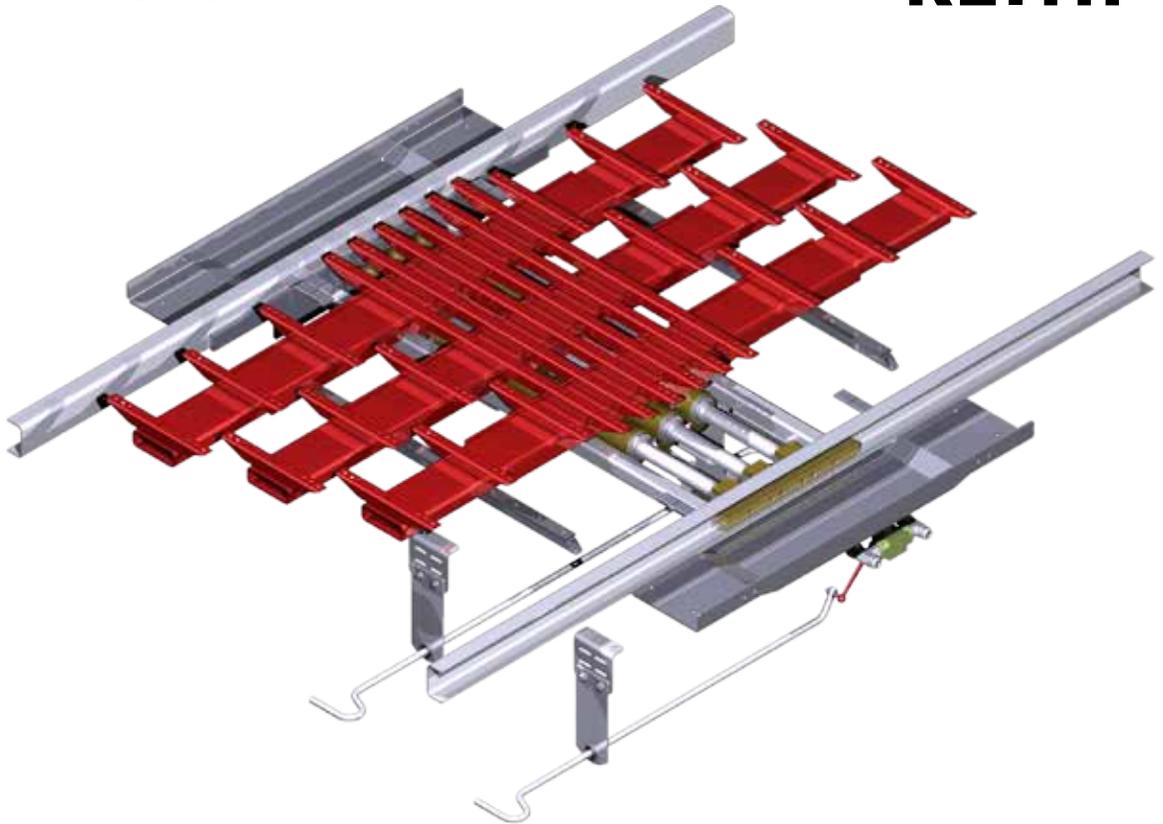


KEITH Mfg. Co.
World Headquarters
800-547-6161
541-475-3802
541-475-2169 fax



KEITH® Running Floor II® Drive Installation Manual Original Instructions

www.keithwalkingfloor.com

Revised 7.28.15C

© 2005, KEITH Mfg. Co. All rights reserved KEITH, WALKING FLOOR® and RUNNING FLOOR II are registered trademarks of KEITH Mfg. Co. Equipment manufactured by KEITH Mfg. Co. is protected by numerous patents both domestic and foreign. WALKING FLOOR® is a product and brand of Keith Mfg. Co.

CONTENTS:

1	INTRODUCTION.....	1
2	TRUCK OR TRAILER PREPARATIONS	
2.1	Drive unit compatibility.....	2
2.2	Trailer alignment.....	3
2.3	Bracing.....	4
2.4	Hydraulic tubing locations.....	5
2.5	Cross-members.....	6
2.6	Shimming.....	8
3	SUB-DECK	
3.1	Baffle plate.....	9
3.2	Square tubing.....	10
3.3	End sub-deck.....	13
3.4	Side seal support	16
4	DRIVE UNIT	
4.1	Center frame trailer.....	16
4.2	Frameless trailer.....	19
4.3	Painting.....	21
5	FLOORING	
5.1	Slide bearings.....	22
5.2	Floor slats.....	23
5.3	Side seal.....	31
5.4	Front shield.....	29
6	HYDRAULIC TUBING.....	35
7	MISCELLANEOUS	
7.1	Wires and lines.....	38
7.2	Caution decals.....	38
7.3	Front guard.....	38
7.4	Trimming Floor Slat.....	39
	Appendix 1 Tools.....	42
	Appendix 2 Materials.....	43
	Appendix 3 Reference Drawings.....	44
	Appendix 4 Check list.....	52
	Appendix 5 Torque chart.....	53

Chapter 1 INTRODUCTION

This manual explains procedures for installing the KEITH® Running Floor II® 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 an 8" stroke system with 3 1/2" flooring. Installation of the system with 6" flooring is similar. Information unique to 6" flooring 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 our website.

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.

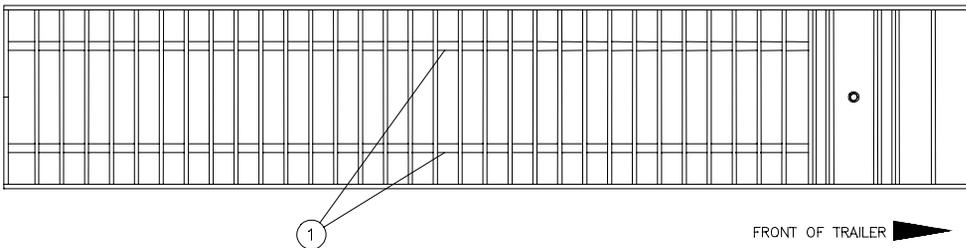
Chapter 2 TRAILER PREPARATIONS

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

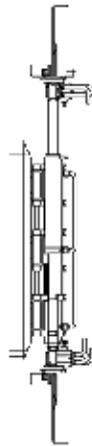
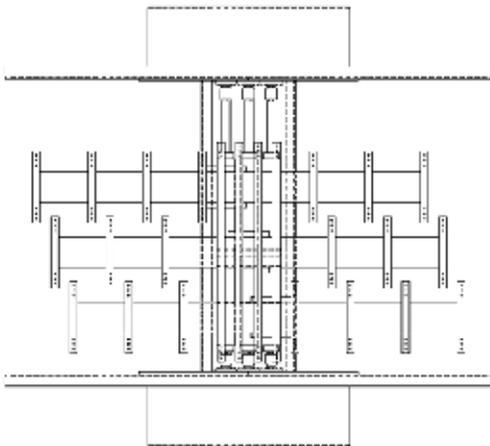
There are two styles of Running Floor II[®] drive units. The trailer's frame determines which style should be used. Check the compatibility of the drive unit with the trailer before making any alterations to the trailer.

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



25030

1. CENTER FRAME



25029

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

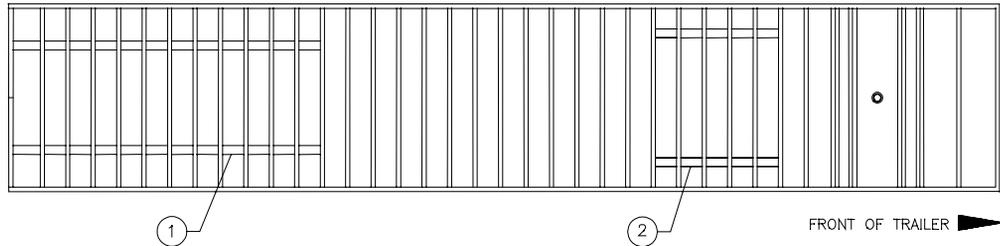


Figure 3

- 1. AXLE FRAME
- 2. LANDING GEAR FRAME

25031

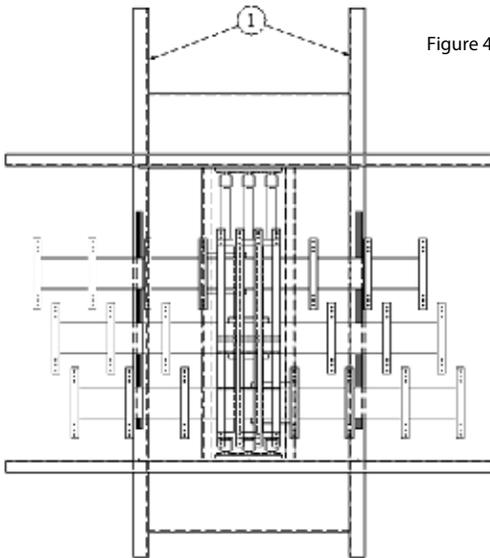
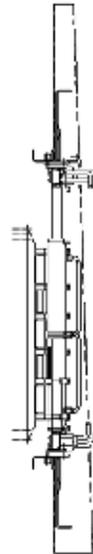


Figure 4

- 1. TAPERED FRAME RAIL



25028

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 113" for 10" stroke, 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.

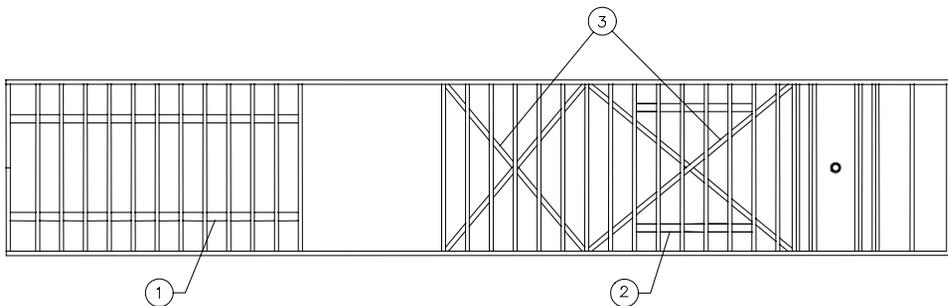


Figure 5

25032

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

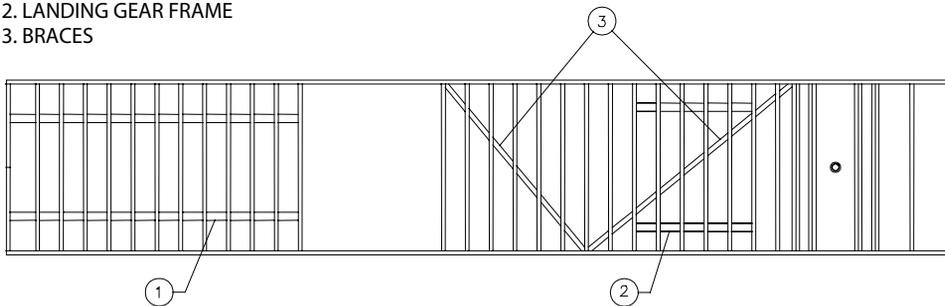


Figure 6

25032a

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 down, if they stay connected while driving.

There are three 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.

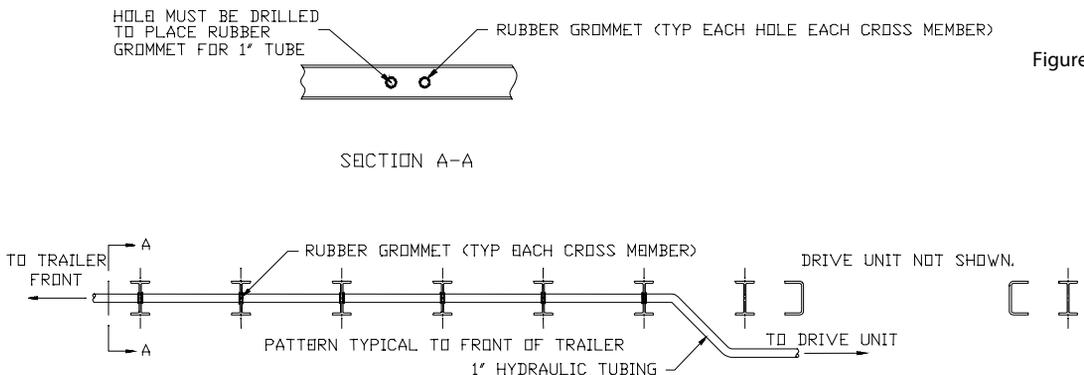


Figure 7

25017

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 crossmembers or placed in 1" inside diameter PVC pipe to prevent rubbing. The side seal should be detachable for maintenance.

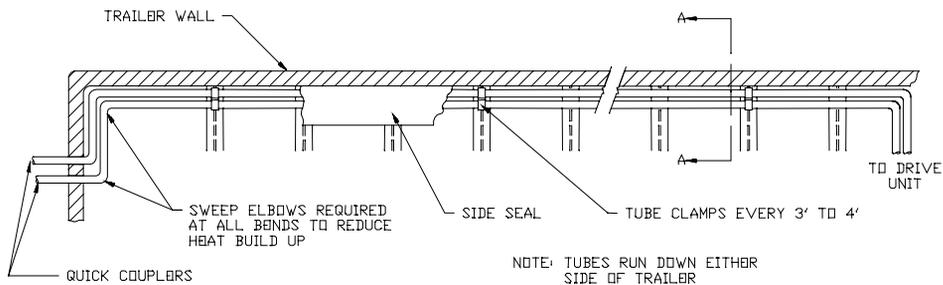
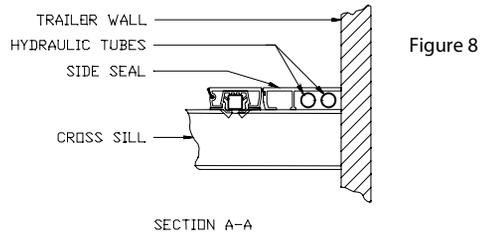


Figure 5

25018

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 and the cross-member's flanges prevent the slide bearings from moving.

1. 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.

2. Check cross-member flange width for proper bearing fit (Figures 9 and 10). Please note that Figure 9 is for 3.65" slat centers and Figure 10 is for 6" slat/plank centers.

The bearings are designed to fit flanges smaller than 2 7/16". If the surface is wider than 2 7/16", standard bearings cannot mount on the top. The bearings can be specially milled to fit a 4" maximum.

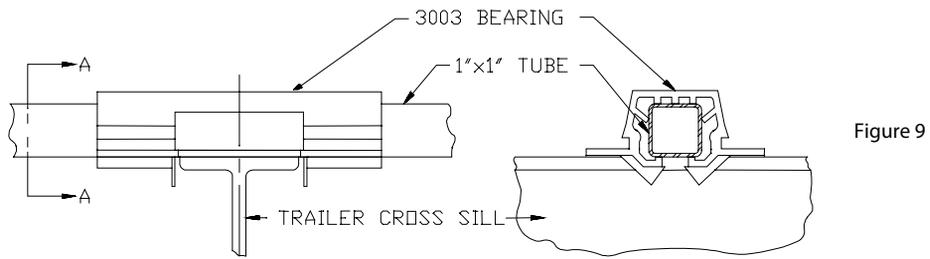


Figure 9

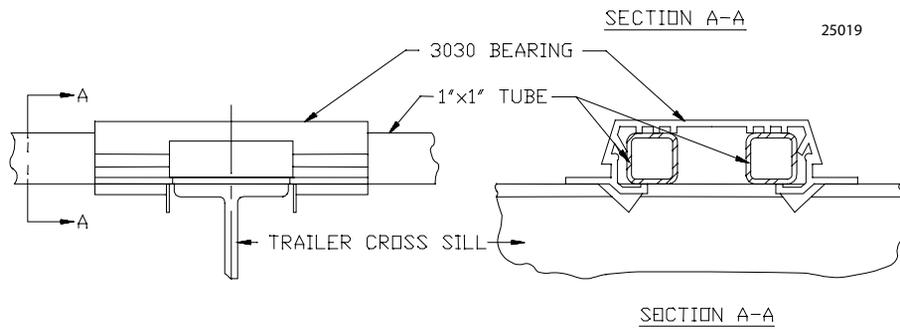


Figure 10

1. Remove cross-members to create an adequate gap for the drive unit (Figure 11). See Chapter 4 for more information about drive unit location.

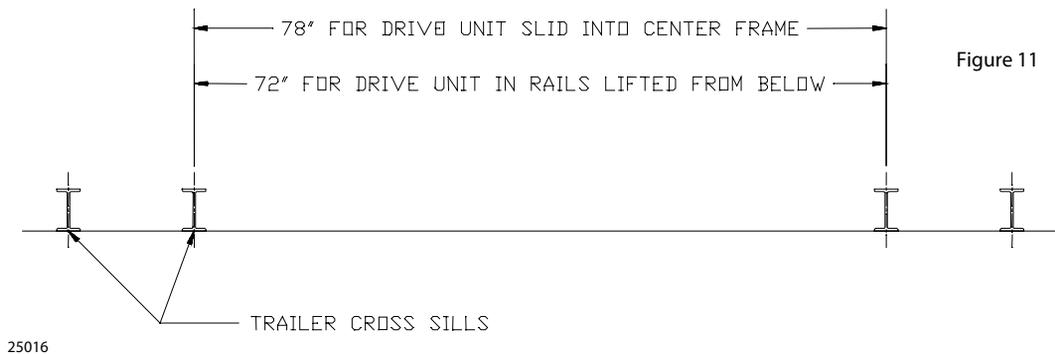


Figure 11

25016

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.

2.6 Shimming

A common hindrance to the installation of *WALKING FLOOR* systems is a section near the kingpin that is higher than the rest of the cross-members. Shimming overcomes this problem.

1. Install shim material.

Flat bar is good shim material. Weld 1/4" x 2" angle iron to existing crossmembers for extra height. Some cases require additional cross-members. The top of the frontmost shim should be higher than all other shims or crossmembers. Gradually decrease shim height to the level of the standard crossmembers. Rest a straight edge on the shim tops to help plan the transition (Figure 12). Triangular tabs may need to be trimmed off the bottom of slide bearings to fit some shims.

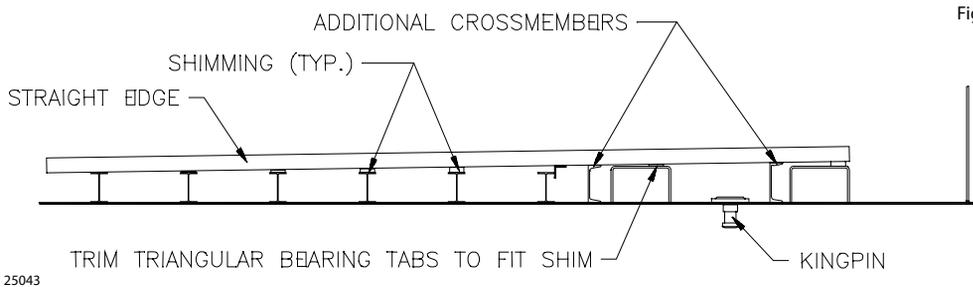


Figure 12

25043

3 SUB-DECK

The sub-deck is the structure directly above the cross-members and underneath the floor slats. The sub-deck consists of square steel tubing or U-shaped aluminum profiles. The square tubing mounts on top of the cross-members. Plastic floor bearings connect to the tubing.

3.1 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 9).

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 2mm plate. 3mm plate is recommended for heavy, abrasive materials (e.g. solid waste). The plate bends down 300mm 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.

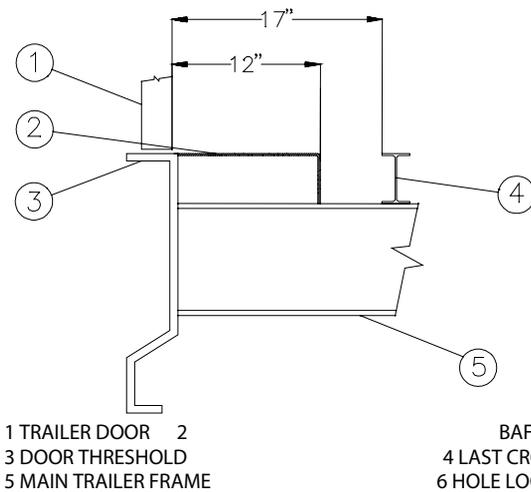
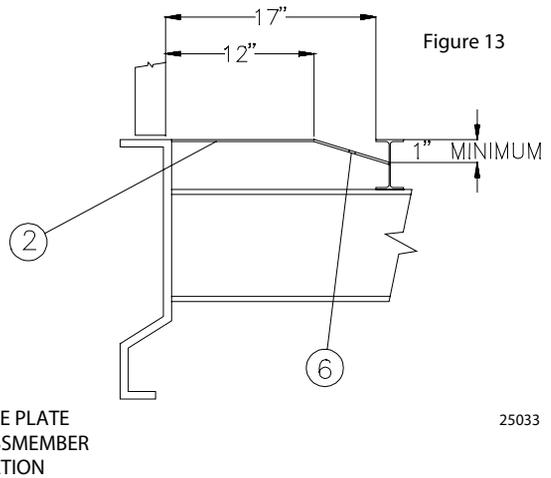


Figure 9



25033

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.

3.2 Square tubing

The proper installation of the square tubing is critical for maintaining drive alignment, floor straightness and for optimal performance of the seal located between the floor slats. Square tubing is usually applied before the drive unit is positioned, unless the drive unit is dropped from above. Please note that the center frame drive (Chapters 2 & 4) should be positioned before the square tubing is applied.

1. Choose the rear end sub-deck most suitable for your application.
See section 3.3 for more information.
2. Cut 1" x 1" tubes to proper length according to your trailer measurements and your end sub-deck selection. The number of tubes installed equals the number of floor slats.

All sub-deck tubes must extend beyond cross-members by 2", because bearings require at least 2" of tubing on both sides of a cross-member for proper attachment.

3. Position and mount the tubes.

Tubing for 3 1/2" flooring is on 3.650" centers (Figure 14). Tubes separated by 2.350" lie in pairs 3.650" apart for 6" flooring (Figure 15).

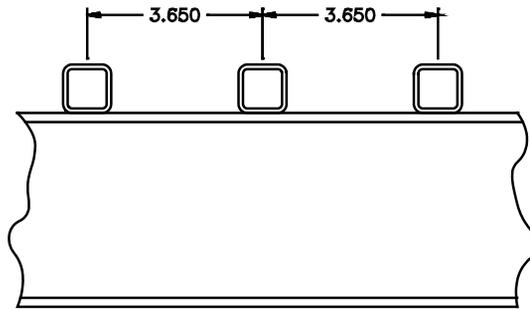


Figure 14

25041

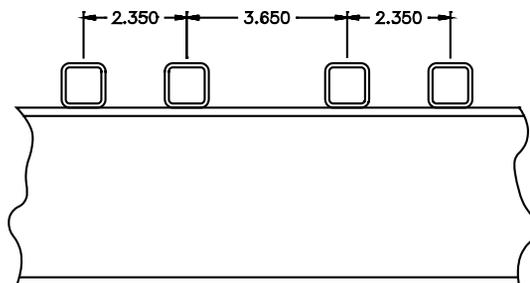


Figure 15

25040

Start at the rear of the trailer. Lay the two outside tubes in the trailer and separate them with spacing jigs. Center the jigs so the tubes are the same distance from the side walls. Lay out the remaining tubes across the width of the trailer, spacing them with jigs. Keeping the jigs above the cross-members, clamp the jig and tubes to every other cross-member. Be sure all tubes attain the minimum overhang of 2". Remember to plan for the formed cross sill attached to the drive unit. Plan the overhang into the drive gap according to the drive unit being installed (Figure 16).

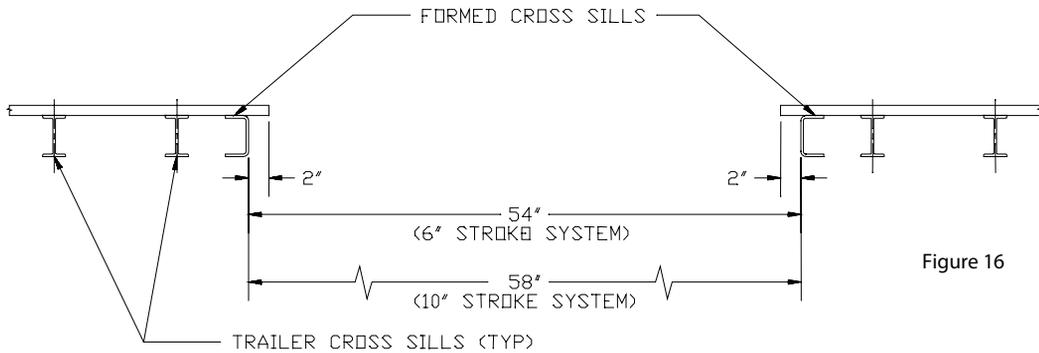
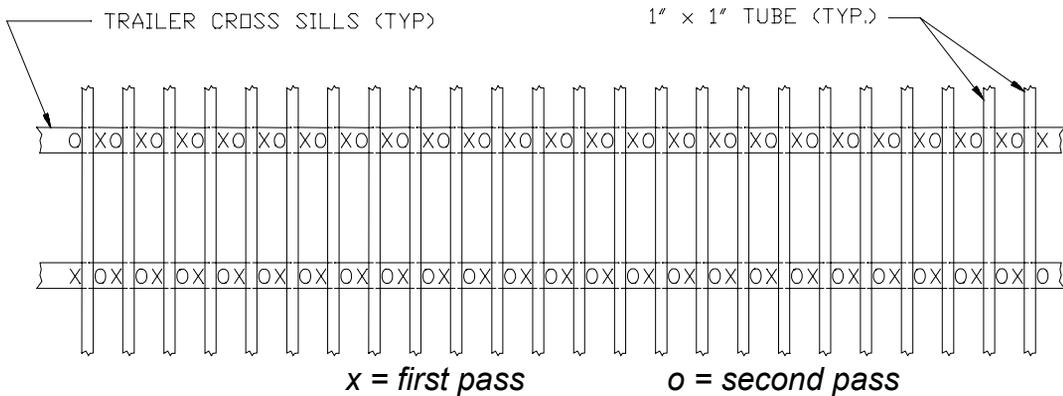


Figure 16

25039

Weld or huck bolt the square tubes to the cross members between the jigs. Move the jigs and make a connection at each intersection of a tube and a crossmember. 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 17 suggests a welding pattern. Starting each pass on the same side of the trailer gives sufficient cooling time.



Fig

25026

If aluminum profile is welded, put the two legs of the U down. If bolting, turn the tube over (Figures 18 and 19). Packing tape or paint should separate aluminum profiles from steel cross-members to prevent metal decay.

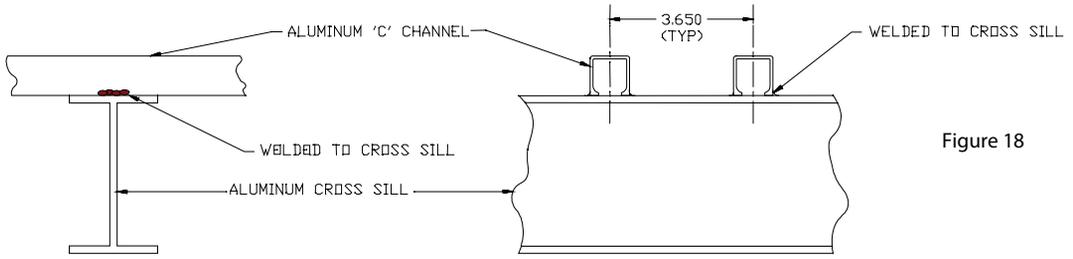


Figure 18

ALUMINUM 'C' CHANNEL ATTACHMENT TO ALUMINUM CROSS MEMBERS
25011

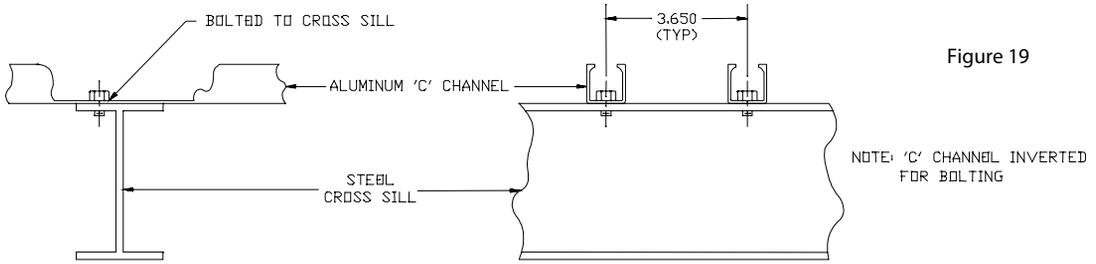
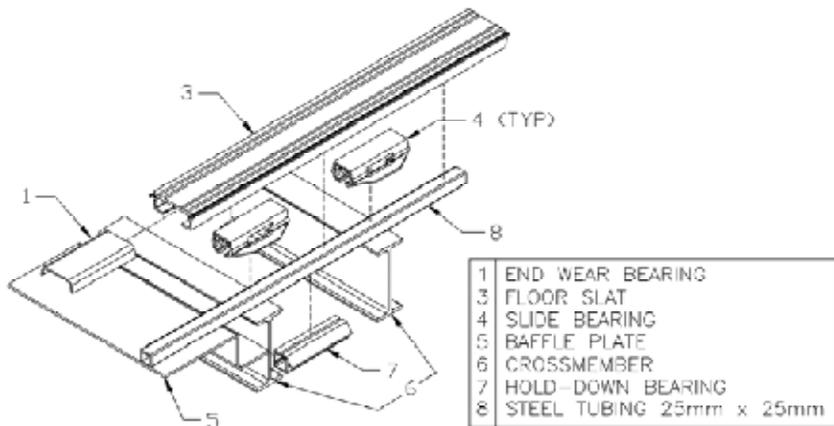


Figure 19

ALUMINUM 'C' CHANNEL ATTACHMENT
TO STEEL CROSS SILL

25010



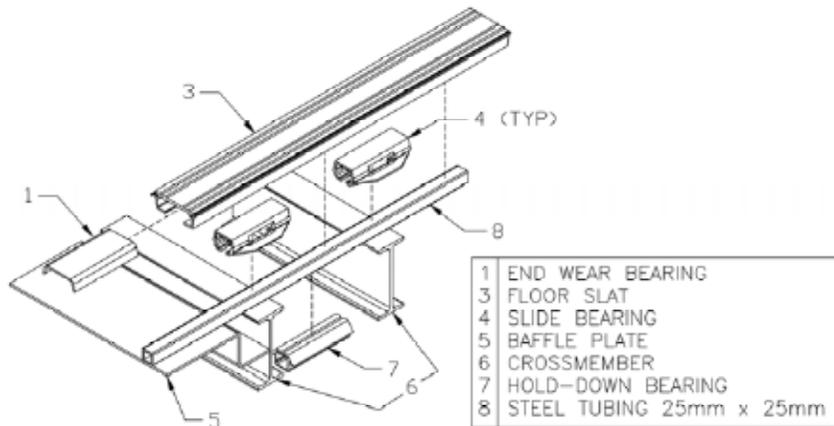
3.3 End sub-deck

The unloading end of the sub-deck needs special attention because the area is fully exposed with the floor slats in the forward position.

There are five end sub-deck options:

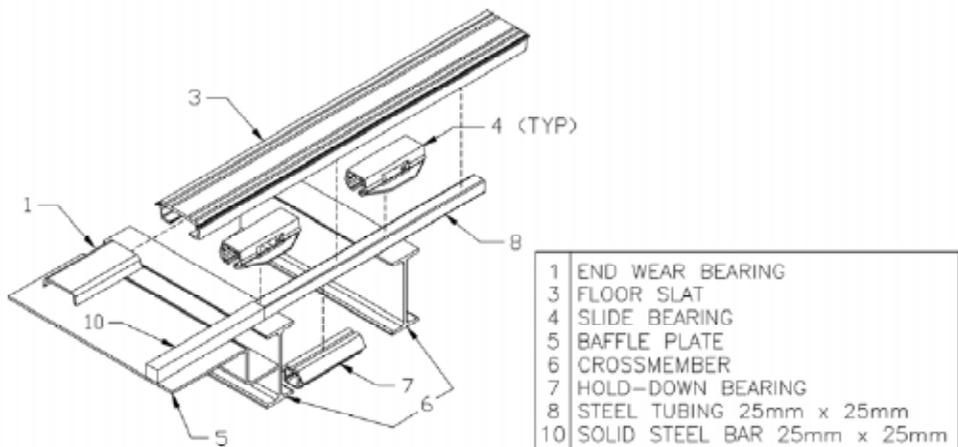
1) Extended square tube.

Extend the tubes used for the rest of the floor to the end area.



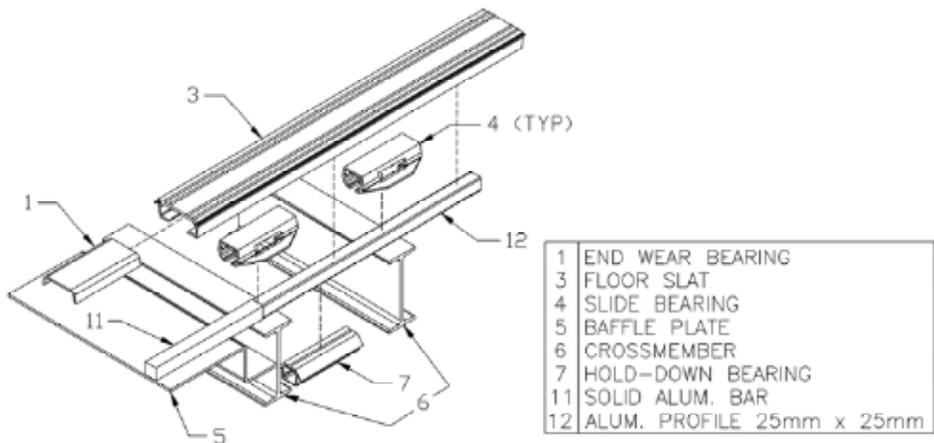
2) Solid steel bar. (1" x 1")

This method is recommended for hauling solid waste or other highly abrasive materials. The solid bars meet the square tubing on the last cross-member.



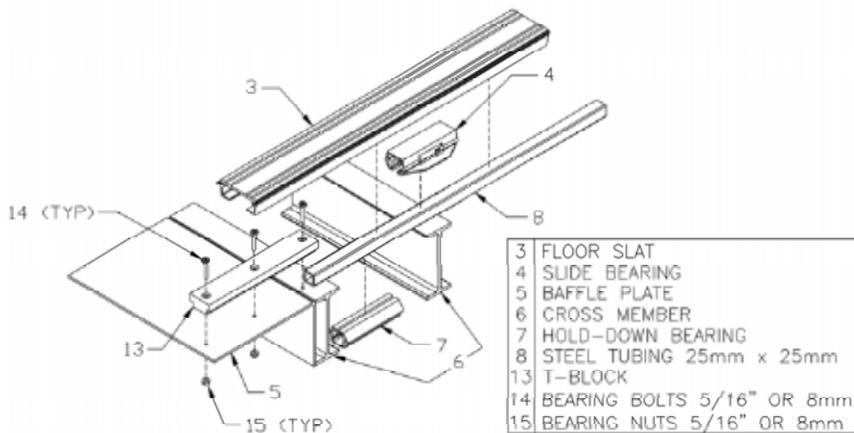
3) Solid aluminum bar.

A solid aluminum bar will provide a strong structure at the end when the subdeck is constructed with aluminum profiles. The aluminum profiles meet the square tubing on the last cross-member.



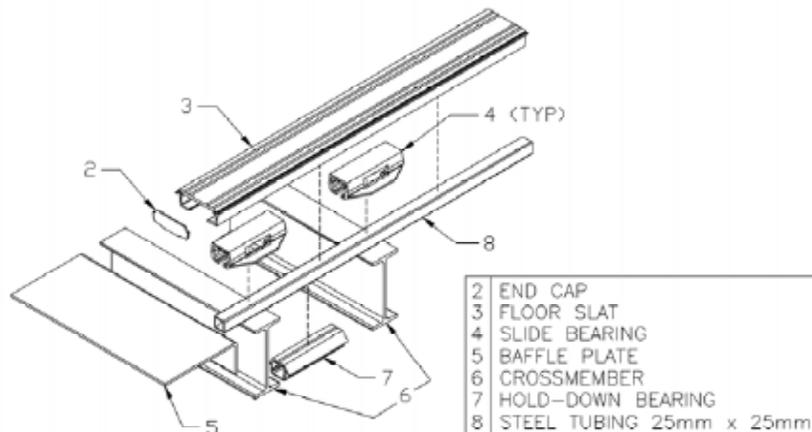
4) T-block.

A plastic T-block provides a sliding surface and prevents material from going underneath slats. T-blocks are not recommended for use with highly abrasive materials.



5) NO end sub-deck

The absence of an end sub-deck is undesirable because it leaves no support for ends of slats.



NOTES: The first three options include a wear pad bearing in the floor slats. The square sub-deck material can extend to 1/2" from the doors for all options.

1. Install the selected end sub-deck following these instructions:

Option 1:

Extended steel tubing

This sub-deck is installed along with the installation of the rear subdeck.

Weld caps to the tube ends to prevent material from entering. Grind to give a smooth finish.

Option 2: Solid steel bar

1. Cut the bars to length (14" minimum for 10" stroke; 10" minimum for 6" stroke)

Under standard conditions, bars reach to 1/2" inside the doors.

2. Align the bars with the installed tubing. Use the spacer jigs to perfect alignment and clamp them down.

3. Weld the bars to the cross-member and to the baffle plate.

Option 3: Solid aluminum bar

Install the same as in Option 2.

Option 4: T-block

1. Drill and countersink bolt holes through the T-blocks and baffle plates.

2. Align the T-blocks with installed tubing. Keep the blocks 1/2" away from the doors.

3. Fasten T-blocks to the baffle plate. Self-tapping screws may be necessary if access is poor. Countersink holes 1/4" below the block top. Make sure the bolts (flat-head socket caps) are below the surface of the block.

3.4 Side seal support

Side seal options are discussed in Section 5.3. Some of the options require support from the sub-deck.

1. Select a side seal option from Section 5.3.
2. Install support for the selected side seal option if necessary.

Plan the support so the top of the side seal will be level with the rest of the flooring. Pieces of tube or angle can be attached on every other cross-member to support the side seal. If hydraulic tubing will be routed under the side seal, make sure that the support will not obstruct it.

4 DRIVE UNIT

Drive unit installation in a center frame trailer differs from an installation in a frameless trailer. Chapter 4 examines the two installations separately.

4.1 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. Position drive unit.

The drive should be positioned, but not welded, before the sub-deck is installed. Remove the formed cross-members from the drive unit. 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 78" is necessary to maneuver the drive unit.

Replace the formed cross-members after setting the drive end plates on the trailer frame rails (Figure 20). The formed sills should be tightened to a torque of 125 ft.-lbs.

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

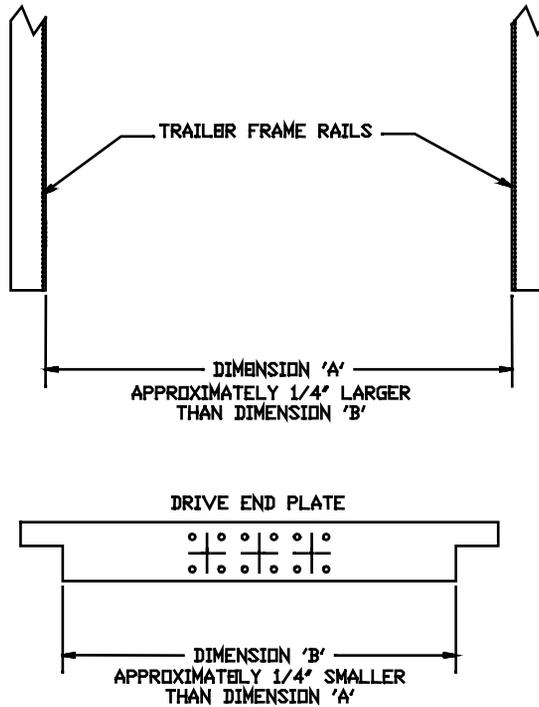


Figure 20

25025

2. Align and level drive unit.

Front to rear alignment

Center the drive unit in the drive gap. The 1" x 1" tubing should extend 2" past the formed cross sills at each end of the drive unit. The 2" x 6" cross-drive tubing should be parallel to trailer cross-members.

Side to side alignment

Recommended method:

After the sub-deck is welded or bolted down, use a straight edge to align punched holes in the drive shoes with centers of respective 1" x 1" tubing. Do this with at least two shoes on each side of the trailer (Figure 21).

Optional method if trailer is perfectly straight:

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

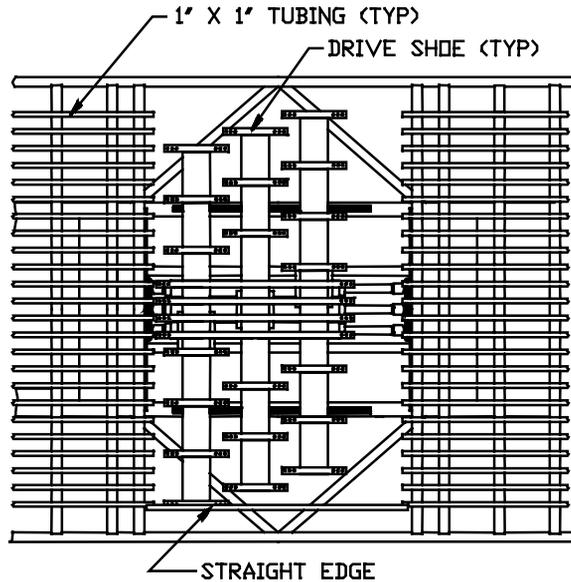


Figure 21

25045

Height

- A.** Place plastic bearings on 1" x 1" tube at sides and center of trailer at each end of drive area.
- B.** Lay a straight edge from bearing to bearing across the drive.
- C.** Raise the drive so the top of the drive shoe touches the straight edge across the shoe length on each straight edge. The 1/4" dimension from the top of the 1" x 1" tube to the top of the drive shoe is critical. Make height adjustments by shimming or grinding ears of the drive unit end plates.

This method gives the proper drive height as bearings are 1/4" above the 1" x 1" tube and the drive shoes connect directly to floor slats (Figure 23).

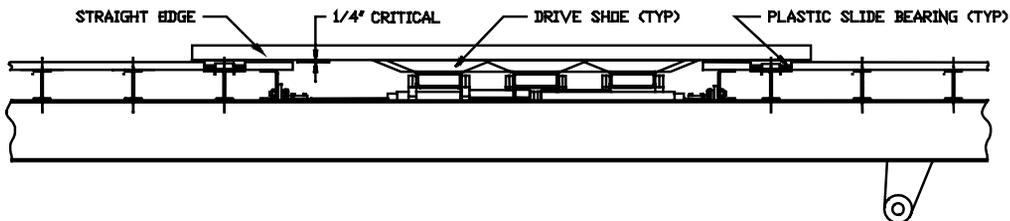


Figure 23

25035

- 3. Weld the drive unit in place.
Weld according to reference drawing 40075. Remember to connect 1" x 1" tubing to the drive unit's formed cross sill.
- 4. Weld bracing to side walls as shown in reference drawing 40075.
- 5. Install cross-drive support tubes as shown in reference drawing 40075.
Slide the support tubes into position between 6" 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.

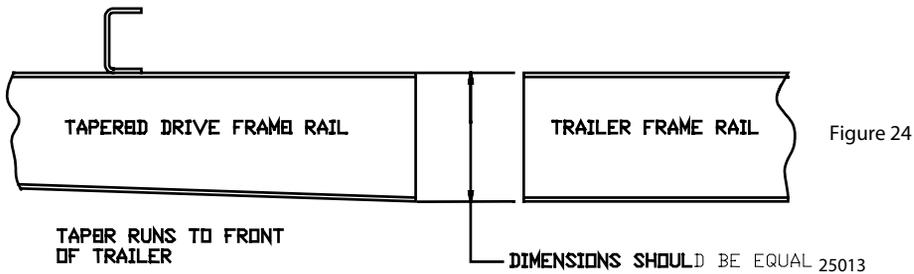
4.2 Frameless trailer

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 113" for 10" stroke, 109" for 6" stroke).

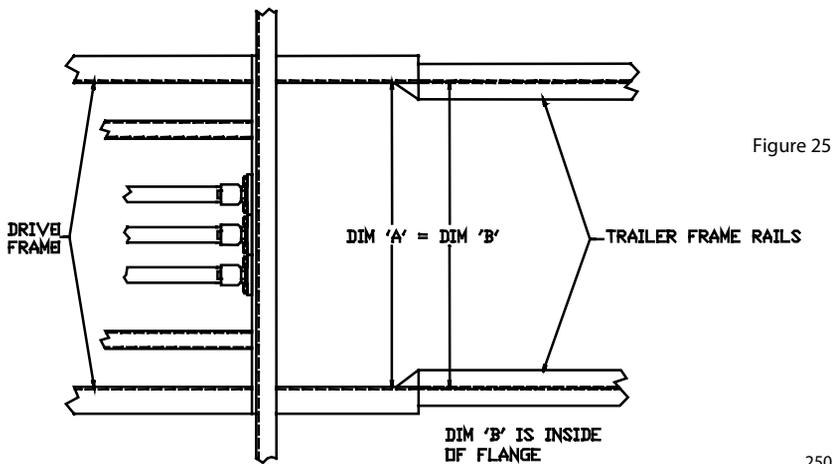
1. Position drive unit in the drive gap.

Check to be sure drive unit dimensions fit the location. The rail heights should be close, (Figure 24) and dimension A should equal dimension B (Figure 25). 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 1" x 1" tubing with the drive shoes is more important than alignment of the drive unit frame with the trailer's axle beams.



25012

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 24 and 25). 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

Recommended method:

After the sub-deck is welded or bolted down, use a straight edge to align punched holes in the drive shoes with centers of respective 1" x 1" tubing. Do this with at least two shoes on each side of the trailer (Figure 26).

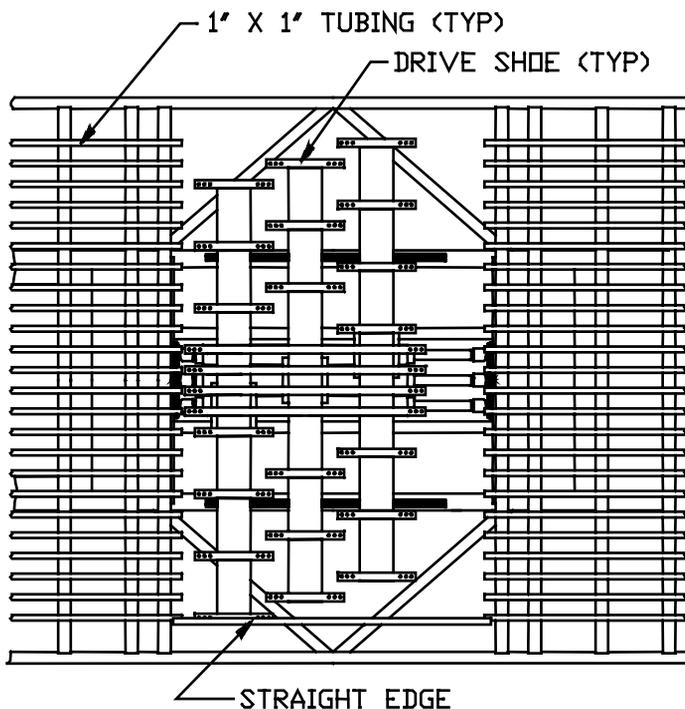


Figure 26

Optional method if trailer is perfectly straight:

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

Height (Figure 27)

- A.** Place plastic bearings on 1" x 1" tube at sides and center of trailer at each end of drive area.
- B.** Lay a straight edges from bearing to bearing across the drive.
- C.** Raise the drive so the top of the drive shoe touches the straight edge across the shoe length on each straight edge. The 1/4" dimension from the top of the 1" x 1" tube to the top of the drive shoe is critical. Raise or lower the drive unit accordingly.

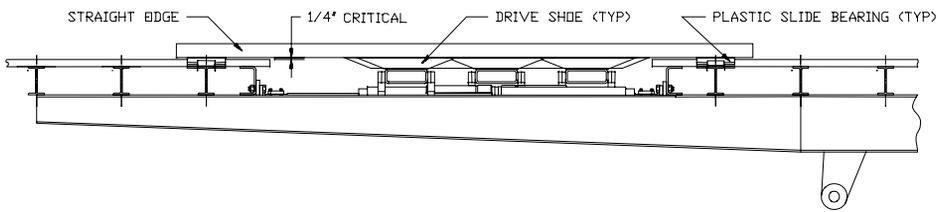


Figure 27

25034

3. Weld the drive unit in place.
Weld according to reference drawing C-10797A. Remember to connect 1" x 1" tubing to the drive unit's formed cross sill.
4. Weld bracing to side walls as shown in reference drawing C-10797A.

4.3 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.

5 FLOORING

After paint dries, the flooring can be installed. The slats slide on plastic bearings. Hold-down bearings mounted at the rear end keep the slats down. The aluminum floor slats are bolted to shoes on the cross drives.

5.1 Slide bearings

1. Compare bearing dimensions with cross-member flange width.
The gap in the bearing should exceed the flange width of the cross-member.
The standard bearing gap is $2 \frac{7}{16}$ ". Milling can enlarge the gap to 4".

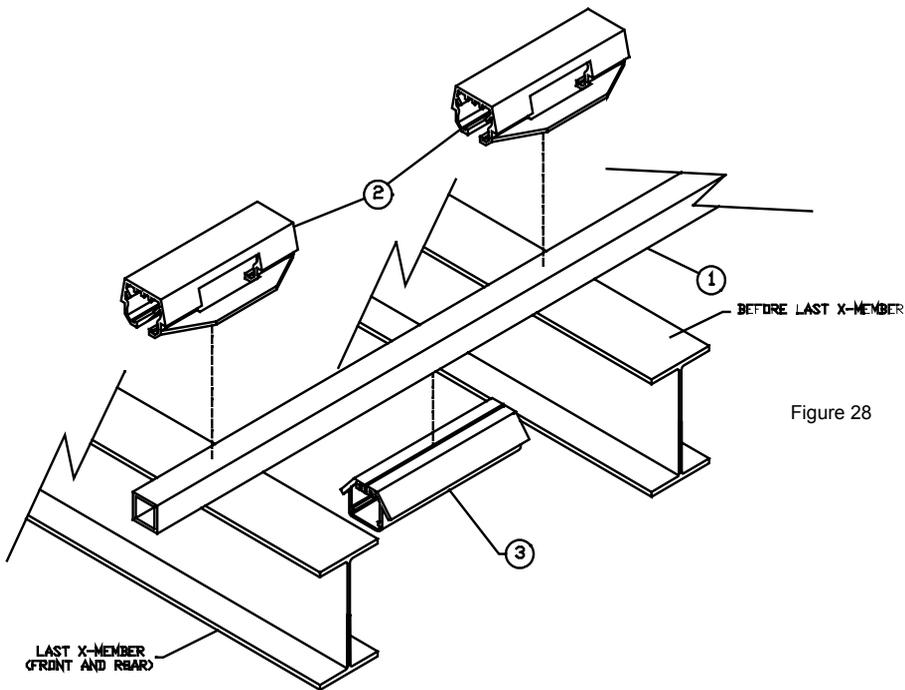


Figure 28

1 SUB-DECK
SLIDE BEARING
3 HOLD-DOWN BEARING

2. Snap bearings on the square tube at the junction of each cross-member.
No tools are needed. (Figure 28).

IMPORTANT: Do not put a bearing on the front cross-member of the trailer if the floor slat will slide beyond the center of this bearing in the backward position.

3. Snap on hold-down bearings.

These are placed between the last two cross-members at the rear of the trailer. Install them upside down from above the sub-deck. Then rotate them around the sub-deck so the ears point downward.

5.2 Floor slats

1. Determine length of floor slats.

The slats have to reach from 1/2" from the doors to a minimum of 13" (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 13 1/2" (9 1/2" for a 6" stroke system) shorter than the inner length of the trailer. For example, maximum slat length for a 10" stroke unit in a 45' trailer is 43'-10 1/2".

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 3-5.

3. Install drive-in wear bearing. See reference drawing D-50625.

A. Place all slats/planks on their sides. The side opposite of the seal groove should be facing upward. Make sure to leave enough space on either side of the slats/planks. You will be using this space to stack all of the slats/planks when you are finished.

B. De-burr the side of the floor slat/plank as it faces you, on both ends. This will help eliminate tearing of the seal after it is installed.

C. Band one end of the slats/planks together to help reduce movement.

D. Place the end of the drive-in wear bearing installation fixture into the first slat/plank and clamp the jig's vice into place.

E. By hand, slide the Drive-In bearing into the jig with the legs of the bearing facing toward the feet of the slat/plank. If the bearing will not easily slide into the jig, discard and use another to avoid damaging the bearing.

F. With a mallet, pound the bearing completely into the jig.

G. Insert the punch tool into the jig.

H. Pound the punch tool into the bearing, until the bearing is flush with the end of the slat/plank.

I. Pound the punch tool into the bearing, until the bearing is flush with the end of the slat/plank.

J. Remove the punch tool from the jig and unclamp the jig from the slat/plank.

K. If the bearing is not flush with the end of the slat/plank, pound it in the rest of the way using the mallet, until it is flush with the slat/plank.

L. Drill five 3mm (1/8") holes on the lower part of the leg of the slat/plank, equally spaced apart and making sure to catch both ends of the pound in bearing. The holes should be drilled approximately 12mm (1/2") to 20mm (3/4") from either end of the bearing. (Repeat this step on the opposite leg as well, for a total of 10 holes to be drilled for each slat/plank)

M. Rivet through each hole, using 3mm (1/8") rivets, making sure the flattened face of the rivet is flush with the edge of the slat/plank.

N. Once completed, remove the band from the slats/planks, and continue on with the seal installation.

4. Attach drive-in wear bearing in slat (Figure 29).

When using the plastic T-blocks, the drive-in wear bearing is not needed. Slide this wear bearing in at the rear end of the slat/plank just above the seal slots until flush with the end of the slat/plank. Attach the bearing with four self-tappers from underneath. Make sure that these screws cannot interfere with the tubing. It is also possible to attach the bearing with two rivets at each side.

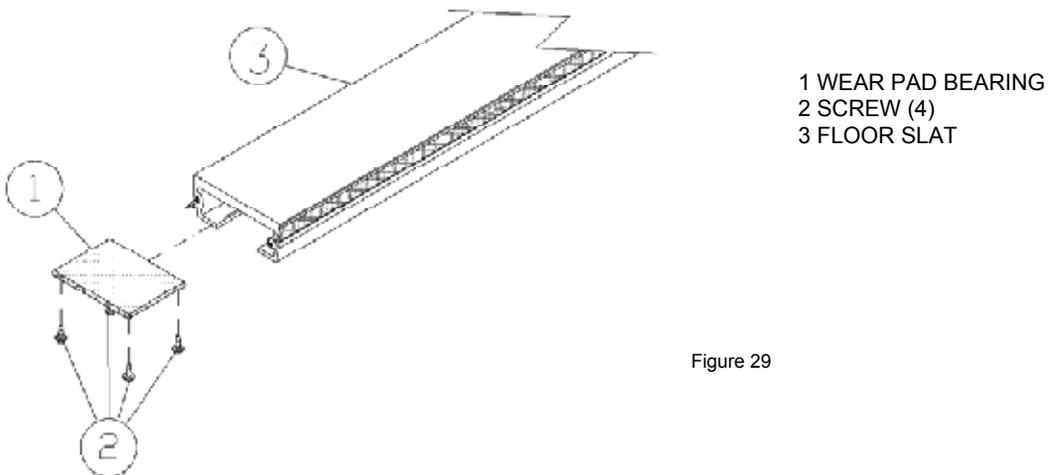


Figure 29

I-30

5. Install seals (Figures 30 to 42).

Weld on wear strips and filler plates BEFORE installing the seal.

A. Place the bundle of floor slats on four equally spaced sawhorses. The sawhorses must be strong enough to support the weight of the floor slats. Remove the banding from the bundle.

B. Inspect the ends of the floor slats. De-burr the seal groove. Chamfer the outside edge of the floor slat opposite the seal groove. De-burr and chamfer both ends of the floor slats (Figure 30).

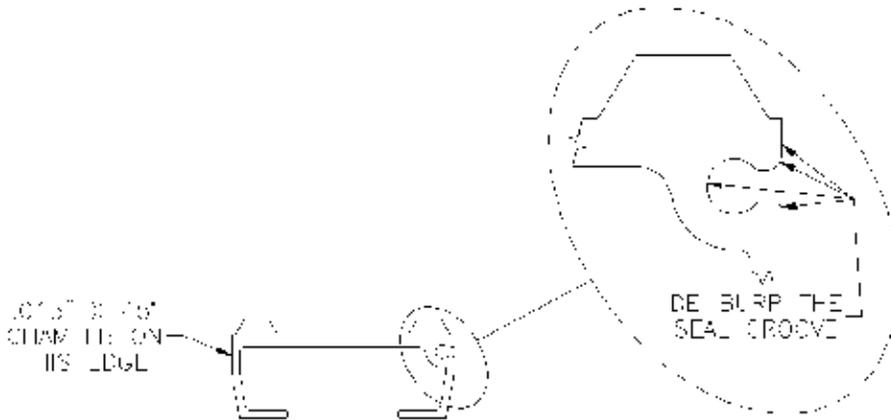


Figure 30

C. Trim the end of the floor seal at a 45° angle at both ends (Figure 31). The angle on the seal pushes the adhesive into the seal groove. Pull the floor seal into the floor slat. The open end of the “Y” must be towards the top of the slat (Figure 32). Pull the polyurethane (black) seal short of the full length by the dimension “X”. The dimension “X” varies with the floor slat length. Refer to Figure 33 to determine the correct “X” length. Cut the floor seal off flush with the end of the floor slat (Figure 34). If using the polyethylene seal (blue) pull it flush with the end of the floor slat (Figure 35).

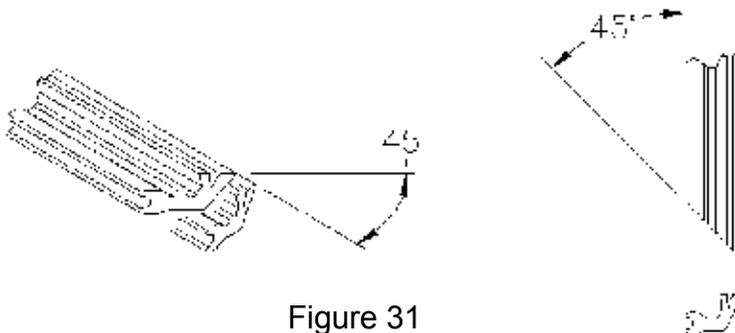


Figure 31

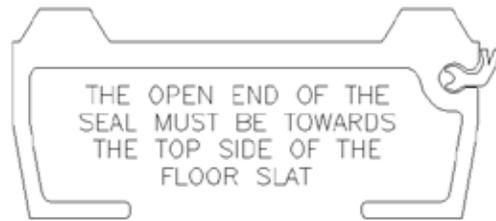
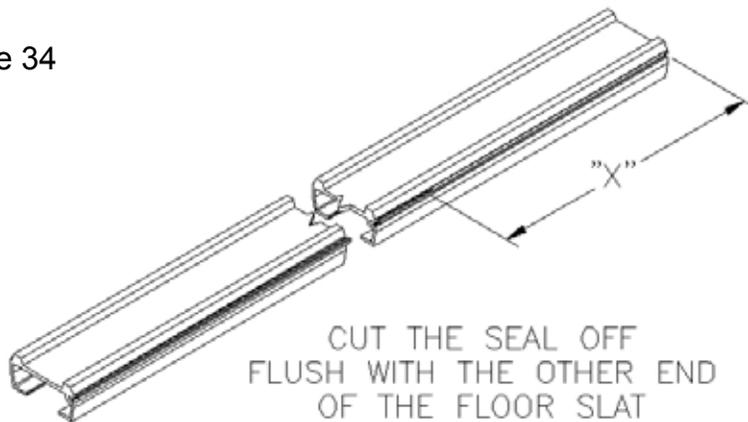


Figure 32

TRAILER LENGTH	SLAT LENGTH	"X" (DISTANCE FROM THE END OF THE FLOOR SLAT)
20'	18'-5"	7"-9" min.
27'	25'-5"	9"-11" min.
32'	30'-5"	11"-13" min.
40'	38'-5"	14"-16" min.
45'	43'-5"	16"-18" min.
48'	46'-5"	17"-19" min.
53'	51'-5"	19"-21" min.

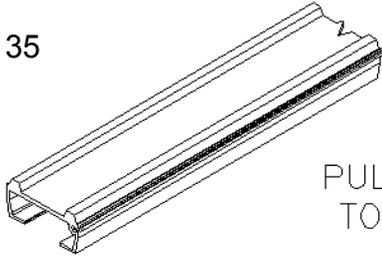
Figure 33

Figure 34



*POLYETHYLENE (BLUE) SEAL

Figure 35



PULL THE SEAL FLUSH
TO THE END OF THE
FLOOR SLAT

D. Apply a 1/8" diameter bead of SikaFlex 221 adhesive sealer into the exposed seal groove (Figure 36). The bead should be from the end of the seal to the end of the slat. If using the polyethylene seal (blue) the bead should be 2" long (Figure 37). Hold the caulking gun at a 60° angle to the floor slat (Figure 38). Push the bead, do not pull.

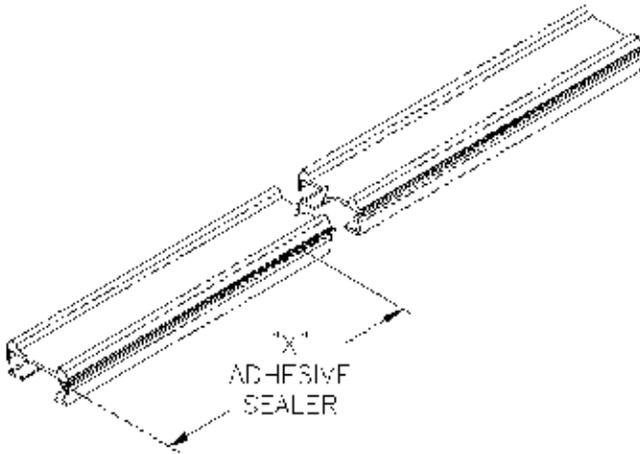


Figure 36

*POLYETHYLENE (BLUE) SEAL

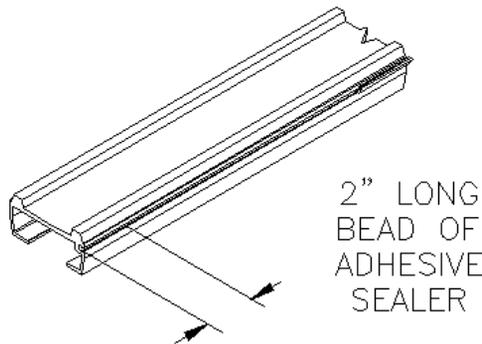


Figure 37

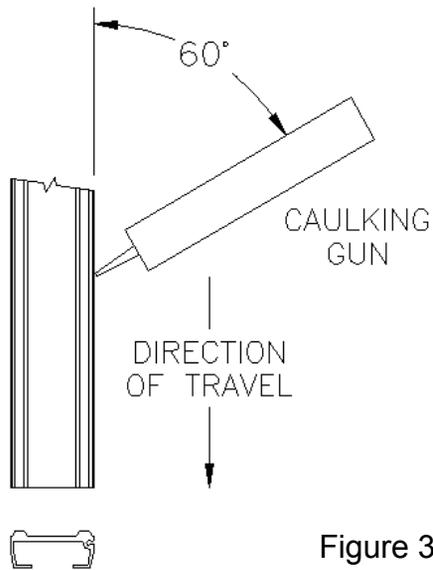


Figure 38

E. Pull the seal flush with the end of the slat. Install the anchor screw (Figure 39). Do not tighten the anchor screw too tightly. Allow the adhesive to dry before finishing the installation of the slat.

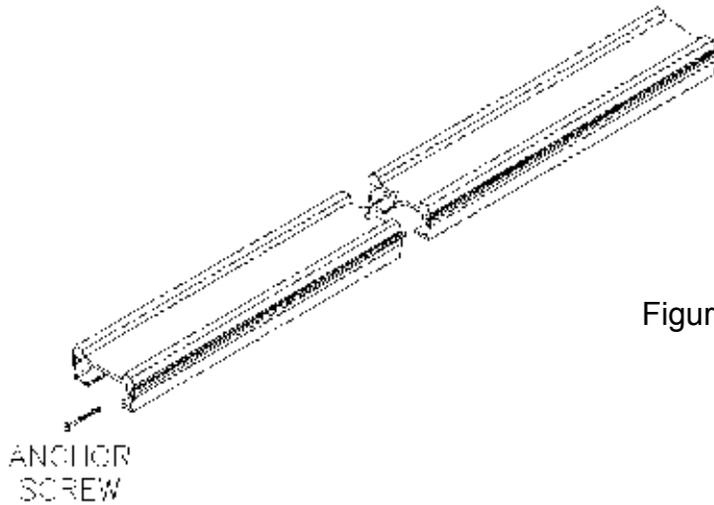
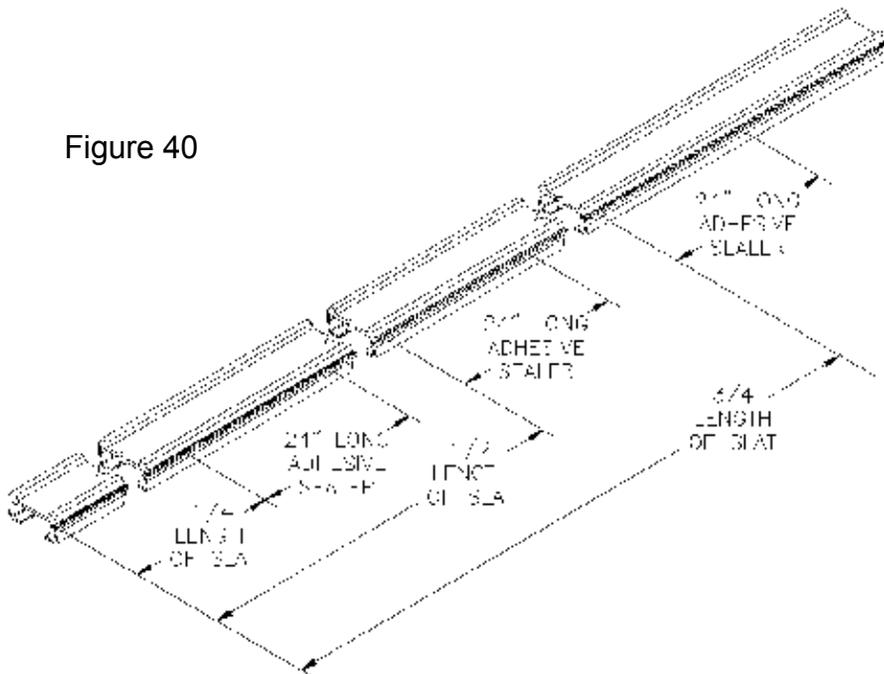


Figure 39

F. Apply three additional beads of adhesive. The additional beads of adhesive should be 24" long. The additional beads should be located at $\frac{1}{4}$ slat length, $\frac{1}{2}$ slat length, and $\frac{3}{4}$ slat length. The additional beads may be applied after the seal is installed (Figure 40).

Figure 40



The additional adhesive is recommended for saw dust and agricultural applications. The additional beads should be used on floor slats #2185, #2188, #2190, and #2203.

Complete steps “c”, “d”, and “e” on all the slats in the bundle. Repeat steps “d” and “e” to the opposite end of all of the floor slats.

When using a splash seal, install it in the T-slot in the same manner. The lip directs downward.

6. Install floor slats.

IMPORTANT: Cylinders must be in the very rear position to attach the floor slats to the right place on the cross-drives. Carefully tap them to this position with a dead blow hammer.

It is most convenient to snap the slats onto the bearings, although it is also possible to slide slats on from the end.

Start with the slat on the curbside of the trailer, keeping the ball seal to the curbside. When snapping, lay the floor slat on top of the bearings and knock it down with something heavy that does not damage the slat (Figure 41).

Make sure that the hold-down bearings are all locked into position and that all the ball seals are ‘standing’.

7. Mount floor slats onto shoes. (Figure 42).

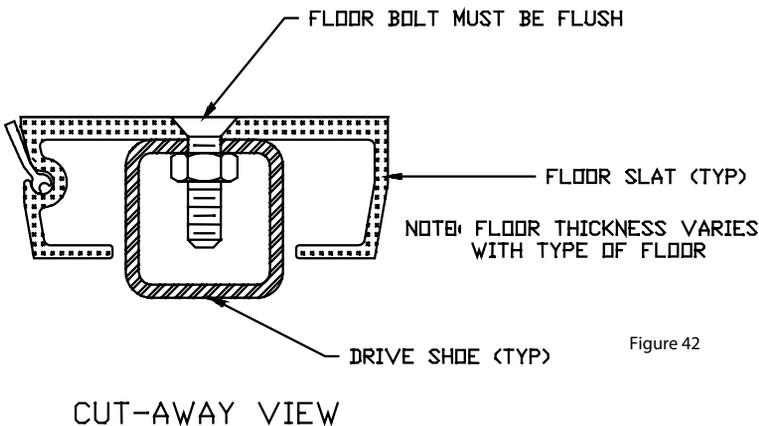


Figure 42

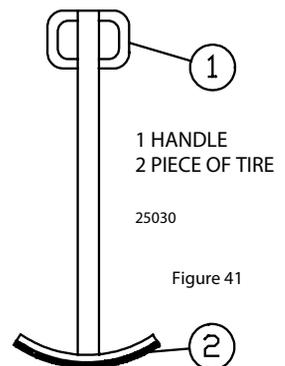


Figure 41

25021

- A. Align the rear end of all slats 1/2" from inside of doors and make sure that all cylinders are collapsed to the rear of the trailer.
- B. Drill holes in the slats from underneath through the drive shoes. (Some holes may need to be drilled from above if slats are over frame rails.)
- C. Countersink the holes so that the floor bolts are flush with the floor top.

IMPORTANT: Do not over-countersink. This will make a weak connection and cause the floor slat to come loose. Use extra caution when countersinking thin flooring. Do not countersink 6" wide slats. They need pre-countersunk bolt plates as shown in reference drawing A-25167.

- D. Bolt floor slats down tightly.
Use Countersunk Socket Head Cap Screws with Nylock nuts. 5/16" bolts attach 3 1/2" flooring to the shoes. 6" flooring requires 3/8" bolts. Recommended torque is shown in Appendix 5.

IMPORTANT: Correct torque on floor bolts is necessary for long floor life.

5.3 Side seal options

The side seal is a non-moving floor slat that fills the gap between the moving floor slats and the side walls. Several options are available. A seal is needed between the moving floor slats and the side seal, so some options require the use of one double seal slat.

1. Use Figure 43, Table 1, and Table 2 to select a feasible side seal option.
Side seal gap width ('B') is the distance measured from the outermost floor slat to the side wall. Allowing for the ball seal, deduct 0.15" to determine the actual width of the side seal.
2. Split slat if necessary.
Rip floor slat with a circular saw to fit side wall as closely as possible. This is another reason trailer alignment is critical. Make sure that the side with the seal groove goes to the left side of the trailer.
3. Bolt side seal onto support.
If hydraulic tubing will be mounted underneath the side seal, wait until the tubing is installed. Make bolts flush with the side seal. Run a silicone bead between the wall and side seal. If a wide gap exists between the side seal and the inside trailer wall, bridge the gap with flat bar or angle.

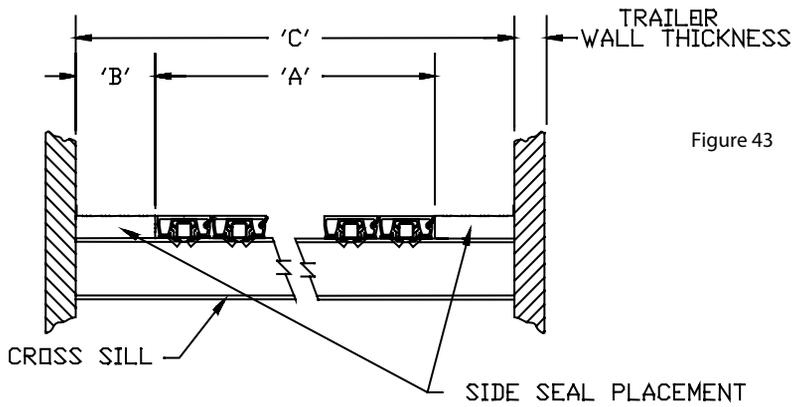
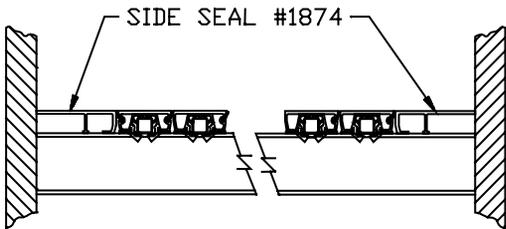


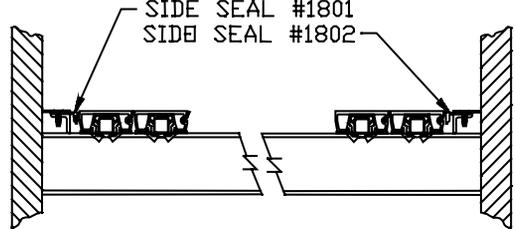
Figure 43

OPTION #1



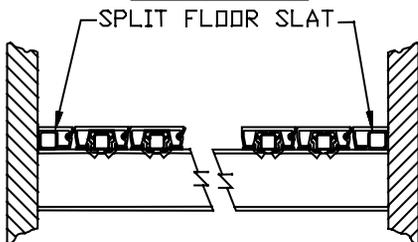
- USED WITH 7/32" & 3/8" FLOORING
- REQUIRES ONE DOUBLE SEAL SLAT

OPTION #2



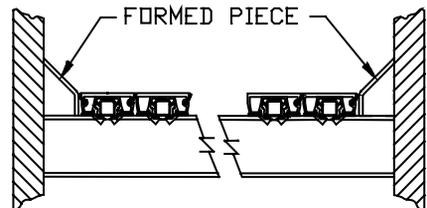
- USED WITH 1/8" AND 7/32" FLOORING

OPTION #3



- MAY REQUIRE SPLITTING OF TWO SLATS TO HAVE PROPER WIDTH
- 1-1/4" x 1-1/4" TUBE USED UNDER SLAT TO MAINTAIN PROPER HEIGHT

OPTION #4



- REQUIRES ONE DOUBLE SEAL SLAT

25036

Table 1
3 1/2" flooring

NUMBER OF MOVING SLATS	SIDE SEAL OPTION NUMBER	'A'	'B'		'C'	
			MIN	MAX	MIN	MAX
26	1	95.05	2.19	5.25	99.42	N/A
	2	95.05	1.25	1.75	97.55	98.55
	3	95.05	2.25	3.50	99.55	N/A
	4	95.05	1.00	5.25	97.05	N/A
25	1	91.40	2.19	5.25	95.77	101.90
	2	91.40	1.25	1.75	93.90	94.90
	3	91.40	2.25	3.50	95.90	98.40
	4	91.40	1.00	5.25	93.40	101.90
24	1	87.75	2.19	5.25	92.12	98.25
	2	87.75	1.25	1.75	90.25	91.25
	3	87.75	2.25	3.50	92.25	94.75
	4	87.75	1.00	5.25	89.75	98.25
23	1	84.10	2.19	5.25	88.47	94.60
	2	84.10	1.25	1.75	86.60	87.60
	3	84.10	2.25	3.50	88.60	91.10
	4	84.10	1.00	5.25	86.10	94.60
21	1	76.80	2.19	5.25	81.17	87.30
	2	76.80	1.25	1.75	79.30	80.30
	3	76.80	2.25	3.50	81.30	83.80
	4	76.80	1.00	5.25	78.60	87.30

Table 2
6" flooring

NUMBER OF MOVING SLATS	SIDE SEAL OPTION NUMBER	'A'	'B'		'C'	
			MIN	MAX	MIN	MAX
16	1	96.00	2.19	5.25	100.38	N/A
	2	96.00	1.25	1.75	98.50	99.50
	3	96.00	2.25	3.50	100.50	N/A
	4	96.00	1.00	5.25	98.00	N/A
15	1	90.00	2.19	5.25	94.38	100.50
	2	90.00	1.25	1.75	92.50	93.50
	3	90.00	2.25	3.50	89.90	97.00
	4	90.00	1.00	5.25	92.00	100.50
14	1	84.00	2.19	5.25	88.38	94.50
	2	84.00	1.25	1.75	86.50	87.50
	3	84.00	2.25	3.50	88.50	91.00
	4	84.00	1.00	5.25	86.00	94.50
13	1	78.00	2.19	5.25	82.38	88.50
	2	78.00	1.25	1.75	80.50	81.50
	3	78.00	2.25	3.50	82.50	85.00
	4	78.00	1.00	5.25	80.00	88.50
12	1	72.00	2.19	5.25	76.38	82.50
	2	72.00	1.25	1.75	74.50	75.50
	3	72.00	2.25	3.50	76.50	79.00
	4	72.00	1.00	5.25	74.00	82.50

5.4 Front shield

1. Determine dimensions (Figure 44).

The width is equal to the inner trailer width. The front shield is angled about 45 degrees. When the floor slats are in the rear position, the slide strip must still lie fully on top of the floor slats.

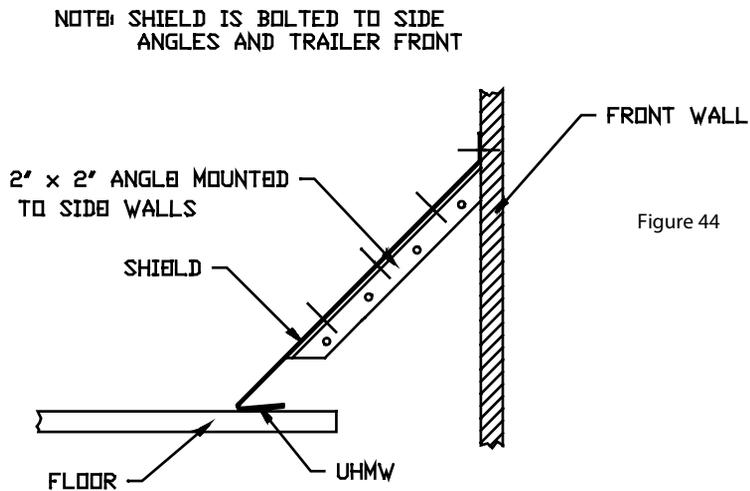
2. Fabricate front shield. (KEITH Mfg. Co. supplies this in most cases.)

Form the plate and attach angle steel for support. Rivet the plastic slide strip to the shield.

3. Mount front shield.

Screw the plate to the side of the trailer.

Provide clean-out holes below the slope sheet.



25027

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.

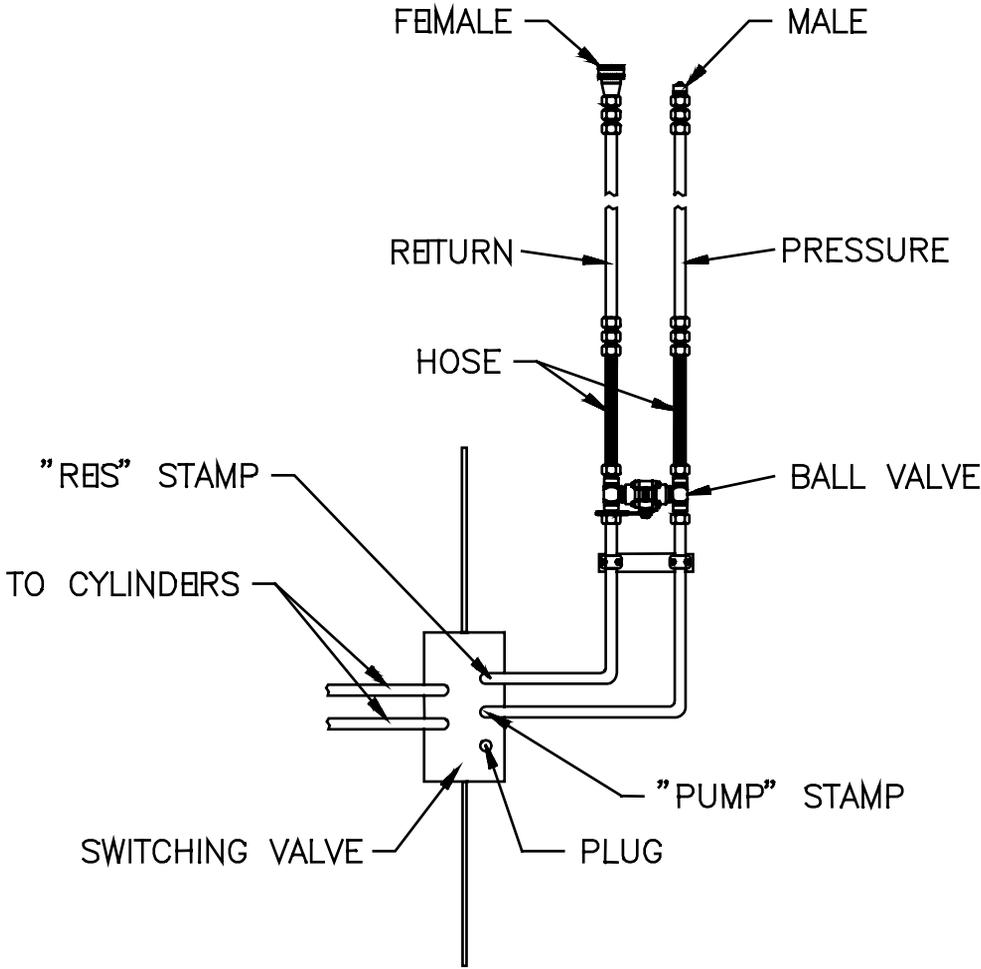
4. Mount quick couplers at front of trailer.

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 45). 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.

FRONT OF TRAILER



DRIVER'S SIDE

25044

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.

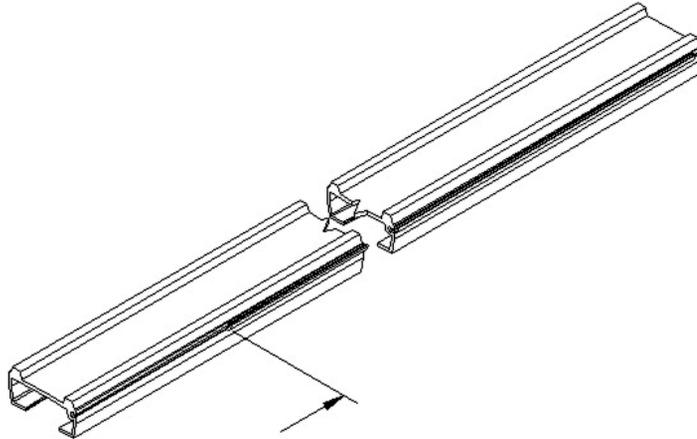
7.3 Front guard

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.

7.6 Trimming a floor slat (After seal is installed)

A. Cut the floor slat to the required length. Do not damage the floor seal. The rear wear strips and front filler strips must be replaced if removed by shortening the floor slat. If there are wear strips or filler strips installed on the slat, it is recommended to cut off the opposite end.

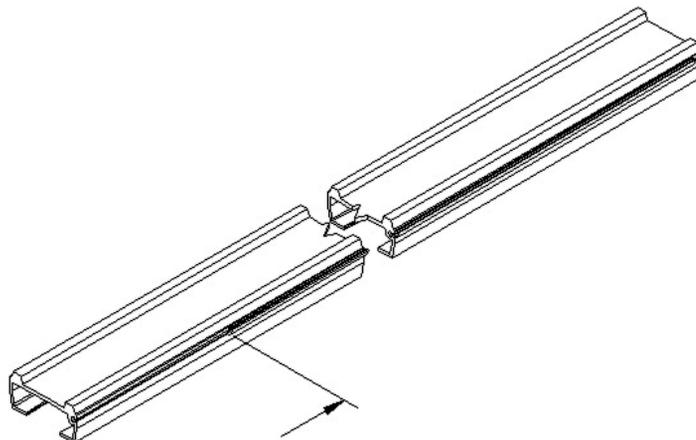
B. Slide the loose end of the floor seal away from the end of the slat as far as possible (Figure 46).



PUSH THE FLOOR SEAL
AWAY FROM THE END
OF THE FLOOR SLAT

Figure 46

C. Inspect the ends of the floor slat. De-burr the seal groove. Chamfer the outside edge of the floor slat opposite the seal groove (Figure 47).



PUSH THE FLOOR SEAL
AWAY FROM THE END
OF THE FLOOR SLAT

Figure 46

D. Weld on wear strips or filler strips. Shield the floor seal from weld splatter. Use a heat sink to prevent damage to the floor seal.

E. Apply a 1/8" diameter bead of SikaFlex 221 adhesive sealer into the exposed seal groove. The bead should be from the end of the seal to the end of the slat. Hold the caulking gun at a 60° angle to the floor slat. Push the bead, do not pull (Figure 48).

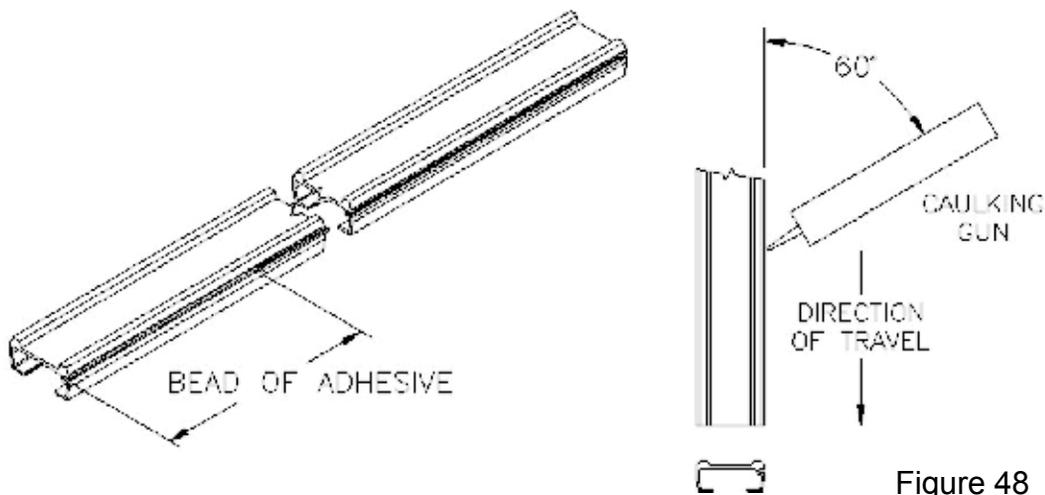


Figure 48

F. Pull the seal flush with the end of the slat. Apply adhesive to the anchor screw. Install the anchor screw (Figure 49). Do not tighten the anchor screw too tightly. Allow the adhesive to dry before installing the slat.

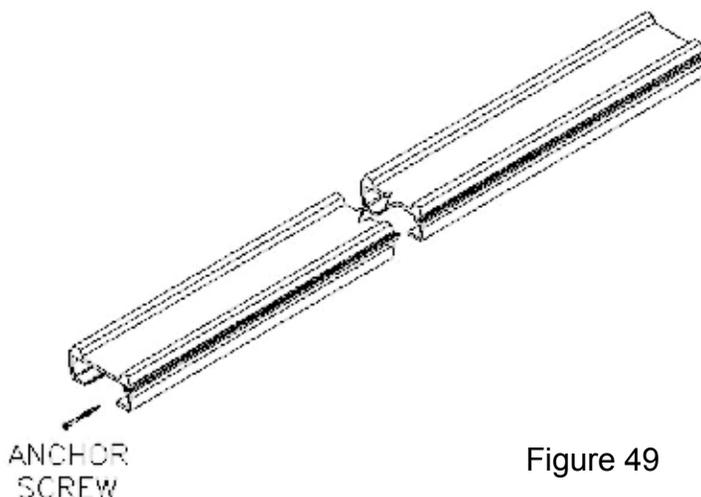


Figure 49

G. A 24" long bead of adhesive sealer is required between the seal and the floor slat (Figure 50). Pull the seal outward to apply the adhesive. Press the seal against the floor slat after applying the adhesive. Allow the adhesive to dry before installing the floor slat.

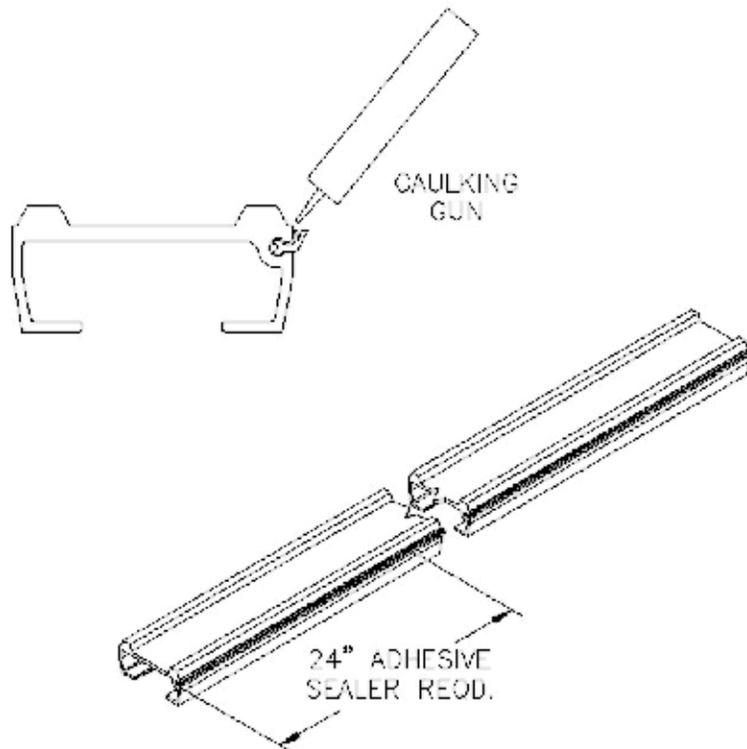


Figure 50

APPENDIX 1

TOOLS

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
- Countersink bit, 82° with 1/2" shank, 3/4" single flute
- Torque wrench up to 50 ft-lbs
- Torque wrench up to 180 ft-lbs
- Mig welder (wire welder)
- Rivet gun
- overhead crane (hoist or forklift)
- Circular saw
- Cutting torch
- Floor slat stomper

Optional tools

- Knee pads
- Band saw

Miscellaneous

- Hydraulic sealant
- Paint

APPENDIX 2 MATERIALS

Standard kit

- Drive unit
- Floor slats
- Slide strips (NOT with T-blocks or slat plugs)
- Ball seal
- 1 1/2" screws (for ball seal)
- Slide bearings
- Hold down bearings
- Floor bolts, Nylock nuts
- Slide strip (for self-fabrication of front shield)
- Caution decals

NOT provided with standard kit

- Sub-decking (1" x 1" steel tubing / aluminum profile)
- 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)
- Steel profile (side seal support)
- Front shield

Options

- Splash seal
- Aluminum wear strips
- Tube clamps
- Plastic T-blocks
- Tubing end caps
- Floor slat plugs
- Rubber grommets
- 1" I.D. PVC pipe

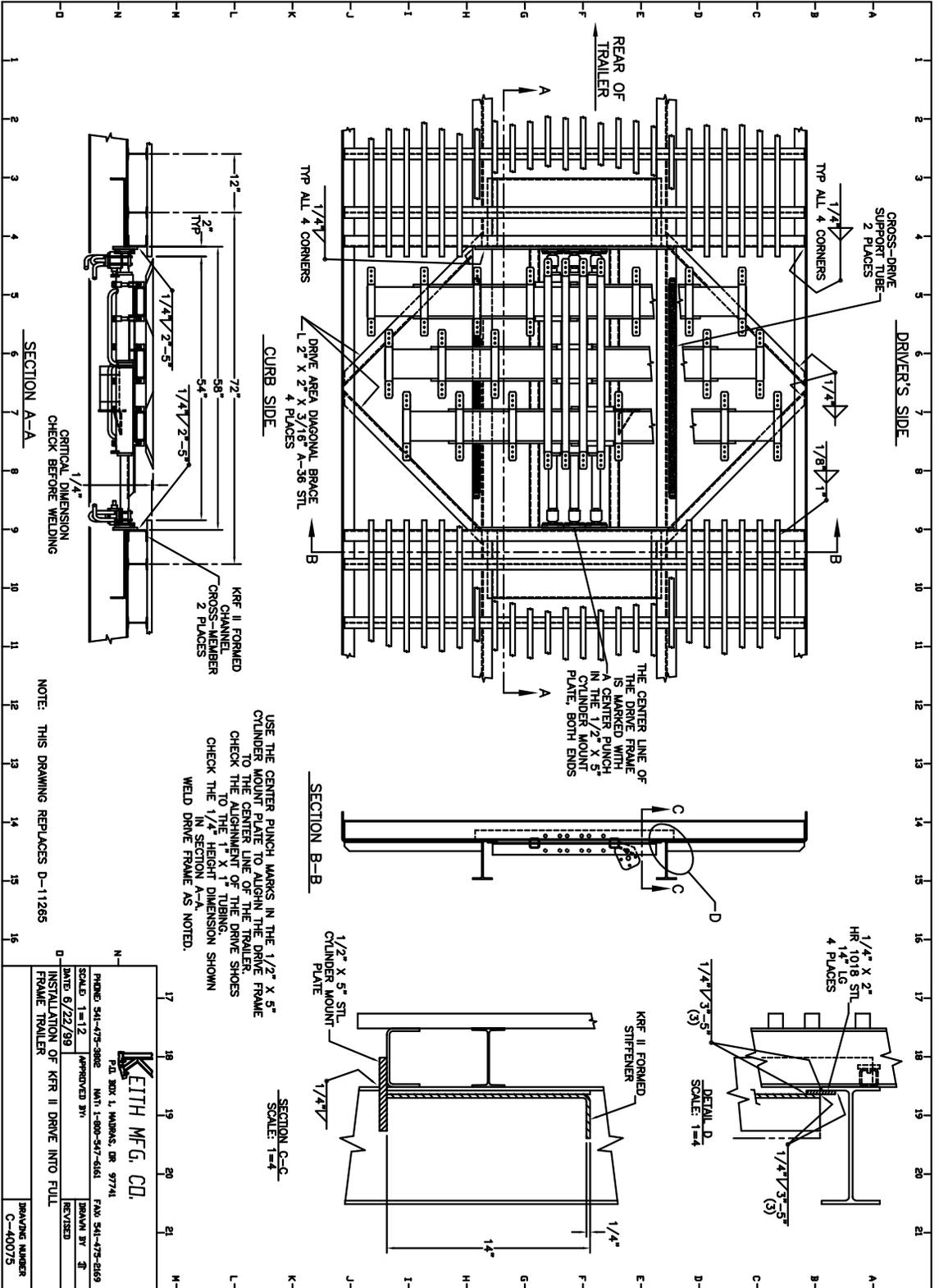
APPENDIX 3

REFERENCE DRAWINGS

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
- A-25167 Application of a counter-sunk bolt plate at drive shoe for flooring at 6" centers.
- D-50625 Installation detail for drive-in wear bearing.
- B-10730C Installation detail for baffle plate at rear door.
- B-10706A Installation detail for front shield.



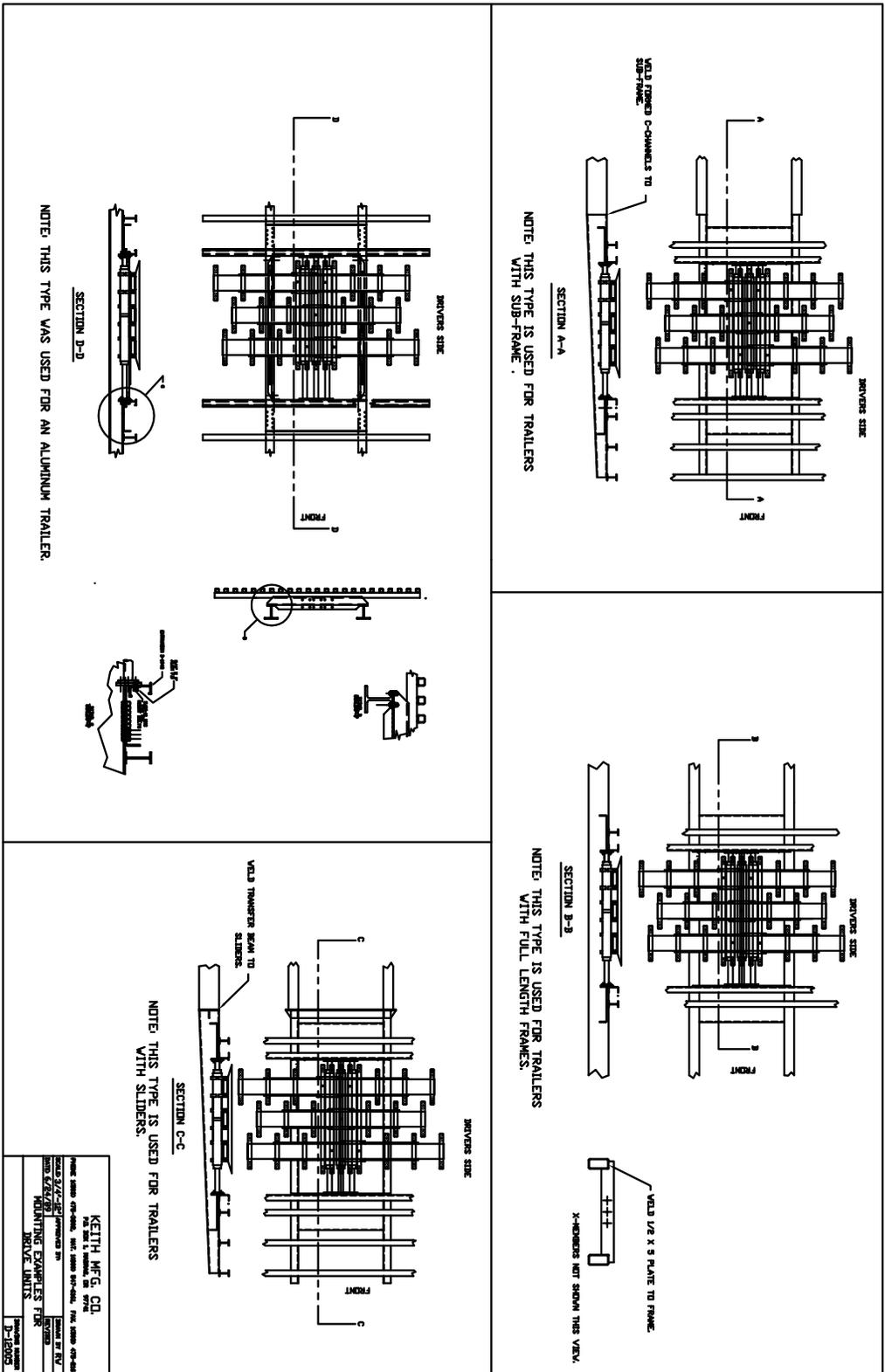
SECTION A-A

CRITICAL DIMENSION CHECK BEFORE WELDING

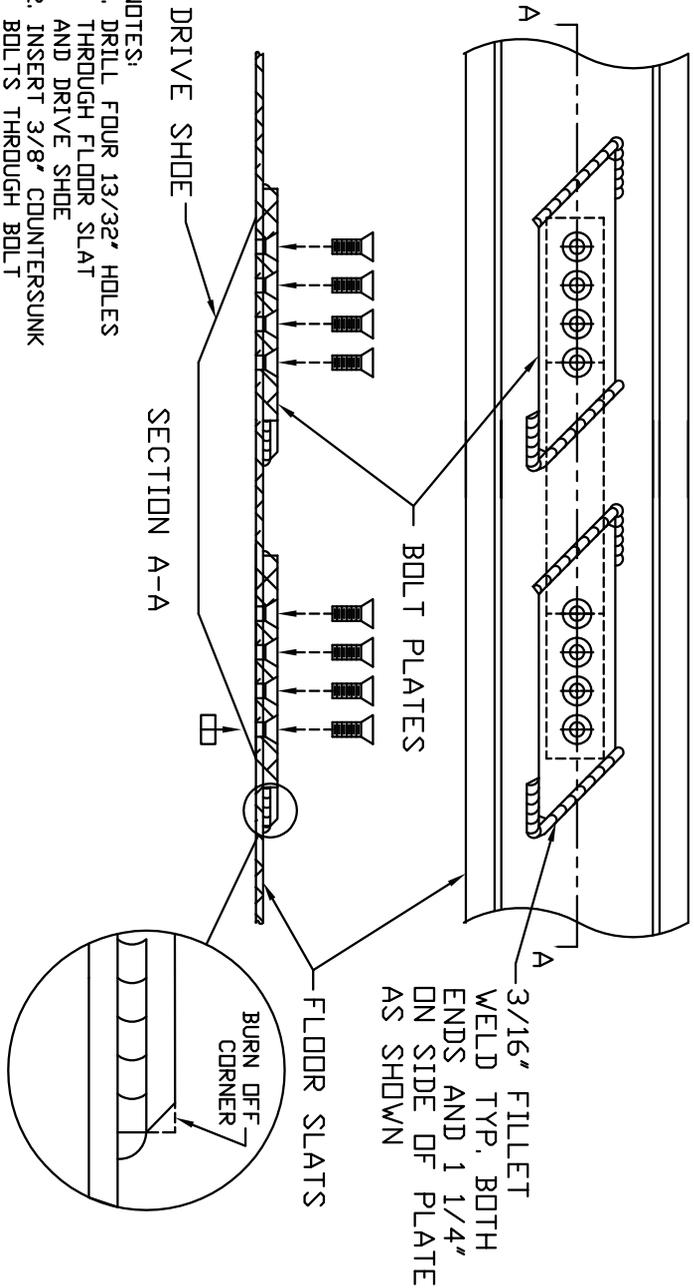
NOTE: THIS DRAWING REPLACES D-11285

DATE 6/22/99	REVISED
INSTALLATION OF KFR II DRIVE INTO FULL FRAME TRAILER	
SCALE 1=1/2	DRAWN BY JT
PHONE 541-475-2002	APPROVED BY
FAX 541-475-2169	
MAIL 1-800-547-6161	
RD. BOX 1, WADSWORTH, OR 97141	
KEITH MFG. CO.	
REV. 1	

ISSUING NUMBER C-40075

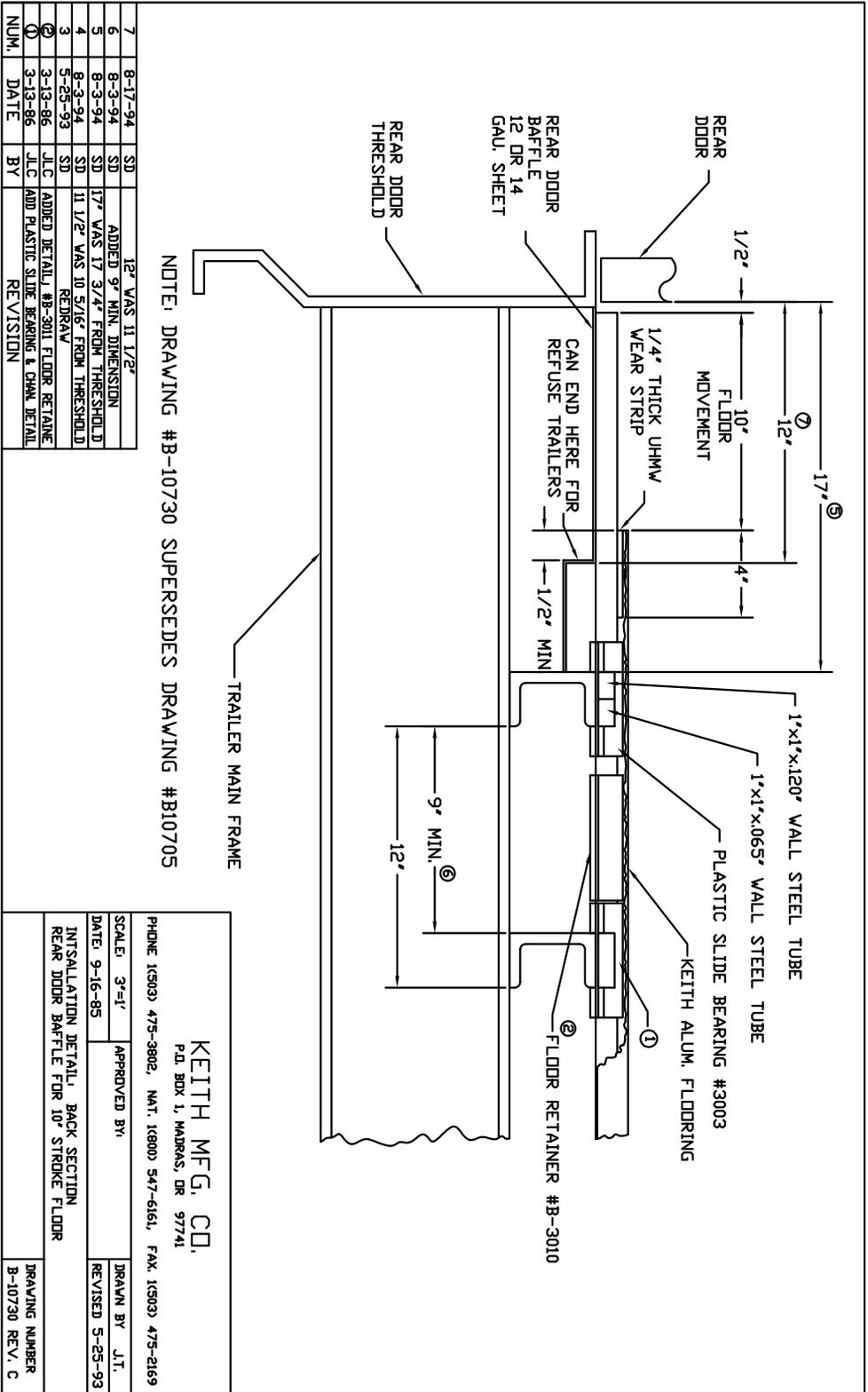


USE ON ALL 6" FLOORING

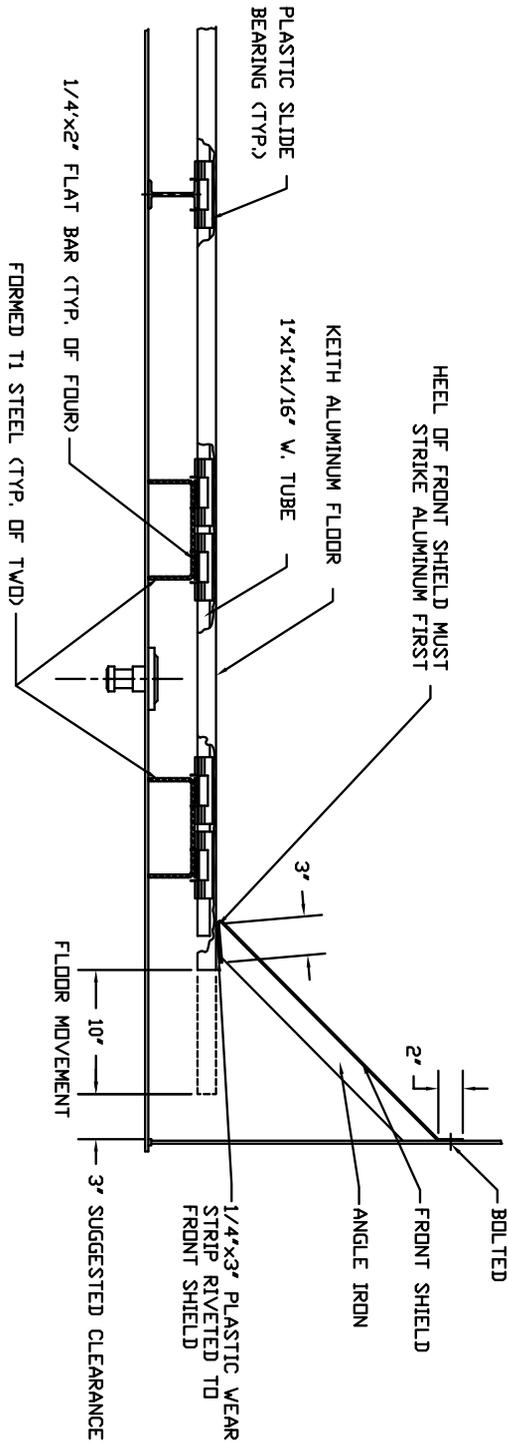


- NOTES:
1. DRILL FOUR 13/32" HOLES THROUGH FLOOR SLAT AND DRIVE SHOE
 2. INSERT 3/8" COUNTERSUNK BOLTS THROUGH BOLT PLATE, FLOOR SLAT, AND DRIVE SHOE
 3. TORQUE COUNTERSUNK BOLTS 45 FT-LBS
 4. WELD BOLT PLATES IN PLACE WITH 3/16" FILLETS AND BURN OFF SHARP CORNERS AS SHOWN IN ENLARGED VIEW (ENLARGED VIEW IS NOT SECTIONED)
 5. DO NOT COUNTERSINK FLOOR SLATS

REV.	BY	DESCRIPTION	DATE
<p>KEITH MFG. CO. P.O. BOX 1, MADRAS, OR 97741</p>			
SCALE: 1"=1/4"		APPROVED BY:	DRAWN BY: JLT
DATE: 7-20-93		REVISED	
PRE-COUNTERSUNK BOLT PLATE			
INSTALLATION INSTRUCTIONS			
DRAWING NUMBER			A-25167



10" FLOOR MOVEMENT



NOTE: FORMED T1 STEEL MUST BE 1/4" LOWER THAN I BEAMS

2	8-19-94	SD	REMOVED TURNBUCKLE
1	6-22-93	SD	REDRAW
NUM.	DATE	BY	REVISION

KEITH MFG. CO.
 P.O. BOX 1, MADRAS, OR 97741
 PHONE 1(503) 475-3802, NAT. 1(800) 547-6161, FAX 1(503) 475-2169

SCALE: NA APPROVED BY: DRAWN BY DAVE
 DATE: 6-11-85 REVISED

INSTALLATION DETAIL - FRONT SECTION
 (10" FLOOR MOVEMENT)

DRAWING NUMBER
 B-10706A

APPENDIX 4 CHECK LIST

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 1" x 1" tubing must be centered in the trailer.
5. The drive unit must be properly aligned.
 - A. The top of the drive shoes must be 1/4" higher than the top of the 1" x 1" tubing.
 - B. The drive shoes must align with respective 1" x 1" tubes.
6. The cylinders must be entirely collapsed before drilling boltholes through floor slats.
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 slide 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.

**APPENDIX 5
TORQUE CHART**

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
5/16-18	Flooring	8	24
3/8-16	Flooring	8	45
5/8-11	Barrel Clamp	5	125
5/8-11	Drive End Plate	5	125