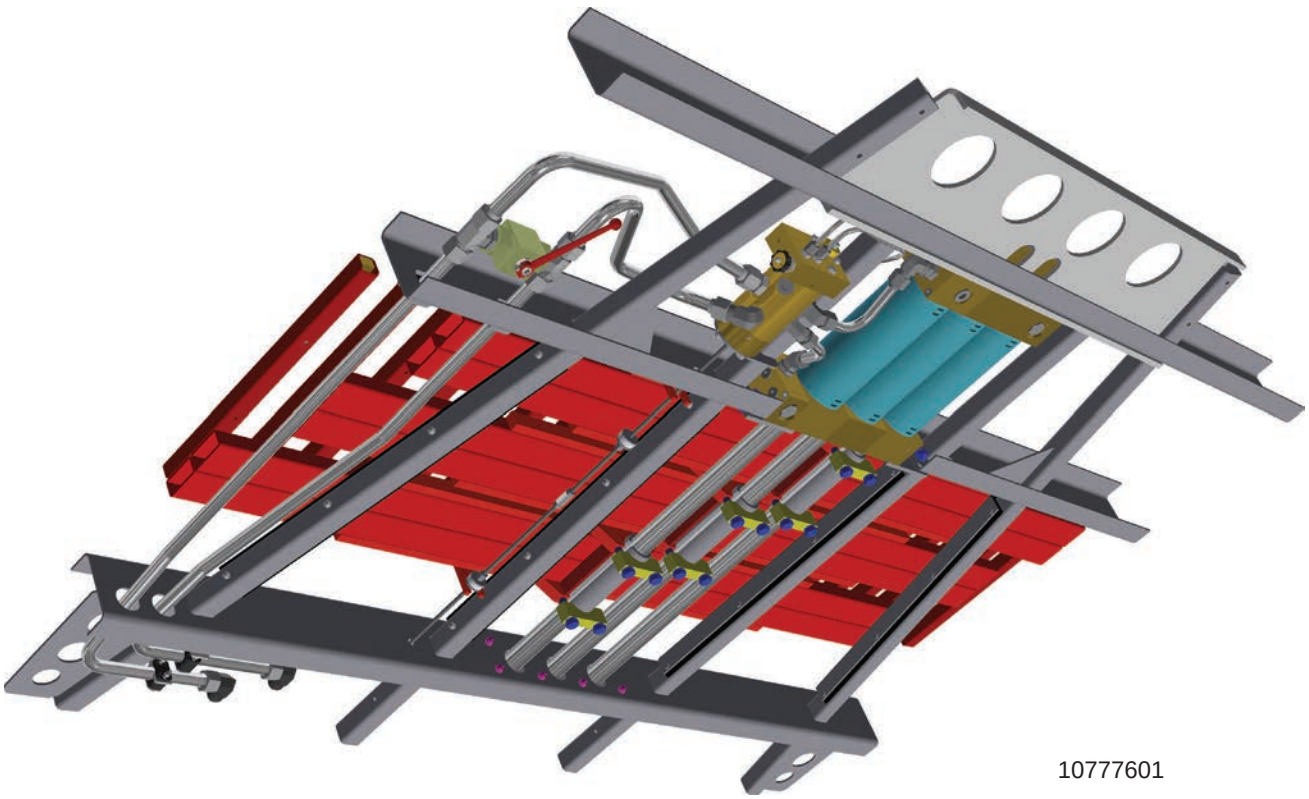
KEITH
WALKING FLOOR India

KICD - Container Drive

KEITH Manufacturing Co.
www.KeithWalkingFloor.com
World Headquarters
Toll-Free: 800-547-6161
Phone: +1-541-475-3802

Europe Headquarters
Phone: +31-342-422007



10777601

INSTALLATION MANUAL

Original Instructions

Released: 2017-08-30

DOC06452 Rev. A

Table of Contents

Contact Information - KEITH Manufacturing Co.

World Headquarters - USA
401 NW Adler St.
P.O. Box 1
Madras, OR 97741
Toll-Free: 800-547-6161
Phone: +1-541-475-3802
Email: Sales@KeithWalkingFloor.com

Europe Headquarters
Barneveld, The Netherlands
Phone: +31-342-422007
Email: EuroSales@KeithWalkingFloor.com

Canada
Brantford, ON
Phone: +1-519-756-9178
Email: CanadaSales@KeithWalkingFloor.com

México
Guadalajara, Jal.
Phone: +52-333-616-5079
Email: KMC_Mexico@KeithWalkingFloor.com

Australia
Waverley Gardens, VIC
Phone: +61-3-9562-2190
Email: AUSales@KeithWalkingFloor.com

1.0 Introduction

This manual explains procedures for installing the KEITH® KICD - Container Drive unloading system. Many variables affect the installation, but the general process remains constant. Details of the installation vary according to container features, slat 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 150 mm [6 in] stroke system with SAE flooring.

Installation time varies and is between 35 hours and 100 hours, depending upon the experience of the installer and the adaptability of the container. 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. The KEITH® KICD - Container Drive owner's manual contains more detailed information about the system and operation procedures.

WARNING: Installing the *WALKING FLOOR*® system will require some alterations to your container.

Direct any questions to KEITH Manufacturing Co. or one of our international offices listed in this manual.

IMPORTANT: When you perform welding on the system, the part on which welding is performed must be directly connected to earth (properly grounded.)

2.0 Container Preparations

The container requires preparation before the system is installed. Planning ahead for the *WALKING FLOOR*® installation requirements saves significant preparation time,

2.1 Container Alignment

Check the compatibility of the drive unit with the container before making any alterations to the container.

1. Adjust the container to meet these conditions:

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

    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 3 mm [1/8 in], make corrections.

2.2 Bracing

Container bracing prevents warping.

1. Install bracing as shown in Figure 1.
    - It is best to add bracing before removing the old floor because the floor keeps the container straight. If flat bar is used, make a cross-bracing because it will buckle easily under compression. The bracing reaches to the drive opening. Weld or bolt the braces to each intersecting cross-member.
2. Weld temporary bracing onto the outside of the side rails to keep the drive opening straight. This is very important if the top of the container was cut out first. Remove after completion.
3. Remove old flooring.

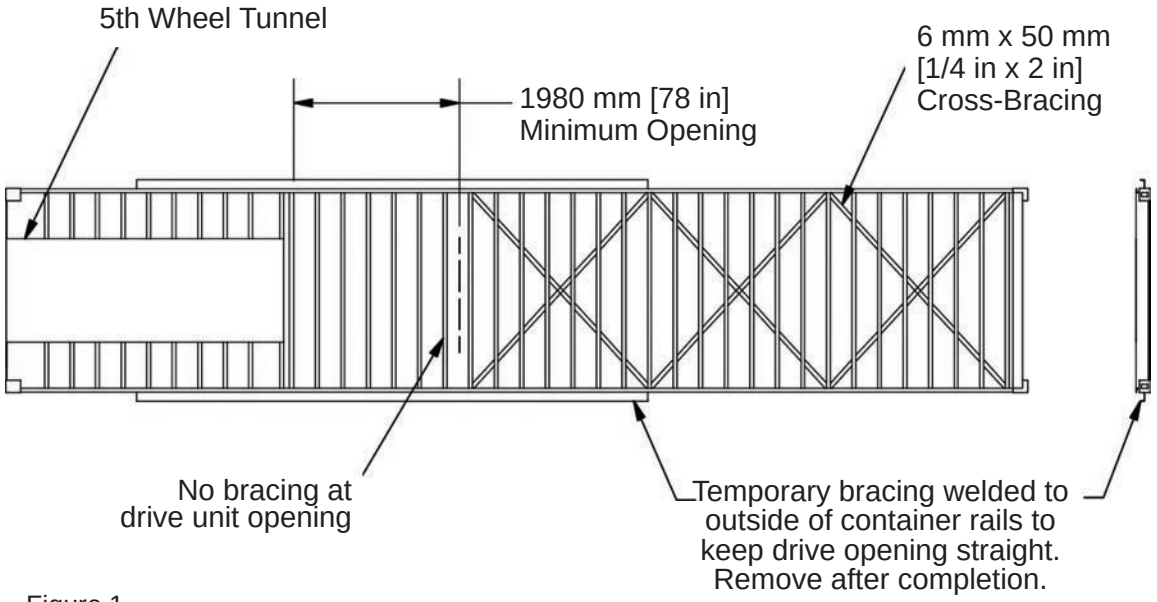


Figure 1

2.3 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.

The location of the hydraulic tubing cut holes are shown so that the tubing will line up with the drive plumbing. Section 4.4 provides more information on this subject. A central location is preferable for the quick-couplers in front of the container. This keeps hose lengths down, if they stay connected while driving.

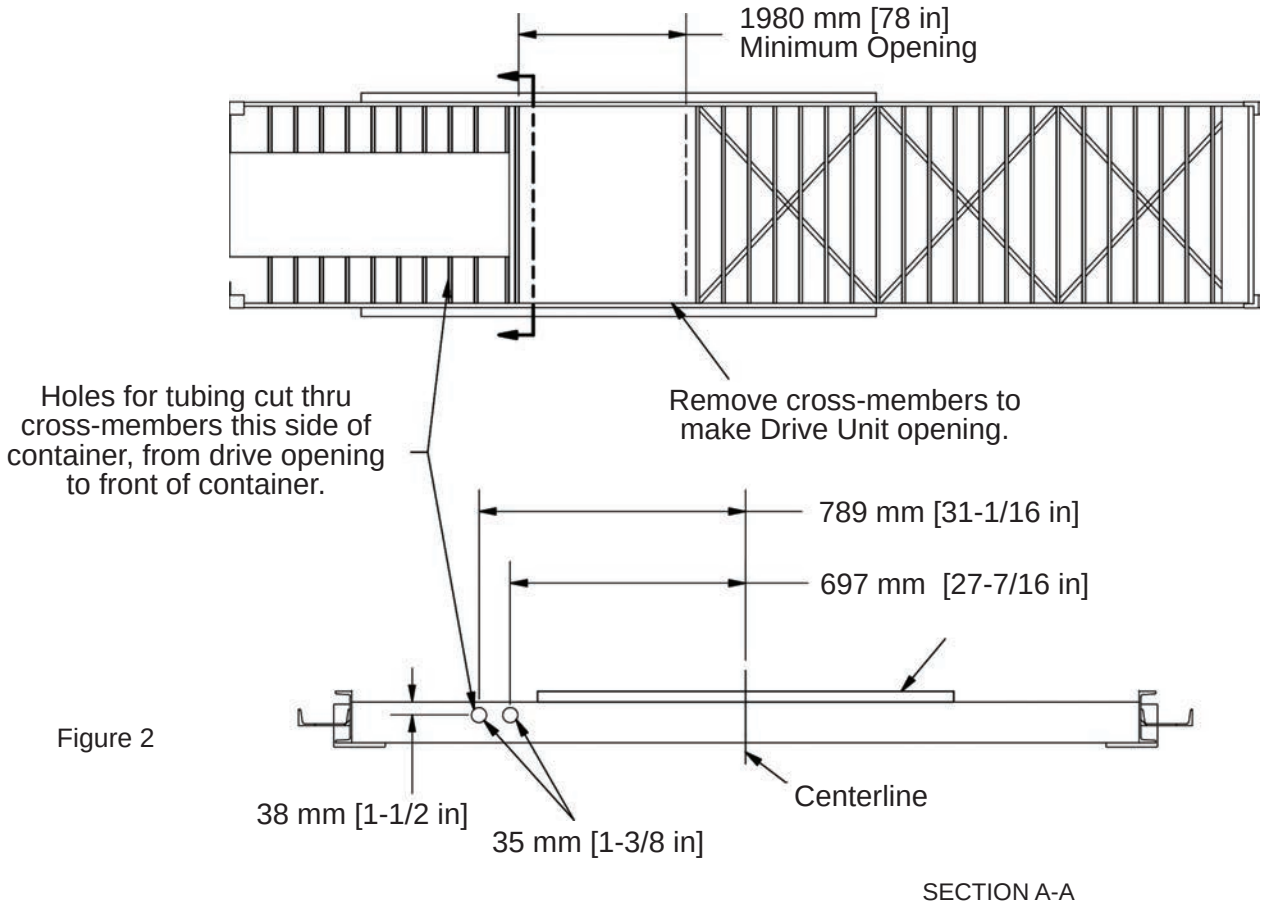


Figure 2

2.4 Cross-Members

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

After removing the flooring, the cross-members need to be shimmed. See section 2.5.

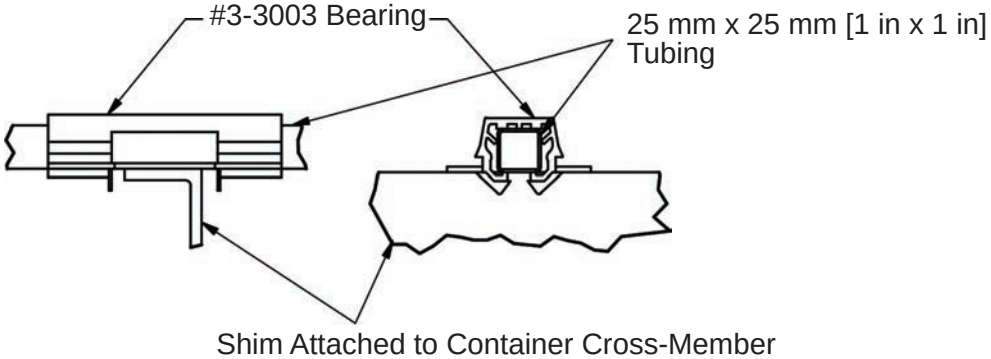


Figure 3

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

Opening between channel at rear of tunnel to cross member.

Side view in container (Figure 4)

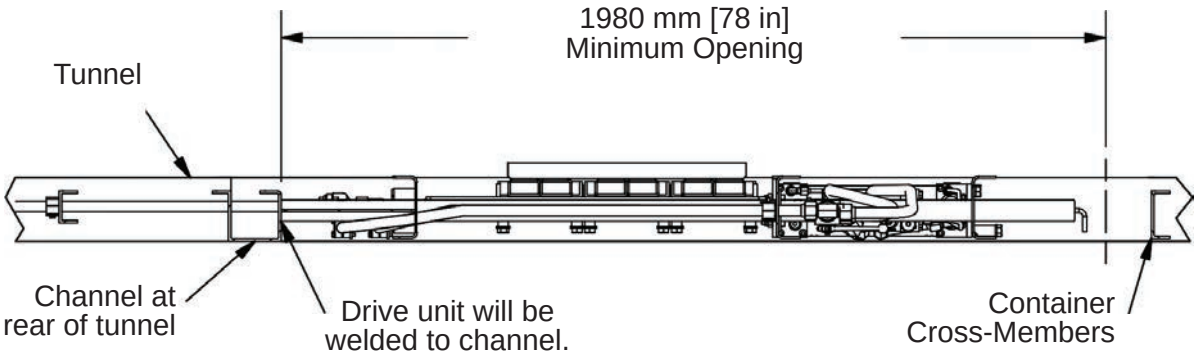
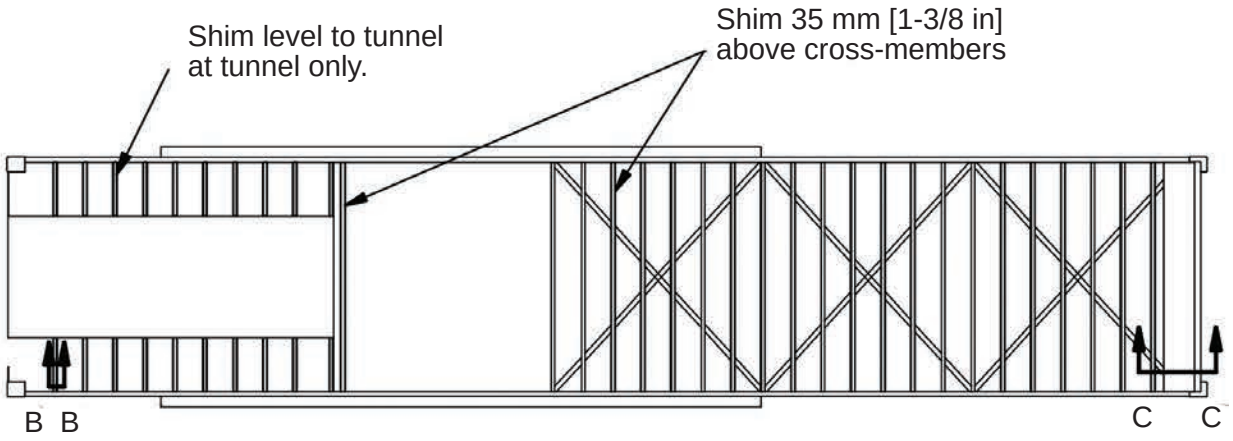


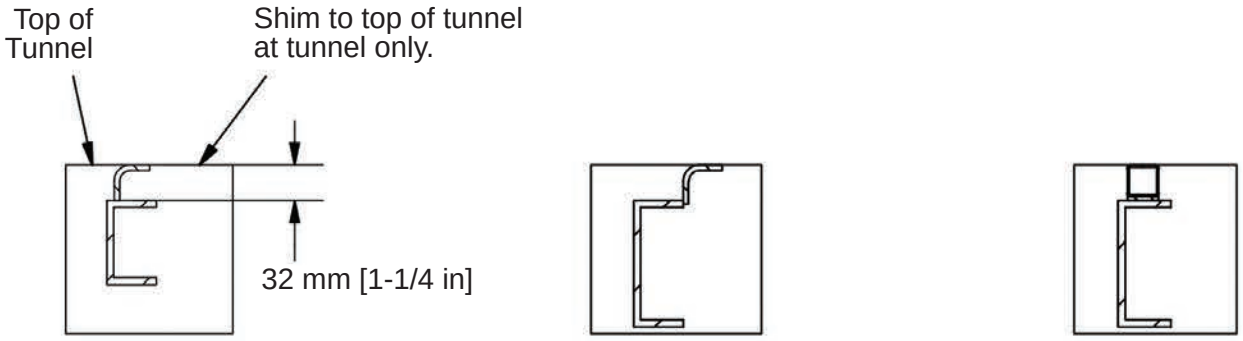
Figure 4

2.5 Shimming

1. The cross-members attached to the tunnel to the side rail need to be shimmed to the same height as the tunnel 32 mm [1-1/4 in]. See Section B-B.
2. The *WALKING FLOOR*® system takes 150 mm [5-7/8 in] clearance from the bottom of cross-members to the bottom of the sub-deck 25 mm x 25 mm [1 in x 1 in] tubing. The cross-members need to be shimmed 35 mm [1-3/8 in] higher from the rear of the tunnel to the front of the rear threshold. See Section C-C.
3. The tunnel area needs further shimming. Use 50 mm [2 in] wide flat bar the full width of the container. Starting at the front cross-member, place 8 mm [5/16 in] thick flat bar on the first 5 cross-members. On cross-members #6 and #7, place 6 mm [1/4 in] flat bar. On cross-members #8 and #9, place 5 mm [3/16 in] flat bar. On cross-member #10, place 3 mm [1/8 in] flat bar. Clamp and weld in place. (Figure 6, Section D-D)



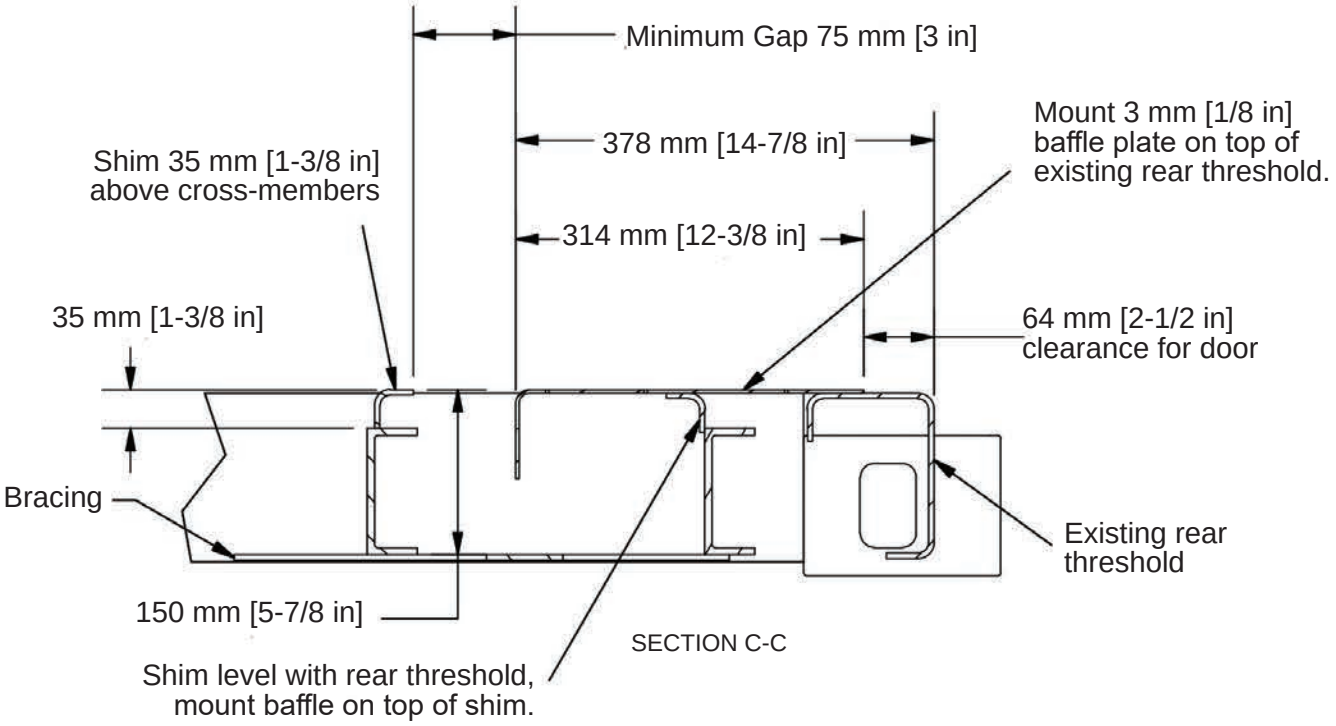
Shimming the Cross-Members & Rear Baffle Plate



SECTION B-B

Different examples of Shimming
on top of Cross-Members

Figure 5



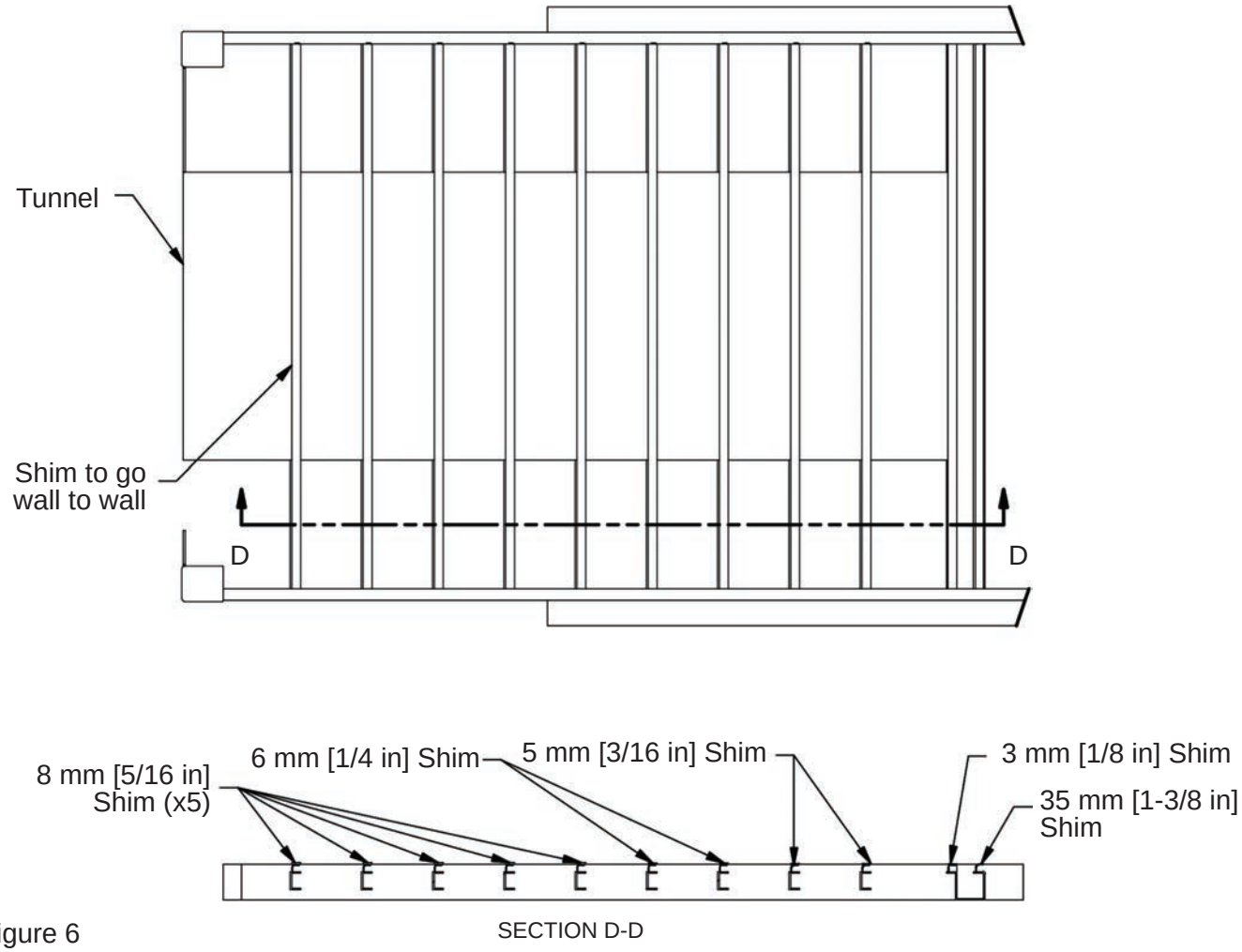


Figure 6

2.6 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.

Starting 65 mm [2-1/2 in] from unload end of threshold, leaving clearance for the door, use 3 mm [1/8 in] thick material to achieve the 150 mm [5-7/8 in] from the bottom of cross-members to top of the baffle plate. Come forward 315 mm [12-3/8 in] then down 100 mm [4 in] and weld 100%. Grind welds flat. See previous page, section C-C.

3.0 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 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. Raise the drive unit into position. Do not weld at this time. The drive unit is in place for locating the end of 25 mm x 25 mm [1 in x 1 in] tubing.

1. Cut 25 mm x 25 mm [1 in x 1 in] tubes to proper length according to your container measurements. The number of tubes installed equals the number of floor slats.

   All sub-deck tubes must extend beyond cross-members by 50 mm [2 in], because bearings require at least 50 mm [2 in] of tubing on both sides of a cross-member for proper attachment. See details on the next page F, G & H.

2. Position and mount the tubes.

   Tubing for SAE flooring is on 92.7 mm [3.65 in] centers (Figure 7).

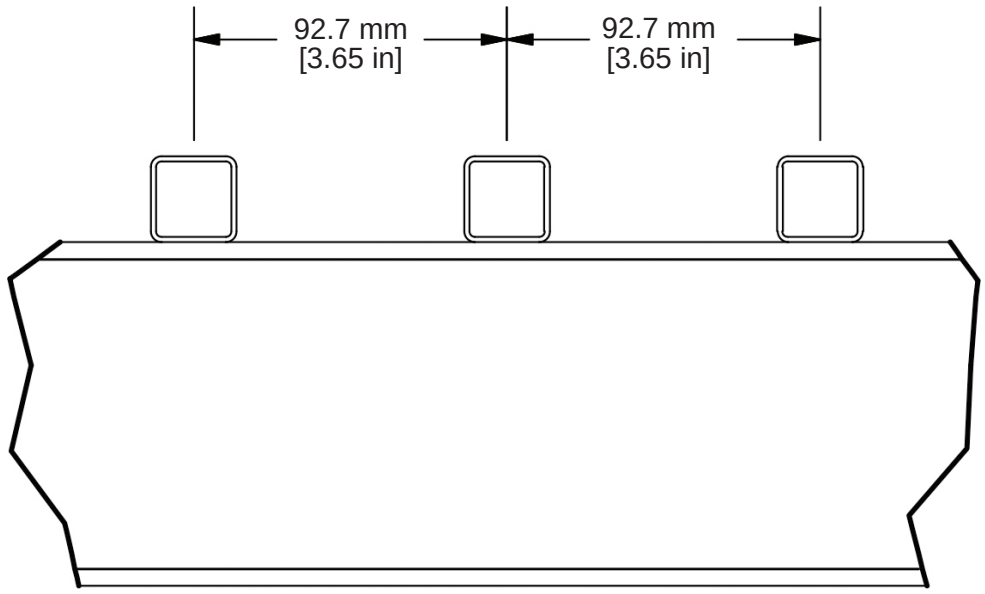
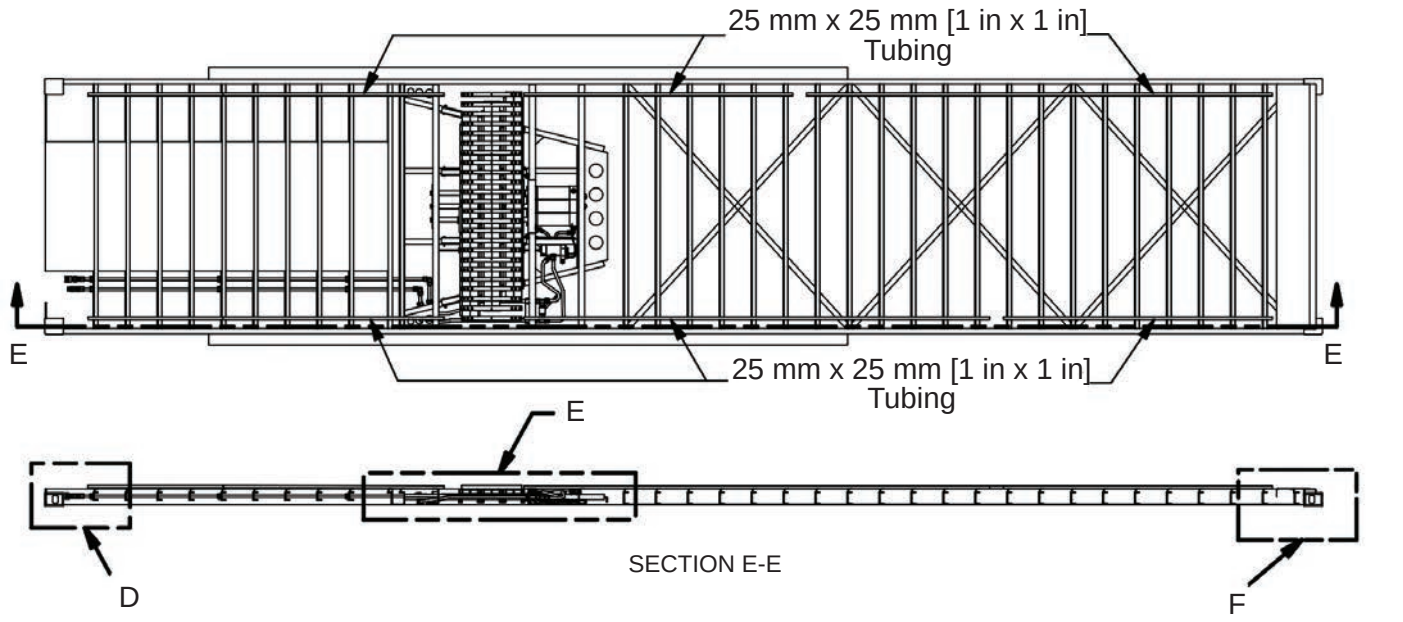
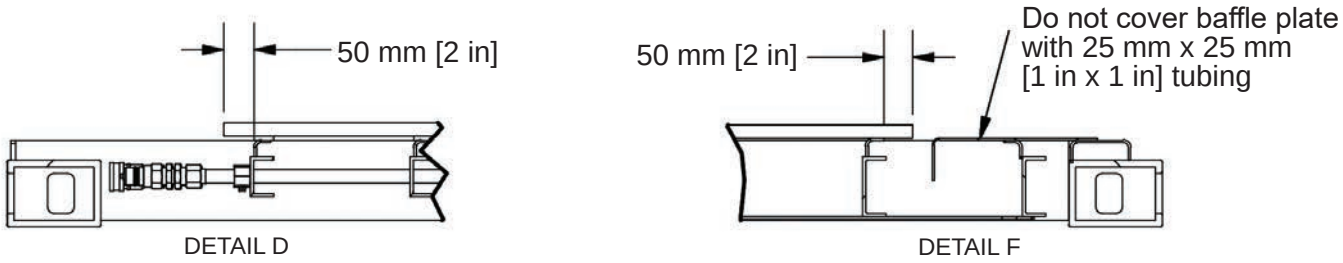


Figure 7

Start at the rear of the container. Lay the two outside tubes in the container and separate them with spacing jigs. Center the jigs so the tubes are the same distance from the side walls and then weld in place. (See Figure 8)


25 mm x 25 mm [1 in x 1 in]
Tubing
E
E
25 mm x 25 mm [1 in x 1 in]
Tubing
E
SECTION E-E
D
F


50 mm [2 in]
DETAIL D
50 mm [2 in]
Do not cover baffle plate
with 25 mm x 25 mm
[1 in x 1 in] tubing
DETAIL F

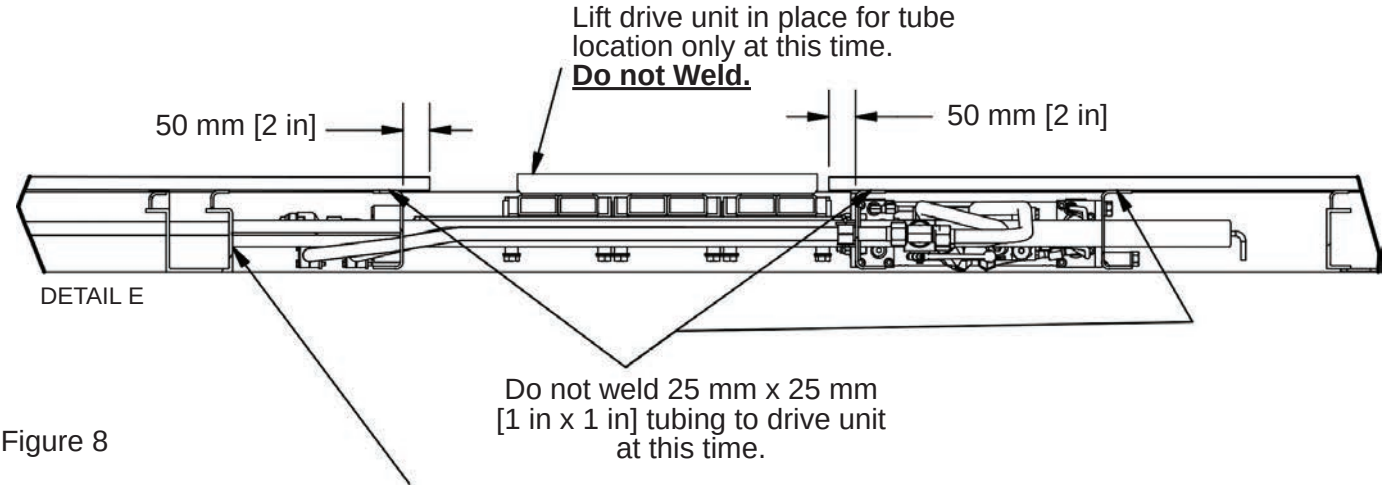

Lift drive unit in place for tube
location only at this time.
Do not Weld.
50 mm [2 in]
50 mm [2 in]
DETAIL E
Do not weld 25 mm x 25 mm
[1 in x 1 in] tubing to drive unit
at this time.
Drive unit to be placed against
rear tunnel channel.

Figure 8

Lay out the remaining tubes across the width of the container, 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 50 mm [2 in]. 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 (Previous page, Figure 8).

Weld or huck bolt the square tubes to the shim that is attached to the cross members between jigs. Move the jigs and make a connection at each intersection of a tube and a cross-member. Welds should be 3 mm [1/8 in] fillet, 20 mm to 30 mm [3/4 in to 1-1/8 in] long, and centered on the flange. Excessive welding and too little cooling will cause cross-members to warp. Figure 10 suggests a welding pattern. Starting each pass on the same side of the container gives sufficient cooling time.

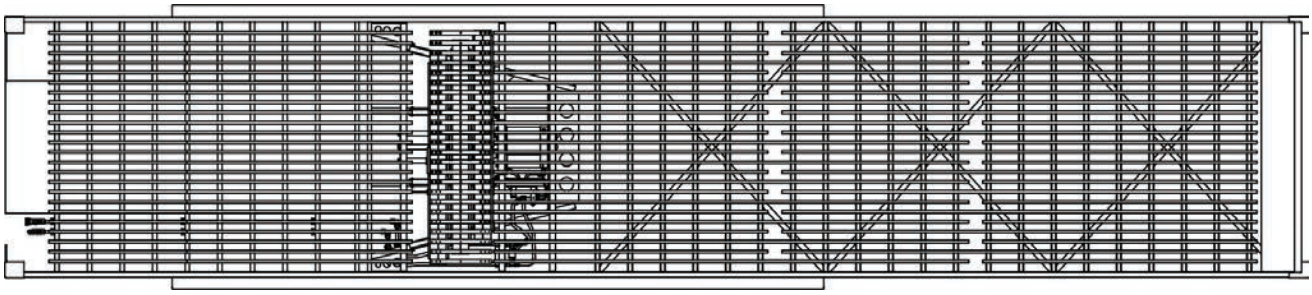


Figure 9

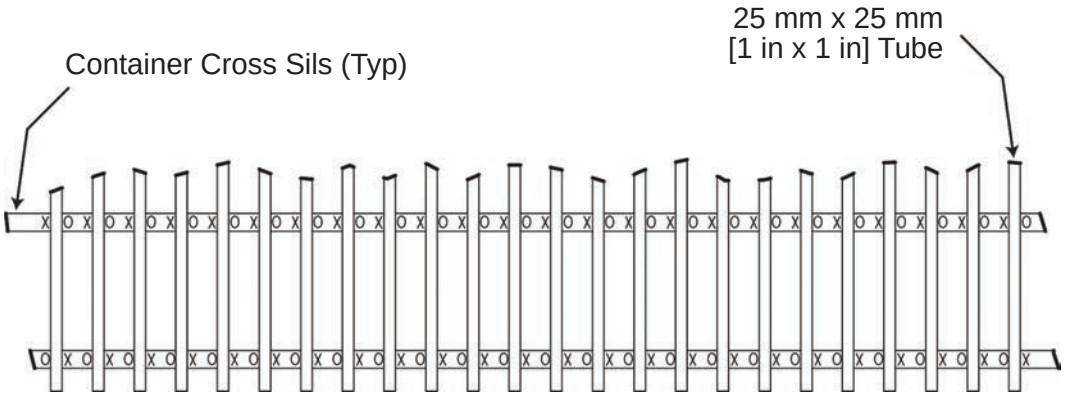


Figure 10

X= Weld First Pass
O= Weld Second Pass

4.0 Drive Unit

NOTE: A minimum drive opening of 1980 mm [78 in] is necessary to maneuver the drive unit. (See Page 4, Figure 4)

IMPORTANT: Do not damage piston rods. Do not lift drive unit by any of the hydraulic components.

Align and level drive unit.

Drive unit is butted against channel at rear of fifth-wheel tunnel. (See detail E) Center the drive unit in the drive gap. The 25 mm x 25 mm [1 in x 1 in] tubing should extend 50 mm [2 in] past the formed cross sills at each end of the drive unit. The cross-drive should be parallel to container cross-members.

Side to Side Alignment

Recommended method:

After the sub-deck is welded or bolted down, (to container, not drive unit) use a straight edge to align the drive shoes with respective 25 mm x 25 mm [1 in x 1 in] tubing. Do this with at least two shoes on each side of the container (Figure 11).

Optional method if container is perfectly straight:

Align the drive unit's "centerline" marks with the container's centerline.

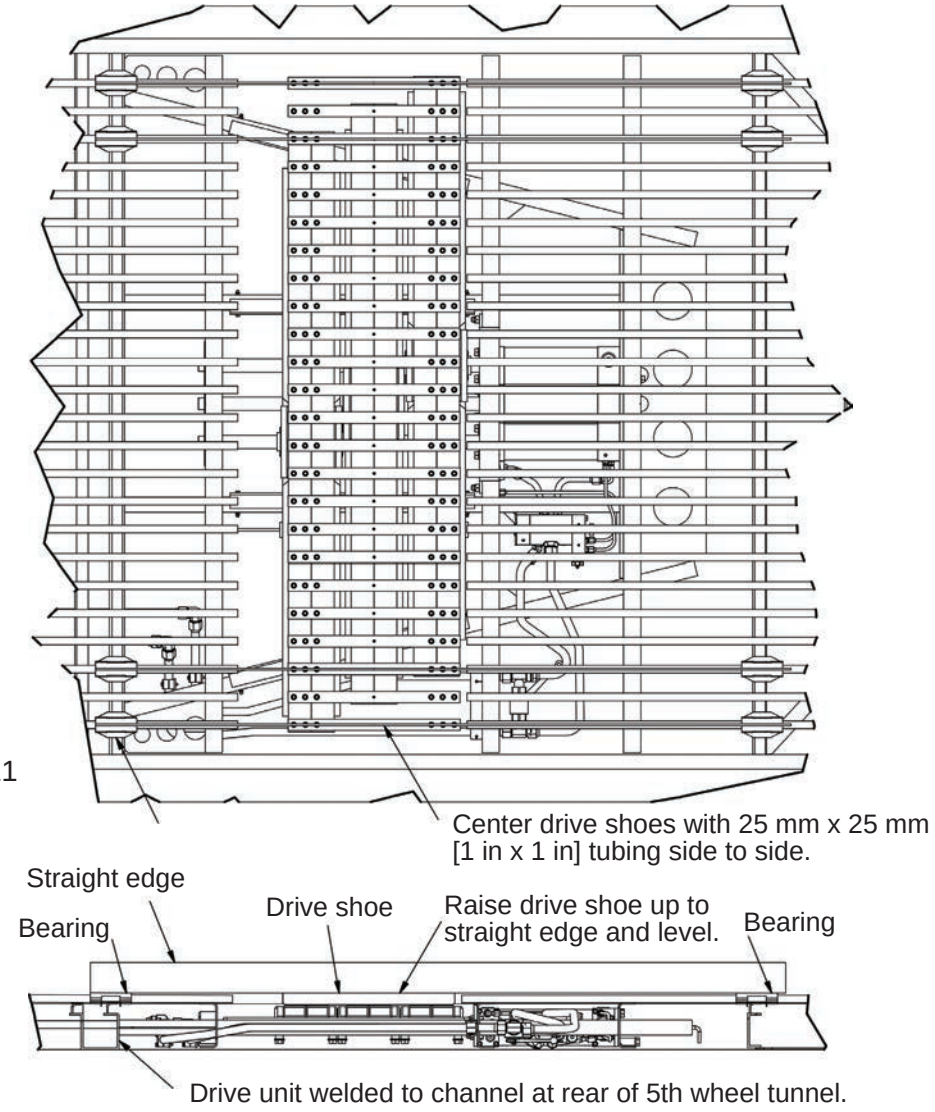


Figure 11

Height

Raise drive frame cross-member to the same height of shimmed cross-member.

This method gives the proper drive height as bearings are 6 mm [1/4 in] above the 25 mm x 25 mm [1 in x 1 in] tube and the drive shoes connect directly to the floor slats. See Detail F.

Weld the drive unit in place.

Use 25 mm x 25 mm [1 in x 1 in] jig to weld 25 mm x 25 mm [1 in x 1 in] tubing to drive unit formed channels.

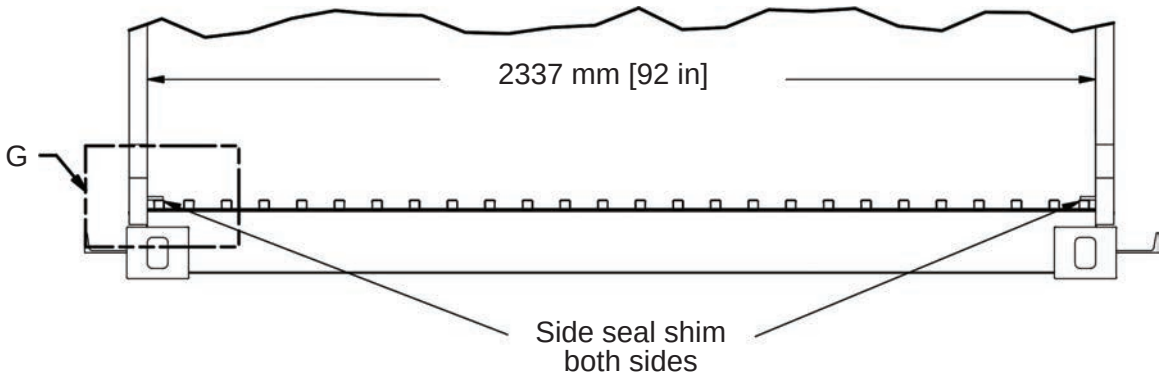
4.1 Side Seal Support

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 the cross-members to support the side seal.



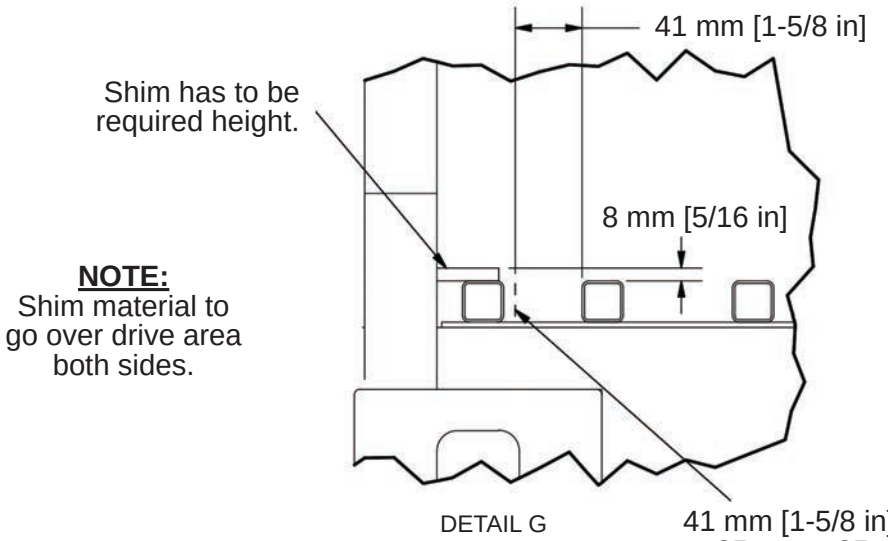


Figure 12

4.2 Painting

The factory paints drive units with red 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.

4.3 T-Block

Plastic T-Blocks provide a sliding surface and prevent material from going underneath the end of the slats at the discharge end of the flooring. (Figure 13)

1. Align the T-Blocks with installed tubing. Keep the blocks 12 mm [1/2 in] away from the doors.
2. Drill and countersink bolt holes through the T-Blocks and baffle plates.
3. Fasten T-Blocks to the baffle plate. Self-tapping screws may be necessary if access is poor. Countersink holes 6 mm [1/4 in] below the block top. Make sure the bolts (flat-head socket caps) are 4 mm [3/16 in] below the surface of the block.

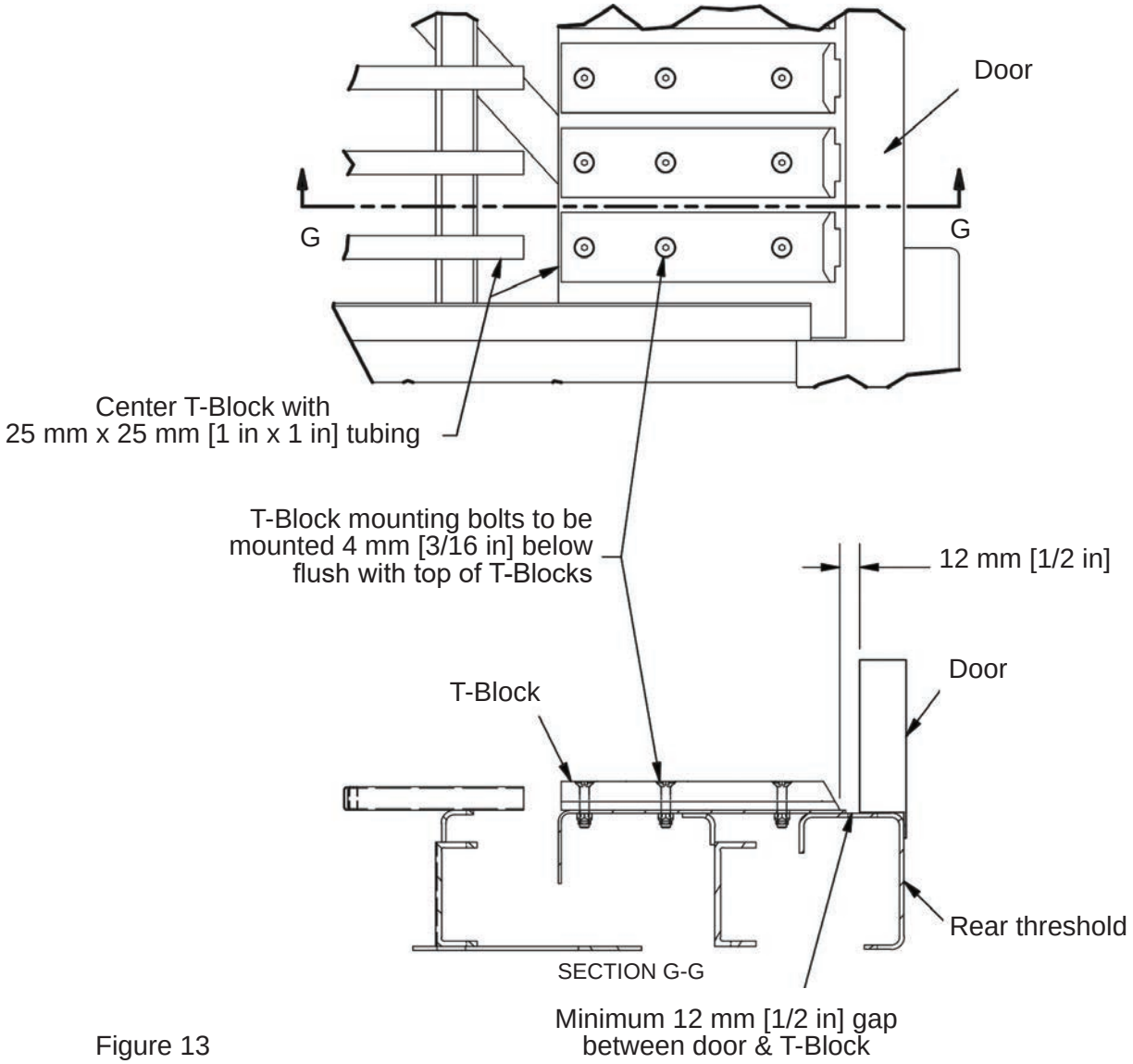


Figure 13

4.4 Hydraulic Tubing

Section 2.3 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.
2. Cut tubes to length.
3. Position tubes.

   Use the weld on tube clamps supplied with the kit or use rubber grommets or PVC tubes to protect the tubing when installing tubes through cross-members
4. Connect tubes to drive unit.

   Connect the pressure line to outside line that is connected to the switching valve port labeled “PUMP” and return line to inside line that is connected to the switching valve port labeled “RES”.
5. Mount quick couplers just inside front of container.

   Connect the male coupler on the pressure line (outside line to switching valve port stamped “pump”). Connect the female coupler to the return line (inside line to switching valve port stamped “res”) (Figure 14). Apply hydraulic sealant.

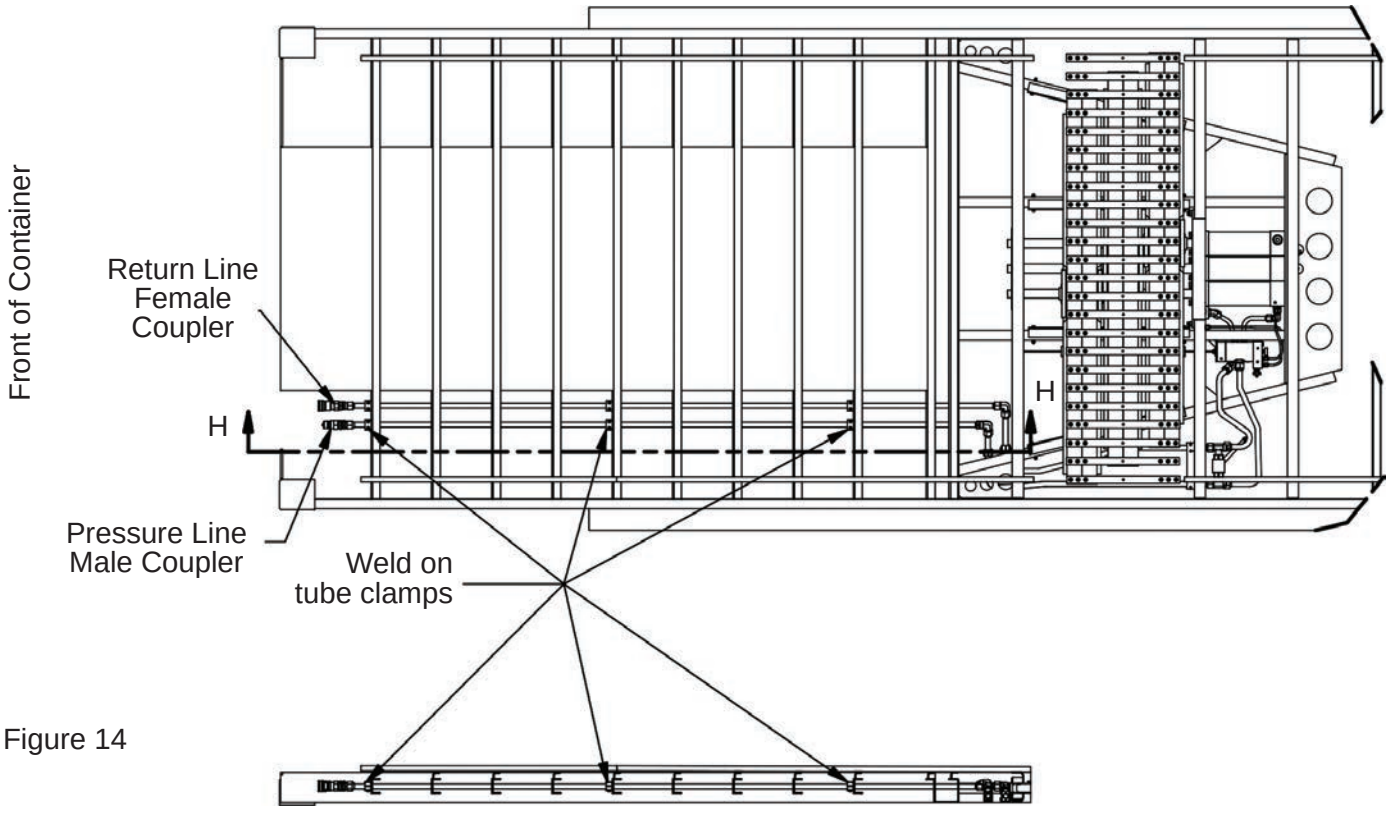


Figure 14

After drive unit is welded in
place attach hydraulic oil lines.

5.0 Flooring

After paint dries, the flooring can be installed. The slats slide on plastic bearings. The aluminum floor slats are bolted to shoes on the cross drives.

5.1 Slide Bearings

1. Compare bearing dimensions with shim on the cross-member flange width. The gap in the bearing should exceed the flange width of the shim of the cross-member. The standard bearing gap is 62 mm [2-7/16 in]. Milling can enlarge the gap to 100 mm [4 in].
2. Snap 6 bearings (3003 Long) 100 mm [4 in] opening on the sub-deck over the load end of cylinders. (See Detail J of Figure 15)
3. Snap one row of 3003 bearings on the sub-deck over the load end of drive frame. Snap 1830 mm [72 in] splash bearing over sub-deck in front of them. Snap another row of 3003 bearings in front of them. Take 12 of the 1830 mm [72 in] splash bearings and cut them in half to 915 mm [36 in] to make a total of 24 splash bearings and snap them on the sub-deck in front of them. Snap on another row of 3003 bearings in front of them. (See Detail I of Figure 15)
4. Snap bearings on the square tube at the junction of each cross-member. No tools are needed.

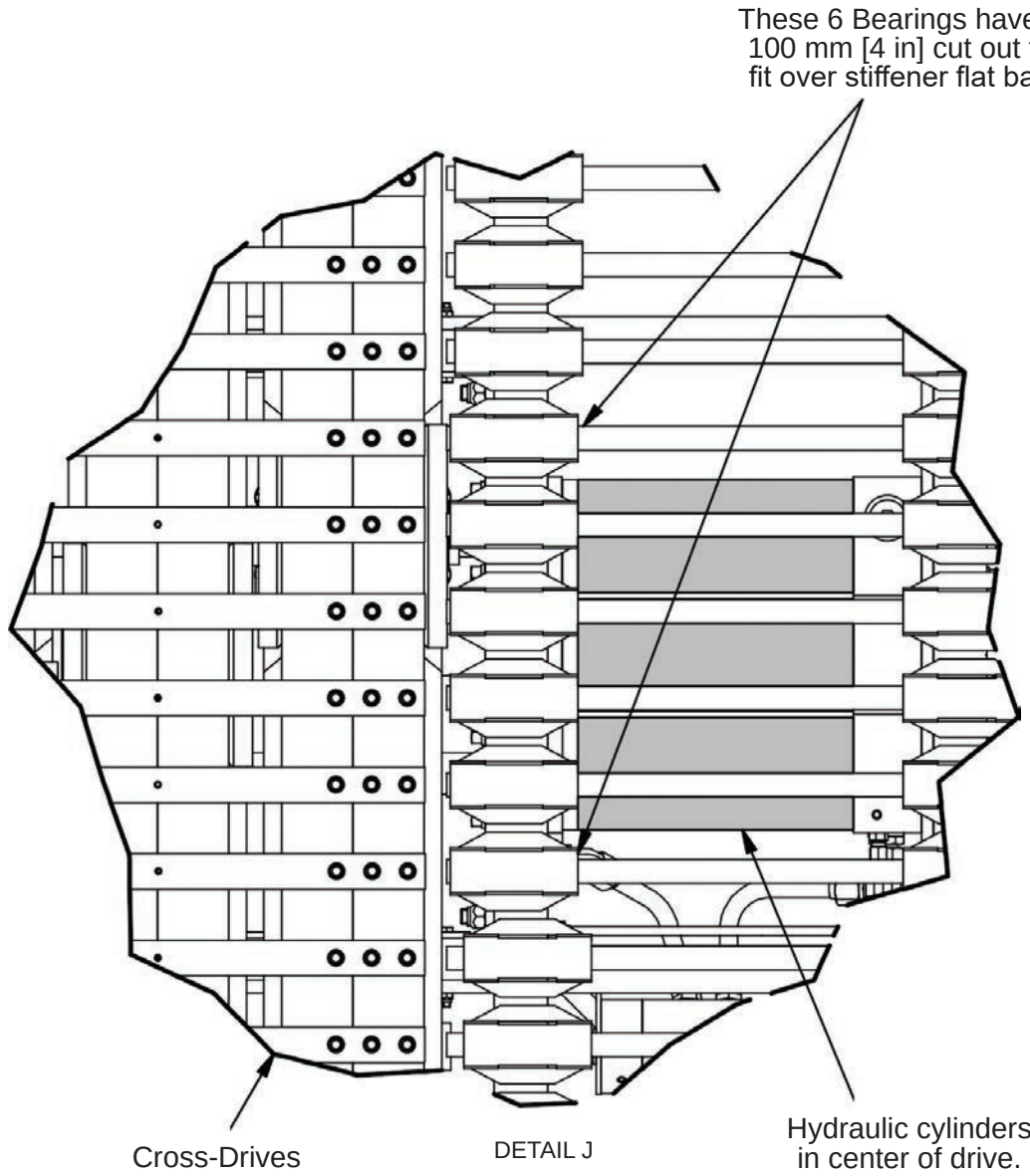


Figure 15

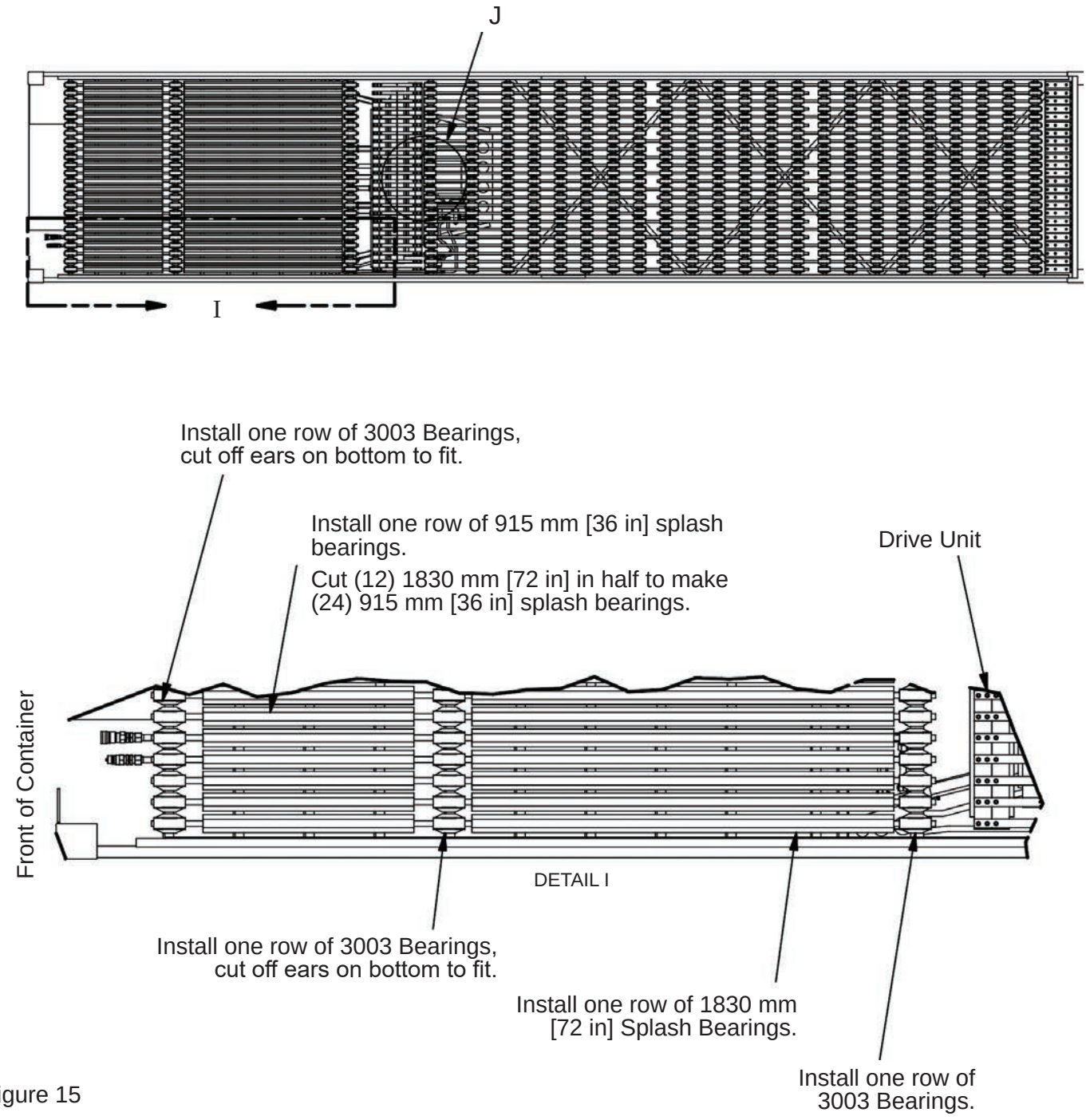


Figure 15

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

5.2 Floor Slats

1. Determine length of floor slats.

   The slats have to reach from 50 mm [2 in] from the doors to a minimum of 300 mm [12 in] from the closest point on the front wall at floor level. This implies that the maximum length of the slats is 350 mm [13-3/4 in] shorter than the inner length of the container. For example, maximum slat length for a 150 mm [6 in] stroke unit in a 12.04 M [39 ft 6 in] container is 11.69 M [38 ft 4 in].

WARNING: Make sure that the slats do not bump the front wall.

2. Determine drilled floor bolt hole location.

   Make sure the cylinders are all the way to the rear of the container when determining the floor bolt hole location.

   The flooring is to be predrilled before installation. Measure the distance from 50 mm inside the door to the first set of holes in the drive shoes. Use this distance to set the shoe drill jig at the first hole.

   (Note: If multiple containers are being outfitted, it is beneficial to place the drive units at the same distance from the rear of the container. Then all of the flooring will be drilled in the same location.)

   (See Figure 16)

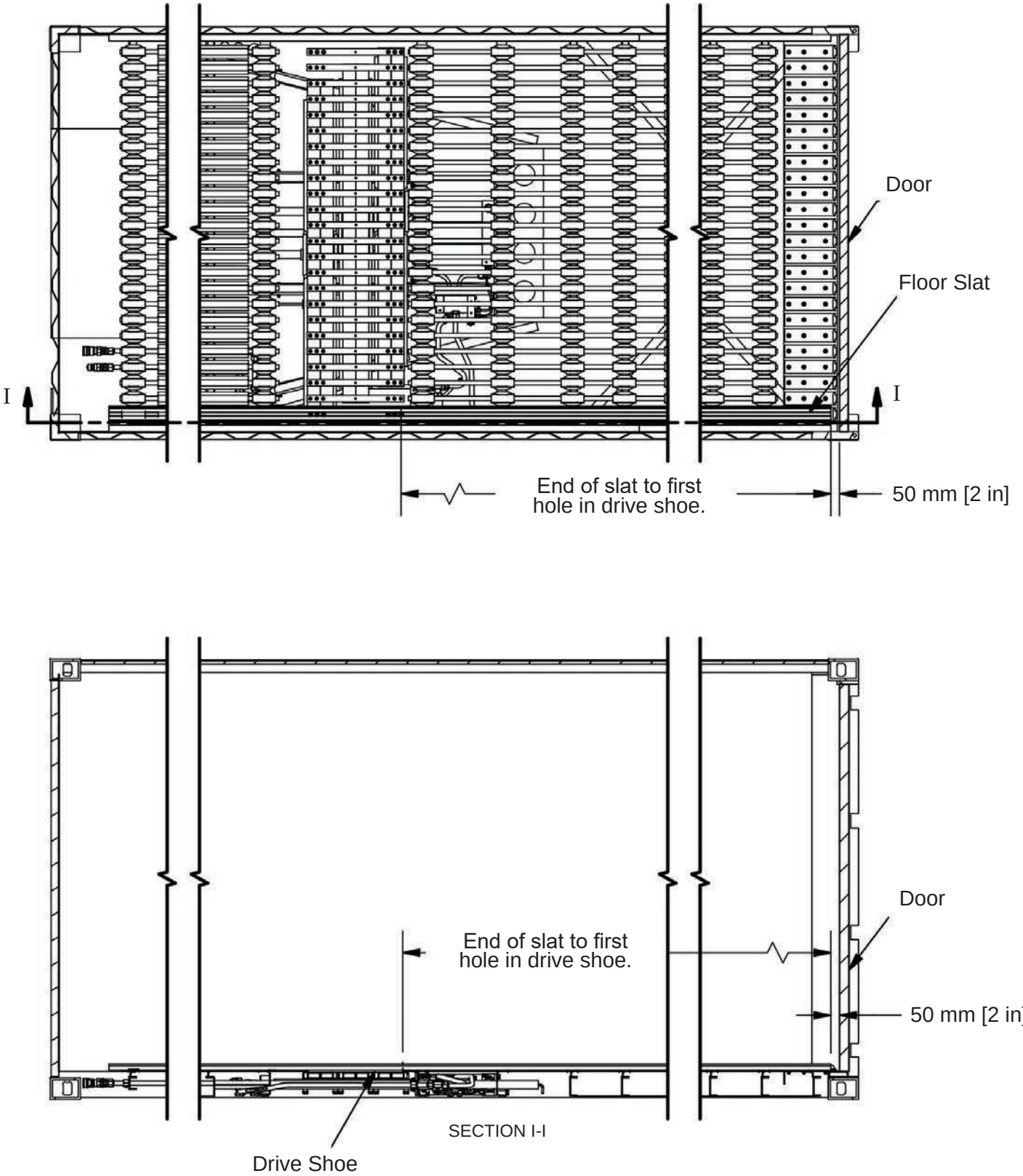

Door
Floor Slat
I
I
End of slat to first
hole in drive shoe.
50 mm [2 in]
Door
End of slat to first
hole in drive shoe.
50 mm [2 in]
SECTION I-I
Drive Shoe

Figure 16

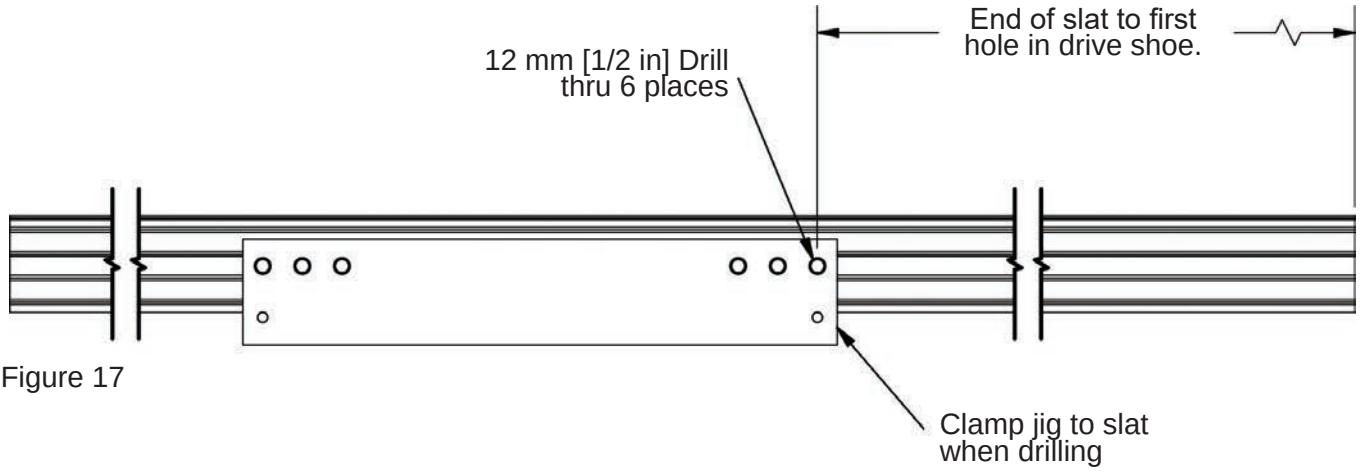


Figure 17

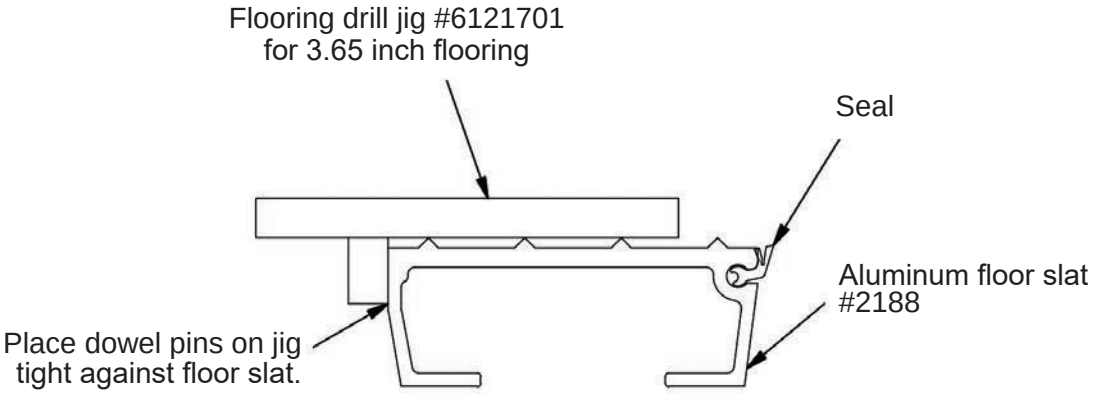


Figure 18

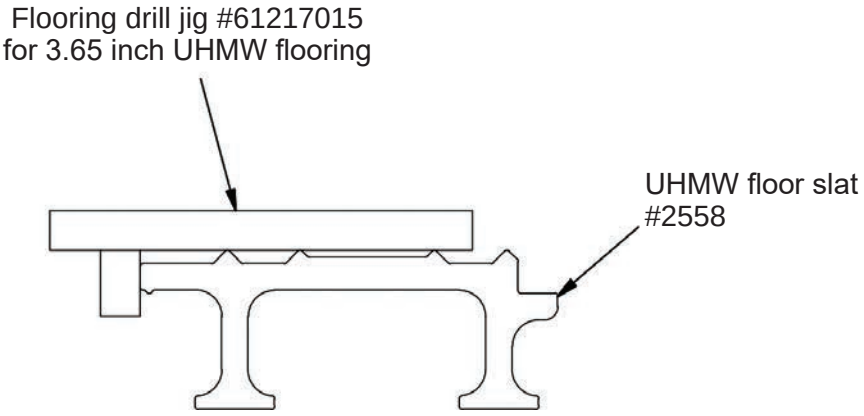


Figure 19

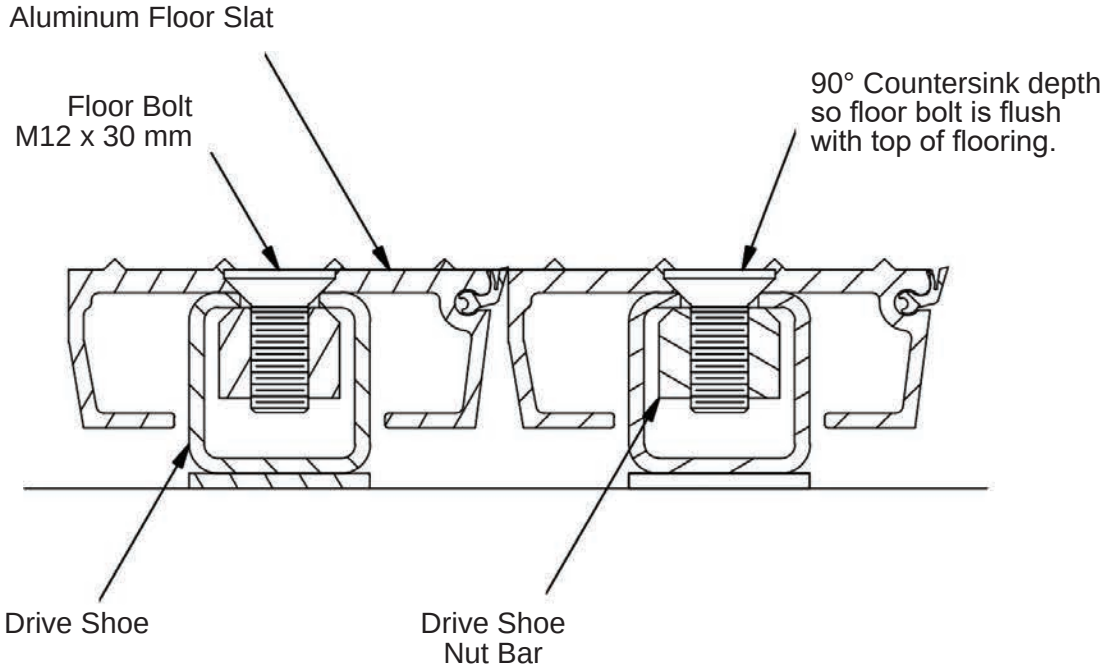


Figure 20

Drive Shoe use Sikaflex fastcure glue on threads and around countersunk surface of bolt holes before torquing the floor bolts per Appendix 4.

Red Loctite may be used instead of Sikaflex on Aluminum flooring.
(Do not use Red Loctite on UHMW Flooring)

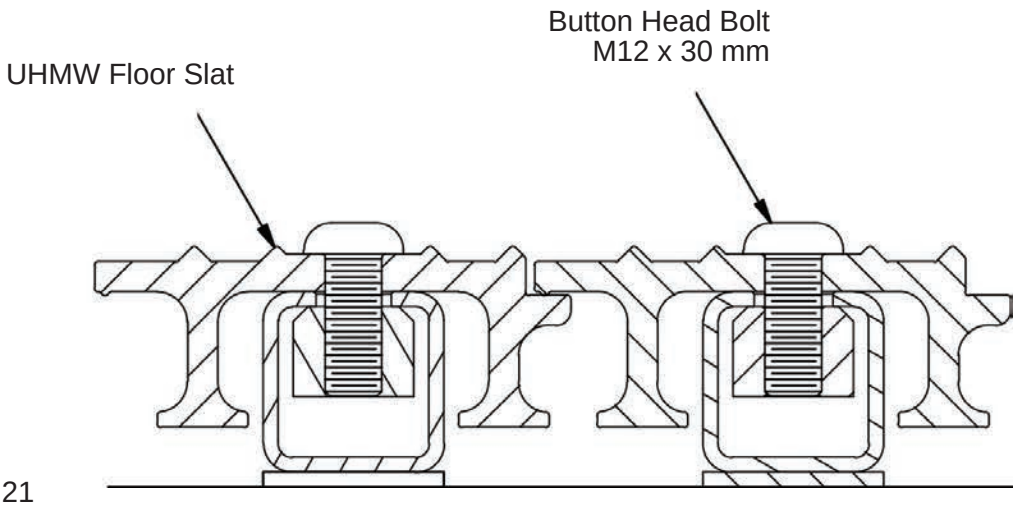


Figure 21

3. Placement of floor slat drill jig.

   Check that you have the right flooring drill jig before continuing. Place flooring drill jig on top of the floor slat with the location dowel pins tight against the side opposite the seal. Center the rear hole over the mark from the end of slat to first hole in drive shoe measurement and clamp the jig. Drill 12 mm holes through the flooring. (Figures 17, 18 & 19)

4. Counter sink holes in aluminum slats only. Do not countersink holes in UHMW floor slats. Using a 90° countersink to a depth so the floor bolts are flush with top of floor slat. It is critical to get a good countersink depth for a tight fit. If possible, it is suggested to use a preset drill press for uniform hole depth. (Figure 20)

5. Install floor slats.

   Slide floor slats over T-Blocks and onto bearings into position and insert bolt into drive shoe nut bar to hold floor slat in position while installing the next slat.

6. Bolt and torque flooring to drive shoes.

   Sikaflex the floor bolts and the countersunk hole surface before inserting bolt. (Figures 20 & 21)

   Torque bolts per Appendix 4.

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. 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 1 mm [0.04 in] to determine the actual width of the side seal.

2. Split slat if necessary. (See Figure 23)

   Rip floor slat with a circular saw to fit side wall as closely as possible. This is another reason container alignment is critical. Make sure that the side with the seal groove goes to the left side of the container.

3. Bolt side seal onto support.

   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 container wall, bridge the gap with flat bar or angle.

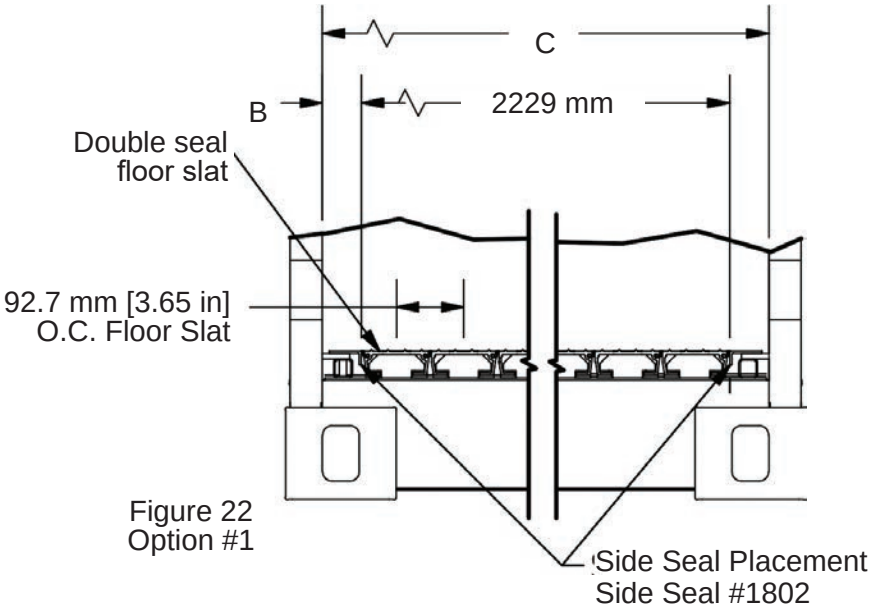


Figure 22
Option #1

To Calculate Side Seal Width:
B = (C-2229)/2

Option #1: Side Seal #1802 requires 32 mm [1-1/4 in] shim and one double seal slat.

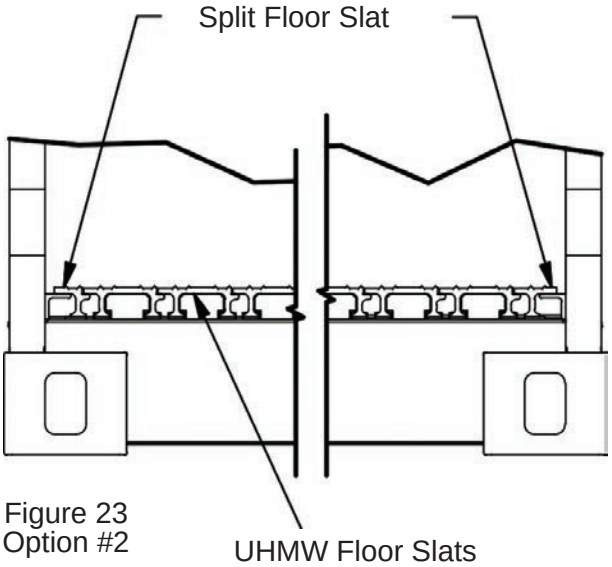


Figure 23
Option #2

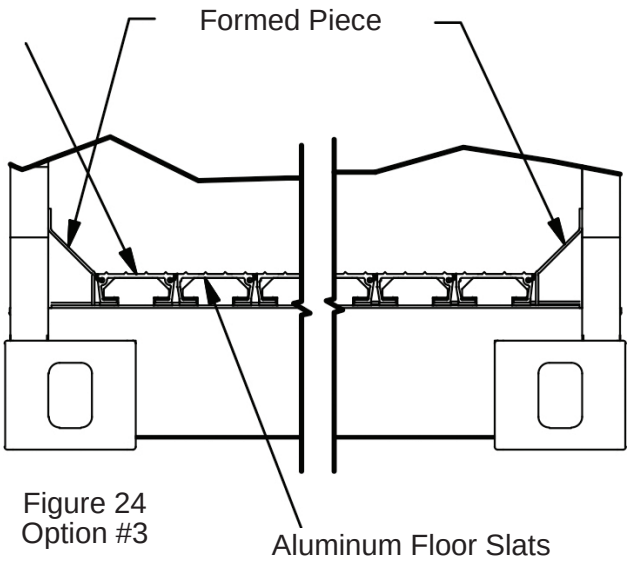


Figure 24
Option #3

Option #2
- Requires splitting of slat for side seal.
- 32 mm x 32 mm [1-1/4 in x 1-1/4 in] tube used under slat to maintain proper height.

Option #3
- Requires one double slat seal.

5.4 Front Shield

1. Determine dimensions (Figure 25).

   The width is a minimum of 6 mm [1/4 in] narrower than the inner container 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 Manufacturing Co. supplies this in most cases.) Form the plate and attach angled steel for support. Rivet the plastic slide strip to the shield.

3. Mount front shield.

   Screw the plate to the side of the container.

   Provide clean-out holes below the slope sheet.

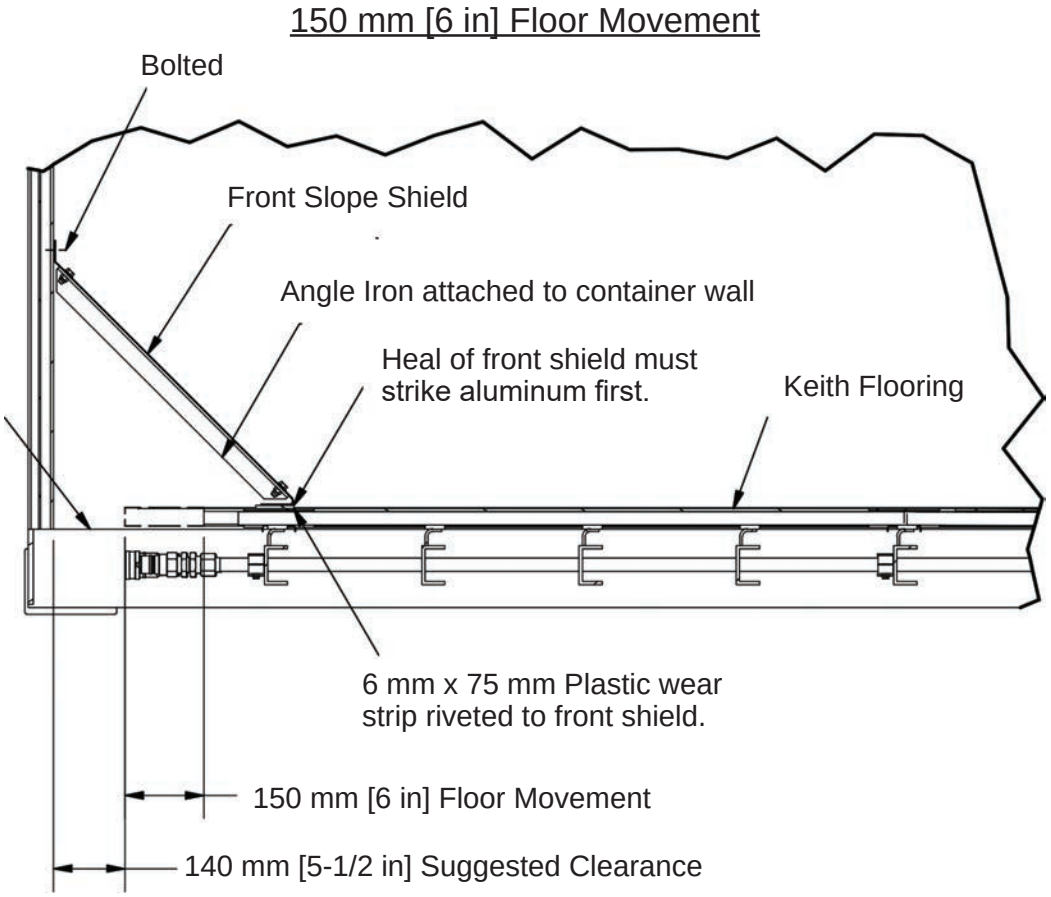


Figure 25

6.0 Miscellaneous

6.1 Caution Decals

Affix caution decals to the side of the container at the location of the drive unit (see Owner's Manual for more information).

6.2 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.

Appendix 1 - Tools

Tools provided by KEITH Manufacturing Co.

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

Basic tools not supplied with kit

- End wrench set up to 16 mm
- Allen wrenches
- Hack saw
- Hand grinder
- 10M tape measure
- 20 C-clamps 11 R
- 6 mm and/or 12 mm hand drill, bit set, 35 mm hole saw
- Straight edges
- Dead blow hammer

Special tools

- Flow meter
- Flaring tool for 25 mm pipe
- 12 mm drill bit
- Countersink bit, 90° with 12 mm shank, 20 mm single flute
- Torque wrench up to 70 N-m
- Torque wrench up to 250 N-m
- Mig welder (wire welder)
- Rivet gun
- Overhead crane (Hoist or forklift)
- Circular saw
- Cutting torch

Optional tools

- Knee pads
- Band saw

Miscellaneous

- Hydraulic sealant
- Paint

Appendix 2 - Materials

Standard Kit

- Drive unit
- Floor slats
- Slide bearings
- Floor bolts
- Slide strip (for self-fabrication of front shield)
- Safety decals

NOT Provided with Standard Kit

- Sub-decking (25 mm x 25 mm [1 in x 1 in] steel tubing / aluminum profile)
- 25 mm [1 in] hydraulic tubing
- Hydraulic quick couplers
- Steel plate (3 mm [1/8 in] to fabricate baffle plate)
- Steel profile (side seal support)
- Front shield
- Tube clamps
- Plastic T-Blocks

Options

- Splash seal
- Aluminum wear strips
- Tubing end caps
- Rubber grommets
- 25 mm [1 in] I.D. PVC pipe

Appendix 3 - Check List

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

Before installation

1. The container should be straight.
2. The container should have cross bracing.
3. Cross-members should be level with other cross-members and kingpin plate.
4. Cross-members need to be shimmed up to the specified height.

During installation

5. The 25 mm x 25 mm [1 in x 1 in] tubing must be centered in the container.
6. The drive unit must be properly aligned.
   - The top of the drive shoes must be 6 mm higher than the top of the 25 mm x 25 mm [1 in x 1 in] tubing.
   - The drive shoes must align with respective 25 mm x 25 mm [1 in x 1 in] tubes.
7. The cylinders must be entirely collapsed before measuring bolt holes for floor slats.
8. A front guard should deny access to the underside of the front end of the container so slats cannot shear anything entering from below.
9. The slide bearings should seat properly on the sub-deck and the flooring should seat properly on the bearings.

After installation

10. The pressure and return lines should connect to the correct switching valve port. (Pressure to pressure; return to return.)
11. Caution decals should be visible. Run the system following the instructions in the owner’s manual.

After operation

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

Appendix 4 - Bolt Torque Requirements

Description	Size	Quantity	Torque Values
Tube Clamp Bolts	M6 CL8.8 HCS	Varies	Snug
* Cylinder Pack Bolts (Requires blue Loctite)	M16 CL10.9 HCS	22	150 ft.-lbs [205 N·m]
Switching Valve Bolts	M10 CL10.9 HCS	3	61 N·m [45 ft.-lbs]
* Rod Clamp Bolts (Requires blue Loctite)	M16 CL10.9 HCS	4 per Rod	150 ft.-lbs [205 N·m]
Bearing Block Bolts	M10 CL10.9 HCS	8	Snug ** (Do Not Overtighten)
* Floor Bolts (Flat Head) (Requires red Loctite)	M12 CL10.9 FHCS (90°)	Varies	113 N·m [83 ft.-lbs]

* Bolts installed using thread lock should be checked using a setting that is 7 N·m [5 ft-lbs] less than the above specified value. If the bolt moves then you should remove it, clean it, apply new loctite to the threads and torque it to the full specified value.

** Over tightening the barrel clamp bolts can deform the cylinder barrel shape causing the system to not function properly.