

Worker's Safety Handbook for Rigger and Signalman



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Preface

This handbook serves as a workplace safety and health resource for workers who are involved in work activities involving lifting equipment such as cranes. The Rigger and Signalman handbook highlights general safety pointers to ensure safe lifting operations. This handbook was developed to assist the Rigger and Signalman to better understand their roles and responsibilities, show examples of good and bad practices for loading and rigging, perform basic inspection of lifting equipments such as hooks, shackles and wire ropes, adhere to good communication practices, and recognise crane hand signals.

This handbook is produced for education and informational purposes by the National Crane Safety Taskforce and Workplace Safety and Health Council and serves as a reference for good practices.

1. Proper Attire for Rigger and Signalman

Wear personal protective equipment (PPE)

Put on the proper attire and PPE at all times

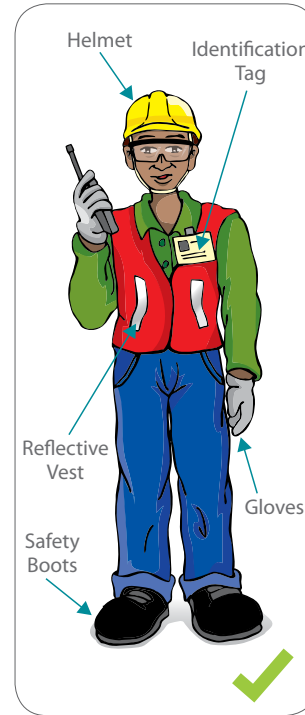


Figure 1: Signalman attire

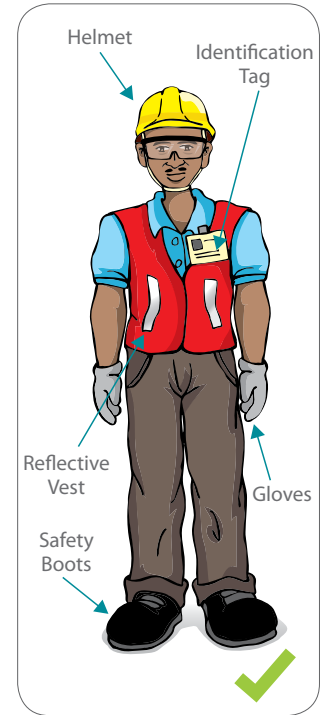
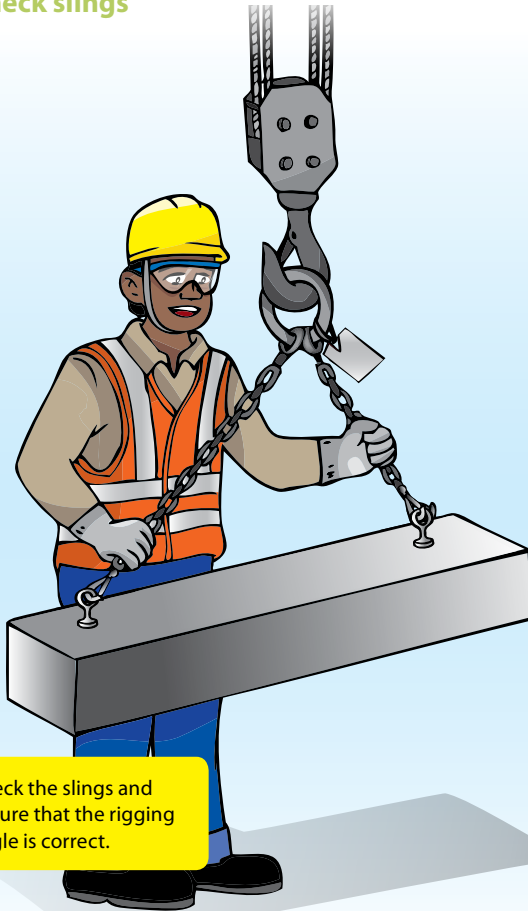


Figure 2: Rigger attire

2. Roles and Responsibilities of a Rigger

Check slings



✓ Check the slings and ensure that the rigging angle is correct.

3. Roles and Responsibilities of a Rigger

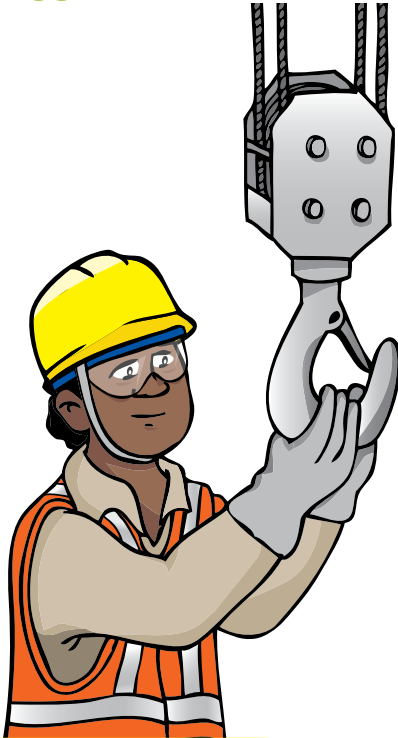
Check load



✓ Make sure the load is properly secured and inform the Crane Operator of the weight of the load.

4. Roles and Responsibilities of a Rigger

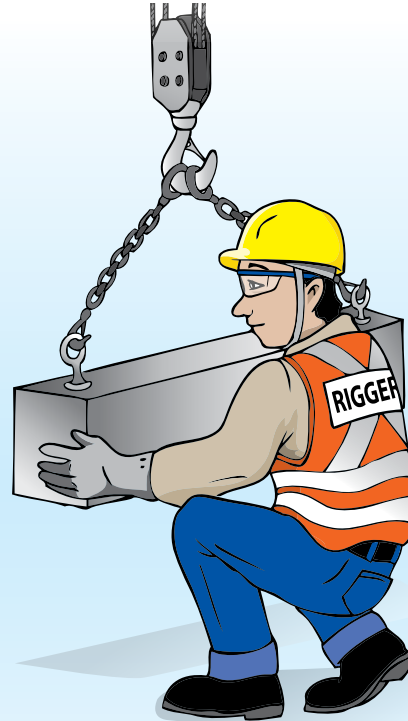
Check lifting gears



Make sure the lifting gears such as slings and shackles are well-maintained and in good working condition.

5. Roles and Responsibilities of a Rigger

Ensure load lifted is safe and balanced



Make sure the load is stable, secured and balanced before any lifting operation.

6. Roles and Responsibilities of a Rigger

Ensure loose loads are secured



Make sure any loose items are placed in a proper receptacle or container to prevent the load from falling during the lifting operation.

7. Roles and Responsibilities of a Rigger

Report defective lifting gear to Lifting Supervisor



Immediately report any defective or faulty lifting gear to the Lifting Supervisor.



8. Roles and Responsibilities of a Rigger

Use paddings on the load edges



Place adequate paddings on the edges of the load to prevent the sling from damage.

9. Good and Bad Rigging Practices

Correct use of choker hitches

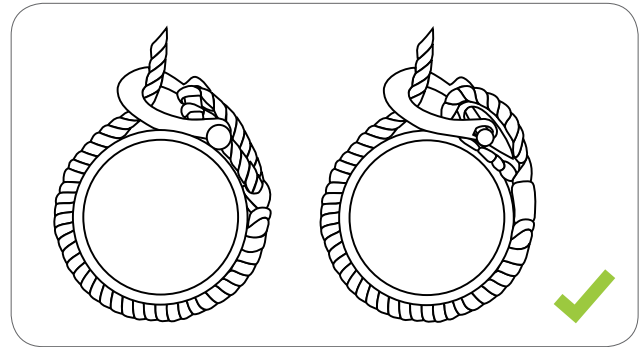


Figure 3: Make sure there is no cutting action on the running line.

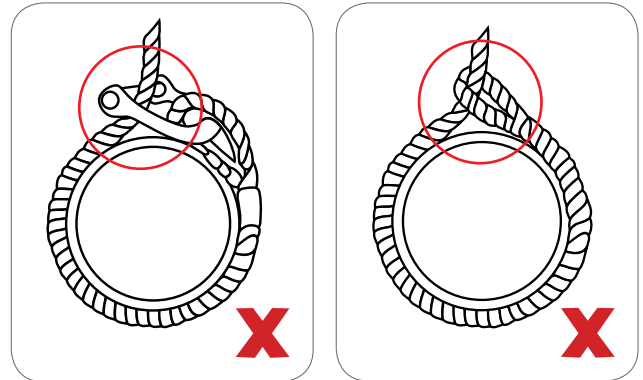


Figure 4: Do not use shackle pin as it will become loose over time.

Figure 5: Make sure there is no cutting action of the wire rope sling eye on the running line.

10. Good and Bad Rigging Practices

Correct way to balance a shackle load

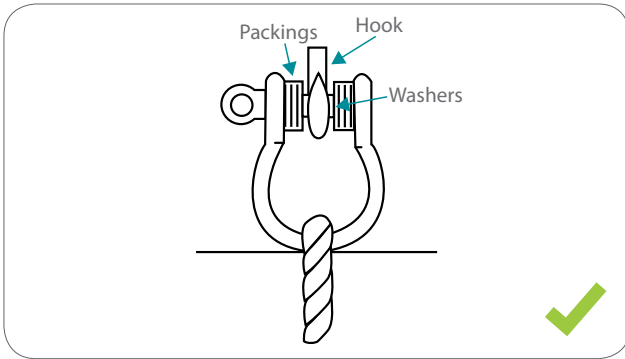


Figure 6: Insert sufficient washers to centralise the position of the shackle.

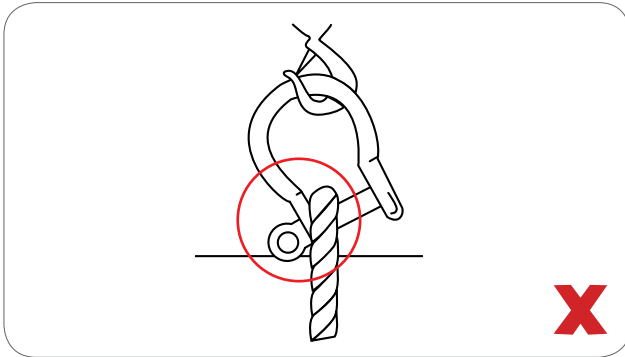


Figure 7: Make sure the shackle is not pulled down at an angle.

11. Good and Bad Rigging Practice

Correct hook-up methods

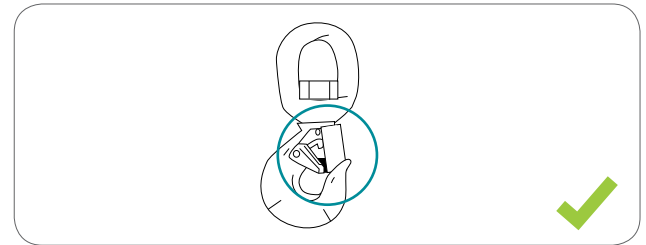


Figure 8: Make sure the safety latch is in good condition.

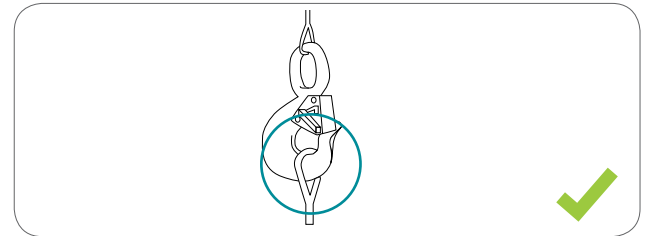


Figure 9: Make sure the shackle is hooked up correctly.

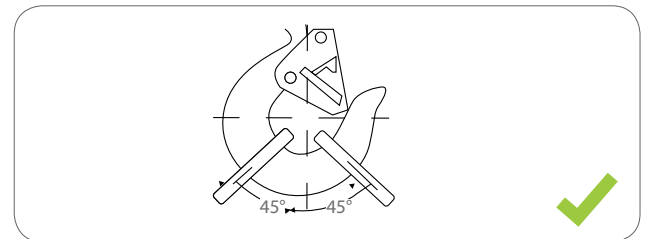


Figure 10: Make sure the shackle is equally spaced apart.

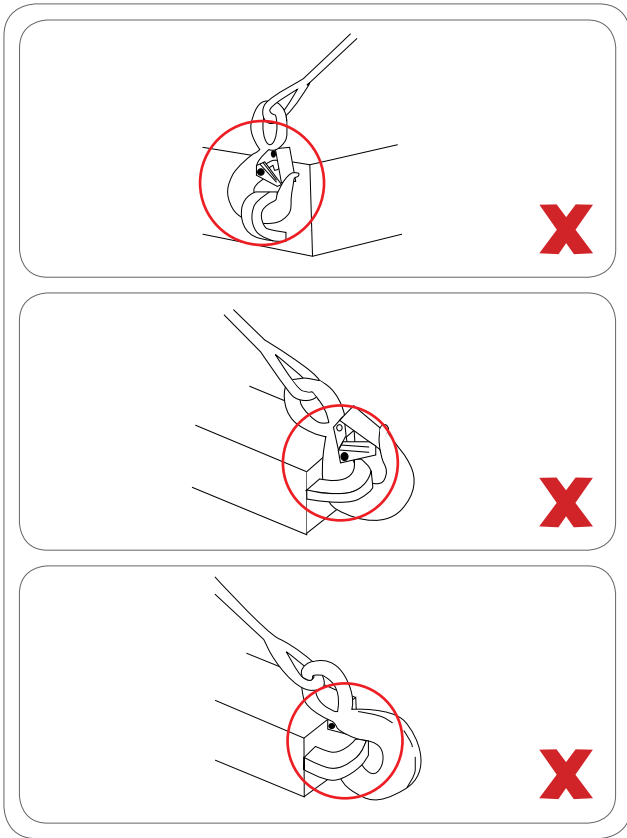


Figure 11: **Wrong hooking up method.**

12. Good and Bad Rigging Practices

Correct rigging method

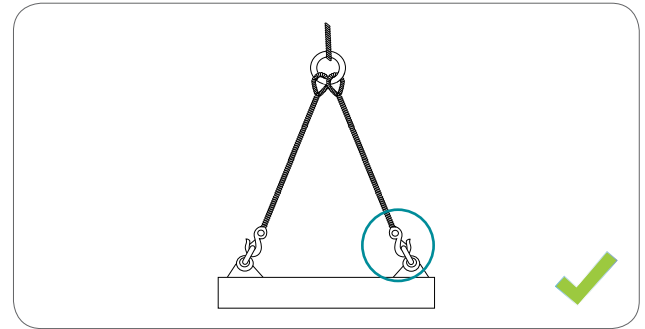


Figure 12: **Secure the hooks facing out.**

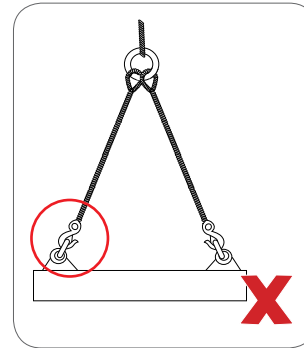


Figure 13: **Do not secure the hooks facing in.**

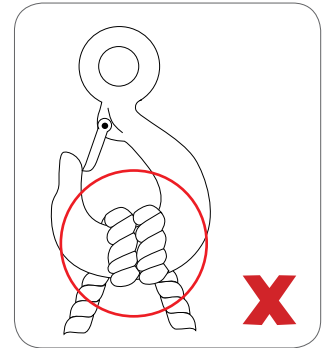


Figure 14: **Do not wrap a rope around the hook.**

13. Good and Bad Rigging Practices

Correct rigging method

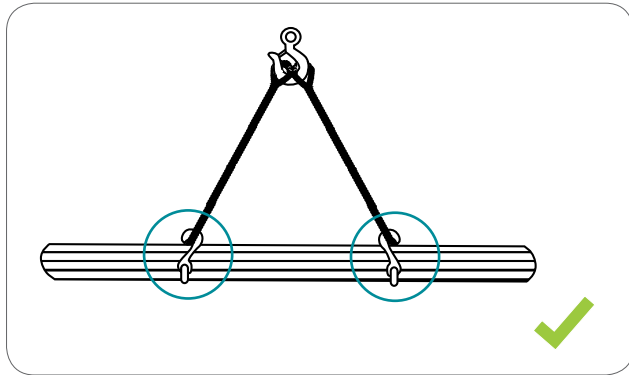


Figure 15: Make sure the load is rigged correctly before lifting.

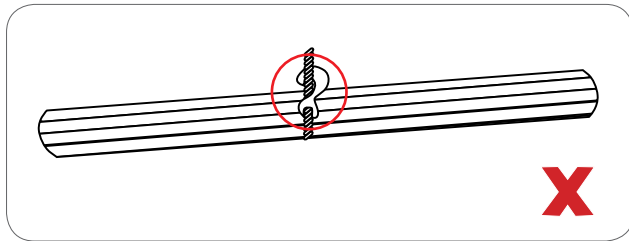


Figure 16: The load will tilt to one side during lifting if it is not rigged correctly.

14. Good and Bad Rigging Practices

Correct rigging method

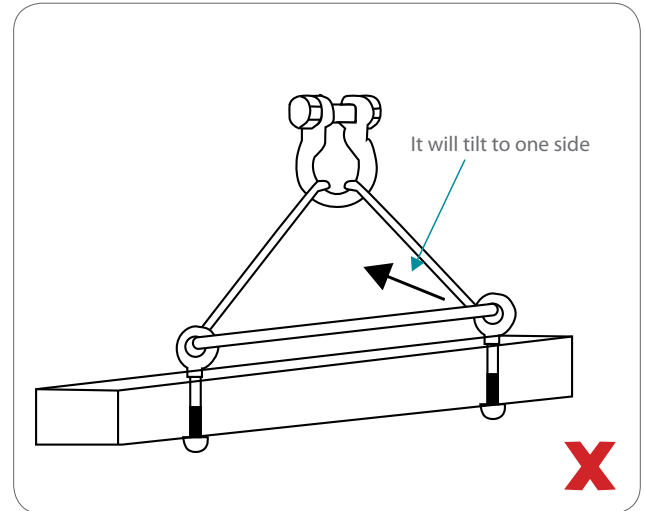


Figure 17: Do not tie the sling from one eye bolt to another as it will tilt to one side.

15. Good and Bad Rigging Practices

Hook up unused slings

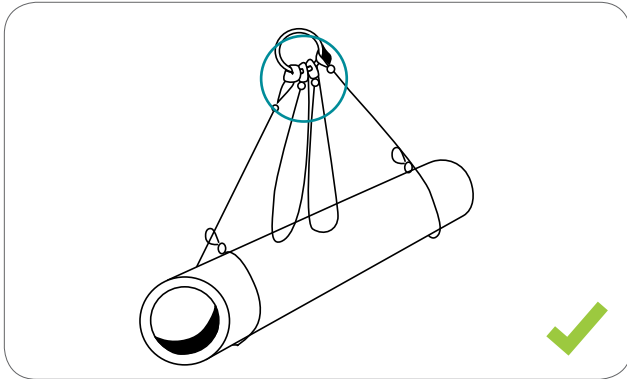


Figure 18: Make sure any unused slings are hooked up properly.

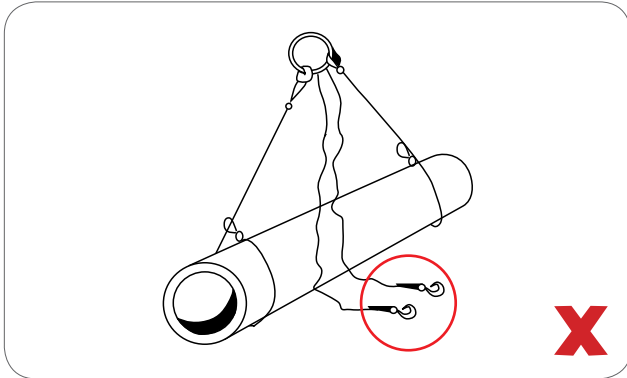


Figure 19: Do not leave unused slings unhooked.

16. Good and Bad Rigging Practices

Correct loading method

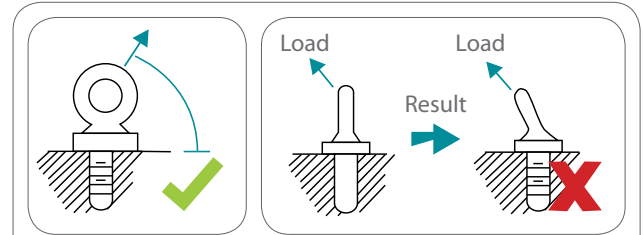
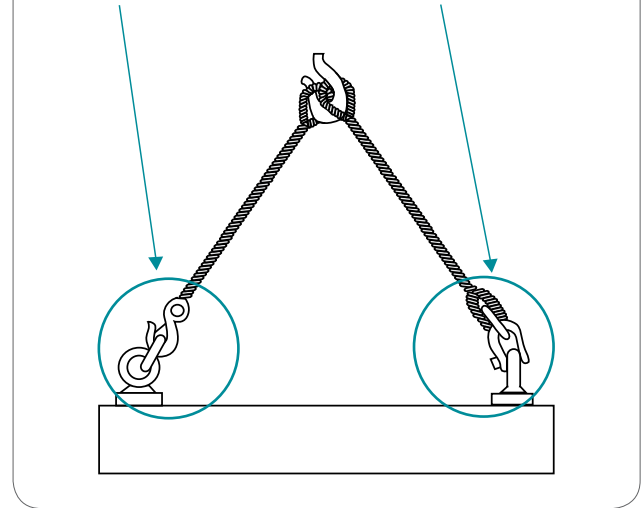


Figure 20: Correct loading method.

Figure 21: The eye bolt will bend if loading is not done correctly.



17. Good and Bad Rigging Practices

Use paddings during lifting

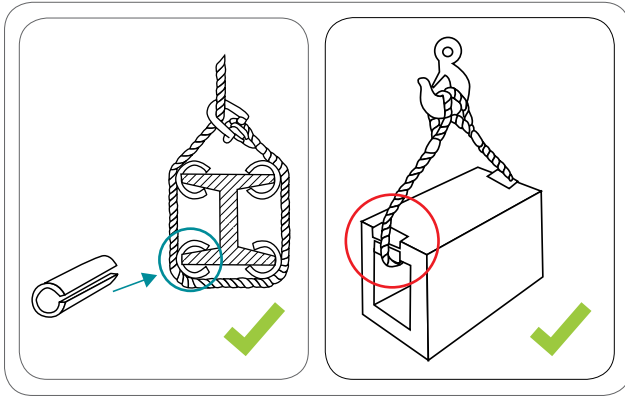


Figure 22: Correct ways of using paddings to prevent damage to the sling.

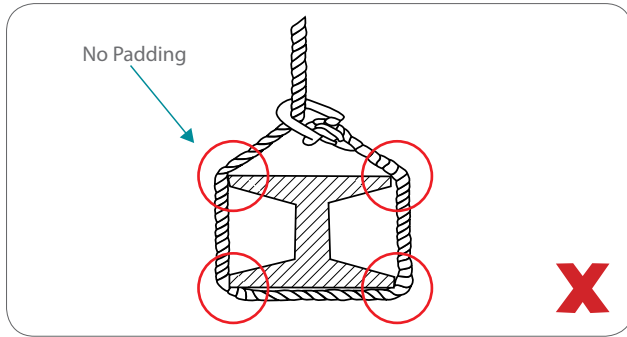


Figure 23: The sling will be damaged if paddings are not used on the load.

18. Good and Bad Rigging Practices

Correct methods of joining sling eyes

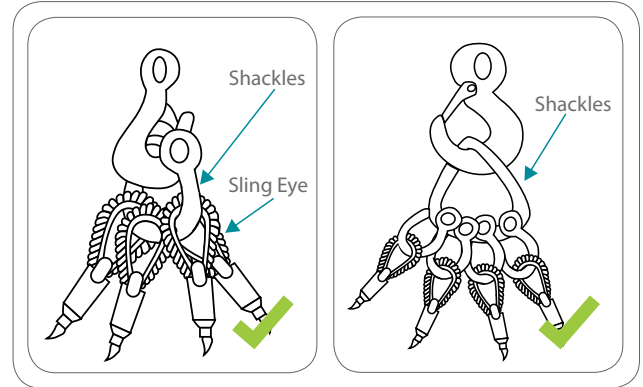


Figure 24: Use a shackle to join the sling eyes.

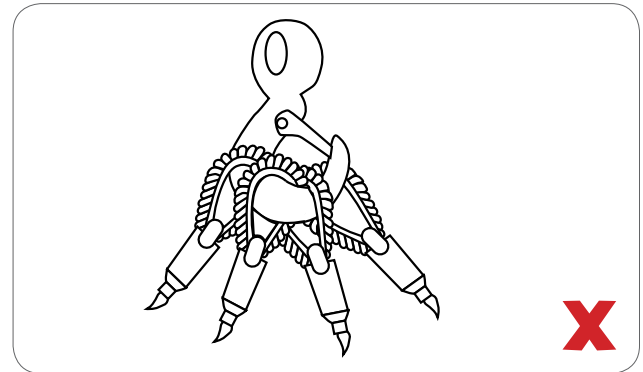


Figure 25: Wrong method of joining the sling eyes.

19. Good and Bad Rigging Practices

Use original screw pin

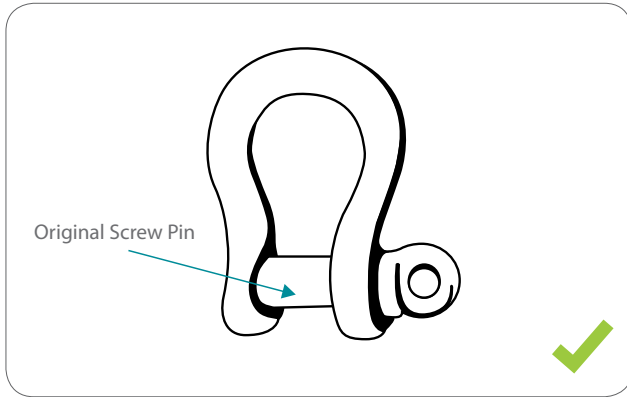


Figure 26: Use the original screw pin for the shackle.

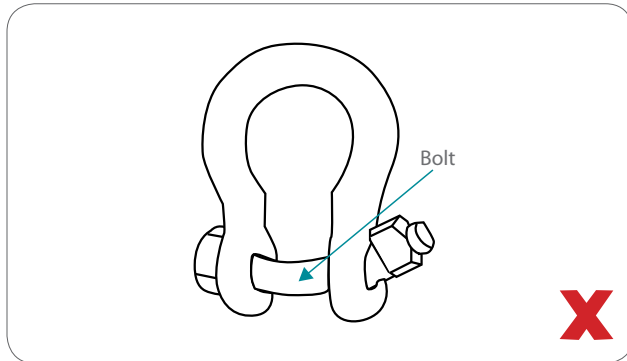
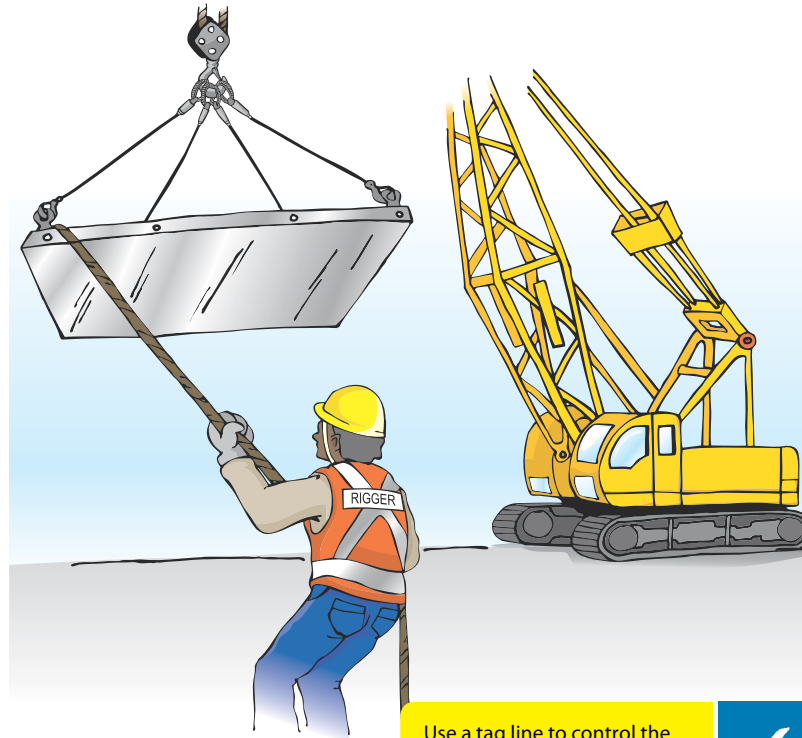


Figure 27: Do not use a bolt as a screw pin as it will bend.

20. Good and Bad Rigging Practices

Use tag line to control movement of the load



Use a tag line to control the movement of the load during a lifting operation.

21. Good and Bad Rigging Practices

Correct method of unloading

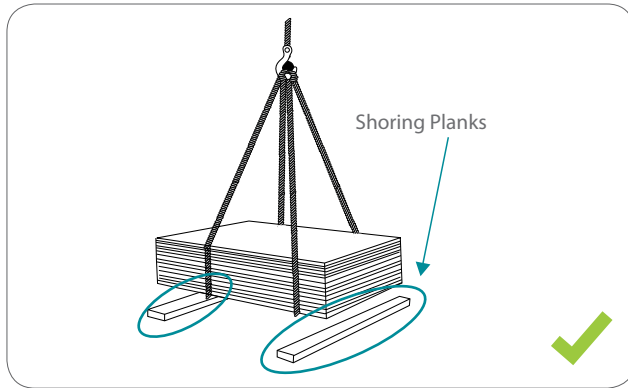


Figure 28: Place load on shoring planks during unloading.

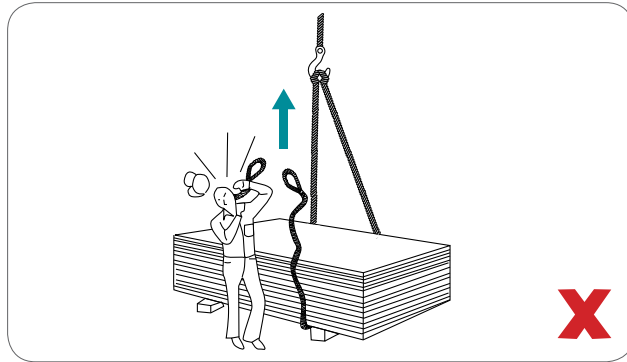
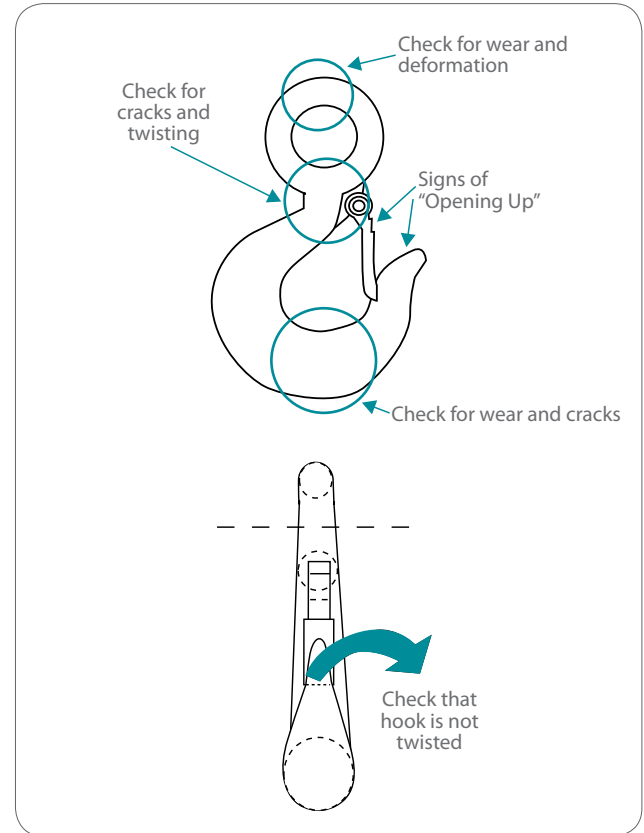


Figure 29: Do not use the crane to pull out the sling from under the load.

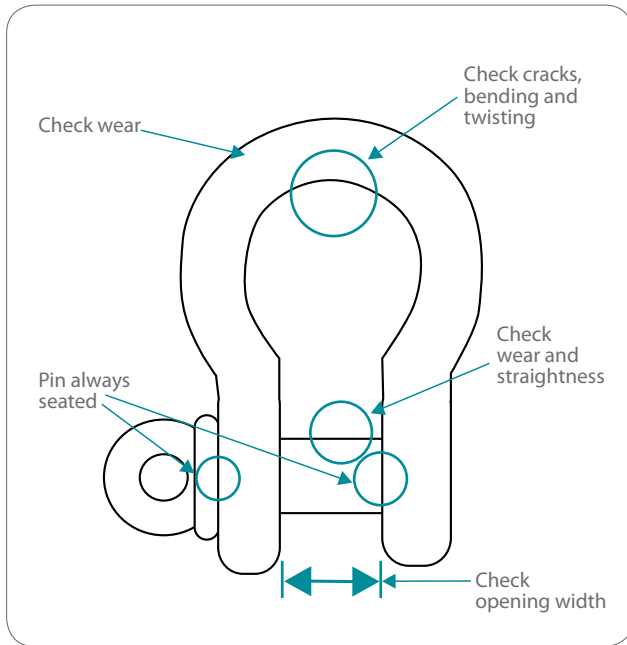
22. Inspection of Hooks and Shackles

Check hook for any defects and make sure it is in good working condition



23. Inspection of Hooks and Shackles

Check shackle for any defects and make sure it is in good working condition



24. Types of Wear and Tear for Wire Ropes

Check wire ropes for any defects and make sure they are in good working condition

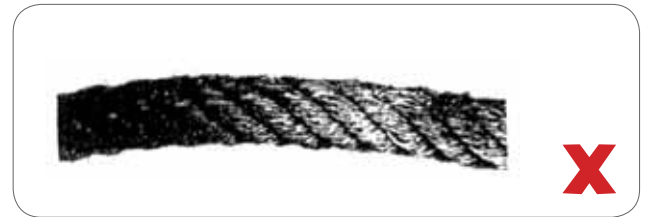


Figure 30: Crushed severely.

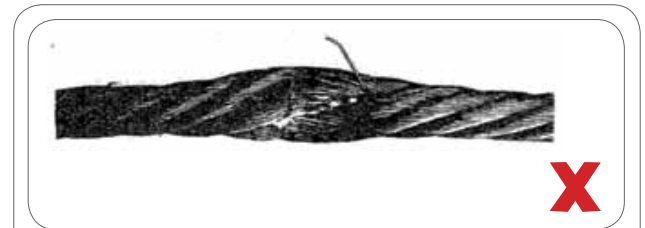


Figure 31: Flatten severely.

25. Types of Wear and Tear for Wire Ropes

Check wire ropes for any defects and make sure they are in good working condition

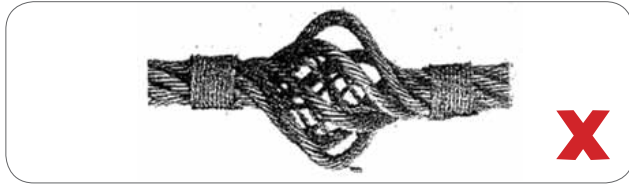


Figure 32: Bird cage.



Figure 33: Dog-leg kink.



Figure 34: Kink.



Figure 35:
Open kink.



Figure 36:
Closed kink.

26. Types of Wear and Tear for Wire Ropes

Check wire ropes for any defects and make sure they are in good working condition

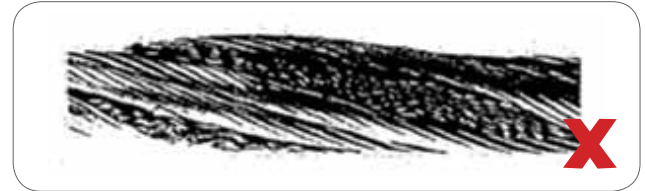


Figure 37: Bulged severely.



Figure 38: Core protrusion.

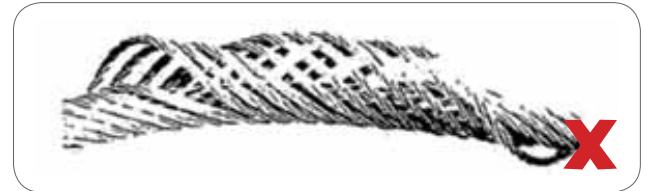
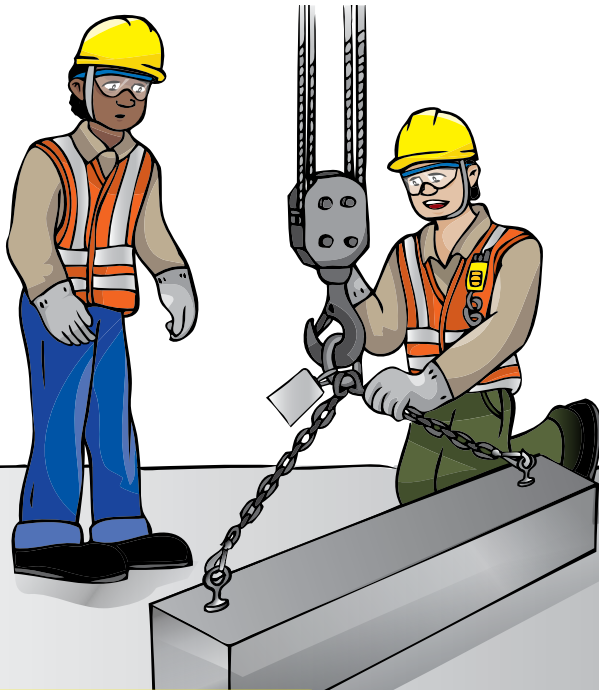


Figure 39: Excessive clearance between strands.

27. Roles and Responsibilities of a Signalman

Check load is properly rigged



Check the load is properly rigged before giving clear signal to the Crane Operator to lift the load.

28. Roles and Responsibilities of a Signalman

Give correct crane hand signals



Give the correct crane hand signals clearly to the Crane Operator to lift the load.

29. Recommended Crane Hand Signals

Understand and practice correct crane hand signals

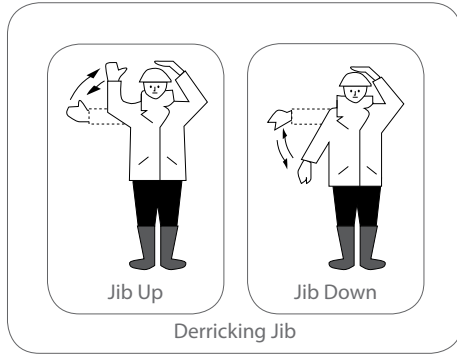


Figure 40: Signal with one hand. Other hand on head.

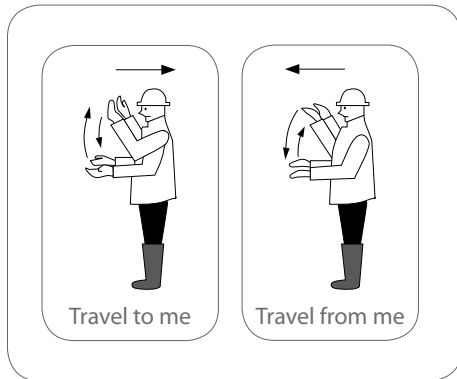


Figure 41: Signal with both hands.

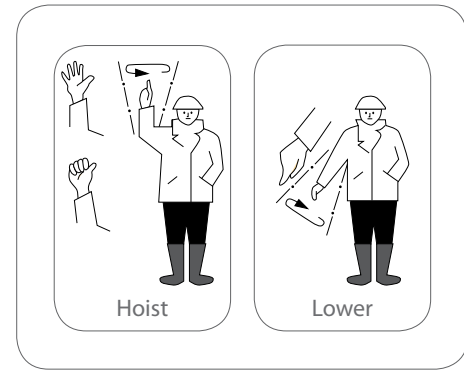


Figure 42: Clench and unclench fingers to signal take the strain.

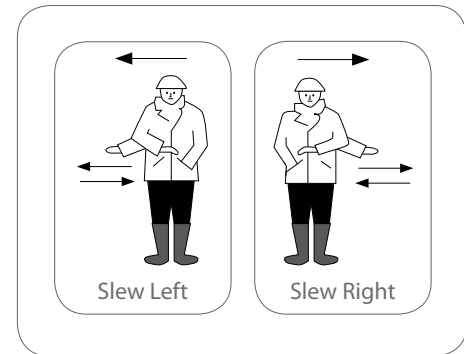


Figure 43: Arm extended, pointing with finger in direction of swing of boom.

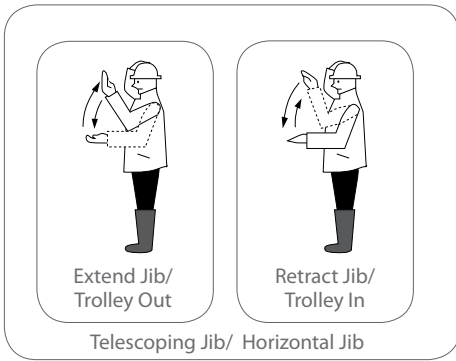


Figure 44: Signal with one hand. Other hand on head.

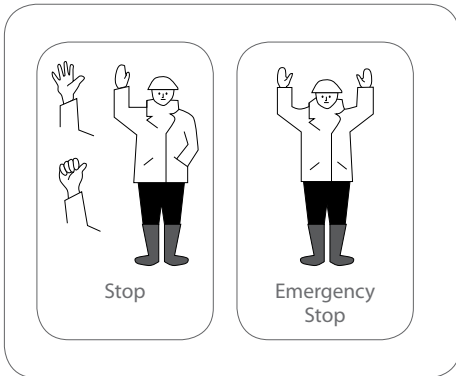


Figure 45: Clench and unclench fingers to signal inch the load.

30. Good Communication Practices

Practice good communication within the Lifting Team



Communication between Lifting Supervisor, Rigger and Signalman must be maintained at all times.



31. Good Communication Practices

Practice good communication within the Lifting Team



Rigger and Signaller must maintain good communication between each other at all times.

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