

LATTICE BOOM

● What is a lattice boom?

A lattice boom crawler crane consist of lattice boom sections, which can be added or removed from the existing boom configuration to increase or decrease the boom length as well as radius to meet the job site requirement. To give maximum strength for the boom sections while minimizing the weight, they are made of steel pipe and welded in a W or V pattern.



Lattice Boom Insert Sections

Lattice boom sections consist of main chords and lacing pipes to support the compression stress caused by lifting loads. There are two types of chord and lacing;

- Tubular chord and lacing
- Angular chord and lacing

In KOBELCO Cranes, Tubular chord and Lacings pipes are used to manufacture the lattice boom sections.

Advantages of the W or V design of boom sections includes;

- Decrease of the total weight of boom
- Increase in the boom strength
- Provides maximum support for heavy loads

● Possible damages on boom.

Possible damages on the boom sections are:

- Dents in lacings pipes and chords.
- Bent or kinked lacing pipes and chords
- Cracked lacings and chord.
- Cracks on the weld bead of lacing pipes, chords and connectors.



- Corrosion in lacing pipes and chords



Corrosions occurs on the boom sections are mainly due to lack of proper maintenance of boom sections and proper storage facilities.



Structural Failure!

Operating crane with damaged lacing pipes and chords, can result in structural failure or collapse of the boom attachment and may cause personal injury or death

Boom sections have great importance in the crane as they provide support during the lifting operations. Damages on the boom sections can result in serious accidents and thus complete loss of machine. To avoid this, maintenance and inspections on boom sections are highly recommended.

DO's on boom section;

- Inspection prior to initial use.
- Inspect the boom structure including the main chords, lacing pipes, plates etc., and the weldment on boom and jib weekly.
- After transportation from one site to another.
- After an overload or shock load caused by pick and carry operation.
- If the attachment gets hit with another object such as building, power lines etc.
- If the attachment has been struck by lightning.
- After long term storage.

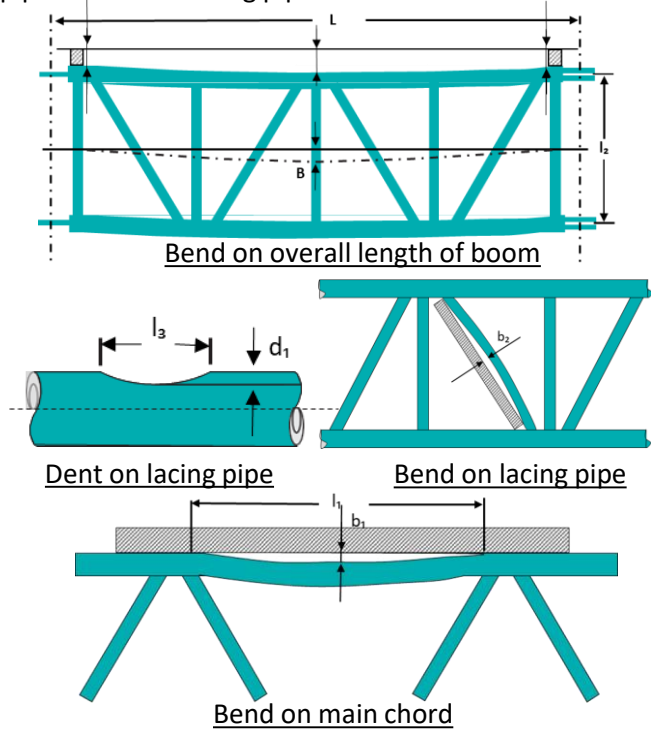
Check It Now!!!

LATTICE BOOM

● Inspection Procedures on Lattice Boom Sections.

1. Dimension Inspection

Bend on overall length of boom, bend of main chord and lacing pipe : Keep magnets of same height adjacent to boom-end connectors. Check the distance between boom main pipe and sling. The inspection should be made at the side of boom in order to get correct readings. The checking points should be at main pipe where the lacing pipes are concentrated.



Repair Standards on Chord and lacing pipes;

| Lifting capacity- upto 650 T | Repair Standard |
|------------------------------|--|
| Chord (Main pipe) | ① $B \leq 3 \text{ mm} + (L / 2000) \text{ mm}$ |
| | ② $b_1 \leq 3 \text{ mm} + (l_1 / 2000) \text{ mm}$ |
| | ③ $d_1 \leq 0.8 \text{ mm}$, but $l_3 \geq 30 \text{ mm}$ |
| Lacing Pipe | ① $b_2 \leq 2 \text{ mm} + (l_2 / 2000) \text{ mm}$ |
| | ② $d_1 \leq 1.0 \text{ mm}$, but $l_3 \geq 15 \text{ mm}$ |

Where;

B - Bend on the overall length of boom,

b_1 - Bend between lacing pipes

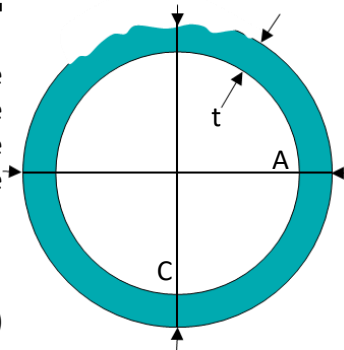
d_1 - Dent on the chord

b_2 - Bend on the lacing pipe

d_1 - Dents on the lacing pipe

2. Abrasion, Corrosion

Remove corrosion from the boom section and make the surface flat. Measure the diameter of non-defective part, A and defected area, C.



Dent, $D = A - C$

Remaining thickness = $(t - D)$

3. Cracks on the weld bead and Kinks on lacing pipes:

The most common weld inspection method for cracks and kinks is visual examination and using liquid penetrance testing. The most sophisticated and clear all doubts is by using magnetic particle testing method (MPT). In case, kinks or cracks found on lacing pipe, repair is not permitted, and it is recommended to replace the damaged lacing pipe.

NOTE: Before starting the test, remove paints and dirt etc. thoroughly from the boom section until weld bead appears.

If the boom sections were found damaged (Dent/Bend), boom repair are allowed under certain repair limitations and guidance, that should be strictly followed.

| Portion | Extend of Repair |
|-------------------|-------------------------------------|
| Chord (Main pipe) | No |
| Lacing Pipe | Maximum 30% on one side fo the boom |
| Diaphragm | Yes |
| Connector | No |

➤ If the damage is on the lacing pipe, it can be replaced. However, If more than 30% lacing is damaged in one side of the boom section, replace boom section.

➤ If the damage is on the main chord, replacement of main chord is strictly prohibited and recommended to replace boom section. Welding repair on the chord may drastically reduce the strength of boom sections and thus will result in structural failure of attachments and cause collapse of boom during lifting.

➤ Lacing pipes must be procured from KOBELCO through authorized dealer/distributor.

➤ Boom section repair must be carried out with a KOBELCO certified welder.

For more details, contact:- webmaster_cr_me@kobelconet.com

KOBELCO CONSTRUCTION MACHINERY MIDDLE EAST AND AFRICA FZCO.