin or drill an 11/32" hole through the bow and the tarp bow pin and use a 5/16" x 1-1/2" bolt, washer, and lock nut to hold in place. If welding grind the weld smooth to avoid cutting or tearing the tarp. If using a bolt drill the hole from the side and insert the bolt so the head will not rub on the tarp.
  - h) Repeat steps f) and g) for the remaining tarp bows.
3. Installing the ridge strap.
  - a) Take the two ridge straps with the ratchet and slide the mounting plates over the bolts that were installed in the apex of the front tarp cap. Make sure the handle of the ratchet is facing down and tighten the bolts at this time.
  - b) Take the two ridge straps and slide the mounting plates over the bolts that were installed in the apex of the rear tarp caps. Tighten the bolts at this time.
  - c) Bring the straps from the rear of the cart to the front of the cart and feed them through the ratchets. Make sure there are no twists in the straps and that the handle of the ratchet is facing down and then tighten the straps using the ratchets. Do not over tighten the straps or the tarp caps will be warped.
  - d) Fold or cut the ridge straps to remove the excess. If cutting the straps heat the end with lighter to prevent unraveling.

## **Installing the quick release tarp stops.**

4. Install the stop base.
  - a) Remove the two pins that hold the mounting base to the stop.
  - b) On the high side of the cart measure 20-1/2" from each end of the cart and place a mark on the outside of the rail. This will be the center point of the stop.
  - c) Hold the stop base so it is centered on the marks and the top of the bracket is even with the top of the cart rail, and mark where the holes will be. It is recommended that two fasteners are used, one at the top and one as close to the bottom as possible. Drill 13/32" holes at marks and attach the bracket using 3/8" x 1" bolts, washers, and nuts.
  - d) Measure the distance between the front and rear tarp stop and divide by the number of tarp stops plus 1 to get the number

- of spaces between the stops. . This measurement should be between 45" and 65". Mark the center lines of the brackets.
- e) Hold each bracket so it is centered on the mark and repeat step c) for each bracket.
  - f) Place the stop back into the mounting base and insert the clevis pins to hold it in place.

## **Latch plate and wall protector installation.**

### **5. Installing the latch plate.**

- a) Measure the length of the trailer and cut the latch plate so it is the same length. Grind cut edge smooth so it can't damage the tarp.
- b) On the low side of the trailer measure in 2" from each end of both latch plates and place a mark. Then place a mark every 12 inches from the front of the latch plates. Measure down 3/8" and drill 13/32" holes at each mark. (Detail J)
- c) Measure down from the top of the low side rail 2" to 4". The latch plate must be bolted to the body of the trailer not to a lip. (Detail E)
- d) If possible hold or clamp the latch plate to the body of the trailer and using the holes drilled into the latch plate drill the holes into the body of the trailer. Install the latch plate using 3/8" x 1" bolts, washers, and nuts. (Detail H)

### **6. Installing the wall protectors.**

- a) Measure from the front and rear of the trailer 13" and make a mark. Measure the distance between the front and rear marks and divide by two. Place a mark at this point.
- b) Measure from the bottom of the latch plate 3" – 4" and make a mark, this will be the center of the top hole of the wall protectors.
- c) Drill a 3/8" hole at each mark. Loosely install the wall protectors using 3/8" ribbed carriage bolts, washers, and nuts through the top hole making sure that the head of the carriage bolt is on the outside of the cart and the nuts and washers are inside. Make sure the wall protectors are straight and drill a second 3/8" hole through the bottom hole of each wall protector. Finish installing the wall protectors using the remaining 3/8" ribbed carriage bolts, washers, and nuts.

## **Assembling and installing the tarp.**

### **7. Assembling the fixed and roll tubes to the tarp.**

- a) Roll out the tarp and measure to make sure that it will fit on the cart. It should be 4" ±1" shorter than the length of the cart and 22" ±1" wider than the width of the cart.
- b) The smaller pocket is where the fixed tube will be installed and the large pocket is where the roll tube will be installed.
- c) Weld the fixed tubes (1" O.D.) together. Grind the weld smooth so it will not tear or wear the tarp. Cut the fixed tube so it is 2" longer than the tarp. Cut off the end that is swaged and grind smooth.
- d) Insert the two plastic plugs into the ends of the fixed tube.
- e) Make sure that the seams of the pockets are facing down and the reinforcing straps are facing up, and then insert the fixed tube into the smaller pocket until it comes out the other end.
- f) Use one of the #10 x 3/4" self-drilling screws and secure the tarp to the fixed tube on one end approximately 1/2" from the end of the tube. Pull the tarp tight at the other end and secure using another #10x 3/4" self-drilling screw.
- g) Weld the two roll tubes together. Cut the roll tube down on the end that doesn't have the spline shaft welded into it so that it is 20" ± 1" longer than the tarp. Grind weld and the cut end smooth to avoid damaging the tarp.
- h) Insert the front bungee return into the front of the roll tube. Secure using #8 x 3/8" self-drilling screw.
- i) Inset the roll tube into the larger pocket so that the spline shaft will be at the rear of the tarp and the bungee return is at the front. The roll tube should stick out of the tarp 4" to 4 1/2" at the front.
- j) Starting at the front of the tarp use tarp clip and #10 x 3/4" self-drilling screw to secure the tarp to the roll tube. Make sure to put the clip over the reinforcing strap before attaching to maximize the strength.
- k) Pull the tarp to tighten and install the rest of the tarp clips over each of the reinforcing straps.
- l) Roll the tarp up using the roll tube until it is a couple of inches away from the fixed tube.
- m) Lift the tarp up and place it on the tarp caps near the tarp stops. Remove the top pin in all of the tarp stops and let them hang down. Pull the fixed tube into the notch in the tarp stops.
- n) Check that the tarp is 2" ±1/2" from the inside edge of each of the tarp caps. Pivot the stops up and reinsert the pins to lock the tarp in place on the high side.
- o) Roll the tarp to the closed position and leave hanging.
- p) Drill 13/32" hole on the front lip of the trailer within 3 inches of the low side of the cart, and mount the eyebolt using the nuts, and washer. Put nut on the eyebolt, insert into drilled hole, put nut and washer on the eyebolt and tighten.
- q) Pull 6" of the bungee cord through the hole in the eyebolt. Slide a 1/2" washer over the end of the bungee cord. Tie a knot in the bungee cord so there is at least 2" of excess cord beyond the knot.

## Crank handle and crank handle retainer installation.

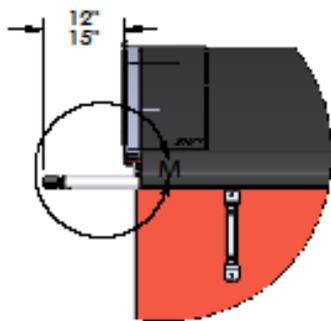
### 8. Building and installing the crank handle.

- a) Slide the knuckle onto the end of the 108" extension that has one hole. Secure using the 3/8" x 2" roll pin.
- b) Insert the crank arm extension into the end of the 108" extension tube that has 4 holes in it. Use 5/16" x 2 7/8" clevis pin and hairpin lock pin to secure in place.
- c) Slide the knuckle over the spline shaft and use the 3/8" x 2" lox-all pin to secure in place.

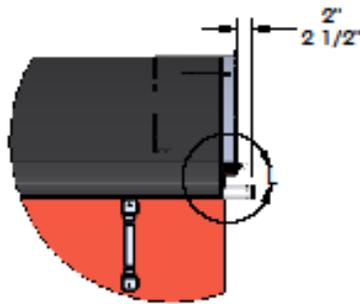
### 9. Assembling and installing the crank handle retainer.

- a) Insert the crank arm telescoping tube into the crank arm retainer base. Hold in place using a 3/8" x 3" bolt, nut, and washer.
- b) Find a mounting position where the crank arm will reach in both the open and closed position. This will usually be to the high side of the trailer just off center.
- c) Hold in place while someone swings the crank arm from the close position and then from the fully open position to make sure it will latch.
- d) Mark where the hole will be by using the holes in the base of the retainer assembly. Drill 3/8" holes through the body of the cart. Go inside of the cart body and insert the 3/8" x 1" rib shank carriage bolts through the holes in the body. Tap in place with a hammer. On the outside of the cart hold the crank arm retainer and slide over the bolts and use lock washers and nuts to mount the retainer. Make sure the bolt heads seat firmly on the inside of the cart or they could come loose later.
- e) Roll the tarp to the fully closed position, so it is seated under the latch plate and swing the arm to the latch plate. There should be around 70 lbs. of pressure on the crank arm to firmly secure the tarp.
- f) If adjustment is needed open the tarp so that it is hanging freely below the latch plate. Remove the lox-all pin from the knuckle and slide the knuckle off of the spline shaft. Rotate the arm one groove in the spline shaft out (away from the centerline of the cart) and try latching again. Keep trying until desired tension is reached.

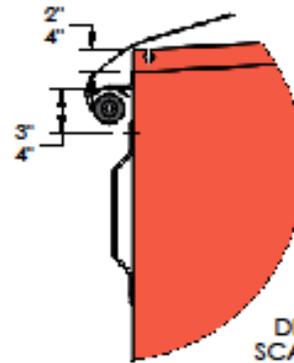
# Directions



DETAIL A  
SCALE 1 : 24



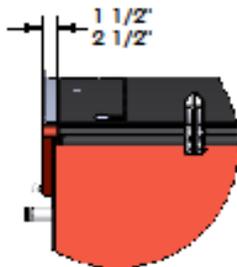
DETAIL B  
SCALE 1 : 24



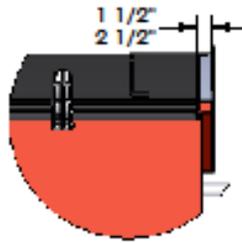
DETAIL E  
SCALE 1 : 12



DETAIL F  
SCALE 1 : 12



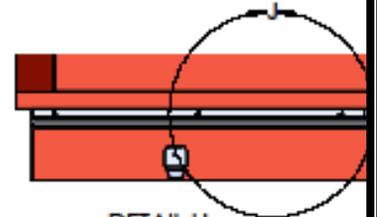
DETAIL C  
SCALE 1 : 24



DETAIL D  
SCALE 1 : 24



DETAIL G  
SCALE 1 : 8



DETAIL H  
SCALE 1 : 16

