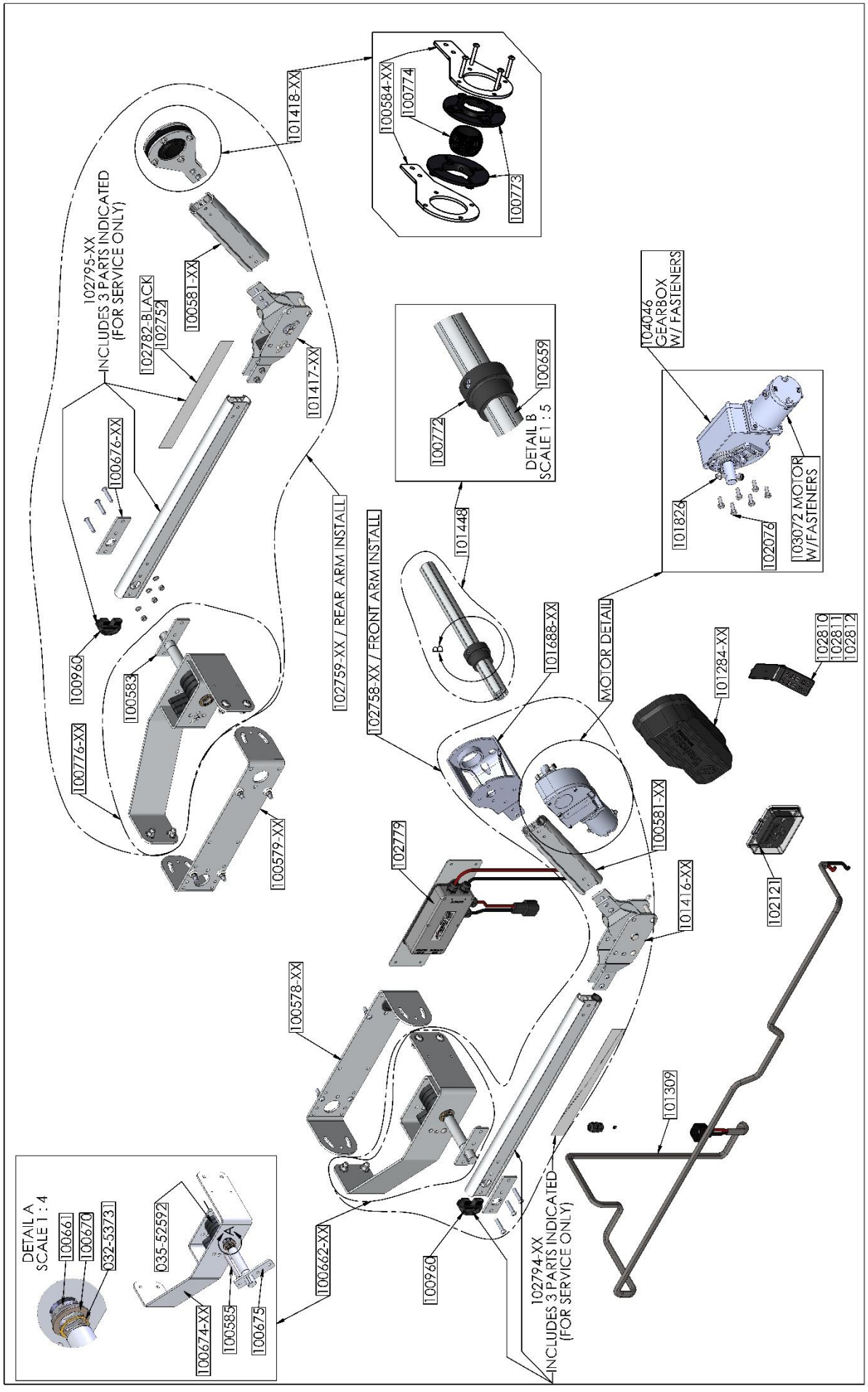
THUNDER 7000
POWER TARP SYSTEM

THUNDER POWER TARP 7000 INSTALLATION INSTRUCTIONS

Part # 102745-XX – Dual Arm
Part # 102746-XX – Single Arm

Thunderstone manufacturing LLC
3400 West O Street
Lincoln, NE
402-435-4249
(Fax) 402-438-318
www.thunderstonemfg.com


101418-XX
100584-XX
100774
100773
102795-XX
INCLUDES 3 PARTS INDICATED
(FOR SERVICE ONLY)
102782-BLACK
102752
100581-XX
101417-XX
100676-XX
100960
100583
100776-XX
100579-XX
102759-XX / REAR ARM INSTALL
102758-XX / FRONT ARM INSTALL
100772
100659
DETAIL B
SCALE 1 : 5
101448
101688-XX
MOTOR DETAIL
104046
GEARBOX
W/ FASTENERS
101828
102078
103072 MOTOR
W/FASTENERS
101284-XX
102810
102811
102812
102779
100581-XX
101416-XX
102121
100578-XX
101309
DETAIL A
SCALE 1 : 4
100661
100670
032-53731
035-52592
100674-XX
100585
100675
100662-XX
100960
102794-XX
INCLUDES 3 PARTS INDICATED
(FOR SERVICE ONLY)

INSTALLATION INSTRUCTIONS

Note:
This kit converts an existing manual crank system that has an existing locking latch plate on the roadside and tarp stops on the curbside into a one-touch electric tarp system.

Tools Needed:
Standard Wrench Set
Standard Deep-well Socket Set
Cordless Drill
Hole saw set up to 2 ½"
Screwdriver Set
Socket Extension
Wire Cutters
Wire strippers/crimpers

Preparation:

1. Roll the tarp to the covered position.
2. Remove the hand crank attachment from the back of the axle.
3. Remove the roll return mechanism(s) from the front and/or back of the axle.

Note:
Keep the existing hand crank attachment. If the motor is damaged, or the system cannot be powered, you can disengage the motor, slide the hand crank attachment on to the adapter and pin it in place. This will allow you to use your hand crank as a backup. (The motor adapter will be installed in later steps.)

Install Tarp Axle Extension

Fig. 3.1

1. Locate the 3'-0" (36in.) axle extension. The axle extension will be swedged on one end. See figure 3.1.
2. If the current manual tarp system has a front bungee return, remove the entire bungee cord, plastic guide, and 10' PVC tube from the front of your axle pipe.
3. Remove the eyebolt from the front of the Latch Plate.
4. Remove tarp clips along the length of the tarp axle tube and slide tarp axle tube forward 16".
5. Insert the swedged end of the axle extension into the front of your tarp axle. If possible, weld axle extension to tarp axle and let cool fully before proceeding to next step. (If you cannot weld the extension into the roll tube, use the four ¼" x 1-¼" self-drilling Phillips head screws that are included in fastener bag to attach the extension). Attach the axle extension to the tarp axle in at least four places at 90 degrees from each other. See figure 3.2.

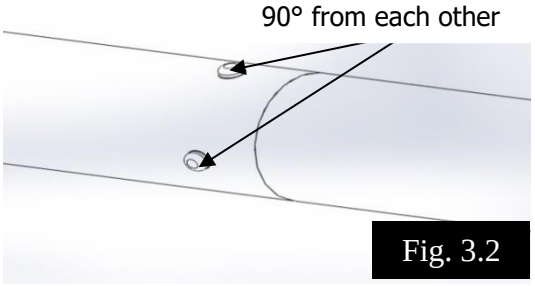


Fig. 3.2

(Make sure weld is cooled before sliding roll tube back into tarp!)

6. Slide axle back into tarp, and go to rear of trailer. Slide the tarp axle back until the end of the spline on the back of the axle is 22" to 24" away from the end of the tarp.
7. When the distance at the rear of the trailer is set, go to the front of the trailer and measure 15" - 17" from the front of the tarp, and mark the axle.
8. Cut the axle at mark to remove excess material, and then remove the burrs from the end of the axle that was cut.
9. On a slanted rear system the rear distance is 30" to 32" from the rear of the tarp and for a slanted front system the front dimension is 16" to 18" from the front of the tarp to the extension end.

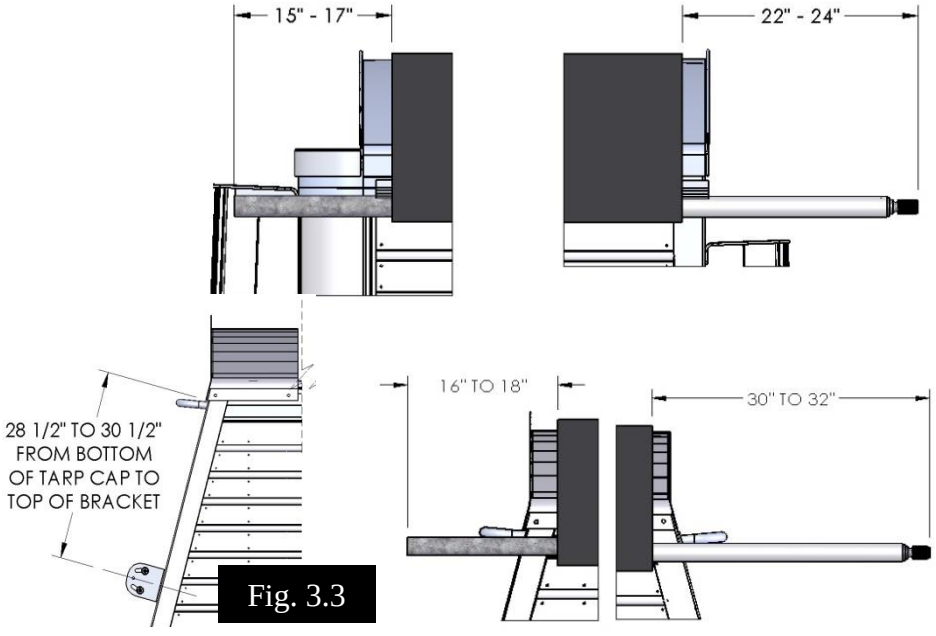


Fig. 3.3

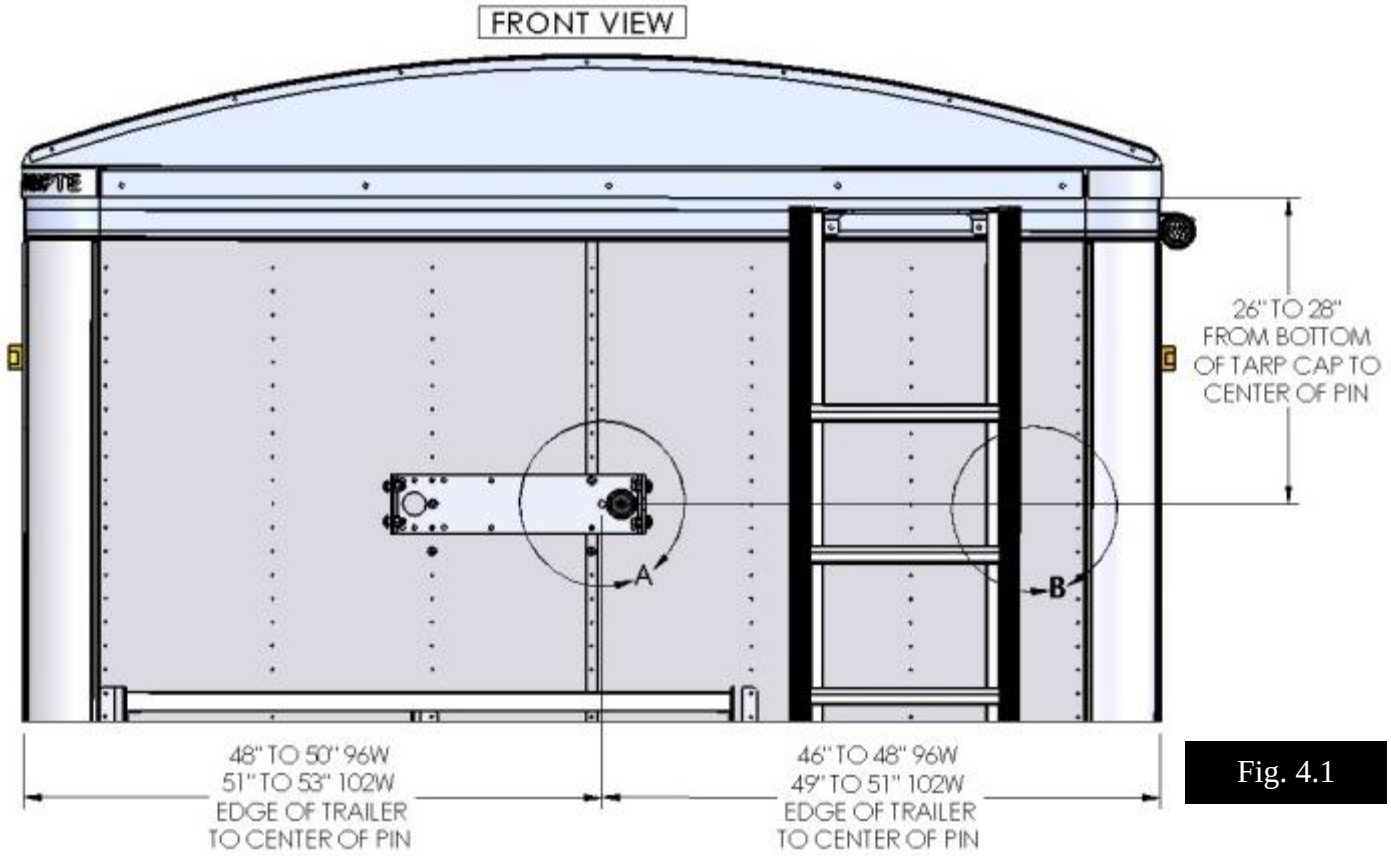


Fig. 4.1

Front Pivot Installation

1. On the front of the trailer measure from the bottom of the tarp cap, for square nose trailers measure straight down approximately 27" and put a mark on the front face of the trailer. **This line should be as close to center as possible.** Refer to the figure 4.1.
2. For slant nose trailers measure approximately 29 1/2" from the bottom of the tarp cap. Refer to the figure 3.3.
3. Line up the 5/8" hole in the inner bracket with the mark made in step 1. Refer to the figure 4.2.
4. Find the four fasteners that line up to four of the holes in the bracket. If no holes in the bracket line up with the fasteners in the nose of the trailer the pivot point can be moved up to 2" to roadside and up to 1" to curbside along the horizontal dimensions shown. The bracket can be moved up to 1" higher or lower on the vertical axis.
5. Once the holes in the bracket are lined up with four fasteners, mark these four fasteners and set the bracket aside for now.
6. Using a drill with a ¼" drill bit remove the existing rivets that will be behind bracket. The bracket will be mounted flat against the nose of the trailer so you will have to remove 6 fasteners total.
7. Drill four 25/64" (.390") holes where the four top and bottom fasteners were that were marked.
8. Align the holes in bracket with holes on nose of trailer and bolt in place using four 3/8" button head bolts, 3/8" washers, and 3/8" lock nuts provided.
9. Drill a 2" hole in the nose of trailer using the hole in bracket as a guide. This will be used for motor wire to pass through. See Fig. 4.2
10. If you have a straight nose trailer, bolt the front outer bracket to the inner bracket using the four 1/2" hex head bolts, lock nuts, and washers provided. Tighten the fasteners until they are snug but not tight. It will appear as shown in the figure 5.3.

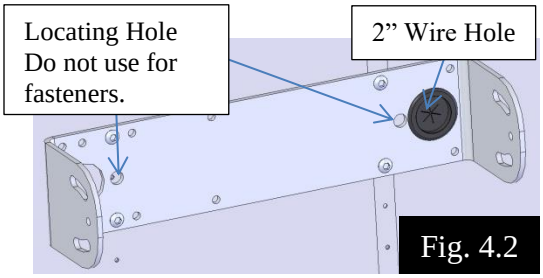


Fig. 4.2

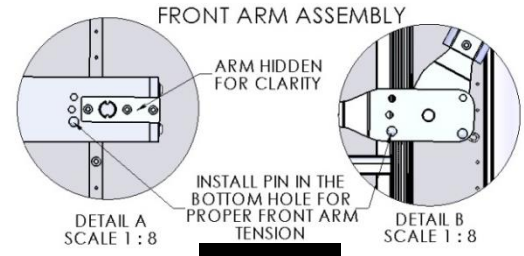


Fig. 4.3

Note: The angled face of the bracket is opposite the ladder side on both the nose and rear of the trailer.

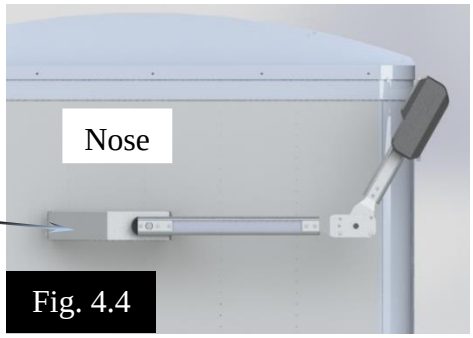


Fig. 4.4

11. If you have a slant nose trailer, bolt the front outer bracket on using two ½" bolts and lock nuts and washers as shown in figure 5.3 in the lower bolt holes. Tighten the fasteners until they are snug but not tight.
12. Put two ½" fasteners into the upper bolt holes and tighten until they are snug but not tight, they will be tightened after arm is attached to the roll tube.

Adapter Extension Installation

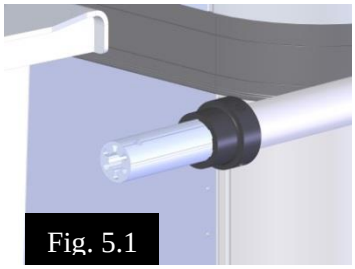


Fig. 5.1

1. Locate the adapter extrusion with the pre-installed polymer bushing. Refer to figure 5.1.
2. Slide the end of the adapter without the pre-drilled hole in it into the front of the existing 2" tarp axle and leave a 1" gap between the face polymer bushing and the tarp axle.
3. If the extrusion is too long measure from the end of the tarp axle to the face of the polymer bushing. Subtract 1/2" from that dimension and remove the adapter extrusion from the tarp axle.
4. Measure and remove the excess material from the end of the adapter extrusion without the bushing and the pre-drilled hole.

(Example if there is 2" between the face of the bushing and the tarp axle remove the extrusion and cut off 1 ½" from the length of the adapter extrusion.)

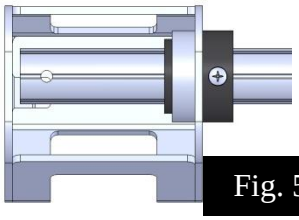


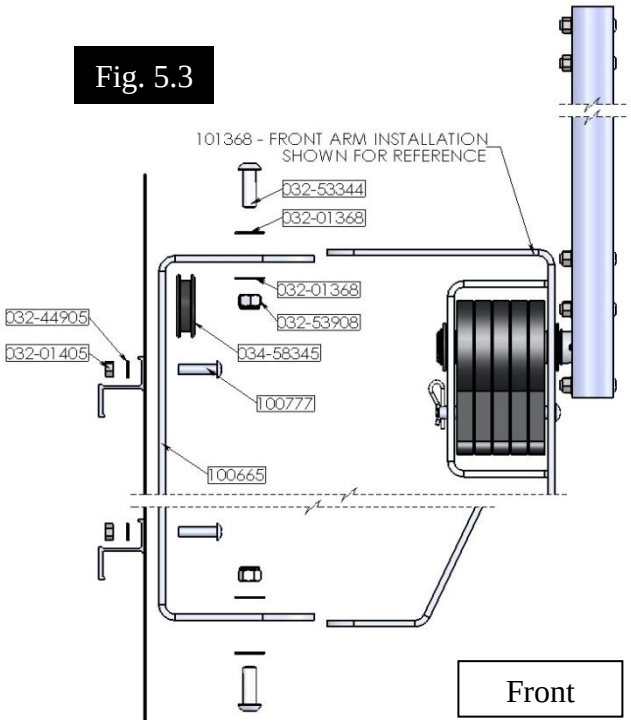
Fig. 5.2

5. Reinsert the adapter extrusion into the tarp axle.
6. Do not attach at this time it must be free floating until after installed into the front arm.

Front Arm to Adapter Extension Installation

1. The spring pin is installed into the lowest hole in the 3-hole pattern at both the pivot assembly and the knuckle. When the arm is rotated up toward the axle, this will be the lowest spring tension.
2. Rotate the brackets until the outer bracket is level.
3. Rotate the pivot arm and motor up to the axle and slide axle adapter into the head of the motor mount bracket and onto the motor shaft.
4. Make sure that the polymer bushing is fully seated in the aluminum head that is bolted to the arm as shown in Fig. 5.2
5. Rotate the adapter extrusion until it aligns with the hole in the motor shaft.
6. Attach the adapter extrusion to the motor shaft using the 3/8" x 3" grade-8 bolt and lock nut that is provided. Do not tighten at this time.
7. Tighten the ½" fasteners that hold the outer bracket to the inner bracket.
8. After the ½" fasteners are tightened lock the bracket into place by using the .390 holes in the inner bracket as a guides and drilling a 25/64" (.390") hole through each side of the outer bracket. Use a 3/8" bolt and lock nut to secure the bracket and prevent it from shifting.

Fig. 5.3



9. The completed arm assembly will appear as shown in figure 5.4 when seen from the front of the trailer.


Fig. 5.4

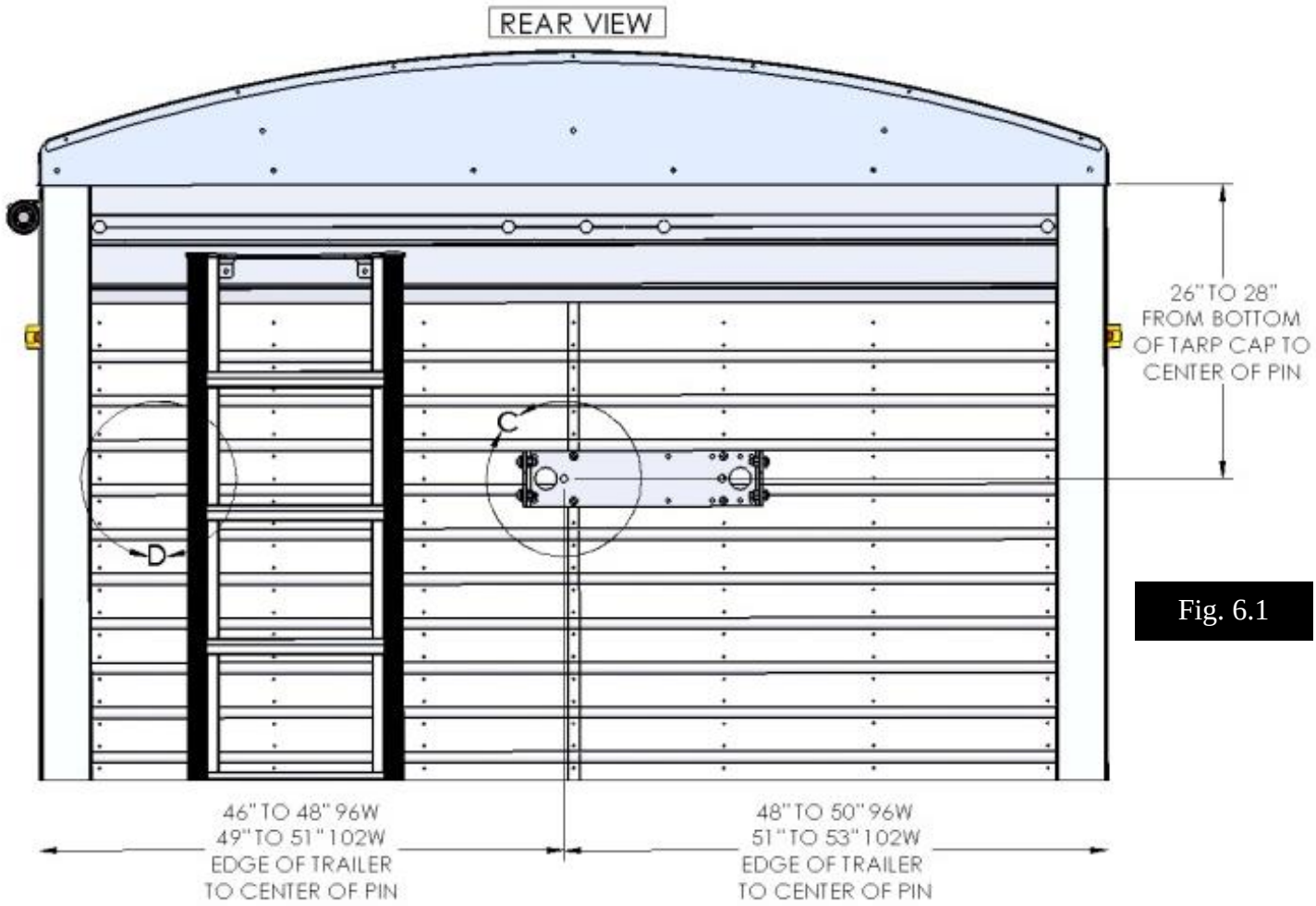
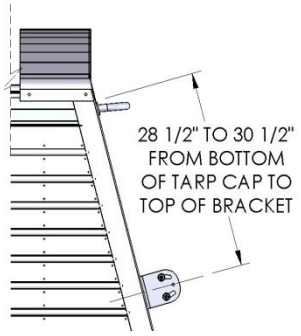


Fig. 6.1

Rear Pivot Installation

For single arm system only the front brackets and arms are installed.

Fig. 6.2



1. On the rear of the trailer measure from the bottom of the tarp cap, straight down 26” to 28” and put a mark on the rear face of the trailer **as close to center as possible.** Refer to figure 6.1.
2. For slant nose trailers measure approximately 29 1/2” from the bottom of the tarp cap. Refer to the figure 6.2.
3. Line up the 5/8” hole in the inner bracket with the mark made in step 1. Refer to figure 6.1.
4. Find the four fasteners that line up to four of the holes in the bracket. If no holes in the bracket line up with the fasteners in the nose of the trailer the pivot point can be moved up to 2” to roadside or up to 1” to curbside along the horizontal dimensions shown. The bracket can be moved up to 1” higher or lower on the vertical axis.
5. Once the holes in the bracket are lined up with four fasteners, mark these four fasteners and set the bracket aside for now.
6. Using a drill with a ¼” drill bit remove the existing rivets that will be behind bracket. The bracket will be mounted using ¼” plastic washer so only remove the 4 fasteners directly behind the four holes in the bracket.
7. Drill four 25/64” (.390”) holes where the four fasteners were that were marked.
8. Align the holes in bracket with holes on rear of trailer and bolt in place using the four 3/8” button head bolts, plastic washers, 3/8” washers, and 3/8” lock nuts provided.

Note: The angled face of the bracket is opposite the ladder side on both the nose and rear of the trailer.

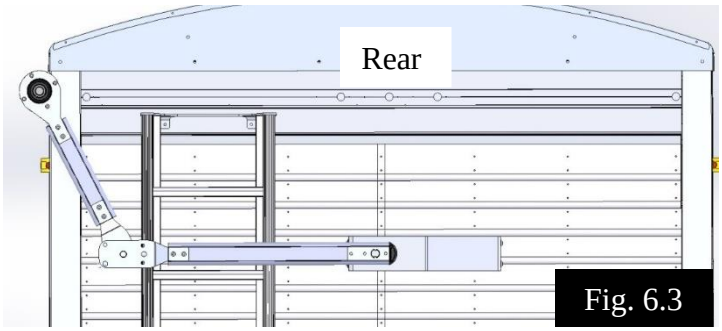


Fig. 6.3

Rear Arm Installation

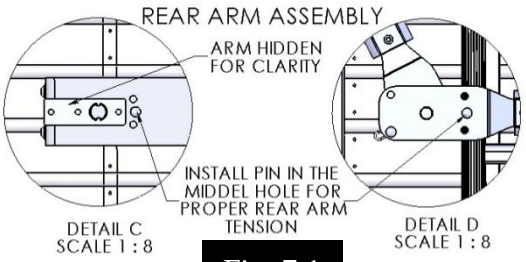


Fig. 7.1

1. The spring pin is installed into the middle hole in the 3-hole pattern at both the pivot assembly and the knuckle. When the arm is rotated up toward the axle, this will be the medium spring tension. See figure 7.1.
2. Slide one of the locking collars onto the roll tube. Do not attach the locking collar at this time.
3. exIf you have a straight back trailer bolt the rear outer bracket to the inner bracket using the four 1/2" hex head bolts, lock nuts, and washers provided. Tighten the fasteners until they are snug but not tight. It will appear as shown in the figure 7.2.
4. If you have a slant nose trailer, bolt the front outer bracket on using two ½" bolts and nuts and washers as shown in fig. 7.2 in the lower bolt holes. Tighten the fasteners until they are snug but not tight.
5. Put two ½" fasteners into the upper bolt holes and tighten until they are snug but not tight.
6. Rotate the brackets until the outer bracket is level.
7. Rotate the arm up until the ball socket assembly can be slipped onto the roll tube as shown in figure 7.3. The bushing may have to be tapped with a rubber mallet to get it past the weld on the spline shaft.
8. Tighten the fasteners to hold the bracket in place. It will appear as shown in figure 7.3.
9. After the ½" fasteners are tightened lock the bracket into place by using the .390 holes in the inner bracket as a guides and drilling a 25/64" (.390") hole through each side of the outer bracket. Use a 3/8" bolt and lock nut to secure the bracket and prevent it from shifting.
10. The finished assembly should look like figure 7.3 when seen from the rear of the trailer.

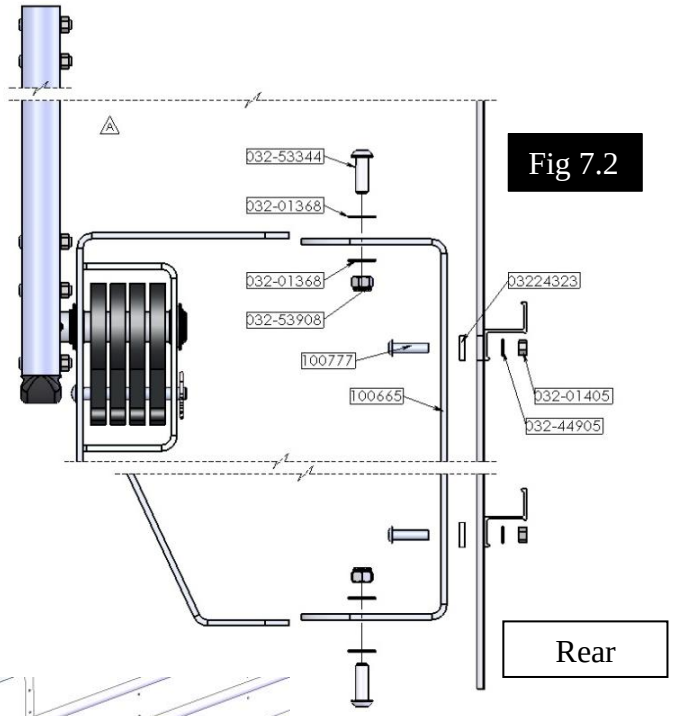


Fig 7.2

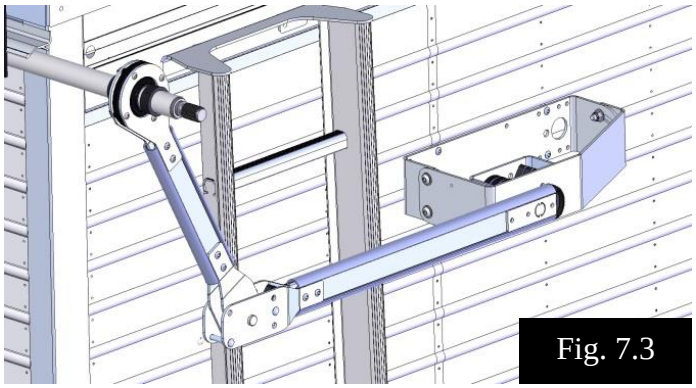


Fig. 7.3

Arm Wiring

1. Run the wire that is pre run through the front arm through the hole in the front bracket. **The wire should hang below the bracket to prevent the wire from rubbing and creating a short.**

2. Insert the grommet that is on the wire into the 2" hole in the mounting bracket. This need to be installed to prevent the wire from being damaged by rubbing in the aluminum hole. Leave some slack in the wire so the wire will not be stretched when the arm is swinging across the front of the trailer shown in Fig. 7.4.

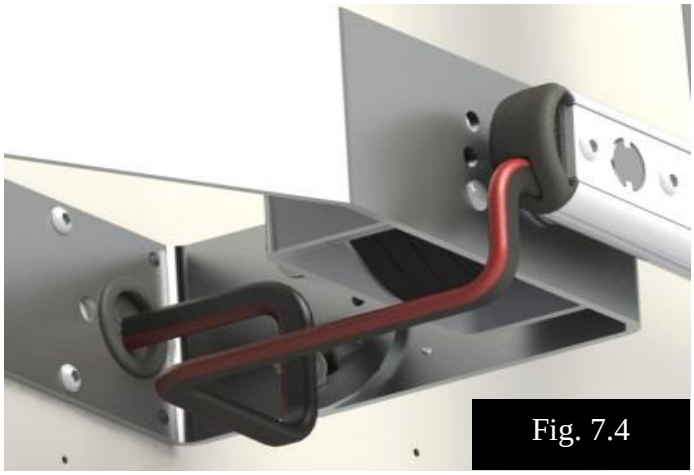
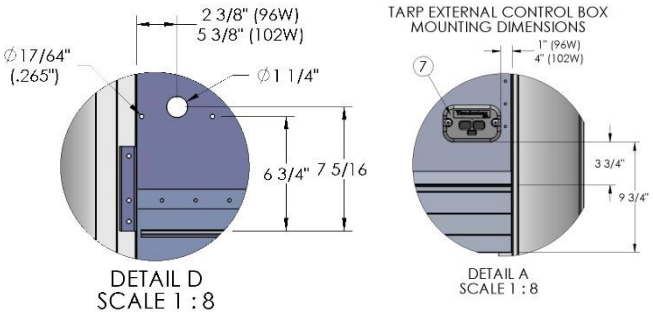


Fig. 7.4

Mounting the External Keypad Controller


Fig. 8.1

1. On the nose of the trailer, drill a 1 ¼" hole approximately 6 3/4" up from the top of the lower frame rail and 2 3/8" (96W) or 5 3/8" (102W) in from the edge of the round roadside corner post. (*It is recommended that you drill the holes in this step from the inside out to avoid hitting a wire or air hose on the inside of the nose*.)
   Place the tarp external keypad to the nose of the trailer.
2. Locate the tarp external keypad approximately 9 ¾" from the bottom rail of the nose of the trailer.
3. Drill two 17/64" holes in the nose of the trailer using the tarp external keypad as a template, or use the template located at the back of this manual.
4. Install the external keypad along with the splash guard enclosure to the nose of the trailer using two ¼"-20 x 1 ½" Phillips pan head screws, the ¼" lock washers, and ¼"-20 nuts.
5. Make sure that all fasteners are tightened.



Inside Nose

Mounting the Inner Control Box

1. Chose a location inside the nose of the trailer between the two center Z-posts above the king pin. Fig. 8.2.
2. Clamp the plate to the Z-posts using vice grip pliers or C-clamps to hold in place.
3. Use four #10 x ¾" self-tapping screws to attach the mounting plate to the Z-posts using the predrilled hole in the plate as a guide.
4. Connect the keypad communications cable:
   a. Plug the communication cable coming from the keypad into the control board connector inside the control box.
   b. Tighten the compression fitting nut into the control box with a 1" end wrench.
   c. Tuck the communications cable behind any existing wire guarding and secure with a zip tie to minimize wear.

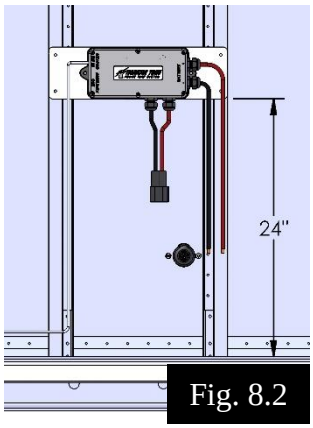


Fig. 8.2

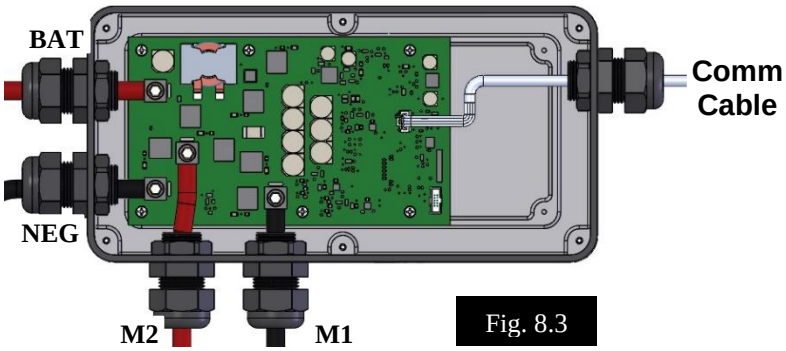


Fig. 8.3

Wiring the Inner Control Box

Connecting the motor plug:

1. Insert the two plugs together until you hear the click sound. Verify that the wires match colors on each side of the plug, red to red, black to black.
2. Slide the white safety lock toward the male connector until seated.

Disconnecting the motor plug:

1. Unlock the safety lock by sliding the white safety lock toward the female connector until unlocked.
2. Lift on the locking tab to disconnect the latch and pull the plug apart.

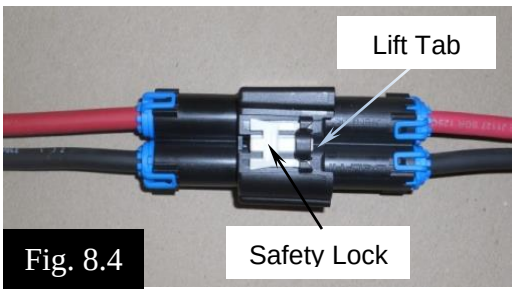


Fig. 8.4

Install the 2-Pole Receptacle

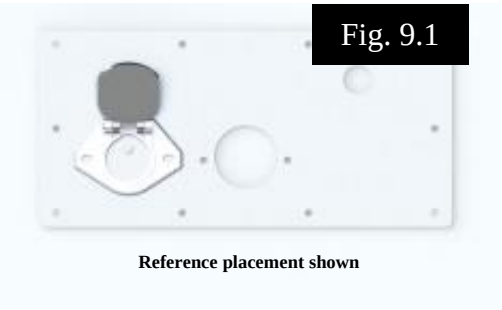


Fig. 9.1

Reference placement shown

1. On the nose doubler plate (where the air & power are), mark a position that will allow the 2-pole receptacle to be installed. When selecting a spot to install the receptacle do not place the receptacle where it will interfere with the connection of the glad hands. (*It is recommended that you drill the holes in this step from the inside out to avoid hitting a wire or air hose on the inside of the trailer*.) Drill a 2 1/8" hole for the receptacle body to go through.
2. Slide the receptacle through the hole in the nose and mark where the holes for the screws will go. Drill a 9/32" hole for each of the screws. Insert the receptacle and attach using the ¼" x 1 ½" Phillips head screws, ¼" nuts, and ¼" lock washers.

Wiring – 2 Pole Receptacle


Fig. 9.2

1. Strip back 3/8" - ½" insulation on the BAT+ and BAT- wires coming from the inner tarp control box if this hasn't already been done.
2. Place supplied large rubber boot over the BAT wires.
3. Insert the BAT+ (red) wire into the top terminal hole on the 2-pole receptacle and tighten the set screw securing the wire. (Use dielectric grease on the wire prior to inserting into the power receptacle) see figure 9.2.
4. Insert the BAT- (black) wire into the bottom terminal hole on the 2-pole receptacle and tighten the set screw securing the wire. (Use dielectric grease on the wire prior to inserting into the power receptacle) see figure 9.2.
5. Slide the large rubber boot up to cover the back of the 2-pole receptacle.

Finalize Axle Assembly

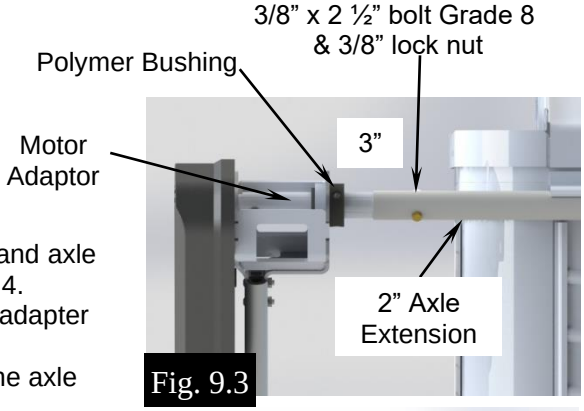


Fig. 9.3

1. Secure the motor to the roll-pipe adapter using the 3/8" x 3" grade 8 bolt and 3/8" lock nut supplied with the motor. Tighten the bolt until it is very snug.
2. Use the operation instructions to power up the system.
3. Run the motor in each direction for approximately 10 seconds to make sure the adapter tube is aligned with the roll tube.
4. Once in place, drill a 3/8" hole 3" from the edge through the roll tube and axle adapter, use the grooves in the axle adapter as a guide, see figure 9.4.
5. Use the 3/8" x 2-1/2" supplied grade 8 bolt and lock nut to attach the adapter to the existing axle.
6. Run the motor in each direction for about 10 seconds to self-center the axle through the tarp and rear arm bushing.
7. Slide the second locking collar behind the rear arm bushing, see figure 9.5.
8. Use #10 x ¾" self-drilling screws and attach the locking collars on each side of the rear arm bushing. Leave approximately ½" to 1" gap between the clip and both the front of the bushing and the rear of the bushing to allow room for the arm to float slightly on the axle.
9. Replace all tarp clips using the supplied #10 x ¾" self-drilling screws as shown in figure 9.6.

(NOTE: Make sure to screw tarp clips into the bottom of the tarp pipe while tarp is fully extended.)

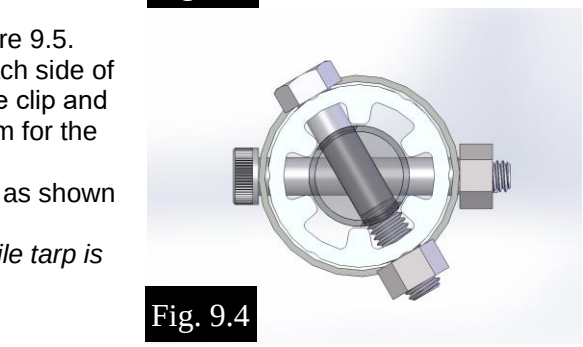


Fig. 9.4

Fig. 9.5

LOCKING COLLAR LOCATION

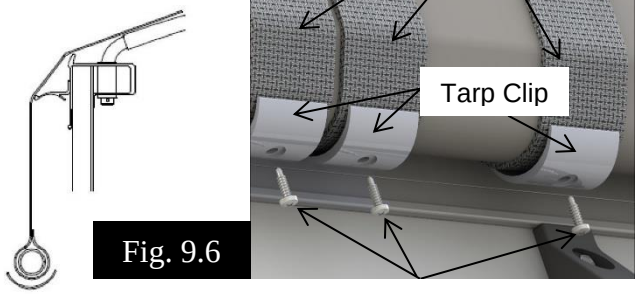


Fig. 9.6

#10 x ¾" Self-Drilling Screw

Crank Handle Retainer Installation

1. Assemble the crank handle retainer shown in figure 10.1.
2. Attach crank handle retainer to the curbside of trailer using supplied 3/8” rib neck carriage bolts, washers, and lock nuts as shown in figure 10.2.

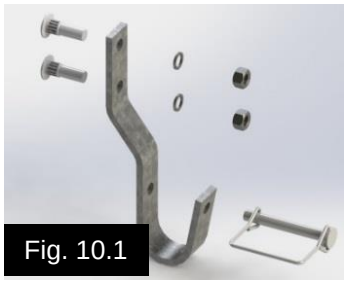


Fig. 10.1

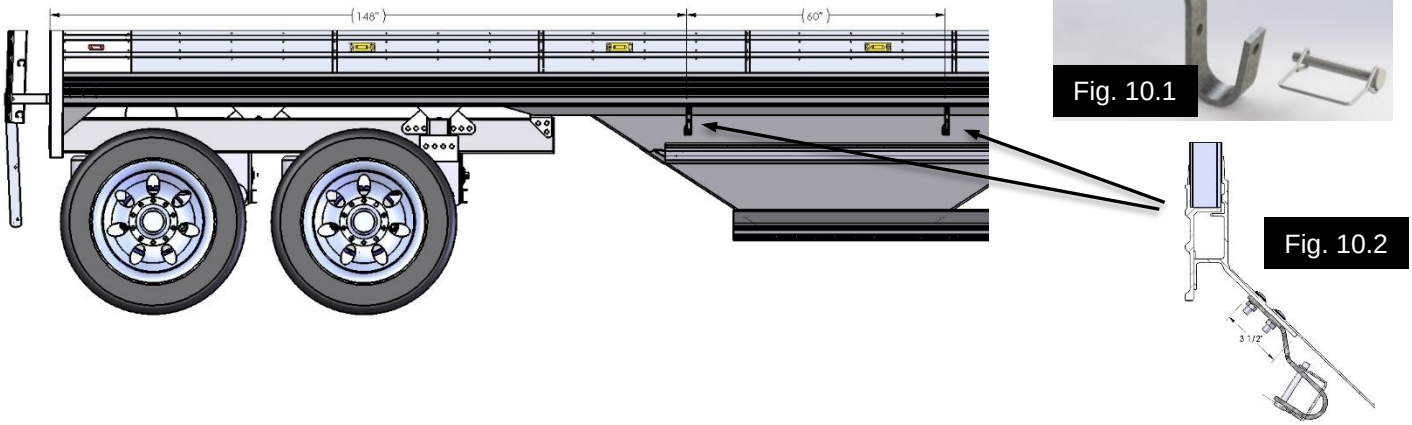


Fig. 10.2

OPTIONAL ARM ADJUSTMENT

- As shipped from the factory, the front and rear arms are set to allow the axle to rest lightly on the end caps while following the contour as it moves across the trailer.

- Different types of loads and conditions may require your tarp to operate differently. For this reason the system has been designed to be very versatile. Please see the steps below to adjust your arm if need be.

1. To help make the arms carry the axle over heaped loads: Increase the knuckle pressure on the front and rear arms by moving the spring pin up to the middle hole. If even more lift is desired, move the spring pin to the top hole.
2. For tighter arm control in windy conditions, increase the base pivot pressure on the front and rear arms by moving the spring pin up to the middle hole. If even more control is desired, move the spring pin to the top hole.

Placement of Corner Light

Determine if you have the old style light shown in figure 10.4.

1. If you have the old style light, unfasten light from corner radius of trailer.
2. Move the light around the corner approximately 3”-4” or until the roll tube extension clears the light See figure 10.5.

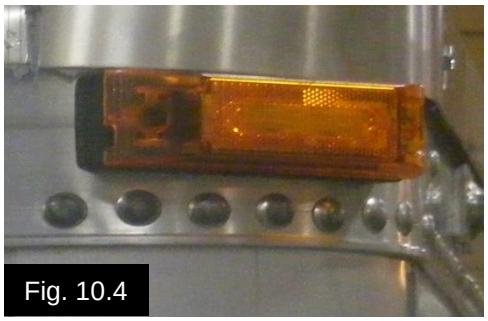


Fig. 10.4

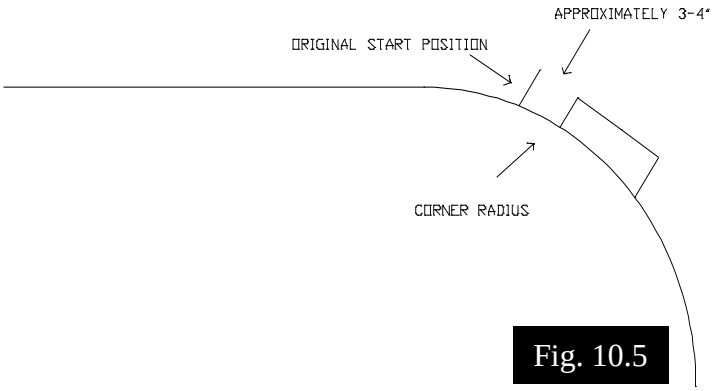
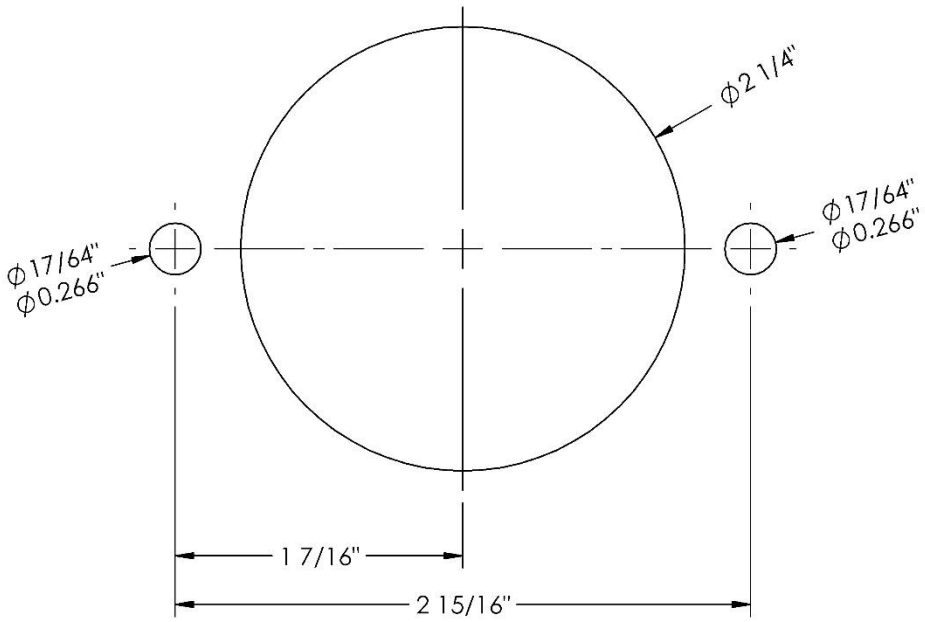


Fig. 10.5

3. Re-fasten light to corner radius of trailer.

HOLE PATTERNS

ELECTRICAL PLUG



KEYPAD