Overhead Weighing

Safety and Periodic Maintenance Manual

Safe Rigging, Loading and Operation Including Suggested Inspection and Maintenance Procedures

October 24, 2023

RICE LAKE WEIGHING SYSTEMS

PN 153105 Rev B

All information contained within this publication is, to the best of our knowledge, complete and accurate at the time of publication. Rice Lake Weighing Systems reserves the right to make changes to the technology, features, specifications and design of the equipment without notice.

The most current version of this publication, software, firmware and all other product updates can be found on our website:

www.ricelake.com

Revision History

This section tracks and describes manual revisions for awareness of major updates.

Revision	Date	Description
B	October 24, 2023	Established revision history; updated style, added descriptions for the following devices: • Lift and weigh • Lift, weigh, and move

Table i. Revision Letter History

Contents

1.0 Introduction

This manual has been prepared to provide information and suggestions for safe operation, rigging, inspection, and maintenance of Rice Lake Weighing Systems MSI Crane Scales.

Manuals are available from Rice Lake Weighing Systems at **www.ricelake.com/manuals**

Warranty information is available at **www.ricelake.com/warranties**

It is not intended that the suggestions in this manual take precedence over existing plant safety rules and regulations, OSHA regulations, or instructions issued by the crane manufacturer. However, the following information should provide a better understanding of operation and afford a greater margin of safety for personnel and machinery.

This is a manual of suggestions for the crane scale operator's use. It is the responsibility of the owner to make personnel aware of all federal, state and local rules and codes and to make certain that operators are properly trained.

If you have any questions or comments please contact:

Rice Lake Weighing Systems

USA: 1-800-472-6703 or International: +1-715-234-9171

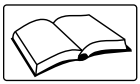
1.1 Safety

Safety Definitions:

WARNING: Indicates a potentially hazardous situation that, if not avoided could result in serious injury or death. Includes hazards that are exposed when guards are removed.

IMPORTANT: Indicates information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.

General Safety



Do not operate or work on this equipment unless this manual has been read and all instructions are understood. Contact any Measurement Systems International or Rice Lake Weighing Systems dealers for replacement manuals.

WARNING

Failure to heed may result in serious injury or death.

DO NOT allow minors (children) or inexperienced persons to operate this unit.

DO NOT stand near the load being lifted as it is a potential falling hazard. Keep a safe distance.

DO NOT use for purposes other then weight taking or dynamic load monitoring.

DO NOT use any load bearing component that is worn beyond 5% of the original dimension.

DO NOT use any associated lifting product if any of the components of the load train are cracked, deformed, or show signs of fatigue.

DO NOT exceed the rated load limit of the associated unit, rigging elements, or the lifting structure.

DO NOT allow multi-point contact with the hook, shackle, or lifting eye of the associated unit.

DO NOT make alterations or modifications to the unit or associated load bearing devices.

DO NOT remove or obscure warning labels.

DO NOT move the sample (load) with a lift and weigh device.

2.0 Safe Operating Guidelines

WARNING: Before operating a crane scale, the scale operator should carefully read and study the appropriate Operation Manual supplied by Rice Lake Weighing Systems and note any special instructions.

2.1 Operating Suggestions

1. Do not make lifts beyond rated load capacity of the crane scale, sling chains, rope slings, etc.
2. Do not operate the crane scale if ropes, slings, cables, chains, etc. show any sign of defects or excessive wear.
3. Before moving the load, make certain that load slings, load chains or other lifting devices are fully seated in the saddle of the crane scale hook with hook latch closed.
4. At no time should a load be left suspended from the crane scale unless the operator is at the master switch or push buttons with the power on. Under this condition keep the load as close to the floor as possible to minimize the possibility of an injury, should the load drop. When the crane scale is holding a load, the crane operator should remain at the master switch or push buttons.
5. When a hitcher is used, it should be the joint responsibility of the crane operator and the hitcher to see that hitches are secure and that all loose material has been removed from the load before starting a lift.
6. Do not lift loads with ropes, slings, cables, chains, etc. hanging loose.
7. All ropes, slings, cables, chains, etc. should be removed from the crane scale when not in use. (A dangling cable can inadvertently snag other objects when the crane is moving.)
8. Operators should not maneuver a loaded crane scale over personnel.

3.0 Handling Hoist Motion

After the crane scale hook has been positioned over the load, lower it until the load can be attached to the scale hook. As the scale hook approaches this level, reduce the speed so that the lowering can be stopped smoothly and quickly.

If load slings are used to handle the load, the slings should be fully seated in the saddle of the scale hook. With the scale hook latch closed, the scale hook should be started upward slowly until all slack has been taken out of the slings. Then ensure the load is properly balanced and the slings are properly positioned.

WARNING: Loads may disengage from crane scale hook and shackle or lifting eye if proper procedures are not followed.

A falling load may cause serious injury or death.

The crane scale hook must always support the load. The load must never be supported by the latch.

Never lift more than the crane scale's assigned Working Load Limit (WLL) rating.

Read and understand the instructions in this manual before using the crane scale.

3.1 Safely Moving Sample (Loads)

There are two different types of overhead weighing devices:

- Lift and weigh
- Lift, weigh, and move

Using a device not designed for application requirements is a safety concern.

Sections Section 3.1.1 and Section 3.1.2 detail both types of overhead weighing devices.

3.1.1 Lift and Weigh

Lift and weigh devices are designed for inline weighing where the sample (load being weighed) applies tension to the weighing device.

For example: If loading is vertical, lift the sample minimally off the floor (or supporting structure) until load is fully supported by the weighing device, capture the static weight and then lower the sample to the floor.

Lift and Weigh devices are not designed to be inline when a sample is moved.

3.1.2 Lift, Weigh and Move

Lift, weigh and move devices are designed for inline weighing and support moving a sample (load) to a new location.

For example: Lift the sample minimally off the floor, capture the static weight, gently move the sample and then lower the sample to the floor.

Although there is a minimum of 5:1 built into all RLWS overhead weighing devices, reducing rough handling will prolong the life of overhead equipment.

3.2 Safe Loading and Rigging Guidelines

- Capacity ratings on the Crane Scale are for inline loading
- Use hardware that creates single point attachments and allows the scale freedom of alignment.

Figure 3-1. In-Line Loading

3.3 During Loading Procedures

Do Not

Use interface hardware that is oversized. If it restricts single point loading and self alignment, it may result in off-axis loading.

Do Not

Push or pull a loaded scale.

Do Not

Side load, back load or tip load a crane scale hook.

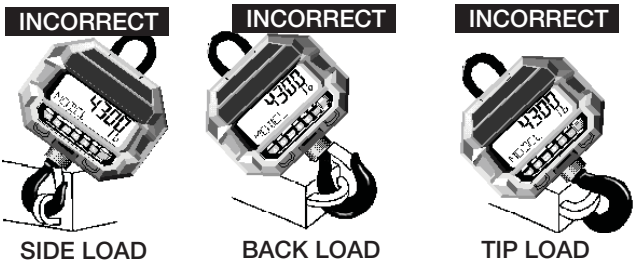
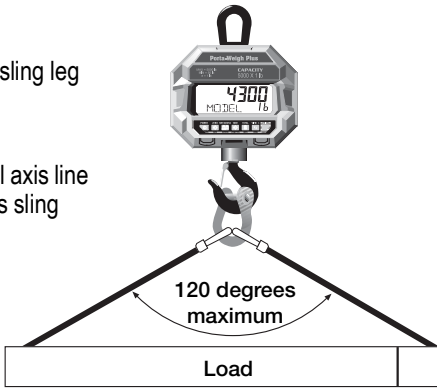
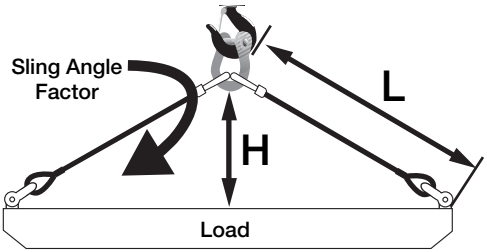


Figure 3-2. Loading Procedure Precautions

- Use bottom shackle with hook for two sling leg loading.
- Never exceed 120° included angle.
- Shackle load rating is based on vertical axis line loading Shackle capacity decreases as sling angle increases from vertical axis.





Horizontal Sling Angle(A) Degree	Sling Angle Factor = L/H
90	1.000
60	0.866
50	0.766
45	0.707
30	0.500
Load on each leg of sling = vertical share of load x load angle factor	

Figure 3-3. Loading the Scale Hook with Multiple Sling Legs

Do Not

Use multiple attachments without the proper hook up of a shackle.

Correct

Use a shackle when multiple attachments are placed on a scale hook

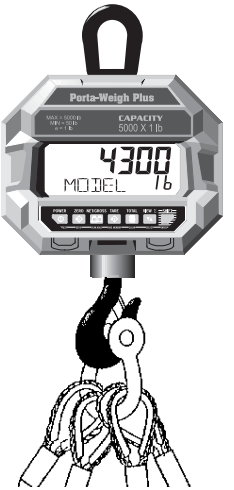


Figure 3-4. Scale with Multiple Attachments

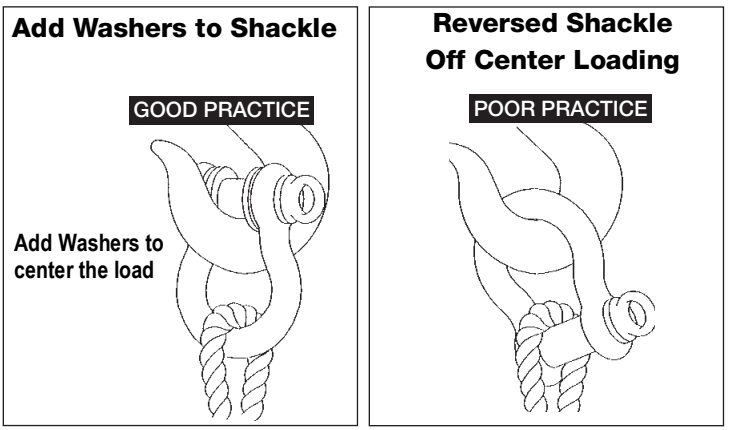


Figure 3-5. Using a Shackle

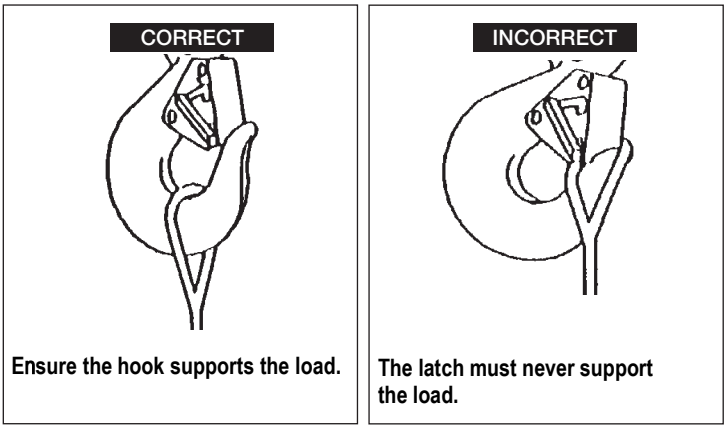


Figure 3-6. Scale Hook with Latches

CAUSE	RESULTANT DAMAGE
Heavy use	Wear
Dragging across floors	Wear
Shock loading	Distortion
Corrosion	Reduction of structural material
Corrosion	Damage to threads
Welding	Destruction of heat treat
Overloading	Distortion
Improper use of multiple slings	Distortion
Tip loading, side loading, back loading	Distortion

Table 3-1. Causes of Damage to Hooks, Shackles, Lifting Eyes and Load Cells

4.0 Load Train Visual Inspection Suggestions

- Always visually inspect scale load bearing components before using.
- Check for distortion such as bends, twists and spread.
- Inspect for wear such as peening, nicks, gouges, cracks, corrosion and thread damage.
- Magnetic particle or dye penetrant crack detection of all components of the load train assembly should be conducted annually. If the crane scale hook, shackle or lifting eye are painted, visual inspection should take this coating into consideration. Surface variations can disclose evidence of heavy or severe use that requires more detailed analysis. The surface condition may, in such instances, call for stripping the paint.
- Annual inspection of the load sensor by an Authorized Rice Lake Weighing Systems Dealer is strongly recommended.

WARNING: Do not use any load bearing component that is worn beyond 5% of original dimension.

Remove from service any load bearing component with a detected crack.

4.1 Visual Inspection of Shackles

- Check for distortion such as bends, twists and spread.
- Look for peening, nicks and gouges.
- Inspect for cracks or corrosion.
- Check for thread damage.

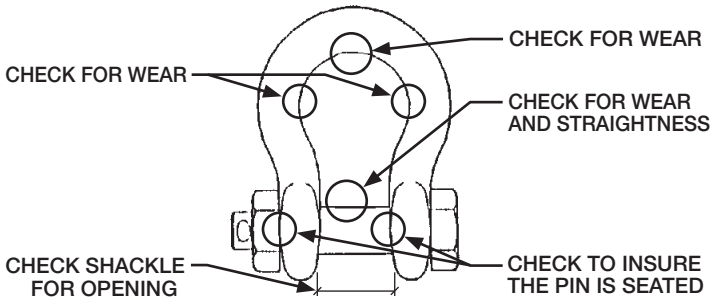


Figure 4-1. Shackle Field Inspection Areas

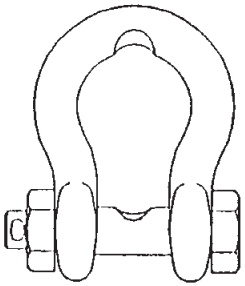


Figure 4-2. Shackle with Excessive Wear

- Look for improper replacement of pins.
- Never replace a pin with a bolt or any other fastener.

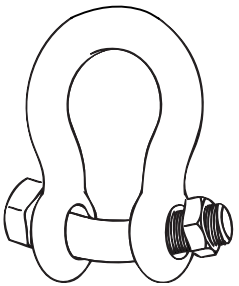
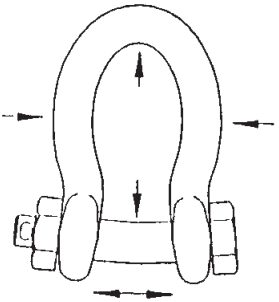


Figure 4-3. Improper Replacement of Pins in Shackle



Bent pin and elongated bow.

Figure 4-4. Overloaded Shackle

Check for ear alignment.

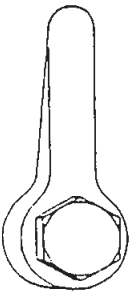


Figure 4-5. Shackle Eye with Twist

WARNING: If any of the preceding conditions exist, remove shackle from service.

5.0 Scale Hook Inspection

The following is a guideline to be used for the examination of scale hooks.

Common inspection methods which may be used are: visual, magnetic particle and dye penetrant.

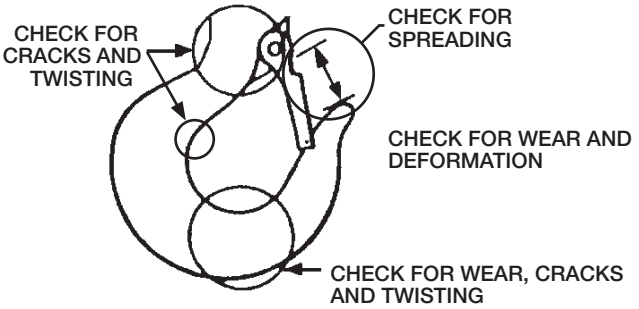
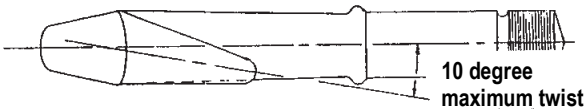


Figure 5-1. Scale Hook Inspection



- Check for wear and deformation.

Figure 5-2. Scale Hook with 10 Degree Maximum Twist

WARNING: Never use a hook whose throat opening has been increased, or whose tip has been bent more than 10° out of plane from the hook body, or is in any other way distorted or bent.

A latch will not work properly on a hook with a bent or worn tip.

6.0 Recommended Preventive Maintenance

6.1 Initial Inspection

Prior to use, all crane scale hook and shackle or lifting eyes should be inspected.

6.2 Frequent and Periodic Inspection

Inspection procedures and record keeping requirements for crane scale hook shackle and lifting eyes in regular service shall be governed by the type of equipment with which they are used.

6.3 Operator Inspection

Visual examination by the operator or other designated person; records not required.

Normal _____ Monthly

Heavy _____ Weekly

6.4 Designated Person Inspection / Manufacturer

Visual inspections by a designated person making records of apparent external conditions to provide the basis for continuing evaluation.

Normal _____ Annual

Heavy _____ Semiannual

Severe _____ Quarterly

6.5 Calibration

Normal _____ Annual

Heavy _____ Semiannual

6.6 Important Safety Information

Repairs of cracks, nicks and gouges shall be carried out by an authorized designated person. All other repairs should be performed by the manufacturer.

Never repair, alter, rework or reshape any load bearing component by: welding, burning, heating or bending. Remove from service any load bearing component with wear or repair that reduces the original dimension by more than 5%.

Magnetic Particle and/or Dye Penetrant Inspection and Surface Preparation

Inspect scale hook, shackle and lifting eye with magnetic particle and/or dye penetrant annually, or more often in severe operating conditions.

Annual inspection of load sensor by an Authorized Rice Lake Weighing Systems Dealer is strongly recommended.

WARNING: Loads imposed on this product should never exceed the maximum rated capacity shown and apply only to uniform direct tension loading. Off-axis loading, bending, side loading and shock loads should be avoided. Damage caused by such, are outside of our warranty. Inspection for wear and cracks on all load bearing components should be conducted annually.

Load bearing components showing defects should be discarded. Continued use of defective components may result in catastrophic failure and personal injury.

Unless authorized by the factory in writing, changes by anyone except the factory such as cutting, welding or permanently attaching other material or products cancels all warranty.

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