



Hygienic Design Failures

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Points to Consider During Hygienic Design Review

Are there hygienic design failures?

Are the surfaces PCS or NPCS?

How are the surfaces cleaned?

What are potential corrective actions?

Were the risks eliminated?



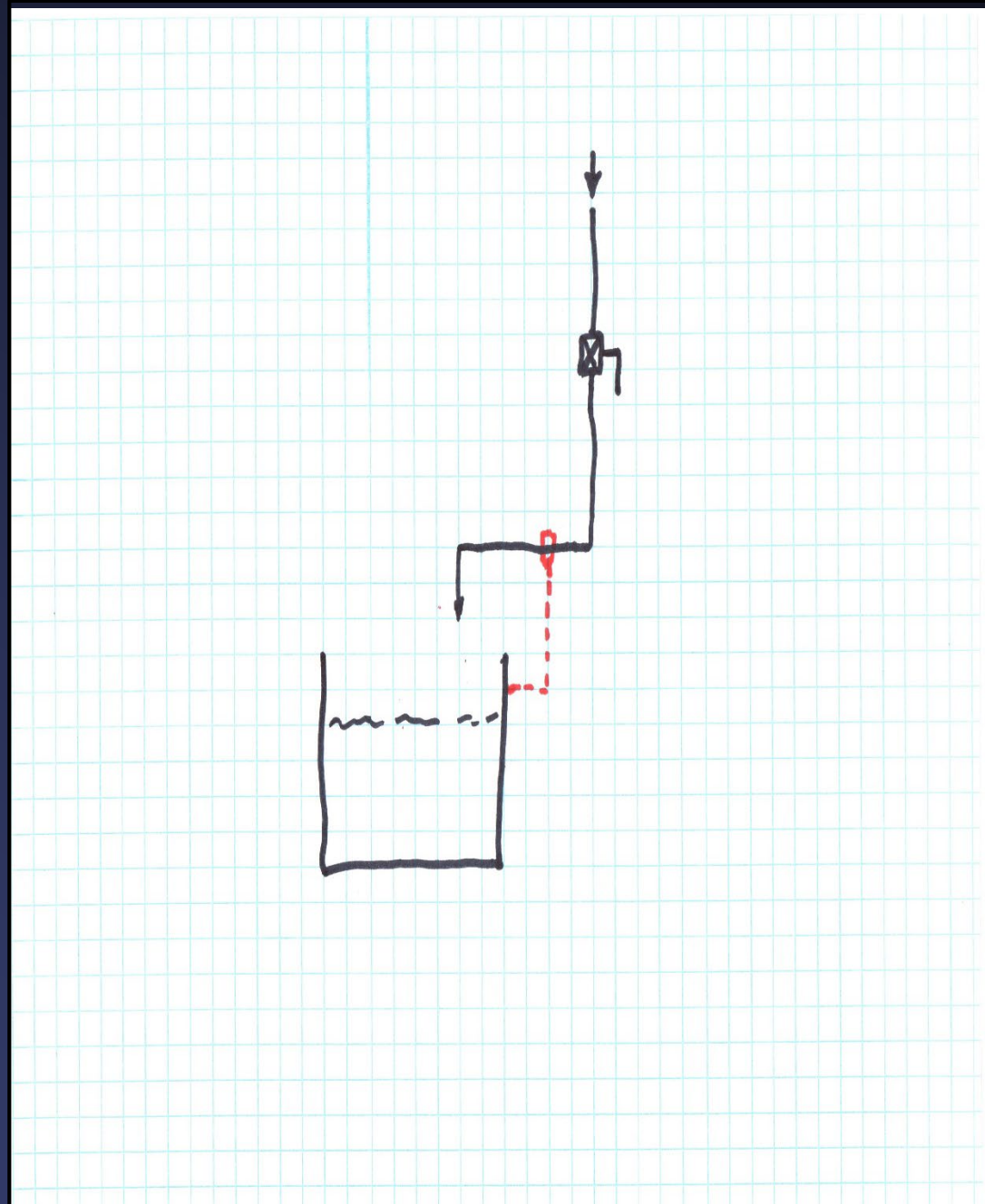
Find the hygienic risks





Design Alternatives

- Move vertical pipe and valve outside PCS drip line
- Move pipe clamp and bracket outside PCS drip line

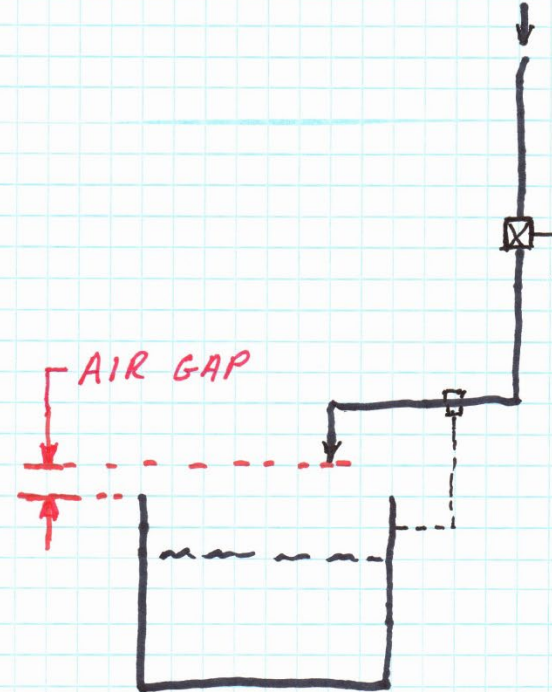


A close-up photograph of a metal bucket. A curved metal spout is pouring a thick, white, foamy liquid into the bucket. The liquid is creating a large amount of white foam that fills the bottom of the bucket. To the right, a vertical metal pipe or tube is visible, partially submerged in the liquid. The bucket itself is made of a light-colored metal, possibly aluminum, and has some rivets visible along its edge.

Air-Gap?

Design Alternatives

- Provide air-gap to meet local plumbing code
- Reference 3-A HTST Practice



Balance Tank with Cover Design Alternatives



60 GAL. S/S HTST BALANCE TANK For Sale | International ...



130-gallon-ss-pmo-approved-htst-bala...



100 Gallon HTST Balance - 323717 For Sale Used N/A



100 Gallon HTST Balance - 323717 For Sale Used N/A



100 Gallon HTST Balance - 323717 For Sale Used N/A



90 gal PMO style rectangular HTST balanc...



100 Gallon HTST Balance - 323717 For Sale Used N/A



70 GAL SS HTST BALANCE TANK ...



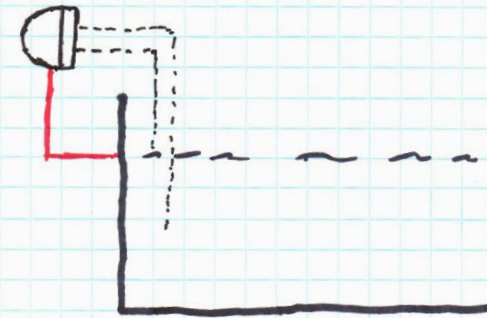
110 GAL. S/S HTS Sale | International





Design Alternatives

- Move the level control mounting bracket outside the PCS drip line
- Provide a more hygienic designed level controller





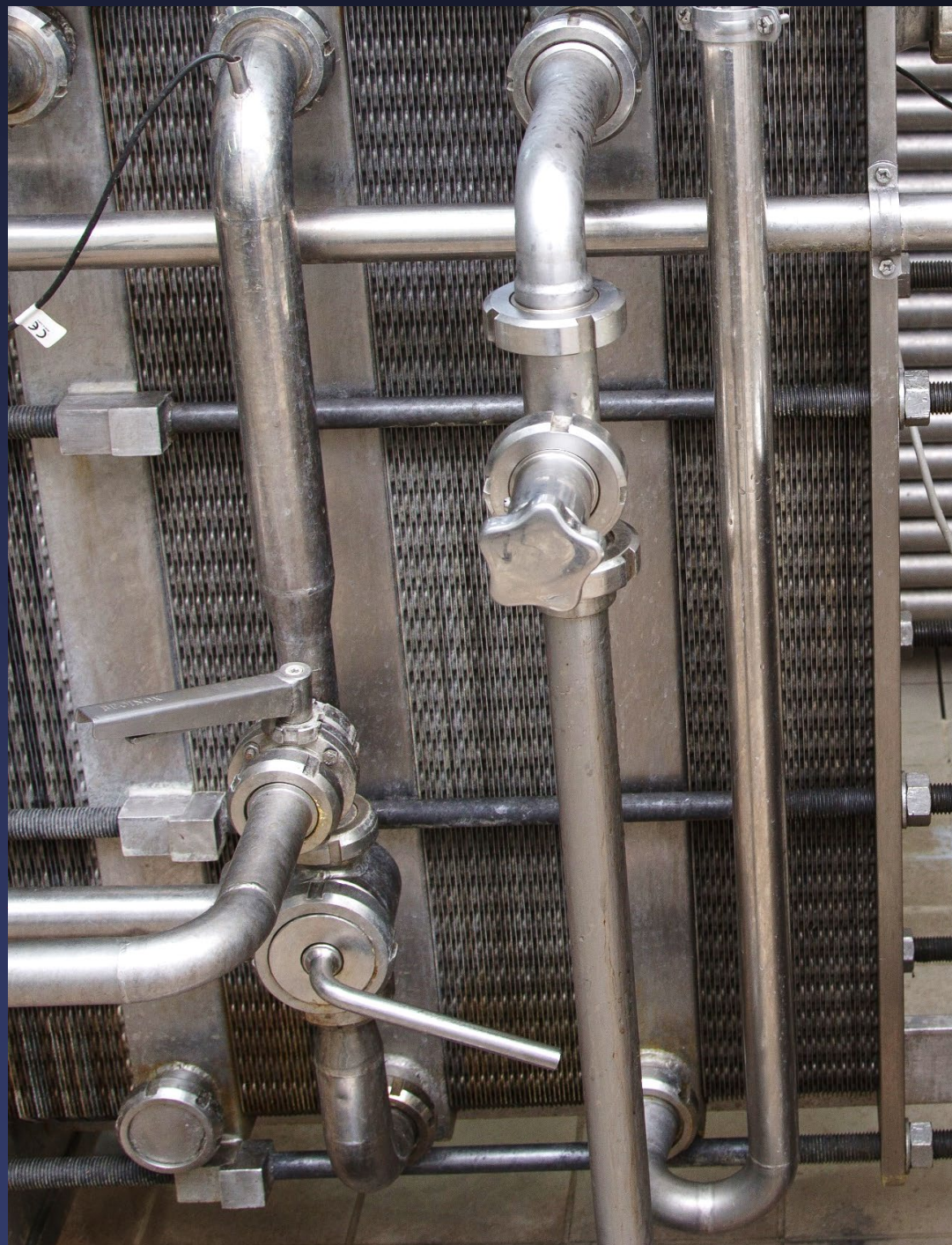
Other Issues

- Bolt and nut missing
- Plastic wire tie – foreign object



Hygienic Valves?

- Manual vs. automatic cleaning

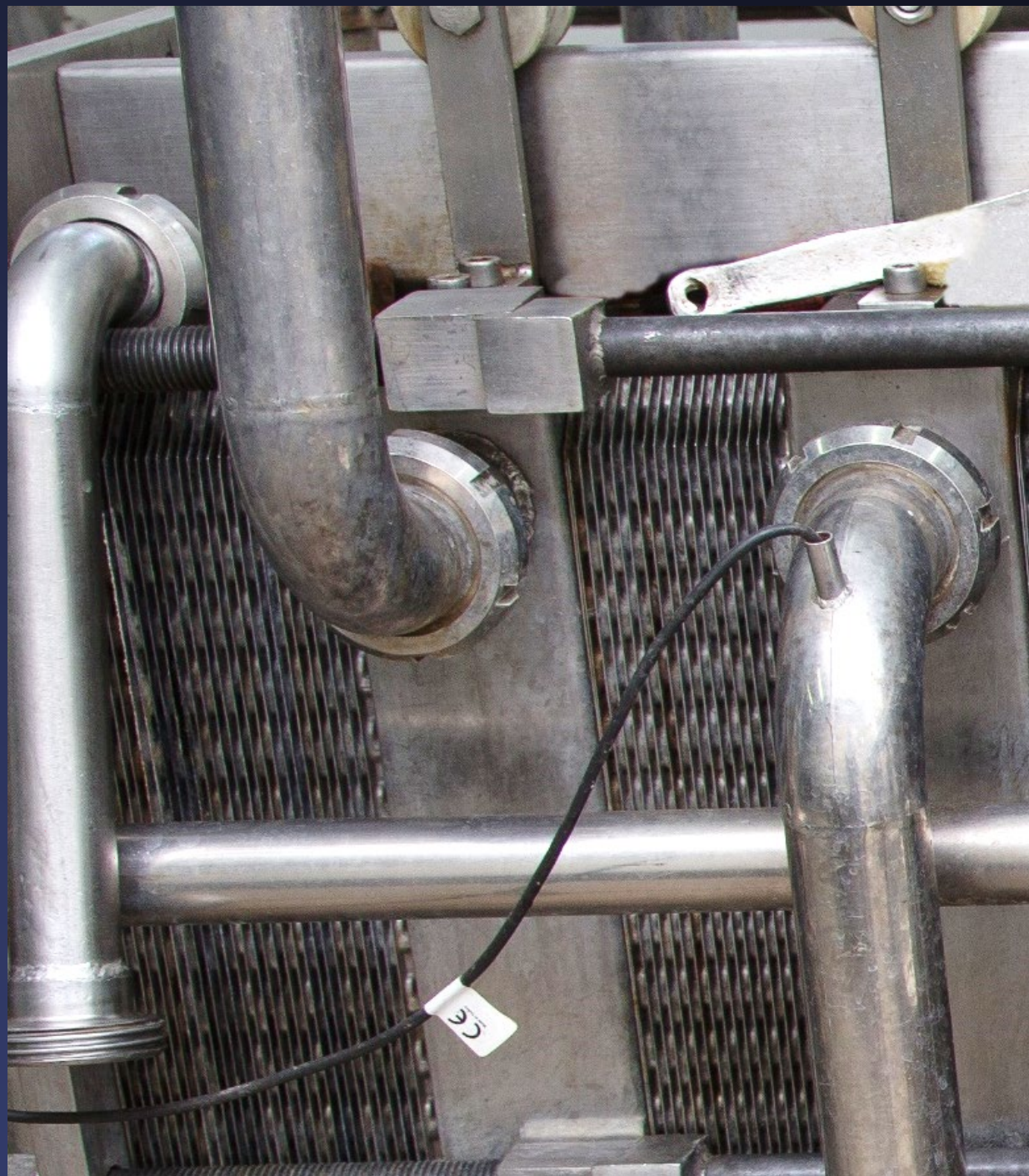


Instrument Connection?

- Verify seal design
- Verify weld quality
- Hollow trap

Hygienic Weld Quality?

- Narrow Weld Bead
- Inconsistent Bead



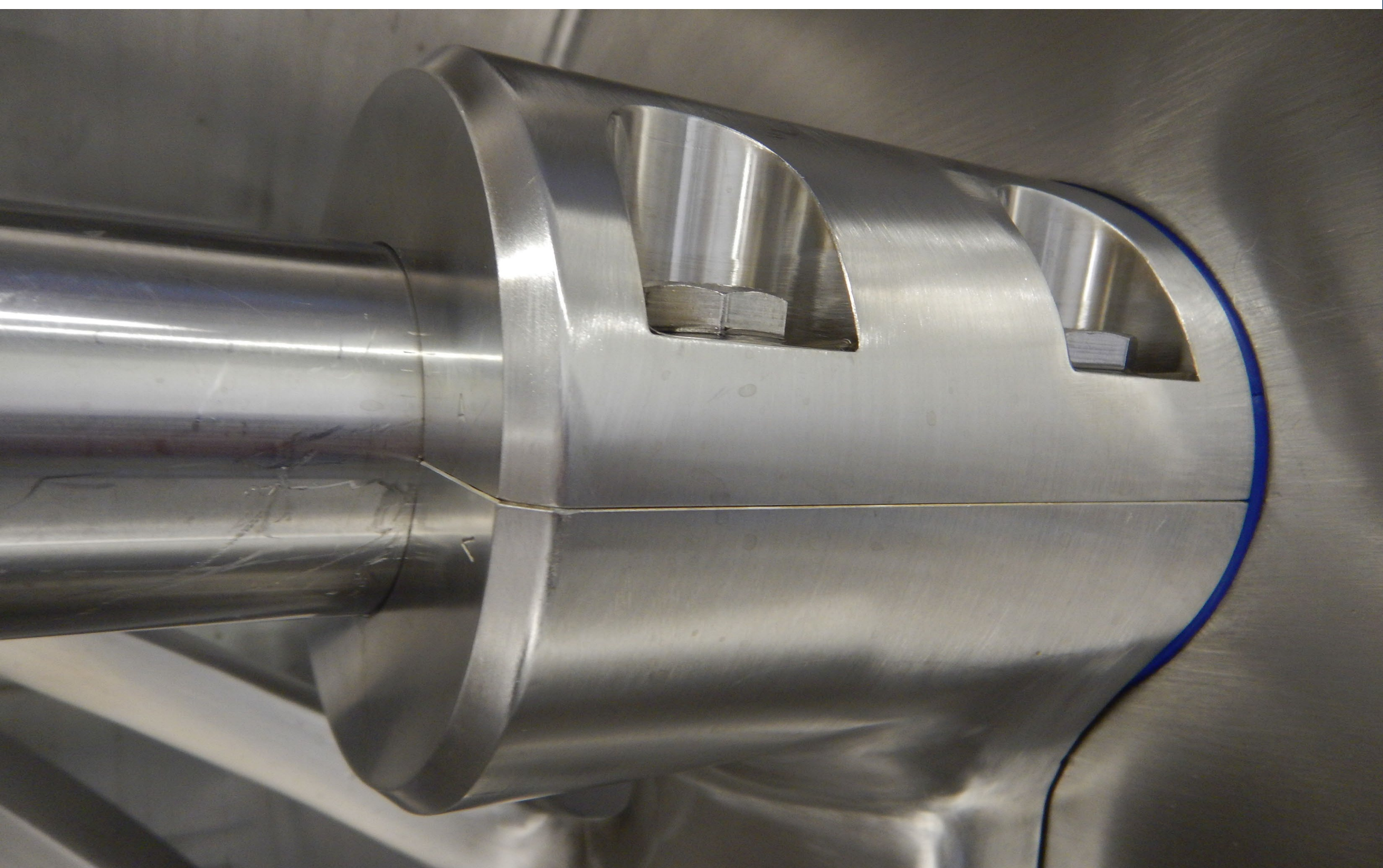


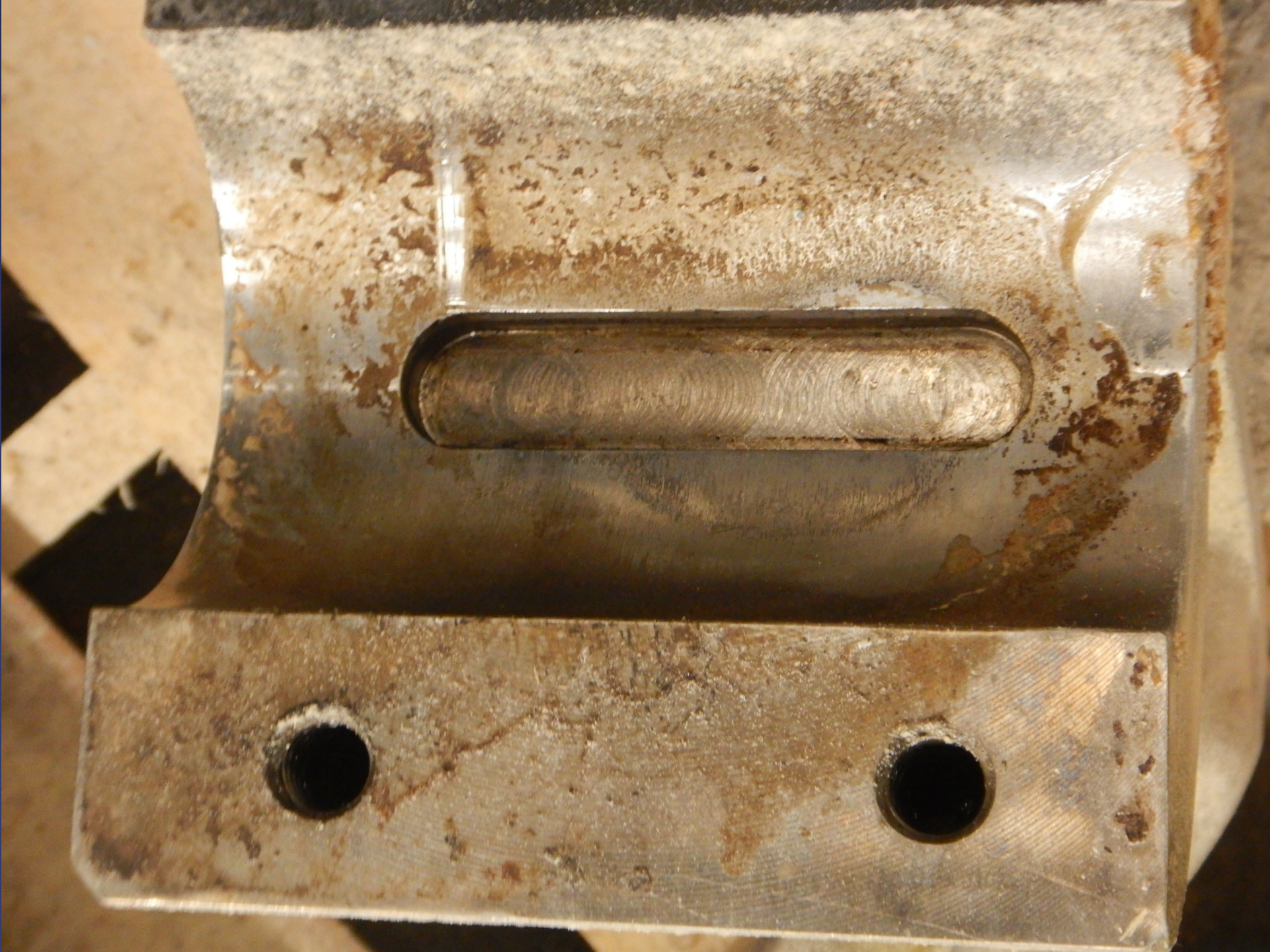












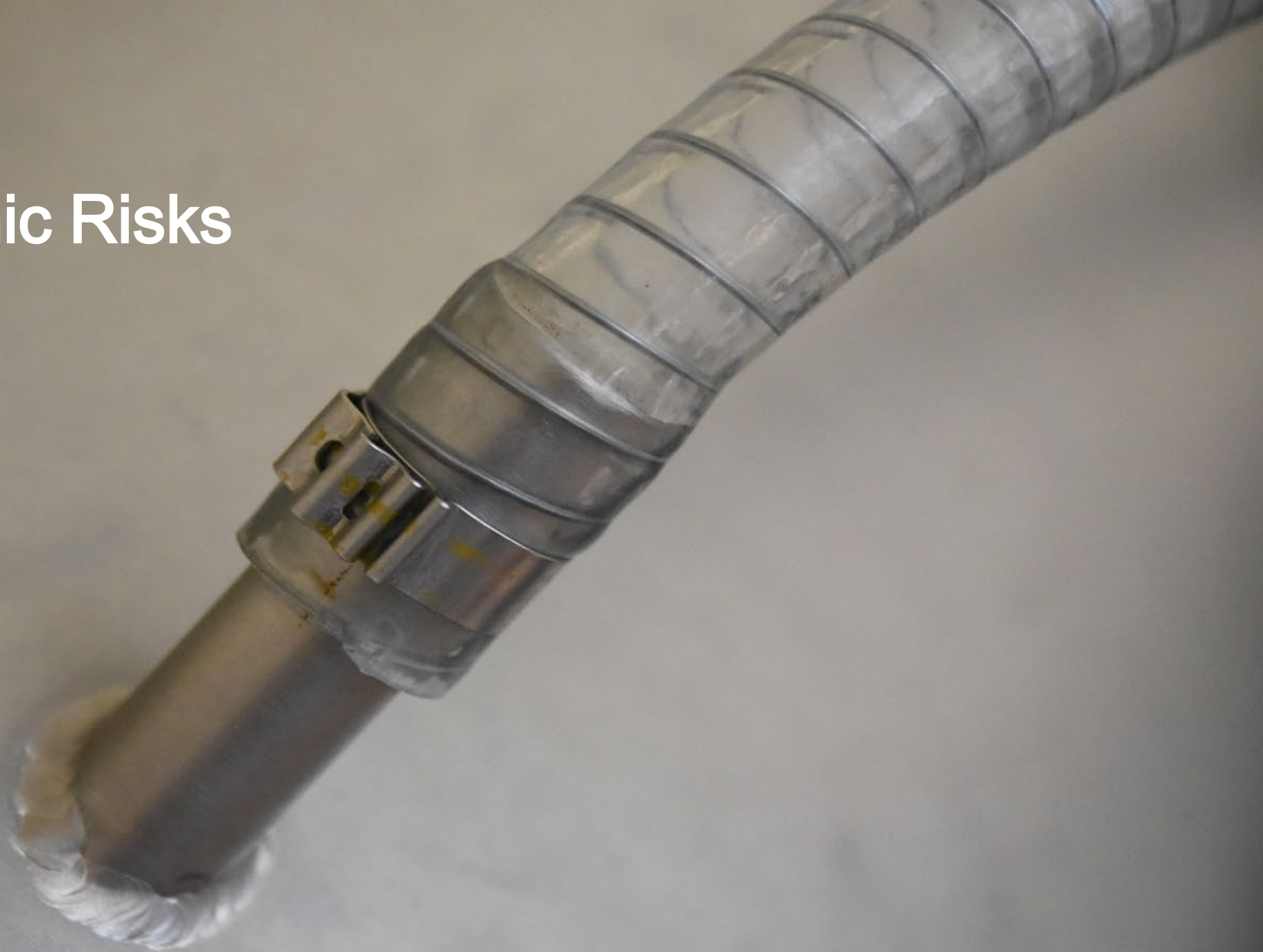




Vacuum Tumbler



Hygienic Risks





**Inside of Vacuum
Tube & Hose**



Tumbler Keyway & Socket Head Setscrew





Meat Grinder



Note corrosion
stains at grinder
plates interface

What are the Hygienic Issues?



Inspection Methods







Stuffing Machine

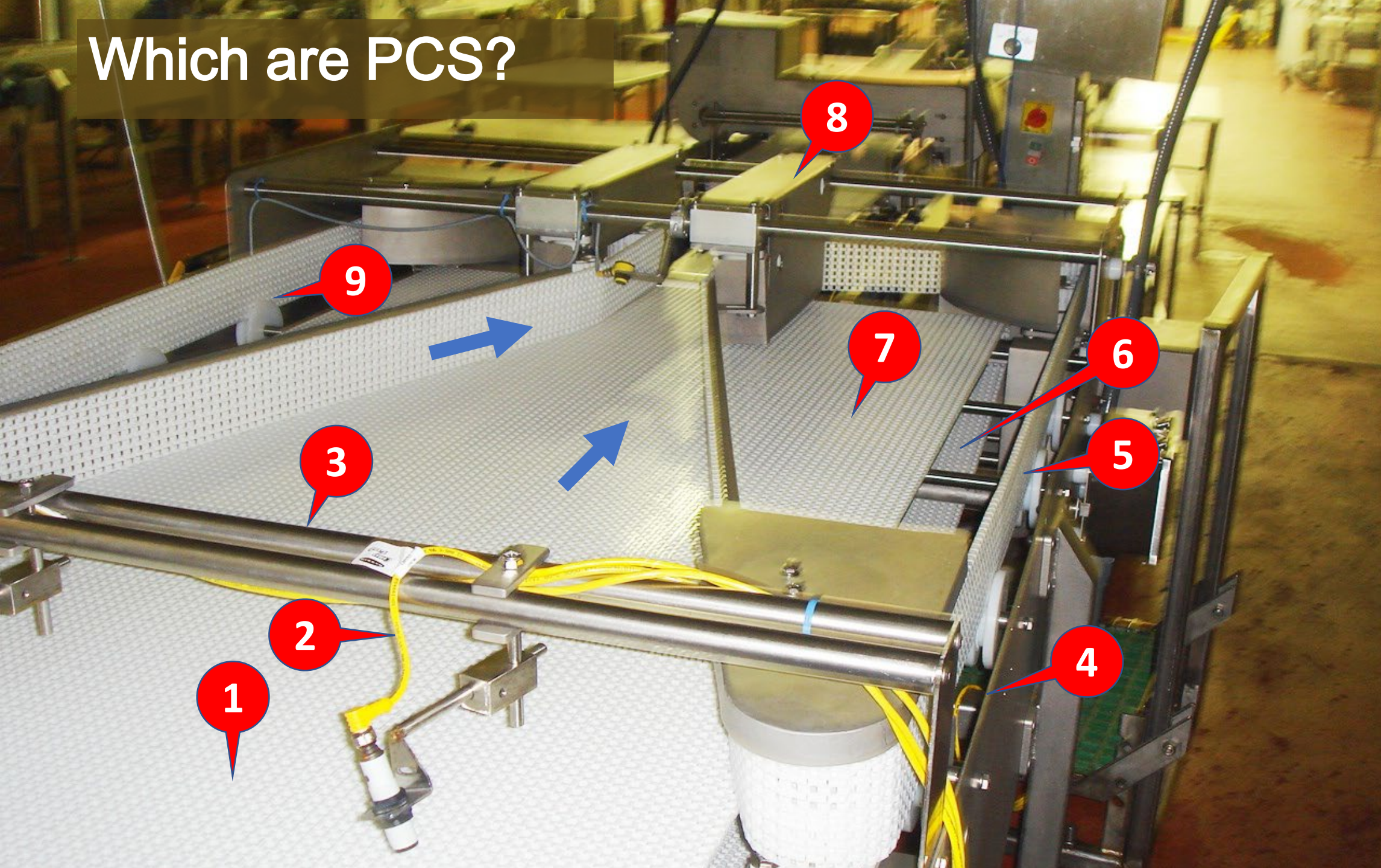






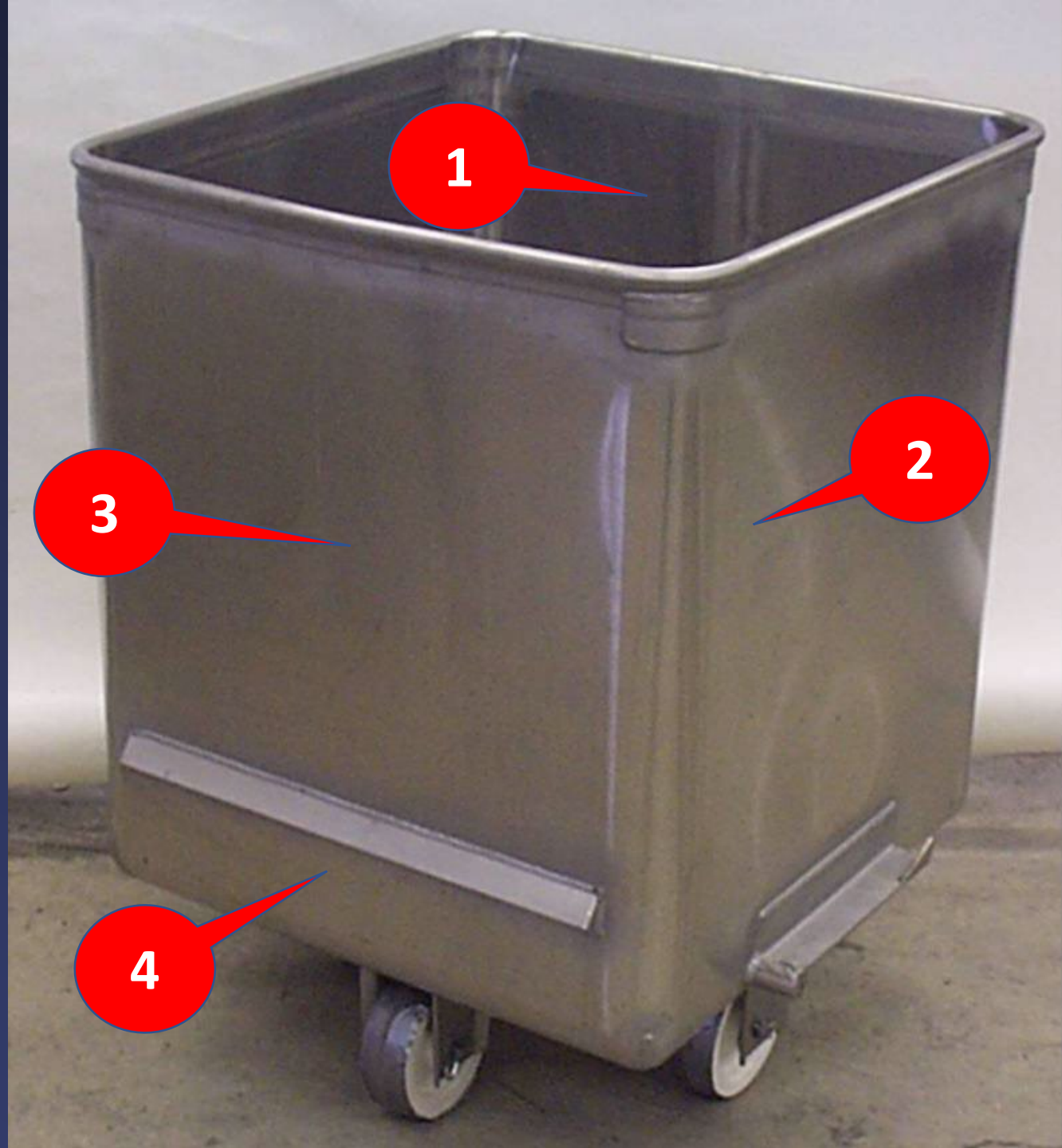
Can You See the Issue?

Which are PCS?



Lift-Dump Tote

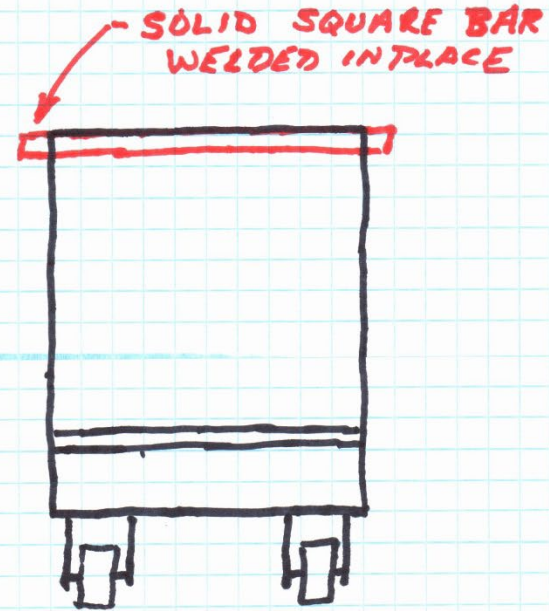
*Which
Surfaces
are PCS?*





Alternative Design for Tubs

- Solid square bar
- Continuous weld around tub
- Finish to 32 Ra

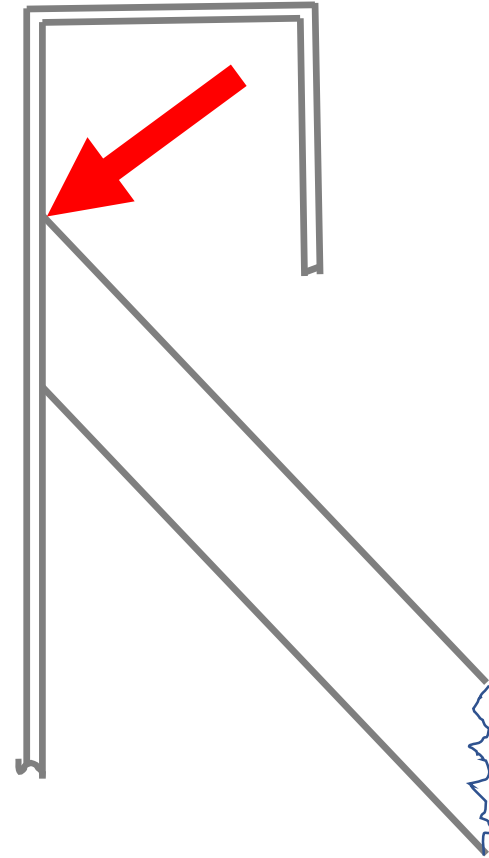
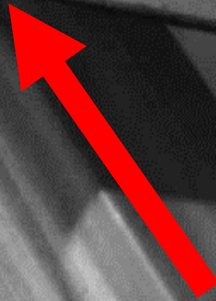


Food Product Wire Belt Drive





**Unwelded
Joint
Inaccessible
for Welding
Torch**



The background image shows a close-up of a metal inspection frame. It features a series of parallel wooden slats held together by a metal bar on the left. The frame is used for inspecting food products, likely for weight and quality control.

Check-weight inspection frame
for exposed food product

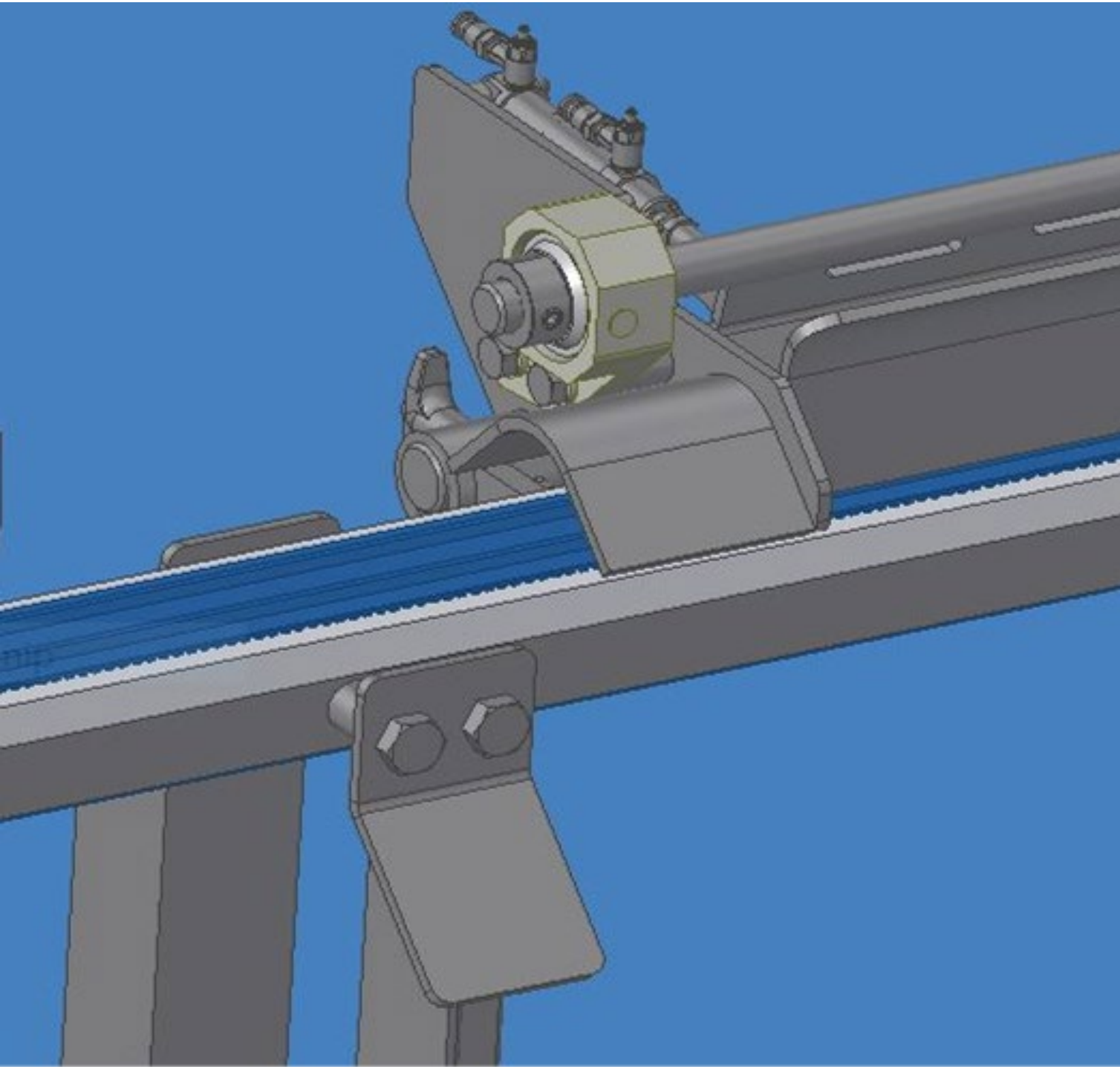
**Explain
the
issue?**

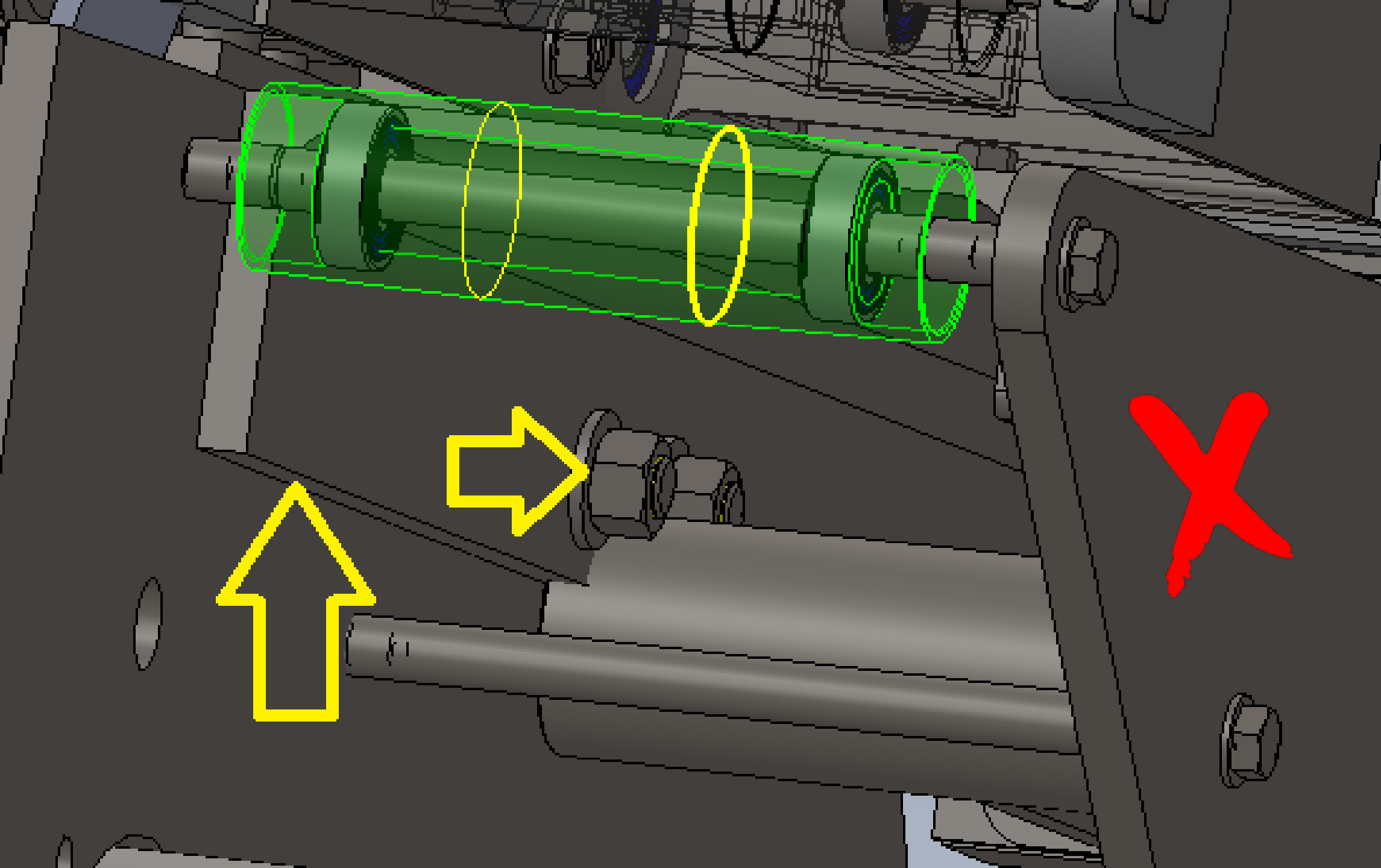


Hygienic Considerations of This Bearing Design

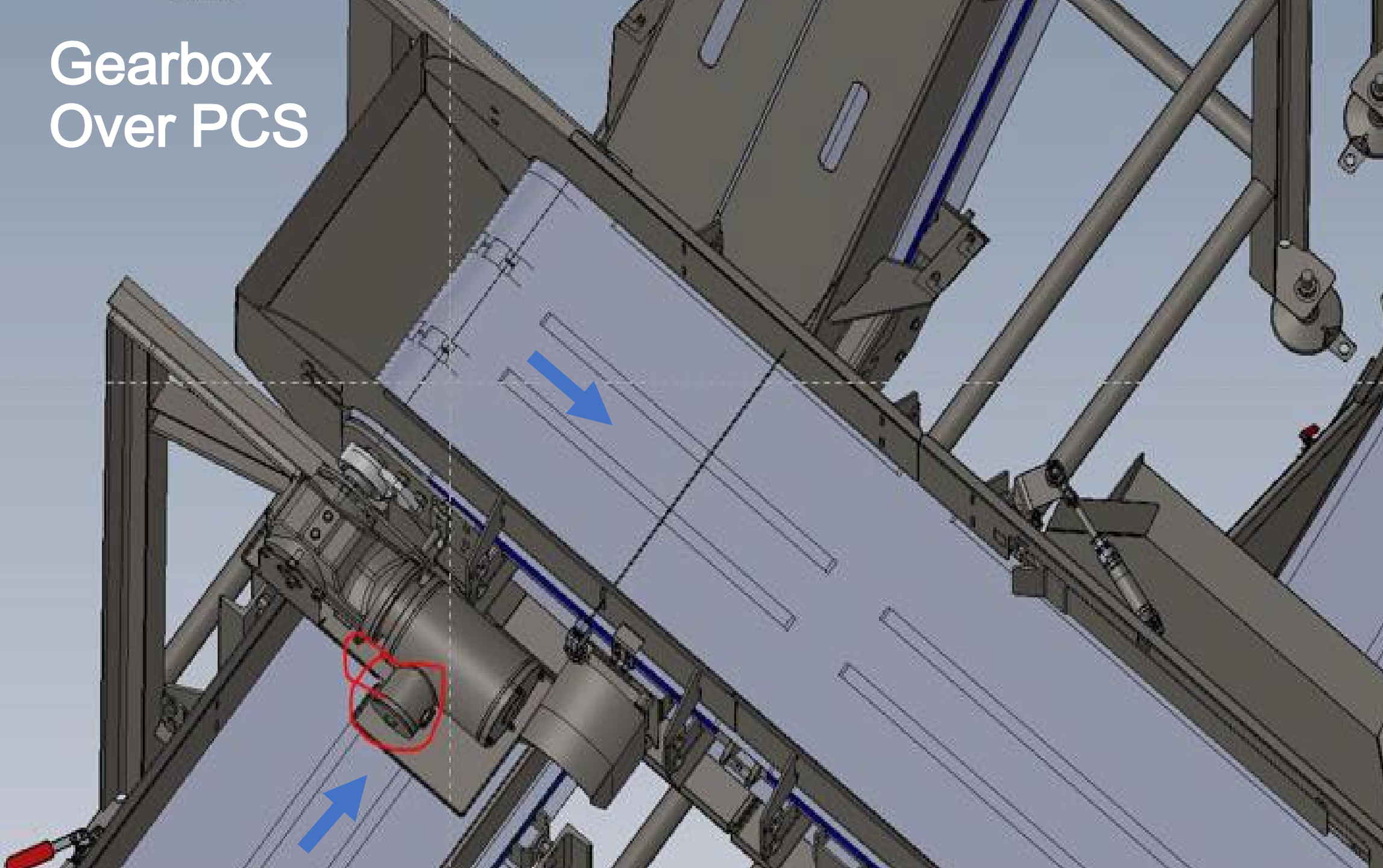


Post Design & Pre- Fabrication Design Review





Gearbox Over PCS





Hygienic Workmanship Failures

Weld inspection



Unwelded Joint in PCS






Incomplete Weld Joint

A close-up photograph of a metal surface, likely a pipe or structural component, showing a weld joint. The weld is characterized by a series of small, irregular, reddish-brown deposits or spatters along the joint line, which is a common defect in welding. The metal surface has a rough, textured appearance with some visible scale or rust.

**Skip weld
on PCS**

A black and white close-up photograph of a metal weld joint. The weld is a butt joint, showing a rough, textured surface with visible ripples and some dark, irregular spots that suggest defects or poor quality. The background is blurred, showing more of the metal structure.

Wrong Welding Method or Poor Welding Skills



Wrong Welding Method & Skills

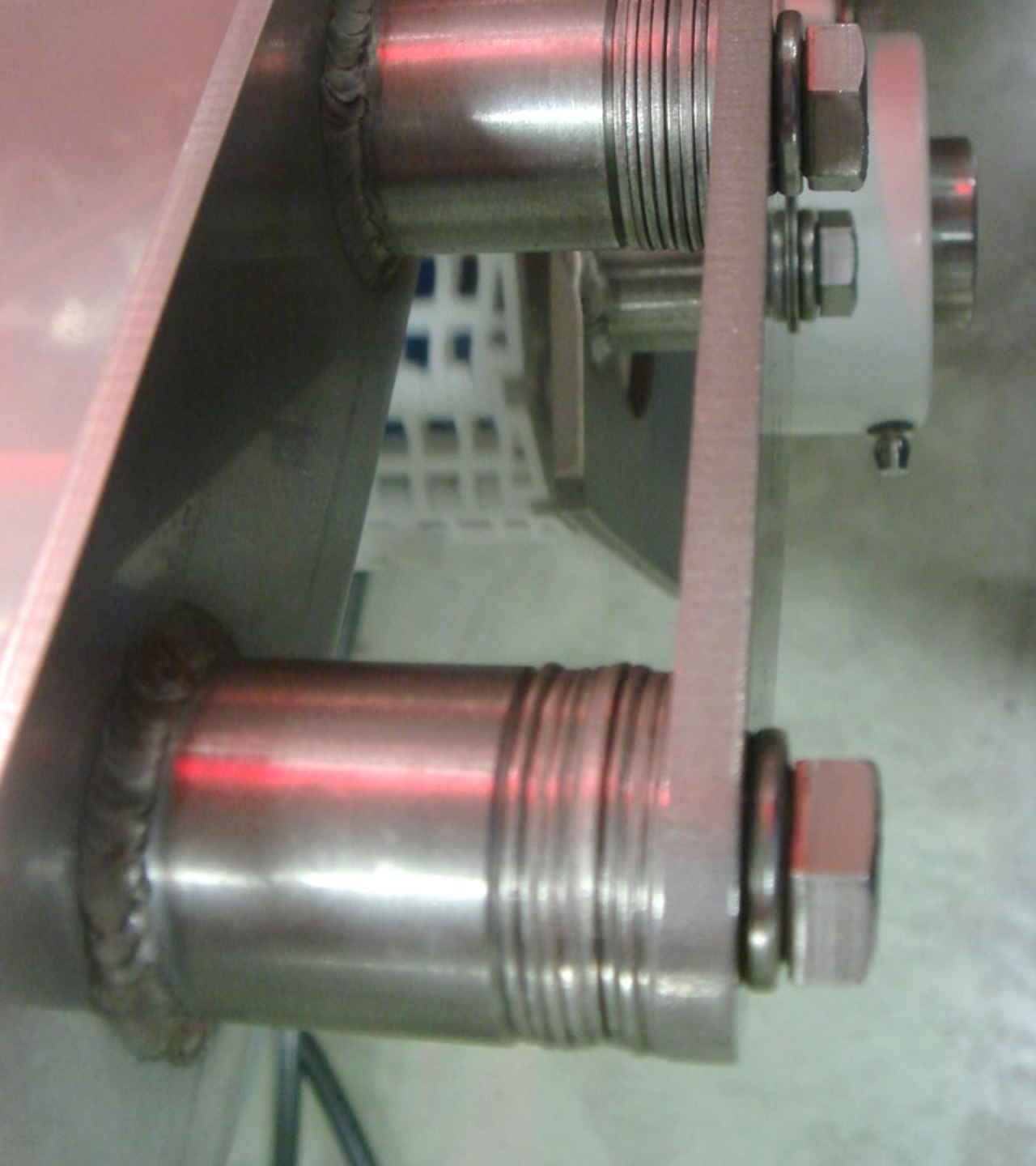
Iron Contamination

08/20/2006

A close-up photograph of a metal surface, likely part of a machine, showing significant rust and corrosion. The rust is brown and flaky, covering a large portion of the metal. A white plastic component with a grid of small holes is visible in the foreground, partially obscuring the metal. The background is a solid blue color.

Iron Contamination

Poor Corrective Action





**Field Modification
After Commissioning**

Holes in Hollow Frame

A close-up photograph of a white, textured plastic component, likely a part of a prosthetic limb (PCS). The image shows a deep, narrow crevice or gap between two sections of the plastic. Inside and around this crevice, there is a significant accumulation of reddish-brown, fleshy-looking material, which appears to be biological tissue or a biofilm. The background is a dark, metallic surface with several screws visible.

Crevice in PCS

Un-Bonded Joint in High-Risk NPCS

HYDRAULIC PUMP 2
OFF ON

SYSTEM STOP



In Closing

Spend too much time to understand PCS and NPCCS

Do design reviews

- Post Design, Prefabrication
- Post Fabrication
- Post Installation

Consider Alternative Design Options

Finally, was the risk eliminated?



Take the
Time
to do a
Hygienic
Design
Review



Thank you