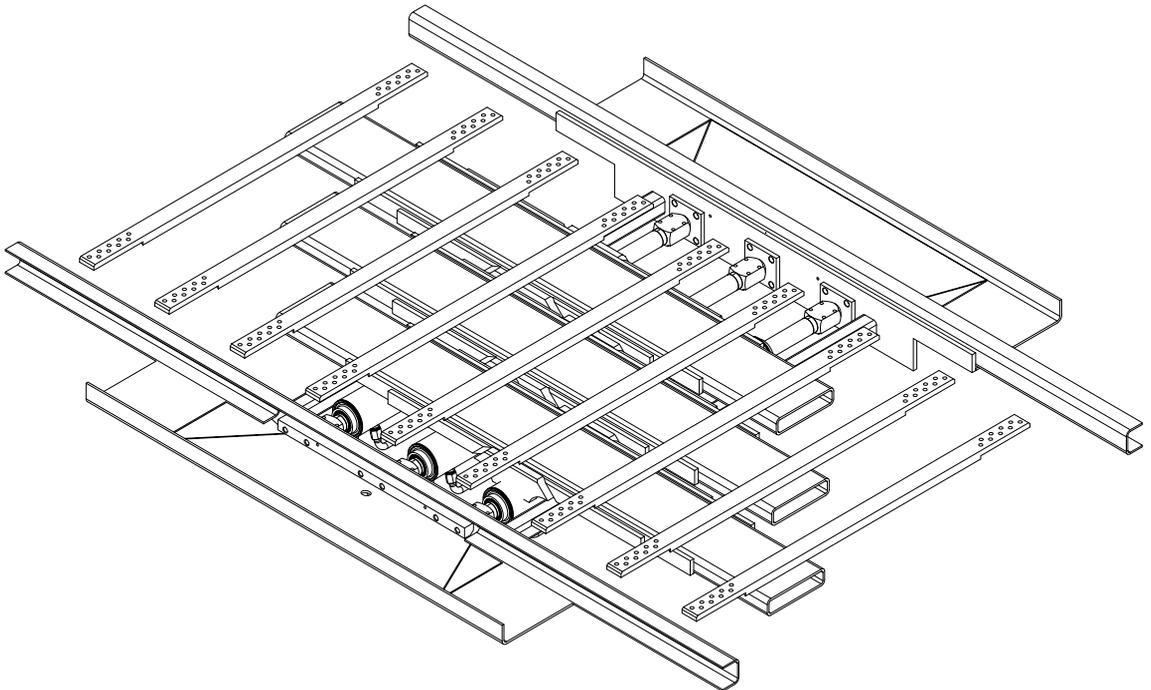


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# KEITH® V-9 V-FLOOR® Drive Installation Manual Original Instructions

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

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<b>1</b>	<b>INTRODUCTION</b>
<b>2</b>	<b>TRAILER PREPARATIONS</b>
2.1	Drive unit compatibility
2.2	Trailer alignment
2.3	Bracing
2.4	Hydraulic tubing locations
2.5	Cross-members
<b>3</b>	<b>DRIVE UNIT</b>
3.1	Center frame trailer
3.2	Frameless trailer
3.3	Painting
<b>4</b>	<b>SUB-DECK</b>
4.1	Baffle plate
4.2	Sub-deck profiles
4.3	End sub-deck
4.4	Side seal options
4.5	Retainer clips
4.6	J-bearing
4.7	Drive channel
<b>5</b>	<b>FLOORING</b>
5.1	Floor slats
5.2	Slat installation
5.3	Front shield
<b>6</b>	<b>HYDRAULIC TUBING</b>
<b>7</b>	<b>MISCELLANEOUS</b>
7.1	Wires and lines
7.2	Caution decals
7.3	Front guard
	Appendix 1 Tools
	Appendix 2 Materials
	Appendix 3 Reference drawings
	Appendix 4 Check list
	Appendix 5 Torque chart

This manual explains procedures for installing the KEITH® V-FLOOR® unloading system. Many variables affect the installation, but the general process remains constant. Details of the installation vary according to trailer features, kit selections, and installer preferences. Optional sets of instructions are given for some operations to allow for flexibility.

This manual focuses on the installation of a 6" stroke, 9-slat system on 10.5" slat centers. Installation of the system with 10" slat centers is similar. Information unique to 10" slat centers is included where it pertains.

Installation time varies and is between 35 and 100 hours, depending upon the experience of the installer and the adaptability of the trailer. If the trailer is not yet built, there are some trailer preparations found (Chapter 2) that will save time and effort. One person with welding skills can complete the entire installation.

An efficient installation requires appropriate tools and accessible materials. A list of tools is found in Appendix 1. Appendix 2 lists materials. Several reference drawings accompany this manual. The KEITH Running Floor II owner's manual contains more detailed information about the system and operation procedures.

Direct any questions to KEITH Mfg. Co. or one of our international offices listed on the cover of this manual.

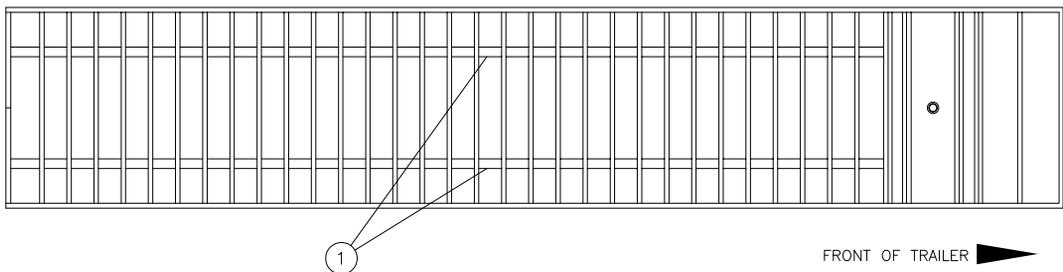
**WARNING:** Installing the *WALKING FLOOR*® system will require some alterations to your trailer. Changes made without approval of the trailer manufacturer may void the trailer's warranty.

The trailer requires preparation before the system is installed. Planning ahead for the *WALKING FLOOR*® installation requirements saves significant preparation time, especially when building a new trailer.

## 2.1 Drive unit compatibility

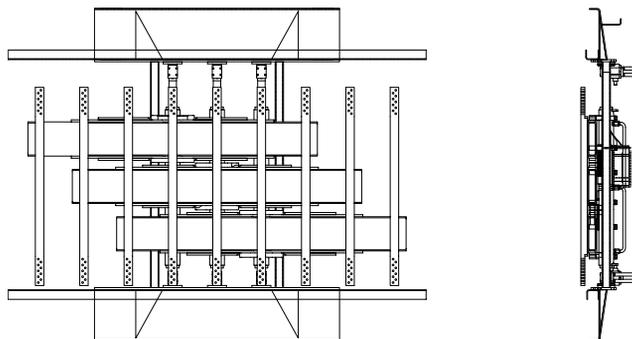
There are two styles of drive units. The trailer's frame determines which style should be used. Check the compatibility of the drive unit with the trailer before making any alterations to the trailer.

If the frame rails extend the full length of the trailer (Figure 1), use a drive unit without frame rails (Figure 2).



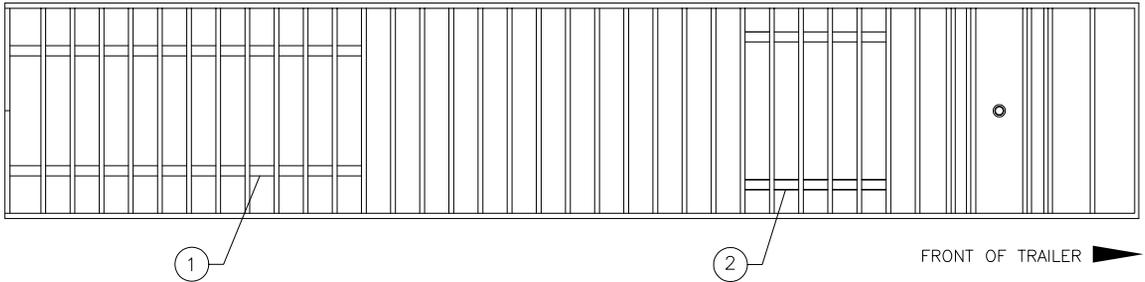
FULL FRAME TRAILER

① CENTER FRAME RAILS



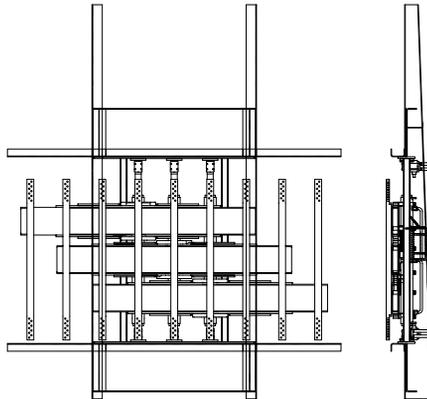
CENTER FRAME DRIVE ASSEMBLY

If the trailer is “frameless” (Figure 3), use a drive unit equipped with tapered frame rails (Figure 4).



### FRAMELESS TRAILER

- ① AXLE FRAME
- ② LANDING GEAR FRAME



TAPERED FRAME RAIL  
DRIVE ASSEMBLY

**NOTE:** Manufacturers of frameless trailers may want to consider extending their axle rails far enough forward that a frameless drive unit can be installed (extend 109" for 6" stroke).

Chapter 4 discusses the drive unit installation process in more detail.

## 2.2 Trailer alignment

1. Adjust the trailer to meet these conditions:

- A) The trailer must be **straight** to allow for proper parallel movement of the slats. Determine straightness by sighting down a floor slat positioned in the trailer.

- B) The cross-members on which the sub-deck mounts must be level, because the friction based principle of the *WALKING FLOOR*® system requires a flat floor. If there are deviations exceeding 1/8", make corrections. Ensure that the last beam of the trailer at the rear door threshold is level with the cross members.

### 2.3 Bracing

Trailer bracing prevents warping.

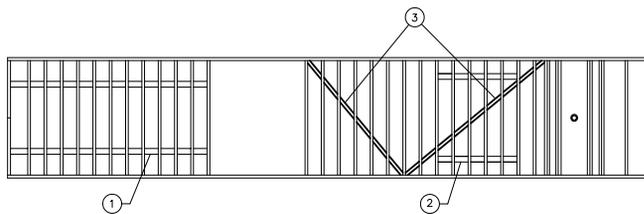


Figure 5

1. AXLE FRAME
2. LANDING GEAR FRAME
3. BRACES

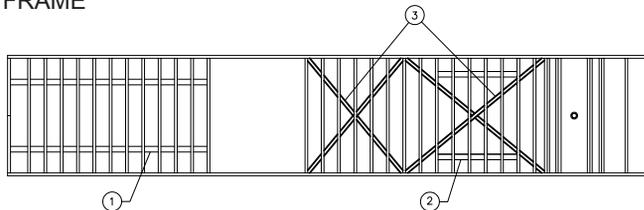


Figure 6

1. Install bracing as shown in Figures 5 and 6.

It is best to add bracing before removing the old floor because the floor keeps the trailer straight. If flat bar is used, make a cross-bracing because it will buckle easily under compression. Steel angle does not require a cross. Make sure there is enough wheel clearance when installing steel angle. The bracing reaches to the drive opening. Weld or bolt the braces to each intersecting cross-member.

2. Remove old flooring.

### 2.4 Hydraulic tubing locations

Hydraulic pressure, generated by the tractor's wet kit, powers the drive unit. Tubing must connect the drive unit to the tractor.

1. Consider the location of the hydraulic tubing. Chapter 6 provides more information on this subject. A central location is preferable for the quick-couplers in front of the trailer. This keeps hose lengths short, if they stay connected while driving.

There are four options available:

- 1) Routing the hydraulic tubing through the cross-members (Figure 7).  
Make two 1 3/8" holes per cross-member. The holes should be close to the sides of the trailer to maintain the structural integrity of the cross-members. Access holes must be cut or drilled through the nose of the trailer, in line with where the tubes will pass through cross-members. Patch the holes after the tubing is in place. The tubes may drop below the cross-members anywhere behind the landing gear and attach to the under side of cross-members.

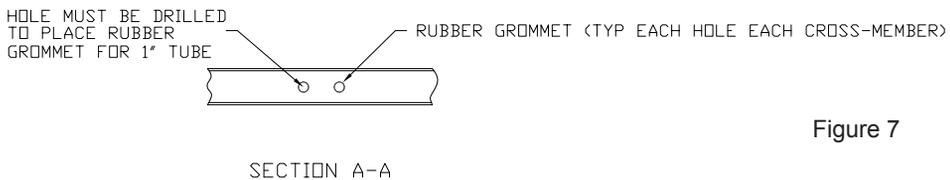
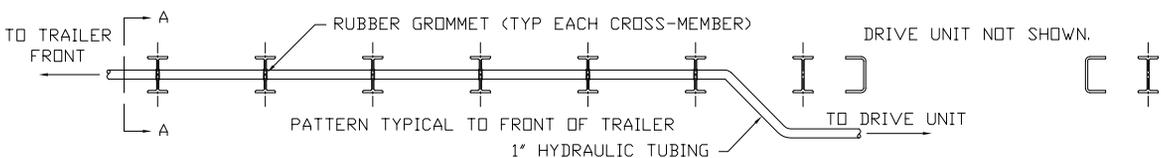


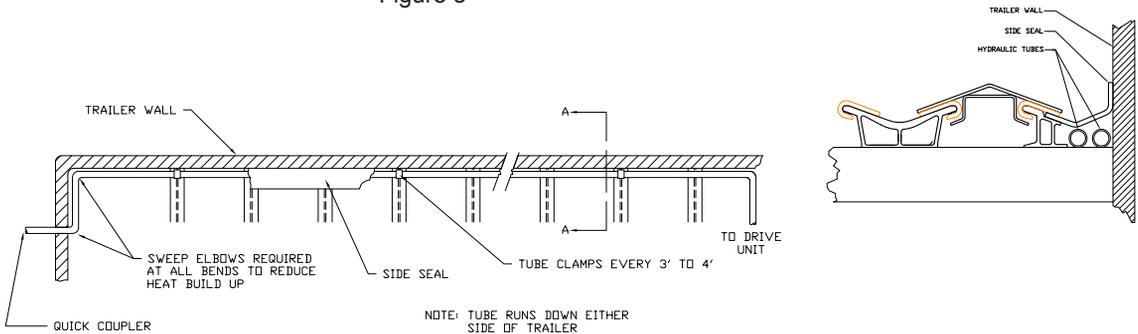
Figure 7



- 2) Routing the tubes under the side seal (Figure 8).

Check the available space underneath the side seal. One tube may occupy each side of the trailer. Tubes are clamped to cross-members or placed in 1" inside diameter PVC pipe to prevent rubbing. The side seal should be detachable for maintenance.

Figure 8



### 3) Routing the tubing underneath the cross-members.

This option is not recommended, as it can cause problems with truck tire clearance and it makes the tubing very vulnerable.

2. Make sure that brake lines and electrical wires will not interfere with moving parts. If necessary, reroute them to protect them from damage.

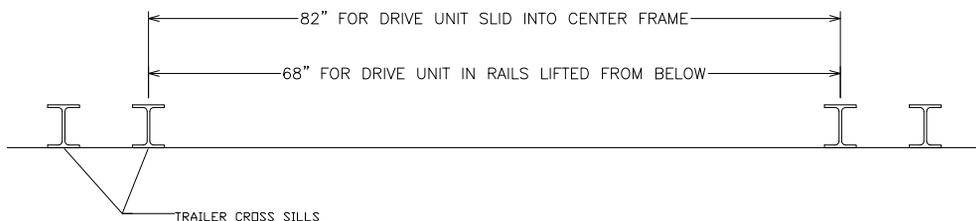
## 2.5 Cross-members

Cross-members function as support for the sub-deck.

Compare the trailer cross-member height to the formed cross sills on the drive unit. They should be the same. If they differ, contact KEITH Mfg. Co. or one of our international offices.

1. Remove cross-members to create an adequate gap for the drive unit (Figure 9). See Chapter 3 for more information about drive unit location.

Figure 9



### 2. Reposition cross-members if necessary.

The rearmost cross-member should be mounted a minimum of 17" inside the trailer doors. The foremost cross-member should be about 17" away from the front wall.

**NOTE:** Holes for the hydraulic tubing should be made through cross-members before they are mounted on a new trailer.

### 3 DRIVE UNIT

Drive unit installation in a center frame trailer differs from an installation in a frameless trailer. Chapter 3 examines the two installations separately.

#### 3.1 Center frame trailer

1. Decide on the location of the drive unit.

The drive unit should be installed as close to the rear of the trailer as is practical.

2. Mark a centerline from rear to front of trailer.

This will be used to align drive and sub-decking.

3. Position drive unit.

The drive should be positioned and welded, before the sub-deck is installed. The system can be lifted into an open top trailer from above with a crane. (Figure 20)

The drive should be positioned and welded, before the sub-deck is installed. The system can be lifted into an open top trailer from above with a crane.

If the trailer top is closed or a lifting mechanism is not available, use the following method:

- a. Set a sheet of plywood inside the rear of the trailer.
- b. Place blocking on the sheet to protect hydraulic tubing.
- c. Lay the drive unit on the sheet.
- d. Slide the sheet forward into the drive gap.
- e. Raise the rear of the unit so the front stiffener plate will fit under the forward cross sill.
- f. Slide the unit forward so the rear stiffener clears the rear cross sill.
- g. Lower the unit and slide to position.

**NOTE:** A minimum drive gap of 82" is necessary to maneuver the drive unit.

**IMPORTANT:** Do not damage piston rods. Do not lift drive unit by the hydraulic crossover tubes on the cylinders or any other hydraulic components.

#### 4. Align and level drive unit.

##### Front to rear alignment

Center the drive unit in the drive gap. The 2" x 8" cross-drive tubing should be parallel to trailer cross-members.

##### Side to side alignment

Align the drive unit's center punch marks with the trailer's centerline.

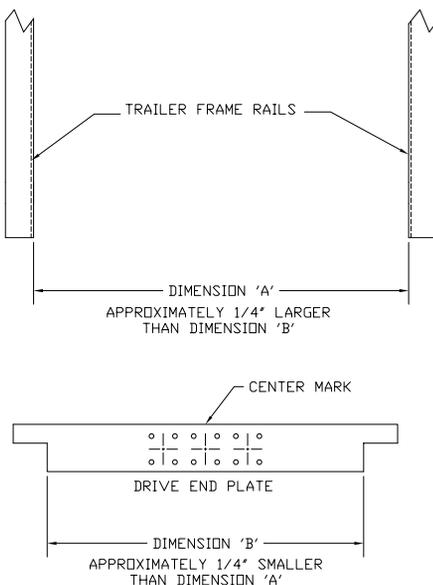


Figure 10a

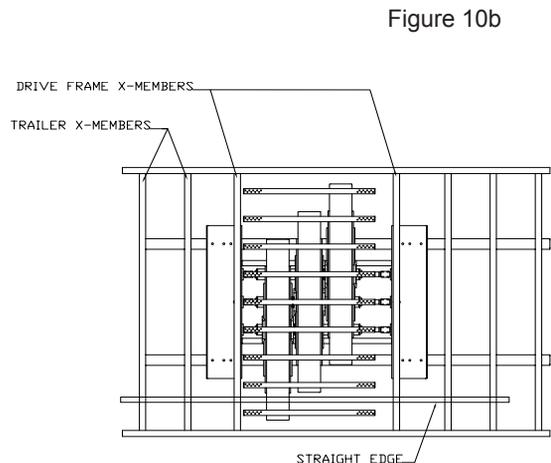


Figure 10b

### Height

- a. Lay a straight edge from cross-member to cross-member across the drive, stretching over two cross-members on each side of the drive unit. (Figure 10)
- b. Raise the drive so the top of the drive cross-members touch the straight edge across the shoe length on each straight edge. Make height adjustments by shimming or grinding ears of the drive unit end plates.

This method gives the proper drive height as drive unit cross-members height should match the trailer's cross-member heights. (Figure 11).

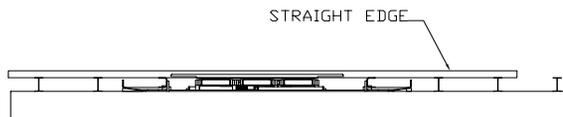


Figure 11

5. Weld the drive unit in place.  
Weld according to reference drawing C-40075.
6. Weld bracing to side walls as shown in reference drawing C-40075.
7. Install cross-drive support tubes as shown in reference drawing C-40075.  
Slide the support tubes into position between 8" x 2" cross drives and trailer frame rails. Place the tubes where they will support the cross-drives over a full stroke. The steel tubes can be shimmed to create a close drive to UHMW fit. Do not shim too much as an extremely tight fit could tear the UHMW from the steel. Bolt the tubes in place with one 3/8" x 1" bolt at each end.

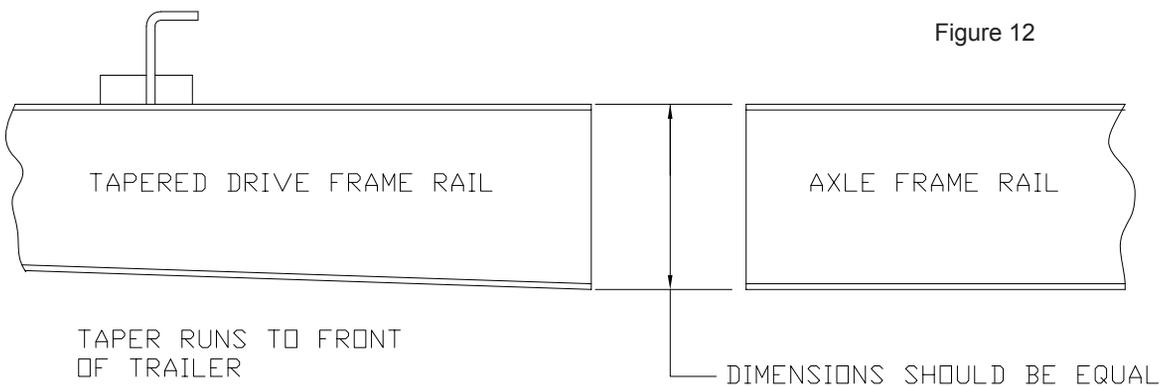
### 3.2 Frameless trailer

**NOTE:** Manufacturers of frameless trailers may want to consider extending their axle rails far enough forward that a frameless drive unit can be installed (extend 109" for 6" stroke).

#### 1. Position drive unit in the drive gap.

Check to be sure drive unit dimensions fit the location. The rail heights should be close, (Figure 12) and dimension A should equal dimension B (Figure 13). The system can be lifted from above with a crane or from below with a forklift. Raise the tapered drive frame rail tight against the bottom of the cross sills.

**IMPORTANT:** Do not damage piston rods. Do not lift drive unit by the hydraulic crossover tubes on the cylinders or any other hydraulic components.



**NOTE:** Exact alignment of trailer centerline with the drive unit centerline is more important than alignment of the drive unit frame with the trailer's axle beams.

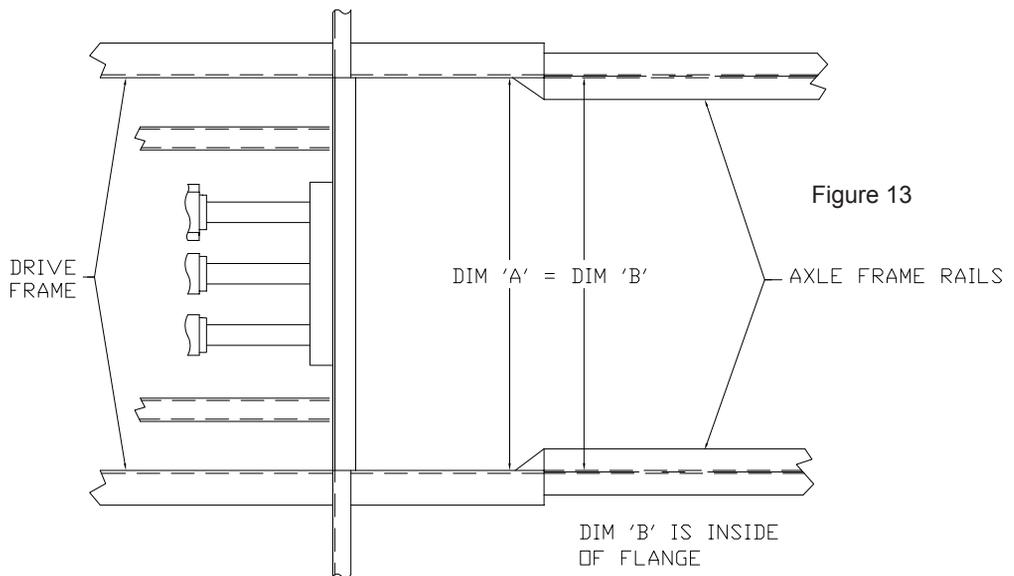


Figure 13

## 2. Align and level drive unit.

The ends of the formed cross sills should rest on the trailer side rails.

### Front to rear alignment

Butt the tapered drive frame rails tight against the ends of the axle beams (Figures 14 and 15). A transfer plate may be placed between the two beams if a flat surface does not exist on either the drive frame or the axle beam.

### Side to side alignment

Align the drive unit's center punch marks with the trailer's centerline. (Figure 14)

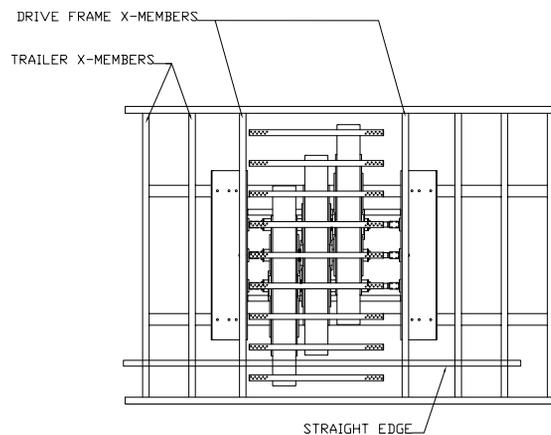


Figure 14

### Height (Figure 15)

- a. Lay a straight edge from cross-member to cross-member across the drive, stretching over two cross-members on each side of the drive unit.
- b. Raise the drive so the top of the drive cross-member touches the straight edge across the shoe length on each straight edge. Raise or lower the drive unit accordingly .

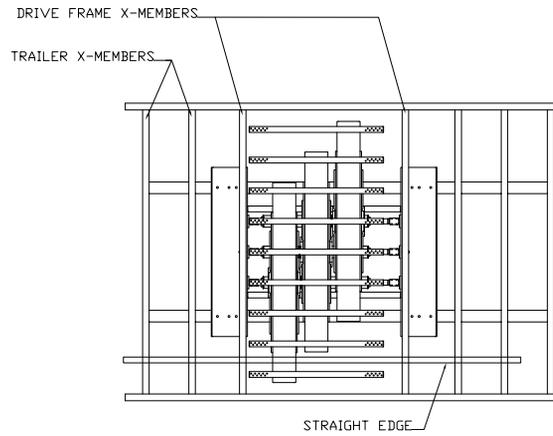


Figure 15

3. Weld the drive unit in place.

Weld according to reference drawing C-10797A

4. Weld bracing to side walls as shown in reference drawing C-10797A.

### 3.3 Painting

The factory paints drive units with gray oxide primer.

1. Confirm that the drive unit is coated well with primer.
2. Treat the drive unit and sub-deck with a finishing paint.

**IMPORTANT:** Make sure that the following parts are protected when painting: cylinder chrome rods, switching valve chrome rod, serial plate and any decals.

## 4 SUB-DECK

The sub-deck is the structure directly above the cross-members and underneath the floor slats. The sub-deck consists of aluminum profiles. The aluminum profiles mount on top of the cross-members.

## 4.1 Baffle plate

A baffle plate extends forward from the door threshold to prevent material from sifting through the floor when slats are in the forward position.

1. Determine the dimensions of the baffle plate (Figure 16).

The baffle plate must be level with the cross-members and is welded to the inside of the last beam of the trailer (threshold). The thickness depends on the type of load. For light materials (e.g. sawdust), use 12 gauge.  $\frac{1}{4}$ " is recommended for heavy, abrasive materials (e.g. solid waste). The plate bends down inside the closed door, leaving an opening so that material will not build up underneath the slats. For fine materials, the baffle plate connects to the nearest cross-member to prevent material from sifting through. Holes may be cut in the plate to let small amounts of fine material drop through. This prevents buildup from exerting upward pressure on slats.

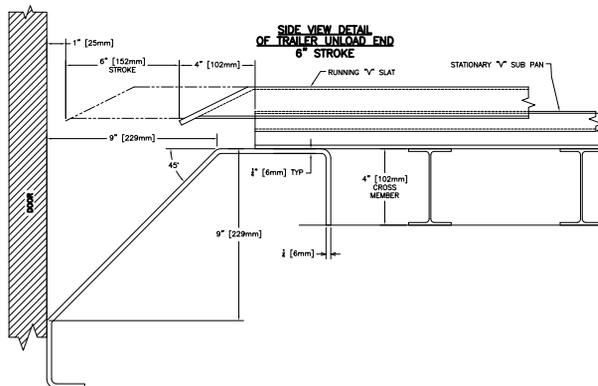


Figure 16

2. Cut and form the baffle plate to the proper dimensions.
3. Install the baffle plate.

Weld the plate in position. Then grind welds flat. Make sure it is level with the cross-members.

## 4.2 Sub-deck profiles

The proper installation of the aluminum profiles is critical for maintaining drive alignment, floor straightness and for optimal performance of the bearing located under the floor slats. Sub-decking is applied after the drive unit is positioned

Position and mount the sub-deck.

Sub-deck on 10.5" centers is for 10.5" slat center flooring (Figure 17). Sub-deck on 10" centers is for 10" slat center flooring (Figure 18).

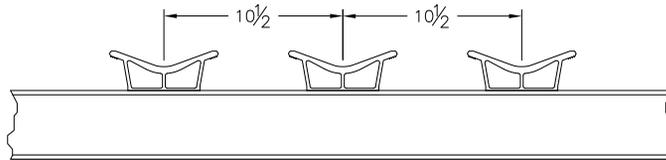


Figure 17

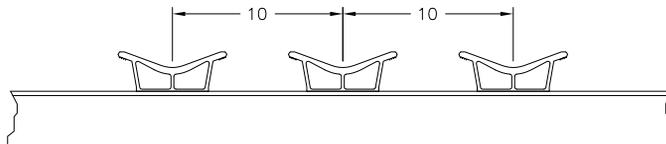


Figure 18

Start at the rear of the trailer. Lay out the sub-deck in the trailer and separate them with spacing jigs, aligning the centerline mark on the jigs with the centerline mark on the cross-member. Keeping the jigs above the cross-members, clamp the jig and sub-deck to every other cross-member. Sub-decking should start 11" inside the rear door and end 6" from the front wall (Figure 19).

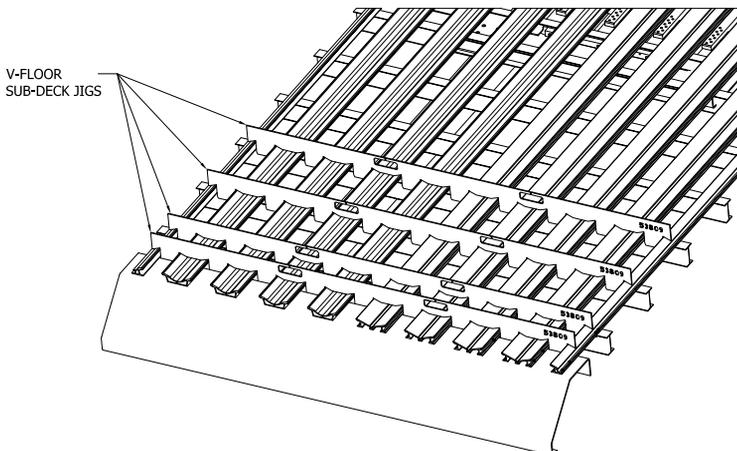


Figure 19

Weld or bolt the sub-deck to the cross members between the jigs. Move the jigs and make a connection at each intersection of a piece of sub-decking and a cross-member. Welds should be 1/8" fillet, 3/4" to 1 1/4" long, and centered on the flange. Excessive welding and too little cooling will cause cross-members to warp (Figure 20).

Figure 20

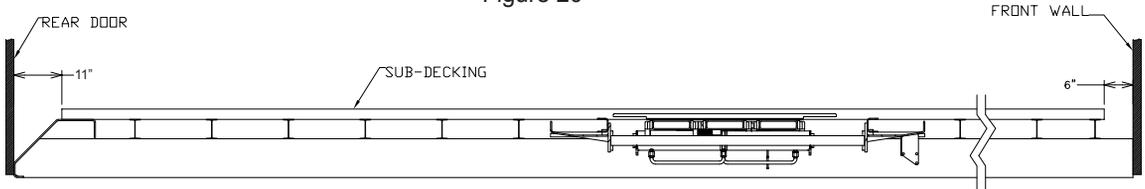


Figure 21 suggests a welding pattern. Starting each pass on the same side of the trailer gives sufficient cooling time.

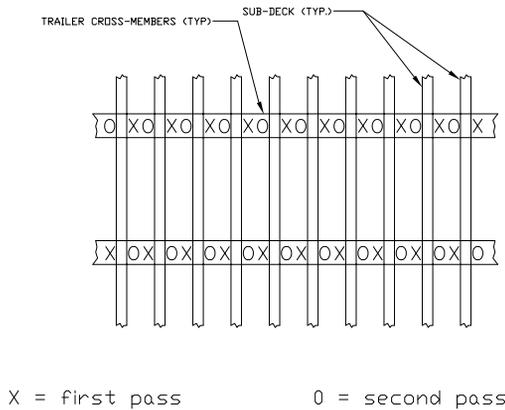


Figure 21

See Figures 22 & 23 for welded and bolted sub-deck details. Mylar tape or paint should separate aluminum profiles from steel cross-members to prevent metal decay.

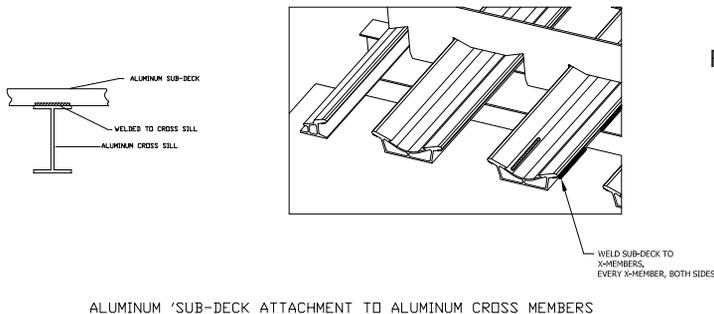


Figure 22

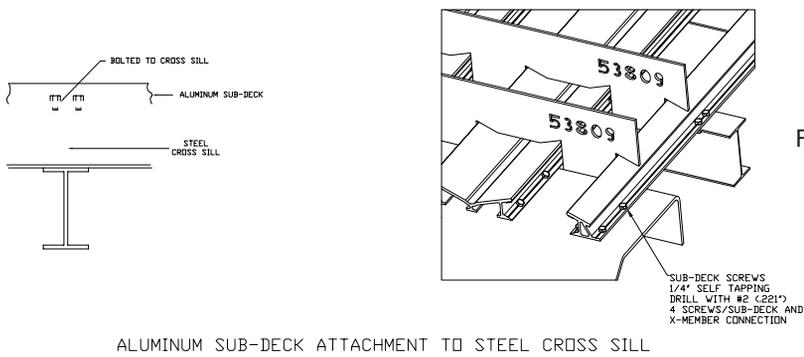


Figure 23

ALUMINUM SUB-DECK ATTACHMENT TO STEEL CROSS SILL

### 4.3 End sub-deck

There are two styles of end cap for the sub-deck at the discharge end of the trailer.

The 1st style is the full width end cap. This style spans the width of the trailer capping all of the pieces of sub-deck.

The 2nd style is the single piece end cap. This style is used to cap a single piece of sub-deck. This style is require when tail end supports are used.

#### 1) Full width weld on cap.

The weld on cap needs to be installed before the slats or the J-bearings. This cap is used to keep material from entering under the sub-decking and also holds the bearings in place. Place cap against sub-deck on discharge end of trailer. The cap should be pre-cut in the profile to match the sub-decking and side-seal pieces (Figure 24).

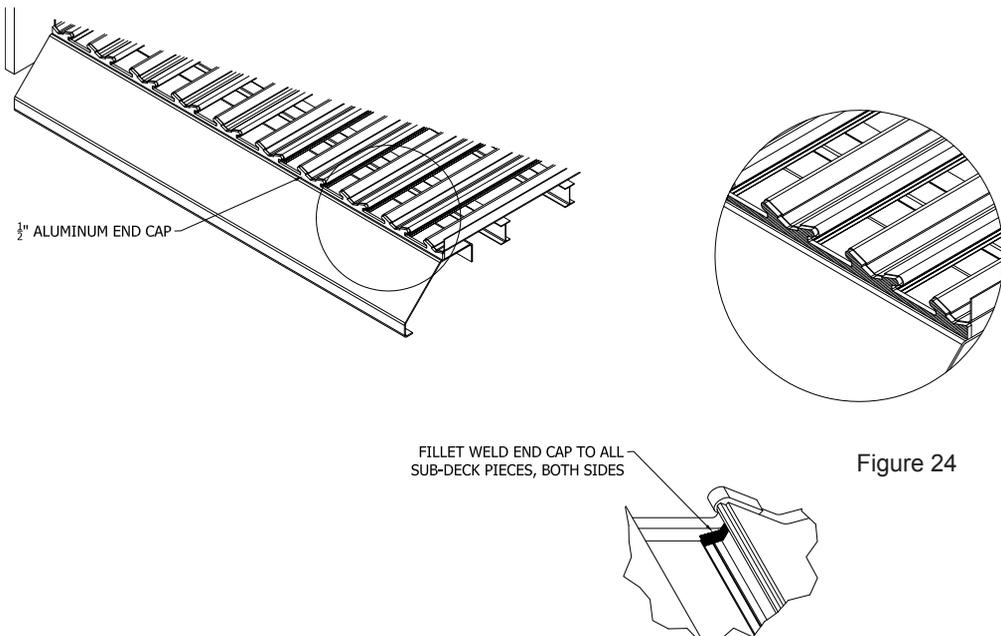
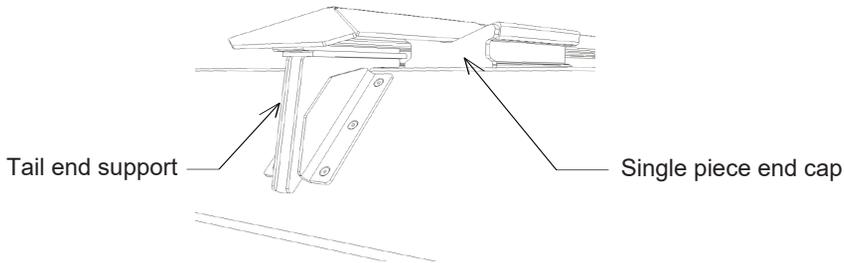


Figure 24

## 2) Single piece cap for tail end supports.

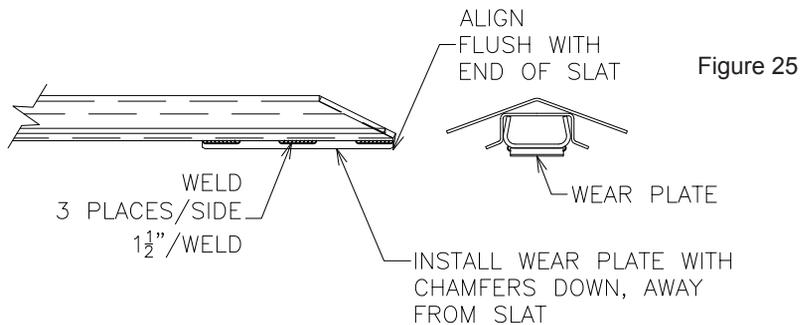
Tail end supports are an option used to support the ends of the slats when heavy loads could damage or bend the slats down during unloading, e.g. crushed car applications. One support is used to support each slat.



**Note 1:** Tail end supports need to be added after the floor slats are installed to ensure proper installation height.

**Note 2:** A system with tail end supports must use the end cap designed for a single sub-deck.

### a. Attach wear plate to bottom of slat using position and weld detail (Figure 25).



### b. Place wear plate support assembly under wear plate, attached to the bottom of the floor slat. Make sure that the two faces of the hardened wear plates are in contact and weld the formed angle mounts to the 45° sloped baffle.

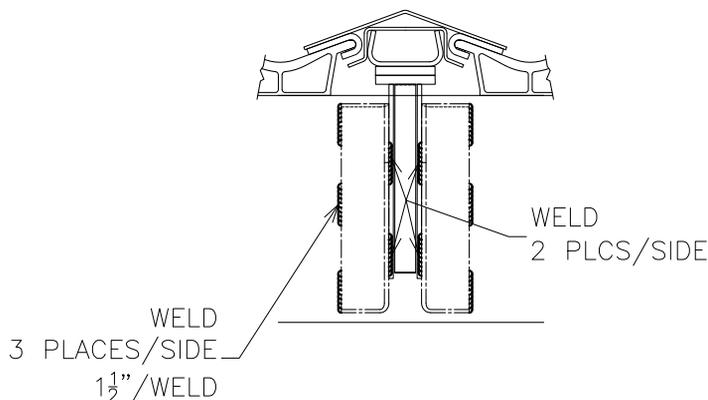


Figure 26

c. Weld the formed angle mounts to the support assembly, making sure that the wear plates are in contact (Figure 27).

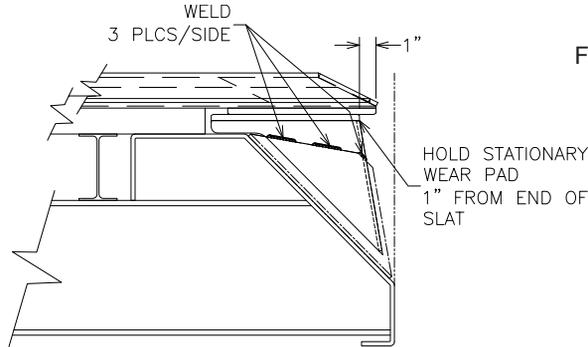


Figure 27

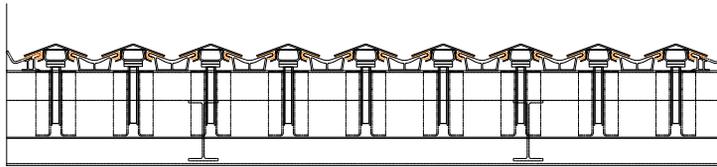


Figure 28

COMPLETED TAIL  
END SUPPORT

#### 4.4 Side seal options

The side seal incorporates the trailer walls to the two outside pieces of sub-decking (also known as side seal sub-decking). The correct quantity and side seal profiles are supplied with your kit.

The side seal material will match the material of the trailer walls. For example, an aluminum walled trailer will use aluminum side seal.

Some of the side seal options are shown on the following page.

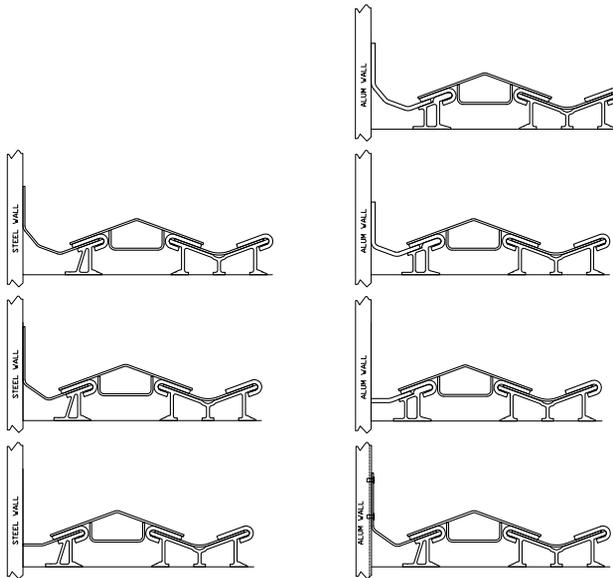


Figure 29

Side seal should span the entire length of the sub-deck. One section of each side may need to be cut, as side seal comes in 12' lengths for steel and 10' lengths for aluminum.

1. Place side seal in trailer. Steel side seal should be no less than  $3/16$ " from the edge of the sub-deck. Either weld or bolt side seal to outside piece of sub-deck (Figure 30).

**Note:** Make sure  $1/2$ " aluminum sub-deck cap is welded into place at end of sub-deck before attaching side seal.

2. Weld the full-length of the side seal to the trailer wall. This should be done with several skip welds to keep from concentrating the heat in one area. The full-length weld will keep material from getting behind the side seal and separating it from the wall.

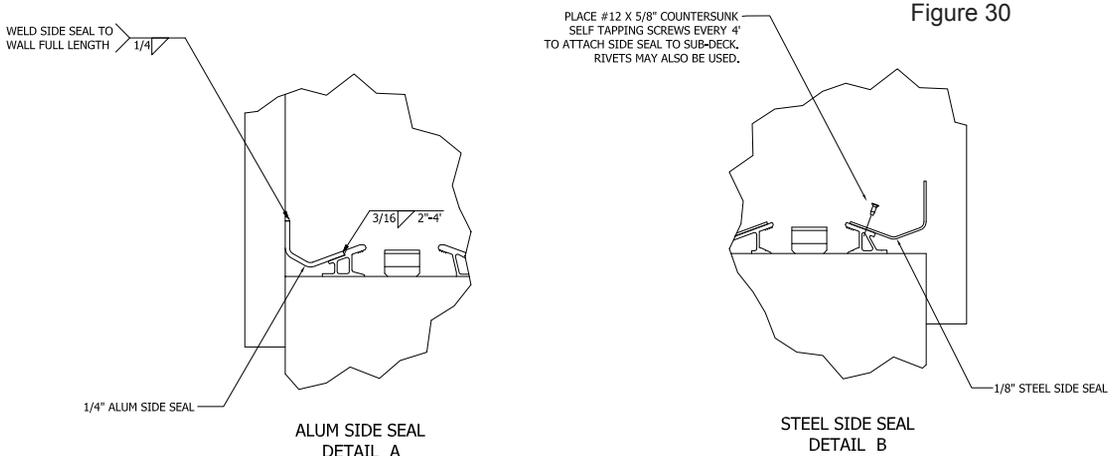


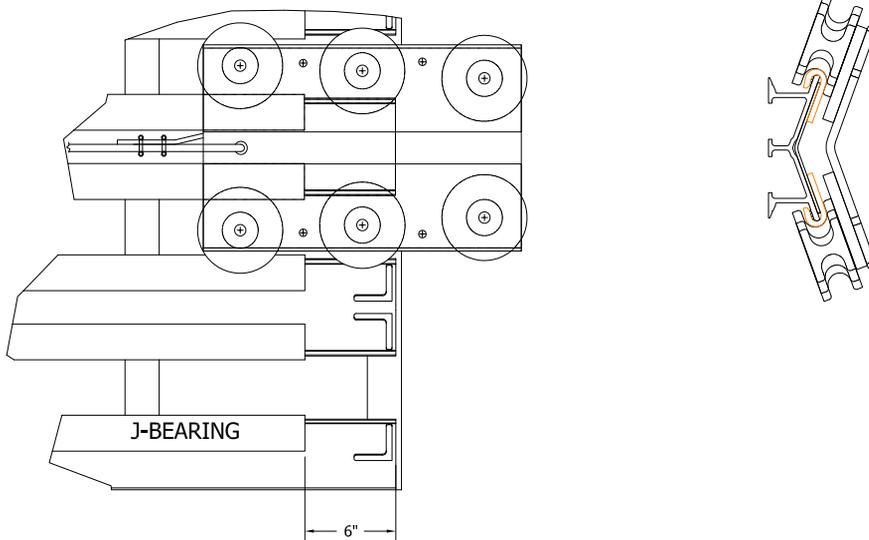
Figure 30

### 4.5 J-bearing

The “J”-shaped bearing supports the flooring and creates a bearing surface so that there is no metal-to-metal contact between the flooring and sub-deck. The J-bearing will need to be 6” shorter than the sub-deck to allow for expansion with the temperature changes. Each slat will be supported by two pieces of bearing.

1. Cut J-bearing 6” shorter than the length of sub-decking.
2. Using a dead blow hammer and starting at the front of the trailer, attach one bearing on each side of a piece of sub-decking. Note that the bearing needs to start 6” from the end of the sub-deck to allow room for expansion. Hammer on the bearings, only 1’ to 2’ by hand (Figure 39).

Figure 31



3. Install the J-bearing the full-length, using the provided roller tool (P/N 05709501). Place the tool over the sub-decking and bearing from the front of the trailer. The wider roller spacing needs to face the discharge end of the trailer.

**Note:** If the front wall of the trailer is already installed, there may be limited room to insert the roller tool between the wall and the sub-decking. The roller tool may need to be slid up from the rear of the trailer to the front wall before placing the J-bearing onto the sub-deck.

4. Tap the roller tool toward the rear of the trailer using a mallet, installing the bearing 1' to 2'. Check to ensure that the bearing is fully installed on the sub-deck. If the bearing is not fully installed tightly onto the sub-deck, the slat will be difficult to install and could increase operating pressures. Adjust the tool, if needed, to ensure proper installation of the bearing.

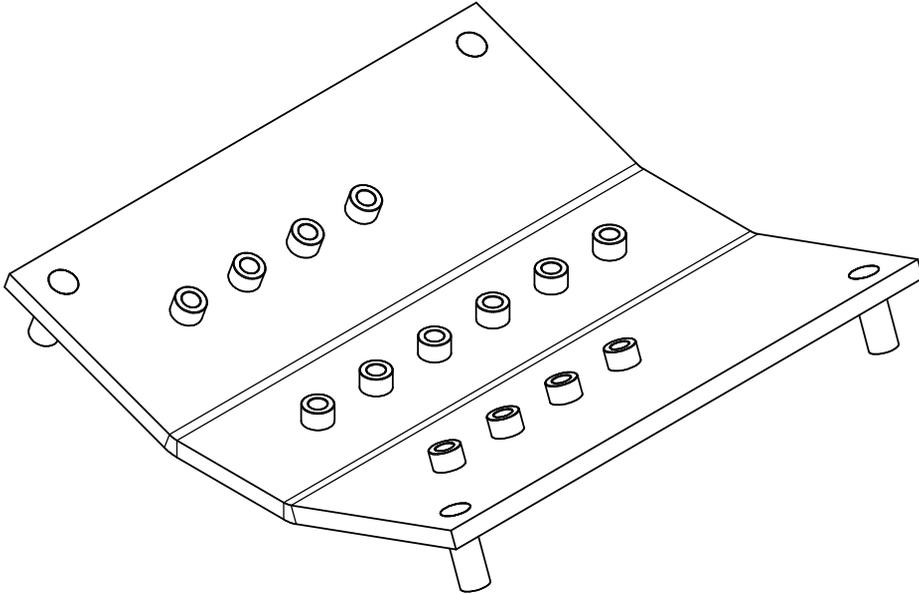
5. After the tool is adjusted correctly, weld a piece of steel flat bar to each end of the tool so that it holds the adjustment. The tool should only need to be adjusted once.

6. Use a forklift or winch with a steel cable to pull the tool to the rear of the trailer, installing the bearing full-length. Repeat these steps to install the bearing on each piece of sub-deck. Periodically check to ensure that the bearing is being fully installed onto the sub-deck.

7. The roller tool will not work to install the outside pieces of J-bearing onto the side seal sub-decking. These need to be hammered on, full-length.

#### 4.6 Securing J-bearing

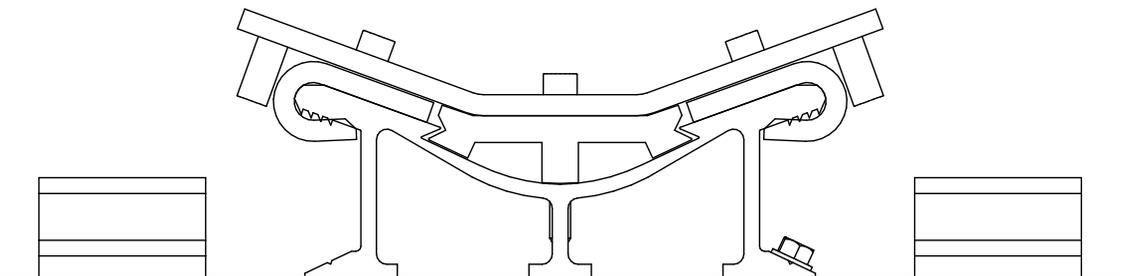
Figure 32



#### Drill Jig (P/N 8270302)

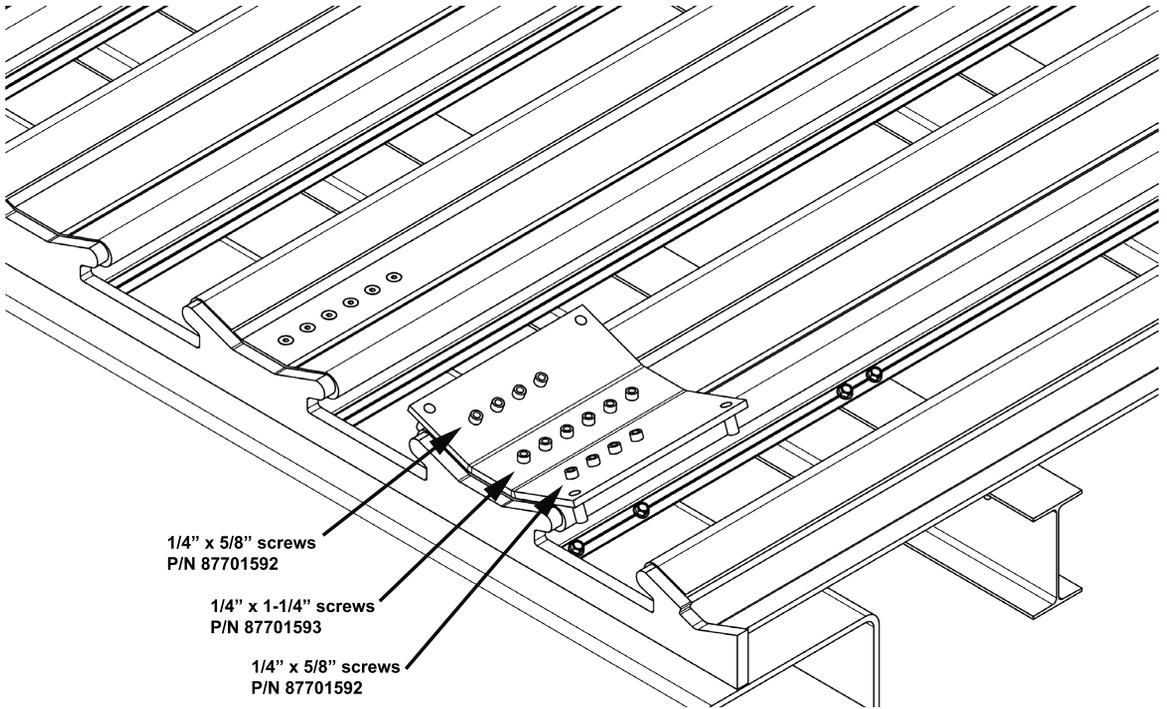
1. Clamp the drill jig (P/N 8270302) in place and drill pilot holes through the J-bearing and sub-deck using the drill template jig and a  $\frac{1}{4}$ " (6.4mm) drill bit. Lubricating the drill bit with aluminum cutting oil between drilling holes will minimize broken bits.

Figure 33



#### Drill Jig: Front View

Figure 34

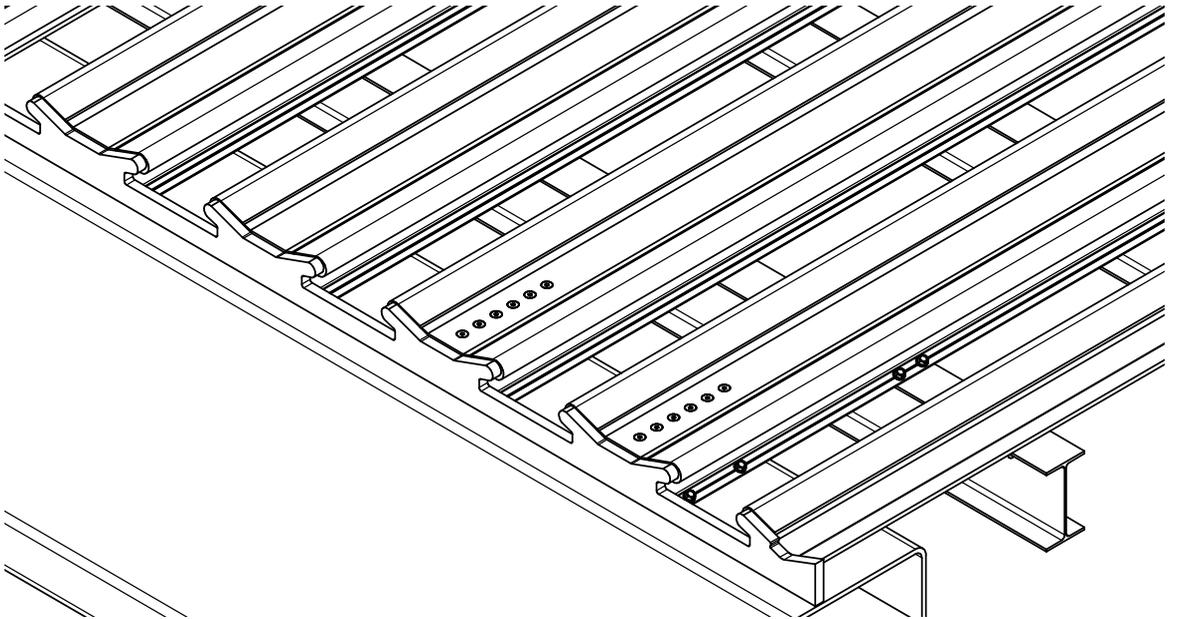


### Drill Jig Application

2. Remove the jig and countersink these holes with a 90° bit. Install (6) 1/4" x 1-1/4" FHCS TORX F ZINC countersunk FH Rolok® screws (KEITH P/N 87701593) at the discharge end of each subdeck insert. Install (4) 1/4" x 5/8" FHCS TORX TYPE F ZINC countersunk FH Rolok® screws (KEITH P/N 87701592) at the discharge end of each piece of J-bearing. Use Loctite thread retainer #243 (KEITH P/N 87103202) or equivalent. Be sure the heads of the screws are flush or just below the surface of the bearing. This secures the bearing in place.

3. Weld end caps onto the discharge end of sub-deck and side seal sub-deck (see weld detail). These caps plug the sub-deck cavities and ensure the bearing can't slide out of the rear of the trailer. Make sure no weld is higher than the top surface of the J-bearing.

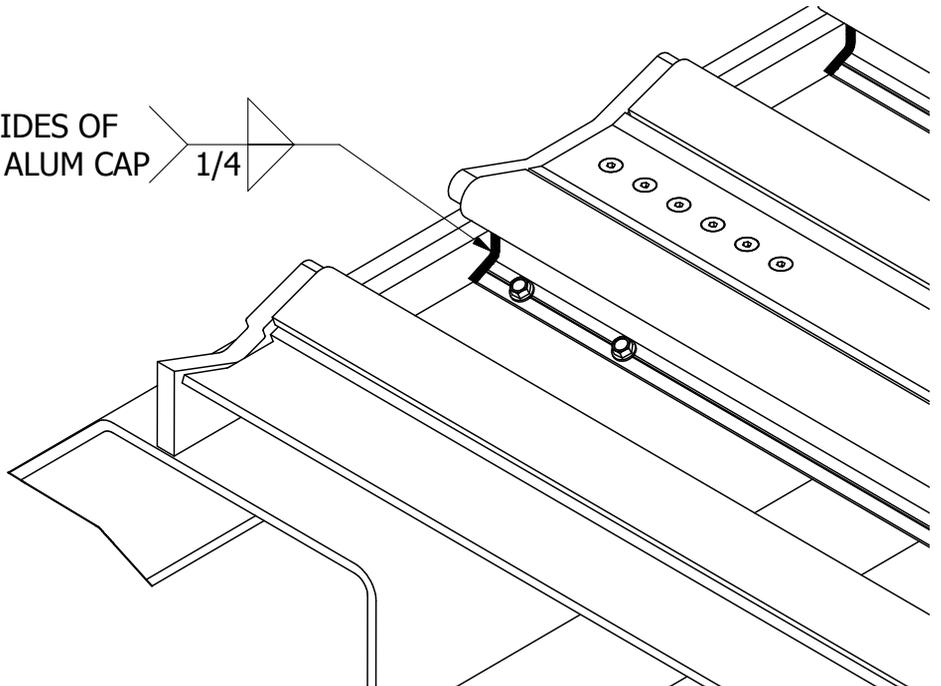
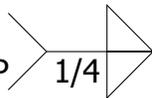
Figure 35



End Cap Application

Figure 36

WELD BOTH SIDES OF  
SUB-DECK TO ALUM CAP



End Cap Weld Both Sides

## 4.7 Drive channel

The drive channel is the connection between the flooring and the cross-drives. An aluminum channel is used for aluminum floor slats and steel drive channel for steel slats.

1. Set the drive channels onto the cross-drive shoes so that the legs of the channel are facing up. Place the tapped nut bar on, aligning the slots in the drive channel. Use two  $\frac{3}{8}$ " x 2" hex bolts on each side to attach the drive channel to the drive shoe (Figure 34). Only use two bolts, because they are only for setup and will be removed.

**Note:** Do not tighten bolts. The drive shoe should be able to slide side-to-side in the slots to allow alignment with the flooring, when installed.

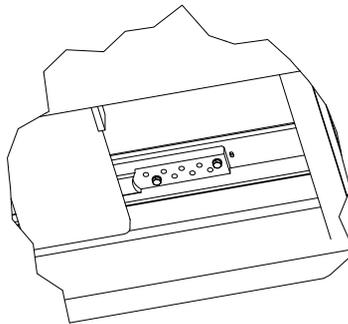
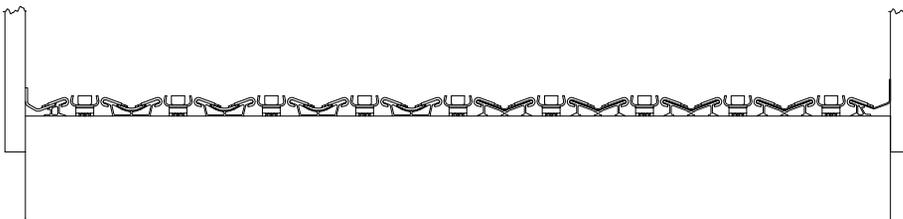


Figure 37

BOLT DIAGRAM  
DETAIL A



1/2" ALUMINUM END CAP NOT SHOWN FOR CLARITY

## 5 FLOORING

### 5.1 Floor slats

#### 1. Determine length of floor slats.

The slats have to reach from 1" from the doors to a minimum of 9"-- for a 6" stroke system-- from the closest point on the front wall at floor level. This implies that the maximum length of the slats is 10"-- for a 6" stroke system-- shorter than the inner length of the trailer. For example, maximum slat length for a 6" stroke unit in a 45' trailer is 44'-2".

**WARNING:** Make sure that the slats do not bump the front wall; watch for round shaped walls. Be particularly careful with bull nosed trailers.

#### 2. Cut floor slats to length.

If a wear plate is mounted on one end of the floor slat, cut the surplus off at the opposite side.

**NOTE:** KEITH Mfg. Co. normally performs steps 1-2.

### 5.2 Slat Installation

Slat installation is the same for all types of slats, in all widths. Make sure all cylinders are collapsed toward the discharge end. The cylinders need to be blocked to keep them from moving when the slats are slid into place.

1. Slide slats into trailer, so that the ears on the bottom of the slat slide underneath the J-bearing, keeping the slat from lifting up. The slats need to end 1" inside the door, with the cylinders collapsed to the discharge end. The slat should end approximately 9" from the front wall. A fork lift may need to be used to push the slats into place.

**NOTE:** The slat may hang up on the drive channel above the drive. If this happens, the drive channel may need to be moved to fit between the slat.

2. Place a weight of approximately 2500 lbs. (1100 kg.) on top of the drive area evenly spaced over the floor slats to hold the slats down tight to the sub-deck when the drive channel is tack welded in place (Figure 38).

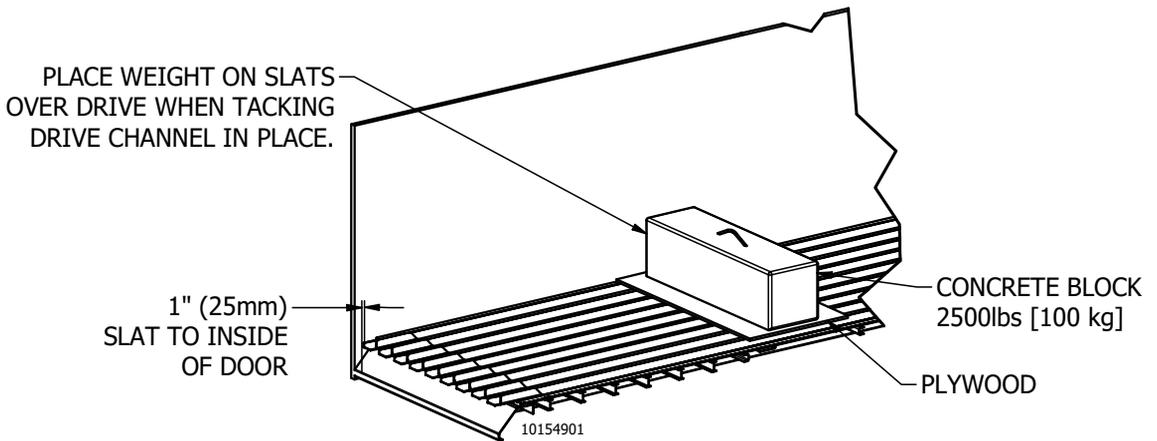


Figure 38

3. Tack-weld drive channels to the corresponding slats (Figure 39). These should be welded with four tack-welds, two on each side of the drive channel. Continue to do this for each slat.

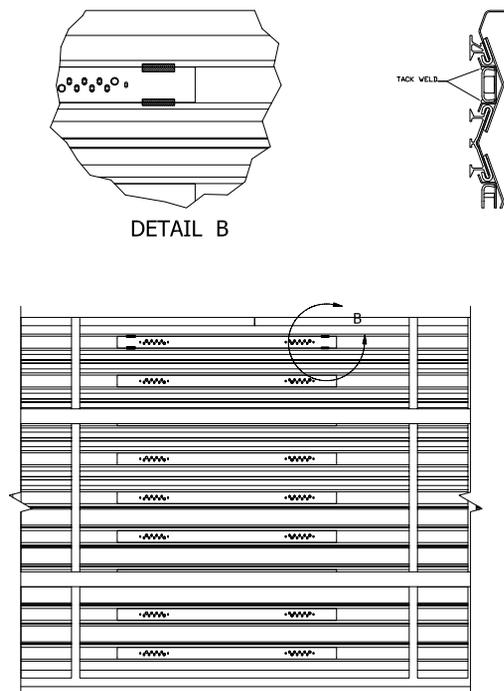
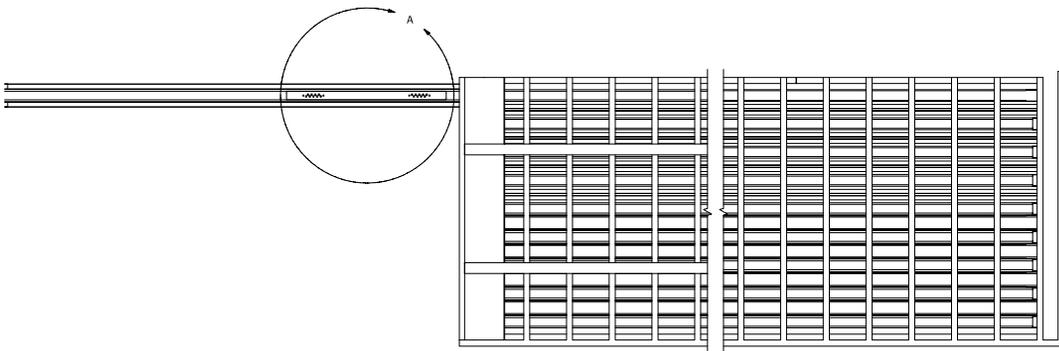


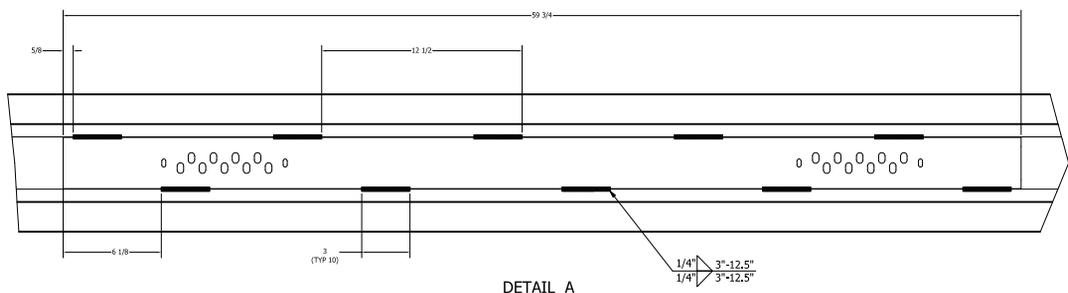
Figure 39

4. Remove 3/8" bolts from drive shoe to free slat.
5. The drive channel will need to be welded following the welding procedure. The slats should not be fully welded in place, as many of the weld locations are blocked by drive frame parts. The slats will need to be pulled out of the rear of the trailer so the drive channel is fully exposed. Slats can also be completely removed and flipped over to keep from overhead welding.
6. Support the slat around the drive channel so the slat does not deform while welding or cooling.
7. Stitch-weld drive channel onto slat, following the welding procedure in Figure 40.



VIEW FROM UNDERSIDE OF TRAILER

Figure 40



8. Keep slat supported until slat has cooled to room temperature.
9. After the slat has cooled, push the slat back into the trailer, aligning the drive channel holes to the holes in the drive shoe. This will again locate the slat 1" inside of the rear door with the cylinders collapsed to the discharge end of the trailer.
10. Bolt the drive shoe to the slat, using 3/8" x 2 Grade 8 patch lock hex bolts and lock washers (Figure 41). Bolts should be torqued to 45-FT-LBS. There may be limited access to some bolts. If this happens, cycle the drive toward the front of the trailer to gain access to these bolts.

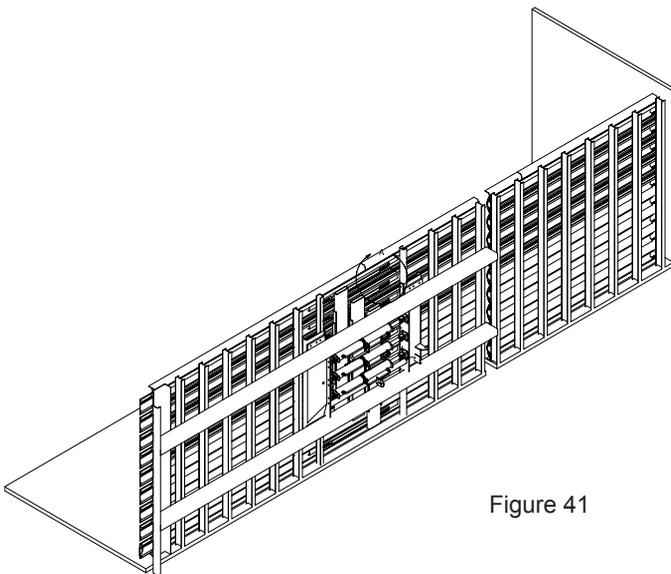
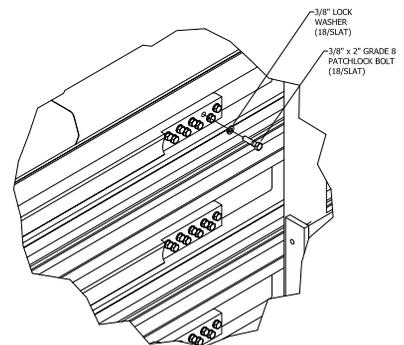


Figure 41



DETAIL A

11. Tighten bolts in sequence 1,2,3...9 (Figure 42). Cycle through tightening two times to assure proper torque.

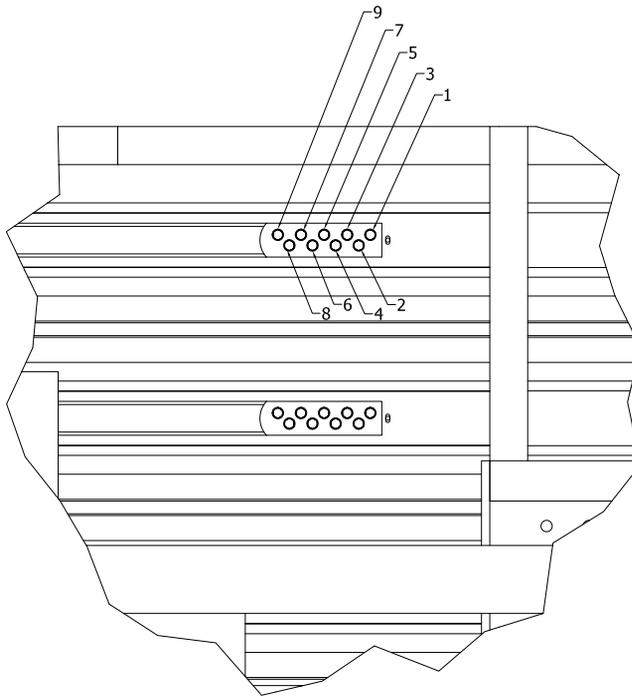


Figure 42

### 5.3 Front shield

#### 1. Determine dimensions (Figure 43).

The width is equal to the inner trailer width. The front shield is angled at 45°.

When the floor slats are in the rear position, the UHMW profile must still lie fully on top of the floor slats.

#### 2. Fabricate front shield.

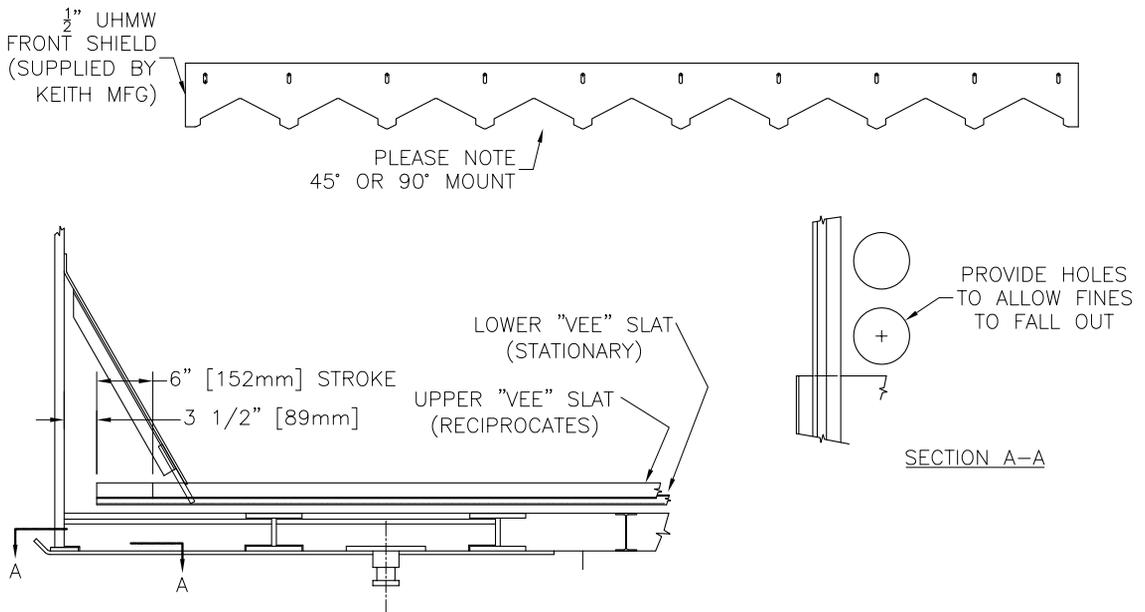
Form the plate and attach angled steel for support. Bolt the UHMW profile to the shield.

#### 3. Mount front shield.

Screw the plate to the side of the trailer.

Provide clean-out holes below the slope sheet.

Figure 43



## 6 HYDRAULIC TUBING

Section 2.4 discusses the location of hydraulic tubing.

**IMPORTANT:** All components and tubing must be kept absolutely clean to prevent dirt from entering the system.

### 1. Determine tube locations and lengths.

Keep bends to a minimum. Make all bends with sweeping elbows to reduce heat build up.

### 2. Cut tubes to length.

### 3. Position tubes.

Use rubber grommets or PVC tubes to protect the tubing when installing tubes through cross-members. Installing the tubes underneath the side seal or cross-members requires fastening with clamps.

1" hoses can be used to connect the tubes to the drive unit.

### 4. Mount quick couplers at front of trailer.

Connect the male coupler on the pressure line (line to switching valve port stamped "pump"). Connect the female coupler to the return line (line to switching valve port stamped "res") (Figure 41). Apply hydraulic sealant.

5. Connect tubes to drive unit.

Connect the pressure line to switching valve port labeled "PUMP" and return line to switching valve port labeled "RES". Make sure that rubber hoses are not twisted.

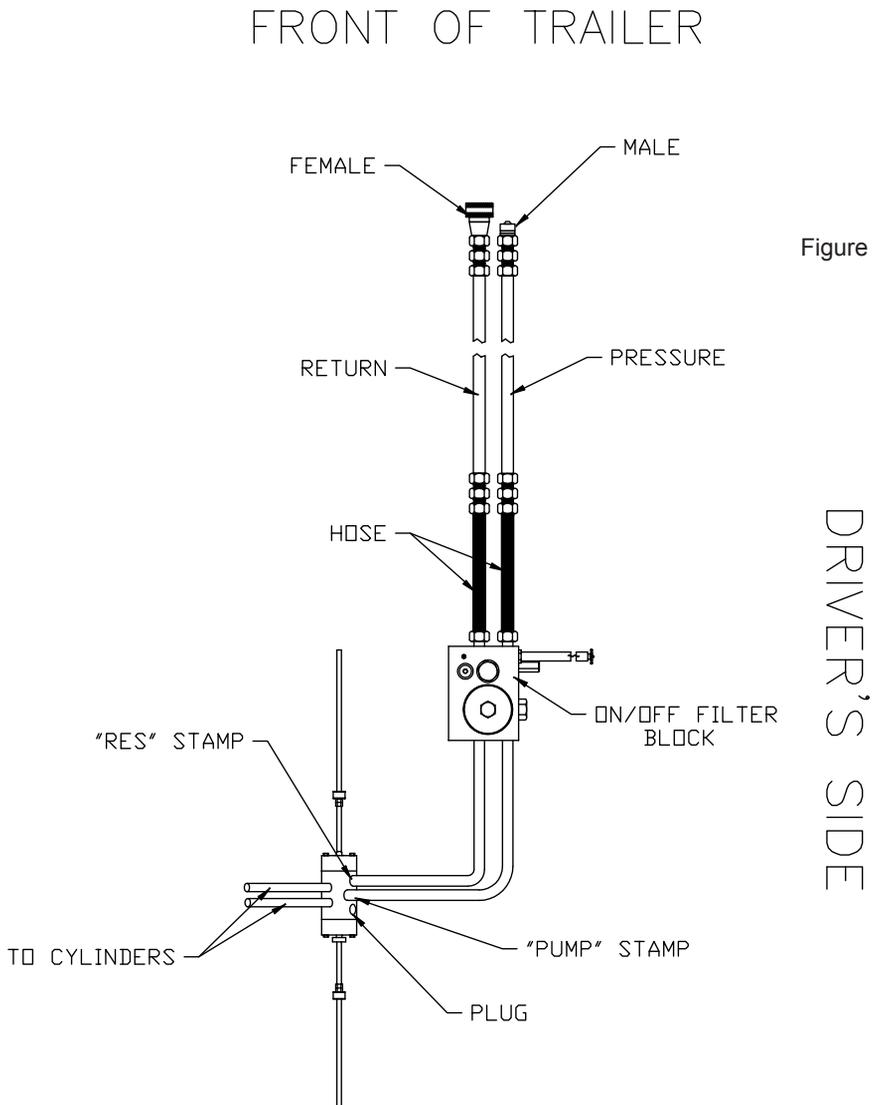


Figure 44

## **7 MISCELLANEOUS**

### **7.1 Trailer wires and lines**

Make sure that wires and lines cannot be damaged by moving parts. Mount them so they cannot rub against other parts. Check proper light and brake performance.

### **7.2 Caution decals**

Affix caution decals to the side of the trailer at the location of the drive unit.

### **7.3 Front guard**

A front guard should deny access to the underside of the front end of the slats so they cannot shear anything entering from below. A screen or plate similar to the rear baffle plate is adequate if one does not already exist.

Tools provided by KEITH Mfg. Co.

- Spacer jigs (for alignment of the sub-deck)

Basic tools not supplied with kit

- End wrench set up to 1 1/2"
- 3/8" ratchet set with 12" extension
- Allen wrenches
- Hack saw
- Hand grinder
- 25 ' tape measure
- 20 C-clamps 11 R
- 3/8" and/or 1/2" hand drill, bit set, 1 3/8" hole saw
- Straight edges
- Dead blow hammer

Special tools

- Flow meter
- Flaring tool for 1" pipe
- 5/16" drill bit, 12" long
- Torque wrench up to 50 ft-lbs
- Mig welder (wire welder)
- Rivet gun
- Overhead crane (hoist or forklift)
- Circular saw

Optional tools

- Knee pads
- Band saw

Miscellaneous

- Hydraulic sealant
- Paint

Standard kit

- Drive unit
- Floor slats
- Sub-deck
- UHMW front shield profile
- Formed side seal
- J-bearings
- Sub-deck cap
- Floor bolts
- Steel V-Pan (if included)
- Drive channels
- Caution decals

NOT provided with standard kit

- 1" hydraulic tubing
- Hydraulic quick couplers
- Hydraulic hose (for connecting drive unit to tubes)
- Steel plate (12 gauge or 14 gauge to fabricate baffle plate)
- Front shield

Options

- Aluminum wear strips
- Tube clamps
- Rubber grommets
- 1" I.D. PVC pipe

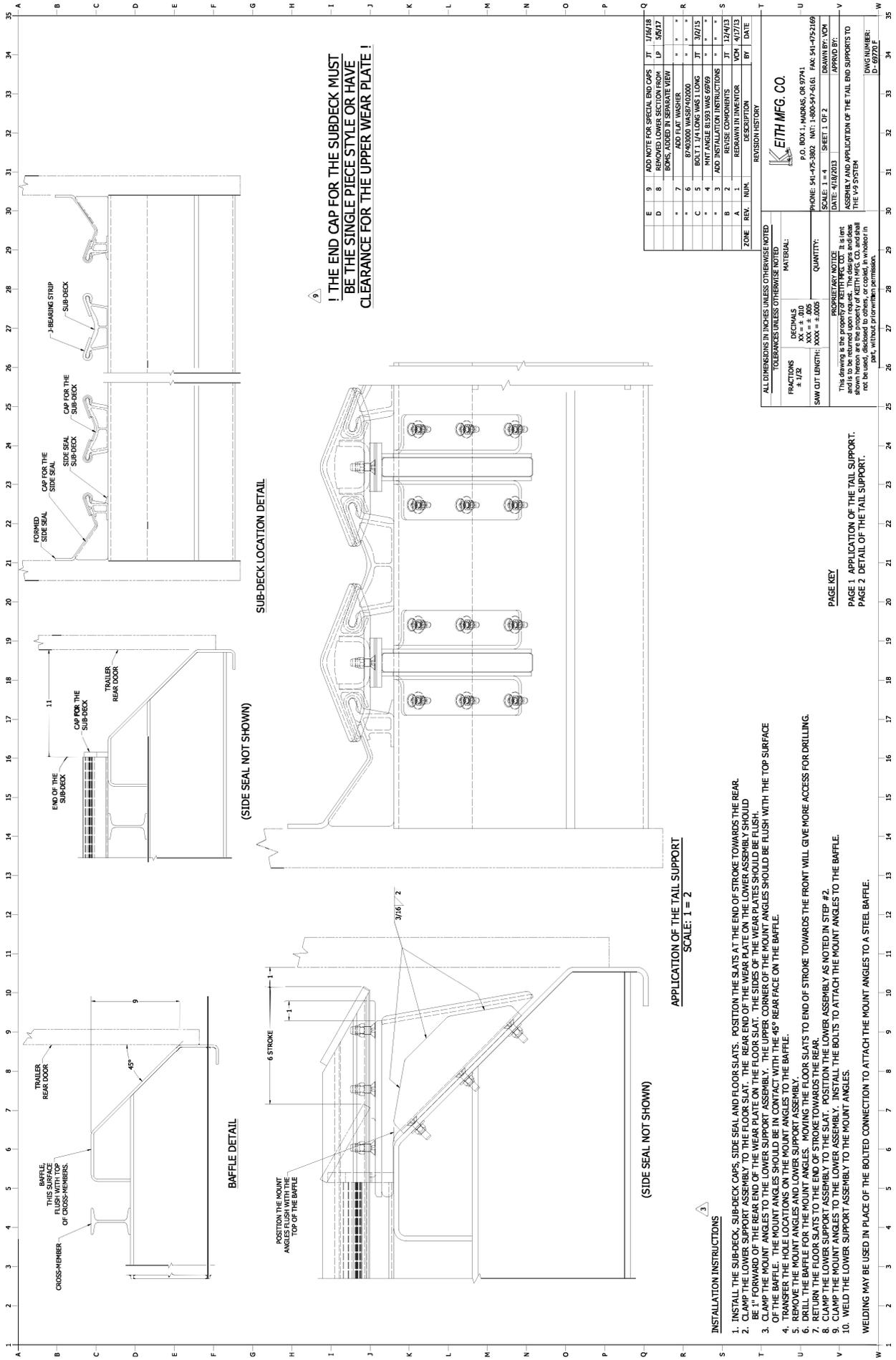
Appendix 3 includes scaled down copies of the reference drawings. Full-scale reference drawings also accompany the installation manual.

Reference drawings accompanying installation manual

- C-10797A Drive installation, frame in tapered rails.
- C-40075 Drive installation into full frame trailer.
- D-12005 Examples of drive mounts







ZONE	REV.	NUM.	DESCRIPTION	BY	DATE
E	9		ADD NOTE FOR SPECIAL END CAPS	JT	1/16/18
D	8		REMOVED LOWER SECTION FROM LP	LP	5/6/17
	7		ADDS BOMS, ADDED IN SEPARATE VIEW		
	7		ADD FLAT WASHER		
	6		REVISED END CAPS		
C	5		BOLT 1/4" LONG WAS 1 LONG	JT	3/2/15
	4		MNT ANGLE B1.593 WAS 6909		
	3		ADD INSTALLATION INSTRUCTIONS		
B	2		REVISE COMPONENTS	JT	1/24/13
A	1		REPAIR IN INVENTOR	WCH	4/27/13

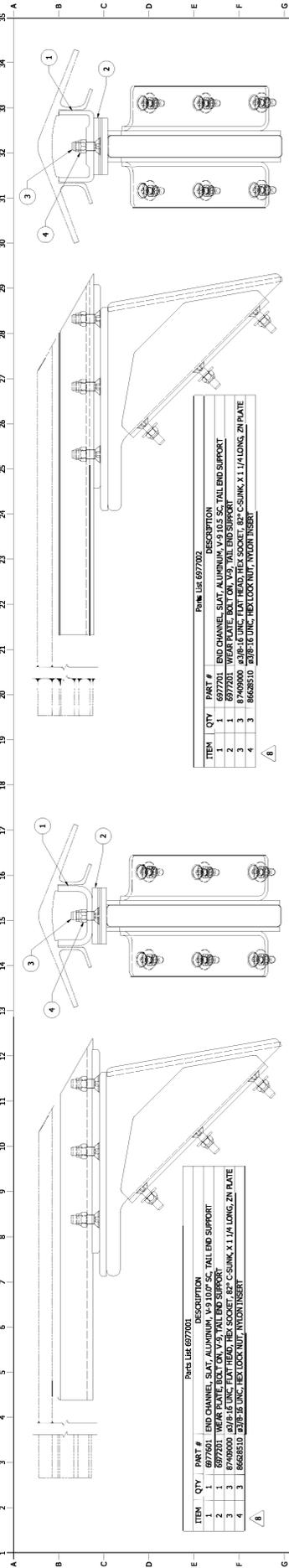
ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED	
TOLERANCES UNLESS OTHERWISE NOTED	
FRACTIONS	±.125
DECIMALS	±.005
XXX ±	±.005
SAW CUT LENGTH:	XXX ± ±.005

**ETH MFG. CO.**  
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 SCALE: 1" = 2" DRAWN BY: VCH  
 APPROVED BY: VCH

**PAGE KEY**  
 PAGE 1. APPLICATION OF THE TAIL SUPPORT.  
 PAGE 2. DETAIL OF THE TAIL SUPPORT.

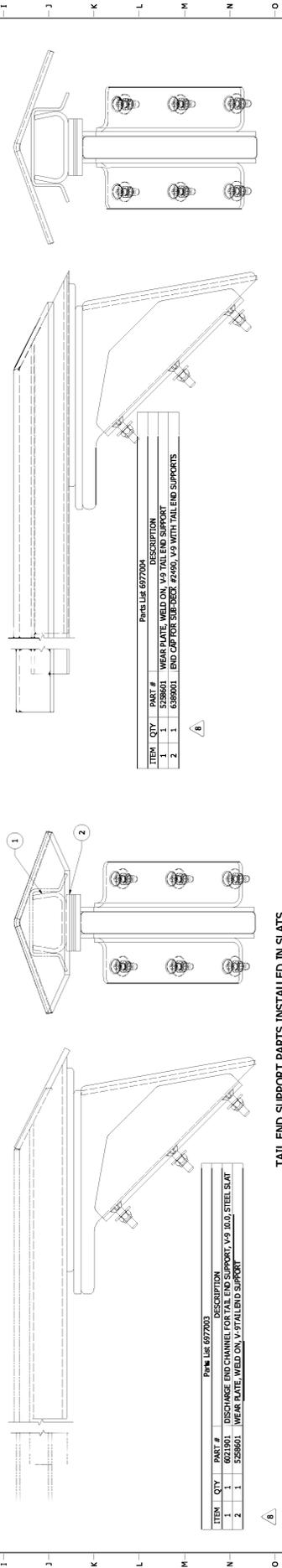
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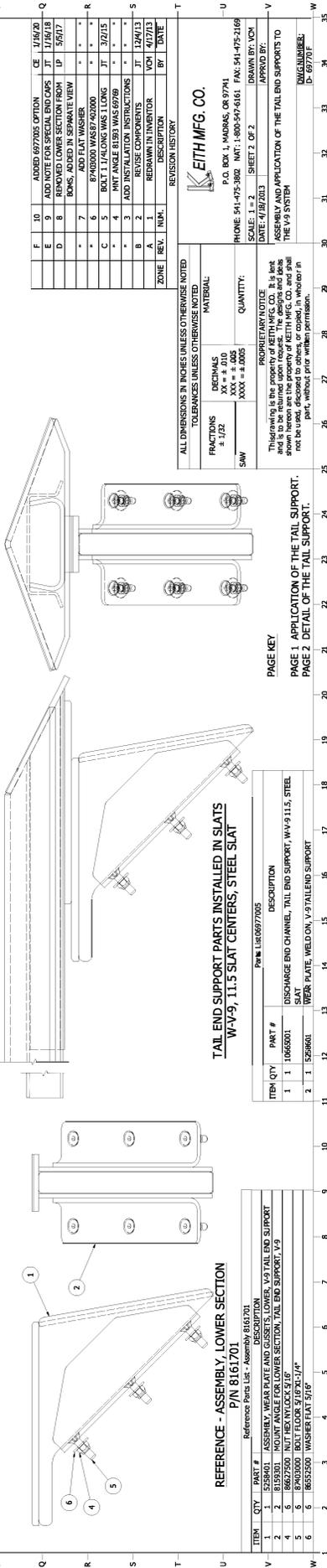
TAIL END SUPPORT PARTS INSTALLED IN SLATS  
V-9, 10.5 SLAT CENTERS, ALUMINUM SLAT

TAIL END SUPPORT PARTS INSTALLED IN SLATS  
V-9, 10.0 SLAT CENTERS, ALUMINUM SLAT



TAIL END SUPPORT PARTS INSTALLED IN SLATS  
V-9, 10.5 SLAT CENTERS, STEEL SLAT

TAIL END SUPPORT PARTS INSTALLED IN SLATS  
V-9, 10.0 SLAT CENTERS, STEEL SLAT



TAIL END SUPPORT PARTS INSTALLED IN SLATS  
V-9, 10.5 SLAT CENTERS, STEEL SLAT

TAIL END SUPPORT PARTS INSTALLED IN SLATS  
V-9, 10.0 SLAT CENTERS, STEEL SLAT



TAIL END SUPPORT PARTS INSTALLED IN SLATS  
V-9, 10.5 SLAT CENTERS, STEEL SLAT

TAIL END SUPPORT PARTS INSTALLED IN SLATS  
V-9, 10.0 SLAT CENTERS, STEEL SLAT

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED  
TOLERANCES UNLESS OTHERWISE NOTED

FRACTIONS	DECIMALS	MATERIAL
± 1/32	XX ± 0.01	
± 1/16	XXX ± 0.005	
± 1/8	XXXX ± 0.0025	

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REVISION HISTORY

NO.	DATE	DESCRIPTION	BY	DATE
1	1/16/18	ADD NOTE FOR SPECIAL END CAPS	JT	1/16/18
2	5/9/17	REWORK LOWER SECTION FROM IP	IP	5/9/17
3		ADD FLAT WASHER		
4		8740000 WASHER 402000		
5	3/21/15	BOLT 1 1/4 LONG WAS 1 LONG	JT	3/21/15
6		WMT ANGLE 8183 WAS 69789		
7		ADD INSTALLATION INSTRUCTIONS		
8	1/24/13	REWORK LOWER SECTION	VON	1/24/13
9	4/17/13	REWORK LOWER SECTION	VON	4/17/13

PAGE KEY  
PAGE 1 APPLICATION OF THE TAIL SUPPORT.  
PAGE 2 DETAIL OF THE TAIL SUPPORT.

Carefully check the items on this list. They are essential for optimal floor performance.

#### Before installation

1. The trailer should be straight.
2. The trailer should have cross bracing.
3. Cross-members should be level with other cross-members and kingpin plate.

#### During installation

4. The aluminum sub-deck tubing must be centered in the trailer.
5. The drive unit must be properly aligned.
6. The cylinders must be entirely collapsed before attaching drive channels.
7. A front guard should deny access to the underside of the front end of the trailer so slats cannot shear anything entering from below.
8. The J-bearings should seat properly on the sub-deck and the flooring should seat properly on the bearings.

#### After installation

9. The pressure and return lines should connect to the correct switching valve port.
10. Caution decals should be visible.

Run the system following the instructions in the owner's manual.

#### After operation

11. Check for leaks and unnecessary rubbing.
12. Refer to the owner's manual and adjust the switching valve.

BOLT	LOCATION	GRADE	TORQUE (ft. lbs.)
1/4-20	Tube Clamp at Ball Valve	5	8
5/16-18	Tube Clamp to Cylinder	5	17
5/16-18	Check Valve	5	17
3/8-16	Flooring	8	45
5/8-11	Barrel Clamp	5	125
5/8-11	Drive End Plate	5	125